GROUND INVESTIGATION REPORT

THE CAMBRIDGE HOTEL, CLARE HILL

HUDDERSFIELD, WEST YORKSHIRE

Report: 714200-GI

Date: December 2024

Client:
Cambridge Hotel,
4 Clare Hill
Huddersfield
West Yorkshire
HD1 5BS

Architect:
Acumen
Headrow House
Old Leeds Road
Huddersfield
HD1 1SG

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DOCUMENT VERIFICATION SHEET

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SUMMARY

Grid Ref: 414255(E), 417385(N) **Elevation:** 96m AOD **Site Area:** 0.32 ha

	Development proposals:	Extension of existing hotel building.
	Past site development:	Site occupied by hotel car park.
Ground Conditions	**Made Ground:**	Generally between 0.60m and 1.90m, extending to more than 5.45m in west corner of proposed extension.
	Natural Soils:	Stiff clay residual soils.
	Bedrock:	Mudstone encountered from 2.50m bgl - 3.70m bgl.
	Groundwater:	Groundwater found between 2.64m bgl and 3.74m bgl during post-investigation monitoring.
	Shallow mining:	Shallow mining found beneath wider site previously.
	Environmental Assessment:	Chemical levels are below GQRA threshold values and no foreseeable pathways with receptors.
	Ground gases:	Gas monitoring ongoing. No radon protection required.
	Remediation:	No chemical elevations identified and no new soft landscaping areas proposed.
	Foundations:	Reinforced strip footings founding 250mm into mudstone bedrock can be considered.
	Drainage:	Attenuation and off-site drainage required.
	Geotechnical Considerations:	Drilling and grouting needed to consolidate shallow mine workings under the site.
	Further Investigation:	Ground gas risk assessment will be provided under separate cover on completion of outstanding monitoring visit.

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1. INTRODUCTION

On the instruction of The Cambridge Hotel, a Phase 2 Ground Investigation was carried out by Abbeydale Geoscience on a site off Clare Hill in Huddersfield, West Yorkshire.

The site is situated on the north side of Huddersfield, centred on National Grid Reference 414255(E), 417385(N), with a site area of around 0.32 ha. See Figure 1.

FIGURE 1 - LOCATION PLAN

This report was produced for our client, The Cambridge Hotel, and their advisors and financiers. It should not be relied upon or transferred to any other parties without the express written authorisation of Abbeydale Geoscience and our client. If any other unauthorised third party comes into possession of this report they rely on it at their own risk and the authors owe them no duty of care or skill.

The comments and recommendations presented in this Ground Investigation report are based on the findings of a review of available information; ground conditions encountered during the intrusive investigation fieldwork and the associated laboratory testing results. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have therefore not been taken in to account by this report. Responsibility cannot be accepted for conditions not revealed by this investigation.

When writing this report it was proposed to build an extension to the rear of the existing hotel at, or close to, existing ground levels. If there are changes to these proposals then some modification to the comments and recommendations given may be required. The proposed site layout is shown on the site plan in Appendix A.

A previous report for this site was produced by Abbeydale Building Environment Consultants (ref: 714155SI, dated September 2018), which was the previous company name for Abbeydale Geoscience. Relevant information from the previous report has been incorporated into this contemporary Ground Investigation report.

2. OBJECTIVES

This report has been undertaken to evaluate the potential risks posed by the ground conditions and current or former uses of the site and surrounding areas, to highlight any potential risks to future receptors.

As part of this evaluation the potential impact on the identified receptors has been assessed, to determine if a potential significant pollution linkage is present between each source and receptor. Where appropriate the report gives recommendations for further investigations and / or remediation options to mitigate any perceivable risks to future receptors.

The report also evaluates the current site proposals with regard to geotechnical and engineering considerations to determine what impact the anticipated ground conditions will have on the integrity of any structures or buildings included in the development proposals. As part of this evaluation the report gives foundation, floor slab, highway and drainage recommendations where relevant.

3. THE SITE

The site is currently occupied by hotel buildings in the south and east of the Cambridge Hotel site, with the hotel's car park occupying the north western corner of the site in the proposed development area. The development area surface is covered

predominantly by tarmac, with a strip of land along the northern boundary vegetated by small shrubs and two large deciduous trees.

There was no visual or olfactory evidence at the surface of any contamination, distressed vegetation or any potentially contaminating sources noted on site, externally to any buildings.

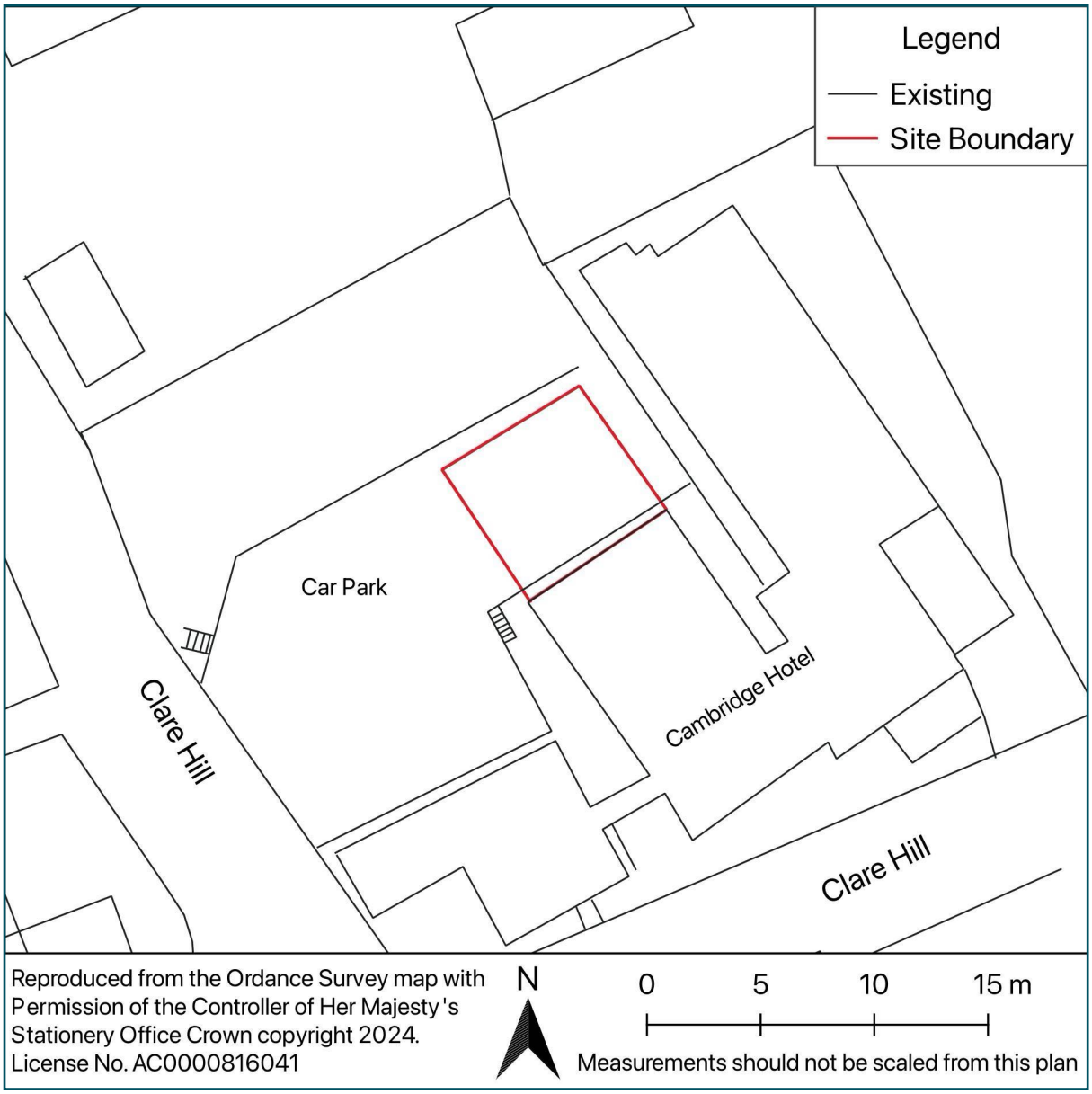


FIGURE 2 - SITE PLAN

The site is bound to the south and west by a stone wall with Clare Hill road running adjacent to it. To the north the site is bounded by a retaining wall with a car park for the Muslim community centre beyond. The east of the site is bounded by an access road serving a neighbouring industrial unit.

Ground levels across the site are essentially level but step down towards the east between retaining walls of several meters in height. The hotel car park has a slight

slope down towards the south east. Retaining walls surrounded the car park on three sides, up to the north by 1.7m, down to the south by ~2.3m, and down to the east as two walls of 0.9m and 3.2m. The southern retaining wall was observed to be of poor quality with joint displacement evident along the length of the wall including at the eastern end in the section installed since 2010. Vertical hairline fractures were also evident in the northern retaining wall. The eastern retaining walls could not be inspected due to access restrictions.

4. HISTORY

The historical setting of the site and surrounding area was summarised in the previously prepared Site Investigation report (ref: 714155SI, dated September 2018) using freely available online sources; summarised below for ease of reference.

4.1. The Site

The earliest OS map of 1851 shows the site to be occupied predominately by gardens; with Clare Bank house situated in the south western corner of the site. Little appears to change on site through to the 1972-1982 map; with the construction of a car park on the northern half of the site now depicted. Further Clare Bank house is now denoted as Clare Manor Hotel. The site continues to be unchanged through to the 1987-1989 map. The hotel has since been renamed the Cambridge Hotel and extended onto the east of the of the site and western edge of the adjoining plot of land.

4.2. Surrounding Area

The earliest map of 1851 shows the site to be surrounded mostly by open fields to the west and north. Huddersfield Collegiate school is located immediately to the east of the site. Newton mill is located roughly 500m south east of the site. The London and North Western railway line is located roughly 550m to the south east of the site, running north-east to south-west. Residential housing was built immediately to the south of the site. The next map of 1890 shows Huddersfield Collegiate school now denoted as Albany Hall, with more residential housing to the south of the site. By 1907 Albany Printing Works had been built 100m to the east of the site. The 1918 map shows a rail goods deposit 400m to the east of the site. By 1948, a continual encroachment of housing is evident around the site. The 1959 1:1250 map records a ruin located immediately beyond the eastern boundary of the site, on the Albany Hall site.

The 1960 map shows St Johns works 100m to the north; and a mill 100m to the east of the site. The next map of 1972-1982 shows Albany Printing Works had become Huddersfield Technical College. The A62 has been constructed and runs 300m to the south of the site. Little has changed by the next map of 1987-1989 with small scale residential construction in the surrounding area. From the 1987-1989 map to present there is continued build up of housing and industrial complexes. Huddersfield Technical College is now a recreational facility. A Muslim community centre has also been built 80m to the north of the site.

5. GEOLOGY

The Geological Survey maps of the area, 1:50,000 scale BGS Sheet 77 (Huddersfield), 1:10,000 scale sheet SE11NW and Yorkshire County Series sheet 246SE have been examined, along with the geological memoir of the area.

The solid geology is recorded as undifferentiated strata of the Lower Coal Measures, of the Upper Carboniferous dipping gently at 4 degrees to the east. The site lies stratigraphically above the Soft Bed Coal.

The nearest geological fault is conjectured approximately 600m to the east of the site, trending north-west to south-east. Strata are downthrown to the north-east.

No superficial drift deposits are recoded to overlie the solid geology across the site; natural soils would therefore be anticipated in the form of residual soil weathered down from the parent bedrock.

6. HYDROGEOLOGY AND HYDROLOGY

The Environment Agency (EA) indicate the bedrock underlying the site is a Secondary A aquifer (formerly minor aquifer); permeable layers capable of supporting water supply on a local rather than a strategic scale and sometimes providing base flow to rivers.

The site is not located within a groundwater source protection zone and there are no recorded licensed drinking water abstractions within 250m of the site.

The nearest surface water feature is Clough House Mill Beck approximately 300m to the north-east of the site. The exact hydraulic gradient is unknown, however it is believed to have a gentle gradient to the east towards Clough House Mill Beck and the River Colne beyond.

The site is not located within a designated Flood Risk Zone.

7. MINING RISK ASSESSMENT & QUARRYING

The 0.60m thick Soft Bed Coal is shown to outcrop at least 250m to the east, downslope of the site, where it trends north-south following the topography of the area. This seam is therefore anticipated underneath the site at shallow depth. The geological memoirs state an average thickness for this coal seam of 0.45m, and is associated with a 0.9m thick fireclay, collectively averaging 1.35m thick. Both the coal and fireclay are recorded to have been extensively worked in the Huddersfield area.

Abbeydale Geoscience was previously involved with a drilling and grouting operation conducted in c.2010 (under previous company name Abbeydale Building Environment Consultants), by the contractor Quine Ltd, as part of the previous ~675m^2 extension for the hotel, just to the north-east of the current site. Prior to treatment, 14 open holes were drilled across the area, to depths between 12.1m and 30.1m below ground level

(bgl). Of these, 11 holes encountered voids, with the largest being 2.2m thick at between 6.1m and 8.3m bgl. Typically voids were around 1.2m thick and were encountered between 6.1m bgl and 10.8m bgl.

8. FIELDWORK

8.1. General

Contemporary fieldwork was undertaken on 11 October 2024 in general accordance with Eurocode 7, BS5930:2015 and BS10175:2011(+A2:2017). Detailed descriptions of the strata encountered are recorded in the exploratory hole logs in Appendix C.

8.2. Exploratory Hole Locations

The relative ground levels and positions of the exploratory holes undertaken were assessed relative to existing features using a tape measure; the approximate locations of which are shown on Figure 3.

Exploratory hole locations were chosen to confirm the ground conditions across the site and allow representative samples of the strata encountered to be taken for geotechnical and environmental laboratory testing.

8.3. Sampling Strategy

Representative disturbed samples of the soils and weathered rock encountered were taken throughout the course of the intrusive investigation works, to facilitate subsequent geotechnical and environmental laboratory testing.

The sampling depths were taken based on a combination of professional judgement and the ground conditions encountered, or at regular depths through the soil profile. Where known the sampling depths took account of proposed finished ground levels post-development, the likely source of potential contamination and the likely receptors.

On completion of the fieldwork the samples were returned to Abbeydale Geoscience's office for scheduling of subsequent laboratory testing.

8.4. Window Sample Holes

Five window sample holes (WS101 to WS105) were carried out across the site, ranging in depth from 3.23m bgl to 5.45m bgl, using a tracked window sample rig.

As part of the window sampling in situ Standard Penetration Tests (SPTs) or Cone Penetration Tests (CPTs) were undertaken based on the ground conditions encountered, to provide in situ relative strength information. The SPTs utilised a 50mm split spoon sampler with a 70° taper, with the CPTs using a solid cone with a 90° taper, driven using a 63.5kg hammer dropping 750mm. The blow counts are recorded for every 75mm driven, as detailed on the appended exploratory logs along with the resultant N values for each test. Where a refusal (N>50) was

encountered the total number of blows over the total penetration distance is recorded.

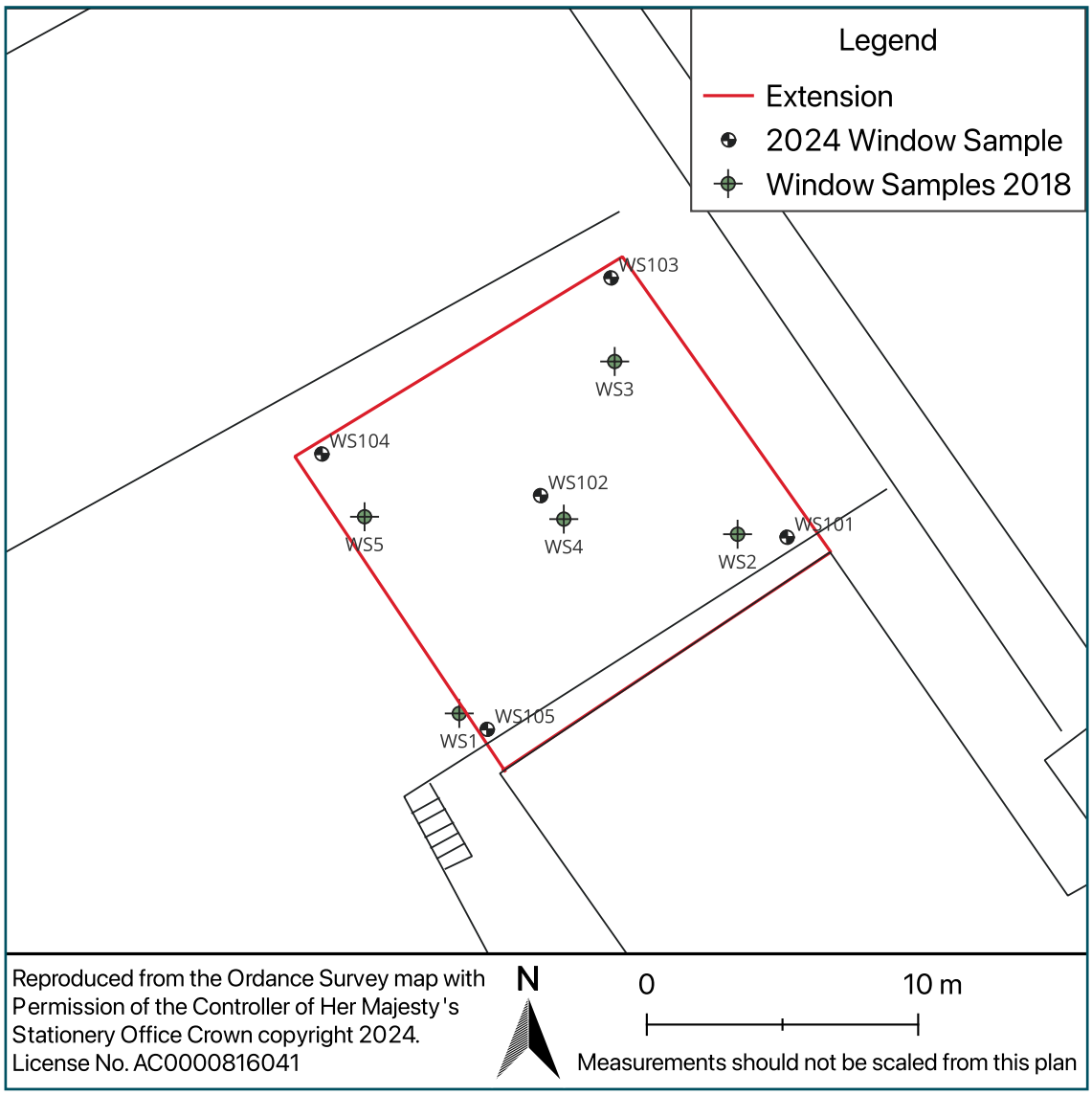


FIGURE 3 - EXPLORATORY HOLE PLAN

Previously during the 2018 investigation five window sample holes, designated as WS1 to WS5, were undertaken across the area of the proposed extension, the approximate locations of which are also shown on Figure 3.

8.5. Monitoring Installations

To facilitate contemporary post-investigation monitoring of the underlying ground gas and groundwater regimes, four gas monitoring standpipes were installed in exploratory holes; see Figure 2. The individual installation details are shown on the relevant logs for each exploratory hole, with monitoring standpipes installed in WS101 to WS104.

None of the previously installed monitoring standpipes from the 2018 site investigation had remained, with the standpipes having been removed since.

Gas monitoring using a Gas Data GFM436 gas monitor was scheduled for six post-investigation visits, of which five have been undertaken to date. On completion of the remaining monitoring visits an ground gas risk assessment will be undertaken to determine whether any further monitoring is deemed necessary, and the requirement for any special ground gas protection measures to be installed in any proposed new buildings.

9. LABORATORY TESTING

Geotechnical laboratory testing was undertaken by Professional Soils Laboratory Ltd (PSL) in accordance with BS1377. To assess the geotechnical characteristics of the natural soils a total of five samples were sent to PSL for Plasticity Index (Atterberg Limits) testing, with natural moisture content testing carried out on the remainder of samples of natural soils obtained for comparison with the plasticity index testing results. The geotechnical testing results are summarised on Table 1 in Appendix B and depicted on Figure 6.

Samples were also sent to Chemtech Environmental Ltd for chemical analysis for a range of metals, polycyclic aromatic hydrocarbons (PAH) and banded petroleum hydrocarbons (TPH CWG). See Tables 2A to 2C in Appendix B. The testing was undertaken to assess potential risks to human health based receptors as part of the proposed redevelopment of the site.

All of the laboratory testing results certificates are included in Appendix D.

10. GROUND CONDITIONS

The ground conditions encountered are recorded in detail in the exploratory logs appended to this report (Appendix C) and summarised on a geological section, Figure 4. Any diagram of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance purposes only. If deemed critical confirmation of intermediate ground conditions should be sought.

Tarmac was present from the surface in all five window sample holes, to a maximum depth of 0.22m bgl. Underlying the tarmac, gravel of limestone hardcore was found to a maximum depth of 0.80m bgl.

Additional made ground was encountered beneath the limestone hardcore in WS101, WS103 and WS104, comprising of both granular and cohesive soils. In WS104, the made ground extended beyond the base of the borehole at 5.45m bgl, and comprised loose black gravelly sand. However, adjacent 2018 borehole WS5 only recorded 2.00m of made ground suggesting that the deeper made ground in WS104 is only likely to be localised.

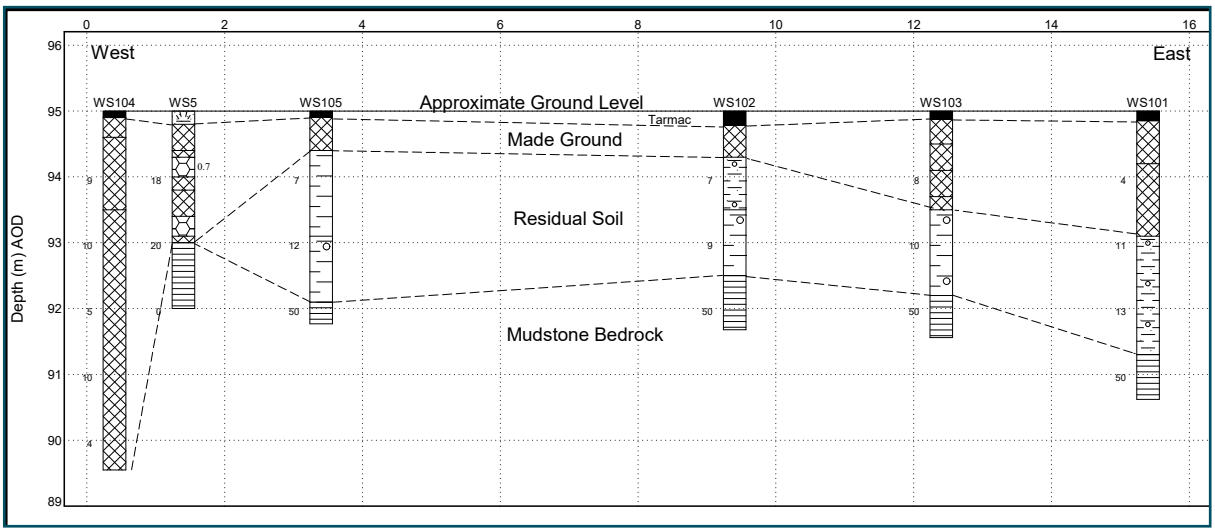


FIGURE 4 - GEOLOGICAL SECTION

Beneath the made ground the window sample holes encountered very stiff clay soils to depths ranging between 2.50m bgl and 3.70m bgl.

As shown on Figure 6, geotechnical index testing on three samples of the residual soils recorded the natural moisture content of the soils to be around the plastic limit values; plasticity index values of the clay ranged from 24% to 54%, equating to classification of medium to high volume change potential in accordance with NHBC Ch.4.2. “Building Near Trees”. Summarised on Figure 5, SPT N values in the clay soils ranged from N7 to N13.

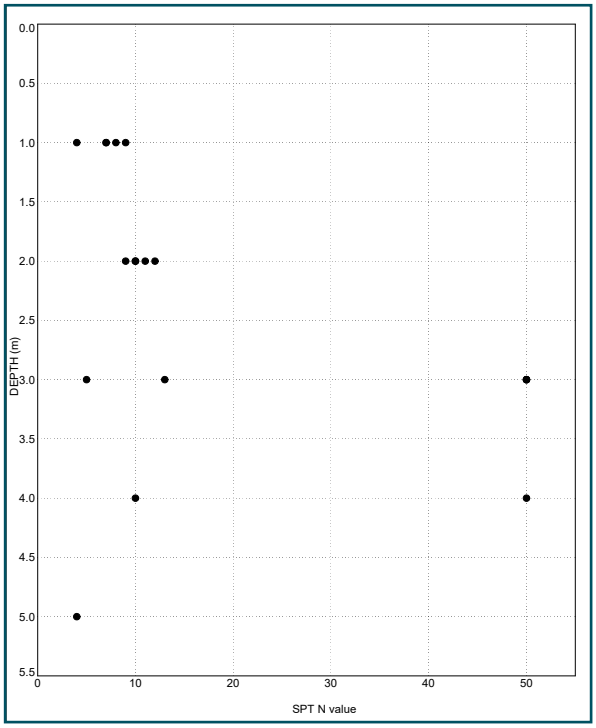


FIGURE 5 - N VALUE VS DEPTH GRAPH

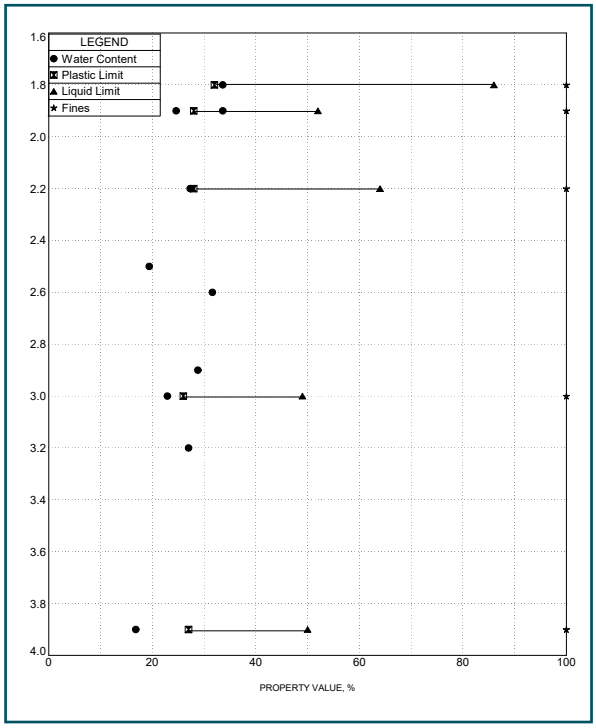


FIGURE 6 - INDEX PROPERTIES VS DEPTH GRAPH

Mudstone bedrock was recorded below the residual soils in four of the window sample holes (WS104 did not encounter bedrock), in which all of the window sample holes refused and noticeable increases in SPT N value were recorded. Geotechnical index testing was undertaken on two samples of the mudstone bedrock which both recorded plasticity value of 23%; classifying as medium volume change potential in accordance with NHBC Ch.4.2.

Where close to the interface between residual soils and weathered mudstone the natural moisture content values were noted to be higher than deeper samples of the weathered mudstone bedrock.

Groundwater was not encountered during the investigation, however on subsequent monitoring visits water levels were recorded to range between 2.64m - 3.74m bgl at the base of the residual soil. It is likely that this is perched water that became trapped in the monitoring wells throughout the course of the monitoring.

11. GEOTECHNICAL CONSIDERATIONS

11.1. General

An outline plan was available when completing this report. It has been assumed that an extension to the existing hotel is to be constructed at, or close to, existing ground levels. The proposed ground loadings were not know but for the purposes of this report are assumed to be less than 150kN/m. If there are changes to these proposals, then some modification to the comments and recommendations given may be required.

11.2. Mining Precautions

Extensive fireclay and coal workings associated with the Soft Bed coal seam are understood to underlay the site, which will require treatment by drilling and grouting on a 3m x 3m grid around the footprint of the proposed extension. Significant voiding was identified and treated as part of the c.2010 extension of the main hotel building. Hence the risk to the site from shallow historical mining, if left untreated, is considered to be **very high**.

Whilst we do not interpret the workings identified to be primarily for coal, before commencement of any works that could intersect either intact coal or associated mine workings, a permit to drill will need to be obtained from the Mining Remediation Authority (previously called the Coal Authority) to undertake the proposed scope of drilling and grouting works.

Due to concerns about displacing mine gasses the drill and grout holes will need to be drilled using full water flush.

The drill logs from the previous investigation prior to treatment show the voids were encountered below 6m bgl and above 10.8m bgl, typically 1.2m thick. The ground levels at the time of drilling are unknown.

Grouting of workings on a hillside can impede the flow of groundwater, with groundwater becoming impounded up slope. Consideration therefore may need to be given to this effect on slope stability or retaining structures.

Retaining structures will be required as part of the new development. It is understood that the development will have a FFL (finished floor level) at the same level as the existing hotel buildings, with the existing ground level reduced by ~2.3m to an elevation of ~93.5m AOD. Subsequently the retaining wall to the south will be removed, the retaining wall to the north will need to be extended/ replaced with a 4m high wall, and a 2.3m wall will need to be installed along the western side to hold back the ground beyond. The existing retaining structure on the eastern side, currently consisting of two falls of 0.9m followed by 3.2m, may need to be lowered to become a single ~1.8m high retaining wall, or construct a ~2.3m high wall to back onto the existing walls.

Importantly the loading above the existing walls should not be increased. The proposed extension should be founded onto bedrock which falls outside the zone of influence of the eastern retaining structures. This zone of influence can be defined as the area above a 45° line which extends upwards and westwards from 1m below the observed base of the retaining wall. The extra 1m below the base represents uncertainty with regards to the true depth and geometry of the retaining wall structure, if the true depth and geometry can be ascertained then the 1m buffer could possibly be reduced.

11.3. Foundations

Having grouted the building footprint, reinforced strip footings founding at least 250mm into the undisturbed mudstone encountered between 2.50m - 3.70m bgl should provide an allowable bearing pressure of at least 150 kN/m^2 assuming a nominal acceptable settlement of up to 25mm can be tolerated by the extension.

Foundations will need to be locally deepened where disturbed ground from previous buildings / structures or deep made ground is present, such as in the area of the retaining walls and WS104. Plasticity testing indicate the mudstone bedrock to have a medium volume change potential.

Foundations may also need to be locally deepened where trees are or have been present, as indicated by rootlets within the natural clay in previous window sample holes WS1 and WS2. Hence, the residual clay is not considered an appropriate founding strata.

Reinforced footings should be designed to span a potential collapse of roof rock and shafts.

An alternative founding option would be to use sleeved bored piles founding on the undisturbed bedrock below the workings. An ultimate skin friction of between 250 and 311kN/m^2 (Tomlinson) can be assumed with a deformation modulus (Ed) of 50MN/m^2. To limit negative skin friction the annulus between the pile and bedrock above the workings should be filled with a 10 to 15kN/m^2 grout.

If greater loadings were required then further investigation of the underlying strata would need to be undertaken.

Consideration needs to be given to the potential for differential movement between the existing hotel building and the proposed extension. Ideally the extension should be founded on the same founding strata as the existing building, however the founding strata of the exiting hotel building is unknown. Movement joints will need to be considered where the proposed extension joins the existing building, to accommodate for any differential settlement that may occur. If the existing building is founded above open untreated workings, the area below the existing building should be treated by drilling and grouting. In which case, conventional drill and grout methods may not be suitable due to access and disturbance issue, so expanding polymer grouting may be more appropriate.

Foundations should not be installed within the zone of influence of the retaining walls, as discussed in section 11.2 as this may cause additional loading to retaining structures.

11.4. Floor Slabs

With greater than 600mm of made ground is present across the site, suspended floors are recommended unless a structural engineer designs floor slabs to account for potential differential movement, or any made ground is excavated down to natural soils and replaced with compacted select granular fill.

11.5. Hardstanding Areas

Any new hardstanding will need to be constructed on re-engineered material. For design purposes a CBR of 2.5% may be assumed provided that the formation is proof rolled and any soft spots are removed.

11.6. Drainage & Excavatability

Some difficulties in excavation of trenches for sewers and foundations in the made ground and bedrock should be anticipated. Consideration should be given to providing safe temporary support of excavations within made ground or where greater than 1.20m deep.

Due to the ground conditions encountered, soakaways are not suitable for this site. Attenuation and off-site drainage will therefore need to be considered. All drainage measures will need to be designed in accordance with Sustainable Drainage Systems (SuDS) requirements.

11.7. Chemical Precautions

To assess the potential for chemical attack of any buried concrete substructures by the existing soils, sulphate and pH testing was undertaken on six samples of the made ground as part of the chemical analysis suite indicate that Class DS-1 (ACEC Class AC-1s) can be used on this site in accordance with BRE Special Digest 1:2005.

11.8. Ground Source Heating

Providing space heating and hot water using ground source heating could be considered for this site. If this method of heating is being proposed then a further assessment of the site and its underlying geology would be required to determine the most efficient ground loop configuration for the required heat load of the proposed building(s).

12. ENVIRONMENTAL RISK ASSESSMENT

Contaminated Land is defined under Part 2A of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995. This supports a 'suitable for use' based approach to the risk assessment of contaminated land. The evaluation is based on an assessment of plausible pollutant linkages, referred to as the **source - pathway - receptor** model, based on the current or proposed use of the site.

A **pollutant linkage** is the relationship between a contaminant, a pathway and a receptor. Unless all three elements are present there is not considered to be a potential pollutant linkage.

However, where a potential pollutant linkage is deemed to be present, the resultant risk is based on the consequence should the event occur, and the probability that the event will occur, as outlined in CIRIA C552. A tabulated summary of the resultant risk matrix is provided below for contextual purposes.

		Consequence (C)			
		Severe	**Medium**	**Mild**	**Minor**
Probability (P)	**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

RISK MATRIX FOR ENVIRONMENTAL RISK ASSESSMENT (BASED ON CIRIA C552)

Part 2A states that for land to be defined as Contaminated Land by the Local Authority it needs to be in such a condition that:

- Significant harm is being caused, or there is significant possibility of such harm being caused.
- Pollution of controlled waters is being caused, or likely to be caused.

12.1. Proposed Site Use

We understand that the current development proposal is for an extension of the current hotel. A proposed layout plan is included in Appendix A.

The surface of the site will be entirely covered by hardstanding and buildings which will break potential pathways between any underlying contaminants and site users.

There is a potential for construction workers to come into contact with existing soils on a short term basis, and standard precautionary measures should be employed to reduce the potential for dermal contact and/or inhalation of dust or vapours. Good hygiene practises and facilities should also be provided as a standard precautionary measure.

Based on the proposed end use of the site the chemical test results have been compared against Soil Guideline Values for a commercial land use scenario when carrying out a Generic Quantitative Risk Assessment (GQRA) to identify any potential significant risks to potential receptors.

12.2. Potential Pathways

- Dermal contact (indoor and outdoor).
- Ingestion of soil and indoor dust.
- Indirect ingestion (indoor and outdoor).
- Inhalation of dust (indoor and outdoor).
- Inhalation of vapours (indoor and outdoor).
- Leaching to groundwater
- Surface water run-off.
- Director contact with concrete substructures.
- Migration through the ground (vertical and horizontal).

12.3. On Site Contamination

Soil chemical testing, summarised on Tables 2A and 2B, indicate that all values are below current GQRA threshold values.

Soil hydrocarbon testing results (see Table 2C) found all levels are below current Suitable 4 Use Levels (S4ULs), even for more sensitive land use scenarios.

12.4. Off Site Contamination

With all chemical levels found to be below current GQRA threshold values. The risk of potential contamination from off-site sources is deemed to be **low**.

The 2018 site investigation identified some elevated leachable PAH levels within the existing made ground soils, however this is likely due to the presence of tarmac gravel in the made ground soils and is unlikely to represent a significant potential risk given that no groundwater was encountered within the contemporary ground investigation undertaken. Consequently the overall risk to groundwater receptors is deemed to be **low** and no further investigation or risk assessment are deemed necessary.

12.5. Ground Gases

The previous report concluded that the site is not within a radon affected area as defined by the Health Protection Agency (HPA) and no radon protection measures are required to be installed in any new buildings in accordance with Building Research Establishment (BRE) document BR211.

As part of the scope of ground investigation works a minimum of six post investigation monitoring visits were scheduled. To date five have been undertaken with the remaining visit still outstanding. Once completed the gas monitoring results and associated ground gas risk assessment will be provided under separate cover. On receipt the ground gas risk assessment should be included behind Appendix F of this report for completeness.

12.6. Invasive Species

The vegetation in and around the site has been examined. No obvious signs of potential invasive plant species were noted during the site walkover undertaken. However, because weedkiller could have been applied prior to carrying out our walkover survey, not seeing any signs of invasive plants during our brief time on site cannot be a guarantee that they are not present on or around the site.

12.7. Conceptual Site Model

Using the information presented above and the **source - pathway - receptor** model, a Conceptual Site Model (CSM) has been formulated to determine whether a potentially significant pollutant linkage is perceivable and what potential risks are posed to the identified future receptor from each potential contaminant source.

The CSM is tabulated and shown graphically in Appendix E. Where required the CSM should be updated as further investigation and/or development works progress to reflect the potential risks to future receptors, especially if any previously unidentified ground conditions are encountered.

12.8. Remediation Requirements

The Generic Quantitative Risk Assessment (GQRA) undertaken indicates that remediation is not required as the risks to future receptors are sufficiently low already, particularly in light of the development proposals.

On completion of the remaining monitoring visit, a ground gas risk assessment will be be provided under separate cover, outlining the requirement (if any) for ground gas protection measures to be installed into the new extension.

12.9. Imported Soils

The development proposals do not include any designated garden or communal soft landscaping areas where future receptors could come into contact with underlying soils, that would require imported soils.

If any imported soils were required to be brought to site to facilitate the proposed development, they will need to be validated to confirm their chemical suitability, and that they do not pose a risk to future receptors. The soils should be validated in accordance with Yorkshire And Lincolnshire Pollution Advisory Group (YALPAG) guidance *"Verification Requirements for Cover Systems"* version 4.1, dated June 2021.

The scope and frequency of analysis required to validate any imported soils will be dependent on the source and/or historical setting of the source site and the volume of soils imported to site.

13. REUSE OF SOILS & WASTE DISPOSAL

Based on the development proposals it is likely that there will be a surplus of soils will be created due to differences in current ground levels across the area of the proposed extension. Based on the chemical testing results the soils could be considered for reuse if a suitable location was available, rather than disposing the soils off site.

Any waste arising from development of the site, such as excess soil or material deemed unsuitable for retention on site, should be disposed of in accordance with the Duty of Care Regulations. If any soils are being disposed directly to a landfill site Waste Acceptance Criteria (WAC) analysis may be required in addition to basic environmental screen testing to determine the most appropriate disposal facility for the waste, in accordance with the requirements of the current Landfill Directive.

14. REGULATORY APPROVAL

The conclusions and recommendations in this report are based on a review of available information and observations made during the site walkover survey undertaken. The conclusions cannot be guaranteed to gain regulatory approval if this report is required as part of a planning application. If it is required as such it should be passed to the relevant regulatory bodies for their comment and approval.

15. FURTHER INVESTIGATION

The information obtained during the intrusive ground investigation undertaken would suggest that further investigation is not deemed necessary to further refine the potential risks to future receptors.

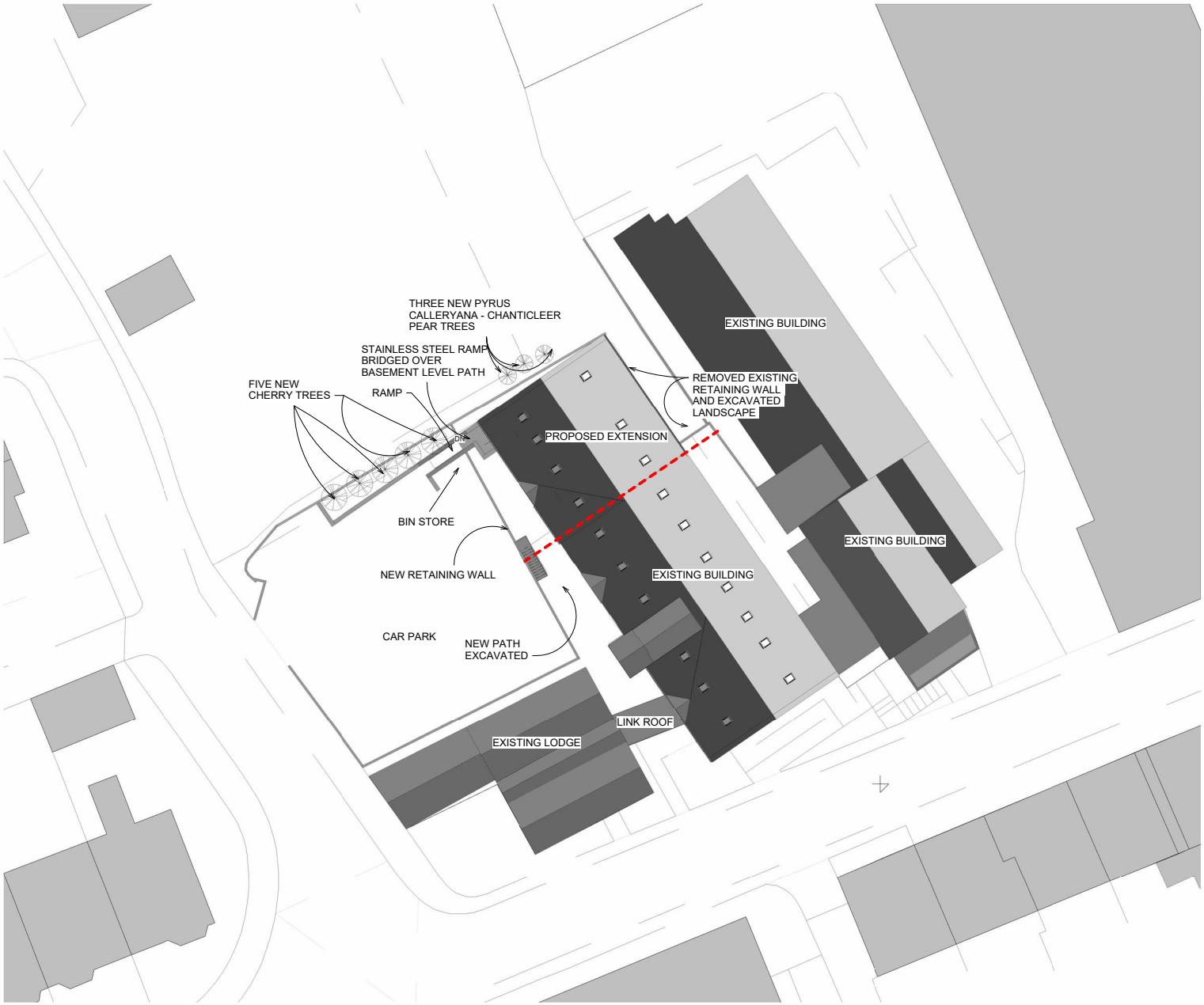
If any unexpected ground conditions or signs of potential unidentified contamination are encountered during earthworks then further geo-environmental advice should be

sought and any additional risk assessment undertaken as required to assess the potential risks to future receptors.

Based on the findings of the drilling and grouting operation for the adjacent main hotel building, drilling and grouting of shallow mine workings will be required beneath the proposed extension, to substantially fill any shallow workings in the Soft Bed Coal seam and associated fireclay. A permit to drill will need to be obtained from the Mining Remediation Authority before undertaking any remediation works that will intersect coal seams or associated coal mine workings.

It would be prudent to include for a geotechnical engineer or structural engineer to be present on site when excavation works are undertaken in the vicinity of WS104 to confirm the depth to suitable founding stratum and the potential extent of any localised deepening of made ground in this area.

APPENDIX A - PROPOSED LAYOUT DRAWINGS



1 Proposed Site Plan
1 : 200

North

GRAPHIC SCALE: 1:100

rev	description	drwn	auth	date
A	Beech trees replaced with pear trees	GH	JC	16.01.24

DO NOT SCALE OFF THIS DRAWING

ACUMEN
Designers & Architects
acumenarchitects.co.uk 01484 546 000
Headrow House, Old Leeds Road, Huddersfield, Huddersfield HD1 1SG

Client: CAMBRIDGE ROAD HOTEL

Project: 4 CLARE HILL, HUDDERSFIELD, HD1 5BS

Project No	Drawing No	Rev
2873	(100)04	A

Description: PROPOSED SITE PLAN

Scale	Date Drawn	Drawn By	Authorised By
1 : 200 @ A1	NOV 23	GH	JC

Purpose of Issue: Planning ⊗ Building Regs ○ Tender ○ Construction ○ Comment ○ Info ○

APPENDIX B - TESTING SUMMARY TABLES

Exploratory Hole	Depth (m bgl)	Water Content (%)	Liquid Limit - LL (%)	Plastic Limit - PL (%)	Plasticity Index - IP (%)	Passing 0.425mm (%)	Modified Plasticity - IP' (%)	PSD D_{60}	PSD D_{10}	Dry Density (Mg/m^3)	Bulk Density (Mg/m^3)
WS101	2.20	27.3	64	28	36	100	36				
WS101	3.20	27									
WS101	3.90	16.8	50	27	23	100	23				
WS102	1.90	24.6	52	28	24	100	24				
WS102	2.60	31.6									
WS103	1.90	33.6									
WS103	2.90	28.8									
WS105	1.80	33.6	86	32	54	100	54				
WS105	2.50	19.4									
WS105	3.00	22.9	49	26	23	100	23				

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GEOTECHNICAL RESULTS SUMMARY

Client: Cambridge Hotel

Project: Cambridge Hotel, Huddersfield

Number: 714200

TABLE 1

Commercial

			Toxic										Phytotoxic			Organics		Other			
Hole Ref.	Depth (m)	Date	Arsenic As	Beryllium Be	Cadmium Cd	Chromium (III) Cr	Chromium (VI) Cr	Lead Pb	Mercury Hg	Selenium Se	Nickel Ni	Vanadium V	Copper Cu	Boron B	Zinc Zn	SOM	Phenols	Cyanide (total) Cn	Asbestos	Sulphate g/l	pH (units)
WS101	1.20		-	-	-	-	-	-	-	-	-	-	-	-	-	3.43	-	-	N.D	-	7.1
WS102	0.90		-	-	-	-	-	-	-	-	-	-	-	-	-	2.34	-	-	N.D	-	5.2
WS103	0.70		-	-	-	-	-	-	-	-	-	-	-	-	-	2.97	-	-	N.D	-	7.0
WS104	0.70		-	-	-	-	-	-	-	-	-	-	-	-	-	7.57	-	-	N.D	-	5.1
WS104	2.10		-	-	-	-	-	-	-	-	-	-	-	-	-	41.1	-	-	N.D	-	5.9
WS105	0.90		-	-	-	-	-	-	-	-	-	-	-	-	-	3.64	-	-	N.D	-	4.8
Number			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		6	6
Average			16.25	1.78	1.60	47.93	0.04	59.47	0.72	3.00	30.95	47.32	38.42	0.75	136.58	10.18	0.50	1.00		0.10	5.85
Minimum			5	1	1.6	33.3	0.04	2.3	0.7	3	2.1	1.8	1.6	0.6	4	2.34	0.5	1		0.0254	4.8
Maximum			44.3	2.5	1.6	66.1	0.04	173	0.8	3	51.4	83.2	81.2	0.96	362	41.1	0.5	1		0.261	7.1
Standard Dev			14.81	0.53	0.00	11.25	0.00	62.76	0.04	0.00	17.46	27.58	26.10	0.16	120.15	15.26	0.00	0.00		0.09	1.00
US95			28.4		1.6			111.1	0.8	3.0	45.3		59.9	0.9	235.4		0.5	1.0		0.2	6.7
Source: LQM S4UL 2015			640	12	190	8600	33	2300	1100	12000	980	9000	68000	240000	730000	%	31000	50		0.5	5 to 9
			640 CS4L		410 CS4L		49 CS4L	6000 CS4L										DUTCH		BRE	

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Notes:

1. Levels expressed as mg/kg (ppm) unless stated.
2. Soil guideline values are for Commercial.
3. Tested levels below S4UL are shown as -
   For actual result see certificate sheet.

CHEMICAL RESULTS ASSESSMENT

Client: Cambridge Hotel

Project: Cambridge Hotel, Huddersfield

Number: 714200

TABLE 2A

Residential With Homegrown Produce (RwHP)

			Probable carcinogens (2)			Possible carcinogens (2)													
Exploratory Hole	Depth (m)	Soil Organic Matter (%)	Benzo (a) Anthracene	Dibenzo (a,h) Anthracene	Benzo (a) Pyrene	Chrysene	Benzo (b&k) Fluoranthene	Indeno (1,2,3-cd) Pyrene	Fluorene	Phen-anthrene	Pyrene	Acenaph-thylene	Benzo (g,h,i) Perylene	Acenaphthene	Anthracene	Naphthalene	Fluoranthene	Carcinogenic PAH Total	PAH 16 Total
WS101	1.20	3.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.280
WS102	0.90	2.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.65	1
WS103	0.70	2.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.36	11.4
WS104	0.70	7.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.280
WS104	2.10	41.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.460
WS105	0.90	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.58	0.691
Number			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		6
Average				0.04	0.18	0.22	0.37	0.13	0.03	0.26	0.33	0.02	0.11	0.04	0.07	0.04	0.38		2.35
Minimum			0.012	0.017	0.019	0.028	0.045	0.019	0.013	0.014	0.016	0.015	0.019	0.013	0.017	0.016	0.017		0.280
Maximum			1.09	0.145	0.860	1.13	1.57	0.563	0.109	1.14	1.70	0.036	0.443	0.155	0.324	0.137	2.01		11.4
Standard Dev			0.43	0.05	0.33	0.44	0.60	0.22	0.04	0.44	0.67	0.01	0.17	0.06	0.13	0.05	0.80		4.44
US95				0.1	0.5	0.6	0.9	0.3	0.1	0.6	0.9	0.0	0.3	0.1	0.2	0.1	1.0		6.0
Source: LQM S4UL 2015			7.2	0.24	2.2 5.0	15	2.6	27	170	95	620	170	320	210	2400	2.3	280		

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Notes:
1. Levels expressed as mg/kg (ppm) unless stated.
2. International Agency for Research on Cancer (IARC) classifications
3. Soil guideline values are for RwHP.
4. Tested levels below S4UL are shown as -
   For actual result see certificate sheet.
5. Levels presented for SOM 1% -
   Higher concentrations may be permissible

PAH RESULTS ASSESSMENT

Client: Cambridge Hotel

Project: Cambridge Hotel, Huddersfield

Number: 714200

TABLE 2B

Residential With Homegrown Produce (RWHP)

			Aliphatic							Aromatic						
Hole Ref.	Depth (m)	Date	Aliphatic C5-C6 mg/kg	Aliphatic C6-C8 mg/kg	Aliphatic C8-C10 mg/kg	Aliphatic C10-C12 mg/kg	Aliphatic C12-C16 mg/kg	Aliphatic C16-C21 mg/kg	Aliphatic C21-C35 mg/kg	Aromatic C6-C7 mg/kg	Aromatic C7-C8 mg/kg	Aromatic C8-C10 mg/kg	Aromatic C10-C12 mg/kg	Aromatic C12-C16 mg/kg	Aromatic C16-C21 mg/kg	Aromatic C21-C35 mg/kg
WS101	1.20	11/10/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WS102	0.90	11/10/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WS103	0.70	11/10/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WS104	0.70	11/10/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WS104	2.10	11/10/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WS105	0.90	11/10/2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number			6	6	6	6	6	6	6	6	6	6	6	6	6	6
Average			0.10	0.10	0.10	1.05	0.88	0.87	4.00	0.01	0.01	0.01	0.90	2.12	2.88	8.08
Minimum			0.1	0.1	0.1	1	0.5	0.7	4	0.01	0.01	0.01	0.6	1	2	11.1
Maximum			0.10	0.10	0.10	1.3	2.7	1.7	4	0.01	0.01	0.01	1.8		7.3	4.5
Standard Dev			0.00	0.00	0.00	0.12	0.89	0.41	0.00	0.00	0.00	0.00	0.50	1.79	2.16	6.39
US95																
Source: LQM S4UL 2015			42	100	27	130 (48)v	1100 (24)	65000* (8.48)	65000* (8.48)	70	130	34	74	140	260	1100

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Notes:
1. Levels expressed as mg/kg (ppm) unless stated.
2. Soil guideline values are for RwHP.
3. Tested levels below S4UL are shown as -
   For actual result see certificate sheet.
4. Levels presented for SOM 1% -
   Higher concentrations may be permissible
5. * Combined analysis for C16 to C35 < 65000 mg/kg

TPH RESULTS ASSESSMENT

Client: Cambridge Hotel

Project: Cambridge Hotel, Huddersfield

Number: 714200

TABLE 2C

APPENDIX C - EXPLORATORY HOLE LOGS

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WINDOW SAMPLE LOG

Abbeydale Geoscience

Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS101
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,262.0 N 417,388.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				94.85		0.15	MADE GROUND. Black tarmac.		
				94.20		(0.65) 0.80	MADE GROUND. Grey sandy gravel. Gravel is fine to coarse, subangular of limestone hardcore.		
0.60	J								
1.00-1.45	CPT	N4 1,1/1,1,1,1		93.10		(1.10) 1.90	MADE GROUND. Grey and brown sandy gravelly clay. Gravel is fine to coarse, subangular of mudstone and wood.		
1.20	J								
2.00-2.45	CPT	N11 2,1/2,3,2,4		91.30		(1.80) 3.70	Very stiff orange-brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular mudstone.		
2.20	D								
2.80	P	3.0+ kg/cm2							
3.00-3.45	CPT	N13 1,2/2,3,3,5					Becoming grey and brown mottled from 3.10m bgl.		
3.20	D								
3.90	D						Extremely weak orange-brown and dark brown MUDSTONE, recovered as coarse angular gravel.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Monitoring standpipe installed to 4.00m bgl.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

ABEC WINDOW SAMPLE 714200.GPJ ABEC TEMPLATE.GDT 22/11/24

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WINDOW SAMPLE LOG

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Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS101
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,262.0 N 417,388.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00-4.38	CPT	N50 6,8/11,17,17,5 for 10mm		90.62		(0.68) 4.38	Extremely weak orange-brown and dark brown MUDSTONE, recovered as coarse angular gravel. *(continued)*		
							Borehole terminated at 4.38m bgl.		

Boring Progress and Water Observations					
Date	Time	Depth	Core/casing Depth	Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Monitoring standpipe installed to 4.00m bgl.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

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WINDOW SAMPLE LOG

Abbeydale Geoscience

Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS102
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,256.0 N 417,387.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				94.78		(0.22) 0.22	MADE GROUND. Black tarmac.		
0.40	J			94.30		(0.48) 0.70	MADE GROUND. Black and red-brown sandy gravel. Gravel is fine to coarse, subangular of brick, limestone and clinker.		
0.90	J			93.50		(0.80) 1.50	Very stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse, subangular of mudstone.		
1.00-1.45	CPT	N7 1,1/2,2,1,2							
1.70	Pen	3.0+ kg/cm2		92.50		(1.00) 2.50	Very stiff brown gravelly CLAY. Gravel is fine to coarse, subangular of mudstone.		
1.90	D								
2.00-2.45	CPT	N9 1,2/2,2,2,3							
2.60	D			91.68		(0.82) 3.32	Dark grey MUDSTONE. Recovered as slightly clayey fine to coarse angular gravel.		
3.00-3.32	CPT	N50 2,2,20,20,10 for 20mm							
							Borehole terminated at 3.32m bgl.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Monitoring standpipe installed to 3.00m bgl.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

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WINDOW SAMPLE LOG

Abbeydale Geoscience

Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS103
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,259.0 N 417,395.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				94.88		0.12	MADE GROUND. Black tarmac.		
0.30	J			94.50		(0.38) 0.50	MADE GROUND. Grey gravel. Gravel is fine to coarse, subangular of Limestone Hardcore.		
0.70	J			94.10		(0.40) 0.90	MADE GROUND. Brown and red-brown sandy gravel. Gravel is coarse, subangular of brick and wood.		
1.00-1.45	SPT	N8 2,2/2,2,2,2		93.70		(0.40) 1.30	MADE GROUND. Stiff gravelly clay. Gravel is fine to coarse, subangular of mudstone.		
1.10	J			93.50		(0.20) 1.50	MADE GROUND. Brown gravel. Gravel is fine to coarse, subangular of brick.		
1.40	J								
1.80	Pen	2.5kg/cm2					Very stiff orange-brown and grey mottled gravelly CLAY. Gravel is fine to coarse, subangular of mudstone.		
1.90	D								
2.00-2.45	SPT	N10 2,2/2,2,3,3		92.20		(1.30) 2.80			
2.90	D						Yellow-brown and grey mottled MUDSTONE. Recovered as fine to coarse, subangular gravel.		
3.00-3.44	SPT	N50 2,2/6,10,14,20 for 60mm		91.56		(0.64) 3.44			
							Borehole terminated at 3.44m bgl.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Monitoring standpipe installed to 3.00m bgl.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

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WINDOW SAMPLE LOG

Abbeydale Geoscience

Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS104
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,247.0 N 417,389.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				94.90		0.10	MADE GROUND. Black tarmac.		
0.20	J			94.60		(0.30) 0.40	MADE GROUND. Grey gravel. Gravel is fine to coarse, subangular of Limestone Hardcore.		
0.70	J						MADE GROUND. Yellow-brown and red-brown sandy gravel. Gravel is fine to coarse, subangular of brick.		
1.00-1.45	SPT	N9 2,1/2,2,2,3		93.50		(1.10) 1.50			
2.00-2.45	SPT	N10 2,2/2,3,3,2					MADE GROUND. Black gravelly sand. Gravel is fine to coarse, subangular of mudstone.		
2.10	J								
3.00-3.45	SPT	N5 3,1/2,1,1,1				(3.95)			
3.10	J								

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Monitoring standpipe installed to 5.00m bgl.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

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WINDOW SAMPLE LOG

Abbeydale Geoscience

Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS104
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,247.0 N 417,389.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
4.00-4.45	SPT	N10 4,3/2,1,2,5					MADE GROUND. Black gravelly sand. Gravel is fine to coarse, subangular of mudstone. *(continued)*		
4.10	J								
5.00-5.45	SPT	N4 1,1/1,1,1,1							
				89.55		5.45			
							Borehole terminated at 5.45m bgl.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Monitoring standpipe installed to 5.00m bgl.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

ABEC WINDOW SAMPLE 714200.GPJ ABEC TEMPLATE.GDT 22/11/24

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WF1 5EF
Tel: 01924 376622
www.abbeydalegeo.com

WINDOW SAMPLE LOG

Abbeydale Geoscience

Project				HOLE No
Cambridge Hotel, Huddersfield, West Yorkshire				WS105
Job No	Date	Ground level (m)	Co-Ordinates (National)	
714200	11-10-24	95.00	E 414,250.0 N 417,380.0	
Method/Plant Used: Archway competitor tracked window sample rig				Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				94.91		0.09	MADE GROUND. Black tarmac.		
0.40	J			94.40		(0.51) 0.60	MADE GROUND. Black andgrey sandy gravel. Gravel is fine to coarse, subangular of brick, limestone and clinker.		
0.90	J						Very stiff yellow and brown mottled CLAY.		
1.00-1.45	SPT	N7 2,1/1,2,2,2				(1.30)			
1.80	D			93.10		1.90			
2.00-2.45	SPT	N12 3,2/3,3,3,3				(1.00)	Very stiff dark grey very gravelly CLAY. Gravel is fine to coarse, subangular of mudstone.		
2.50	D			92.10		2.90			
3.00	D					(0.33)	Dark grey MUDSTONE. Recovered as slightly clayey fine to coarse angular gravel.		
3.00-3.23	SPT	N50 25 for 70mm/42,8 for 10mm		91.77		3.23			
							Borehole terminated at 3.23m bgl.		

Boring Progress and Water Observations

Date	Time	Depth	Core/casing Depth	Core/casing Dia. mm	Water Dpth

GENERAL REMARKS

CAT used prior to boring to check for underground services. Backfilled with arisings and sealed with concrete.
Stable

All dimensions in metres Scale 1:25	Client: Cambridge Hotel	Contractor: RP Drilling	Logged By: GH

ABEC WINDOW SAMPLE 714200.GPJ ABEC TEMPLATE.GDT 22/11/24

APPENDIX D - LABORATORY TESTING RESULTS

ANALYTICAL TEST REPORT

Report Number	24-02878, issue number 1
Contract name:	Cambridge Hotel, Hud
Client reference:	714200
Clients name:	Abbeydale Building Environment Consultants
Clients address:	Abbeydale Building Environment Consultants 4 Neville Street Wakefield WF1 5EF
Samples received:	15/10/2024
Analysis started:	15/10/2024
Analysis completed:	24/10/2024
Report issued:	24/10/2024

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
U/S	Sample not suitable for testing
NAD	No Asbestos Detected

Approved by: Ryan Wetherell
General Manger

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
17620	WS101	0.00 - 1.20	Brown Clayey Loam with Gravel.	-	-	13.8
17621	WS102	0.00 - 0.90	Brown Clayey Loam with Gravel.	-	-	18.9
17622	WS103	0.00 - 0.70	Brown Clayey Loam with Gravel.	-	-	12.6
17623	WS104	0.00 - 0.70	Brown Clayey Loam with Gravel.	-	-	20.9
17624	WS105	0.00 - 2.10	Black Sandy Loam with Gravel.	-	-	10.8
17625	WS106	0.00 - 0.90	Brown Sandy Loam with Gravel.	-	-	18.7

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

a	Sampling date not provided
b	Sampling time not provided (waters only)
c	Sample not received in appropriate containers
d	Storage Temperature
e	Headspace present in sample container
f	Sample exceeded sampling to reciept
g	Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
17620	WS101	0.00 - 1.20	N	
17621	WS102	0.00 - 0.90	N	
17622	WS103	0.00 - 0.70	N	
17623	WS104	0.00 - 0.70	N	
17624	WS105	0.00 - 2.10	N	
17625	WS106	0.00 - 0.90	N	

SOILS

Lab Number					17620	17621	17622	17623	17624
Sample ID					WS101	WS102	WS103	WS104	WS105
Depth (m)					0.00 - 1.20	0.00 - 0.90	0.00 - 0.70	0.00 - 0.70	0.00 - 2.10
Sampling Date					11/10/2024	11/10/2024	11/10/2024	11/10/2024	11/10/2024
Test	**Method**	**Accred**	**LoD**	**Units**					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	NAD	NAD	NAD	NAD
Metals									
Water Soluble Sulphate	CE061	M	10	mg/l	25.4	261	33.0	64.6	33.1
Water Soluble Boron	CE063	N	0.5	mg/kg	0.73	0.60	0.62	0.96	0.65
Arsenic	CE264	U	1.8	mg/kg	6.3	5.0	14.9	44.3	19.3
Beryllium	CE264	M	0.2	mg/kg	1.0	1.5	2.1	2.5	2.0
Cadmium	CE264	M	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Copper	CE264	M	1.6	mg/kg	35.8	31.6	39.6	81.2	47.5
Lead	CE264	U	2.3	mg/kg	27.0	27.4	173	90.6	32.8
Mercury	CE264	U	0.7	mg/kg	0.8	0.8	< 0.7	< 0.7	< 0.7
Nickel	CE264	M	2.1	mg/kg	32.8	25.9	51.4	33.0	46.1
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Vanadium	CE264	U	1.8	mg/kg	39.0	32.6	59.4	83.2	55.0
Zinc	CE264	M	4	mg/kg	75.3	82.5	362	137	124
Volatile Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Colourimetric									
Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Total Monohydric Phenols	CE078	N	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Cyanide	CE077	N	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	CE077	N	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium III	CE208	N	2	mg/kg	47.2	33.3	53.0	48.0	40.0
Combustion									
Moisture Content	CE001	N	0.1	%	13.8	18.9	12.6	20.9	10.8

SOILS

Soil Organic Matter	CE072	N	0.1	%	3.43	2.34	2.97	7.57	41.1
Soil Organic Matter	CE072	N	0.1	%	3.43	2.34	2.97	7.57	41.1
TPH Ali/Aro									
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5	2.7
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	< 1.0	< 1.0	5.1	< 1.0	3.6
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	< 0.7	< 0.7	< 0.7	< 0.7	1.7
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	< 2.0	< 2.0	7.3	< 2.0	< 2.0
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	< 4.5	< 4.5	19.9	< 4.5	11.1
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	< 2.0	< 2.0	4.1	< 2.0	2.7
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	1.3
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	< 0.6	< 0.6	1.8	< 0.6	1.2
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	0.137	< 0.016	0.037
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	0.031	0.036	< 0.015	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	< 0.013	0.155	< 0.013	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013	< 0.013	0.109	< 0.013	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	0.014	0.026	1.14	< 0.014	0.306
Anthracene	CE087	U	0.017	mg/kg	< 0.017	< 0.017	0.324	< 0.017	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	< 0.017	0.085	2.01	< 0.017	0.027
Pyrene	CE087	M	0.016	mg/kg	< 0.016	0.075	1.70	< 0.016	0.026
Benzo(a)anthracene	CE087	U	0.012	mg/kg	< 0.012	0.059	1.09	< 0.012	< 0.012
Chrysene	CE087	M	0.028	mg/kg	< 0.028	0.048	1.13	< 0.028	0.039
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020	0.158	1.10	< 0.020	0.025
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	0.059	0.470	< 0.025	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	0.143	0.860	< 0.019	< 0.019
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	0.153	0.563	< 0.019	< 0.019
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	0.031	0.145	< 0.017	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	0.136	0.443	< 0.019	< 0.019
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280	1.00	11.4	< 0.280	0.460
Wet Chem									
pH	CE004	M	0.1	pH units	7.1	5.2	7.0	5.1	5.9

SOILS

Lab Number					17625
Sample ID					WS106
Depth (m)					0.00 - 0.90
Sampling Date					11/10/2024
Test	**Method**	**Accred**	**LoD**	**Units**	
Asbestos					
Asbestos Identification	SUBCON	SU	0	-	NAD
Metals					
Water Soluble Sulphate	CE061	M	10	mg/l	158
Water Soluble Boron	CE063	N	0.5	mg/kg	0.94
Arsenic	CE264	U	1.8	mg/kg	7.7
Beryllium	CE264	M	0.2	mg/kg	1.6
Cadmium	CE264	M	1.6	mg/kg	< 1.6
Copper	CE264	M	1.6	mg/kg	29.0
Lead	CE264	U	2.3	mg/kg	30.7
Mercury	CE264	U	0.7	mg/kg	< 0.7
Nickel	CE264	M	2.1	mg/kg	27.2
Selenium	CE264	U	3	mg/kg	< 3.0
Vanadium	CE264	U	1.8	mg/kg	51.9
Zinc	CE264	M	4	mg/kg	110
Volatile Petroleum Hydrocarbons					
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010
Colourimetric					
Chromium VI	CE263	N	0.04	mg/kg	< 0.040
Total Monohydric Phenols	CE078	N	0.5	mg/kg	< 0.50
Total Cyanide	CE077	N	1	mg/kg	< 1.0
Free Cyanide	CE077	N	1	mg/kg	< 1.0
Chromium III	CE208	N	2	mg/kg	66.1
Combustion					
Moisture Content	CE001	N	0.1	%	18.7

SOILS

Soil Organic Matter	CE072	N	0.1	%	3.64
Soil Organic Matter	CE072	N	0.1	%	3.64
TPH Ali/Aro					
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	< 1.0
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	< 0.7
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	< 2.0
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	< 4.0
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	< 4.5
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	< 2.0
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	< 0.6
Polyaromatic hydrocarbons					
Naphthalene	CE087	M	0.016	mg/kg	< 0.016
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	0.080
Anthracene	CE087	U	0.017	mg/kg	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	0.142
Pyrene	CE087	M	0.016	mg/kg	0.124
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.086
Chrysene	CE087	M	0.028	mg/kg	0.076
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	0.076
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	0.043
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	0.033
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	0.031
Total PAH(16)	CE087	N	0.28	mg/kg	0.691
Wet Chem					
pH	CE004	M	0.1	pH units	4.8

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE267	VPH in Soil	HS-GCFID	As submitted sample
SUBCON	Asbestos Solid	HSG248	Air Dried Sample
CE061	W. Sol Metals	ICPOES	Air dried sample
CE063	Water soluble boron	ICPOES	Air dried sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample
CE263	ChromiumVI by Discrete Analyser in Solid	Gallery	Air dried sample
CE250	GCXGC in Solids	DCM Extraction and GCxGC-FID	As submitted sample
CE087	PAH in Soil	DCM Extraction and GCMS	As submitted sample
CE078	Phenols in Solids	Continuous Flow Analyser	As submitted sample
CE077	Cyanides in Solids	Continuous Flow Analyser	As submitted sample
CE208	Chromium Hexavalent in Soil	Colorimetry	Air dried sample

REPORT INFORMATION

Report No.:24-02878, issue number 1

Key	
U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix
*	ISO17025 accreditation not applicable for sample matrix
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.
Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
The results relate only to the sample received.
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.
Moisture Content Calculated on a Wet Weight basis
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying
For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt
All water samples will be retained for a period of 2 weeks from the point of Reporting
Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

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

LABORATORY REPORT

Contract Number: PSL24/7607

Report Date: 24 October 2024

Client's Reference: 714200/4372

Client Name: Abbeydale BEC
4 Neville Street
Wakefield
WF1 5EF

For the attention of: Glyn Hogg

Contract Title: Cambridge Hotel

Date Received: 17/10/2024
Date Commenced: 17/10/2024
Date Completed: 24/10/2024

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

A Watkins (Managing Director)	R Berriman (Associate Director)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	D Nicholson (Senior Technician)	T Watkins (Senior Technician)

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Doncaster,
DN4 0AR
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Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS101			2.20		Brown slightly sandy very silty CLAY.
WS101			3.20		Brown mottled grey very silty CLAY.
WS101			3.90		Brown laminated very silty CLAY.
WS102			1.90		Brown slightly sandy very silty CLAY.
WS102			2.60		Dark grey laminated silty CLAY.
WS103			1.90		Brown slightly gravelly slightly sandy CLAY.
WS103			2.90		Brown mottled grey very silty CLAY.
WS105			1.80		Brown very silty CLAY.
WS105			2.50		Grey laminated very silty CLAY.
WS105			3.00		Dark grey very silty CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Cambridge Hotel	Contract No:
	PSL24/7607
	Client Ref:
	714200/4372

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Water Content %	Linear Shrinkage	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 0.425mm %	Remarks
WS101			2.20		27.3			64	28	36	100	High Plasticity CIH
WS101			3.20		27.0							
WS101			3.90		16.8			50	27	23	100	High Plasticity CIH
WS102			1.90		24.6			52	28	24	100	High Plasticity CIH
WS102			2.60		31.6							
WS103			1.90		33.6							
WS103			2.90		28.8							
WS105			1.80		33.6			86	32	54	100	Very High Plasticity CIV
WS105			2.50		19.4							
WS105			3.00		22.9			49	26	23	100	Medium Plasticity CIM

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022
Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7
Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9
Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic

UKAS TESTING 4043

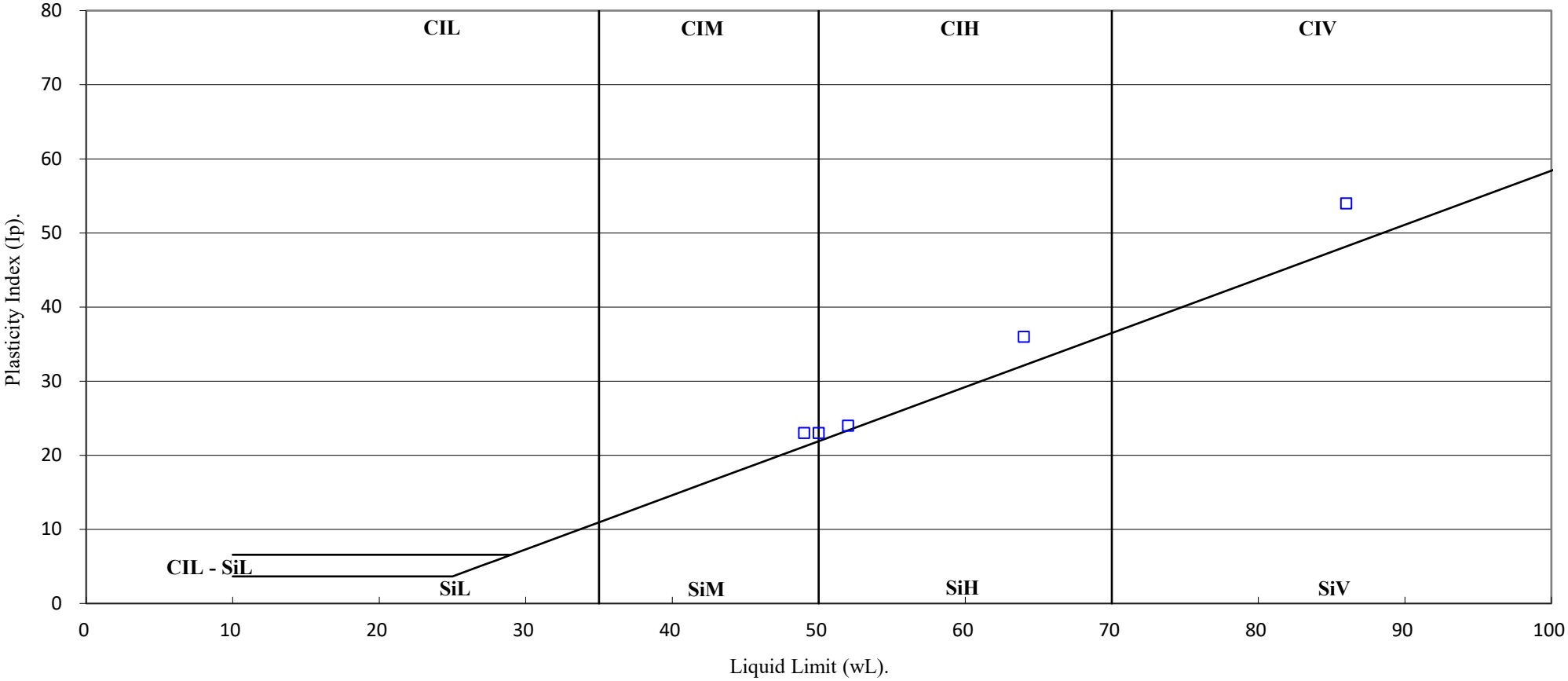
PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Cambridge Hotel

Contract No:
PSL24/7607
Client Ref:
714200/4372

PLASTICITY CHART

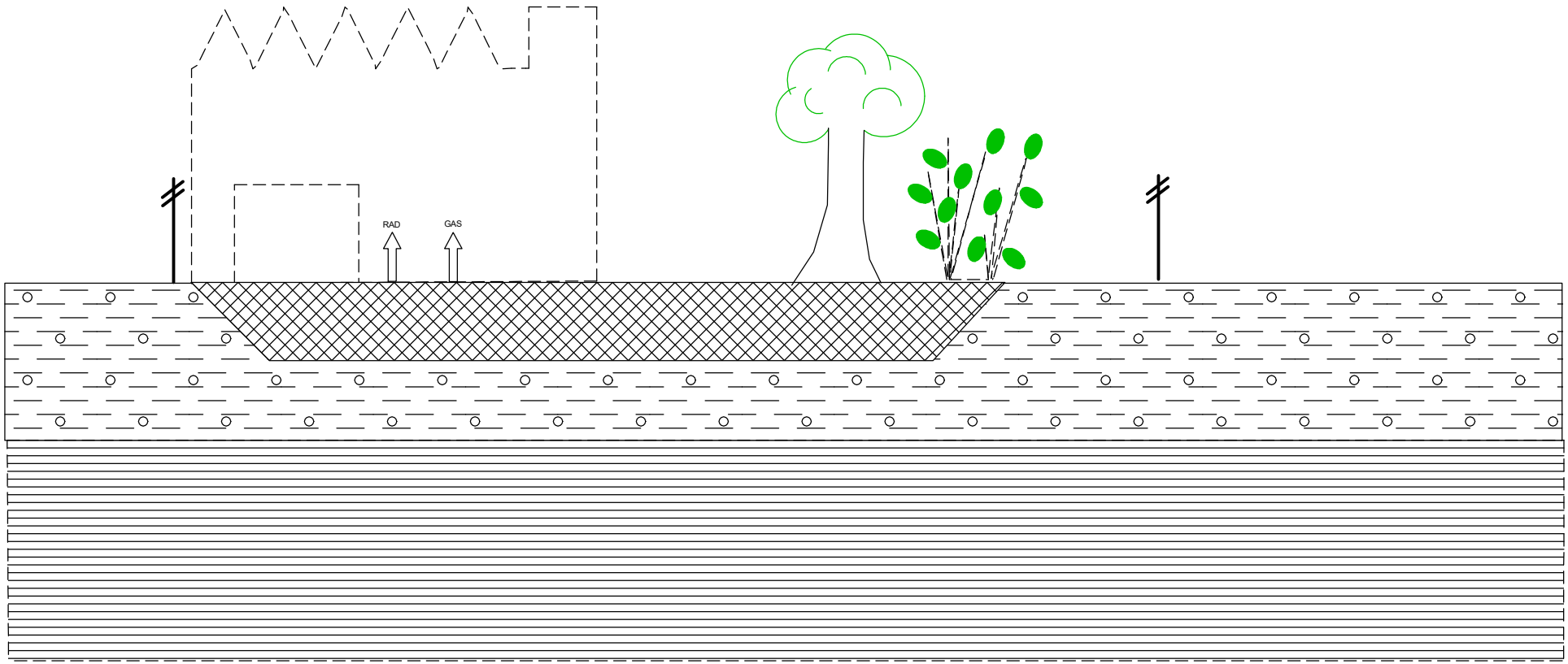
BS EN ISO 14688-2:2017 Clause 4.4



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Cambridge Hotel**	**Contract No:** **PSL24/7607** **Client Ref:**

APPENDIX E - CONCEPTUAL SITE MODEL

Commercial



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Notes:
1. Diagram not to scale. This model is schematic only and does not reflect the specific ground conditions identified on or off the site.
2. See Conceptual Model Table for further details.
3. Sloping ground not depicted. Topography is considered in report text.

CONCEPTUAL SITE MODEL

Client: Cambridge Hotel

Project: Cambridge Hotel, Huddersfield

Number: 714200

Ref.	Hazard	Source	Pathway	Receptor	Pollutant Linkage ?	Current anticipated risk (1) *	Comment	Action	Residual Risk *^
1	Heavy metals	Made Ground	Consumption of homegrown produce	Residents	✅	Low / 100%	No risks at levels present	No further action deemed necessary	Low
2	Carcinogenic PAHs	Made Ground	Consumption of homegrown produce	Residents	✅	Low / 100%	No risks at levels present	No further action deemed necessary	Low
3	TPH	Made Ground	Consumption of homegrown produce	Residents	✅	Low / 100%	No risks at levels present	No further action deemed necessary	Low
4	Sulphate	Made Ground	Direct contact	Concrete substructures	✅	Low / 100%	No risks at levels present	No further action deemed necessary	Low
5	Ground gases	Made Ground	Migration through the ground	Site users	✅	Moderate/low / 100%	Gas Monitoring Ongoing	Await recommendations in assessment letter following monitoring	Moderate/Low
6	Mine gases	Bedrock	Vertical migration through	Site users	✅	Moderate/low / 100%	Gas Monitoring Ongoing	Await recommendations in assessment letter following monitoring	Moderate/low
7	Radon	Bedrock	Vertical migration through	Site users	✅	Low / 100%	No risks at levels present	No further action deemed necessary	Low
8	Invasive plant species	Invasive plant species	Direct contact	On site buildings	✅	Low / 100%	None identified during site walkover survey undertaken	No further action deemed necessary	Low
9	Trees	On site trees	Direct contact	On site buildings	✅	Low / 100%	None identified during site walkover survey undertaken	No further action deemed necessary	Low
10	Flooding	River	Over land flow	On site buildings	✅	Low / 100%	No risks at levels present	No further action deemed necessary	Low
11	Shallow Mine Workings	Bedrock	Vertical migration through	On site buildings	✅	High / 100%	Voids encountered during previous GI	Drilling & Grouting required to stabilise mine workings	Low

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NOTES:

(1) Anticipated risk over percentage site area.

* Refer to Risk Matrix Table within report text.

^ Anticipated risk after carrying out action

CONCEPTUAL MODEL TABLE

Client : Cambridge Hotel

Project : Cambridge Hotel, Huddersfield

Job No : 714200

APPENDIX F - GAS MONITORING RESULTS