

# INTERPRETATIVE SITE INVESTIGATION

**constructiveevaluation**  
site investigation • building pathology

At

The George Hotel  
Huddersfield

On behalf of

**William Birch & Sons Ltd**



PROJECT REFERENCE: 22.1150

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## Interpretative Site Investigation Report

by

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# Foreword

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## 1.0 Introduction

On 18<sup>th</sup> October 2022 Constructive Evaluation (CE) Limited was commissioned by William Birch & Sons Ltd to carry out a Site Investigation at The George Hotel, St Georges Square, Huddersfield, HD1 1JA, hereafter referred to as the “site”.

The purpose of this investigation and report is to provide lithological details of the sub-strata beneath the site and provide parameters of the soils and rocks to aid in the future design of the structure.

Attention is drawn to the fact that whilst every effort has been made to ensure the accuracy of the data supplied and any analysis derived from it, there is a potential for variations in ground and groundwater conditions between and beyond the specific locations investigated. No liability can be accepted for any such variations. Furthermore, any recommendations are specific to the Client’s requirements as detailed herein and no liability will be accepted should these be used by third parties without prior consultation with Constructive Evaluation Ltd.

A desk study as outlined in BS5930 “Code of practice for site investigations” was not requested and therefore has not been carried out.

### 1.1 Site Proposal

It is understood that the proposed development is to lower the existing basement floor.

### 1.2 Summary of Site Investigation

An outline of the intrusive works instructed are summarised below:

- 5no windowless sampler boreholes to a maximum depth of 3.0mbgl,
- Standard Penetration Testing (SPT) at 1 metre intervals to 3.0mbgl,
- 14no. hand excavated foundation pits to 1.2mbgl,
- 1no Rotary percussive borehole to 10.0mbgl, and 2no rotary percussive boreholes to 30.0mbgl,
- Soil sampling for geotechnical and environmental testing.

## 2.0 Site Background

### 2.1 Published Geology

Reference to the publications of the British Geological Survey (BGS), indicate the site is underlain by bedrock of the Pennine Lower Coal Measures. Superficial deposits for the area are recorded as Head Deposits.

**Head Deposits** – 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. Solifluction is the slow viscous downslope flow of waterlogged soil and other unsorted and unsaturated superficial deposits. The term gelifluction is restricted to the slow flow of fluidized superficial deposits during the thawing of seasonally frozen ground. The flow is initiated by meltwater from thawing ice lenses. Polymict deposit comprises gravel, sand and clay depending on upslope source and distance from source. Locally with lenses of silt, clay or peat and organic material.

**Pennine Lower Coal Measures** - Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part.

### 2.2 Physical Site Setting

The site is located in the city centre of Huddersfield to the east of Huddersfield Station. It is centred at the approximate National Grid Reference SE 14417 16934. A Site Location Plan is provided as **Figure 1**.

The building is Grade II listed under the Planning (Listed Buildings and Conservation Areas) Act 1990 (list entry number: 1277386). It dates from 1850's and was designed by architects William Wallen and Charles Child.

The building consists of three primary parts from different construction periods, built around a central ballroom space with an internal light well above. The three primary blocks of the building are as follows:

- 1850's building – includes main entrance, foyer and hotel rooms,
- 1930/60's extension building – includes ballroom, kitchen and hotel rooms,
- 1870's building – includes museum, restaurant and hotel rooms.

The site is shaped like a right angle triangle and covers an area of approximately 1200m<sup>2</sup>. The south face of the building opens to St Georges Square, with the east face opening along the main high-street of Huddersfield; John William Street which slopes downhill northward at a rate of approximately 5m over 150m distance. To the west is a small carpark consisting of approximately 70 spaces associated with Network Rail and the railway station depot. An approximately 3-5m tall retaining wall separates the car park from John William Street and continues to the north of the building.

A summary of the site surroundings is as follows;

- North Boundary – Car park and John Williams Street with commercial and residential multistorey properties beyond,
- East Boundary – John Williams Street with commercial and residential multistorey properties beyond,
- South Boundary – Railway Street and St Georges Square,
- West Boundary – Access to north carpark with the Huddersfield Station beyond.

Access to site is gained via Railway Street to the south. Topography in the area of the site dips eastward at a ratio of 5m over 150m. The surface cover across site comprises blacktop in the northwest in the area of the adjacent car park, a brick laid paving to the west, changing to a stone paving slab to the south and east following the pedestrian walkway.

Site photographs are presented in **Appendix A**.

## 3.0 Field Work

The internal basement works, and external borehole works were completed over four separate site visits, summarised in Table 1.

Table 1: Summary of Field Work Dates

Nature of Works	Dates of Works
Hand Excavated Foundation Pits (TP1-TP14)	27 <sup>th</sup> October 2022 – 2 <sup>nd</sup> November 2022
Windowless sampling Boreholes (WLS1-WLS3)	3 <sup>rd</sup> November 2022
Perth Penetrometer Tests (PP1-PP2)	10 <sup>th</sup> February 2023
Rotary Percussive Borehole (BH7)	23 <sup>rd</sup> November 2022 – 2 <sup>nd</sup> December 2022

The following is the final reported site works for the above dates.

- 3no windowless sampling boreholes to a maximum depth of 1.85mbgl,
- Standard Penetration Testing (SPT) at 1.0 metre intervals to 1.70mbgl,
- 14no hand excavated foundation pits to 1.20mbgl,
- 1no Rotary percussive borehole to 30.0mbgl, with SPT at 1.5 metre intervals to 9.50mbgl,
- 2no Perth Penetrometer tests to a maximum depth of 2.15mbgl,
- Soil sampling for geotechnical and environmental testing.

The Site Investigation Plan showing the final exploratory positions is provided in **Figure 2 and Figure 3**.

Perth penetrometer testing was used to provide a profile of the soils in the locations of BH4 and BH5 where the windowless drilling rig was unable to operate due to height limitations of the working area.

The geotechnical laboratory testing was scheduled by a representative of Ramboll.

The ground investigation was undertaken in accordance with the scope of works agreed with our Client and in relation to statutory guidance including BS5930:2015+A1:2020 Code of Practice for Ground Investigations and BS10175: 2011+A2: 2017 Investigation of Potentially Contaminated Sites: Code of Practice.

### 3.1 Soil Sample Collection

All intrusive locations were logged, visual and/or olfactory evidence of contamination noted, and representative soil samples removed in accordance with current protocol for geotechnical and geo-environmental parameters.

Selected samples were placed in sealed glass jars, plastic tubs, plastic bags or wooden boxes (dependent on the exact laboratory requirements and analysis to be undertaken) before transit. Samples were handled using a fresh pair of nitrile gloves.

## 4.0 Ground Conditions

### 4.1 Observed Stratigraphical Units

The following materials were encountered during the intrusive basement works, summarised in Table 2.

Table 2: Observed Stratigraphical Units from Intrusive Basement Locations.

Material	Top Depth (mbgl)	Bottom Depth (mbgl)	Description
Concrete	G.L.	0.65	Concrete floor slab
Made Ground	0.10	1.20	The Made Ground primary constituent varied significantly between positions but regularly comprised gravels of red bricks, sandstone bricks, and concrete.
Head Deposits	0.20	1.65	Soft becoming stiff with depth grey mottled brown slightly sandy slightly gravelly CLAY. Gravels were recorded as sandstone.
Weathered Pennine Lower Coal Measures Formation	0.30	1.85	Extremely weak to very weak grey MUDSTONE.

The surface cover in the majority of the basement comprised concrete to depths between 0.1mbgl and 0.65mbgl. In the southwest corner of the basement at the locality of TP8, the surface cover comprised York stone paving slabs 50mm thick. Beneath the concrete, Made Ground soils of predominantly gravelly Sand comprising red brick and sandstone bricks were observed to depths between 0.2mbgl and the base of the trial pits TP1, TP10 & TP12. In TP11 the concrete surface cover was possibly underlain by natural soils or a reworked material of the Head deposits. Beneath the Made Ground in trial pits TP2-TP5, TP9, TP13 & TP4, and windowless sampling boreholes WLS2 & WLS3, Head deposits comprising a slightly sandy slightly gravelly Clay soil were observed to the base of the locations. Within trial pits TP6, TP7 & TP8, and borehole WLS1, the Made Ground was underlain by weathered Pennine Lower Coal Measures Formation soils being recovered as a gravel of very weak Mudstone.

On completion, the boreholes (WLS1, WLS2 and WLS3) were backfilled with bentonite pellets to 1.0mbgl, finished with arisings and concrete at surface. The trial pits were left open as specified by the Client.

The following materials were encountered during the external works, summarised in Table 3.

Table 3: Observed Stratigraphical Units from External Location.

Material	Top Depth (mbgl)	Bottom Depth (mbgl)	Description
<b>Made Ground</b>	0.35	1.00	Type 1 Gravel with occasional concrete blocks upto 160mm dia.
<b>Head Deposits</b>	1.00	5.30	Soft to firm brown and grey mottled slightly sandy slightly gravelly CLAY. Gravels were recorded as angular to rounded fine to coarse of black mudstone and concretions of sandstone.
<b>Weathered Pennine Lower Coal Measures Formation</b>	5.30	13.80	Extremely weak becoming very weak with depth thinly laminated dark grey MUDSTONE.
<b>Coal Seam within PLCM</b>	13.80	14.20	Fusain coal seam. Friable, black and shiny.
<b>Pennine Lower Coal Measures Formation</b>	13.80	30.50	Medium strong to strong thinly interlaminated dark grey MUDSTONE/SANDSTONE.

The surface cover of BH7 comprised brick paving over concrete to 0.35mbgl, over a subbase of type 1 gravel with fragments of concrete observed to 1.0mbgl. Head deposits were observed underlying the Made Ground to 5.3mbgl, comprising cohesive soils containing detrital material from the surrounding bedrock of the area. Beneath the Head deposits, the weathered Pennine Lower Coal Measures Formation was observed to a depth of 13.8mbgl, before a 0.4m seam of coal separated the weathered to unweathered section of the PLCM formation. Directly below the coal seam was a lighter coloured rock comprising thinly bedded siltstone/sandstone was observed to 15.5mbgl but is considered to form part of the PLCM as an adjusted environment of deposition following the coal seam. Medium strong to strong thinly interlaminated dark grey mudstone/sandstone was observed below and to the base of BH7 at 30.5mbgl.

On completion, BH7 was installed with a dual purpose ground gas and groundwater monitoring standpipe, constructed with 50mm internal diameter HDPE plain and slotted pipe. The response zone of the standpipe was designed to target the underlying groundwater and gas within the Made Ground to a depth of 5.3mbgl.

## 4.2 Groundwater

Groundwater was encountered within eight of the trial pits, and two windowless sampling boreholes. The groundwater in the external rotary percussive borehole was unable to be confirmed during the works due to the water-flush drilling aid used during the drilling process, however a standpipe to 5.3mbgl was installed to allow for monitoring past the site works. Details of the groundwater is provided in Table 4.

Table 3: Summary of Groundwater Observations.

Locality	Initial Groundwater Strike (mbgl)	Peak Groundwater Recorded (mbgl)	Date of Peak
BH1	1.10	1.10	02/11/2022
BH2	1.10	1.10	02/11/2022
TP1	0.30	0.25	01/11/2022
TP5	Dry during excavation	1.10	27/09/2022
TP6	0.70	0.70	01/11/2022
TP7	0.30	0.30	01/11/2022
TP8	0.30	0.30	01/11/2022
TP9	0.65	0.45	01/11/2022
TP10	0.65	0.65	01/11/2022
TP13	1.00	1.00	31/10/2022

### 4.3 Field Evidence of Contamination

Within TP9 a hydrocarbon odour associated with the Made Ground was noted.

No other visual or olfactory evidence of contamination was observed during the site investigation. Anthropogenic materials were observed throughout the shallow investigation.

Engineers' Logs are presented within **Appendix B**.

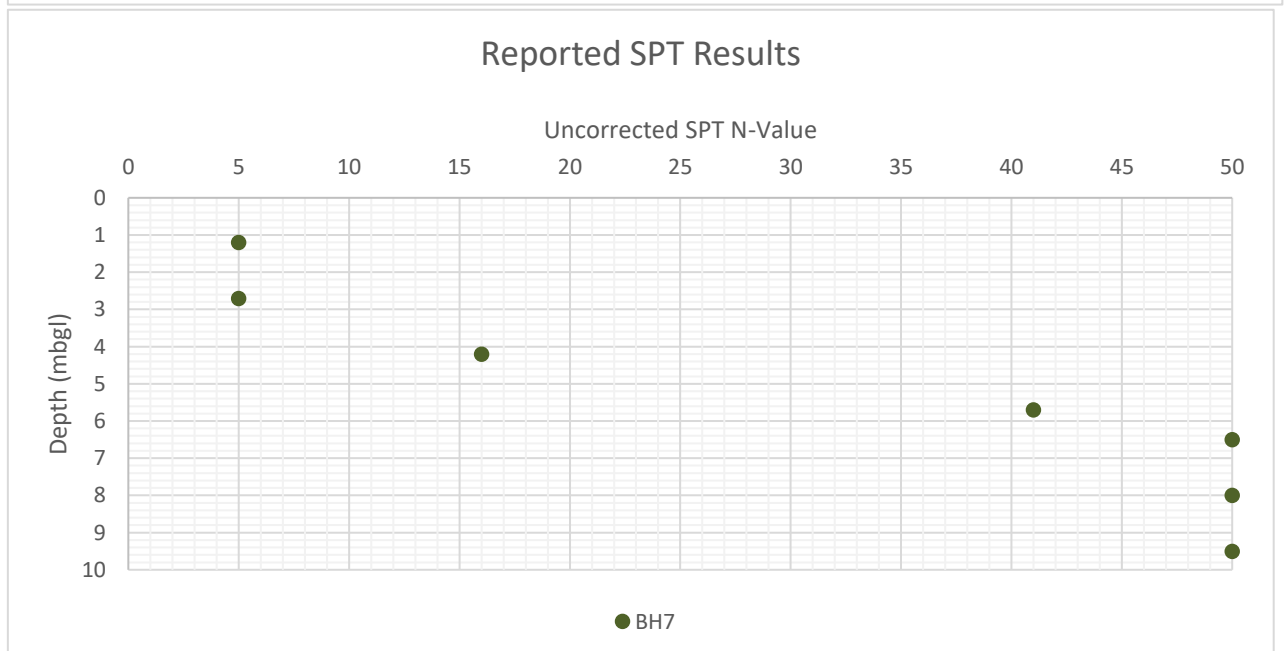
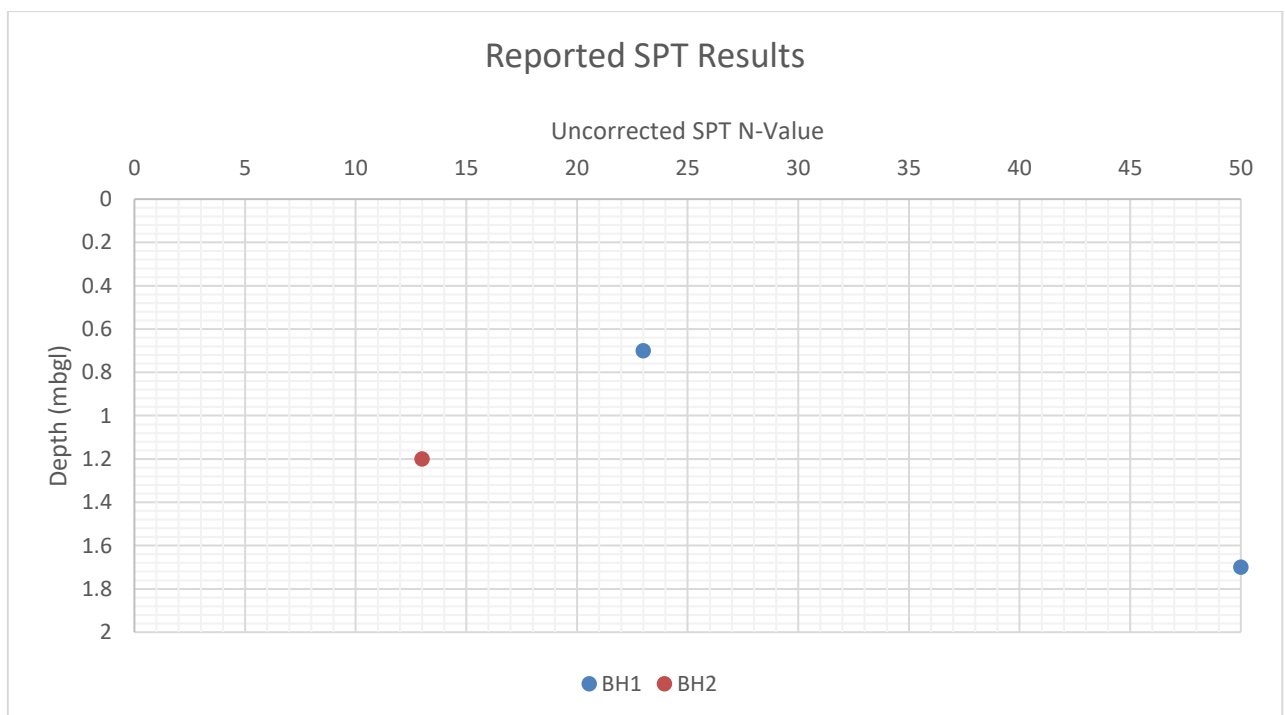
## 5.0 Insitu Testing

### 5.1 Standard Penetration Testing

Standard penetration testing (SPT) was completed throughout the drilling of boreholes BH1 and BH2 at 1.0m centres, and BH7 at 1.5m centres to 9.5mbgl.

This form of testing is completed using a 63.5kg drop hammer weight, over a 760mm drop, measuring the blow counts for six, 75mm increments. The first two values are recorded as seating blows, with the remaining four values, added together to provide an 'N-value'.

The results of the SPT testing are presented in the graphs below:



BH1 recorded two SPT tests within the weathered Pennine Lower Coal Measures Formation resulting in an uncorrected SPT N-value of N=23 at 0.7mbgl, increasing to a refusal of the test resulting in 50blows for 150mm.

One SPT test was completed in BH2 at 1.2mbgl within the Head deposits recording an uncorrected SPT N-value of N=13.

Throughout BH7, three tests were completed within the Head deposits recording a range of SPT N-values between N=5 and N=16. Within the underlying weathered PLCM four tests were completed, three of which resulted in refusal criteria (>50blows) at 6.5mbgl, 8.0mbgl, and 9.5mbgl. One test at 5.7mbgl resulted in an uncorrected SPT N-value of N=41.

## 5.2 Hand Penetrometer Testing

Hand penetrometer testing was undertaken in cohesive materials where possible during the trial pitting. The measurements of strength from the test may not be directly representative of the founding material as a whole and should be regarded as point measurements. Hand penetrometer results are summarised in Table 4.

Table 4: Summary of Hand Penetrometer Testing

	Made Ground	Head Deposits	Weathered Pennine Lower Coal Measures Formation
<b>Recorded Unconfined Compressive Strength (kPa)</b>	49 – 221	24 – 392	392 – 441

## 5.3 Perth Penetrometer Testing

Perth penetrometer testing was undertaken in the locations of BH4 and BH5 to provide a profile of the shallow soils. This form of testing is based on AS 1289.6.3.3-1997<sup>1</sup> utilising a flat ended rod of 16 ±0.2 mm diameter driven with a 9kg mass, dropping 600 mm. This standard procedure for this method measures blow count over 450mm, however for the purposes of this investigation, the equipment was used to provide relative resistance with depth to indicate the top of the weathered PLCM formation assumed to be represented by a refusal of further penetration upto 50 blows over 50mm penetration. PP1 completed in replace of location of BH5 recorded a refusal at 2.15mbgl. PP2 completed in replace of location BH4 recorded a refusal at 2.1mbgl.

<sup>1</sup> Australian Standard 1289.6.3.3 – 1997 – Methods of testing soils for engineering purposes. Method 6.3.3: Soil strength and consolidation tests – Determination of the penetration resistance of a soil

## 6.0 Existing Foundations

### 6.1 Hand Excavated Foundation Pits

14no. hand excavated trial pits were completed within the basement of the site, one through paving slabs while the remaining were through areas of hardstanding.

Trial pit TP1 was ceased at 0.4mbgl due to a substantial hard layer and water obscuring the base of the pit.

Trial pits TP1, TP6, TP7, TP8, TP9, TP10, and TP13 recorded groundwater entering the pits from 0.3mbgl to 1.0mbgl with subsequent excavation ceased due to lack of visibility of the base of the pits.

Details of the foundations encountered are presented in Table 5.

Table 5: Summary of Existing Foundations

Trial Pit ID	Location	Foundation Type	Base Depth (mm bgl)	Maximum Projection (mm)	Founding Stratum
TP1	Western Retaining Wall	Concrete	Not Observed	300	Unknown – likely weathered PLCM
TP2	Western Retaining Wall	Red Brick over Sandstone Brick	600	400	Head Deposits
TP3	Former Rugby League Heritage Centre	Concrete	150	200	Made Ground
TP4	Former Rugby League Heritage Centre	Red Brick over Sandstone Brick	400	250	Head Deposits
TP5	Staff Room	Red Brick over Sandstone Brick	600	300	Head Deposits
TP6	Maintenance	Red Bricks	Not Observed	130	Unknown – likely weathered PLCM
TP7	Maintenance	Red Bricks	Not Observed	180	Unknown – likely weathered PLCM
TP8	Wine Store	Concrete	Not Observed	250	Unknown – likely weathered PLCM
TP9	Southern Corridor	Concrete	Not Observed	100	Unknown – Head Deposits or weathered PLCM
TP10	Bottle Store	Concrete	Not Observed	350	Unknown – Head Deposits or weathered PLCM
TP11	Bottle Store	Concrete	Not Observed	550	Unknown – Head Deposits or weathered PLCM

<b>TP12</b>	Staff Room	Red Brick over Sandstone Brick	550	300	Made Ground / Reworked Head Deposits
<b>TP13</b>	Former Rugby League Heritage Centre	Concrete over Brick	500	200	Head Deposits
<b>TP14</b>	Former Rugby League Heritage Centre	Red Brick	200	0	Head Deposits

Trial Pit Sections are presented within **Appendix C**.

## 7.0 Geotechnical Laboratory Testing

### 7.1 Natural Moisture Content and Atterberg Limits

27no samples of material underwent determination of their natural moisture content (NMC) of which nine samples of Made Ground and Head Deposits were scheduled by Ramboll for the determination of their plasticity index (PI) / Atterberg Limits. These were selected at depths ranging from 0.2mbgl to 5.3mbgl.

Table 6 summarises the NMC results, and Table 7 summarises the PI/Atterberg Limit results.

Table 6: Natural Moisture Content Summary

	Made Ground	Head Deposits	Weathered Pennine Lower Coal Measures
Natural Moisture Content (%)	11.3 – 18.5	12.1 – 32.6	9.6 – 22.6

Table 7: Plasticity Index/Atterberg Limits Summary

Lithology	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Volume Change Potential
Made Ground	18.3	46	21	25	Medium
Head Deposits	18.0 – 32.6	36 – 48	17 – 25	20 – 27	Low – Medium

Geotechnical Laboratory Testing results are provided in **Appendix D**.

## 8.0 Geo-Environmental Testing

### 8.1 Soil Analysis

13no. soil samples obtained from depths ranging between 0.20 and 1.20m bgl were submitted to ELAB Ltd, a UKAS and MCERTS accredited laboratory testing facility, for a screen of contamination testing from the Made Ground, Head Deposits and weathered Pennine Lower Coal Measures Formation.

Samples were tested for a generic contamination screen including an asbestos screen, heavy metals and hydrocarbons including speciated total petrol hydrocarbons (TPH LQM aromatic/aliphatic split), BTEX, MTBE and speciated polycyclic aromatic hydrocarbons (PAH), as well as a background suite of pH, SOM, total cyanide, and total phenols.

Five samples were also subjected to a full suite of waste acceptance criteria (WAC) analyses. Testing was carried out on samples from 0.3-1.2m bgl.

### 8.2 Screening Criteria

The results of this laboratory testing have been compared to published guidance criteria, widely referred to by consultants and Regulatory Authorities within the industry, and include the following:

- The UK Soil Guideline (SGVs) for selected metals, BTEX and phenols, produced by the EA and the Department of Environment, Food and Rural Affairs (DEFRA), 2009;
- Suitable 4 Use Levels (S4ULs) Generic Assessment Criteria (GAC) for 82no. contaminants developed by the Chartered Institute of Environmental Health (CIEH) in partnership with Land Quality Management Ltd (2015). It is anticipated that this screening criteria will be applied by the Local Authorities, but it should be noted that the CIEH S4ULs have not been issued through the EA or DEFRA;
- A further set of GAC for 35no. mainly organic contaminants not already covered by SGV or S4ULs produced by the CIEH and published by Contaminated Land: Applications In Real Environments (CL:AIRE) in conjunction with the Association of Geotechnical and Environmental Specialists (AGS) and the Environmental Industries Commission (EIC), 2010;
- Provisional Category 4 Screening Levels (pC4SL) for lead, which have been produced by CL:AIRE (2014).
- As there is no UK GAC for cyanide the Dutch Intervention Value (DIV) has been adopted.
- In the case of asbestos and MTBE, the Detection Limits have been adopted as the GAC.

Comparisons were made against guidance criteria for the '**Commercial**' land use setting. This is based on the principal exposure pathways to include direct soil and indoor dust ingestion, skin contact with soils and dusts, and inhalation of dust and vapours with a critical receptor of a working female adult (aged 16 to 65 years old). A conservative Soil Organic Matter (SOM) value of 1% has been used for organic contaminants (i.e. TPH and PAH) as a worst-case scenario.

### 8.3 Soil Results

A summary of soil results is presented in Table 8, including further discussion in section 10.

Table 8: Environmental Test Summary

Determinand	GAC Commercial	Source	Min	Max	Exceeded
Asbestos	DL	CE	Not Detected	Not Detected	-
Asbestos Quantification	0.001%	CE	-	-	-
Total Cyanide	50	DIV	BDL	BDL	-
Total Phenols	760	LQM	BDL	BDL	-
Arsenic	640	LQM	5.8	15.8	-
Cadmium	190	LQM	BDL	0.7	-
Chromium	8600	LQM	18.7	32.9	-
Copper	68000	LQM	22.6	90.7	-
Lead	1100	C4SL	17.5	1140	TP6 0.5-0.83mbgl = 1140mg/kg
Mercury	1100	LQM	BDL	4.5	-
Nickel	980	LQM	20.9	56.1	-
Selenium	12000	LQM	BDL	1.4	-
Zinc	730000	LQM	51.9	138	-
Naphthalene	190	LQM	BDL	0.3	-
Acenaphthylene	83000	LQM	BDL	BDL	-
Acenaphthene	84000	LQM	BDL	0.3	-
Fluorene	63000	LQM	BDL	BDL	-
Phenanthrene	22000	LQM	BDL	1.7	-
Anthracene	520000	LQM	BDL	0.3	-
Fluoranthene	23000	LQM	BDL	1.6	-
Pyrene	54000	LQM	BDL	1.3	-
Benzo(a)anthracene	170	LQM	BDL	0.7	-
Chrysene	350	LQM	BDL	0.9	-
Benzo(b)fluoranthene	44	LQM	BDL	0.6	-
Benzo(k)fluoranthene	1200	LQM	BDL	0.5	-
Benzo(a)pyrene	35	LQM	BDL	0.6	-
Indeno(1,2,3-cd)pyrene	500	LQM	BDL	0.3	-
Dibenz(a,h)anthracene	3.5	LQM	BDL	BDL	-
Benzo(ghi)perylene	3900	LQM	BDL	0.3	-

Benzene	27	LQM	BDL	BDL	-
Toluene	56000	LQM	BDL	BDL	-
Ethylbenzene	5700	LQM	BDL	BDL	-
Total Xylenes	5900	LQM	BDL	BDL	-
MTBE	DL	CE	BDL	BDL	-
Aliphatic >C5-C6	3200	LQM	BDL	BDL	-
Aliphatic >C6-C8	7800	LQM	BDL	BDL	-
Aliphatic >C8-C10	2000	LQM	BDL	BDL	-
Aliphatic >C10-C12	9700	LQM	BDL	4.5	-
Aliphatic >C12-C16	59000	LQM	BDL	34.4	-
Aliphatic >C16-C35	1600000	LQM	BDL	35.3	-
Aliphatic >C35-C40	1600000	LQM	BDL	BDL	-
Aromatic >C5-C7	26000	LQM	BDL	BDL	-
Aromatic >C7-C8	56000	LQM	BDL	BDL	-
Aromatic >C8-C10	3500	LQM	BDL	BDL	-
Aromatic >C10-C12	16000	LQM	BDL	2.3	-
Aromatic >C12-C16	36000	LQM	BDL	15.2	-
Aromatic >C16-C21	28000	LQM	BDL	13.5	-
Aromatic >C21-C35	28000	LQM	BDL	10.2	-
Aromatic >C35-C40	28000	LQM	BDL	1.4	-

In summary, lead has exceeded guidance criteria in TP6 from 0.5-0.83mbgl.

WAC testing results suggest that soils are to be disposed of at an Inert waste landfill.

## 8.4 Sulphate And pH Analysis

18no samples of material were scheduled for the determination of pH and water-soluble sulphate concentration via the BRE SD1 Suite A method. Table 9 summarises the results.

Table 9:- BRE SD1 Suite A Test Summary

Lithology	pH	Water Soluble Sulphate Concentration (mg/l)
Made Ground	6.7 – 7.7	75 – 122
Head Deposits	5.9 – 8.2	<20 – 216
Weathered Pennine Lower Coal Measures Formation	7.2 – 8.4	25 – 60

Environmental Laboratory Testing results are provided in **Appendix E**.

## 9.0 Geotechnical Discussion

### 9.1 Made ground

Below a surface cover of concrete and brick paving, the site is found to be underlain by Made Ground soils to a maximum depth recorded of 1.0mbgl in BH7, external to the building, and greater than 1.2m below basement level in TP12. The Made Ground was variable across positions but regularly comprised gravels of red bricks, sandstone bricks, and concrete.

Made Ground is highly variable in its nature both from the point of view of composition and bearing capacity and can be subject to significant settlement when loaded. In addition, Made Ground may contain contaminated materials which may be putrescible or a hazard to human health or a potential source of ground gases.

### 9.2 Head Deposits

Beneath the Made Ground soils, Head Deposit soils were observed to a maximum depth of 5.3mbgl in BH7, to the base of BH2 at 1.65mbgl, BH3 at 1.0mbgl and 8no of the 14no basement trial pits.

The Head deposits were consistent across the localities comprising soft becoming stiff with depth grey mottled brown slightly sandy slightly gravelly CLAY. Gravels were recorded as sandstone.

A summary of the insitu and laboratory test results is provided in Table 10.

Table 10:- Head Deposit parameters

Parameter	Range
Uncorrected SPT 'N value'	5 – 16
Moisture Content (%)	18.0 – 32.6
Liquid Limit (%)	36 – 48
Plastic Limit (%)	17 – 25
Plasticity Index (%)	20 – 27
Volume Change Potential	Low to Medium
pH	6.7 – 7.7
Water Soluble Sulphate Concentration (mg/l)	75 – 122
Undrained Shear Strength (kPa)	20 – 150
Unconfined Compressive Strength (kPa)	24 – 392

### 9.3 Weathered Pennine Lower Coal Measures Formation

Below the Made Ground soils in BH1 ,TP6, TP7 and TP8, and below the Head Deposits in BH7, a weathered material of the Pennine Lower Coal Measures Formation was observed to a maximum depth of 13.8mbgl in BH7. The material comprised extremely weak becoming very weak with depth thinly laminated dark grey MUDSTONE, recovered as a gravel from the basement works. Between 13.8mbgl and 14.2mbgl a coal seam was recorded within BH7 marking the boundary between the weathered and unweathered PLCM.

A summary of the insitu and laboratory test results are provided in Table 9.

Table 9:- Weathered Pennine Lower Coal Measures Formation parameters

Parameter	Range
Uncorrected SPT 'N value'	23 – 50+ (refusal)
Moisture Content (%)	9.6 – 22.6
pH	7.2 – 8.4
Water Soluble Sulphate Concentration (mg/l)	25 – 60
Unconfined Compressive Strength (MPa) *	0.6 – 5.0

\*Based on field description

Two SPT tests were completed within BH1 recording N-values of N=23 at 0.7mbgl, and N=50 for 150mm at 1.7mbgl. Four SPT tests were recorded in BH7 recording N-values of N=41 at 5.7mbgl and then three refusals between 6.5-9.5mbgl. No further laboratory or in-situ testing was conducted in this material.

### 9.4 Pennine Lower Coal Measures

Below the coal seam within BH7 the Pennine Lower Coal Measures a noticeable change is observed to a medium strong to strong thinly interlaminated dark grey MUDSTONE/SANDSTONE. This material was only observed within BH7 and was recorded to the base of the borehole at 30.5mbgl.

No in-situ or laboratory tests were completed within this material.

## 10.0 Foundation Design

### 10.1 Shallow Foundations

Any foundations formed within Made Ground soils would be expected to be subject to total and differential settlement beyond tolerable limits. These soils are frequently present in a variable and inconsistent nature such that would render them unsuitable as a founding strata.

The clay soils encountered are of worst case **medium** volume change potential. Approximately four trees of the Maple species were noted between 5m and 25m to the north of the existing building dotted between parking spaces. These species are of moderate water demand with a mature height up to 18m.

It should be noted that the NHBC guidance, Chapter 4.2 'Building near Trees' notes that foundations deeper than 2.5m within the zone of influence of trees are outside of the scope of the document and may require specific assessment by the engineer.

The makeup of the current foundations was proven in 7no of the 14no trial pits within the basement during the site investigation, ranging between 0.2mbgl and 0.6mbgl, with the majority founding on Head Deposits.

Based on the in-situ testing of the Head Deposits a moderately conservative safe allowable bearing capacity of 75kN/m<sup>2</sup> could be achievable assuming foundations bear onto the Head Deposits at 1.5m below basement level.

It should be noted that the extent and founding material of the existing foundations could not be proven across the entire basement during the investigation. If foundation depth and composition is found to vary across the site during subsequent investigations, it may be prudent to consider deep foundation methodologies to limit the risk of unacceptable long-term settlement.

### 10.2 Excavations

At this stage we are unaware of the extent or depth of any excavation proposed; however, the following recommendations assume that excavations to depths of about 1.5m may be required.

The excavations encountered shallow made ground to around 0.8m bgl underlain by firm to stiff clay. Collapses are likely within the made ground especially where shallow groundwater is encountered. Whilst the underlying clays may remain stable in the short term, in the medium and long term instability and collapses should be anticipated, especially where groundwater is present. Therefore, trench shoring is recommended where excavations are to remain open for any period of time or if personnel entry is required.

All temporary batter slopes should be inspected by a geotechnical engineer at no greater than 1.5m depth intervals to check that the exposed conditions are consistent with the expectations from the boreholes and do not contain any adverse defects which may affect stability. If a risk of instability is deemed high, the excavations will need to be temporarily supported in order to satisfy statutory safety regulations.

### 10.3 Groundwater

Groundwater was observed during the site works between 0.25mbgl and 1.1mbgl. It is likely groundwater levels will exhibit seasonal variations and levels may change after periods of heavy rainfall or prolonged drought.

Where groundwater or surface water is encountered within any excavations during the construction phase it should be dealt with appropriately and removed using good engineering practices. At this stage it is considered that pumping from sumps should be sufficient to deal with low volumes of groundwater.

#### 10.4 Concrete in Aggressive Ground

The results of laboratory testing have indicated a recommended design class and subclass between the Made Ground, Head Deposits and weathered PLCM Formation soils, which will be suitable for buried concrete on this site, in accordance with BRE SD1 guidance.

18no samples from the soils across site were tested, based on the BRE SD1 guidance the highest 20% of the measured sulphate concentration (mg/l SO<sub>4</sub>), and lowest pH has been used. This is in response to a maximum water-soluble sulphate concentration of 216mg/l, and a minimum pH value of 5.9 resulting in an overall design sulphate class of DS-1 with a subclass of AC-1s.

## 11.0 Geo-Environmental Discussion

### 11.1 Discussion of Findings

The aims of the Site Investigation were to target the underlying soils in the proposed areas of development.

One sample from TP6 0.5-0.83mbgl was identified for exceeding determinands for lead in Made Ground soils. These are perhaps a result of service pipework installed during initial development. Further to the above, there is some potential for other unidentified areas of contamination.

It is likely that these materials will be excavated and removed as part of the future redevelopment and enabling works. Of the materials tested the soils are classified to be suitable for inert waste landfill, it is recommended these soils be disposed of offsite at a licensed waste facility.

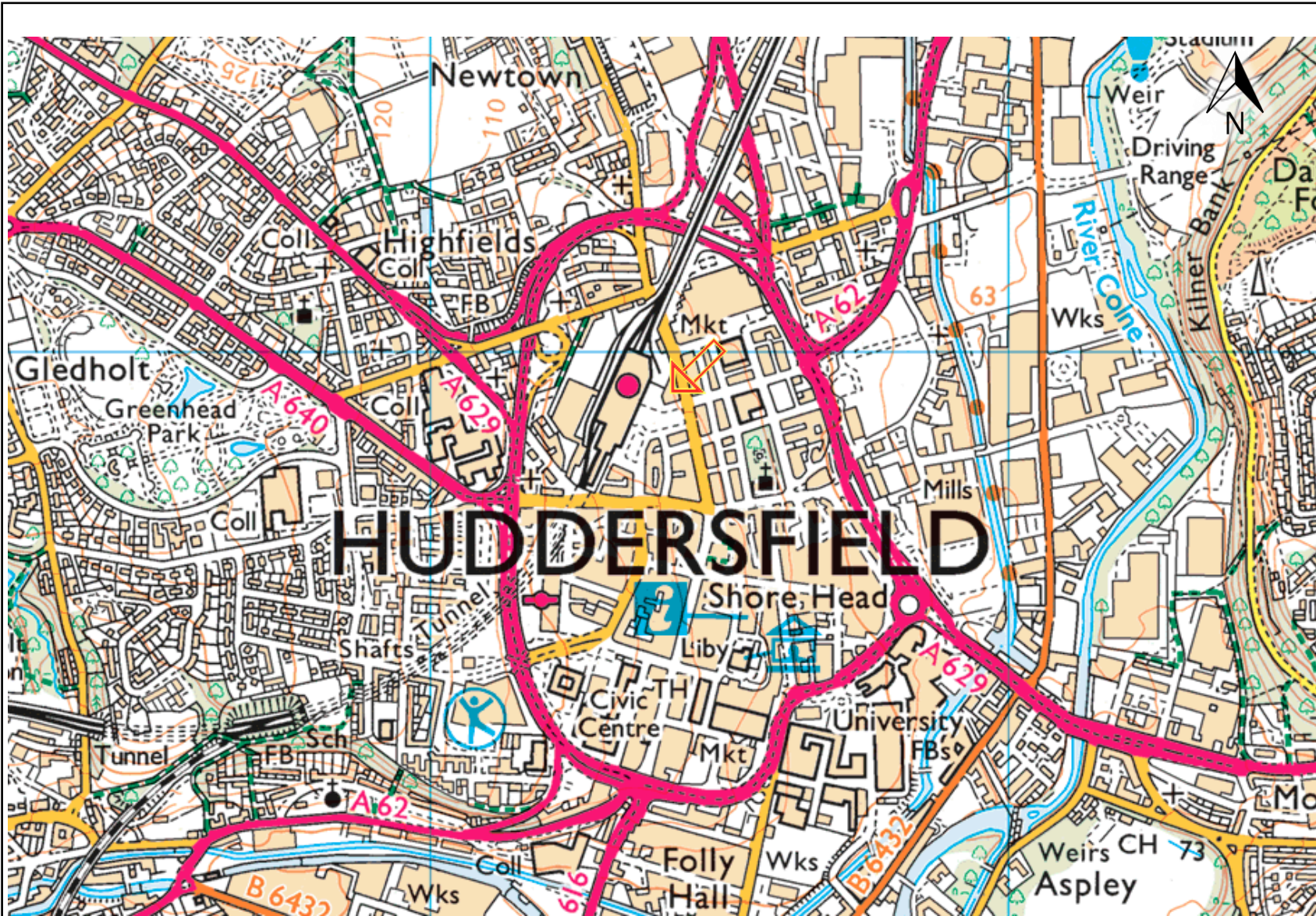
# FIGURES

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Figure 1 – Site Location Plan

Figure 2 – Basement Investigation Plan

Figure 3 – External Investigation Plan



- Notes:
1. Do not scale from this drawing.
  2. All dimensions must be checked on site prior to commencement of work.
  3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
  4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY

 Site

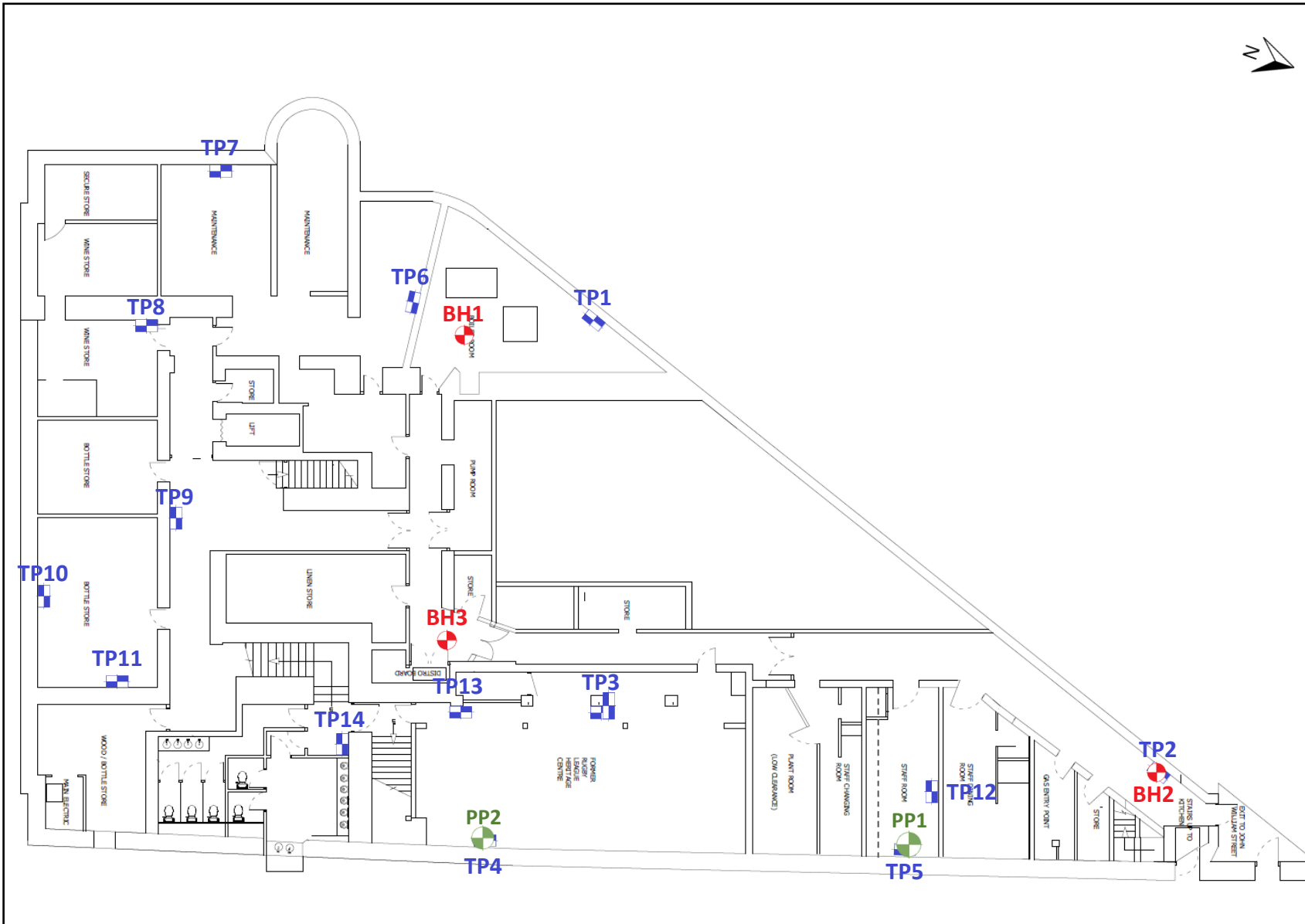
Drawing Title:  
 Site Location Plan

Project Reference:  
 22.1159

Site Name:  
 The George Hotel,  
 Huddersfield

Revision: 0  
 Drawn by: Soils  
 Scale: Not to Scale

Figure 1: Site location plan showing the topographical location of the site. (Source: www.Streetmap.co.uk)



- Notes:
1. Do not scale from this drawing.
  2. All dimensions must be checked on site prior to commencement of work.
  3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
  4. This drawing is the copyright of Constructive Evaluation Ltd.

**KEY**

-  **Windowless Sampling Borehole**
-  **Hand Excavated Foundation Pit**
-  **Perth Penetrometer Test**

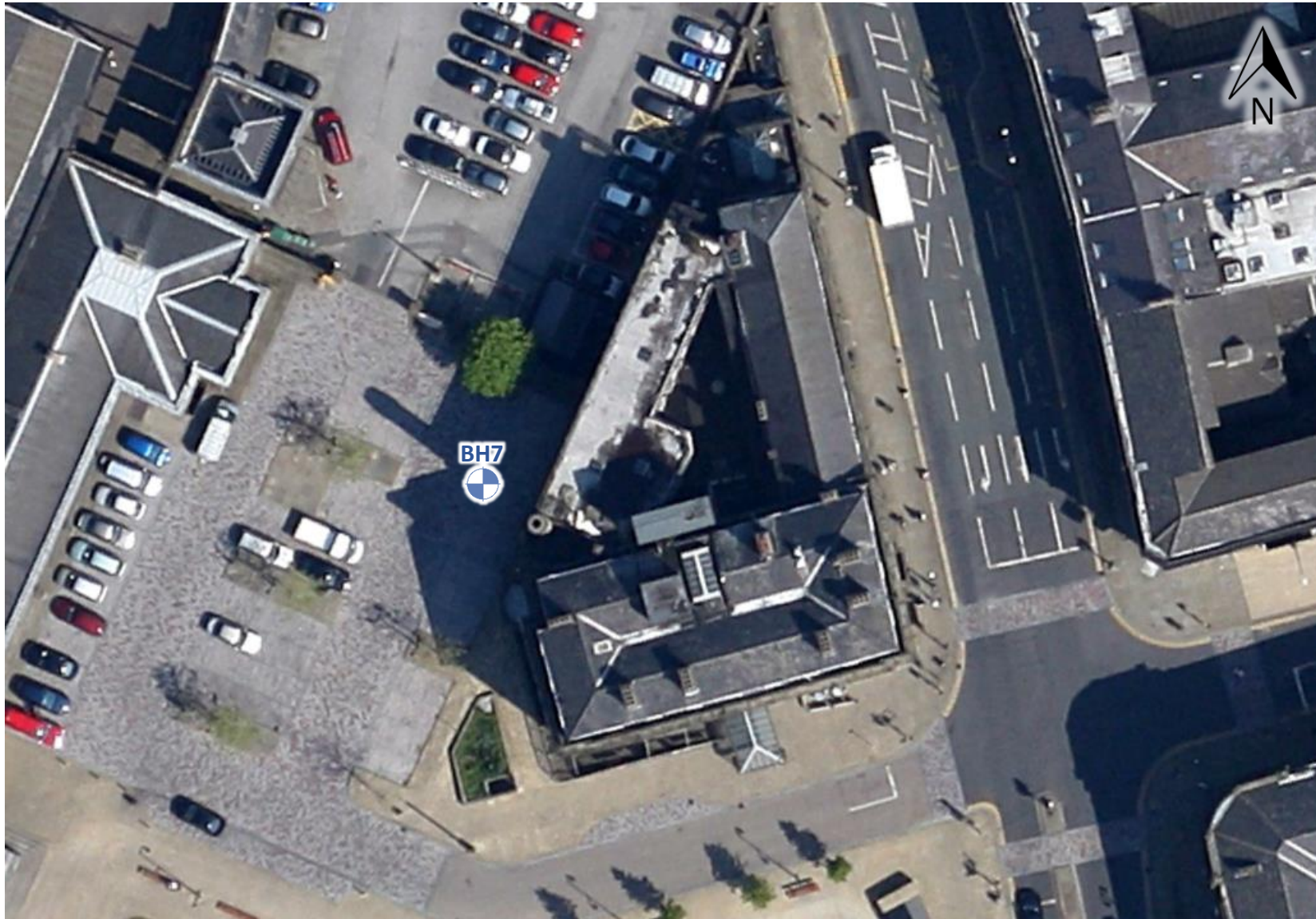
Drawing Title:  
**Basement Investigation Plan**

Project Reference:  
 22.1159

Site Name:  
**The George Hotel, Huddersfield**


Revision: 0  
 Drawn by: Soils  
 Scale: Not to Scale

**Figure 2:** Basement investigation plan showing the final positions of the intrusive works. (Source: GRG-RUK-XX-XX-SK-C-0007 OUTLINE SI SKETCH RevB Oct2022 Amendment)



- Notes:
1. Do not scale from this drawing.
  2. All dimensions must be checked on site prior to commencement of work.
  3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
  4. This drawing is the copyright of Constructive Evaluation Ltd.

KEY

 **Rotary Percussive Borehole**

Drawing Title:  
**External Investigation Plan**

Project Reference:  
 22.1159

Site Name:  
**The George Hotel,  
 Huddersfield**

Revision: 0  
 Drawn by: Soils  
 Scale: Not to Scale

**Figure 3:** External investigation plan showing the final positions of the deep borehole works. (Source: GoogleEarth)

# APPENDICES

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Appendix A – Site Photographs

Appendix B – Stratigraphic Logs

Appendix C – Foundation Pit Illustrations

Appendix D – Geotechnical Laboratory Testing

Appendix E – Environmental Laboratory Testing

Appendix F – Report Terms and Conditions

# APPENDIX A

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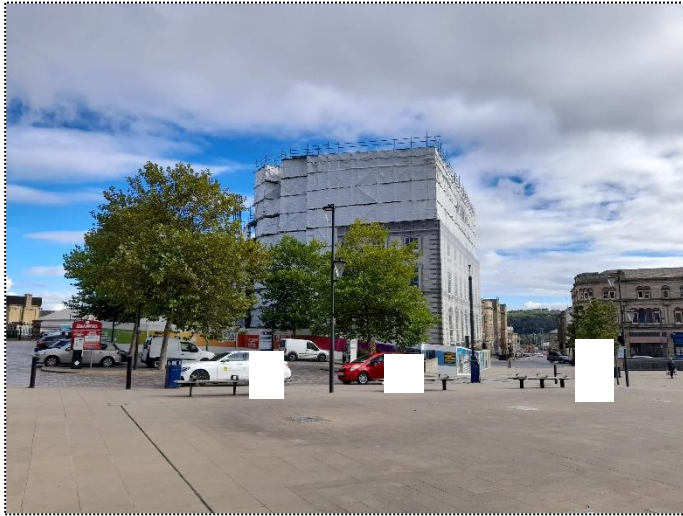
## Site Photographs

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

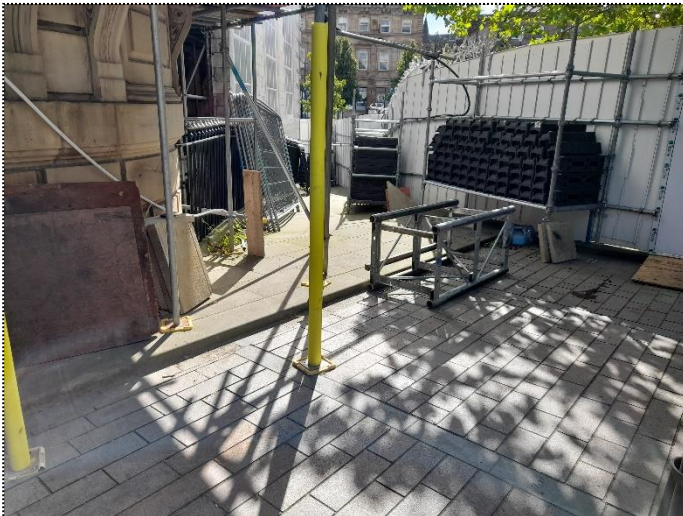
1.



2.



3.



4.



- 1) The George Hotel from St Georges Square,
- 2) Site entrance and access route,
- 3) Existing scaffolding and obstructions around site,
- 4) Existing site welfare and waste in compound area,

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

5.



6.



7.



8.



- 5) Access stairs to basement,
- 6) Access stairs to rugby room/basement,
- 7) Doorway to rugby bar,
- 8) Surface cover walls in rugby bar,

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

9.



10.



9) Basement corridor N,

10) Basement corridor S,

11) Bottle storeroom,

12) Boiler room,

11.



12.



# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

13.



14.



15.



16.



- 13) TP1
- 14) TP2
- 15) TP3
- 16) TP4

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

17.



18.



19.



20.



17) TP6

18) TP7

19) TP8

20) TP9

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

21.



22.



21) TP10

22) TP11

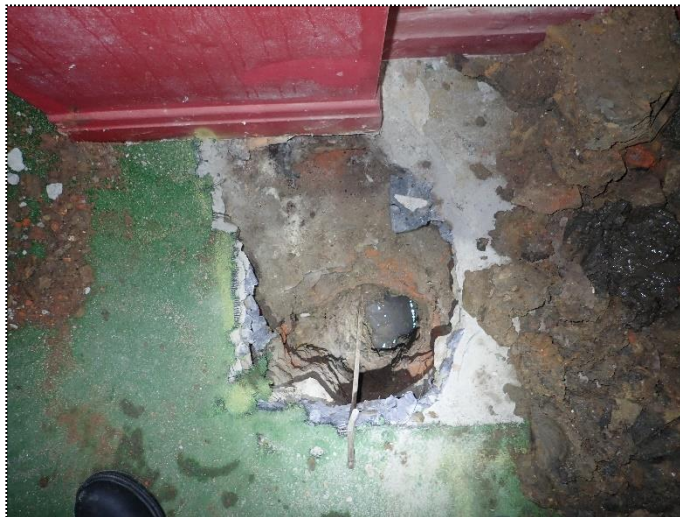
23) TP12

24) TP13

23.



24.



# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

25.



26.



- 25) TP14
- 26) BH1 Set up
- 27) BH2 Set up
- 28) BH3 Pit

27.



28.



# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

29.



30.



- 29) BH7 area pre works
- 30) BH7 set up
- 31) BH7 1.2-2.7mbgl
- 32) BH7 2.7-4.2mbgl

31.



32.



# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

33.



34.



35.



36.



- 33) BH7 5.7-6.5mbgl
- 34) BH7 6.5-8.0mbgl
- 35) BH7 8.0-9.5mbgl
- 36) BH7 9.5-11.0mbgl

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

37.



38.



39.



40.



- 37) BH7 11.0-12.5mbgl
- 38) BH7 12.5-14.0mbgl
- 39) BH7 14.0-15.5mbgl
- 40) BH7 15.5-18.5mbgl

# Site Photographs

Project Ref: 22.1150

Site Name: The George Hotel, Huddersfield

41.



42.



43.



44.



- 41) BH7 18.5-21.5mbgl
- 42) BH7 21.5-24.5mbgl
- 43) BH7 24.5-27.5mbgl
- 44) BH7 27.5-30.5mbgl

# APPENDIX B

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## Stratigraphic Logs

# Rotary Core Log

Borehole No.

**BH7**

Sheet 1 of 3

Project Name: The George Hotel	Project No. 22.1150	Co-ords: 414395.00 - 416933.00	Hole Type RC
Location: St Georges Square, Huddersfield, HD1 1JA		Level:	Scale 1:55
Client: William Birch & Sons Ltd		Dates: 01/12/2022 - 02/12/2022	Logged By SR/IB

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.10			Brick Pavier	
							0.35			Concrete	
			0.80 - 1.00	D				1.00		TYPE 1 Gravel. Concrete blocks at base recovered up to 160mm diameter.	
			1.20 - 2.70	B						Soft to firm brown and grey mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of black mudstone and concretions of sandstone. (HEAD DEPOSITS)	1
			2.50 - 2.70	D							
			2.70 - 4.20	B							
			3.50 - 3.70	D							
			4.20 - 5.30	B						<i>- Becomes soft</i>	
			5.02 - 5.17	D							
			5.30 - 5.70	B				5.30		<i>- Becomes very stiff</i> <i>- 1mm diameter roots</i>	4
			5.70 - 6.50	C							
			5.70 - 6.50		91	39	25			Extremely weak to very weak thinly laminated dark grey mottled brown MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Joints dip 05 - 15 degrees medium to widely spaced stepped smooth and tight stained orangish brown.	6
			6.50 - 8.00	C							
			6.50 - 8.00		93	37	17				
		8.00 - 9.50	C				8.00		Extremely weak thinly laminated dark grey MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Joints dip 05 - 25 degrees medium spaced undulating rough and partly open infilled with brown clay and stained orangish brown.	8	
		8.00 - 9.50		100	57	0					
		9.50 - 11.00	C								
		9.50 - 11.00		100	20	20	10.10				
		11.00 - 12.50	C						Very weak very thinly bedded dark grey MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Joints dip 05 - 10 degrees medium spaced planar rough and clean (possible drilling induced).	10	

Continued on next sheet

**Remarks**

1. Location CAT scanned prior to excavation and at 0.3m intervals to 1.2mbgl.
2. Cored through concrete, hand dug through Made Ground.
3. Switched to Windowless sampling at 1.2mbgl. Switched to Rotary coring at 5.3mbgl.
4. Borehole installed with 50mm pipework to 5.3mbgl.



# Rotary Core Log

Borehole No.

**BH7**

Sheet 2 of 3

Project Name: The George Hotel	Project No. 22.1150	Co-ords: 414395.00 - 416933.00	Hole Type RC
Location: St Georges Square, Huddersfield, HD1 1JA		Level:	Scale 1:55
Client: William Birch & Sons Ltd		Dates: 01/12/2022 - 02/12/2022	Logged By SR/IB

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		11.00 - 12.50		97	60	7					12
		12.50 - 14.00	C								13
		12.50 - 14.00		93	40	0					
		14.00 - 15.50	C				13.80		■	Fusain Coal Seam. Friable black and shiny.	14
		14.00 - 15.50		100	75	43	14.20		□	Moderately weak thinly bedded grey SILTSTONE/SANDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Frequent fossil burrows of random orientation infilled with black mudstone.	15
		15.50 - 17.00	C				15.50			Medium Strong to Strong thinly interlaminated dark grey MUDSTONE/SANDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Frequent fossil burrows of random orientation infilled with black mudstone. Joints dip 05 - 25 degrees medium spaced undulating smooth and rough tight and stained orangish brown. Joints dip 70 - 85 degrees widely spaced planar rough and tight stained orangish brown.	16
		15.50 - 17.00		93	61	56					17
		17.00 - 18.50	C								18
		17.00 - 18.50		97	86	55					19
		18.50 - 20.00	C								20
		18.50 - 20.00		81	68	44					21
		20.00 - 21.50	C								22
		20.00 - 21.50		73	55	37					
		21.50 - 23.00	C								

Continued on next sheet

**Remarks**

1. Location CAT scanned prior to excavation and at 0.3m intervals to 1.2mbgl.
2. Cored through concrete, hand dug through Made Ground.
3. Switched to Windowless sampling at 1.2mbgl. Switched to Rotary coring at 5.3mbgl.
4. Borehole installed with 50mm pipework to 5.3mbgl.



# Rotary Core Log

Borehole No.

**BH7**

Sheet 3 of 3

Project Name: The George Hotel	Project No. 22.1150	Co-ords: 414395.00 - 416933.00	Hole Type RC
Location: St Georges Square, Huddersfield, HD1 1JA	Level:		Scale 1:55
Client: William Birch & Sons Ltd	Dates: 01/12/2022 - 02/12/2022		Logged By SR/IB

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		21.50 - 23.00		93	90	43					
		23.00 - 24.50	C								23
		23.00 - 24.50		77	55	42					24
		24.50 - 26.00	C								25
		24.50 - 26.00		87	82	59					26
		26.00 - 27.50	C								27
		26.00 - 27.50		93	87	76					28
		27.50 - 29.00	C								29
		27.50 - 29.00		100	80	37					30
	29.00 - 30.50	C								31	
	29.00 - 30.50		93	90	50					32	
						30.50				33	

End of borehole at 30.50 m

**Remarks**

1. Location CAT scanned prior to excavation and at 0.3m intervals to 1.2mbgl.
2. Cored through concrete, hand dug through Made Ground.
3. Switched to Windowless sampling at 1.2mbgl. Switched to Rotary coring at 5.3mbgl.
4. Borehole installed with 50mm pipework to 5.3mbgl.

# Borehole Log

Borehole No.

**BH7**

Sheet 1 of 3

Project Name: The George Hotel

Project No.  
22.1150

Co-ords: 414395E - 416933N

Hole Type  
RC

Location: St Georges Square, Huddersfield, HD1 1JA

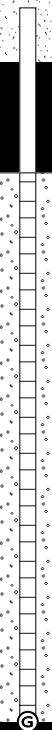
Level:

Scale  
1:56

Client: William Birch &amp; Sons Ltd

Dates: 01/12/2022

Logged By  
SR/IB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		Brick Pavier		
					0.35		Concrete		
								TYPE 1 Gravel. Concrete blocks at base recovered up to 160mm diameter.	
			0.80 - 1.00	D		1.00			1
			1.20 - 2.70	B				Soft to firm brown and grey mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of black mudstone and concretions of sandstone. (HEAD DEPOSITS)	2
			1.20	SPT	N=5 (2,1/1,1,1,2)				
			2.50 - 2.70	D					
			2.70 - 4.20	B					
			2.70	SPT	N=5 (1,1/1,1,1,2)			- Becomes soft	3
			3.50 - 3.70	D					
			4.20 - 5.30	B				- Becomes very stiff	4
			4.20	SPT	N=16 (2,2/3,3,4,6)			- 1mm diameter roots	5
			5.02 - 5.17	D		5.30			
		5.30 - 5.70	B						
		5.70 - 6.50	C				Extremely weak to very weak thinly laminated dark grey mottled brown MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Joints dip 05 - 15 degrees medium to widely spaced stepped smooth and tight stained orangish brown.	6	
		5.70	SPT	N=41 (10,8/8,9,12,12)					
		6.50 - 8.00	C						
		6.50	SPT	N=70 (9,12/10,12,22,26)					
		8.00 - 9.50	C		8.00		Extremely weak thinly laminated dark grey MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Joints dip 05 - 25 degrees medium spaced undulating rough and partly open infilled with brown clay and stained orangish brown.	8	
		8.00	SPT	0 (0 for 0mm/0 for 0mm)				9	
		9.50 - 11.00	C						
		9.50	SPT	0 (0 for 0mm/0 for 0mm)				10	
		11.00 - 12.50	C		10.10		Very weak very thinly bedded dark grey MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Joints dip 05 - 10 degrees medium spaced planar rough and clean (possible drilling induced).	11	

## Remarks

1. Location CAT scanned prior to excavation and at 0.3m intervals to 1.2mbgl.
2. Cored through concrete, hand dug through Made Ground.
3. Switched to Windowless sampling at 1.2mbgl. Switched to Rotary coring at 5.3mbgl.
4. Borehole installed with 50mm pipework to 5.3mbgl.





# Borehole Log

Borehole No.

**BH1**

Sheet 1 of 1

Project Name: The George Hotel

Project No.  
22.1150

Co-ords:

Hole Type  
WLS

Location: St Georges Square, Huddersfield, HD1 1JA

Level:

Scale  
1:10

Client: William Birch & Sons Ltd

Dates: 02/11/2022

Logged By  
SR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
							Concrete	
		0.30 - 0.70	D		0.20		Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of brick and sandstone. (MADE GROUND)	
		0.30 - 0.70	ES		0.30			
		0.70	SPT	N=23 (3,4/4,6,6,7)			Extremely weak to very weak grey MUDSTONE (PENNINE LOWER COAL MEASURES FORMATION). Recovered as angular fine to coarse Gravel.	
		1.50 - 1.60	D					
		1.70	SPT	50 (25 for 75mm/50 for 150mm)				
					1.85			
							End of Borehole at 1.850m	

Remarks

1. Location was CAT scanned prior to excavation.
2. Groundwater strike at 1.1mbgl.
3. Location ceased at 1.85mbgl due to refusal in strata.



# Borehole Log

Borehole No.

**BH2**

Sheet 1 of 1

Project Name: The George Hotel

 Project No.  
22.1150

Co-ords:

 Hole Type  
WLS

Location: St Georges Square, Huddersfield, HD1 1JA

Level:

 Scale  
1:10

Client: William Birch &amp; Sons Ltd

Dates: 02/11/2022

 Logged By  
SR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10		Concrete	
					0.50		Greyish brown clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of concrete red brick and sandstone. (MADE GROUND)	
					1.20		Soft becoming stiff with depth grey mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of sandstone.	
			SPT	N=13 (1,2/3,3,3,4)	1.65		End of Borehole at 1.650m	

**Remarks**

1. Location was CAT scanned prior to excavation.
2. Groundwater strike at 1.1mbgl.
3. Location ceased at 1.65mbgl due to insufficient headroom.

# Borehole Log

Borehole No.

**BH3**

Sheet 1 of 1

Project Name: The George Hotel

 Project No.  
22.1150

Co-ords:

 Hole Type  
WLS

Location: St Georges Square, Huddersfield, HD1 1JA

Level:

 Scale  
1:10

Client: William Birch &amp; Sons Ltd

Dates: 02/11/2022

 Logged By  
SR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10		Concrete	
		0.50 - 0.70	D		0.60		Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular fine to coarse of brick ceramic and sandstone. (MADE GROUND)	
		0.60 - 1.00	D				Very stiff dark grey sandy CLAY. Sand is fine to coarse.	
					1.00		End of Borehole at 1.000m	

**Remarks**

1. Location was CAT scanned prior to excavation.
2. Location ceased at 1.0mbgl due to insufficient headroom.



# Trial Pit Log

Trialpit No

**TP2**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 27/09/2022
Location: St Georges Square, Huddersfield, HD1 1JA	Dimensions (m): Depth 1.20		Scale 1:10 Logged IB
Client: William Birch & Sons Ltd			

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10			Concrete
	0.50 - 1.20 0.50 - 1.20	D ES		0.50			Greyish brown clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of concrete red brick and sandstone. (MADE GROUND)
				1.20			Soft becoming firm with depth grey mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of sandstone.
							End of pit at 1.20 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Trial pit remained dry during excavation.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.2mbgl due to maximum depth reached.

Stability: Trial pit remained stable



1

2


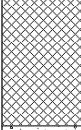
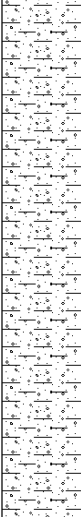
# Trial Pit Log

Trialpit No

**TP3**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 31/10/2022
Location: St Georges Square, Huddersfield, HD1 1JA		Dimensions (m): Depth 1.00	Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.13			Concrete
	0.30 - 1.00 0.30 - 1.00	D ES		0.30			Grey slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of brick and sandstone. (MADE GROUND)
							Soft brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of sandstone. <u>Pocket Penetrometer = 392</u>  <u>Pocket Penetrometer = 245</u>
				1.00			End of pit at 1.00 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Trial pit remained dry during excavation.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.0mbgl due to target depth reached.

Stability: Trial pit remained stable



# Trial Pit Log

Trialpit No

**TP4**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 28/09/2022
Location: St Georges Square, Huddersfield, HD1 1JA	Dimensions (m): Depth 1.20		Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	0.4

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10			Concrete
	0.20 - 1.20	D		0.20			Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. (MADE GROUND)
	0.20 - 1.20	ES					Soft becoming firm with depth grey mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of sandstone.
							Pocket Penetrometer = 118
							Pocket Penetrometer = 108
				1.20			End of pit at 1.20 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Trial pit remained dry during excavation.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.2mbgl due to maximum depth reached.

Stability: Trial pit remained stable



1

2




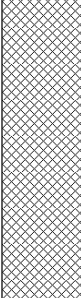

# Trial Pit Log

Trialpit No

**TP6**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 01/11/2022
Location: St Georges Square, Huddersfield, HD1 1JA	Dimensions (m): Depth 0.85		Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼				0.10			Concrete
				0.50			Grey slightly silty slightly gravelly SAND. Sand is fine to coarse. Gravel is angular fine to coarse of brick and sandstone. (MADE GROUND)
	0.50 - 0.80 0.50 - 0.80	D ES		0.85			Very weak grey mudstone recovered as angular fine to coarse gravel.
							End of pit at 0.85 m

1

2

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Groundwater strike at 0.7mbgl.  
3. Location ceased at 0.85mbgl due to a hard layer and lack of visibility due to the water.  
4. Excavation was not backfilled in accordance with Client request.

Stability: Trial pit remained stable




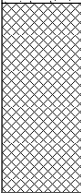

# Trial Pit Log

Trialpit No

**TP7**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 01/11/2022
Location: St Georges Square, Huddersfield, HD1 1JA	Dimensions (m): Depth 0.75		Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼				0.10			Concrete
	0.35 - 0.75	D		0.35			Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. (MADE GROUND)
	0.35 - 0.75	ES		0.75			Very weak grey mudstone recovered as angular fine to coarse gravel.
							End of pit at 0.75 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Groundwater strike at 0.3mbgl.  
3. Location ceased at 0.75mbgl due to a hard layer and lack of visibility due to the water.  
4. Excavation was not backfilled in accordance with Client request.

Stability: Trial pit remained stable



1  
2

# Trial Pit Log

Trialpit No


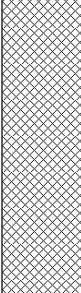


**TP8**

Sheet 1 of 1

Project Name: The George Hotel      Project No. 22.1150      Co-ords: -      Date 01/11/2022  
 Level:      Level:

Location: St Georges Square, Huddersfield, HD1 1JA      Dimensions (m): 0.4      Scale 1:10

Client: William Birch & Sons Ltd      Depth 0.60      Logged SR

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼				0.05			Concrete paving slab
							Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. (MADE GROUND)
	0.45 - 0.60	D		0.45			Very weak grey mudstone recovered as angular fine to coarse gravel.
	0.45 - 0.60	ES		0.60			End of pit at 0.60 m

Remarks: 1. Location was CAT scanned prior to excavation.  
 2. Groundwater strike at 0.3mbgl.  
 3. Location ceased at 0.6mbgl due to a hard layer and lack of visibility due to the water.  
 4. Excavation was not backfilled in accordance with Client request.

Stability: Trial pit remained stable



1  
2






# Trial Pit Log

Trialpit No

**TP9**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 31/10/2022
Location: St Georges Square, Huddersfield, HD1 1JA		Dimensions (m): Depth 1.00	Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼  ▽	0.20 - 1.10	D ES		0.10			Concrete
	0.20 - 1.10			0.20		Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. (MADE GROUND)	
							Soft grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of sandstone.
							Pocket Penetrometer = 49
				1.00			End of pit at 1.00 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Groundwater strike at 0.65mbgl rising to 0.45mbgl on completion.  
3. Location ceased at 1.0mbgl due to lack of visibility through the water.  
4. Excavation was not backfilled in accordance with Client request.

Stability: Trial pit remained stable





# Trial Pit Log

Trialpit No  
**TP11**  
Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 03/11/2022
Location: St Georges Square, Huddersfield, HD1 1JA	Dimensions (m): Depth 1.10		Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30 - 1.10	D		0.30		Concrete	
	0.30 - 1.10	ES				Blue plastic sheet	
						Very soft grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of sandstone.	
						Pocket Penetrometer = 24	
						Pocket Penetrometer = 24	
				1.10		End of pit at 1.10 m	

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Trial pit remained dry during excavation.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.1mbgl due to maximum depth reached.


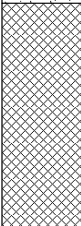
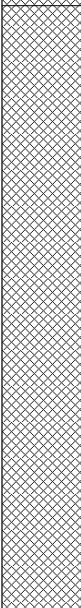
Stability: Trial pit remained stable



# Trial Pit Log

Trialpit No  
**TP12**  
Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 27/10/2022
Location: St Georges Square, Huddersfield, HD1 1JA	Dimensions (m): Depth 1.20		Scale 1:10 Logged IB
Client: William Birch & Sons Ltd		0.4	0.5

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10			Concrete
				0.40			Subbase of red bricks concrete and sandstone.
	0.40 - 1.20 0.40 - 1.20	D ES		0.40			Firm becoming stiff with depth dark brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. <u>Pocket Penetrometer = 88</u>  <u>Pocket Penetrometer = 221</u>
				1.20			End of pit at 1.20 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Trial pit remained dry during excavation.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.2mbgl due to maximum depth reached.

Stability: Trial pit remained stable


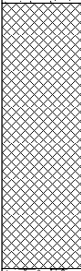
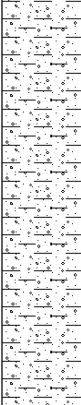


1  
2

# Trial Pit Log

Trialpit No  
**TP13**  
Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 31/10/2022
Location: St Georges Square, Huddersfield, HD1 1JA		Dimensions (m): Depth 1.00	Scale 1:10 Logged SR
Client: William Birch & Sons Ltd		0.4	

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼	0.45 - 1.00 0.45 - 1.00	D ES		0.10			Concrete
				0.45			Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. (MADE GROUND)
				1.00			Soft brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of sandstone. <u>Pocket Penetrometer = 25</u>  <u>Pocket Penetrometer = 25</u>
							End of pit at 1.00 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Groundwater strike at 1.0mbgl.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.0mbgl due to target depth reached.

Stability: Trial pit remained stable



# Trial Pit Log

Trialpit No

**TP14**

Sheet 1 of 1

Project Name: The George Hotel	Project No. 22.1150	Co-ords: - Level:	Date 01/11/2022
Location: St Georges Square, Huddersfield, HD1 1JA		Dimensions (m): Depth 1.00	Scale 1:10 Logged SR
Client: William Birch & Sons Ltd			

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
							Concrete
				0.20			Grey silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of red brick and sandstone. (MADE GROUND)
	0.35 - 1.00 0.35 - 1.00	D ES		0.35			Very soft becoming soft with depth grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of sandstone.  <u>Pocket Penetrometer = 25</u>    <u>Pocket Penetrometer = 49</u>
				1.00			End of pit at 1.00 m

Remarks: 1. Location was CAT scanned prior to excavation.  
2. Trial pit remained dry during excavation.  
3. Excavation was not backfilled in accordance with Client request.  
4. Trial pit ceased at 1.0mbgl due to target depth reached.

Stability: Trial pit remained stable



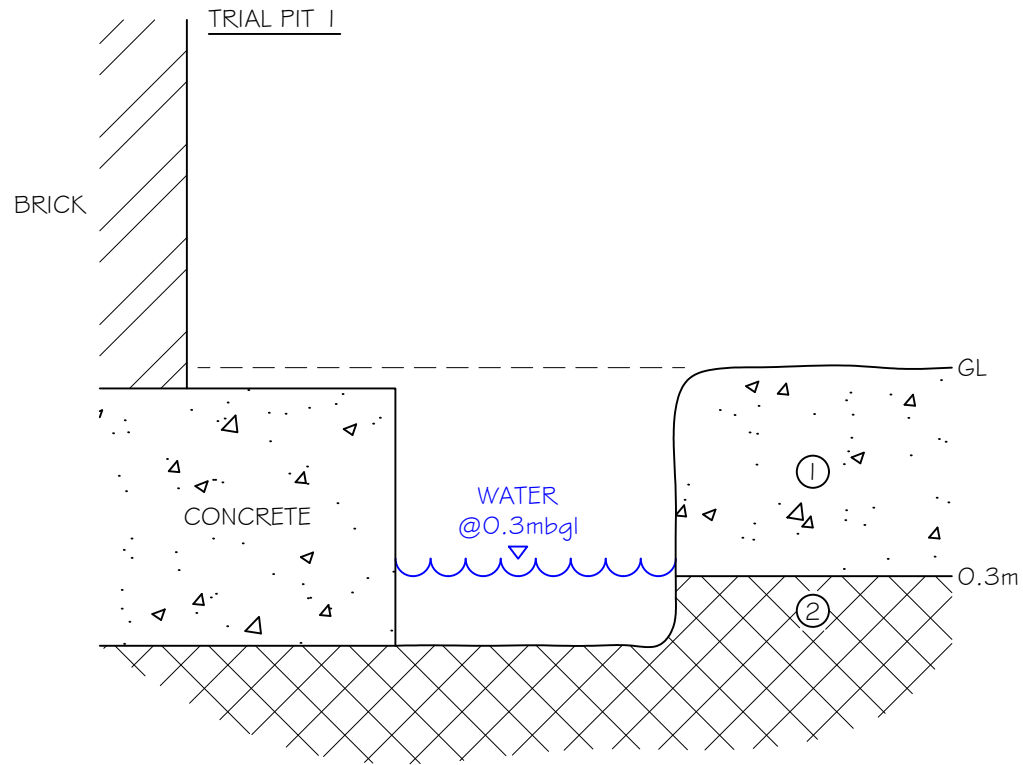
# APPENDIX C

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## Foundation Pit Illustrations

NOTES

1. Do not scale from this drawing  
Use figured dimensions only.
2. All dimensions must be checked on site  
prior to commencement of work.
3. Where applicable this drawing is to be  
read in conjunction with other  
consultants drawings.
4. This drawing is the copyright of  
Constructive Evaluation Ltd.



EXCAVATION HALTED @  
0.4mbgl DUE TO VISIBILITY  
LIMITED BY WATER

① = GL-0.3m CONCRETE

② = 0.3-0.4m MADE GROUND CONCRETE SLABS, BRICKS, GLASS,  
LOOSE BITS OF METAL PIPE, CONCRETE FRAGMENTS

rev	date	amendment	check

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site investigation • building pathology  
celtduk.com 01243 533499 info@celtduk.com

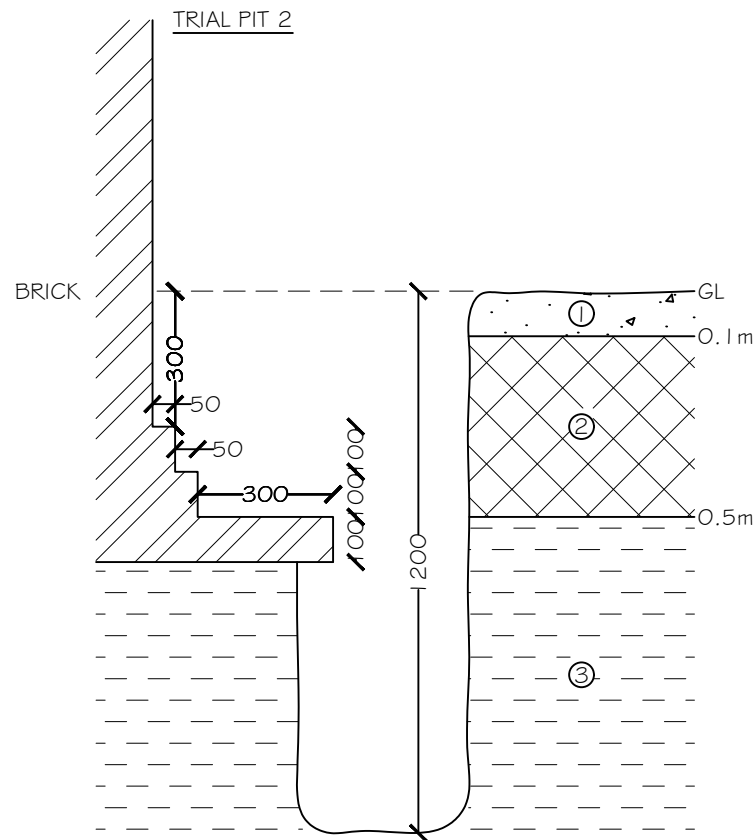
Client:  
WILLIAM BIRCH & SONS LTD

Project:  
THE GEORGE HOTEL, HUDDERSFIELD

Drawing:  
TRIAL PIT 1

scale  
NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	



- NOTES
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  2. All dimensions must be checked on site prior to commencement of work.
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  4. This drawing is the copyright of Constructive Evaluation Ltd.

① = GL-0.1m CONCRETE

② = 0.1-0.5m MADE GROUND GREYISH BROWN CLAYEY SANDY GRAVEL. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO ROUNDED FINE TO COARSE OF CONCRETE, RED BRICK, SANDSTONE

③ = 0.5m SOFT BECOMING FIRM WITH DEPTH SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS SUBANGULAR TO ROUNDED FINE TO COARSE OF SANDSTONE

rev	date	amendment	check



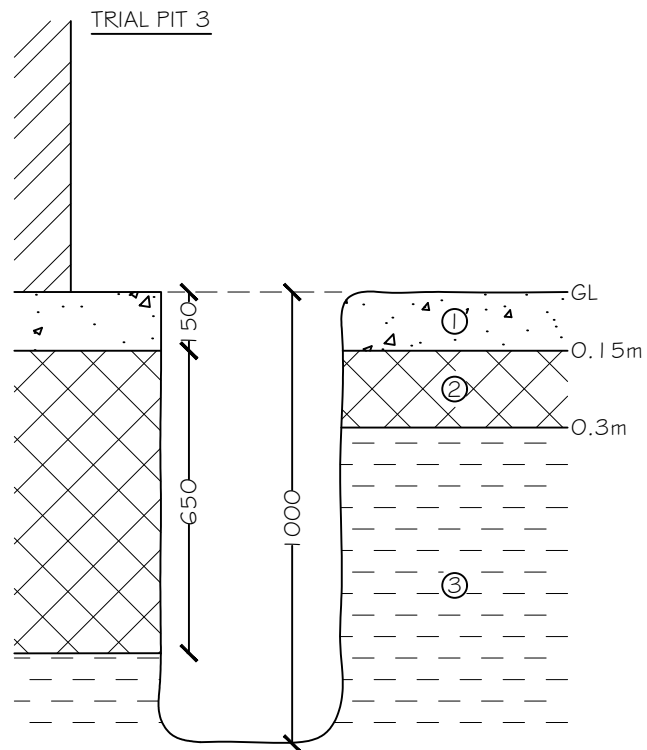
Client:  
WILLIAM BIRCH & SONS LTD

Project:  
THE GEORGE HOTEL, HUDDERSFIELD

Drawing:  
TRIAL PIT 2

scale  
NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	



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① = GL-0.13m CONCRETE

② = 0.13-0.3m GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO ROUNDED FINE TO COARSE BRICK & SANDSTONE

③ = 0.3m SOFT BROWN & GREY SLIGHTLY SANDY, SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS SUBANGULAR TO ROUNDED FINE TO COARSE SANDSTONE

rev	date	amendment	check



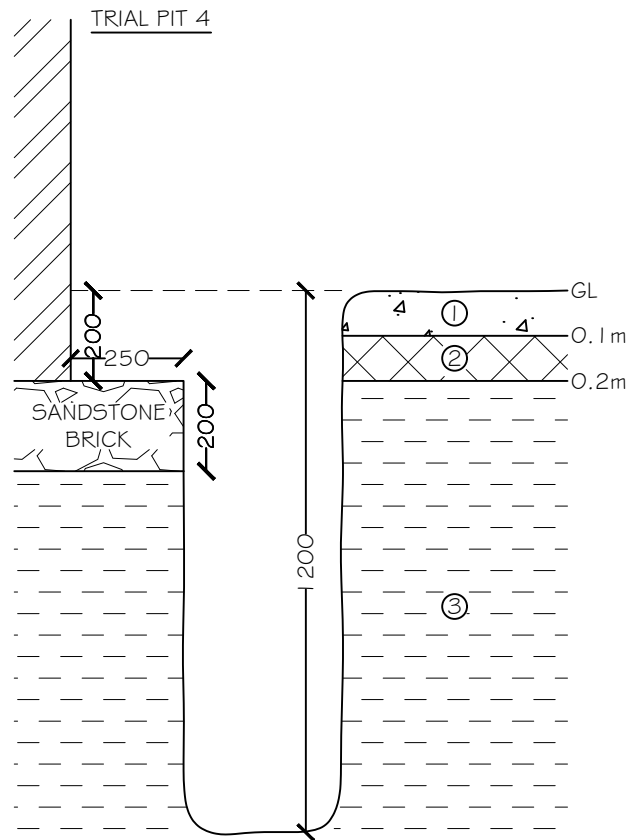
Client:  
WILLIAM BIRCH & SONS LTD

Project:  
THE GEORGE HOTEL, HUDDERSFIELD

Drawing:  
TRIAL PIT 3

scale  
NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	



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① = GL-0.1 m CONCRETE

② = 0.1-0.2m GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO ROUNDED FINE TO COARSE RED BRICK & SANDSTONE

③ = 0.2m SOFT BECOMING FIRM WITH DEPTH DARK GREY MOTTLED BROWN SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS SUBANGULAR TO ROUNDED FINE TO COARSE OF SANDSTONE

rev	date	amendment	check

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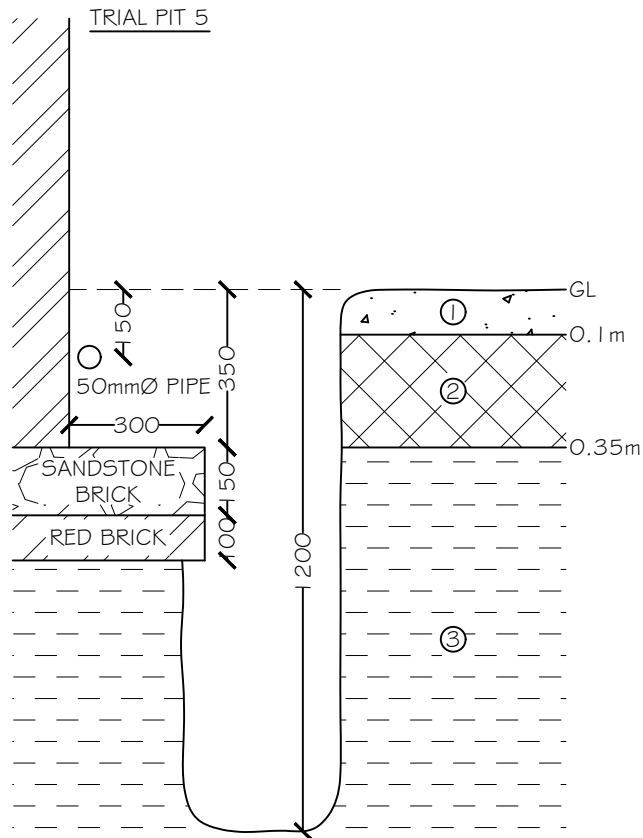
Client:  
 WILLIAM BIRCH & SONS LTD

Project:  
 THE GEORGE HOTEL, HUDDERSFIELD

Drawing:  
 TRIAL PIT 4

scale  
 NT5

date	NOV 22	drawn	D.Y.	checked
drawing number	22.1150	revision		



- NOTES
1. Do not scale from this drawing  
Use figured dimensions only.
  2. All dimensions must be checked on site  
prior to commencement of work.
  3. Where applicable this drawing is to be  
read in conjunction with other  
consultants drawings.
  4. This drawing is the copyright of  
Constructive Evaluation Ltd.

- ① = GL-0.1m CONCRETE
- ② = 0.1-0.35m BRICK COBBLE SUBBASE, RED BRICKS, CONCRETE & SANDSTONE. BLACK SAND MATRIX
- ③ = 0.35m FIRM BECOMING STIFF WITH DEPTH. DARK BROWN MOTTLED GREY SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO SUBROUNDED FINE TO COARSE RED BRICK SANDSTONE & CHERT/FLINT

rev	date	amendment	check



Client:  
WILLIAM BIRCH & SONS LTD

Project:  
THE GEORGE HOTEL, HUDDERSFIELD

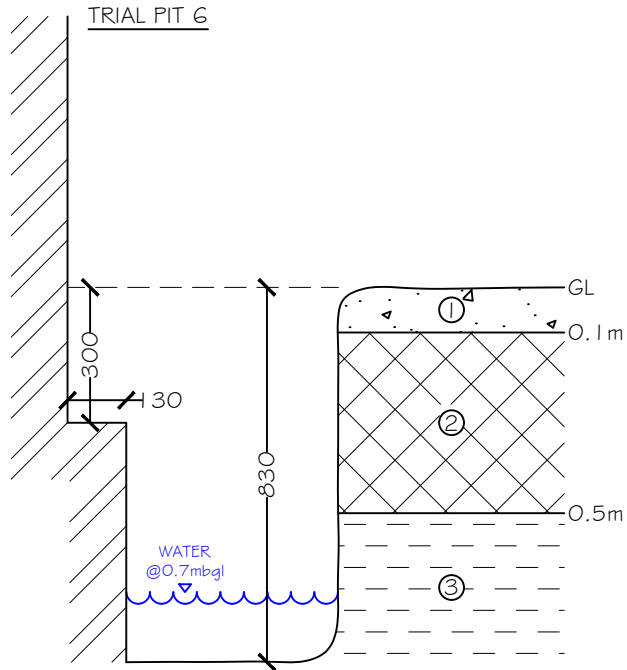
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scale  
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date	NOV 22	drawn	D.Y.	checked
drawing number	22.1150	revision		

NOTES

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EXCAVATION HALTED @ 0.83mbgl DUE TO HARD LAYER AND WATER. WALL AND FOUNDATIONS OF BRICK. BASE NOT OBSERVED.

① = GL-0.1m CONCRETE

② = 0.1-0.5m MADE GROUND GREY SLIGHTLY SILTY SLIGHTLY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE BRICK & SANDSTONE

③ = 0.5m VERY WEAK GREY MUDSTONE. RECOVERED AS ANGULAR FINE TO COARSE GRAVEL WET

rev	date	amendment	check



Client:  
WILLIAM BIRCH & SONS LTD

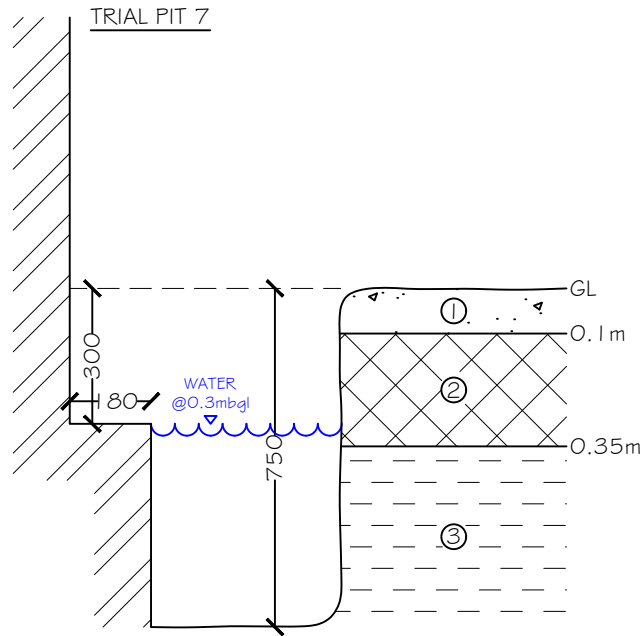
Project:  
THE GEORGE HOTEL, HUDDERSFIELD

Drawing: TRIAL PIT 6 scale NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	

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EXCAVATION HALTED @ 0.75mbgl DUE TO HARD LAYER AND WATER. WALL AND FOUNDATIONS OF BRICK. BASE NOT OBSERVED.

① = GL-0.1m CONCRETE

② = 0.1-0.35m MADE GROUND GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE BRICK & SANDSTONE

③ = 0.35m VERY WEAK GREY MUDSTONE. RECOVERED AS ANGULAR FINE TO COARSE GRAVEL

rev	date	amendment	check



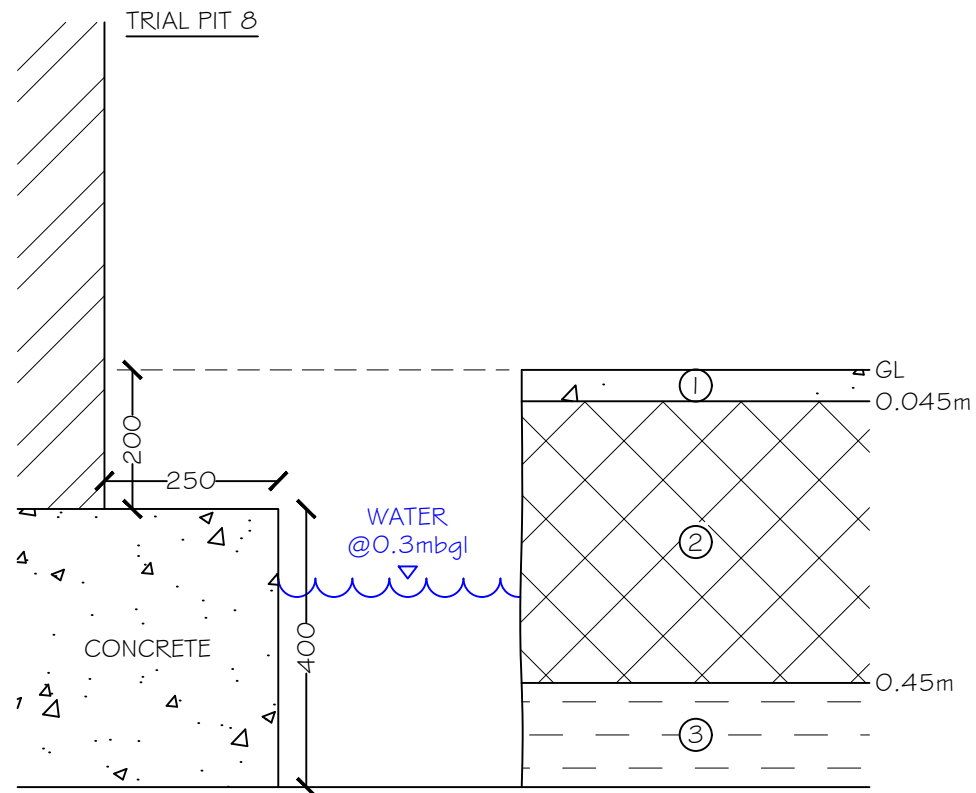
Client:  
WILLIAM BIRCH & SONS LTD

Project:  
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Drawing:  
TRIAL PIT 7

scale  
NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	



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  3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
  4. This drawing is the copyright of Constructive Evaluation Ltd.

- ① = GL-0.045m CONCRETE PAVING
- ② = 0.045-0.45m MADE GROUND GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE BRICK & SANDSTONE
- ③ = 0.45-0.6m VERY WEAK GREY MUDSTONE. RECOVERED AS WET ANGULAR FINE TO COARSE GRAVEL

rev	date	amendment	check



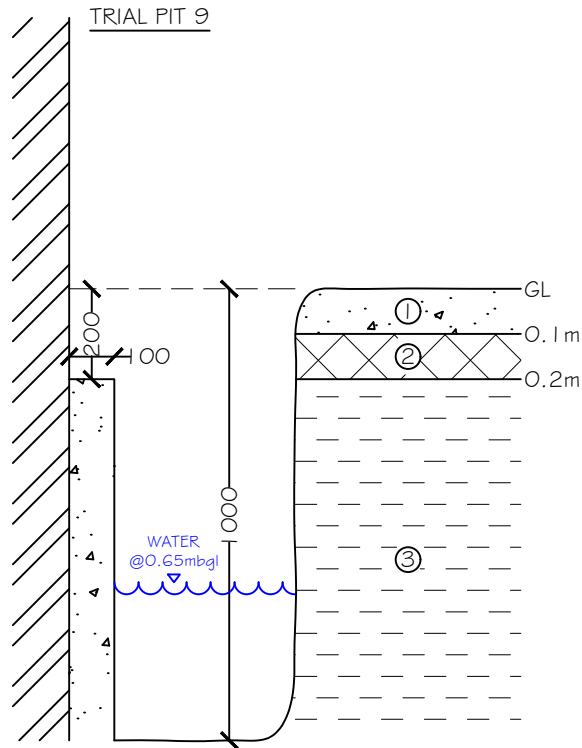
Client:  
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Project:  
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Drawing:  
TRIAL PIT 8

scale  
NT5

date	drawn	checked
NOV 22	D.Y.	
drawing number	22.1150	revision



① = GL-0.1 m CONCRETE

② = 0.1-0.2m GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO ROUNDED FINE TO COARSE BRICK & SANDSTONE

③ = 0.2m SOFT GREY SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS SUBANGULAR TO ROUNDED FINE TO COARSE SANDSTONE

NOTES

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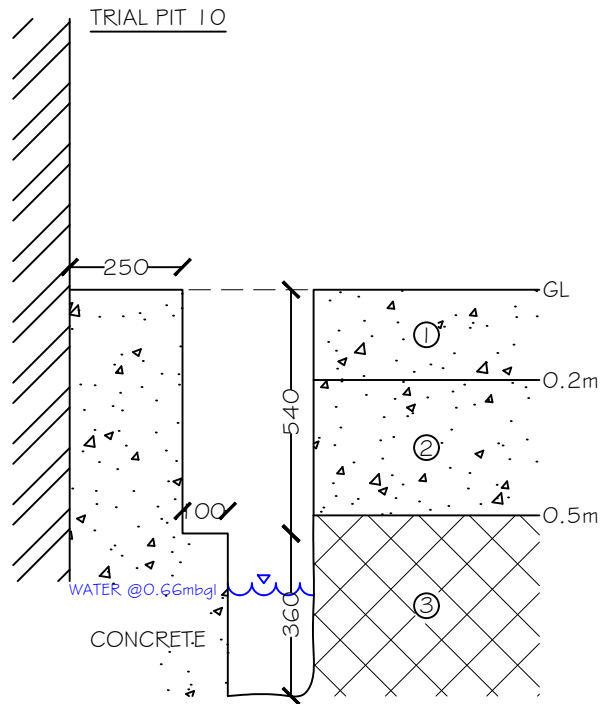
Project:  
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Drawing: TRIAL PIT 9 scale NT5

date NOV 22	drawn D.Y.	checked
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- ① = GL-0.2m CONCRETE. BLUE PLASTIC SHEET AT 0.1m DEPTH
- ② = 0.2-0.5m CONCRETE
- ③ = 0.5m MADE GROUND GREY SLIGHTLY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE BRICK SANDSTONE & CONCRETE

rev	date	amendment	check

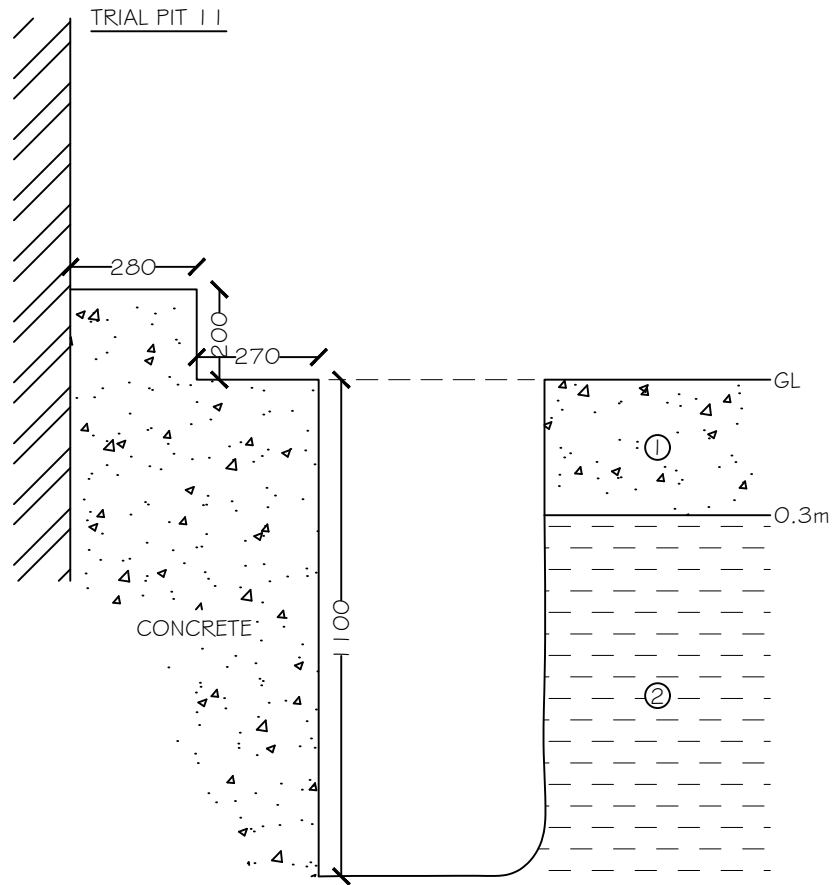
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Project:  
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Drawing: TRIAL PIT 10 scale NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	



① = GL-0.3m CONCRETE. BLUE PLASTIC SHEET AT 0.11m DEPTH

② = 0.3m VERY SOFT GREY SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE COBBLES OF SANDSTONE

- NOTES
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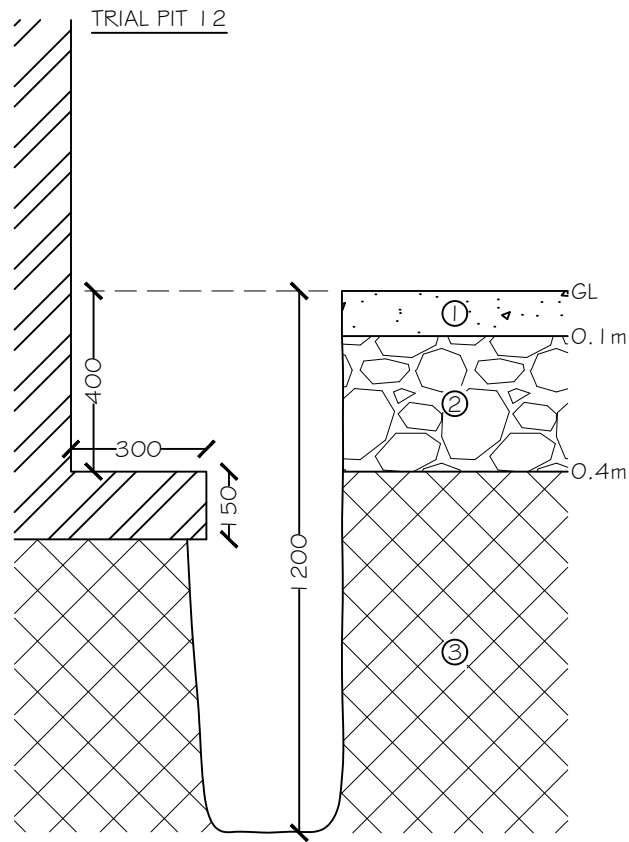
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Drawing: TRIAL PIT 1.1 scale NT5

date	drawn	checked
NOV 22	D.Y.	
drawing number	22.1150	revision



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- ① = GL-0.1 m CONCRETE.
- ② = 0.1-0.4m MASONRY SUBBASE. RED BRICKS, CONCRETE & SANDSTONE
- ③ = 0.4m MADE GROUND FIRM BECOMING STIFF WITH DEPTH DARK BROWN SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO ROUNDED FINE TO OF RED BRICK & SANDSTONE

rev	date	amendment	check

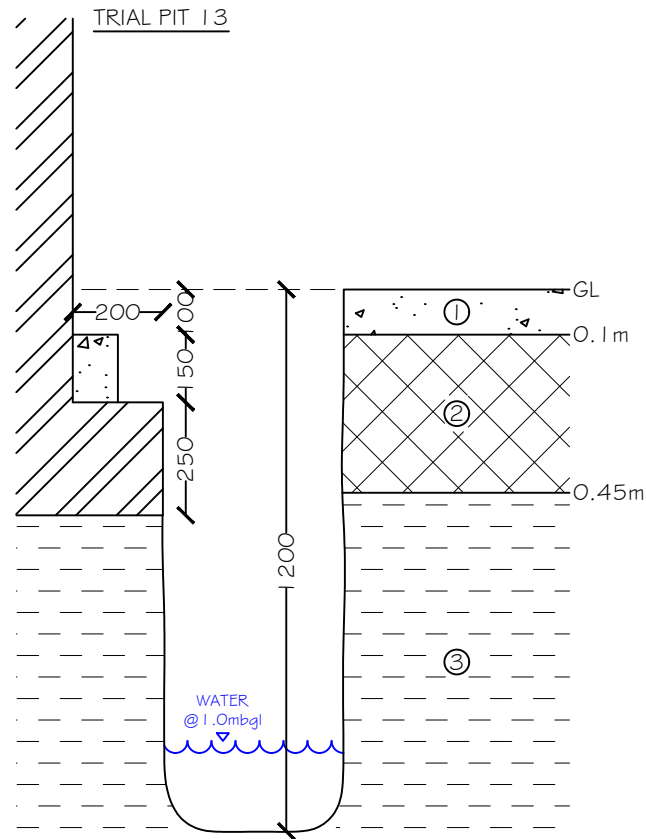
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Project:  
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Drawing: TRIAL PIT 12 scale NT5

date NOV 22	drawn D.Y.	checked
drawing number 22.1150	revision	



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  4. This drawing is the copyright of Constructive Evaluation Ltd.

- ① = GL-0.1m CONCRETE.
- ② = 0.1-0.45m MADE GROUND GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR TO ROUNDED FINE TO COARSE BRICK & SANDSTONE
- ③ = 0.45m SOFT BROWN SLIGHTLY SANDY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS SUBANGULAR TO ROUNDED FINE TO COARSE SANDSTONE

rev	date	amendment	check

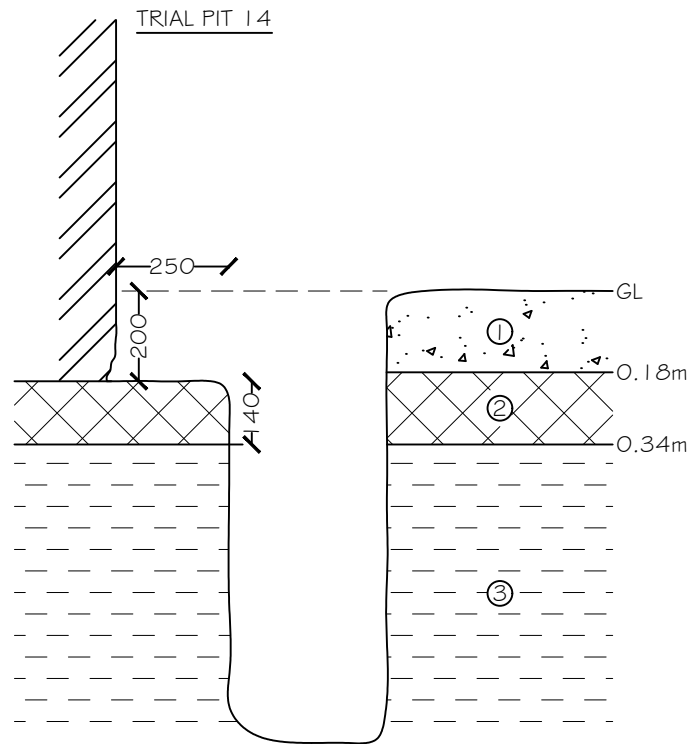
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Project:  
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Drawing: TRIAL PIT 13 scale NT5

date	drawn	checked
NOV 22	D.Y.	
drawing number	22.1150	revision



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- ① = GL-0.18m CONCRETE.
- ② = 0.18-0.34m MADE GROUND GREY SILTY GRAVELLY SAND. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE BRICK & SANDSTONE
- ③ = 0.34m VERY SOFT TO SOFT GREY SLIGHTLY GRAVELLY CLAY. SAND IS FINE TO COARSE. GRAVEL IS ANGULAR FINE TO COARSE SANDSTONE

rev	date	amendment	check

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Client:  
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Project:  
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Drawing: TRIAL PIT 14 scale NT5

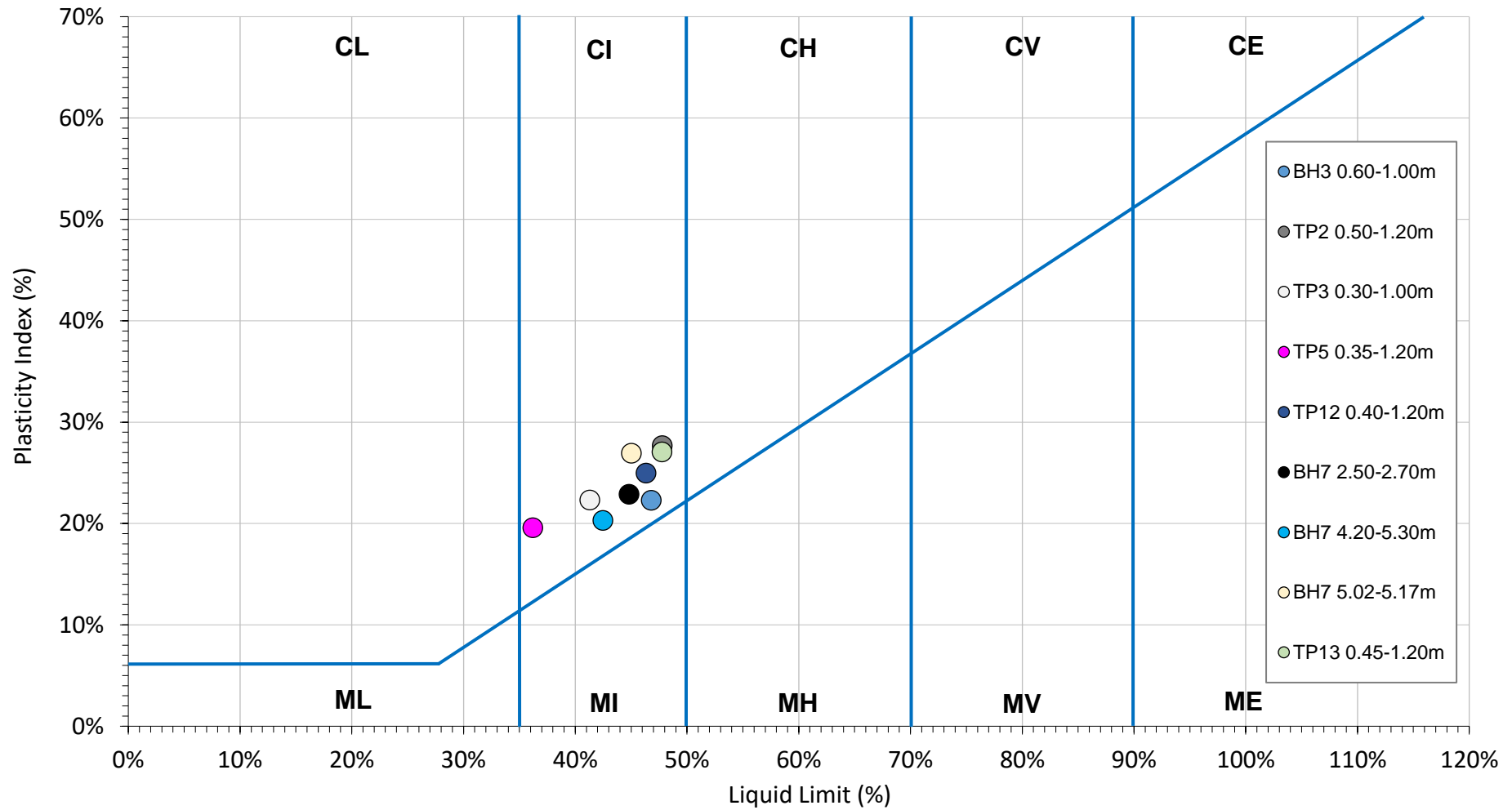
date NOV 22 drawn D.Y. checked  
 drawing number 22.1150 revision

# APPENDIX D

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## Geotechnical Laboratory Testing



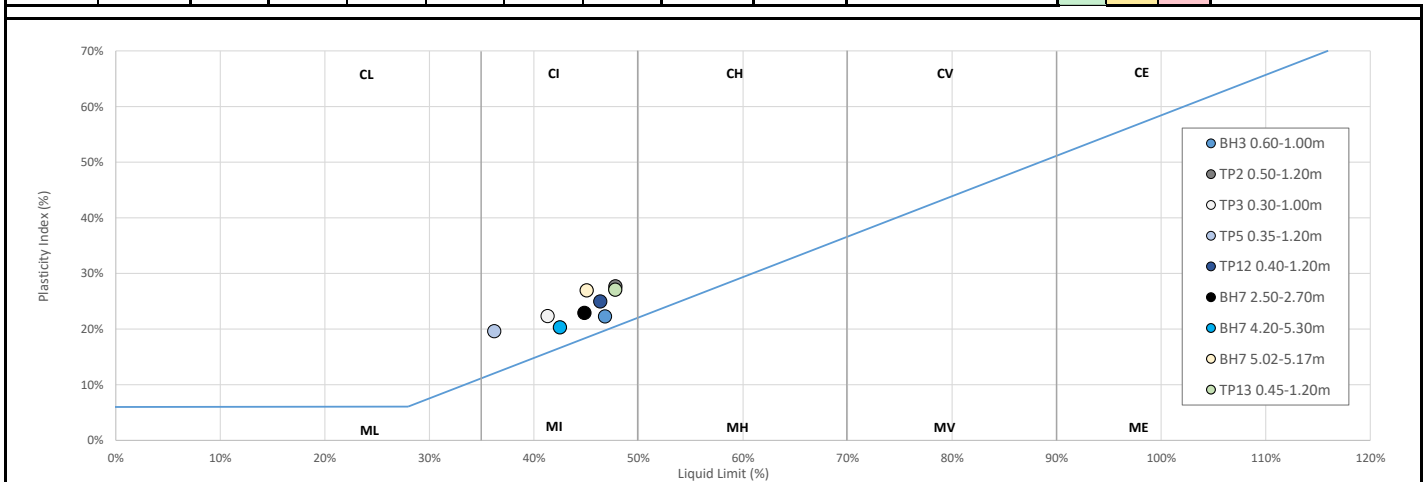


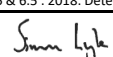
Project No **22.1150**

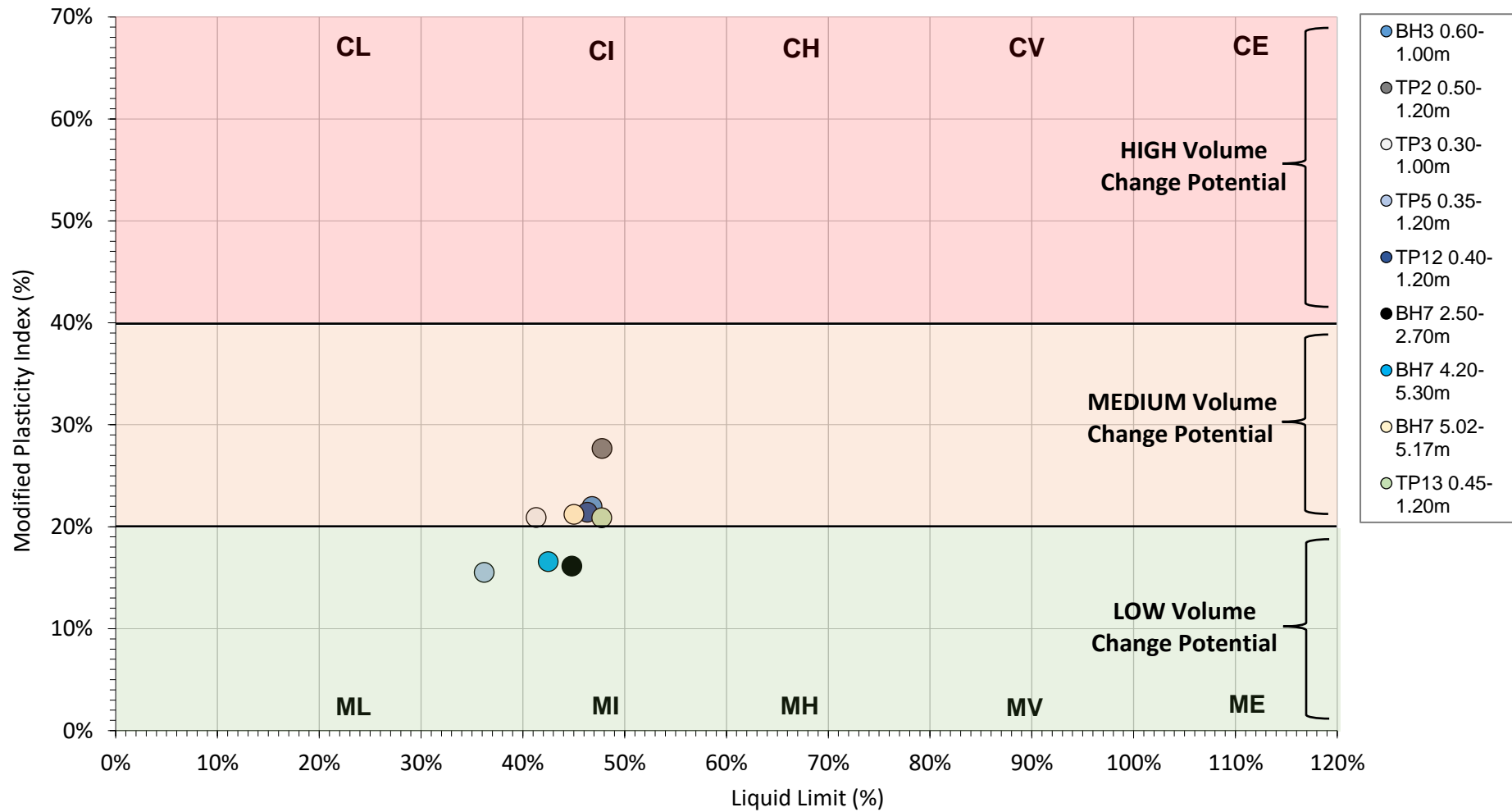
 Project Name **The George Hotel, Huddersfield**

 Client **William Birch and Sons**

Hole ID	Depth (m)	Moisture Content (W%)	Liquid Limit (WL%)	Plastic Limit (WP%)	Plasticity Index (PI%)	Portion retained on 425µm Sieve (%)	Modified PI (I <sub>p</sub> %)	Soil Classification	Consistency Index (I <sub>pc</sub> )	Sample description	Volume change potential			Remarks
											Low	Medium	High	
BH3	0.60-1.00m	21%	47%	25%	22%	1%	22%	CI	1.17	Black slightly sandy CLAY.	No	Yes	No	
TP2	0.50-1.20m	28%	48%	20%	28%	0%	28%	CI	0.73	Dark brown, dark grey and orangish brown mottled slightly gravelly slightly sandy CLAY.	No	Yes	No	
TP3	0.30-1.00m	21%	41%	19%	22%	6%	21%	CI	0.92	Brown grey, dark grey and brown mottled slightly gravelly slightly sandy CLAY.	No	Yes	No	
TP5	0.35-1.20m	18%	36%	17%	20%	21%	16%	CI	0.93	Dark brown mottled grey slightly gravelly slightly sandy CLAY.	Yes	No	No	
TP12	0.40-1.20m	18%	46%	21%	25%	14%	21%	CI	1.12	Dark brown mottled dark grey slightly sandy slightly gravelly CLAY.	No	Yes	No	
BH7	2.50-2.70m	19%	45%	22%	23%	30%	16%	MI	1.15	Multicoloured slightly gravelly slightly sandy SILT.	Yes	No	No	
BH7	4.20-5.30m	30%	42%	22%	20%	18%	17%	CI-MI	0.59	Black dark grey and grey brown mottled slightly gravelly slightly sandy CLAY.	Yes	No	No	
BH7	5.02-5.17m	24%	45%	18%	27%	21%	21%	CI	0.77	Dark brown, grey and yellowish brown mottled slightly gravelly slightly sandy CLAY.	No	Yes	No	
TP13	0.45-1.20m	33%	48%	21%	27%	23%	21%	CI	0.56	Dark brown dark grey and brown mottled slightly gravelly slightly sandy CLAY.	No	Yes	No	



Constructive Evaluation Ltd Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celtdruk.com	<b>Test Procedure(s):</b> BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index	<b>Checked and Approved:</b> SFL (Senior Lab Technician) 	23/02/2023		



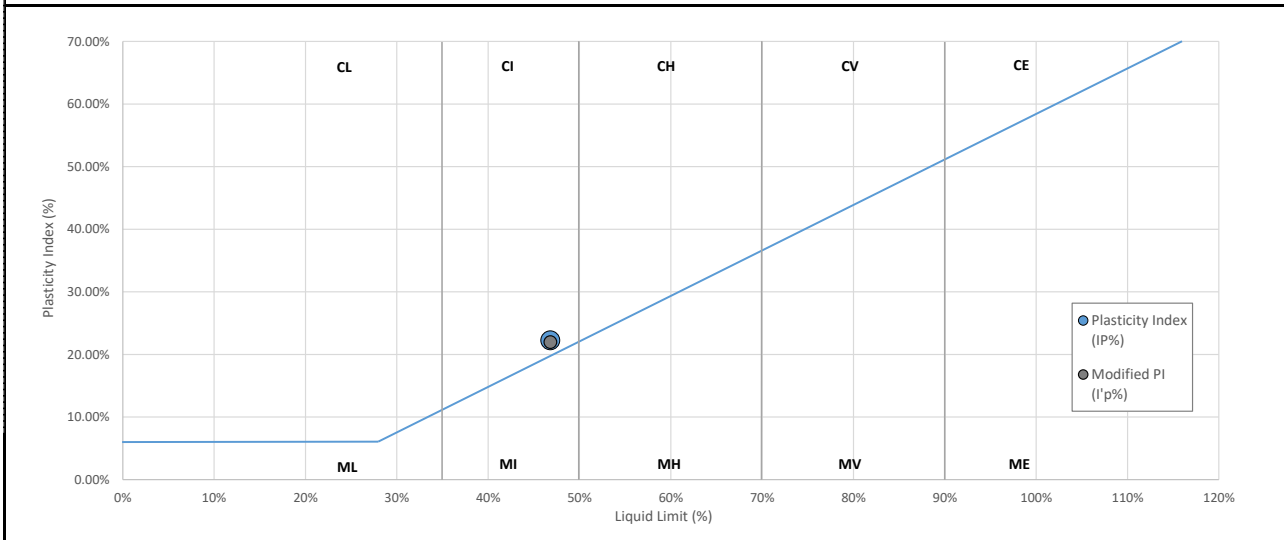
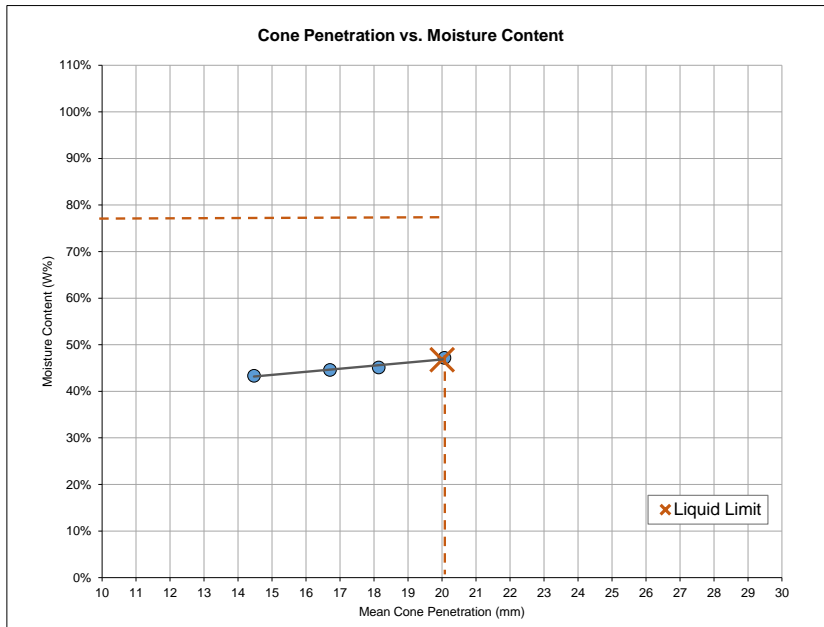


Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>BH3</b>	<b>0.60-1.00m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	<b>Black slightly sandy CLAY.</b>	Original Dried Mass (g):	<b>257.00</b>
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Natural Moisture Content (W%)	<b>21%</b>
Liquid Limit (WL%)	<b>47%</b>
Plastic Limit (WP%)	<b>25%</b>
Plasticity Index (IP%)	<b>22%</b>
Classification	<b>CI</b>
Portion Retained on 425µm Sieve (%)	<b>1%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>22%</b>
Consistency Index (I <sub>pc</sub> )	<b>1.17</b>
Fall Cone Used:	<b>30°-80 g cone</b>
Remarks	



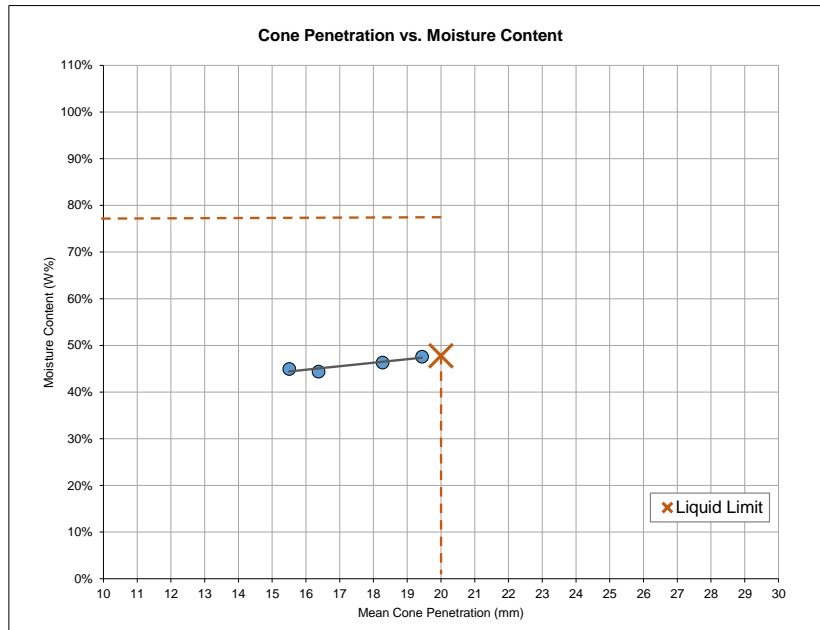
<b>Constructive Evaluation Ltd</b> Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celtduk.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Lyke</i>
		<b>23/02/2023</b>

Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

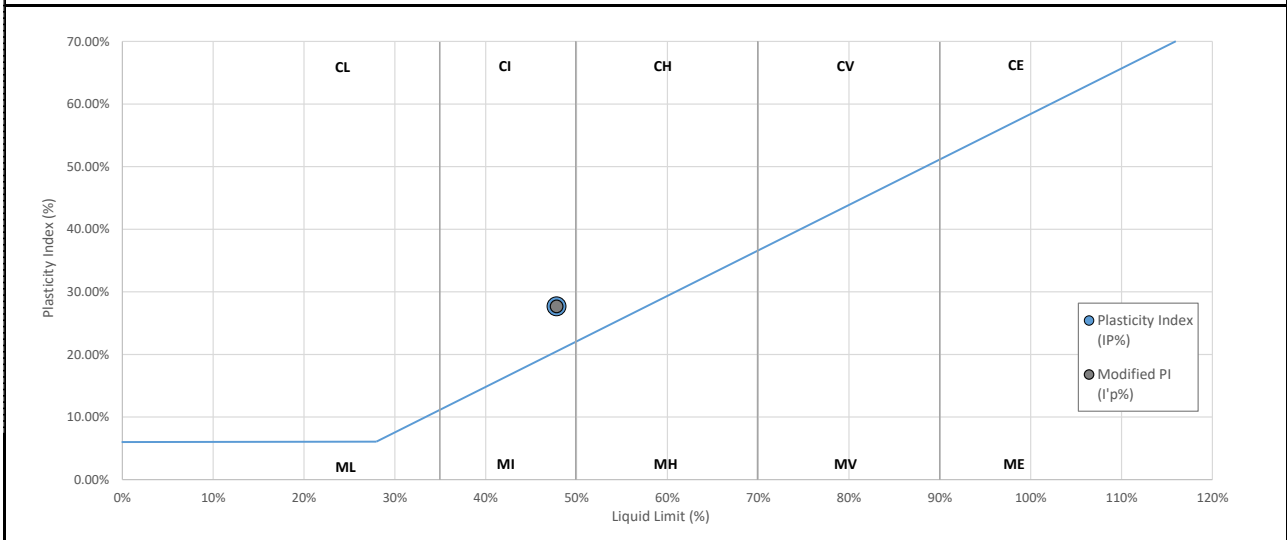
Sample Position & Depth:	<b>TP2</b>	<b>0.50-1.20m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Dark brown, dark grey and orangish brown mottled slightly gravelly slightly sandy CLAY.	Original Dried Mass (g):	249.25
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Natural Moisture Content (W%)	<b>28%</b>
Liquid Limit (WL%)	<b>48%</b>
Plastic Limit (WP%)	<b>20%</b>
Plasticity Index (IP%)	<b>28%</b>
Classification	<b>CI</b>
Portion Retained on 425µm Sieve (%)	<b>0%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>28%</b>
Consistency Index (Ipc)	<b>0.73</b>
Fall Cone Used:	<b>30°-80 g cone</b>



Remarks	
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<b>Constructive Evaluation Ltd</b> Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celtduk.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Light</i>
		<b>23/02/2023</b>

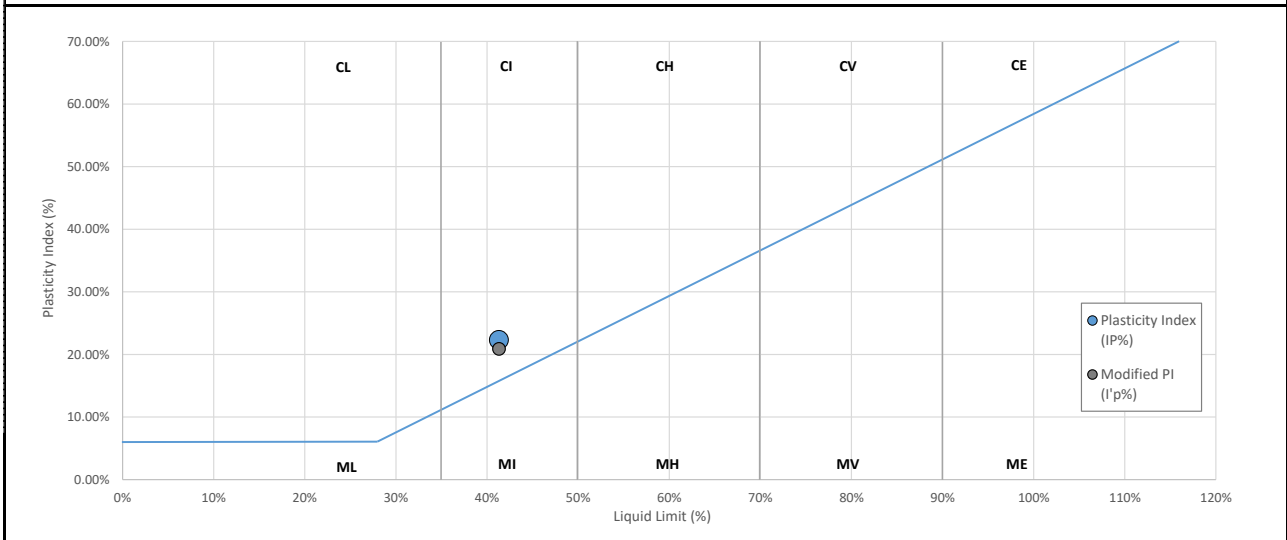
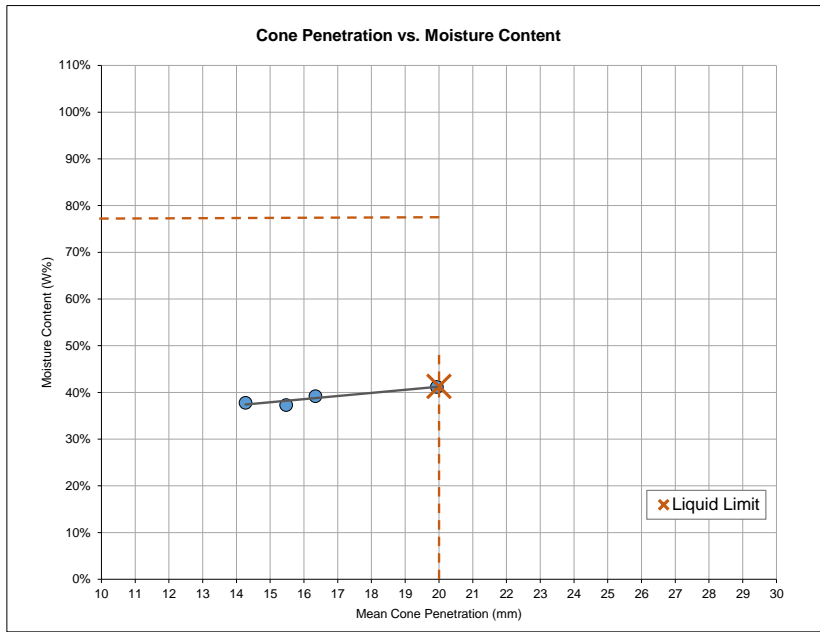


Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>TP3</b>	<b>0.30-1.00m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Brown grey, dark grey and brown mottled slightly gravelly slightly sandy CLAY.	Original Dried Mass (g):	268.90
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Natural Moisture Content (W%)	<b>21%</b>
Liquid Limit (WL%)	<b>41%</b>
Plastic Limit (WP%)	<b>19%</b>
Plasticity Index (IP%)	<b>22%</b>
Classification	<b>CI</b>
Portion Retained on 425µm Sieve (%)	<b>6%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>21%</b>
Consistency Index (Ipc)	<b>0.92</b>
Fall Cone Used:	<b>30°-80 g cone</b>
Remarks	



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	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Lyle</i>
		<b>23/02/2023</b>

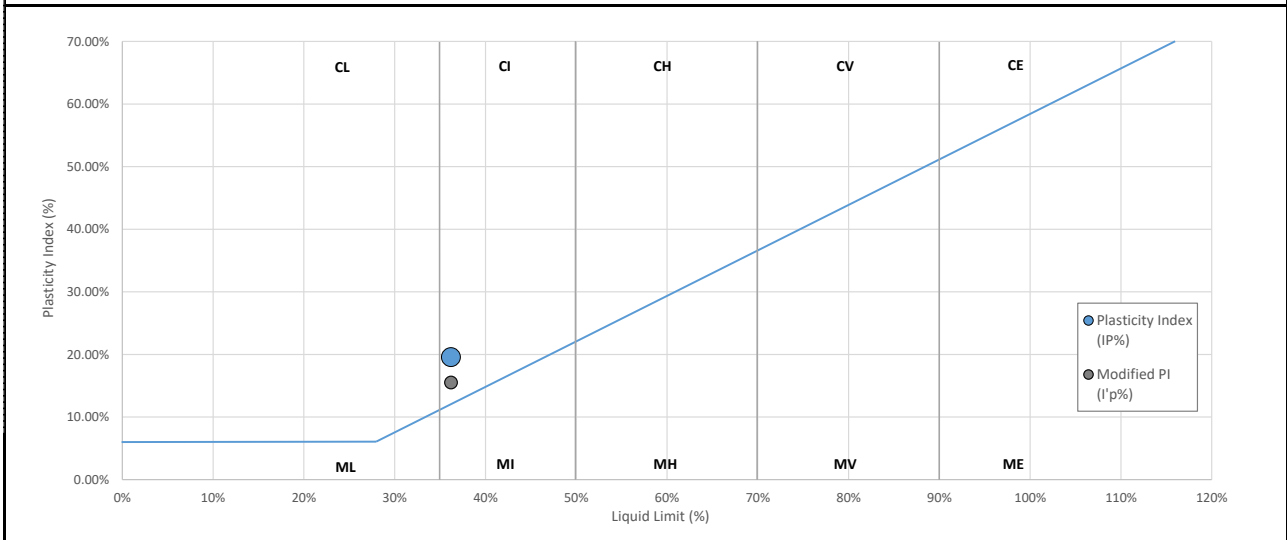
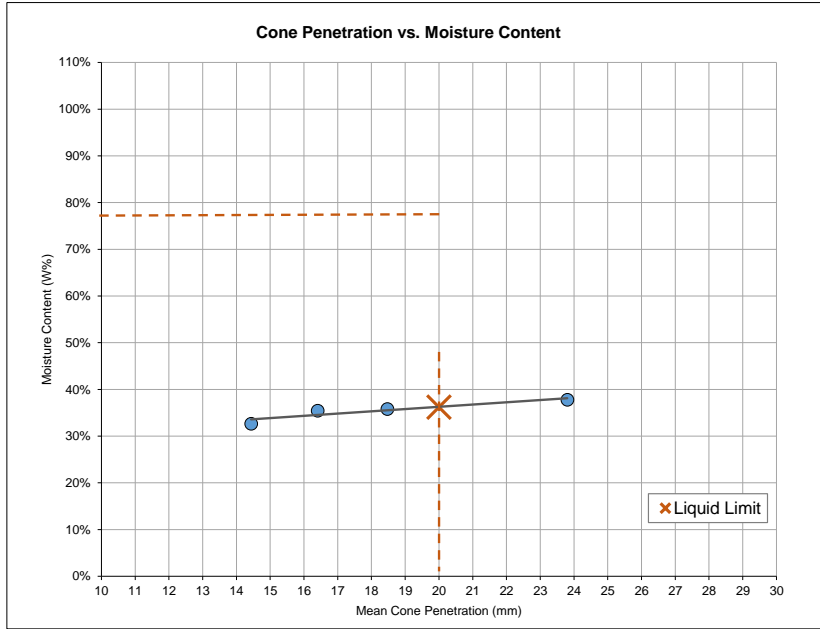


Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>TP5</b>	<b>0.35-1.20m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Dark brown mottled grey slightly gravelly slightly sandy CLAY.	Original Dried Mass (g):	272.65
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Natural Moisture Content (W%)	<b>18%</b>
Liquid Limit (WL%)	<b>36%</b>
Plastic Limit (WP%)	<b>17%</b>
Plasticity Index (IP%)	<b>20%</b>
Classification	<b>CI</b>
Portion Retained on 425µm Sieve (%)	<b>21%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>16%</b>
Consistency Index (I <sub>pc</sub> )	<b>0.93</b>
Fall Cone Used:	<b>30°-80 g cone</b>
Remarks	



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	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Lyke</i>
		<b>23/02/2023</b>

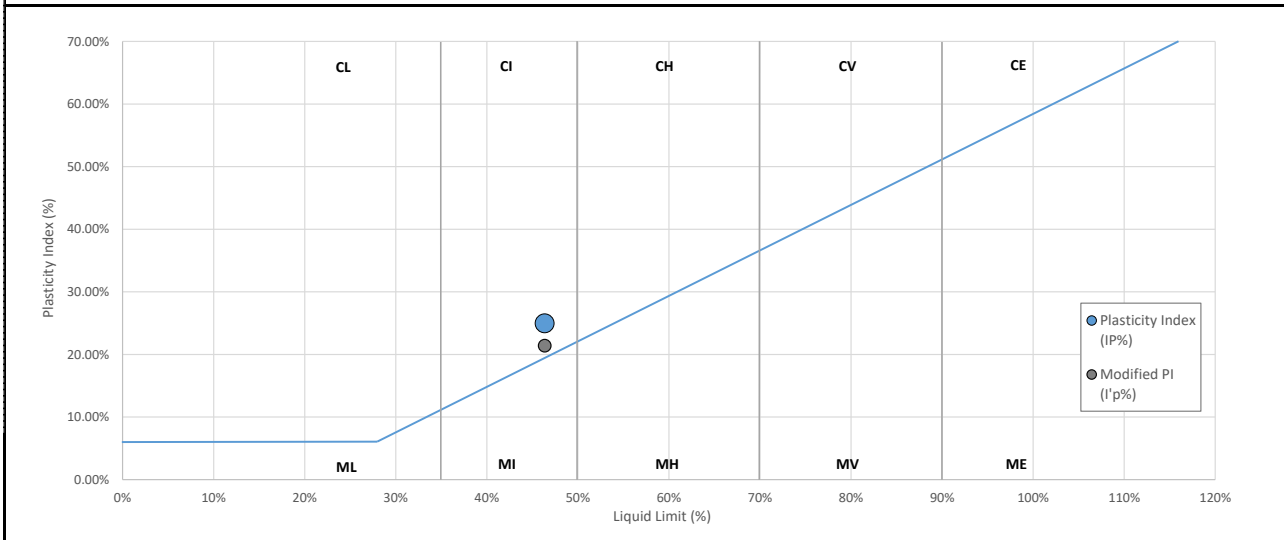
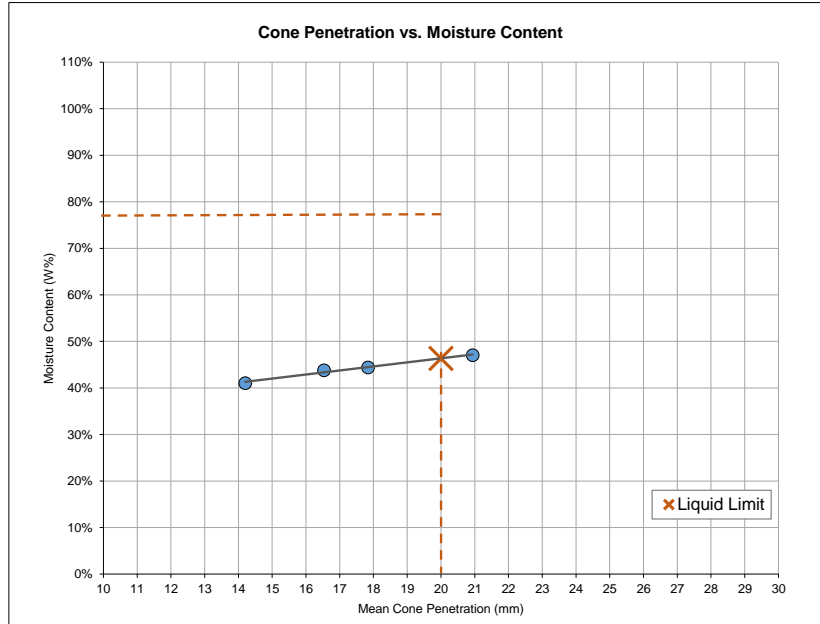


Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	TP12	0.40-1.20m	Test Date:	23/02/2023
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Sample Description:	Dark brown mottled dark grey slightly sandy slightly gravelly CLAY.	Original Dried Mass (g):	280.10
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Natural Moisture Content (W%)	18%
Liquid Limit (WL%)	46%
Plastic Limit (WP%)	21%
Plasticity Index (IP%)	25%
Classification	CI
Portion Retained on 425µm Sieve (%)	14%
Modified Plasticity Index (factoring in the above) (I'p%)	21%
Consistency Index (Ipc)	1.12
Fall Cone Used:	30°-80 g cone
Remarks	



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	Checked and Approved:	SFL (Senior Lab Technician) <i>Sam Lyth</i>
		23/02/2023

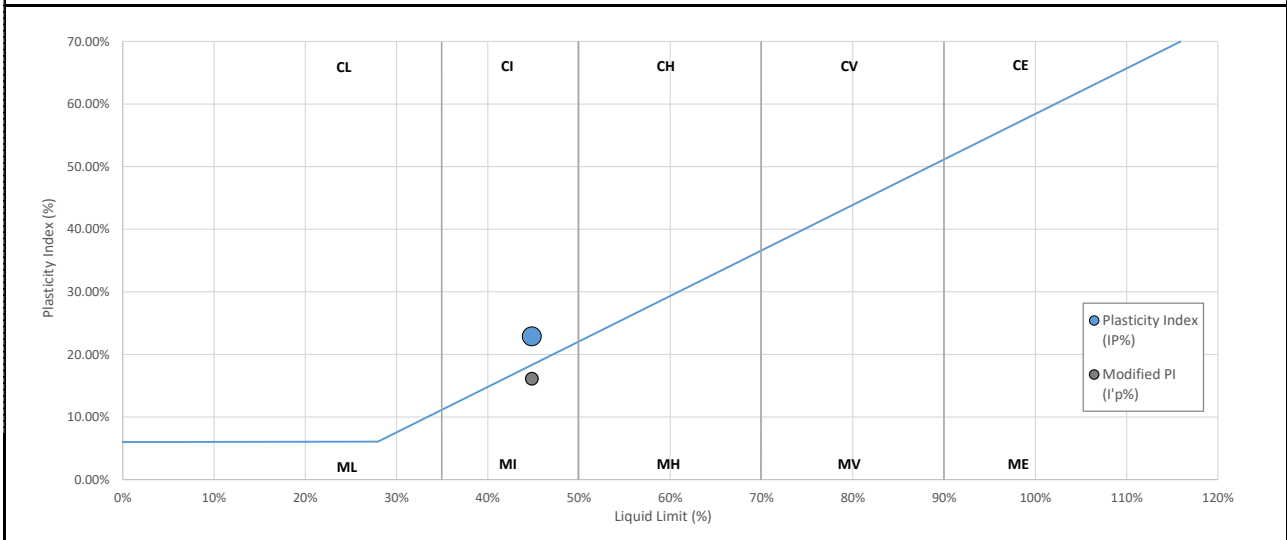
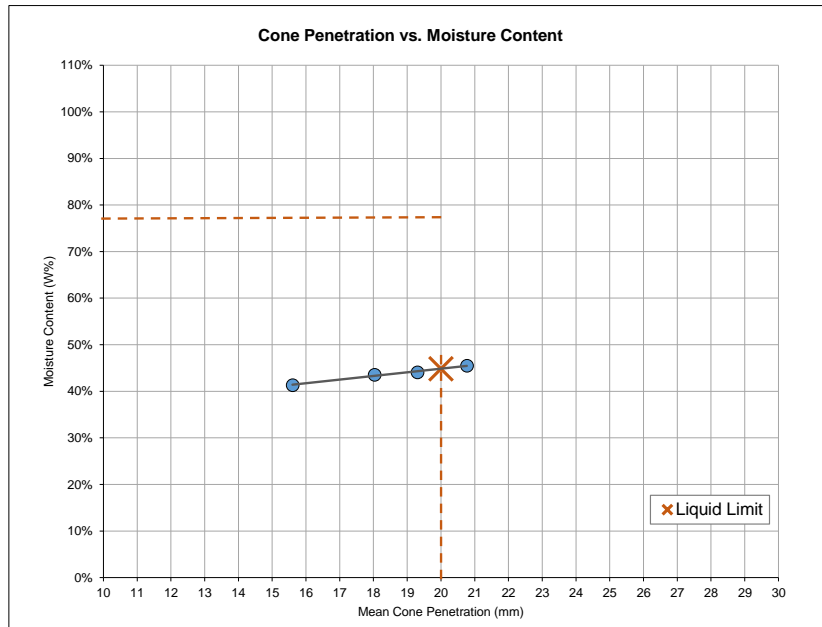


Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>BH7</b>	<b>2.50-2.70m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Multicoloured slightly gravelly slightly sandy SILT.	Original Dried Mass (g):	339.00
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Natural Moisture Content (W%)	<b>19%</b>
Liquid Limit (WL%)	<b>45%</b>
Plastic Limit (WP%)	<b>22%</b>
Plasticity Index (IP%)	<b>23%</b>
Classification	<b>MI</b>
Portion Retained on 425µm Sieve (%)	<b>30%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>16%</b>
Consistency Index (Ipc)	<b>1.15</b>
Fall Cone Used:	<b>30°-80 g cone</b>
Remarks	



<b>Constructive Evaluation Ltd</b> Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celduk.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
	Checked and Approved:	SFL (Senior Lab Technician) <i>Sam Lyle</i>
		<b>23/02/2023</b>

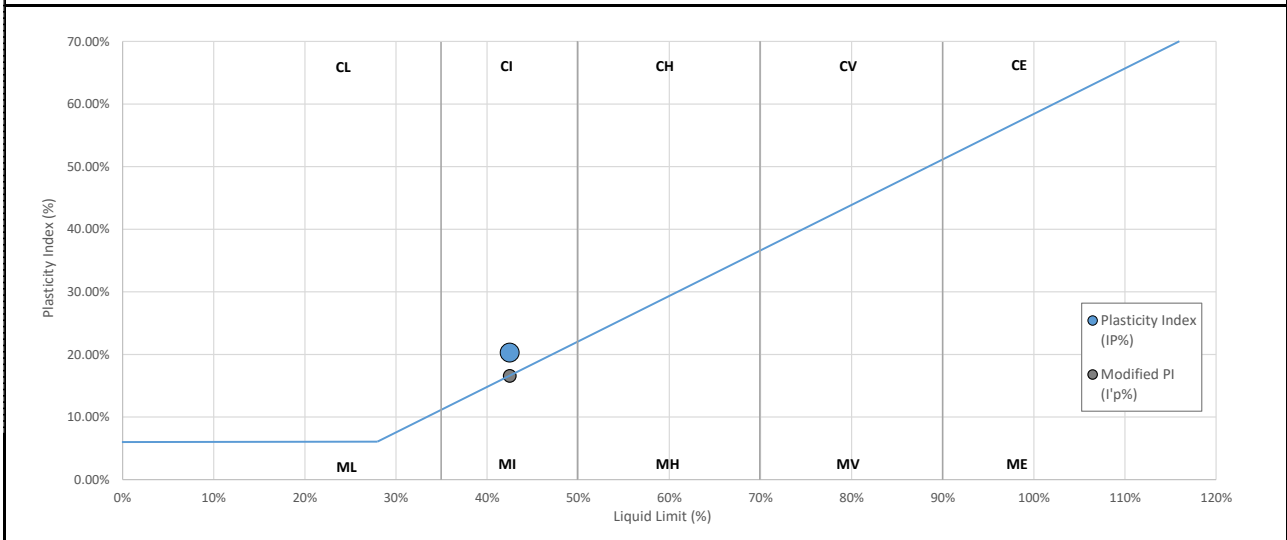
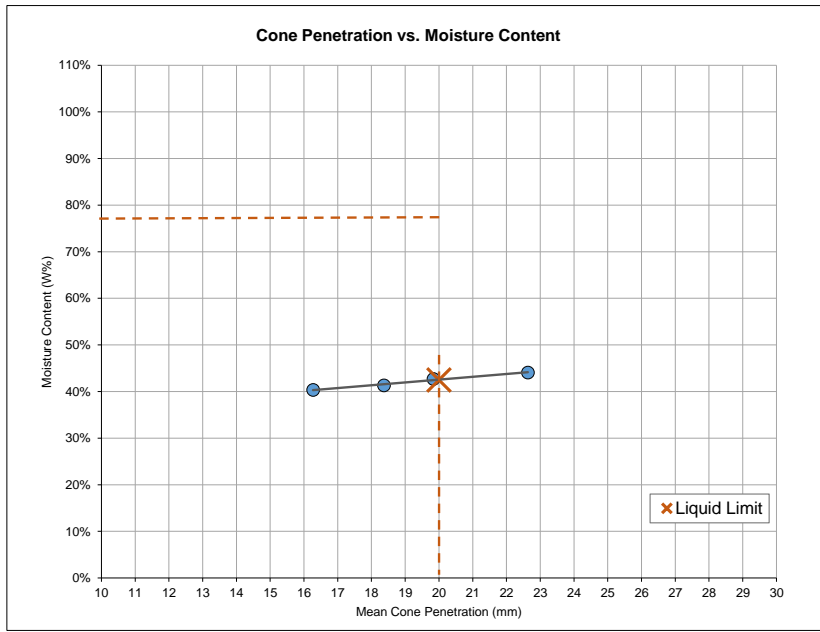


Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>BH7</b>	<b>4.20-5.30m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Balck dark grey and grey brown mottled slightly gravelly slightly sandy CLAY.	Original Dried Mass (g):	247.05
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Natural Moisture Content (W%)	<b>30%</b>
Liquid Limit (WL%)	<b>42%</b>
Plastic Limit (WP%)	<b>22%</b>
Plasticity Index (IP%)	<b>20%</b>
Classification	<b>CI-MI</b>
Portion Retained on 425µm Sieve (%)	<b>18%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>17%</b>
Consistency Index (I <sub>pc</sub> )	<b>0.59</b>
Fall Cone Used:	<b>30°-80 g cone</b>
Remarks	



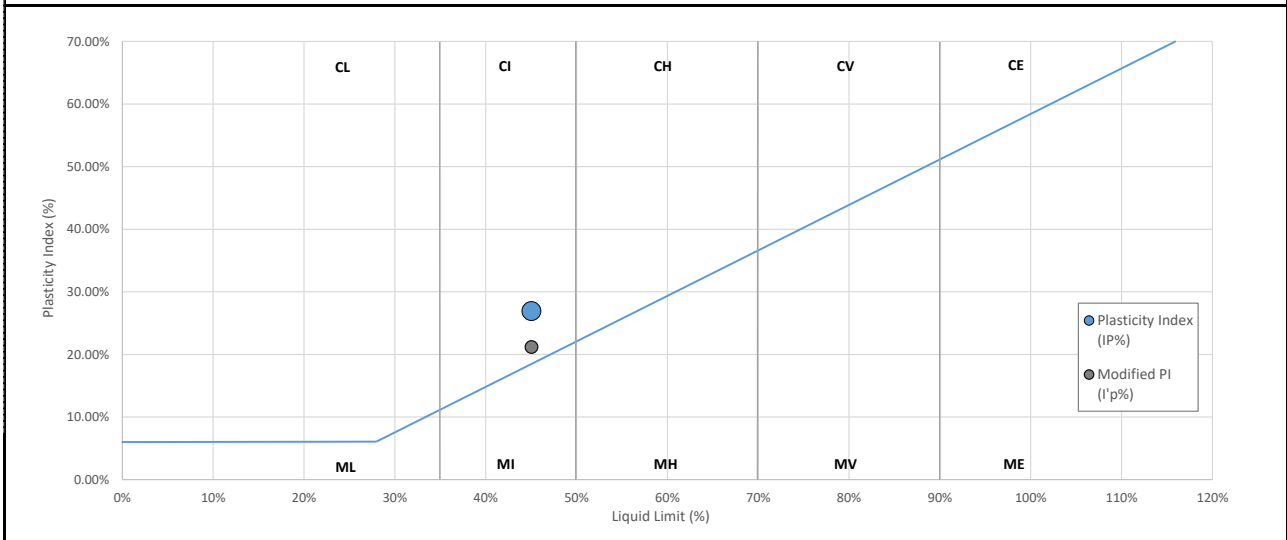
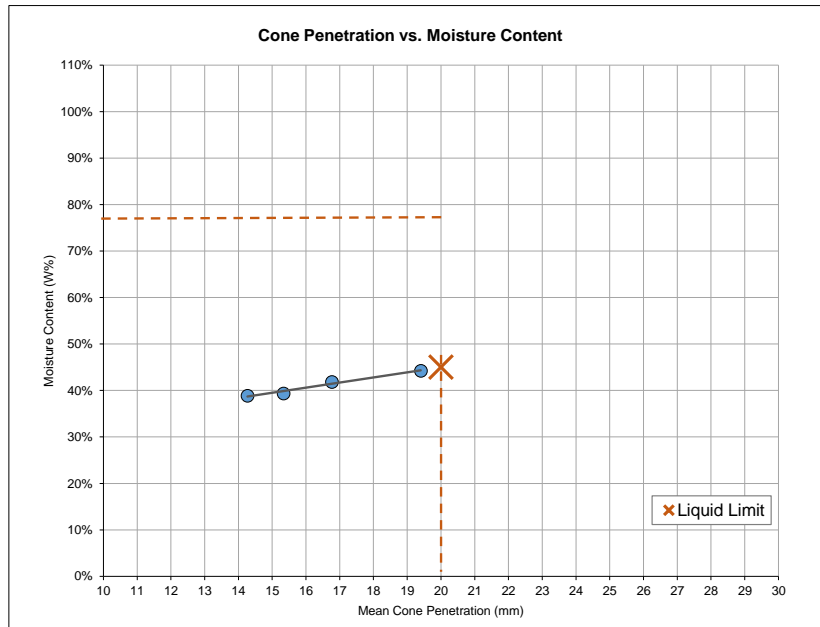
<b>Constructive Evaluation Ltd</b> Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celtduk.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Light</i>
		<b>23/02/2023</b>

Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>BH7</b>	<b>5.02-5.17m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Dark brown, grey and yellowish brown mottled slightly gravelly slightly sandy CLAY.	Original Dried Mass (g):	<b>336.40</b>
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Natural Moisture Content (W%)	<b>24%</b>
Liquid Limit (WL%)	<b>45%</b>
Plastic Limit (WP%)	<b>18%</b>
Plasticity Index (IP%)	<b>27%</b>
Classification	<b>CI</b>
Portion Retained on 425µm Sieve (%)	<b>21%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>21%</b>
Consistency Index (Ipc)	<b>0.77</b>
Fall Cone Used:	<b>30°-80 g cone</b>
Remarks	



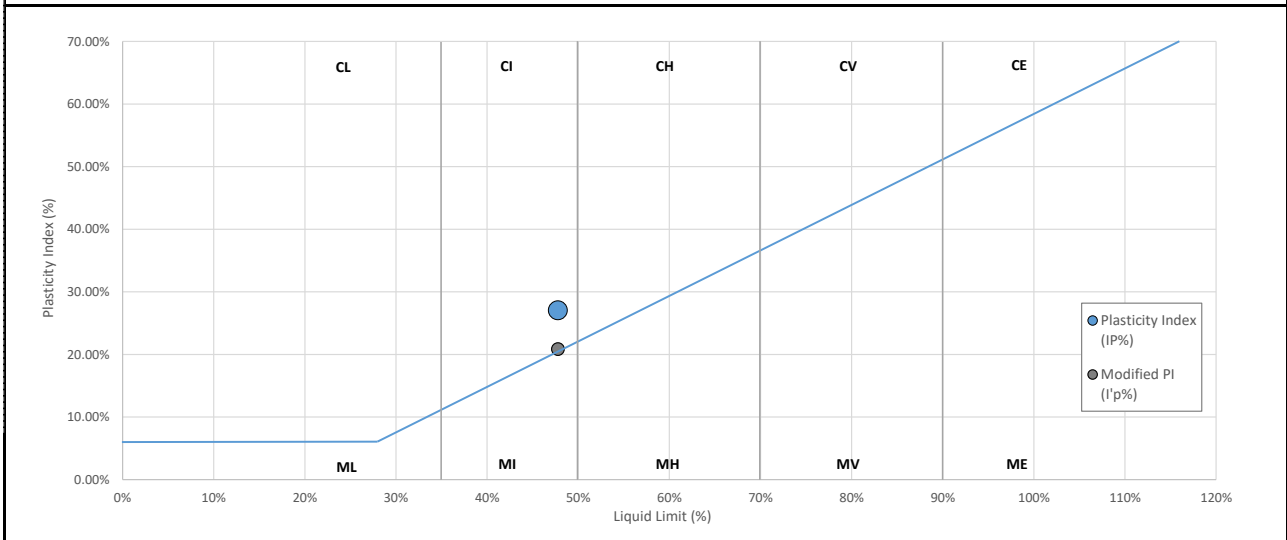
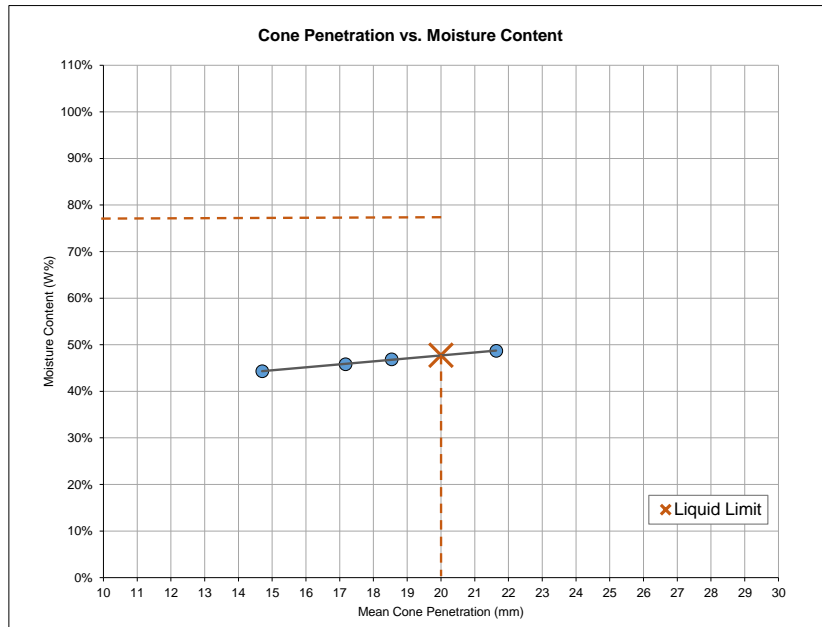
<b>Constructive Evaluation Ltd</b> Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celtduk.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Lyth</i>
		<b>23/02/2023</b>

Project No	<b>22.1150</b>
Project Name	<b>The George Hotel, Huddersfield</b>
Client	<b>William Birch and Sons</b>

Sample Position & Depth:	<b>TP13</b>	<b>0.45-1.20m</b>	Test Date:	<b>23/02/2023</b>
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Sample Description:	Dark brown dark grey and brown mottled slightly gravelly slightly sandy CLAY.	Original Dried Mass (g):	282.35
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Natural Moisture Content (W%)	<b>33%</b>
Liquid Limit (WL%)	<b>48%</b>
Plastic Limit (WP%)	<b>21%</b>
Plasticity Index (IP%)	<b>27%</b>
Classification	<b>CI</b>
Portion Retained on 425µm Sieve (%)	<b>23%</b>
Modified Plasticity Index (factoring in the above) (I'p%)	<b>21%</b>
Consistency Index (I <sub>pc</sub> )	<b>0.56</b>
Fall Cone Used	<b>30°-80 g cone</b>
Remarks	



<b>Constructive Evaluation Ltd</b> Units 15 & 16 Ford Lane Business Park, Ford Lane Arundel, West Sussex BN18 0UZ TEL: 01243 957063 E: info@celduk.com	Test Procedure(s):	BS17892: Part 1: Clause 5.2 : 2014: Determination of water content by the oven drying method BS17892: Part 12: Clause 5.3 : 2018: Determination of the liquid limit by the fall cone method BS17892: Part 12: Clauses 5.5 & 6.5 : 2018: Determination of the plastic limit and plasticity index
	Checked and Approved:	SFL (Senior Lab Technician) <i>Simon Lyke</i>
		<b>23/02/2023</b>

# APPENDIX E

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## Environmental Laboratory Testing



Unit A2  
Windmill Road  
Ponswood Industrial Estate  
St Leonards on Sea  
East Sussex  
TN38 9BY  
Telephone: (01424) 718618

[cs@elab-uk.co.uk](mailto:cs@elab-uk.co.uk)  
[info@elab-uk.co.uk](mailto:info@elab-uk.co.uk)

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## THE ENVIRONMENTAL LABORATORY LTD

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**Analytical Report Number:** 22-44412

**Issue:** 1

**Date of Issue:** 10/11/2022

**Contact:** Ben Rawlinson

**Customer Details:** Constructive Evaluation  
Unit 15 & 16  
Ford Lane Business Park  
Arundel  
West Sussex BN18 0UZ

**Quotation No:** Q21-02430

**Order No:** 22.1150

**Customer Reference:** 22.1150

**Date Received:** 03/11/2022

**Date Approved:** 10/11/2022

**Details:** George Hotel, Huddersfield

**Approved by:**

Tim Reeve, Quality Officer

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Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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## Sample Summary

Report No.: 22-44412, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
300441	TP2 0.50 - 1.20	27/10/2022	03/11/2022	Silty clayey loam	
300442	TP12 0.40 - 1.20	27/10/2022	03/11/2022	Silty clayey loam	
300443	TP5 0.35 - 1.20	27/10/2022	03/11/2022	Silty clayey loam	
300444	TP4 0.20 - 1.20	27/10/2022	03/11/2022	Silty clayey loam	

# Results Summary

Report No.: 22-44412, issue number 1

ELAB Reference	300441	300442	300443	300444
Customer Reference				
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP12	TP5	TP4
Sample Depth (m)	0.50 - 1.20	0.40 - 1.20	0.35 - 1.20	0.20 - 1.20
Sampling Date	27/10/2022	27/10/2022	27/10/2022	27/10/2022

Determinand	Codes	Units	LOD				
<b>Soil sample preparation parameters</b>							
Moisture Content	N	%	0.1	21.4	18.5	19.5	16.7
Material removed	N	%	0.1	7.4	9.8	4.8	< 0.1
Description of Inert material removed	N		0	Stones	Stones	Stones	None
<b>Metals</b>							
Arsenic	M	mg/kg	0.5	9.4	7.7	14.1	7.2
Cadmium	M	mg/kg	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	M	mg/kg	1	21.9	18.7	20.1	19.6
Copper	M	mg/kg	4	39.8	29.7	47.4	36.4
Lead	M	mg/kg	1	41.3	51.0	292	31.2
Mercury	M	mg/kg	0.1	< 0.1	0.2	0.2	< 0.1
Nickel	M	mg/kg	1	20.9	21.7	23.7	28.9
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	4.5	59.9	51.9	73.0	66.7
<b>Anions</b>							
Water Soluble Sulphate	M	mg/l	20	73	122	82	152
<b>Inorganics</b>							
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
<b>Miscellaneous</b>							
Acid Neutralisation Capacity	N	mol/kg	0.1	< 0.1	n/t	n/t	n/t
Loss on Ignition	M	%	0.01	3.08	n/t	n/t	n/t
pH	M	pH units	0.1	7.7	7.7	8.2	7.7
Soil Organic Matter	U	%	0.1	1.2	1.7	1.5	1.2
Total Organic Carbon	N	%	0.01	0.55	n/t	n/t	n/t
<b>Phenols</b>							
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5



# Results Summary

2683

Report No.: 22-44412, issue number 1

ELAB Reference	300441	300442	300443	300444
Customer Reference				
Sample ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sample Location	TP2	TP12	TP5	TP4
Sample Depth (m)	0.50 - 1.20	0.40 - 1.20	0.35 - 1.20	0.20 - 1.20
Sampling Date	27/10/2022	27/10/2022	27/10/2022	27/10/2022

Determinand	Codes	Units	LOD				
<b>Polyaromatic hydrocarbons</b>							
Naphthalene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.3
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	0.5	< 0.1	1.7
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.3
Fluoranthene	M	mg/kg	0.1	< 0.1	0.8	< 0.1	1.6
Pyrene	M	mg/kg	0.1	< 0.1	0.4	< 0.1	1.3
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	0.7
Chrysene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	0.9
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	0.6
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	0.5
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	0.1	< 0.1	0.6
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.3
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	0.3
Total PAH(16)	M	mg/kg	0.4	< 0.4	3.2	< 0.4	9.4
Total (of 17) PAHs	N	mg/kg	2	< 2	n/t	n/t	n/t
<b>BTEX</b>							
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
MTBE	U	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0
Total BTEX	N	mg/kg	0.01	< 0.01	n/t	n/t	n/t
<b>TPH CWG</b>							
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_2D_AL)	M	mg/kg	1	3.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic (EH_2D_AL)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	3.8	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic (EH_2D_AR)	M	mg/kg	1	2.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic (EH_2D_AR)	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	2.9	< 1.0	< 1.0	< 1.0
Total petroleum hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_Total)	N	mg/kg	1	6.7	< 1.0	1.8	< 1.0
<b>Total Petroleum Hydrocarbons</b>							
Mineral Oil w Florisil (EH_CU_1D_Total)	N	mg/kg	5	< 5	n/t	n/t	n/t
<b>PCB (ICES 7 congeners)</b>							
Total PCBs (7 congeners)	M	mg/kg	0.03	< 0.03	n/t	n/t	n/t

# Results Summary

Report No.: 22-44412, issue number 1

WAC Analysis							
Elab Ref:	300441				Landfill Waste Acceptance Criteria Limits*		
Sample Date:	27/10/2022				Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	TP2						
Depth (m)	0.50 - 1.20						
Site:	George Hotel, Huddersfield						
Determinand	Code	Units					
Total Organic Carbon	N	%	0.55	3	5	6	
Loss on Ignition	M	%	3.1	--	--	10	
Total BTEX	M	mg/kg	< 0.01	6	--	--	
Total PCBs (7 congeners)	M	mg/kg	< 0.03	1	--	--	
TPH Total WAC (EH_CU_1D_Total)	N	mg/kg	< 5	500	--	--	
Total (of 17) PAHs	N	mg/kg	< 2	100	--	--	
pH	M		7.7	--	>6	--	
Acid Neutralisation Capacity	N	mol/kg	< 0.1	--	To evaluate	To evaluate	
Eluate Analysis			10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
		mg/l	mg/kg				
Arsenic	N	< 0.005	< 0.05	0.5	2	25	
Barium	N	< 0.005	< 0.05	20	100	300	
Cadmium	N	< 0.001	< 0.01	0.04	1	5	
Chromium	N	< 0.005	< 0.05	0.5	10	70	
Copper	N	< 0.005	< 0.05	2	50	100	
Mercury	N	< 0.005	< 0.01	0.01	0.2	2	
Molybdenum	N	< 0.005	< 0.05	0.5	10	30	
Nickel	N	0.003	< 0.05	0.4	10	40	
Lead	N	< 0.001	< 0.05	0.5	10	50	
Antimony	N	< 0.005	< 0.05	0.06	0.7	5	
Selenium	N	< 0.005	< 0.05	0.1	0.5	7	
Zinc	N	< 0.005	< 0.05	4	50	200	
Chloride	N	6	64.00	800	15000	25000	
Fluoride	N	< 5	< 10	10	150	500	
Sulphate	N	17	170.00	1000	20000	50000	
Total Dissolved Solids	N	65	647.00	4000	60000	100000	
Phenol Index	N	< 0.01	< 0.10	1	-	-	
Dissolved Organic Carbon	N	14.800	148.00	500	800	1000	
Leach Test Information							
pH	N	8.2					
Conductivity (uS/cm)	N	97					
Dry mass of test portion (g)		101.000					
Dry Matter (%)		78					
Moisture (%)		29					
Eluent Volume (ml)		944					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

\* Stated limits are for guidance only, and not for conformity assessment.



Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY  
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

## Results Summary

Report No.: 22-44412, issue number 1

### Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
300441	0.50 - 1.20	TP2	Brown/Grey sandy soil, stones, concrete	No asbestos detected	n/t	n/t	n/t	n/t
300442	0.40 - 1.20	TP12	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
300443	0.35 - 1.20	TP5	Brown/Grey sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
300444	0.20 - 1.20	TP4	Brown sandy soil, stones, slate	No asbestos detected	n/t	n/t	n/t	n/t



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[info@elab-uk.co.uk](mailto:info@elab-uk.co.uk)

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## THE ENVIRONMENTAL LABORATORY LTD

---

**Analytical Report Number:** 22-44562

**Issue:** 1

**Date of Issue:** 16/11/2022

**Contact:** Ben Rawlinson

**Customer Details:** Constructive Evaluation  
Unit 15 & 16  
Ford Lane Business Park  
Arundel  
West Sussex BN18 0UZ

**Quotation No:** Q21-02430

**Order No:** 22.1150

**Customer Reference:** 22.1150

**Date Received:** 10/11/2022

**Date Approved:** 16/11/2022

**Details:** Huddersfield

**Approved by:**

Mike Varley, General Manager

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Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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## Sample Summary

Report No.: 22-44562, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
301089	BH1 0.30 - 0.70	01/11/2022	10/11/2022	Silty loam	f
301090	TP3 0.30 - 1.00	31/10/2022	10/11/2022	Silty loam	f
301091	TP6 0.50 - 0.83	01/11/2022	10/11/2022	Sandy silty loam	f
301092	TP7 0.35 - 0.75	01/11/2022	10/11/2022	Sandy silty loam	f
301093	TP8 0.45 - 0.60	01/11/2022	10/11/2022	Silty loam	f
301094	TP9 0.20 - 1.00	31/10/2022	10/11/2022	Silty clayey loam	f
301095	TP11 0.30 - 1.10	03/11/2022	10/11/2022	Silty loam	
301096	TP13 0.45 - 1.20	31/10/2022	10/11/2022	Silty loam	f
301097	TP14 0.34 - 1.00	01/11/2022	10/11/2022	Silty loam	f



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## Results Summary

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ELAB Reference	301089	301090	301091	301092	301093	301094	301095	301096	301097
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH1	TP3	TP6	TP7	TP8	TP9	TP11	TP13	TP14
Sample Depth (m)	0.30 - 0.70	0.30 - 1.00	0.50 - 0.83	0.35 - 0.75	0.45 - 0.60	0.20 - 1.00	0.30 - 1.10	0.45 - 1.20	0.34 - 1.00
Sampling Date	01/11/2022	31/10/2022	01/11/2022	01/11/2022	01/11/2022	31/10/2022	03/11/2022	31/10/2022	01/11/2022

Determinand	Codes	Units	LOD									
<b>Soil sample preparation parameters</b>												
Moisture Content	N	%	0.1	9.6	12.1	22.6	15.5	16.3	12.6	12.7	23.3	12.3
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None	None	None	None	None
<b>Metals</b>												
Arsenic	M	mg/kg	0.5	13.3	5.8	15.8	13.0	13.0	8.2	5.8	7.9	7.2
Cadmium	M	mg/kg	0.2	0.3	< 0.2	0.2	0.7	< 0.2	< 0.2	< 0.2	0.4	< 0.2
Chromium	M	mg/kg	1	27.4	19.6	32.9	30.4	24.0	22.3	20.4	23.8	20.8
Copper	M	mg/kg	4	53.4	22.6	90.7	81.0	33.8	31.1	24.9	43.3	31.2
Lead	M	mg/kg	1	42.0	17.5	1140	180	69.3	32.4	21.2	66.4	25.6
Mercury	M	mg/kg	0.1	0.1	< 0.1	4.5	0.6	0.3	0.1	< 0.1	0.1	< 0.1
Nickel	M	mg/kg	1	33.4	32.6	48.9	51.0	32.7	36.1	34.4	56.1	38.1
Selenium	M	mg/kg	1	1.7	< 1.0	< 1.0	1.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	4.5	88.9	53.5	138	132	57.1	65.4	54.8	104	70.4
<b>Anions</b>												
Water Soluble Sulphate	M	mg/l	20	49	68	60	26	25	21	52	216	100
<b>Inorganics</b>												
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>Miscellaneous</b>												
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	< 0.1	n/t	< 0.1	n/t	< 0.1	< 0.1	n/t
Loss on Ignition	M	%	0.01	n/t	n/t	5.91	n/t	5.68	n/t	3.44	5.94	n/t
pH	M	pH units	0.1	7.2	7.0	7.8	7.7	8.4	8.0	8.1	7.7	7.4
Soil Organic Matter	U	%	0.1	1.8	0.9	2.4	2.4	2.3	1.3	1.1	1.7	1.1
Total Organic Carbon	N	%	0.01	n/t	n/t	2.1	n/t	2.0	n/t	0.83	1.1	n/t

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## Results Summary

Report No.: 22-44562, issue number 1

ELAB Reference	301089	301090	301091	301092	301093	301094	301095	301096	301097
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH1	TP3	TP6	TP7	TP8	TP9	TP11	TP13	TP14
Sample Depth (m)	0.30 - 0.70	0.30 - 1.00	0.50 - 0.83	0.35 - 0.75	0.45 - 0.60	0.20 - 1.00	0.30 - 1.10	0.45 - 1.20	0.34 - 1.00
Sampling Date	01/11/2022	31/10/2022	01/11/2022	01/11/2022	01/11/2022	31/10/2022	03/11/2022	31/10/2022	01/11/2022

Determinand	Codes	Units	LOD									
<b>Phenols</b>												
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
<b>Polyaromatic hydrocarbons</b>												
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.5	< 0.4	< 0.4	< 0.4
Total (of 17) PAHs	N	mg/kg	2	n/t	n/t	< 2	n/t	< 2	n/t	< 2	< 2	n/t

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## Results Summary

Report No.: 22-44562, issue number 1

ELAB Reference	301089	301090	301091	301092	301093	301094	301095	301096	301097
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH1	TP3	TP6	TP7	TP8	TP9	TP11	TP13	TP14
Sample Depth (m)	0.30 - 0.70	0.30 - 1.00	0.50 - 0.83	0.35 - 0.75	0.45 - 0.60	0.20 - 1.00	0.30 - 1.10	0.45 - 1.20	0.34 - 1.00
Sampling Date	01/11/2022	31/10/2022	01/11/2022	01/11/2022	01/11/2022	31/10/2022	03/11/2022	31/10/2022	01/11/2022

Determinand	Codes	Units	LOD	301089	301090	301091	301092	301093	301094	301095	301096	301097
<b>BTEX</b>												
Benzene	M	ug/kg	10	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	< 10.0	f < 10.0	f < 10.0
Toluene	M	ug/kg	10	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	< 10.0	f < 10.0	f < 10.0
Ethylbenzene	M	ug/kg	10	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	< 10.0	f < 10.0	f < 10.0
Xylenes	M	ug/kg	10	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	< 10.0	f < 10.0	f < 10.0
MTBE	U	ug/kg	10	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	f < 10.0	< 10.0	f < 10.0	f < 10.0
Total BTEX	N	mg/kg	0.01	n/t	n/t	f < 0.01	n/t	f < 0.01	n/t	< 0.01	f < 0.01	n/t
<b>TPH CWG</b>												
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	< 0.01	f < 0.01	f < 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	< 0.01	f < 0.01	f < 0.01
>C8-C10 Aliphatic (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	< 1.0	f < 1.0	f < 1.0
>C10-C12 Aliphatic (EH_2D_AL)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 4.5	< 1.0	f < 1.0
>C12-C16 Aliphatic (EH_2D_AL)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 34.4	< 1.0	f < 1.0
>C16-C21 Aliphatic (EH_2D_AL)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 35.3	< 1.0	f < 1.0
>C21-C35 Aliphatic (EH_2D_AL)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 11.7	< 1.0	f < 1.0
>C35-C40 Aliphatic (EH_2D_AL)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	< 1.0	f < 1.0
Total aliphatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AL)	N	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f 1.6	f 3.2	f 86.7	< 1.0	f < 1.0	f < 1.0
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	< 0.01	f < 0.01	f < 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	f < 0.01	< 0.01	f < 0.01	f < 0.01
>C8-C10 Aromatic (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	< 1.0	f < 1.0	f < 1.0
>C10-C12 Aromatic (EH_2D_AR)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 2.3	< 1.0	f < 1.0
>C12-C16 Aromatic (EH_2D_AR)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 15.2	< 1.0	f < 1.0
>C16-C21 Aromatic (EH_2D_AR)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f < 1.0	f 13.5	< 1.0	f < 1.0
>C21-C35 Aromatic (EH_2D_AR)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f 4.7	f 6.0	f 10.2	< 1.0	f < 1.0	f < 1.0
>C35-C40 Aromatic (EH_2D_AR)	M	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f 1.2	f 1.4	f < 1.0	< 1.0	f < 1.0	f < 1.0
Total aromatic hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_AR)	N	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f 7.5	f 9.4	f 42.3	< 1.0	f < 1.0	f < 1.0
Total petroleum hydrocarbons (>C5 - C40) (HS_1D_MS+EH_2D_Total)	N	mg/kg	1	f < 1.0	f < 1.0	f < 1.0	f 9.2	f 12.6	f 129	< 1.0	f < 1.0	f < 1.0

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## Results Summary

Report No.: 22-44562, issue number 1

ELAB Reference	301089	301090	301091	301092	301093	301094	301095	301096	301097
Customer Reference									
Sample ID									
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH1	TP3	TP6	TP7	TP8	TP9	TP11	TP13	TP14
Sample Depth (m)	0.30 - 0.70	0.30 - 1.00	0.50 - 0.83	0.35 - 0.75	0.45 - 0.60	0.20 - 1.00	0.30 - 1.10	0.45 - 1.20	0.34 - 1.00
Sampling Date	01/11/2022	31/10/2022	01/11/2022	01/11/2022	01/11/2022	31/10/2022	03/11/2022	31/10/2022	01/11/2022

Determinand	Codes	Units	LOD									
<b>Total Petroleum Hydrocarbons</b>												
Mineral Oil w Florisil (EH_CU_1D_Total)	N	mg/kg	5	n/t	n/t	f < 5	n/t	f < 5	n/t	< 5	f 78	n/t
<b>PCB (ICES 7 congeners)</b>												
Total PCBs (7 congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	n/t	< 0.03	n/t	< 0.03	< 0.03	n/t

## Results Summary

Report No.: 22-44562, issue number 1

### WAC Analysis

Elab Ref:	301096					<b>Landfill Waste Acceptance Criteria Limits*</b>		
Sample Date:	31/10/2022					<b>Inert Waste Landfill</b>	<b>Stable Non-reactive Hazardous waste in non-hazardous Landfill</b>	<b>Hazardous Waste Landfill</b>
Sample ID:	TP13							
Depth (m)	0.45 - 1.20							
Site:	Huddersfield							
Determinand		Code	Units					
Total Organic Carbon		N	%	1.10	3	5	6	
Loss on Ignition		M	%	5.9	--	--	10	
Total BTEX		M	mg/kg	< 0.01	6	--	--	
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--	
TPH Total WAC (EH_CU_1D_Total)		N	mg/kg	78	500	--	--	
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--	
pH		M		7.7	--	>6	--	
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate	
Eluate Analysis			<b>10:1</b>	<b>10:1</b>	<b>Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg</b>			
			<b>mg/l</b>	<b>mg/kg</b>				
Arsenic		N	< 0.005	< 0.05	0.5	2	25	
Barium		N	0.032	0.32	20	100	300	
Cadmium		N	< 0.001	< 0.01	0.04	1	5	
Chromium		N	< 0.005	< 0.05	0.5	10	70	
Copper		N	< 0.005	< 0.05	2	50	100	
Mercury		N	< 0.005	< 0.01	0.01	0.2	2	
Molybdenum		N	0.005	0.05	0.5	10	30	
Nickel		N	0.005	0.05	0.4	10	40	
Lead		N	< 0.001	< 0.05	0.5	10	50	
Antimony		N	< 0.005	< 0.05	0.06	0.7	5	
Selenium		N	< 0.005	< 0.05	0.1	0.5	7	
Zinc		N	< 0.005	< 0.05	4	50	200	
Chloride		N	6	57.00	800	15000	25000	
Fluoride		N	< 5	< 10	10	150	500	
Sulphate		N	43	426.00	1000	20000	50000	
Total Dissolved Solids		N	221	2210.00	4000	60000	100000	
Phenol Index		N	< 0.01	< 0.10	1	-	-	
Dissolved Organic Carbon		N	4.210	42.00	500	800	1000	
Leach Test Information								
pH		N	7.2					
Conductivity (uS/cm)		N	330					
Dry mass of test portion (g)			103.000					
Dry Matter (%)			73					
Moisture (%)			37					
Eluent Volume (ml)			976					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

\* Stated limits are for guidance only, and not for conformity assessment.

## Results Summary

Report No.: 22-44562, issue number 1

### WAC Analysis

Elab Ref:	301095					<b>Landfill Waste Acceptance Criteria Limits*</b>		
Sample Date:	03/11/2022					<b>Inert Waste Landfill</b>	<b>Stable Non-reactive Hazardous waste in non-hazardous Landfill</b>	<b>Hazardous Waste Landfill</b>
Sample ID:	TP11							
Depth (m)	0.30 - 1.10							
Site:	Huddersfield							
Determinand		Code	Units					
Total Organic Carbon		N	%	0.83	3	5	6	
Loss on Ignition		M	%	3.4	--	--	10	
Total BTEX		M	mg/kg	< 0.01	6	--	--	
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--	
TPH Total WAC (EH_CU_1D_Total)		N	mg/kg	< 5	500	--	--	
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--	
pH		M		8.1	--	>6	--	
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate	
<b>Eluate Analysis</b>			<b>10:1</b>	<b>10:1</b>	<b>Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg</b>			
			<b>mg/l</b>	<b>mg/kg</b>				
Arsenic		N	< 0.005	< 0.05	0.5	2	25	
Barium		N	0.005	0.05	20	100	300	
Cadmium		N	< 0.001	< 0.01	0.04	1	5	
Chromium		N	< 0.005	< 0.05	0.5	10	70	
Copper		N	< 0.005	< 0.05	2	50	100	
Mercury		N	< 0.005	< 0.01	0.01	0.2	2	
Molybdenum		N	< 0.005	< 0.05	0.5	10	30	
Nickel		N	0.001	< 0.05	0.4	10	40	
Lead		N	< 0.001	< 0.05	0.5	10	50	
Antimony		N	< 0.005	< 0.05	0.06	0.7	5	
Selenium		N	< 0.005	< 0.05	0.1	0.5	7	
Zinc		N	< 0.005	< 0.05	4	50	200	
Chloride		N	< 5	< 50	800	15000	25000	
Fluoride		N	< 5	< 10	10	150	500	
Sulphate		N	10	99.40	1000	20000	50000	
Total Dissolved Solids		N	49	491.00	4000	60000	100000	
Phenol Index		N	< 0.01	< 0.10	1	-	-	
Dissolved Organic Carbon		N	5.090	51.00	500	800	1000	
<b>Leach Test Information</b>								
pH		N	7.3					
Conductivity (uS/cm)		N	73					
Dry mass of test portion (g)			104.000					
Dry Matter (%)			86					
Moisture (%)			16					
Eluent Volume (ml)			999					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

\* Stated limits are for guidance only, and not for conformity assessment.

## Results Summary

Report No.: 22-44562, issue number 1

### WAC Analysis

Elab Ref:	301093					<b>Landfill Waste Acceptance Criteria Limits*</b>		
Sample Date:	01/11/2022					<b>Inert Waste Landfill</b>	<b>Stable Non-reactive Hazardous waste in non-hazardous Landfill</b>	<b>Hazardous Waste Landfill</b>
Sample ID:	TP8							
Depth (m)	0.45 - 0.60							
Site:	Huddersfield							
Determinand		Code	Units					
Total Organic Carbon		N	%	2.00	3	5	6	
Loss on Ignition		M	%	5.7	--	--	10	
Total BTEX		M	mg/kg	< 0.01	6	--	--	
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--	
TPH Total WAC (EH_CU_1D_Total)		N	mg/kg	< 5	500	--	--	
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--	
pH		M		8.4	--	>6	--	
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate	
Eluate Analysis			<b>10:1</b>	<b>10:1</b>	<b>Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg</b>			
			<b>mg/l</b>	<b>mg/kg</b>				
Arsenic		N	< 0.005	< 0.05	0.5	2	25	
Barium		N	0.013	0.13	20	100	300	
Cadmium		N	< 0.001	< 0.01	0.04	1	5	
Chromium		N	< 0.005	< 0.05	0.5	10	70	
Copper		N	< 0.005	< 0.05	2	50	100	
Mercury		N	< 0.005	< 0.01	0.01	0.2	2	
Molybdenum		N	0.008	0.08	0.5	10	30	
Nickel		N	< 0.001	< 0.05	0.4	10	40	
Lead		N	< 0.001	< 0.05	0.5	10	50	
Antimony		N	< 0.005	< 0.05	0.06	0.7	5	
Selenium		N	< 0.005	< 0.05	0.1	0.5	7	
Zinc		N	< 0.005	< 0.05	4	50	200	
Chloride		N	< 5	< 50	800	15000	25000	
Fluoride		N	< 5	< 10	10	150	500	
Sulphate		N	3	29.50	1000	20000	50000	
Total Dissolved Solids		N	74	737.00	4000	60000	100000	
Phenol Index		N	< 0.01	< 0.10	1	-	-	
Dissolved Organic Carbon		N	5.350	54.00	500	800	1000	
Leach Test Information								
pH		N	7.6					
Conductivity (uS/cm)		N	110					
Dry mass of test portion (g)			101.000					
Dry Matter (%)			79					
Moisture (%)			27					
Eluent Volume (ml)			959					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

\* Stated limits are for guidance only, and not for conformity assessment.

## Results Summary

Report No.: 22-44562, issue number 1

### WAC Analysis

Elab Ref:	301091					<b>Landfill Waste Acceptance Criteria Limits*</b>		
Sample Date:	01/11/2022					<b>Inert Waste Landfill</b>	<b>Stable Non-reactive Hazardous waste in non-hazardous Landfill</b>	<b>Hazardous Waste Landfill</b>
Sample ID:	TP6							
Depth (m)	0.50 - 0.83							
Site:	Huddersfield							
Determinand		Code	Units					
Total Organic Carbon		N	%	2.10	3	5	6	
Loss on Ignition		M	%	5.9	--	--	10	
Total BTEX		M	mg/kg	< 0.01	6	--	--	
Total PCBs (7 congeners)		M	mg/kg	< 0.03	1	--	--	
TPH Total WAC (EH_CU_1D_Total)		N	mg/kg	< 5	500	--	--	
Total (of 17) PAHs		N	mg/kg	< 2	100	--	--	
pH		M		7.8	--	>6	--	
Acid Neutralisation Capacity		N	mol/kg	< 0.1	--	To evaluate	To evaluate	
Eluate Analysis			<b>10:1</b>	<b>10:1</b>	<b>Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg</b>			
			<b>mg/l</b>	<b>mg/kg</b>				
Arsenic		N	< 0.005	< 0.05	0.5	2	25	
Barium		N	0.006	0.06	20	100	300	
Cadmium		N	< 0.001	< 0.01	0.04	1	5	
Chromium		N	< 0.005	< 0.05	0.5	10	70	
Copper		N	< 0.005	< 0.05	2	50	100	
Mercury		N	< 0.005	< 0.01	0.01	0.2	2	
Molybdenum		N	< 0.005	< 0.05	0.5	10	30	
Nickel		N	< 0.001	< 0.05	0.4	10	40	
Lead		N	< 0.001	< 0.05	0.5	10	50	
Antimony		N	< 0.005	< 0.05	0.06	0.7	5	
Selenium		N	< 0.005	< 0.05	0.1	0.5	7	
Zinc		N	< 0.005	< 0.05	4	50	200	
Chloride		N	< 5	< 50	800	15000	25000	
Fluoride		N	< 5	< 10	10	150	500	
Sulphate		N	12	121.00	1000	20000	50000	
Total Dissolved Solids		N	78	782.00	4000	60000	100000	
Phenol Index		N	< 0.01	< 0.10	1	-	-	
Dissolved Organic Carbon		N	4.420	44.00	500	800	1000	
Leach Test Information								
pH		N	7.5					
Conductivity (uS/cm)		N	117					
Dry mass of test portion (g)			102.000					
Dry Matter (%)			79					
Moisture (%)			27					
Eluent Volume (ml)			974					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

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## Results Summary

Report No.: 22-44562, issue number 1

### Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
301089	0.30 - 0.70	BH1	Brown sandy soil, stones, shale	No asbestos detected	n/t	n/t	n/t	n/t
301090	0.30 - 1.00	TP3	Brown sandy soil, stones, concrete	No asbestos detected	n/t	n/t	n/t	n/t
301091	0.50 - 0.83	TP6	Brown soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
301092	0.35 - 0.75	TP7	Brown soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
301093	0.45 - 0.60	TP8	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
301094	0.20 - 1.00	TP9	Brown sandy soil, stones, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
301095	0.30 - 1.10	TP11	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t
301096	0.45 - 1.20	TP13	Brown sandy soil, stones, concrete, brick, clinker	No asbestos detected	n/t	n/t	n/t	n/t
301097	0.34 - 1.00	TP14	Brown sandy soil, stones	No asbestos detected	n/t	n/t	n/t	n/t



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## THE ENVIRONMENTAL LABORATORY LTD

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**Analytical Report Number:** 23-46581

**Issue:** 1

**Date of Issue:** 10/02/2023

**Contact:** Simon Lyle

**Customer Details:** Constructive Evaluation  
Unit 15 & 16  
Ford Lane Business Park  
Arundel  
West Sussex BN18 0UZ

**Quotation No:** Q22-03418

**Order No:** 22.1150

**Customer Reference:** 22.1150

**Date Received:** 06/02/2023

**Date Approved:** 10/02/2023

**Details:** The George Hotel, Huddersfield

**Approved by:**

Mike Varley, General Manager

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Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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## Sample Summary

Report No.: 23-46581, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
311067	BH3 0.60 - 1.00	02/11/2022	06/02/2023	Silty loam	fg
311068	TP3 0.30 - 1.00	02/11/2022	06/02/2023	Sandy silty loam	fg
311069	TP5 0.35 - 1.20	02/11/2022	06/02/2023	Sandy silty loam	fg
311070	TP12 0.40 - 1.20	02/11/2022	06/02/2023	Sandy silty loam	fg
311071	BH7 4.20 - 5.30	02/11/2022	06/02/2023	Silty clayey loam	fg



2683



## Results Summary

Report No.: 23-46581, issue number 1

ELAB Reference	311067	311068	311069	311070	311071
Customer Reference					
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	BH3	TP3	TP5	TP12	BH7
Sample Depth (m)	0.60 - 1.00	0.30 - 1.00	0.35 - 1.20	0.40 - 1.20	4.20 - 5.30
Sampling Date	02/11/2022	02/11/2022	02/11/2022	02/11/2022	02/11/2022

Determinand	Codes	Units	LOD					
<b>Soil sample preparation parameters</b>								
Moisture Content	N	%	0.1	14.2	13.2	13.7	11.3	20.3
Material removed	N	%	0.1	9.8	5.5	12.7	14.2	10.2
Description of Inert material removed	N		0	Stones	Stones	Stones	Stones	Stones
<b>Anions</b>								
Water Soluble Sulphate	M	mg/l	20	fg 69	fg 101	fg 78	fg 75	fg < 20
<b>Miscellaneous</b>								
pH	M	pH units	0.1	fg 6.0	fg 6.6	fg 5.9	fg 6.7	fg 6.1



## Method Summary

Report No.: 23-46581, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
<b>Soil</b>					
pH	M	Air dried sample	09/02/2023	113	Electromeric
Water soluble anions	M	Air dried sample	07/02/2023	172	Ion Chromatography



## Report Information

Report No.: 23-46581, issue number 1

### Key

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U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.  
 Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.  
 ELAB are unable to provide an interpretation or opinion on the content of this report. The results relate only to the sample received.  
 PCB congener results may include any coeluting PCBs  
 Uncertainty of measurement for the determinands tested are available upon request  
 Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

### Deviation Codes

- 
- a No date of sampling supplied
  - b No time of sampling supplied (Waters Only)
  - c Sample not received in appropriate containers
  - d Sample not received in cooled condition
  - e The container has been incorrectly filled
  - f Sample age exceeds stability time (sampling to receipt)
  - g Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

### Sample Retention and Disposal

---

All soil samples will be retained for a period of one month  
 All water samples will be retained for 7 days following the date of the test report  
 Charges may apply to extended sample storage

### TPH Classification - HWOL Acronym System

- 
- HS Headspace analysis
  - EH Extractable Hydrocarbons - i.e. everything extracted by the solvent
  - CU Clean-up - e.g. by florisil, silica gel
  - 1D GC - Single coil gas chromatography
  - Total Aliphatics & Aromatics
  - AL Aliphatics only
  - AR Aromatics only
  - 2D GC-GC - Double coil gas chromatography
  - #1 EH\_Total but with humics mathematically subtracted
  - #2 EH\_Total but with fatty acids mathematically subtracted
  - \_ Operator - underscore to separate acronyms (exception for +)
  - + Operator to indicate cumulative e.g. EH+HS\_Total or EH\_CU+HS\_Total
  - MS Mass Spectrometry

## Method Summary

Report No.: 22-44562, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
<b>Soil</b>					
Hexavalent chromium	N	As submitted sample	11/11/2022	110	Colorimetry
Phenols in solids	M	As submitted sample	11/11/2022	121	HPLC
PAH (GC-FID)	M	As submitted sample	11/11/2022	133	GC-FID
Water soluble anions	M	Air dried sample	11/11/2022	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	14/11/2022	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	14/11/2022	181	GC-MS
Total cyanide	M	As submitted sample	11/11/2022	204	Colorimetry
TPH CWG soil by gc-gc	M	As submitted sample	11/11/2022	271	
Asbestos identification	U	Air dried sample	15/11/2022	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	11/11/2022	300	ICPMS
Soil organic matter	U	Air dried sample	11/11/2022	BS1377:P3	Titrimetry
<b>Leachate</b>					
Arsenic	N		15/11/2022	301	ICPMS
Cadmium	N		15/11/2022	301	ICPMS
Chromium	N		15/11/2022	301	ICPMS
Lead	N		15/11/2022	301	ICPMS
Nickel	N		15/11/2022	301	ICPMS
Copper	N		15/11/2022	301	ICPMS
Zinc	N		15/11/2022	301	ICPMS
Mercury	N		15/11/2022	301	ICPMS
Selenium	N		15/11/2022	301	ICPMS
Antimony	N		15/11/2022	301	ICPMS
Barium	N		15/11/2022	301	ICPMS
Molybdenum	N		15/11/2022	301	ICPMS
pH Value	N		15/11/2022	113	Electrometric
Electrical Conductivity	N		15/11/2022	136	Probe
Dissolved Organic Carbon	N		15/11/2022	102	TOC analyser
Chloride	N		15/11/2022	131	Ion Chromatography
Fluoride	N		15/11/2022	131	Ion Chromatography
Sulphate	N		15/11/2022	131	Ion Chromatography
Total Dissolved Solids	N		15/11/2022	144	Gravimetric
Phenol index	N		15/11/2022	121	HPLC
<b>WAC Solids analysis</b>	N				
pH	M	Air dried sample	11/11/2022	113	Electrometric
Total Organic Carbon	N	Air dried sample	14/11/2022	210	IR
Loss on Ignition	M	Air dried sample	11/11/2022	129	Gravimetric
Acid Neutralisation Capacity	N	Air dried sample	11/11/2022	NEN 737	Electrometric
Total BTEX	M	As submitted sample	14/11/2022	181	GCMS
Mineral Oil (EH_CU_1D_Total)	N	As submitted sample	11/11/2022	117	GCFID
Total PCBs (7 congeners)	M	Air dried sample	11/11/2022	120	GCMS
Total (of 17) PAHs	N	As submitted sample	14/11/2022	133	GCFID

Tests marked N are not UKAS accredited

## Report Information

Report No.: 22-44562, issue number 1

### Key

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---

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Where a sample has a deviation code, the applicable test result may be invalid.

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---

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### TPH Classification - HWOL Acronym System

---

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
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AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

# APPENDIX F

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## Report Terms and Conditions

### Trading Terms

Unless specifically stated within the tender/quotation or unless identified within the introduction to this report it is confirmed that this report has been compiled wholly in accord with Constructive Evaluation Limited's terms of engagement. This report is provided for sole use by the Client and is confidential to them. No responsibility whatsoever for the contents of the report will be accepted to anyone other than the Client.

### Copyright

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### Context

This report is written in the context of an agreed scope of work between Constructive Evaluation Limited and the Client and should not be used in a different context. In light of additional information becoming available, improved practices and changes in legislation amendment or re-interpretation of the report in whole or part may be necessary after its original submission.

### Professional Interpretation

The recommendations made and opinions expressed in the report are based on the conditions revealed by the site works together with an assessment of the data from the insitu and laboratory testing or in respect of the desktop reports. No responsibility can be accepted for conditions that have not been revealed by the research, site works and testing.

The Client is advised that the conditions observed on site by Constructive Evaluation Limited at the time of any site survey may be subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance and they may subsequently have become evident. It is not possible to assess areas which are inaccessible or where access is not granted and CE accept no liability for risks subsequently identified therein.

The conceptual model, Risk assessment and sampling regime has been formulated in accordance with current UK guidance at time of production based upon the relevant information gained from Phase 1 and Phase 2 investigations. While the model and assessment offer opinions and interpretations of these guidelines, the comments made are for guidance only and no liability can be accepted for their accuracy. It is possible that aspects of desktop study may need to be altered to conform to the requirements of the statutory regulatory bodies.

### Intrusive Field Operations

The data collected through direct operations in the production of this report has been so obtained, unless directly otherwise stated, in accordance with current UK guidance, law or accepted industry practice, including but not limited to: BS.5930: 1990 Code of Practice for Site Investigations (Amendment 2: 2010), BS 10175:2011+A1:2013 Investigations into Potentially Contaminated Sites, and BS.8576:2013 Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds. Exact exploratory locations will depend upon access conditions, site use and plant capability, CE do not accept liability for issues arising from material identified between or outside of the area of exploratory locations.

### Laboratory Testing

Unless stated otherwise within the text, all geotechnical and material laboratory tests have been performed in accordance with the relevant British Standard Documents. Laboratory testing for contaminated land assessment is completed under the UKAS / MCERTS accreditation schemes, unless identified as otherwise in the report.

### Human Health Risk Assessment Criteria

The Environment Agency has recently undertaken revision of the Soil Guideline Values (SGVs) which are partially complete. Where standards are available using the "new" approach, these have been utilised for correlative purposes. Where standards have not yet been revised, guidance following the "old" approach has been utilised. Please note that upon release of the remaining guidelines, the standards contained within this report may be subject to change. In addition, the second edition of the LQM CIEH guidance has now been released and will be utilised in favour of previously published guideline values.

### Third Parties

The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from previous Site investigations and chemical testing laboratories. Constructive Evaluation Limited has assumed that such information is correct. Constructive Evaluation Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon and can accept no responsibility for inaccuracies with the data supplied by other parties.

The accuracy of the historical map extracts supplied cannot be guaranteed and it should be noted that different conditions may have existed between mapping sheet editions. Therefore, there can be no certainty that all areas of contamination have been identified during the Phase 1 investigation.

### Definitions

Reference to the word "contamination" in this report does not relate to the statutory definition of contaminated land under 1990 Environmental Protection Act unless otherwise stated. The definition used in this report is: "Land that contains substances that, when present in sufficient quantities or concentrations, are likely to cause harm, directly or indirectly, to man, to the environment, or on occasion to other targets" (NATO CCMS, 1985).  
CE Ltd 2014