

Phase 2: Site Investigation

George Hotel, Huddersfield

GMI Construction Group PLC

S250101

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PHASE 2 SITE INVESTIGATION REPORT

GEORGE HOTEL, HUDDERSFIELD

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1 EXECUTIVE SUMMARY

Site Address	George Hotel, St Georges Square, Huddersfield, HD1 1JA
Proposed Development	The proposed plan for the site is the redevelopment of the existing hotel and the deepening of the existing basement floor.
Fieldwork	• 3no rotary boreholes (BH01 to BH03) to a maximum depth of 41.20mbgl.
Ground Conditions	• Made ground varied within the boreholes with tarmac surfacing over concrete to 0.70mbgl in BH's 01 and 02 and brick pavers over concrete to 0.35mbgl in BH03. Under the concrete gravelly sand was proven to depths between 0.90mbgl and 1.50mbgl. Under the sand in BH's 01 and 02 very sandy gravelly clay was proven to 1.50mbgl. • Natural ground generally comprised soft to firm sandy slightly gravelly clay of low to intermediate plasticity to depths between 2.70mbgl and 3.30mbgl. • Rockhead, generally comprising mudstone, was encountered within all three boreholes at depths between 2.70mbgl (BH03) and 3.30mbgl (BH01). Moderately strong to strong siltstone was encountered from 28.85mbgl to 30.70mbgl in BH01 and from 34.20mbgl to 35.90mbgl in BH02. • At 12.20mbgl to 12.70mbgl within BH02, intact coal was encountered. No recovery was recorded within BH03 between 12.70 and 16.20mbgl. • Groundwater was not encountered during this investigation.
Contamination Analysis	• Given the site's proposed residential land use, the levels of contamination recorded on site will not pose a risk to the current and future users of the site. • If any zones of odorous, brightly coloured or suspected contaminated ground or groundwater are encountered then work should cease in that area until the material has been investigated. The results of the investigation will therefore determine whether or not remediation will be required. • Made ground classed as posing a low risk with respect to construction workers. PPE for workers. Damping down of site during dry windy conditions. • Controlled waters unlikely to be at risk. • With respect to utilities pH was elevated; as a minimum all services should be laid in clean trenches. • Sub surface concrete should be designed to DS-1 ACEC (Class AC-1s). This assumes static groundwater conditions. • No Phase 3 Remediation is considered necessary over the details contained within this report.
Geotechnical Analysis & Foundation Recommendations	• **Foundation recommendations are given assuming grouting works have been carried out under the site.** • Bearing capacity of 110kN/m^2 at minimum depth of 1.50mbgl on 0.60m wide strips founded on clay. • Local deepening of foundations due to depth of made ground. • Settlements within 25mm. • Normal earthworks plant for excavations.

2 INTRODUCTION

2.1 Authorisation

The site investigation described in this report was carried out by Solmek to the instructions of GMI Construction Group PLC, on land located at George Hotel, St Georges Square, Huddersfield, HD1 1JA (Figure 1).

Sources of information, including previous work undertaken at the site, are detailed below:

- *Solmek Revised Coal Mining Risk Assessment (S250101) May 2025.*
- *Network Rail, Stage 2 Mining Report, June 2025.*
- *GDP Scope of Additional Ground Investigation (Rotary Boreholes), GDP 2371-R01-Issue 1*

Reference should be made to the above reports for details of the site's history, environmental setting and the ground conditions encountered.

2.2 Scope of Works

The proposed plan for the site is the redevelopment of the existing hotel and the deepening of the existing basement floor.

The following steps may be required in the investigation and remediation of potentially contaminated land:

Phase 1: Desk Study
Phase 2: Intrusive Investigation
Phase 3: Remediation Statement
Phase 4: Validation Reports

Phases 1 and 2 are generally required in the redevelopment of most sites. Phases 3 and 4 are subject to the findings of the initial stages.

A geotechnical and environmental (Phase 2) investigation including a ground gas risk assessment was requested. The fieldwork and testing was generally carried out according to;

- BS 5930:2015+A1:2020 Code of Practice for Ground Investigations
- BS 10175:2011+A1:2013 Investigation of Potentially Contaminated Sites – Code of Practice.
- CIRIA C665:2007 Assessing Risks Posed by Hazardous Ground Gas to Buildings
- BS 8485:2015+A1:2019 Code of Practice for the Characterization and Remediation from Ground Gas in Affected Developments
- Rock and soil descriptions shall be in accordance with BS EN ISO 14689-1:2003, BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004
- CIRIA C758D Abandoned Mine Workings Manual

This report forms part of a Stage 1 Risk Assessment (Generic Quantitative Risk Assessment) with respect to the Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*.

The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

3 SITE DESCRIPTION

The centre of the site is located at OS Grid Ref 414418, 416943. The site is located to the east of Huddersfield Train Station, St George's Square, Huddersfield HD1 1JB.

The site consists of a large 4 storey hotel and associated carpark and incorporates a basement area around the front of the building. The hotel is located in St Georges Square and is currently pedestrianised. Huddersfield Train Station is noted >100m to the west of the site. Several services are noted around the perimeter of the site including street lighting, drains and other underground services.

4 FIELDWORK

The fieldwork was carried out commencing 22nd July 2025. The extent of the investigation was:

- 3no rotary cored boreholes (BH01 to BH03 inclusive to a maximum depth of 41.20mbgl.
  - The boreholes were drilled to investigate the presence of shallow historic mine workings.
  - The boreholes were drilled to retrieve rock-core to provide geological information for pile design.
- A gas monitoring well was installed in BH03.
- Retrieval of samples for geotechnical and chemical testing.

The boreholes were respectively backfilled with clean arisings and bentonite/installations upon completion.

Descriptions of the strata encountered in the boreholes together with details of sampling and groundwater are presented in Appendix B of this report. A plan showing the location of the boreholes can be found in Appendix A (Figure 2).

5 GROUND CONDITIONS

A summary of the ground conditions encountered is given below. The exploratory hole logs are presented in Appendix B.

5.1 Made Ground

Made ground varied within the boreholes with tarmac surfacing over concrete to 0.70mbgl in BH's 01 and 02 and brick pavers over concrete to 0.35mbgl in BH03. Under the concrete gravelly sand was proven to depths between 0.90mbgl and 1.50mbgl. The gravel component comprised mudstone, sandstone, concrete and brick. Under the sand in BH's 01 and 02 very sandy gravelly clay was proven to 1.50mbgl. The gravel here comprised mudstone, sandstone, concrete and brick.

5.2 Natural Deposits

Proven to underlie the made ground deposits across the site, natural ground generally comprised soft to firm sandy slightly gravelly clay of low to intermediate plasticity to depths between 2.70mbgl (BH03) and 3.30mbgl (BH01). The gravel component comprised sandstone, mudstone, quartz and shale.

5.3 Solid Geology

Rockhead, generally comprising mudstone, was encountered within all three boreholes at depths between 2.70mbgl (BH03) and 3.30mbgl (BH01).

Within the three rotary boreholes which were drilled to a maximum depth of 41.20mbgl bedrock was proven to generally comprise completely weathered mudstone, initially recovered as firm or stiff slightly sandy, slightly gravelly clay to depths between 5.00mbgl and 6.70mbgl. Extremely weak to very weak thinly laminated highly weathered mudstone was then encountered to depths between 12.20mbgl (BH02) and 13.00mbgl (BH01). In BH03 at 12.70mbgl no recovery was recorded to 16.20mbgl.

At 12.20mbgl to 12.70mbgl within BH02, intact coal was encountered.

Within BH01 weak mudstone with laminations of siltstone was logged from 13.00mbgl to 16.00mbgl. In BH02 weak siltstone was recorded from 12.70mbgl to 16.90mbgl. No recovery was recorded within BH03 between 12.70 and 16.20mbgl.

Weak mudstone with siltstone laminae was encountered to depths between 28.85mbgl in BH01 and 34.20mbgl (BH02). BH03 was terminated at 34.20mbgl due to jamming of drill.

Moderately strong to strong siltstone was encountered from 28.85mbgl to 30.70mbgl in BH01 and from 34.20mbgl to 35.90mbgl in BH02.

Weak mudstone was logged within the two boreholes below the siltstone to the base of BH01 at 40.00mbgl and to 40.20mbgl in BH02 where drilling progressed in moderately strong to strong siltstone to 41.20mbgl where drilling terminated.

5.4 Groundwater

Groundwater was not encountered during this investigation.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

6 CONTAMINATION TESTING RESULTS

The proposed plan for the site is the redevelopment of the existing hotel and the deepening of the existing basement floor. The chemical samples were generally retrieved in line with BS ISO 18400-105:2017 *Soil Quality. Sampling*. The chemical results are presented in Appendix C.

6.1 Contamination Testing and Rationale

To provide information upon the possibility of ground contamination five samples of made ground were selected for shallow contamination testing. The samples selected are detailed below:

- BH01 – 0.80m (Made ground – granular)
- BH01 – 1.30m (Made ground – cohesive)
- BH02 – 0.80m (Made ground – granular)
- BH03 – 0.80m (Made ground – granular)
- BH03 – 1.30m (Made ground – granular)

The samples selected are considered to provide coverage of the made ground from across the site that would be most likely to be exposed during future site works. The samples were tested for the following contaminant suites:

- 5no Metals, semi-metals, non-metals, inorganic determinants
- 5no Asbestos identification screenings
- 5no Speciated Polyaromatic Hydrocarbons (PAHs)
- 5no Total Petroleum Hydrocarbon Criteria Working Group fractions (TPHCWG)

6.2 Test Results

Based on the proposed development at the site, the test results have been compared to a series of Land Quality Management (LQM) Suitable for Use Levels (S4UL) based on a residential without home grown produce land use. These are the most up to date thresholds published in 2015.

The value for lead has been compared with the Category 4 Screening Level (March 2014) developed by Contaminated Land: Applications In Real Environments (CL:AIRE).

The test results are presented in Appendix C, and a summary is provided below in Tables 1 & 2.

TABLE 1: SUMMARY OF INORGANIC CONTAMINATION TESTING RESULTS

Determinand	Units	Number of Samples above Level of Detection	Minimum Level	Maximum Level	Residential Without HGP Value	Number of Results Exceeding Threshold Value
Metals						
Cadmium	mg/kg	3	<0.1	0.2	85	0
Chromium III	mg/kg	5	25	44	910	0
Copper	mg/kg	5	17	210	7100	0
Lead	mg/kg	5	17	45	310*	0
Inorganic Mercury	mg/kg	0	<0.05	-	56	0
Nickel	mg/kg	5	23	42	180	0
Zinc	mg/kg	5	58	96	40000	0
Semi metals and non metals						
Arsenic	mg/kg	5	3.9	8.3	40	0
Boron	mg/kg	5	0.5	0.7	11000	0
Selenium	mg/kg	0	<0.5	-	430	0
Inorganic chemicals						
Cyanide (total)	mg/kg	0	<0.1	-	73.8**	0
W.S. Sulphate	mg/l	1	<10	21	2000^	0
Other						
pH	pH	-	6.8	8.1	<5.5^	0

** Category 4 Screening Levels, March 2014*
*** CLEA Software Version 1.06 (pH7 and 1%SOM)*
^ EA Threshold Values
HGP Home Grown Produce

6.3 Metals, Semi Metals and Non Metals

None of the samples indicated significant raised levels of contamination above the S4UL threshold values, based on the five samples tested.

6.4 Inorganic Chemicals

Soluble sulphates (potentially aggressive to foundation concrete) were recorded between <10 and 21mg/l. None of the samples were elevated above levels affecting human health, or above the BRE Special Digest 1 500mg/l limit for the sulphate classification of concrete.

The results of the pH testing were between 6.8 and 8.1. These pH levels are consistent with slightly acidic to alkaline conditions.

6.5 Organic Chemicals

The organic thresholds vary depending on the levels of soil organic matter (SOM). A SOM of 1.00% has been used to determine the S4UL thresholds. Table 2, below, summarises the results.

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TABLE 2: SUMMARY OF ORGANIC CONTAMINATION TESTING RESULTS

Determinand	Units	Number of Samples above LOD	Minimum Level	Maximum Level	S4UL 1% SOM	S4UL 2.5% SOM	S4UL 6% SOM	Number of Results Exceeding Threshold Value
TPH Aliphatic Fractions								
C5-6	mg/kg	0	<0.01	-	42	78	160	0
C6-8	mg/kg	0	<0.01	-	100	230	530	0
C8-10	mg/kg	0	<0.01	-	27	65	150	0
C10-12	mg/kg	0	<1.5	-	130	330	770	0
C12-16	mg/kg	0	<1.2	-	1100	2400	4400	0
C16-35	mg/kg	0	<3.4	-	65000	92000	110000	0
TPH Aromatic Fractions								
C5-7 (Benzene)	mg/kg	0	<0.01	-	370	690	1400	0
C7-8 (Toluene)	mg/kg	0	<0.01	-	860	1800	3900	0
C8-10	mg/kg	0	<0.01	-	47	110	270	0
C10-12	mg/kg	0	<0.9	-	250	590	1200	0
C12-16	mg/kg	0	<0.5	-	1800	2300	2500	0
C16-21	mg/kg	0	<0.6	-	1900	1900	1900	0
C21-35	mg/kg	0	<1.4	-	1900	1900	1900	0
Speciated PAH								
Naphthalene	mg/kg	0	<0.01	-	2.3	5.6	13	0
Acenaphthylene	mg/kg	0	<0.01	-	2900	4600	6000	0
Acenaphthene	mg/kg	0	<0.01	-	3000	4700	6000	0
Fluorene	mg/kg	0	<0.01	-	2800	3800	4500	0
Phenanthrene	mg/kg	0	<0.01	-	1300	1500	1500	0
Anthracene	mg/kg	1	<0.01	0.14	31000	35000	37000	0
Fluoranthene	mg/kg	1	<0.01	0.24	1500	1600	1600	0
Pyrene	mg/kg	1	<0.01	0.30	3700	3800	3800	0
Benz' (a)anth' ene	mg/kg	0	<0.01	-	11	14	15	0
Chrysene	mg/kg	0	<0.01	-	30	31	32	0
Benz' (b)fluor' ene	mg/kg	0	<0.01	-	3.9	4.0	4.0	0
Benz' (k)fluor' ene	mg/kg	0	<0.01	-	110	110	110	0
Benz' (a)pyrene	mg/kg	0	<0.01	-	3.2	3.2	3.2	0
Benz (ghi)per' ene	mg/kg	0	<0.01	-	360	360	360	0
Diben(ah)anth'ene	mg/kg	0	<0.01	-	0.31	0.32	0.32	0
Id' (123cd)pyrene	mg/kg	0	<0.01	-	45	46	46	0
Total PAH	mg/kg	0	<1.6	-	50*	50*	50*	0
Phenol	mg/kg	0	<0.3	-	750	1300	2300	0
* *EA Threshold Values0*								

From the five samples tested for organic determinants, no exceedances were recorded.

6.6 Asbestos

From the five samples subject to asbestos screening, no asbestos fibres were recorded.

6.7 Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to "identify and remove unacceptable risks to human health and the environment" and to "seek to ensure that contaminated land is made suitable for its current use". Part 2A uses a risk based approach to defining contaminated land whereby the "risk" is interpreted as "the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land" and by "the scale and seriousness of such harm or pollution if it did occur".

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."*

To determine if land is contaminated the local authority use various categories from 1 to 4. Categories 1 and 2 include “land which is capable of being determined as contaminated land on grounds of significant possibility of significant harm to human health.” Categories 3 and 4 “encompass land which is not capable of being determined on such grounds”.

See Appendix E for additional notes on contamination guidelines.

7 CONTAMINATION ANALYSIS

7.1 Users of the Site Once Development is Complete

The users of the site, particularly construction workers, are likely to be exposed to contaminants present in the soils beneath the site during redevelopment work. **Potential** exposure pathways include dermal absorption after contact with contaminated ground, inhalation of soil or dust, inhalation of volatised compounds, and inadvertent soil ingestion.

To establish if the levels of contaminants present on site may pose a risk to the health of the future users of the site the results of the contamination testing have been compared to a series of LQM S4UL thresholds based on a residential without home grown produce land use. (see Tables 1 and 2).

The levels of contaminants across the site are generally low with no exceedances.

Based on the **shallow** soil contamination testing, it is considered that the levels of contamination should not pose a risk to future users of the site, as soft landscaping is not proposed in the final development. Any pollutant linkage would be severed as any contaminated areas are covered either by buildings, hardstanding, or a clean cover system.

7.2 Construction Workers and Users of Surrounding Sites

Short term human exposure to contaminants present in soils can occur via several pathways during the construction and ground works phase of the development. These include dermal absorption after contact with contaminated ground, inhalation of soil or dust (including windblown dust), inhalation of volatised compounds, inadvertent soil ingestion and contact with contaminated groundwater.

The risk of short-term acute exposure (e.g. to construction workers) falls under the *Health and Safety at Work Act: 1974* and underlying regulations, such as the *Control of Substances Hazardous to Health (COSHH, 2002)* Regulations. The levels of contamination and the associated risks to site workers should be considered under the *Construction Design and Management (CDM, 2015)* regulations during the planning of works and the preparation of the designers and contractors Health and Safety Plans and Method Statements.

As good practice, full PPE must be employed in accordance with Health and Safety Executive*: Protection of Workers and the General Public During the Development of Contaminated Land* and safeguards should be taken to limit dust during ground works, and access to the public should be restricted. Construction workers should use gloves as a precaution when handling any fill materials. Provision of suitable hygiene facilities are needed for site workers. Wheel washers should be provided and used for any vehicle entering or leaving site to prevent cross contamination.

Although asbestos or other forms of contamination were not detected from the soil samples subjected to testing within this investigation, the possibility still exists that asbestos containing materials may still be present on site and currently lie undetected. It is therefore advised that a ‘watching brief’ is undertaken during the initial site strip and any excavation works and advice sought if asbestos is found or suspected.

During dry weather, any excavations may require clean water to be sprinkled at shallow depth to prevent excess dust escaping to off-site receptors. Monitoring of dust concentrations during construction should be given careful consideration to ensure occupational exposure levels are not exceeded. Works should be undertaken in line with BRE: *The Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance*.

7.3 Vegetation

Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, nickel, and zinc.

To establish if the levels of contaminants present on site may pose a risk to vegetation the results of the contamination testing have been compared to a series of threshold values published in *Code of Good Agricultural Practice for the Protection of Soil*. No concentrations of the phytotoxic determinants are shown as elevated from the five samples tested.

7.4 Ground and Surface Water

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology.

7.4.1 *Hydrogeological Context*

From the site investigation undertaken, ground conditions broadly comprise made ground (ca. 1.50m) over drift deposits comprising sandy gravelly silty clays (low permeability) encountered to depths between 2.70 and 3.30mbgl, overlying mudstone.

7.4.2 *Contamination Context*

No contamination was recorded based on the five soil samples tested.

7.4.3 *Hydrogeological Risk Assessment*

Due to the generally low contamination found across the site, the development is considered to represent a low risk to groundwater or surface water receptors.

7.5 Construction Materials

Materials at risk from potential soil contamination include inorganic matrices such as cement and concrete and also organic material; e.g. plastics and rubbers. Acid ground conditions and elevated levels of sulphates can accelerate the corrosion of building materials. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum-based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

7.5.1 *Concrete Classification*

BRE Special Digest One: *Concrete in Aggressive Ground*: 2005 3rd Edition has been used to assess the risks posed to underground concrete and to establish the design measures required to mitigate the risks. The results of the pH and water-soluble sulphate tests (when converted to total potential sulphate) fall into Class DS-1 ACEC (Class AC-1s) requirements for concrete protection. This assumes static groundwater conditions.

7.5.2 *Water Supply Pipes Material Selection*

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication *Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites* (January 2011). A Brownfield Site is defined in the document as “Land or premises that have previously been used or developed that may be vacant or derelict”. It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer.

Based on the samples tested during the site investigation, levels of slightly acidic to alkaline pH (6.8 to 8.1) were recorded across the site at depths of between 0.80mbgl and 1.30mbgl within the made ground samples.

The concentrations of the selected determinants should be compared to the pipe material selection table in Appendix E, and consultation with the appropriate utility supply company is required to identify the most suitable service fabric. However, the pH levels may preclude the use of copper pipes depending on the depth of proposed service corridors.

7.6 Unexpected Contamination

If during the initial site strip or subsequent ongoing construction activities, any zones of odorous, brightly coloured or suspected contaminated ground, or suspected Asbestos Containing Materials (ACMs) are encountered, then the following procedure should be followed:

- Stop work in the affected area
- Contact Solmek and provide pictures of the affected area
- Solmek can visit site to investigate the material and provide guidance
- If required – Solmek can sample and test the material
- Once test results are returned, this will determine whether or not remediation will be required

7.7 Waste Classification

During the site strip and construction activities, material may be required to be removed from site. Any such material would require classification, in line with Environment Agency Technical Guidance *Waste Classification: Guidance on the classification and assessment of waste* (2015). This would classify the material as either Non-Hazardous or Hazardous Waste.

Once the material has been classified, determining the suitable landfill for disposal is governed by landfill directive Waste Acceptance Criteria (WAC) testing, with landfills categorized as Inert Waste, Stable Non-Reactive Hazardous Waste and Hazardous Waste.

If waste classification and/or WAC testing are not undertaken, material taken off site may be subject to WAC testing by the appropriate waste disposal company. The decision on whether or not to accept waste, or whether further testing is required, is at the discretion of the waste disposal company.

For this project, Waste Classification has not been requested by the client. Waste classification, in line with the aforementioned EA guidance, would be needed to classify the material as Hazardous or Non-Hazardous Waste. WAC testing would then be required to determine the suitability of the material for the relevant landfill.

7.8 Phase 3 Remediation Statement

Given the low levels of contamination proven as part of this investigation a Phase 3 Remediation Statement is not considered necessary over and above the recommendations already contained within this report.

8 MINING ASSESSMENT

8.1 Mining Assessment – Shallow Workings

For this site, the CMRA indicated the site was underlain by possible ancient shallow unrecorded mine workings, which would pose a risk to future development.

The ten times seam thickness rule states that where competent rock exceeds ten times the extracted seam thickness, then no major crown holing should occur at the surface (Structural Foundations Manual; M. F. Atkinson, *Spon Press* 2003). If the competent rock cover is less than ten times the extracted seam thickness, then recommendations suggest the workings must be grouted using a mixture of pulverised fuel ash (PFA) and cement placed into the area under pressure.

Multiple situations may mean a ratio in excess of 10x seam thickness is required to prevent crown hole collapse, including but not exclusive to; steeply dipping strata, presence of groundwater, a high extraction ratio noted, and multiple seam extractions underlying the site (CIRIA C758D, Table 5.1). Additionally, weak basement rock underlying the workings has potential to cause a separate collapse mechanism via pillars sinking.

Conversely, there are scenarios where the acceptable cover criterion may be decreased from 10x seam thickness, these include where a rigid non-degradable roof strata is present to stop the upward void migration and where low residual voidage is proven either via infilling or extensive collapse (CIRIA C758D, Table 5.1).

For certain developments, a ratio of less than 10x may be addressed via bridging techniques i.e. utilising raft foundations, however this would be dependent on approval from the regulatory authorities.

Table 3 below shows a summary of the ground conditions encountered within the rotary boreholes drilled to date highlighting possible mining related information.

TABLE 3: SOLID GEOLOGY SUMMARY

Borehole Reference	Depth of coal/possible workings (mbgl)	Thickness of coal/void (m)	Flush Returns (%)	Overlying Solid Geology Thickness (m)	Remarks
BH01	none	-	100	-	-
BH02	12.20-12.70	0.50	100	7.20	Intact Coal
BH03	12.70	No recovery	0	Approx. 7.70	Loss of flush – Inferred workings

From the BGS 1:10,000 Geological map the Soft Bed coal seam is shown to outcrop 210m to the north of the site with a section thickness of 0.60m. When compared to the BGS Borehole SE11NW22, a coal seam with a section thickness of 0.60m is also noted at a depth of 12.50m which is likely to be the Soft Bed coal seam. Previous site investigations, provided by the client, also noted a coal seam as shallow as 13.80mbgl (0.40m thick) at the west end of the current building therefore, the Soft Bed coal seam is expected at a depth of 15mbgl.

As only one coal seam has been encountered, this is likely to be the Soft Bed Seam.

The three rotary boreholes drilled to scheduled 40.00mbgl depth recorded possible workings at a depth of 12.70mbgl in BH03. Due to no recovery, a seam thickness could not be logged. **Due to the loss of flush in BH03 at 12.70mbgl and lack of recovery, it is suggested that workings may be present here**. When assessing the cover ratio, a minimum worked thickness of 1.00m has been adopted for seams <1.00m thickness (CIRIA C758D).

In this case, mine working thickness of 1.00m, with respective overlying solid geology thicknesses of 7.70m has been applied. This gives a cover ratio of 7.70, therefore treatment via grouting is required prior to development.

Information within this report should be made available to an experienced grouting contractor who can advise on expected costs, timescales and methods involved in the works. It should be noted that further areas of voided or collapsed workings may be present in areas of the site not investigated. Grouting works must take place in accordance with CIRIA guidance C758D “Abandoned Mine Workings Manual”.

The current mining assessment is based on three rotary boreholes. In order to determine a more accurate cost for grouting the site, as well as to accurately delineate the boundaries of the area necessitating grouting, it is **recommended to undertake further proof drilling holes to ca. 20.00mbgl** in a closer grid pattern in beneath the footprints of any proposed buildings.

The drilling should consist primarily of rotary open-hole probing to investigate the presence of voids/broken rock, however it is also recommended to undertake a series of supplementary cored boreholes to provide greater detail regarding the composition and competence of the bedrock, notably the ceiling and basement rock above and below workings.

9 GROUND GAS ASSESSMENT

The proposed plan for the site is the redevelopment of the existing hotel and the deepening of the existing basement floor.

Ground gases such as carbon dioxide (CO_2), methane (CH_4), carbon monoxide (CO) and volatile organic compounds (VOCs) can be classed as a form of contamination where there is a potential risk to human health.

For this report, gas monitoring is via measuring emissions from BH03 that were installed during the sitework. The gas monitoring will consist of six visits over a period of three months. The gas monitoring results will be presented as an addendum to this report.

10 GEOTECHNICAL TESTING AND ANALYSIS

Samples taken from the boreholes underwent a series of geotechnical tests at a UKAS accredited laboratory to aid foundation design and soil description. The geotechnical results are presented in Appendix D.

10.1 Moisture Contents

Three samples recovered from the boreholes have been subject to moisture content tests to determine the moisture profile at depths of 1.80mbgl. Moisture levels were between 4% and 9%.

10.2 Atterberg Limit Determinations

Three Atterberg Limit Determination tests were carried out on samples of cohesive material to classify the fine grained soils. The results were compared to the Casagrande Chart published in BS 5930 and showed the samples to generally be clay of low to intermediate plasticity.

The Plasticity Indices ranged from 15 to 21 with moisture contents recorded above/below the corresponding plastic limits. The cohesive material can be assessed as having a **medium** shrinkage potential in relation to NHBC Guidance Chapter 4.2.

10.1 Rock Uniaxial Compressive Strength (UCS) Tests

A series of 7no rock core samples taken were subjected to UCS testing, ranging in depth from 5.20mbgl to 17.20mbgl and comprised Mudstone.

Four of the samples exhibited ‘axial cleavage’ failure mode and three exhibited fragmented failure mode. UCS results were between 0.90 and 59.4MPa (equivalent to 900kPa to 59400kPa).

10.2 Point Load Testing

50no samples of rock core from BH01-BH03 were sent for Point Load Testing (both axial and diametral) to provide an indication of the strength of the rock. The corrected results ranged between 0.01 and 6.48 $Is_{(50)}$MPa, which can approximately be converted to UCS values of 0.24 to 155MPa.

10.3 Foundations

The following foundation recommendations are given assuming grouting works have been carried out under the site.

10.3.1 *Conventional Foundations upon Cohesive Deposits*

Based on plasticity index results, all cohesive soils at the site should be regarded as being of medium volume change potential. Foundations should therefore be placed at a minimum depth of 0.90m below original or finished ground level, whichever is the lower. However made ground is up to 1.50mbgl so foundations will require deepening accordingly.

Based on a conservative undrained shear strength of 45kN/m² a safe bearing capacity of 110kN/m² has been determined for strip foundations **0.60m wide founding on the natural low to medium strength clay at depths of around 1.50mbgl. Providing the safe bearing capacity is not exceeded settlements have been calculated to be less than 25mm.

Locally, foundations will require deepening due to made ground depths. All deepened sections should be adequately stepped, in accordance with NHBC Standards Chapter 4.4.

It should be recognised that clay rich soils can deteriorate fairly rapidly on exposure, particularly in periods of wet weather and frost. It would be prudent to protect all exposed soils in foundation excavations with a concrete blinding layer, particularly if they are likely to remain open for extended period of time.

Prior to placing foundation concrete, obvious soft or loose spots should be removed and replaced with suitably recompacted hardcore or lean mix concrete. In addition, all excavations should be inspected to ensure that they fully penetrate areas of disturbed ground.

Further advice should be sought from Solmek if unexpected ground conditions are encountered during redevelopment.

10.3.2 *General Foundation Comments*

It is recommended that an adequate drainage system for surface water be installed by a competent contractor in order to prevent surface water ponding or collecting during and post construction, which may in turn lead to deterioration of the founding stratum.

Prior to placing foundation concrete, obvious soft or loose spots should be removed and replaced with suitably recompacted hardcore or lean mix concrete. In addition, all excavations should be inspected to ensure that they fully penetrate areas of disturbed ground.

Further advice should be sought from Solmek if unexpected ground conditions are encountered during redevelopment.

10.4 Excavation

Based on the nature of the ground conditions encountered, excavations should be within the capacity of normal earthworks plant although breaking out of relict foundations and other obstructions should be anticipated. Stability of excavations will be poor in the made ground but should improve in the natural clay. Excavation sides should be designed, constructed and supported in accordance with the recommendations given in CIRIA Report No. 97: “Trenching Practice”.

10.5 Groundwater

Groundwater was not encountered during this investigation.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

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APPENDIX A



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Figure Title

Site Location Plan

Project Number

S250101

Project Name

George Hotel, Huddersfield

Client

GMI Construction Group PLC

Date

September 2025

DRG Number

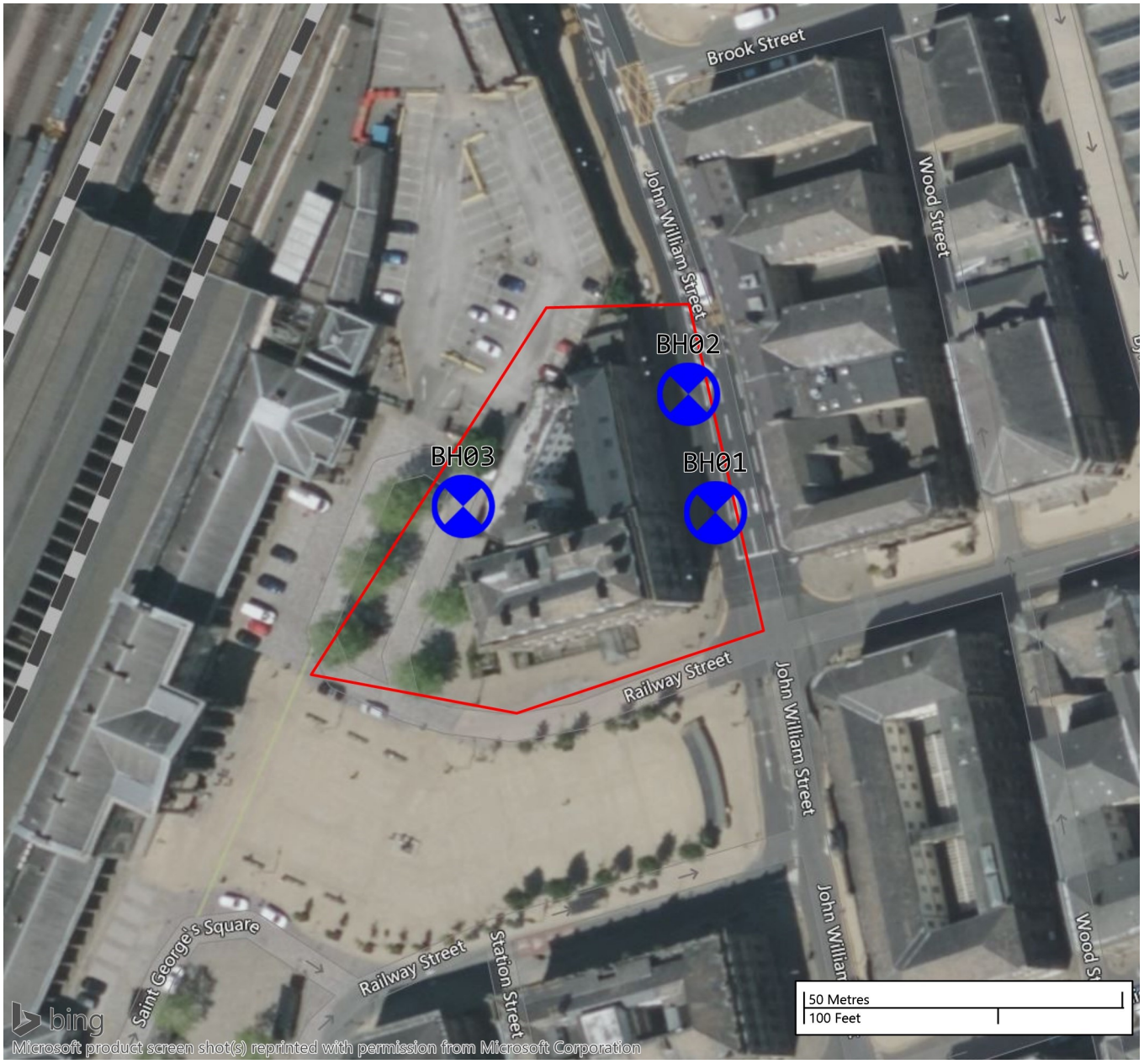
Figure 1

Scale

1:5000 @ A4 [DO NOT SCALE]

Legend Key

Project Bounds - Project Bounds



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Figure Title

Exploratory Hole Location Plan

Project Number

S250101

Project Name

George Hotel, Huddersfield

Client

GMI Construction Group PLC

Date

September 2025

DRG Number

Figure 2

Scale

1:1000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - Empty
- Locations By Type - RC
- Project Bounds - Project Bounds

APPENDIX B

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Rotary Coring Log

Scale 1:50 Sheet 1 of 4

BH01

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	22/07/2025
Client:	GMI Construction Group PLC			**Ended:**	25/07/2025
Method:	Rotary Cored			**Backfilled:**	25/07/2025

GL (AOD):
Easting: 414434.20
Northing: 416935.78
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
		0.03		MADE GROUND: Black tarmac.							
				MADE GROUND: Concrete.							
		0.70									
		0.90		MADE GROUND: Black clayey gravelly sand with rare cobbles of redbrick, concrete. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of mudstone, sandstone, concrete, and brick.							
		1.50		MADE GROUND: Soft black very sandy gravelly clay with rare cobbles of redbrick, concrete. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of mudstone, sandstone, concrete, and brick.							
				Soft to firm brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone, mudstone, quartz and shale.							
		3.30		Completely weathered MUDSTONE, Recovered as Firm Brown slightly sandy slightly Gravelly CLAY. Sand fine to coarse. Gravel is angular to subrounded fine to Coarse of mudstone.							
				Not Rock, Completely Weathered							
		5.50		Extrememly weak to very weak very thinly laminated highly weathered grey MUDSTONE From 10m becomes weathered and very weak to weak.				87	30	7	NI 0 100
								33	0	0	NI 0 0
								95	75	24	NI 40 140

Hole Diameter

Depth Base (m)	Diameter (mm)

Casing Depths

Depth Base (m)	Diameter (mm)

General Remarks

1.2m Hand excavated inspection pit dug.
No groundwater encountered.

Flush Returns

From (m)	To (m)	Flush Type	Flush (%)

Ground Water

Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 2 of 4

BH01

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	22/07/2025
Client:	GMI Construction Group PLC			**Ended:**	25/07/2025
Method:	Rotary Cored			**Backfilled:**	25/07/2025

GL (AOD):
Easting: 414434.20
Northing: 416935.78
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Extrememly weak to very weak very thinly laminated highly weathered grey MUDSTONE From 10m becomes weathered and very weak to weak.				100	65	11	NI 0 160
								87	43	0	NI 0 70
		13.00		Weak very thinly laminated grey MUDSTONE with very thin to thin laminations of grey Siltstone. Disc 1) 0 degrees, very closely to medium spaced, planar to undulating, smooth, partially open to open, clay infilled fractures. From 16m becomes MUDSTONE with very thin laminations to thin beds of light grey SILTSTONE.				87	85	55	NI 110 220
								97	80	30	NI 60 170
								100	94	49	NI 50 250
								93	93	56	NI 80 170
								100	94	65	NI 100 180

Hole Diameter		Casing Depths		General Remarks	Flush Returns				Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.	From (m)	To (m)	Flush Type	Flush (%)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 3 of 4

BH01

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	22/07/2025
Client:	GMI Construction Group PLC			**Ended:**	25/07/2025
Method:	Rotary Cored			**Backfilled:**	25/07/2025

GL (AOD):
Easting: 414434.20
Northing: 416935.78
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Weak very thinly laminated grey MUDSTONE with very thin to thin laminations of grey Siltstone. Disc 1) 0 degrees, very closely to medium spaced, planar to undulating, smooth, partially open to open, clay infilled fractures. From 16m becomes MUDSTONE with very thin laminations to thin beds of light grey SILTSTONE.							
								100	99	71	NI 70 220
								100	98	52	NI 60 330
								100	96	53	NI 90 340
								100	100	40	20 70 180
								100	97	67	NI 110 300
		28.85		Moderatly strong to strong light grey SILTSTONE with very thin to thin laminations of grey Mudstone. Disc 1) 0 degrees, very closely to widely spaced, planar ,smooth, partially open to open fractures.				100	100	91	20 200 530

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 4 of 4

BH01

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	22/07/2025
Client:	GMI Construction Group PLC			**Ended:**	25/07/2025
Method:	Rotary Cored			**Backfilled:**	25/07/2025

GL (AOD):
Easting: 414434.20
Northing: 416935.78
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Moderatly strong to strong light grey SILTSTONE with very thin to thin laminations of grey Mudstone. Disc 1) 0 degrees, very closely to widely spaced, planar ,smooth, partially open to open fractures.				100	95	76	NI 120 840
		30.70		Weak very thinly laminated dark grey MUDSTONE with very thin to thin laminations of grey Siltstone. Disc 1) 0 degrees, very closely to widely spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.				100	97	92	NI 300 370
								100	100	95	60 110 630
								100	91	80	NI 170 510
								100	95	79	NI 220 240
				No recovery - Ground the rock away due to blockage.				100	0	0	NI 0 30
		40.00		End of Borehole at 40.000m				100	0	0	NI 0 20

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns				Ground Water				
From (m)	To (m)	Flush Type	Flush (%)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 1 of 5

BH02

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	28/07/2025
Client:	GMI Construction Group PLC			**Ended:**	01/08/2025
Method:	Rotary Cored			**Backfilled:**	01/08/2025

GL (AOD):
Easting: 414429.88
Northing: 416954.45
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
		0.03		MADE GROUND: Black tarmac. MADE GROUND: Concrete.							
		0.70		MADE GROUND: Black clayey gravelly sand with rare cobbles of redbrick, concrete. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of mudstone, sandstone, concrete, and brick.							
		0.90		MADE GROUND: Soft black very sandy gravelly clay with rare cobbles of redbrick, concrete. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of mudstone, sandstone, concrete, and brick.							
		1.50		Soft to firm brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of sandstone, mudstone, quartz and shale.							
				Not Rock, Completely Weathered							
		3.00		Completely weathered MUDSTONE, Recovered as Firm Brown slightly sandy slightly Gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of mudstone.							
				Not Rock, Completely Weathered							
		5.00		Extremely weak to very weak very thinly laminated highly weathered grey MUDSTONE. From 10m becomes weathered and very weak to weak.				91	48	26	NI 0 160
		6.40		Weak very thinly laminated grey MUDSTONE with very thin to thin laminations of grey Siltstone. Disc 1) 0 degrees, very closely to closely, planar to undulating, smooth, partially open to open, clay infilled fractures. From 9.70m becomes MUDSTONE with very thin laminations of light grey SILTSTONE.				100	47	7	NI 0 110
								91	74	7	NI 0 110

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns				Ground Water				
From (m)	To (m)	Flush Type	Flush (%)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 2 of 5

BH02

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	28/07/2025
Client:	GMI Construction Group PLC			**Ended:**	01/08/2025
Method:	Rotary Cored			**Backfilled:**	01/08/2025

GL (AOD):
Easting: 414429.88
Northing: 416954.45
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Weak very thinly laminated grey MUDSTONE with very thin to thin laminations of grey Siltstone. Disc 1) 0 degrees, very closely to closely, planar to undulating, smooth, partially open to open, clay infilled fractures. From 9.70m becomes MUDSTONE with very thin laminations of light grey SILTSTONE.				87	61	0	NI 0 70
								100	77	0	NI 20 80
		12.20		Extremely weak black COAL. Recovered as angular to subangular, fine to coarse. Gravel and Cobbles of COAL. Intact, no workings							
		12.70		Weak light grey SILTSTONE with very thin to thin laminations of grey mudstone. Disc 1) 0 degrees, very closely to closely, planar ,smooth, partially open to open fractures.				100	95	13	NI 110 200
								47	40	7	NI 50 110
								93	63	0	NI 50 90
		16.90		Weak very thinly laminated grey MUDSTONE with very thin to thin beds of grey sandstone and siltstone. Disc 1) 0 degrees, very closely to medium spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.				96	93	57	NI 90 360
								93	91	51	NI 90 210

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 3 of 5

BH02

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	28/07/2025
Client:	GMI Construction Group PLC			**Ended:**	01/08/2025
Method:	Rotary Cored			**Backfilled:**	01/08/2025

GL (AOD):		
Easting:	414429.88	
Northing:	416954.45	
Logged:	GT	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Weak very thinly laminated grey MUDSTONE with very thin to thin beds of grey sandstone and siltstone. Disc 1) 0 degrees, very closely to medium spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.							
								27	25	7	NI 50 100
								87	82	27	NI 90 240
								100	91	53	NI 90 200
								67	63	27	NI 40 240
								75	72	52	NI 50 240
								92	89	65	NI 110 250
								80	79	56	NI 140 240

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 4 of 5

BH02

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	28/07/2025
Client:	GMI Construction Group PLC			**Ended:**	01/08/2025
Method:	Rotary Cored			**Backfilled:**	01/08/2025

GL (AOD):
Easting: 414429.88
Northing: 416954.45
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Weak very thinly laminated grey MUDSTONE with very thin to thin beds of grey sandstone and siltstone. Disc 1) 0 degrees, very closely to medium spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.							
								95	95	51	NI 40 310
								93	91	75	NI 40 310
		34.20		Moderately strong to strong light grey SILTSTONE with very thin to thin beds of sandstone. Disc 1) 0 degrees, very closely to medium spaced, planar ,smooth, partially open to open fractures.				91	91	81	NI 230 440
		35.90		Weak very thinly laminated grey MUDSTONE with very thin to thin beds of grey sandstone and siltstone. Disc 1) 0 degrees, very closely to widely spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.				100	95	87	NI 200 770
								95	90	69	NI 90 420
								100	99	87	NI 170 560

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns				Ground Water				
From (m)	To (m)	Flush Type	Flush (%)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 5 of 5

BH02

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	28/07/2025
Client:	GMI Construction Group PLC			**Ended:**	01/08/2025
Method:	Rotary Cored			**Backfilled:**	01/08/2025

GL (AOD):
Easting: 414429.88
Northing: 416954.45
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
		40.20		Weak very thinly laminated grey MUDSTONE with very thin to thin beds of grey sandstone and siltstone. Disc 1) 0 degrees, very closely to widely spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.				89	84	41	NI 70 230
		41.20		Moderately strong to strong light grey SILTSTONE with very thin to thin beds of sandstone. Disc 1) 0 degrees, very closely to closely, planar ,smooth, partially open to open fractures.							
				End of Borehole at 41.200m							

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Rotary Coring Log

Scale 1:50 Sheet 1 of 4

BH03

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	04/08/2025
Client:	GMI Construction Group PLC			**Ended:**	07/08/2025
Method:	Rotary Cored			**Backfilled:**	07/08/2025

GL (AOD):
Easting: 414394.34
Northing: 416936.65
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
		0.10		MADE GROUND: Car park surface, Brick Pavier.							
				MADE GROUND: Concrete.							
		0.35		MADE GROUND: Dark brown, clayey, gravelly, sand with rare cobbles of redbrick, concrete. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of mudstone, sandstone, concrete, and brick.							
		1.50		Soft to firm, light brown, sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of mudstone, sandstone and shale.							
				CLAY - Drift deposits							
		2.70		Soft to firm, brown and grey mottled, slightly sandy, slightly gravelly, CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of sandstone and mudstone.							
				NO Recovery							
		5.80		Soft, light brown to yellow, sandy , slightly gravelly, CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of sandstone and mudstone							
		6.00						100			
		6.20		soft, light brown to yellow, sandy , turning gravelly at 6m, CLAY. Sand is fine to coarse. Gravel i ssubangular to rounded, fine to coarse of sandstone and mudstone	6.20	HV	85kPa				
		6.70		Stiff to very stiff, dark brown, slightly gravelly, slightly sandy, CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of sandstone and mudstone:				37			
				Extrememly weak to very weak, highly weathered, very thinly laminated, grey MUDSTONE. From 9.4m becoming very weak/weak; with with rounded planar fragments. From 10m becomes weathered and very weak to weak.				37			

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
				1.2m Hand excavated inspection pit dug. No groundwater encountered. Borehole termination: From 31.20m very little (19cm) to no recovery. Due to closely spaced natural rock fractures, sections of core <100mm, dislodging and jamming drilling bit, causing wearing of material to mud. 5 hrs of drilling to cover 3m of depth with no recovery. Drilling slowed by loss of water supply, with constant water top up from hose. Unable to maintain drilling water levels as suspected to be lost in natural closely spaced rock fractures. Drilling Polamar added with no effect. Geoboring so unable to switch to short 1m runs. Driller did not have enough rods to conduct SPT at 34m.

Flush Returns				Ground Water				
From (m)	To (m)	Flush Type	Flush (%)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

SOLMEK
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 607083
info@solmek.com

Rotary Coring Log

Scale 1:50 Sheet 2 of 4

BH03

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	04/08/2025
Client:	GMI Construction Group PLC			**Ended:**	07/08/2025
Method:	Rotary Cored			**Backfilled:**	07/08/2025

GL (AOD):
Easting: 414394.34
Northing: 416936.65
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Extrememly weak to very weak, highly weathered, very thinly laminated, grey MUDSTONE. From 9.4m becoming very weak/weak; with with rounded planar fragments. From 10m becomes weathered and very weak to weak.				100	26	7	NI 30 100
		10.70		Very weak to weak, extremely weathered, very thinly laminated dark grey MUDSTONE with very thin to thin laminations of grey Siltstone. 0 - 10 degrees of fracture dip, very closely to widely spaced, planar to rough, partially open to open, with stained brown/orange clay infilled fractures.							
		11.00		Very weak to weak, extremely weathered, very thinly laminated dark grey MUDSTONE with very thin to thin laminations of grey Siltstone. 0 - 10 degrees of fracture dip, very closely to widely spaced, planar to rough, partially open to open, with stained brown/orange clay infilled fractures.				42	40	0	NI 80 90
		12.70		NO RECOVERY: Mud clogging water flush *NO RECOVERY* *Flush blocked, casings pulled, cleaned and replaced; NO RECOVERY*							
		16.20		Weak, dark grey, thin bedding MUDSTONE, with frequent fossil burrows of random orientation, infilled with black mudstone, joints 0 - 5 degrees, rough, open, <2mm infilled with dark grey mud.				43	37	25	NI 90 190
		18.50		Weak, laminated dark grey MUDSTONE with to thin <2mm to wide <30mm laminations of grey Siltstone. Disc 1) 0 degrees, very closely to widely spaced, planar to undulating, smooth, partially open to open, clay infilled fractures.				75	65	65	NI 120 310
		19.20		Weak, laminated dark grey MUDSTONE with very thin to thin <2mm laminations of grey Siltstone. 5-10 degree <150mm spaced smooth to rough, open fractures infilled with clay.				29	25	19	NI 140 150

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered. Borehole termination: From 31.20m very little (19cm) to no recovery. Due to closely spaced natural rock fractures, sections of core <100mm, dislodging and jamming drilling bit, causing wearing of material to mud. 5 hrs of drilling to cover 3m of depth with no recovery. Drilling slowed by loss of water supply, with constant water top up from hose. Unable to maintain drilling water levels as suspected to be lost in natural closely spaced rock fractures. Drilling Polamar added with no effect. Geoboring so ~~unable to switch to short 1m runs. Driller did not have enough rods to conduct SPT at~~ 34m.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

SOLMEK
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Rotary Coring Log

Scale 1:50 Sheet 3 of 4

BH03

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	04/08/2025
Client:	GMI Construction Group PLC			**Ended:**	07/08/2025
Method:	Rotary Cored			**Backfilled:**	07/08/2025

GL (AOD):
Easting: 414394.34
Northing: 416936.65
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing: Depth (m)	Type	Results	Coring / Fractures: TCR (%)	SCR (%)	RQD (%)	Fracture
				Weak, laminated dark grey MUDSTONE with very thin to thin <2mm laminations of grey Siltstone. 5-10 degree <150mm spaced smooth to rough, open fractures infilled with clay.							
								76	68	33	NI 80 240
		22.20		Weak, laminated dark grey MUDSTONE with very thin/ thin <2mm laminations of grey Siltstone. 5-10 degree <150mm spaced smooth to rough, open fractures infilled with clay with 1) closely spaced horizontal planar tight - open <1mm fractures. 2) infrequent 80 degree tight blocky fractures with brown staining.				100	93	67	8 120 180
								95	89	68	NI 110 240
								57	55	9	20 90 130
								59	57	29	25 90 180
		28.00		Weak, laminated dark grey MUDSTONE/SILTSTONE, with medium spaced fracture sets <400mm spacing of 45 - 80 degree tight to open <2mm undulating rough with brown staining.				40	31	0	12 50 95

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered. Borehole termination: From 31.20m very little (19cm) to no recovery. Due to closely spaced natural rock fractures, sections of core <100mm, dislodging and jamming drilling bit, causing wearing of material to mud. 5 hrs of drilling to cover 3m of depth with no recovery. Drilling slowed by loss of water supply, with constant water top up from hose. Unable to maintain drilling water levels as suspected to be lost in natural closely spaced rock fractures. Drilling Polamar added with no effect. Geoboring so ~~unable to switch to short 1m runs. Driller did not have enough rods to conduct SPT at~~ 34m.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

SOLMEK
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Rotary Coring Log

Scale 1:50 Sheet 4 of 4

BH03

Contract no:	S250101	**Site:**	George Hotel, Huddersfield	**Driller:**	ID Drilling Ltd
				Plant used:	MI3
				Started:	04/08/2025
Client:	GMI Construction Group PLC			**Ended:**	07/08/2025
Method:	Rotary Cored			**Backfilled:**	07/08/2025

GL (AOD):
Easting: 414394.34
Northing: 416936.65
Logged: GT
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing			Coring / Fractures			
					Depth (m)	Type	Results	TCR (%)	SCR (%)	RQD (%)	Fracture
				Weak, laminated dark grey MUDSTONE/SILTSTONE, with medium spaced fracture sets <400mm spacing of 45 - 80 degree tight to open <2mm undulating rough with brown staining.				67	31	29	NI 160 180
				NO RECOVERY: section of core stuck in drill bit							
								13	13	8	12 30 30
		34.20		End of Borehole at 34.200m							

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	1.2m Hand excavated inspection pit dug. No groundwater encountered. Borehole termination: From 31.20m very little (19cm) to no recovery. Due to closely spaced natural rock fractures, sections of core <100mm, dislodging and jamming drilling bit, causing wearing of material to mud. 5 hrs of drilling to cover 3m of depth with no recovery. Drilling slowed by loss of water supply, with constant water top up from hose. Unable to maintain drilling water levels as suspected to be lost in natural closely spaced rock fractures. Drilling Polamar added with no effect. Geoboring so unable to switch to short 1m runs. Driller did not have enough rods to conduct SPT at 34m.

Flush Returns			
From (m)	To (m)	Flush Type	Flush (%)

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

APPENDIX C

Certificate of Analysis

Certificate Number	25-20105	*Issued:*	08-Sep-25
Client	SOLMEK 12 Yarm Road Stockton On Tees Cleveland TS18 3NA		

Our Reference	25-20105
Client Reference ~	S250101
Order No ~	SOL10017
Contract Title ~	George Hotel, Huddersfield
Description	5 Soil samples.
Date Received	01-Sep-25
Date Started	01-Sep-25
Date Completed	08-Sep-25
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Reyhan Irfan
Operations Manager

2139

Sample Deviations present. See Deviation Table Section for details.

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 25-20105
Client Ref ~ S250101
Contract Title ~ George Hotel, Huddersfield

Sample ID	Depth	Lab No	Completed	Matrix Description
BH01	0.8	2561448	08/09/2025	Dark brown very gravelly, sandy CLAY including odd rootlets
BH01	1.3	2561449	08/09/2025	Dark brown very gravelly, sandy CLAY including odd rootlets
BH02	0.8	2561450	08/09/2025	Dark brown very gravelly, sandy CLAY including odd rootlets
BH03	0.8	2561451	08/09/2025	Dark brown very gravelly, sandy CLAY including odd rootlets
BH03	1.3	2561452	08/09/2025	Dark brown very gravelly, sandy CLAY including odd rootlets

Summary of Chemical Analysis
Soil Samples

Our Ref 25-20105
Client Ref ~ S250101
Contract Title ~ George Hotel, Huddersfield

	Lab No	2561448	2561449	2561450	2561451	2561452
	Sample ID ~	BH01	BH01	BH02	BH03	BH03
	Depth ~	0.80	1.30	0.80	0.80	1.30
	Other ID ~					
	Sample Type ~	ES	ES	ES	ES	ES
	Sampling Date ~	22/07/2025	23/07/2025	28/07/2025	04/08/2025	04/08/2025
	Sampling Time ~	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	3.9	4.9	8.3	5.1	6.9
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.5	0.5	0.5	0.5	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.1	0.1	< 0.1	0.2
Chromium	DETSC 2301#	0.15	mg/kg	32	44	41	25	38
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	24	25	210	17	30
Lead	DETSC 2301#	0.3	mg/kg	17	19	45	18	27
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	32	42	35	23	32
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	64	82	96	58	76
Inorganics								
pH	DETSC 2008#		pH	8.1	6.8	7.4	7.6	7.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	< 10	< 10	< 10	21	< 10
Petroleum Hydrocarbons								
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic >EC35-EC40: EH_2D_AL	DETSC 3521*	3.4	mg/kg	< 3.40	< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic C5-C40: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40
Aromatic >EC35-EC40: EH_2D_AR	DETSC 3521*	1.4	mg/kg	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40
Aromatic C5-C40: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00
TPH Ali/Aro C5-C40: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00
PAHs								
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Summary of Chemical Analysis
Soil Samples

Our Ref 25-20105
Client Ref ~ S250101
Contract Title ~ George Hotel, Huddersfield

	Lab No	2561448	2561449	2561450	2561451	2561452
	Sample ID ~	BH01	BH01	BH02	BH03	BH03
	Depth ~	0.80	1.30	0.80	0.80	1.30
	Other ID ~					
	Sample Type ~	ES	ES	ES	ES	ES
	Sampling Date ~	22/07/2025	23/07/2025	28/07/2025	04/08/2025	04/08/2025
	Sampling Time ~	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	0.14
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	0.24	< 0.10	0.20
Pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	0.30	< 0.10	< 0.10
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Asbestos Analysis
Soil Samples

Our Ref 25-20105
Client Ref ~ S250101
Contract Title ~ George Hotel, Huddersfield

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2561448	BH01 0.80	SOIL	NAD	none	Pierce Booth
2561449	BH01 1.30	SOIL	NAD	none	Pierce Booth
2561450	BH02 0.80	SOIL	NAD	none	Pierce Booth
2561451	BH03 0.80	SOIL	NAD	none	Pierce Booth
2561452	BH03 1.30	SOIL	NAD	none	Pierce Booth

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 25-20105
Client Ref ~ S250101
Contract ~ George Hotel, Huddersfield

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date Sampled ~	Containers Received	Holding time exceeded for tests	Incorrect container for tests
2561448	BH01 0.80 SOIL	22/07/25	GJ 250ml, GJ 60ml, PT 1L x2	Anions 2:1 (30 days), BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2561449	BH01 1.30 SOIL	23/07/25	GJ 250ml, GJ 60ml, PT 1L x2	Anions 2:1 (30 days), BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2561450	BH02 0.80 SOIL	28/07/25	GJ 250ml, GJ 60ml, PT 1L x2	Anions 2:1 (30 days), BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2561451	BH03 0.80 SOIL	04/08/25	GJ 250ml, GJ 60ml, PT 1L x2	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	
2561452	BH03 1.30 SOIL	04/08/25	GJ 250ml, GJ 60ml, PT 1L x2	BTEX / C5-C10 (14 days), EPH/Aliphatic/Aromatic (14 days), Naphthalene (14 days), PAH FID (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days)	

Key: G-Glass P-Plastic J-Jar T-Tub
Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 250µm sieve
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
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
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 2311	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	As Received	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3321	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3321	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3521	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3521	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3521	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3521	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3521	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3521	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS

Key:
~ Sample details are provided by the client and can affect the validity of the results
***** -not accredited.
# -MCERTS (accreditation only applies if report carries the MCERTS logo).
$ -subcontracted.
n/s -not supplied.
I/S -insufficient sample.
U/S -unsuitable sample.
t/f -to follow.
nd -not detected.

End of Report

APPENDIX D

Laboratory Report Front Sheet

Site name	Job number
George Hotel, Huddersfield	S250101

G2M Testing (Stockton)
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Client details:

Reference:	S250101
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	lrichards@solmek.com
FAO:	Luke Richards

Samples received: 29/08/2025

Date commenced: 01/09/2025

Date reported: 19/09/2025

Observations and interpretations are outside of the UKAS Accreditiation

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

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Site name	Job number
George Hotel, Huddersfield	S250101

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BH01	1.80		B	6.1	105	8.7	70	30	33-s	12	21	-0.157	CL	Tested after washing to remove >425µm
BH02	1.80		B	4.0	105	9.1	44	56	34-s	15	19	-0.311	CL	Tested after washing to remove >425µm
BH03	1.80		B	9.0	105	23	39	61	35-s	20	15	0.200	CI	Tested after washing to remove >425µm

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	D Anderson
Approval date	04/09/2025 13:27
Date report generated	
Report Number	

Summary of Rock Point Load Tests

G2M Testing (Stockton)
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 033318
info@g2mtesting.co.uk

Site name	Job number
George Hotel, Huddersfield	S250101

Hole	Sample			Specimen		Rock type and test condition	Test Type		Failure validity	Dimensions			Is	Is(50)	Remarks
	Depth m	Ref	Type	Depth m	Ref		Type	Dir.		W mm	D mm	D' mm	MPa	MPa	
BH01	7.00		C			As received	D	L	Valid		100		0.01	0.01	
BH01	7.00		C			Mudstone	A	P	Valid	100	30		0.19	0.21	
BH01	8.50		C			Mudstone	D	L	Valid		100		0.03	0.04	
BH01	8.50		C			Mudstone	A	P	Valid	100	50		0.08	0.10	
BH01	10.00		C			Mudstone	A	P	Valid	100	20		3.60	3.61	
BH01	13.00		C			Mudstone	A	P	Valid	100	30		0.30	0.33	
BH01	17.50		C			Mudstone	D	L	Valid		100		0.69	0.95	
BH01	17.50		C			Mudstone	A	P	Valid	100	65		1.95	2.56	
BH01	20.50		C			Mudstone	D	L	Valid		100		0.12	0.17	
BH01	20.50		C			Mudstone	A	P	Valid	100	30		3.65	4.02	
BH01	26.50		C			Mudstone	D	L	Valid		100		0.21	0.29	
BH01	26.50		C			Mudstone	A	P	Valid	100	35		1.50	1.71	
BH01	31.00		C			Mudstone	D	L	Valid		100		0.05	0.07	
BH01	31.00		C			Mudstone	A	P	Valid	100	50		2.36	2.91	
BH01	35.50		C			Mudstone	D	L	Valid		100		0.72	0.98	
BH01	35.50		C			Mudstone	A	P	Valid	100	35		3.43	3.91	
BH02	5.20		C			Mudstone	D	L	Valid		100		0.02	0.03	
BH02	5.20		C			Mudstone	A	P	Valid	100	55		0.04	0.05	
BH02	6.70		C			Mudstone	D	L	Valid		100		0.02	0.02	
BH02	6.70		C			Mudstone	A	P	Valid	100	50		0.05	0.06	

Test not currently within the scope of G2M Testing UKAS accrediation schedule

Column	Key	Description
Test Type	A	Axial
	B	Block
	D	Diametral
	I	Irregular lump
Test Direction	L	Parallel to planes of weakness
	P	Perpendicular to planes of weakness
	U	Unknown
Dimensions	W	Width
	D	Platen seperation at start of test
	D'	Platen seperation at sample failure
	Is	Point Load Index
	Is(50)	Corrected Point Load Index to equivalent 50 mm diameter

Approved by	
Approval date	04/09/2025
Date report generated	
Report Number	

Summary of Rock Point Load Tests

G2M Testing (Stockton)
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 033318
info@g2mtesting.co.uk

Site name	Job number
George Hotel, Huddersfield	S250101

Hole	Sample			Specimen		Rock type and test condition	Test Type		Failure validity	Dimensions			Is	Is(50)	Remarks
	Depth m	Ref	Type	Depth m	Ref		Type	Dir.		W mm	D mm	D' mm	MPa	MPa	
BH02	9.70		C			Mudstone	D	L	Valid	100	35		0.47	0.40	
BH02	12.70		C			Mudstone	A	P	Valid		100		2.83	1.45	
BH02	12.70		C			Mudstone	D	L	Valid	100	40		1.76	1.59	
BH02	17.20		C			Mudstone	A	P	Valid		100		9.35	4.78	
BH02	17.20		C			Mudstone	A	P	Valid	100	35		1.26	1.44	
BH02	24.70		C			Mudstone	D	L	Valid		100		0.03	0.04	
BH02	24.70		C			Mudstone	A	P	Valid	100	35		1.38	1.58	
BH02	32.20		C			Mudstone	D	L	Valid		100		0.03	0.04	
BH02	32.20		C			Mudstone	A	P	Valid	100	45		1.79	2.16	
BH02	39.70		C			Mudstone	D	L	Valid		100		0.42	0.58	
BH02	39.70		C			Mudstone	A	P	Valid	100	50		2.21	2.73	
BH03	8.20		C			Mudstone	D	L	Valid		100		0.03	0.04	
BH03	8.20		C			Mudstone	A	P	Valid	100	40		0.08	0.09	
BH03	9.70		C			Mudstone	A	P	Valid	100	10		0.77	0.66	
BH03	11.20		C			Mudstone	D	L	Valid		100		0.21	0.29	
BH03	11.20		C			Mudstone	A	P	Valid	100	40		0.91	1.06	
BH03	16.20		C			Mudstone	D	L	Valid		100		0.34	0.47	
BH03	16.20		C			Mudstone	A	P	Valid	100	70		0.64	0.85	
BH03	17.70		C			Mudstone	D	L	Valid		100		0.14	0.18	
BH03	17.70		C			Mudstone	A	P	Valid	100	80		0.54	0.74	

Test not currently within the scope of G2M Testing UKAS accrediation schedule

Column	Key	Description
Test Type	A	Axial
	B	Block
	D	Diametral
	I	Irregular lump
Test Direction	L	Parallel to planes of weakness
	P	Perpendicular to planes of weakness
	U	Unknown
Dimensions	W	Width
	D	Platen seperation at start of test
	D'	Platen seperation at sample failure
	Is	Point Load Index
	Is(50)	Corrected Point Load Index to equivalent 50 mm diameter

Approved by	
Approval date	04/09/2025
Date report generated	
Report Number	

Summary of Rock Point Load Tests

G2M Testing (Stockton)
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 033318
info@g2mtesting.co.uk

Site name	Job number
George Hotel, Huddersfield	S250101

Hole	Sample			Specimen		Rock type and test condition	Test Type		Failure validity	Dimensions			Is	Is(50)	Remarks
	Depth m	Ref	Type	Depth m	Ref		Type	Dir.		W mm	D mm	D' mm	MPa	MPa	
BH03	19.20		C			Mudstone	D	L	Valid		100		0.17	0.23	
BH03	19.20		C			Mudstone	A	P	Valid	100	30		1.60	1.76	
BH03	20.70		C			Mudstone	D	L	Valid		100		0.07	0.10	
BH03	20.70		C			Mudstone	A	P	Valid	100	40		0.46	0.54	
BH03	25.20		C			Mudstone	D	L	Valid		100		0.22	0.30	
BH03	25.20		C			Mudstone	A	P	Valid	100	40		2.38	2.79	
BH03	28.20		C			Mudstone	A	P	Valid	100	30		5.89	6.48	
BH03	28.20		C			Mudstone	D	L	Valid		50		1.18	1.18	
BH03	29.70		C			Mudstone	D	L	Valid		100		0.02	0.03	
BH03	29.70		C			Mudstone	A	P	Valid	100	40		1.41	1.66	

Test not currently within the scope of G2M Testing UKAS accrediation schedule

Column	Key	Description
Test Type	A	Axial
	B	Block
	D	Diametral
	I	Irregular lump
Test Direction	L	Parallel to planes of weakness
	P	Perpendicular to planes of weakness
	U	Unknown
Dimensions	W	Width
	D	Platen seperation at start of test
	D'	Platen seperation at sample failure
	Is	Point Load Index
	Is(50)	Corrected Point Load Index to equivalent 50 mm diameter

Approved by	
Approval date	04/09/2025
Date report generated	
Report Number	

UNIAXIAL COMPRESSION TEST ON ROCK - SUMMARY OF RESULTS

Project No.: S250101

Project Name: George Hotel, Huddersfield

Hole No.	Sample				Rock Type	Specimen Dimensions2			Bulk Density2	Water Content 1	Uniaxial Compression3				Remarks
	Ref	Top	Base	Type		Dia. mm	Length mm	H/D	Mg/m3	%	Condition	Stress Rate MPa/s	Mode of failure	UCS MPa	
BH01		5.50		C	Mudstone	100.0	85.0	0.9	1.91	7.5	as received	0.1273	F	1.3	Unsuitable for test - fragmented
BH01		13.00		C	Mudstone	100.0	60.0	0.6	2.42	1.9	as received	0.1273	F	10.0	
BH02		5.20		C	Mudstone	100.0	70.0	0.7	2.06	10.0	as received	0.1273	F	1.3	
BH02		12.70		C	Mudstone	100.0	95.0	1.0	2.63	1.8	as received	0.1273	AC	10.2	
BH02		17.20		C	Mudstone	100.0	143.0	1.4	2.54	1.6	as received	0.1273	AC	30.5	
BH03		6.70		C	Mudstone	100.0	229.0	2.3	1.95	7.5	as received	0.1273	AC	0.9	
BH03		16.20		C	Mudstone	100.0	142.0	1.4	2.58	1.5	as received	0.1273	AC	59.4	

Notes

1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as tested for UCS

2 ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density

3 ISRM p153 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials

above notes apply unless annotated otherwise in the remarks

Mode of failure :

S - Single shear MS - multiple shear

AC - Axial cleavage F - Fragmented

Test Specification	Date Printed	Approved By	Table
International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007	19/09/2025	JBrischuk	1 sheet 1

APPENDIX E

♣Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2025)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2011 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.

SOLMEK NOTES ON CONTAMINATION GUIDANCE (REF: VERSION 1/2025)

UK BACKGROUND

Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to *"identify and remove unacceptable risks to human health and the environment" and* to *"seek to ensure that contaminated land is made suitable for its current use".*

Part 2A uses a risk based approach to defining contaminated land whereby the "risk" is interpreted as *"the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land"* and by *"the scale and seriousness of such harm or pollution if it did occur".*

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."*

A conceptual model is used to develop and communicate the risks associated with a particular site.

To determine if land is contaminated the local authority use various categories from 1 to 4. Categories 1 and 2 include *"land which is capable of being determined as contaminated land on grounds of significant possibility of significant harm to human health."*

Categories 3 and 4 *"encompass land which is not capable of being determined on such grounds".*

PRELIMINARY CONCEPTUAL MODEL

Preliminary Conceptual Models are undertaken in accordance with CIRIA C552. The Preliminary Conceptual Model assesses the consequence and the likelihood of a risk being realised to provide a risk classification, using the tables detailed below.

CONSEQUENCE OF RISK BEING REALISED (Based on C552 CIRIA, 2001)

Classification	Definition	Example
Severe	Short-term (acute) risk to human health, the environment, an element of the development or other aspect with is likely to result in *significant harm*, damage or both.	High concentrations of cyanide on the surface of an informal recreational area. Major spills of contaminants from site into controlled water. High concentrations of explosive gas in the subsurface environment that have a clear unobstructed pathway into buildings.
Moderate	Chronic damage to human health, a plausible chance that an event will occur, although the timeline is not immediate to be in the short-term.	Appreciable concentration of contamination that over the longer-term will cause significant harm i.e. high lead concentration in topsoil. Shallow mine workings that are potentially unstable but may remain in a satisfactory or stable conditions for a number of years.
Mild	Low level pollution of non-sensitive water, a feasible hazardous scenario although the timeline of such occurring can probably be considered in 10's of years.	The effect of high sulphate concentrations on structural concrete. Pollution of non-classified groundwater.
Minor	Harm, although not necessarily significant to human health, or with respect to other aspects of the development, which are considered implausible in terms of occurrence, or will have little consequential impact.	The presence of contaminants at such low concentrations that protective equipment is required during site works. Any damage to structures is minimal and will not be structural in characteristics.

PROBABILITY OF RISK BEING REALISED (C552 CIRIA, 2001)

Classification	Definition
High Likelihood	There is a viable pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence that the receptor has been harmed or polluted.
Likely	There is a viable pollutant linkage and all elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a viable pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a viable pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

RISK CLASSIFICATION MATRIX (C552 CIRIA, 2001)

Risk = Probability x Consequence		Consequence			
		Severe	Moderate	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

HUMAN RECEPTORS

Human exposure to contaminants present in soils can occur via several pathways. Direct exposure pathways include dermal absorption after contact with contaminated ground, inhalation of soil or dust, inhalation of volatised compounds, and inadvertent soil ingestion (or deliberate soil ingestion in the case of some children). Other indirect pathways include human ingestion of plants grown in contaminated soil or contaminated ground or surface water. Contaminants associated with wind blown dust can affect humans on surrounding sites.

VEGETATION

Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, lead, nickel, and zinc.

To establish if the levels of contaminants present on a site may pose a risk to vegetation the results of the contamination testing are compared to a series of threshold values published in 'Code of Good Agricultural Practice for the Protection of Soil'.

GROUNDWATER AND SURFACE WATER RECEPTORS

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology. Surface watercourses may also accumulate contamination as contaminated sediments are deposited within the water body.

Where the site investigated overlies major/principal aquifers (and in some cases minor/secondary aquifers depending on certain conditions), groundwater Source Protection Zones and areas in close proximity to groundwater abstractions, contamination test results have been compared with the Water Supply (Water Quality) Regulations 1989 and The Water Supply (Water Quality) Regulations 2000.

Should a surface water receptor, such as a fresh water environment (river, canal, stream, lake etc), or marine environment be considered sensitive in relation to a site, then test results are compared with DEFRA & SEPA Environmental Quality Standards (2004). Many of the Environmental Quality Standards are hardness ($CaCO_3$) depended. Where no hardness values are available, Solmek assume conservative values (of between 0 and 50mg/l).

In the absence of vulnerable ground and surface water environments, Solmek may compare any test results with the Environment Agency Leachate Quality Threshold Values.

DETAILED QUANTITATIVE RISK ASSESSMENT (DQRA)

In line with Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*, a DQRA for groundwater/human health may be required following a Phase 2 investigation and before the preparation of a Phase 3 Remediation Strategy. For human health DQRA, a site specific assessment criteria is undertaken using CLEA Software Version 1.06. For groundwater DQRA, the Environment Agency Remedial Targets Worksheet Version 3.1 is used.

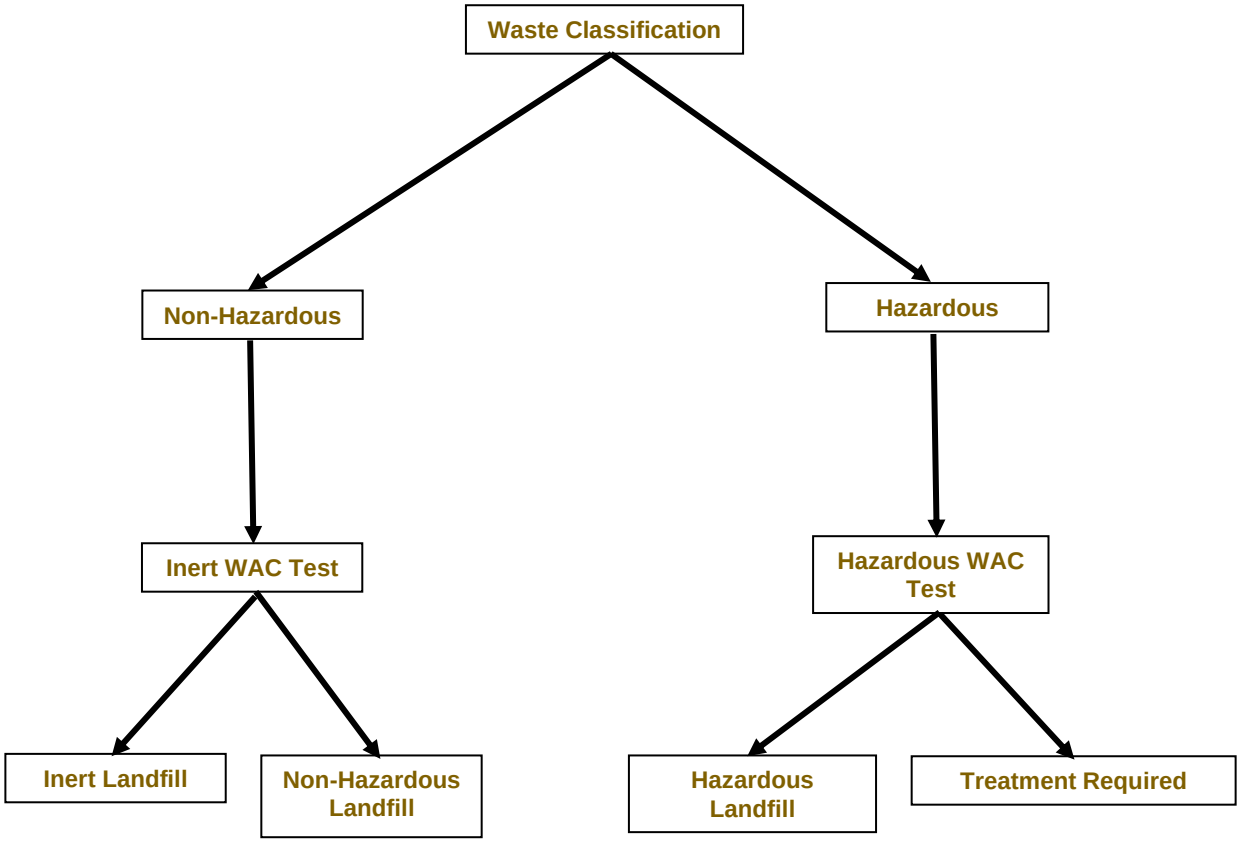
WASTE CLASSIFICATION AND WASTE ACCEPTANCE CRITERIA

During the site strip and construction activities, material may be required to be removed from site. Any such material would require classification, in line with Environment Agency Technical Guidance *Waste Classification: Guidance on the classification and assessment of waste (2015)*. This would classify the material as either Non-Hazardous or Hazardous Waste.

Once the material has been classified, determining the suitable landfill for disposal is governed by landfill directive Waste Acceptance Criteria (WAC) testing, with landfills categorized as Inert Waste, Stable Non-Reactive Hazardous Waste and Hazardous Waste. The WAC testing relates to materials that are to be exported from a site/development to landfill, and do not directly relate to human health specifically. The testing results are generally presented as certificates which can be used by site owners/contractors etc, which should be presented to the accepting waste facility or waste contractor.

If waste classification and/or WAC testing are not undertaken, material taken off site may be subject to WAC testing by the appropriate waste disposal company. The decision on whether or not to accept waste, or whether further testing is required, is at the discretion of the waste disposal company.

The below flow chart provides further information on the waste classification process.



CONSTRUCTION MATERIALS

Materials at risk from possible soil contaminants include inorganic matrices such as cement and concrete and also organic material such as plastics and rubbers. Acid ground conditions and high levels of sulphates can accelerate the corrosion of building materials. Where pH and soluble sulphate analysis has been undertaken, Solmek compare the test results with the guidelines presented within BRE Special Digest 1, 2005 (3rd Edition) 'Concrete in Aggressive Ground'. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication "Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites" (January 2011). A Brownfield Site is defined in the document as "Land or premises that have not previously been used or developed that may be vacant or derelict". It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer. The table below outlines the pipe material selection threshold concentrations.

	Pipe Material (Threshold concentrations in mg/kg)					
Parameter group	**PE**	**PVC**	**Barrier pipe (PE-AL-PE)**	**Wrapped Steel**	**Wrapped Ductile Iron**	**Copper**
Extended VOC suite by purge and trap or head space and GC-MS with TIC	0.5	0.125	Pass	Pass	Pass	Pass
+ BTEX + MTBE	0.1	0.03	Pass	Pass	Pass	Pass
SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C5-C10)	2	1.4	Pass	Pass	Pass	Pass
+ Phenols	2	0.4	Pass	Pass	Pass	Pass
+ Cresols and chlorinated phenols	2	0.04	Pass	Pass	Pass	Pass
Mineral oil C11-C20	10	Pass	Pass	Pass	Pass	Pass
Mineral oil C21-C40	500	Pass	Pass	Pass	Pass	Pass
Corrosive (Conductivity, Redox and pH)	Pass	Pass	Pass	Corrosive if pH <7 and conductivity >400µS/cm	Corrosive if pH <5, Eh not neutral and conductivity >400µS/cm	Corrosive if pH <5 or >8 and Eh positive
Specific suite identified as relevant following site investigation						
Ethers	0.5	1	Pass	Pass	Pass	Pass
Nitrobenzene	0.5	0.4	Pass	Pass	Pass	Pass
Ketones	0.5	0.02	Pass	Pass	Pass	Pass
Aldehydes	0.5	0.02	Pass	Pass	Pass	Pass
Amines	Fail	Pass	Pass	Pass	Pass	Pass

REQUIREMENTS OF PARTIES WITHIN THE DEVELOPMENT PROCESS

Interested parties involved in the development process may use the data in different ways and there may be varying views and interpretation of the factual data. Local Authority staff may have a view on contamination and human health and the wider environment. The Environment Agency are concerned principally with the protection of Controlled waters. Building insurers, funders and purchasers may be primarily concerned with issues of potential commercial blight. Purchasers are also not always fully informed, and perceptions on issues associated with risk can affect the decision to purchase. Developers and construction organisations will focus on financial aspects of dealing with the contamination in the context of the development and construction programme.

RISKS & LIABILITIES FROM CONTAMINATION

In simple terms, risks associated with contamination may be considered in terms of 1) statutory risks and 2) development related risks. If contamination is severe or forms a potential hazard based on its potential to affect groundwater, surface water or human health, a statutory risk may be present, and as such, if the risk is not reduced, criminal proceedings may be instigated by a government body or local authority.

If the contamination is less severe or not considered to be mobile, it may be considered a commercial liability which could, in theory remain untreated, but which may at a later date affect the value of the property, or, with changing legislation, become a statutory risk. Commercial liabilities could give rise to civil proceedings by third parties if there are grounds for action.