

ENVIRONMENT

Wilson Bowden Developments Ltd
Plot L Kingsway Business Park
Rochdale
Phase 2 Geo-Environmental Assessment

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Rochdale
Phase 2 Geo-Environmental Assessment

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY	
Revision Notes	Revision P2 of this report was produced to incorporate a revised Masterplan (Appendix 1). Conclusions have not changed, and the main geotechnical implications are for the layout and subsequent design of retaining structures.
Site Address	The site is located at Plot L Kingsway Business Park Rochdale in Greater Manchester, at National Grid coordinates 391359, 411650.
Site Setting and History	The site is irregular in shape, occupying approximately 4.33 hectares. The site lies between the town of Rochdale and the M62 motorway and exists as part of the development land of Kingsway Business Park. The site elevation varies between approximately 151 to 147m AOD, sloping gently from the south to the north. An unnamed ordinary watercourse crosses the site flowing from south to north in the eastern half of the site, emerging from a culvert under the adjacent Lower Lane and terminating in a ditch on the northern site boundary. The site has historically existed as agricultural fields, with an abattoir present in the south of the site and occupying the site grounds from the mid- to late-20th Century. The abattoir has since been demolished in the early 21st Century. The site is now being sought for commercial development as part of the larger development area of Kingsway Business Park. A Phase 1 desk study and Phase 2 ground investigation and report was undertaken by BWB in 2017, and this report includes a review of that data.
Published Geology	Information published by the BGS indicates the site is underlain by superficial deposits comprising Head, Peat, and Hummocky Glacial Deposits. The BGS indicates the site is underlain by bedrock deposits of the Milnrow Sandstone and Pennine Middle Coal Measures Formation. In contrast to the geological maps, the 2017 ground investigation did not encounter peat on site. The superficial and bedrock deposits are classified as Secondary A Aquifers by the Environment Agency.
Site Investigation	A ground investigation was completed between 06/03/2023 – 13/03/2023 and comprised the following works: •Non-intrusive survey of excavation locations for underground utilities; •Seven machine excavated trial pits to a maximum depth of 4.10m bgl; •Three cable percussive boreholes to a maximum depth of 10.45m bgl; •Four subsequent gas and groundwater monitoring visits; •Chemical analysis of soils; and •Geotechnical testing of soil.
Ground Conditions Encountered	The ground conditions were generally recorded as topsoil overlying the soils of Hummocky Glacial Deposits. In contrast to the geological maps, peat deposits were not encountered. Topsoil thickness ranged from 0.30m and 0.60m, with the Hummocky Glacial Deposit thickness not proven, recorded to depths of at least 10.45m bgl (depth of borehole termination). Hummocky Glacial Deposits above 141mAOD were generally soft/loose with an SPT 'N' value of less than 10, with stiffer material below 141mAOD and an SPT 'N' value around 15. Made Ground was found above natural superficial deposits in TP203, TP204, and TP206 (thicknesses ranging from 1.00m to 1.80m) and in 2018 exploratory holes TP08, TP15 and TP16 (maximum depth not proved; to 3.5m in TP16, but typically less than 0.8m depth). It is generally seen in the south and east of the site, but is not thought to be laterally consistent. Bedrock was not encountered during the investigation.

EXECUTIVE SUMMARY	
	Groundwater is perched on clay layers and at the surface, and a water table is present around 148.5mAOD in the south-east, falling to around 145.5mAOD towards the north-west.
Geotechnical Appraisal	Ground conditions are soft/loose and compressible to around 141mAOD, and ground improvement will be required under structures, ground bearing slabs, and heavily loaded areas. Vibro stone columns or rigid inclusions are considered suitable. Soft organic material was present, but only encountered in one trial pit (TP15, to 2.05m depth), located next to the stream and is not expected to be widespread. Most material is anticipated to be suitable for re-use as fill. Cut/fill works will likely need temporary groundwater control to manage, including dewatering. Surface conditions are soft and wet. Water content of site won material likely exceeds optimum moisture content and stabilisation may be required in combination with strict ground and surface water control. Most of the site-won material will likely be natural material plus localised Made Ground and be suitable for re-use as engineered fill subject to confirmatory testing and control of water content. Use of the Materials Management Plan (MMP)) route will be needed for site-won material re-use. Proposed slope angles of 1:3 are reasonable to assume in cut and fill outside of soft organic areas or Made Ground, subject to site-specific analysis. Local retaining structures up to 1.5m height supporting soil slopes are also expected to be feasible subject to design. There is potential for concrete obstructions from demolished buildings and potentially existing drainage pipes (concrete encountered in TP08 and TP205). Design Sulphate Class DS-1 and ACEC Class AC-1 should be adopted when considering the most appropriate type of concrete to be used at the site.
Environmental Appraisal	No significant soil contamination has been identified such as could represent a risk to human health and control waters. Ground gas monitoring followed by a ground gas assessment has indicated that the west of the site is classified as CS2 whereby ground gas protection measures are required. The east of the site is classified as CS1 and ground gas protection measures are not required.
Recommendations	Allowance should be made for temporary shoring of excavations due to likely stability issues associated with running sands. Contingency for groundwater control and use of lime/cement to achieve compaction requirements should be considered. It is recommended construction works are not carried out in winter months (between October and April). Installing a land drain system in advance of construction to assist groundwater drainage in the south east of the site should be considered. Feasibility will depend on whether a suitable outlet can be identified, and whether drains may be installed from existing level such that they will be below proposed or estimated platform level. Ground improvement measures will be required to support the proposed structures and loaded areas. Retaining structures will be required on the site boundary in some areas, and design of these measures will need to take existing spatial constraints into account, as well as careful assessment of construction sequencing.
This summary should be read in conjunction with BWB's full report (ref.PLK-BWB-ZZ-XX-RP-YE-0003_Ph2) and reflects an assessment of the Site based on information received by BWB at the time of production.	

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1. INTRODUCTION

Instruction

- 1.1 BWB Consulting (BWB) was instructed by Wilson Bowden Developments Ltd (the Client) to carry out a Phase 2 Geo-Environmental Assessment. Details of the project brief are included in BWB proposal reference 230215/P0/0001/222009/MH/AFB dated March 2023.
- 1.2 This Phase 2 Geo-Environmental Assessment report relates to the proposed erection of four industrial units/warehouses (Classes E(g)(iii), B2 and B8) with ancillary office space, new access, car parking, servicing, boundary treatments, hard and soft landscaping, drainage works and other associated development (see proposed plan attached).
- 1.3 The proposed development Masterplan is included in **Appendix 1** of this report.

Previous Reports

- 1.4 The following geo-environmental reports have previously been completed for the site in relation to a previous WBD scheme:
 - 'Phase 1 and Phase 2 Geo-Environmental Assessment' by BWB Consulting Ltd for Wilson Bowden Developments Ltd, reference HLK-BWB-ZZ-XX-EN-RP-YE-0001_CombinedPh1Ph2_P1, dated June 2017.
 - It is understood that the Client has reliance on the above reports and therefore pertinent information has been included within this report. It is presented in **Appendix 2** of this report.
- 1.5 The 2017 ground investigation was completed between 8th May and 7th June 2017 and comprised:
 - Non-intrusive survey of excavation locations for underground utilities;
 - Seventeen machine excavated trial pits to a maximum depth of 4m below ground level (mbGL);
 - Three cable percussive boreholes to a maximum depth of 10.45m bgl;
 - Four subsequent gas and groundwater monitoring visits;
 - Chemical analysis of soils; and
 - Geotechnical testing of soil.
- 1.6 Exploratory hole locations for the 2017 ground investigation are shown on **Drawing 2** of this report.

Objectives

- 1.7 This report comprises a Phase 2 Geo-Environmental assessment and incorporates a review of the 2017 Phase 1 and Phase 2 geo-environmental assessment for the purposes of the current scheme.

- 1.8 The desk study element of this report (**Sections 3 to 6**) has been completed to present pertinent information into the environmental risks and liabilities associated with the site. It has been completed to fulfil the requirements of a preliminary risk assessment in accordance with BS10175: 2011+A2:2017 'Investigation of Potentially Contaminated Sites Code of Practice' and EA Guidance on Risk Management of Land Contamination <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>'. The objectives of the report are:
- To assess historical activities at the site with respect to their potential impact on the site environment;
 - To characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities;
 - To assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact the subject property;
 - To review existing site investigation and remediation information available for the site;
 - To develop a preliminary Conceptual Site Model (CSM); and
 - To assess potential environmental liabilities associated with the site.
- 1.9 This report presents the information obtained from the 2017 ground investigation and contains relevant factual information from the previous investigations undertaken by BWB. It also presents the factual information from the ground investigation undertaken in 2023 for the purposes of the current proposed development.
- 1.10 The objectives of the Phase 2 aspect of this report are to assess:
- The prevailing ground and groundwater conditions across the site;
 - The potential presence and extent of contamination in shallow soil and groundwater beneath the site;
 - The significance and magnitude of the observed contamination through comparison of analytical data to appropriate published environmental screening criteria;
 - The strength properties of the soil beneath the site to enable foundation design; and
 - The ground gas regime beneath the site.
- 1.11 The above objectives will allow the Conceptual Site Model and subsequent recommendations presented in the previous Phase 2 report to be verified and updated. The report has been completed in accordance with BS10175:2011(+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice' and CLR11 'Model Procedures for the Management of Land Contamination'.
- 1.12 **Sections 7 to 17** of the report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007.

Scope of Ground Investigation Works

1.13 The ground investigation scope of works was completed on 13/03/2023 and comprised the following:

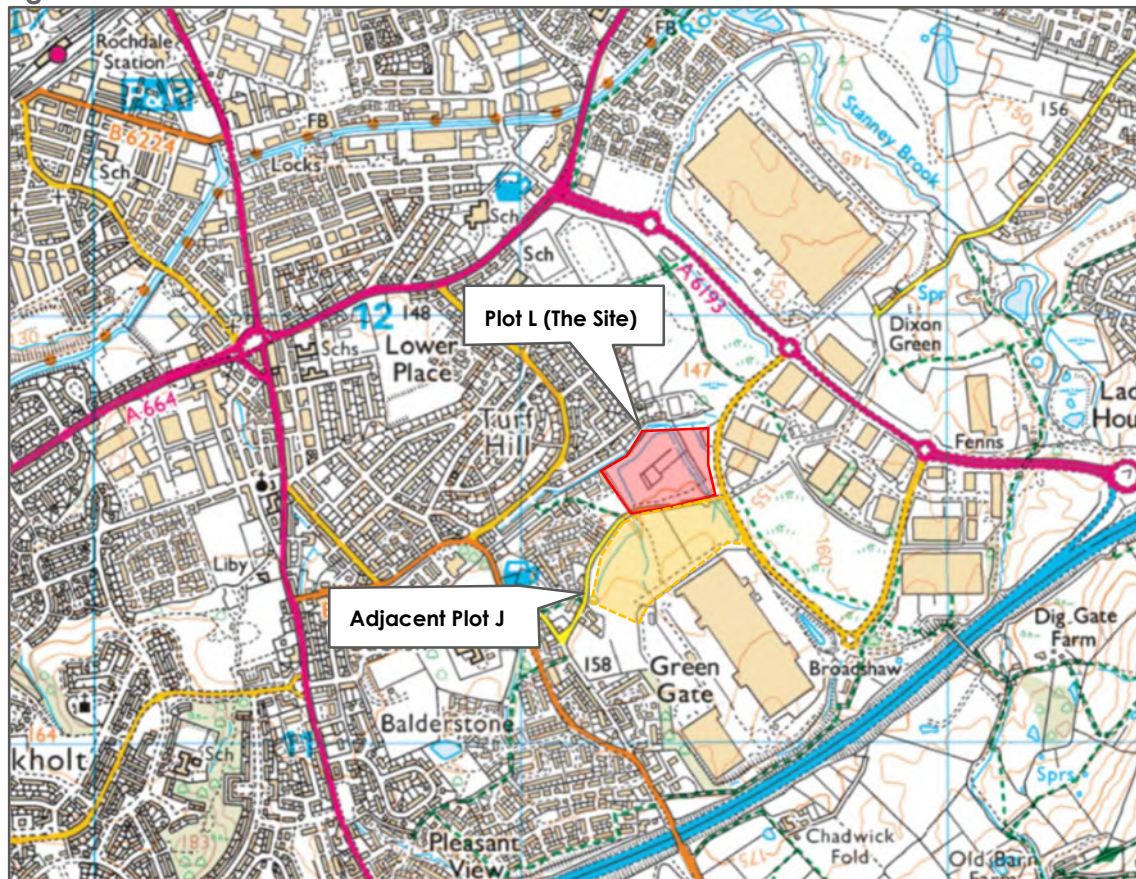
- Non-intrusive survey of excavation locations for underground utilities;
- Seven machine excavated trial pits;
- Three cable percussive boreholes;
- Four gas and groundwater monitoring visits;
- Chemical analysis of soils and groundwater; and
- Geotechnical testing of soil.

2. THE SITE

Site Location

- 2.1 The site is located at Plot L Kingsway Business Park, Rochdale, in Greater Manchester, at National Grid coordinates/reference 391359, 411650 (SD913116, approximate site centre). The approximate location of the site is shown in **Figure 2.1**.

Figure 2.1: Site Location Plan.



Site Description

- 2.2 The layout of the site with the main features is presented as **Figure 2.2**.
- 2.3 The site is irregular in shape, occupying approximately 4.33 hectares. The site lies between the town of Rochdale and the M62 motorway and exists as part of the Kingsway Business Park.
- 2.4 The site ground levels vary between approximately 151 to 147m AOD, sloping gently from the south to the north. The site is bound to the north and the west by residential housing and to the south and east by light industrial warehouse units of the larger development site. To the immediate south is Plot J, for which earthworks and subsequent construction of a new development is anticipated to begin in mid-2023.

- 2.5 The northern, southern and western boundaries are occupied by semi-mature and mature trees. A small area of mature woodland also exists in the south east corner of the site. A bund (~3m tall) is also present along the northern site boundary. The internal area of the site is occupied by grassland (90%), semi mature trees (5%) and hedgerows/fences (5%).
- 2.6 A drainage ditch (unnamed ordinary watercourse) intersects the site south to north and drains away to the west running along the northern site boundary. At the time of the site walkover and ground investigation undertaken in 2017 the site was relatively dry, but it is expected the site will be boggy during inclement weather over the winter months.
- 2.7 During 2023 ground investigation works, heavy rain occurred on Monday 13th March. Flowing water estimated around 2m deep was observed within the drainage ditch (unnamed ordinary watercourse) crossing the site, flowing from south to north. The underfoot conditions were boggy and waterlogged and works had to be postponed until a tracked excavator could be brought to site to facilitate rig access.
- 2.8 No visual or olfactory sources of contamination were noted during the site walkover.

Figure 2.2: Key Site Features.



3. PUBLISHED GROUND CONDITIONS

- 3.1 The anticipated ground conditions for the site and controlled waters vulnerability are discussed within **Table 3.1** below.

Table 3.1: Anticipated Ground Conditions.

Ground Conditions	
Geology	The Groundsure report indicates that the site is directly underlain by superficial deposits comprising Hummocky Glacial Deposits (Diamicton), Head (Clay, Silt, Sand and Gravel) and Peat. The BGS Lexicon describes Hummocky Glacial Deposits as lithologically diverse and complex glacial deposits, composed of rock debris, clayey till and poorly- to well-stratified sand and gravel. Head is described as poorly sorted and poorly stratified deposits comprising sand and gravel, locally with lenses of silt, clay, peat and organic material. Peat is described as humic deposits, an accumulation of wet, dark brown, partially decomposed vegetation; may be an organic rich clay. The Groundsure report indicates that the site is directly underlain by bedrock strata of the Pennine Middle Coal Measures Formation (PMCM, northeast corner of the site) and the Milnrow Sandstone (rest of the site). No Made Ground or other Artificial Ground is indicated to be present on site in the Groundsure Report. However, Made Ground is anticipated to be present due to the recent and historic occupation of the site. BGS borehole logs located to the west of the site largely confirm the anticipated geological sequence. However, the ground investigation undertaken in 2017 by BWB did not encounter significant deposits of peat which were anticipated from the geological map.
Hydrogeology	The Environment Agency (EA) lists the superficial deposits as a Secondary A Aquifer and the Bedrock geology as a Secondary A Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. Three historical Groundwater Abstraction Licenses are attributed to the site, relating to general farming and domestic, with a maximum annual abstraction volume of 5123.34m³. The closest active license is located 1846m to the east (United Utilities Water Ltd). The site is not within an EA Groundwater Source Protection Zone (SPZ). There is a high potential for soil leaching to impact groundwater on site related to the deep, permeable, coarse textured soils present locally. These will readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential.

Ground Conditions	
Surface Waters	No standing water is indicated to be present on site from published records, although boggy conditions are anticipated from the site walkover. An unnamed ordinary watercourse is located on site running from the south of the site to the north and along the northern boundary of the site east to west. Due to the local nature of these watercourses, they are likely to be subject to significant seasonal variations. There are no active or historic Surface Water Abstraction Licenses within 1000m of the site.
Ground Gas & Radon	The presence of Made Ground is anticipated due to previous on-site developments. Made Ground has the potential to emit elevated concentrations of hazardous ground gases. The site is not within a Radon Affected Area, as less than 1% of properties are above the action level.
Mining and Mineral Extraction	The site is located within the specified search distance of an identified coal mining area. No other mining or mineral extraction is indicated within 1000m of the site boundary.
Ground Stability	The Groundsure Report (included with Appendix 2) has indicated the following Natural Ground Subsidence hazards for the site: • Low hazard potential for shrink-swell clays; • Very Low hazard potential for landslides; • Negligible hazard potential for ground dissolution; • High hazard potential for compressible deposits; • Very Low hazard potential for collapsible deposits; and • Very Low hazard potential for running sands.
Landfill/Waste Sites	No landfills or waste sites are located within 500m of the site.
UXO	A review of the Zetica Regional Unexploded Ordnance Map for Greater Manchester (included with Appendix 2) has indicated the site is at low risk from Unexploded Ordnance.

4. SITE HISTORY

- 4.1 Historical Ordnance Survey (OS) mapping for the site area has been reviewed. These maps and plans date from the 1883 OS County Series to the recent 2004 OS Plans. The historical plans reviewed are included with **Appendix 2**. The key points of the historical development of the site and surrounding area are summarised below in **Tables 4.1 and 4.2**.

Table 4.1: Key Points of Development History.

Dates	On Site	Significance
1851	Site appears to largely exist as AGRICULTURAL fields. A small house exists in the south of the site. A stream is intersecting the site north to south, and traverses the site east to west along the northern boundary.	Use of the site as cropland may have given rise to elevated concentrations of agricultural contaminants such as herbicides and pesticides. Made Ground will exist on site in the footprint of the house. The stream represents a potential receptor.
1891	No significant changes.	
1910	A rectangular area in the north of the site now appears to be paddocked/fenced.	Occupation of the site has likely introduced areas of Made Ground in building footprints.
1930	The rectangular area is now labelled SHEEPWASH . A spring is also mapped centrally on-site.	Any animal remains/waste disposed of on-site has the potential to present risk of anthrax or other pathogens. Marshland and pond could act as a sensitive receptor.
1955	Marsh listed in the north-east corner of the site.	
1992	House in the south of the site is now listed as a SLAUGHTERHOUSE . Pond also listed in the south-east of the site.	
2002	No significant changes.	
2010	SLAUGHTERHOUSE is no longer shown as present on site.	
2014	No significant changes.	
No further on-site changes indicated by mapping.		

Table 4.2: Key Points of Surrounding Area Development History.

Dates	On Site	Significance
1851	A number of MILLS (woollen/cotton) listed 750m+ to the north-west. Stanney Brook is located 700m to the north-east and beyond lies a RAILWAY LINE . Rochdale Canal runs 750m to the north of the site.	Industry of the mills and iron works has the potential to introduce contamination of heavy metals, inorganic compounds, asbestos and organic contaminants. Railway land may introduce contamination of PAHs,

Dates	On Site	Significance
1891	Surrounding land exists dominantly as agricultural land. A Castle and well is bordering the site to the south, with houses approximately 120m to the east and a farm approximately 150m to the south-west. Extensive development to the north-west of the site (Rochdale), including MILLS and IRON WORKS . Three Reservoirs are also shown 1km to the south-west of the site.	ethylene glycol, creosote, ash, sulphate and asbestos. Surface reservoirs, marshes, and canal represent potential receptors. Residential housing and community centre also present potential receptors.
1910	An IRON WORKS and TANK is listed approximately 120m to the east of the site.	
1928	Large residential development bordering the north-west of the site.	
1938	No significant changes.	
1955	Iron works is converted to MILL (Cotton Spinning). Marshland indicated to border the site to the north-east.	
1967	No significant changes.	
1976	Construction of the M62 motorway 600m south of the site indicated on mapping.	
1992	COMMUNITY CENTRE now present bordering the north of the site.	
2010	Works to the east of the site are no longer present. Implemented new road infrastructure east of the site and the development of BUSINESS PARK .	

Previous Investigation Reports

- 4.2 BWB completed an intrusive investigation at the site in June 2017 which is detailed in the report presented for reference in **Appendix 2**.
- 4.3 The report concluded that:
- No visual or olfactory evidence of contamination was identified during the intrusive investigation.

- Preliminary screening of hazardous ground gases recorded slightly elevated concentrations of carbon dioxide.
- Chemical soil analysis has been undertaken of samples from the site and has not identified elevated concentrations of contaminants above their respective screening criteria. All samples analysed for Anthrax (the potential for which was highlighted in **Table 4.1** above) returned negative.
- In the context of a future development the localised contamination may represent a significant risk to human health. The risk to human health is considered to be Moderate/Low for future site users.
- Design Sulphate Class DS-1 and ACEC Class AC-1 for soils and groundwater, when considering the most appropriate type of concrete to be used at the site.

Related BWB Ground Investigation Information

- 4.4 BWB has also completed a number of other intrusive investigations on nearby plots within Kingsway Business Park.
- 4.5 Extensive areas of peat have been identified on Plot K directly east of the site, Plot J to the south of the site, and Plot M directly north of the site. Although significant extents of peat are not expected on site at Plot L, bands of soft highly organic layers are present close to the valley brook (up to 2.05m deep in TP15, with underlying organic clay pockets in gravels to 3.0m). A organic topsoil and subsoil is also present across the site (typically around 0.4m to 0.5m thick).
- 4.6 The Hummocky Glacial Deposits comprise clayey till and poorly- to well-stratified sand and gravel. Nearby investigations have encountered thick bands of silty sands and have arisen in excavations as running sands.

Geotechnical Lessons Learned from Adjacent Developments

- 4.7 Earthworks, ground improvement, and subsequent construction works have been undertaken to date at the adjacent Plot I (immediately south east of Plot L) and Plot M. Works included:
- Gabion gravity retaining walls;
 - Embedded sheet pile retaining walls;
 - Cut and fill earthworks, including soil modification with lime and/or cement to control the moisture content;
 - Temporary excavations for drainage and foundations;
 - Ground improvement, including vibro stone columns;
 - Temporary dewatering;
 - Backfilling of seasonal watercourses and installation of culverts;
 - Construction of shallow pad foundations and ground bearing slabs on improved ground.
- 4.8 The following challenges and lessons learned at these sites may be pertinent to the proposed works at Plot L:

- The geological setting of the Kingsway site includes a large-scale glacial channel of Hummocky Glacial Deposits which is highly variable in composition and contributes to laterally and seasonally variable groundwater conditions. Groundwater control in these ground conditions is challenging.
- At Plot I, installation of land drains during earthworks was seen to be beneficial in controlling the groundwater. For future plots, installing a land drain system in advance of construction to assist groundwater drainage should be considered, if a suitable outlet can be identified and where they may be installed from existing level that they will be below proposed or estimated platform level.
- At Plot I, earthworks during cold weather and the wet ground required a higher percentage of lime/cement to achieve the required compaction standard than planned, perhaps triple initial estimates. Use of this process in cold weather therefore slowed the construction process.
- Winter (October to April) working in the Hummocky Glacial Deposits should therefore be avoided where possible, in particular where silty fine sand and sandy silt is encountered.

5. REGULATORY SETTING

Permits Consents and Authorisations

- 5.1 A full listing of permits, consents and authorisations including discharge consents, pollution incidences and other environmental information included in the Groundsure® Report, is presented in **Appendix 2**.
- 5.2 The factors that could influence the environmental status of the site are described below in **Table 5.1**:

Table 5.1: Notable Environmental Information.

Feature	No. Within 500m of the site boundary	Closest to the site	Comments
Records of Planning Hazardous Consents and Enforcements	One, 118m to the east of the site. Approved application dating to 1992 from British Vita Plc.		No entries have been attributed to the site.
Dangerous or hazardous sites	One, 58m to the east of the site. Historical NIHHS Site related to British Vita Plc.		No entries have been attributed to the site.
Environment Agency Recorded Pollution Incidents	Two, one on site and one 181m to the east of the site.	On-site entry relates to the pollution to water (Category 3, Minor) from Blood and Offal.	The entries are attributed to the former on-site slaughterhouse with the pollution incident dated to August 2003. This could present a potential source of contamination.

Landfilling and Waste Management

- 5.3 A full listing of EA, BGS and Local Authority recorded landfills are provided in the Groundsure® Report presented with the report in **Appendix 2**.
- 5.4 No landfills or other waste sites have been listed to be within 500m of the site's boundary.

6. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Introduction

- 6.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.
- 6.2 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the current proposed development and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study and 2017 ground investigation. At this stage the assessment is qualitative and aimed to determine likely pollutant linkages, allowing for uncertainty, but informed by the 2017 ground investigation to refine our understanding of the anticipated risk.
- 6.3 Three impact potentials exist for any given site; these are:
- The site impacting upon itself;
 - The site impacting on its surroundings; and
 - The surroundings impacting on the site.
- 6.4 All three impacts need to be considered in a risk assessment.
- 6.5 A Source, Pathway, Receptor analysis has been undertaken for the site based on the information provided in the preceding sections. This is presented as Table 5 and further information about the risk classification scheme is included within Appendix 5.
- 6.6 Sources (S); These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).
- 6.7 Pathways (P); A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.
- 6.8 Receptors (R); Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

Table 6.1: Conceptual Site Model.

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
On-site Sources S1a: Buried animal remains and other contaminants associated with the former abattoir. Contaminants of potential concern are spores of anthrax or other pathogens. S1b: Made Ground and/or topsoil present across the site. Contaminants of potential concern may include heavy metals, PHCs, PAHs, phenols, chlorinated solvents and sulphates, asbestos and ACMs, ground gases and soil-derived vapours.	P1: Dermal contact, incidental ingestion and/or inhalation of contaminated soil particulates.	R1: Ground and construction workers.	Sv	UI	M/L	Anthrax testing was undertaken during the 2017 investigation, and all samples analysed for anthrax returned negative. The recommendations of <i>CIRIA Report 132 – 'A Guide for Safe Working on Contaminated Sites'</i> and <i>CIRIA Report C741 – 'Environmental Good Practice On Site'</i> should be considered during ground works at the site to ensure the appropriate PPE is worn and correct procedures are adopted. The use of specialist, licenced contractors during future works would help to mitigate the risks for future site users.
		R2: Potential future site users.	Md	UI	L	It is anticipated that hard standing will be present across most of the site after construction of the proposed development (roads and buildings) and in areas of soft landscaping, a layer of topsoil or 'clean' capping material is likely to be required. This will limit the potential for direct contact with the soils and minimise dust generation from potentially contaminated soils at the site.
		R3: Buried concrete structures and water utility pipes.	Mi	UI	L	Soil testing for sulphate was undertaken during the 2017 investigation, resulting in a Design Sulphate Class of DS-1 and ACEC Class AC-1. Updated testing as part of future ground investigation works should be undertaken to confirm the appropriate concrete class for on-site use. Chemical soil analysis in 2017 did not identify elevated concentrations of contaminants above their screening criteria and widespread contamination is not anticipated. Updated laboratory testing results from future ground investigation works may be required by the water utilities providers to confirm the most suitable pipe materials. Barrier pipes are unlikely to be required based on the 2017 test results.

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
	P2: Outdoor inhalation of soil-derived vapours and ground gases in ambient air post-construction and via migration into excavations during construction phase.	R1: Ground and construction workers.	Mi	Li	M/L	Ground gas monitoring in 2017 recorded elevated levels of carbon dioxide. The 2023 ground investigation will include gas monitoring in new boreholes to provide up to date information. Given that elevated concentrations of hazardous ground gases/vapours are anticipated from previous ground investigation works, where entry into confined spaces/excavations is required by construction workers, a combination of appropriate PPE and/or Respiratory Protective Equipment (RPE), monitoring equipment (such as explosive level meters) and safe entry procedures would be required to mitigate the potential risk of exposure to hazardous gases/vapours by workers.
		R2: Potential future site users.	Mi	Lw	L	Ground gas monitoring in 2017 recorded elevated levels of carbon dioxide consistent with Characteristic Gas Situation 2 (CGS2) for new structures. The 2023 ground investigation will include gas monitoring in new boreholes to provide up to date information.
	P3: Indoor inhalation of soil-derived vapours and ground gases.	R2: Potential future site users.	Md	Li	M/L	The risk to potential future site users outside and in yard areas is anticipated to be low. Based on the anticipated elevated concentrations of carbon dioxide, and the characterisation of CGS2, the installation of ground gas protection measures in buildings (warehouses, offices, and confined spaces) are expected to be required during construction to mitigate ground gases/vapours. Potential sources of ground gases and vapours such as Made Ground, highly organic soils and contaminated soils could potentially be mitigated through removal or treatment prior to construction.
	P4: Leaching and permeation through soil profile followed	R4: Underlying Secondary A Aquifers.	Mi	UI	L	The 2017 ground investigation recorded a very low potential for leaching contaminants to impact surface and groundwater.

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
	by groundwater migration and surface run-off into drainage systems.	R5: On-site surface water drainage ditch.	Mi	Li	M/L	The recommendations of EA document <i>PPG6: Construction and Demolition Sites: Prevent Pollution</i> should be considered during construction.
Off-Site Sources S2: Contamination from off-site development and associated Made Ground. CoPC include heavy metals, PHCs, PAHs, phenols, chlorinated solvents, sulphates, asbestos and ACMs, ground gases and soil-derived vapours.	P1: Dermal contact, incidental ingestion and/or inhalation of contaminated soil particulate.	R1: Ground and construction workers.	Mi	Lw	L	The land in the surrounding area is generally well developed. It is considered unlikely that on-site receptors will be exposed to off-site soils. No elevated chemical concentrations were recorded during the 2017 ground investigation. The recommendations of <i>CIRIA Report 132 – ‘A Guide for Safe Working on Contaminated Sites’</i> and <i>CIRIA Report C741 – ‘Environmental Good Practice On Site’</i> should be considered during ground works at the site to ensure the appropriate PPE is worn and correct procedures are adopted.
		R2: Potential future site users.	Mi	UI	VL	It is anticipated that hard standing will be present across some of the site (roads and buildings) and in areas of soft landscaping and gardens a layer of topsoil or ‘clean’ capping material is anticipated to be present at the surface. This will limit the potential for direct contact with the soils and minimise dust generation from potentially contaminated soils at the site.
		R3: Buried concrete structures and water utility pipes.	Mi	UI	VL	Soil testing for sulphate was undertaken during the 2017 investigation, resulting in a Design Sulphate Class of DS-1 and ACEC Class AC-1. Updated testing as part of future ground investigation works should be undertaken to confirm the appropriate concrete class for on-site use. Chemical soil analysis in 2017 did not identify elevated concentrations of contaminants above their screening criteria and widespread contamination is not anticipated. Updated laboratory testing results from future ground investigation works may be required by the water utilities providers to confirm the most suitable pipe materials. Barrier pipes are unlikely to be required based on the 2017 test results.

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
	P2: Outdoor inhalation of soil-derived vapours and ground gases in ambient air post-construction and via migration into excavations during construction phase.	R1: Ground and construction workers.	Mi	UI	VL	In the event that elevated concentrations of hazardous ground gases are identified during ground investigation (carbon dioxide is anticipated); where entry into confined spaces and/or excavations is required by construction workers, a combination of appropriate PPE and/or RPE, monitoring equipment and safe entry procedures would be required to mitigate the potential risk of exposure to hazardous gases/vapours by construction workers. Ground investigation for general coverage purposes should include exploratory hole locations adjacent to the site boundaries, where possible.
		R2: Potential future site users.	Mi	UI	VL	
	P3: Indoor inhalation of soil-derived vapours and ground gases.	P3: Indoor inhalation of soil-derived vapours and ground gases.	Md	UI	VL	In the event that elevated concentrations of hazardous ground gases/vapours are identified during ground investigation works the installation of protection measures may be required during construction to mitigate ground gases/vapours. Ground investigation for general coverage purposes should include exploratory hole locations adjacent to the site boundaries where possible.
	P4: Leaching and permeation through soil profile followed by groundwater migration and surface run-off into drainage systems.	R4: Underlying Secondary A Aquifers	Mi	Lw	L	Groundwater testing data or information of standing water levels is available for the site from the 2017 investigation and the adjacent Plot J investigations. Updated investigation would confirm whether potentially unacceptable risks are present. Ground investigation for general coverage purposes should include exploratory hole locations adjacent to the site boundaries where possible.
VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely						

7. PHASE II ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION

- 7.1 Intrusive ground investigation works were undertaken between 06/03/2023 –13/03/2023 and comprised the following works:
- Clearance of investigation locations by a specialist buried services tracing company;
 - Collection of coordinates and elevations of exploratory hole locations;
 - The advancement of three cable percussive boreholes (BH201 to BH203 inclusive) to a maximum depth of 10.45m bgl with completion of SPTs and installations of dual gas and groundwater monitoring wells;
 - The advancement of seven machine excavated trial pits (TP201 to TP207 inclusive) to a maximum depth of 4.10m bgl;
 - Collection of environmental soil and groundwater water samples for chemical analysis at a UKAS and MCERTS accredited laboratory;
 - Collection of bulk and disturbed soil samples for geotechnical analysis at a UKAS accredited laboratory; and
 - Four post-investigation ground gas and groundwater level monitoring visits between 28/03/2023 and 14/04/2023.
- 7.2 An exploratory hole location plan is presented as **Drawing 1**. BWB exploratory hole records are presented as **Appendix 3**, the SPT calibration certificate is presented in **Appendix 4**, and the post investigation gas and groundwater monitoring data is presented as **Appendix 8**.
- 7.3 The site investigation works were carried out in general accordance with BS5930:2015 'Code of Practice for Site Investigations' and BS10175:2011 'Investigation of Potentially Contaminated Sites'.

Chemical Sampling Strategy

- 7.4 The chemical sampling strategy was targeted based on the 2017 ground investigation:
- TP16 encountered Made Ground to at least 3.50m bgl; the trial pit was terminated without proving the base of the stratum. BH201, TP206, and TP207 were therefore situated in close proximity of this to investigate the thickness and extent of the Made Ground in this area, which had not been demonstrated in the previous investigation.
 - The previous investigation also had a trial pit (TP08) terminate at 0.40m bgl due to a concrete obstruction. TP205 in the 2023 investigation was purposely placed to explore the extent of this obstruction through localised trenching with the mechanical excavator.
- 7.5 Overall, limited potential sources of contamination were identified in the previous investigation. In addition to the targeted exploratory holes above, the exploratory locations for the 2023 investigation were placed to provide a wide spatial coverage of the site based on the revised masterplan for the site.

Chemical Analytical Strategy

Soil Strategy

- 7.6 Selected soil samples collected from exploratory hole locations were sent to I2 Analytical Services Ltd (UKAS and MCERTS accredited) for chemical analysis. The following chemical analytical testing was undertaken:
- Twelve soil samples tested for a soil suite (BWB Standard Suite) comprising arsenic, barium, beryllium, water soluble boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), total phenols, total cyanide, free cyanide, complex cyanide, fraction of organic carbon, pH, Polycyclic Aromatic Hydrocarbons (PAHs) (United States Environment Protection Agency priority 16 compounds) and Total Petroleum Hydrocarbons (TPH) C6-C40;
 - Three soil samples tested for TPH speciated to the UK Criteria Working Group (TPHCWG) aliphatic and aromatic compounds; and
 - Eight soil samples for asbestos screening.
- 7.7 The results of the soil chemical testing are presented as **Appendix 5**.

Geotechnical Strategy

- 7.8 The cable percussive borehole locations were positioned relative to the proposed building footprints to assess underlying ground conditions for geotechnical purposes. The trial pits were positioned to determine ground conditions, soil strength properties and characteristics across the wider site to inform geotechnical assessment and earthworks design.
- 7.9 In situ soil strength testing, comprising Standard Penetration Tests (SPTs) and Hand Shear Vanes (HSVs) were undertaken within the cable percussive and recovered samples from the trial pits respectively. SPT 'N' values and HSV results are included on the exploratory hole logs presented as **Appendix 3**.
- 7.10 Selected disturbed and bulk samples were collected from the investigation locations and sent to the geotechnical project laboratory (I2 Analytical Services Ltd), which is UKAS accredited. The following geotechnical testing was undertaken;
- Thirteen samples tested for moisture content;
 - Six samples tested for Atterberg (liquid and plastic) limits;
 - Eight samples tested for particle size distribution by pipette;
 - Three samples tested for particle size distribution by sedimentation;
 - Three standard (2.5kg) dry density/moisture content relationship "compaction" tests;
 - Three heavy (4.5kg) dry density/moisture content relationship "compaction" tests; and
 - Six samples tested for BRE Suite comprising aqueous sulphate and pH.

7.11 The results of the geotechnical testing are included as **Appendix 6**.

Limitations and Uncertainty

7.12 The full extent of the concrete slab or feature anticipated around 2017 Trial Pit TP08 could not be found during the 2023 investigation. TP205 was intended to explore the extent of the anticipated slab, but it was terminated during excavation due to infiltration of water with cracks developing in the trial pit sides. The nature of the concrete obstruction is unproven, but it is potentially part of former, unmarked drainage associated with the former farmland.

8. GROUND CONDITIONS ENCOUNTERED

Geological Summary

- 8.1 BGS borehole logs located to the west of the site largely confirm the anticipated geological sequence. However, the ground investigation undertaken in 2017 by BWB did not encounter significant deposits of peat which were anticipated from the geological map.
- 8.2 The recorded ground conditions are summarised in **Table 8.1** below. Uncorrected SPT results collected from the borehole locations are presented on the exploratory hole records presented in **Appendix 3**.

Table 8.1: Summary of Ground Conditions (from 2017 and 2023 investigations).

Stratum	Top Depth (m)		Base Depth (m)		Thickness (m)		SPT N Value	
	Min	Max	Min	Max	Min	Max	Min	Max
Topsoil	0.0		0.0	1.0	0.0	1.0	-	
Made Ground	0.0		0.4	1.8*	1.0	1.8*	-	
Potential Alluvium – organic sands, gravels and clays (TP15 only)**					0.8	3.0	2.2	-
Hummocky Glacial Deposits	0.3	1.8	Not Proven (base of holes 10.45m)		Not proven		1	30

*Made Ground in TP16 was encountered to the full depth of the trial pit, 3.5m. This is likely localised and not representative of Made Ground across the site. It is thought to be associated with localised fill deposited at the stub of the adjacent John Milne Avenue.

**Organic clay and gravel in TP15 (2017) was recorded as Hummocky Glacial Deposits. Potentially, this material is younger alluvial material associated with the adjacent stream, and is compositionally distinct from the surrounding material.

Geological Descriptions

Topsoil

- 8.3 Topsoil was encountered consistently across the site apart from areas of deeper Made Ground with thicknesses typically between 0.3m and 0.6m. The material typically comprised dark brown variably sandy, variably gravelly silty clay with rootlets. Gravel typically comprised siltstone and sandstone. BH202 and TP205 also displayed glass content within the topsoil stratum.
- 8.4 The typical depth of topsoil over the site is around 0.5m, which may vary from location to location, noting estimates of topsoil volumes should consider the potential for lateral variation.

Made Ground

- 8.5 Made Ground was encountered from ground level within TP203, TP204, and TP206 and in TP08, TP15 and TP16 as shown in plan on **Drawing 3**. Thicknesses generally ranged between 0.40m and 1.80m. TP16 encountered Made Ground to the base of the hole at 3.5m depth, but it is anticipated this is localised and thought to be associated with localised fill deposited at the stub of the adjacent John Milne Avenue. Made Ground was encountered in the south-eastern and eastern sections of site but is unlikely to be laterally consistent. It is noted artificial inclusions were also encountered in Topsoil in TP01A and TP06.
- 8.6 The Made Ground typically comprised a dark brown gravelly slightly sandy clayey silt with high brick and concrete cobble content. Gravel typically comprised angular to subangular fine to coarse brick, concrete, porcelain, glass and siltstone.
- 8.7 No SPT values were recorded within the Made Ground as this stratum was not encountered at borehole locations.

Potential Alluvium

- 8.8 TP15, undertaken in 2017, recorded light brown very sandy very organic CLAY between 0.8m and 2.05m, underlain by light brown very sandy organic GRAVEL with large soft clay pockets to 3.0m. This was recorded as Hummocky Glacial Deposits, but noting the high described organic content, it is possible this deposit is alluvium associated with the stream.
- 8.9 No strength tests were undertaken in this stratum. A single moisture content test was undertaken from a sample at 1.9m depth, recording a natural moisture content of 25%. PSD testing indicated the material at 1.9m was a clayey sand with a fines content of 18.3%.

Hummocky Glacial Deposits

- 8.10 Hummocky Glacial Deposits were encountered in all exploratory holes. Its full extent and thickness was not found, with all holes terminated within this stratum (maximum depth 10.45m). The top depth varied from 0.30m bgl and 1.80m bgl, being found directly under topsoil and/or sections of Made Ground.
- 8.11 The Hummocky Glacial Deposits varied in composition throughout all exploratory holes. It was recovered as multiple layers of poorly sorted coarse and fine grained deposits with strong variation laterally and locally.
- 8.12 SPT N60 values within the Hummocky Glacial Deposits were recorded in the range of 1 and 30 blows. Value generally increased with depth. Typically soils above 140mAOD have representative N60 values less than 10, and soils below this level are generally found to be stiffer, with N60 greater than 15.
- 8.13 The peak shear strength values obtained from in situ hand shear vane (HSV) tests were between 17kPa and 93kPa based on the average of three results.

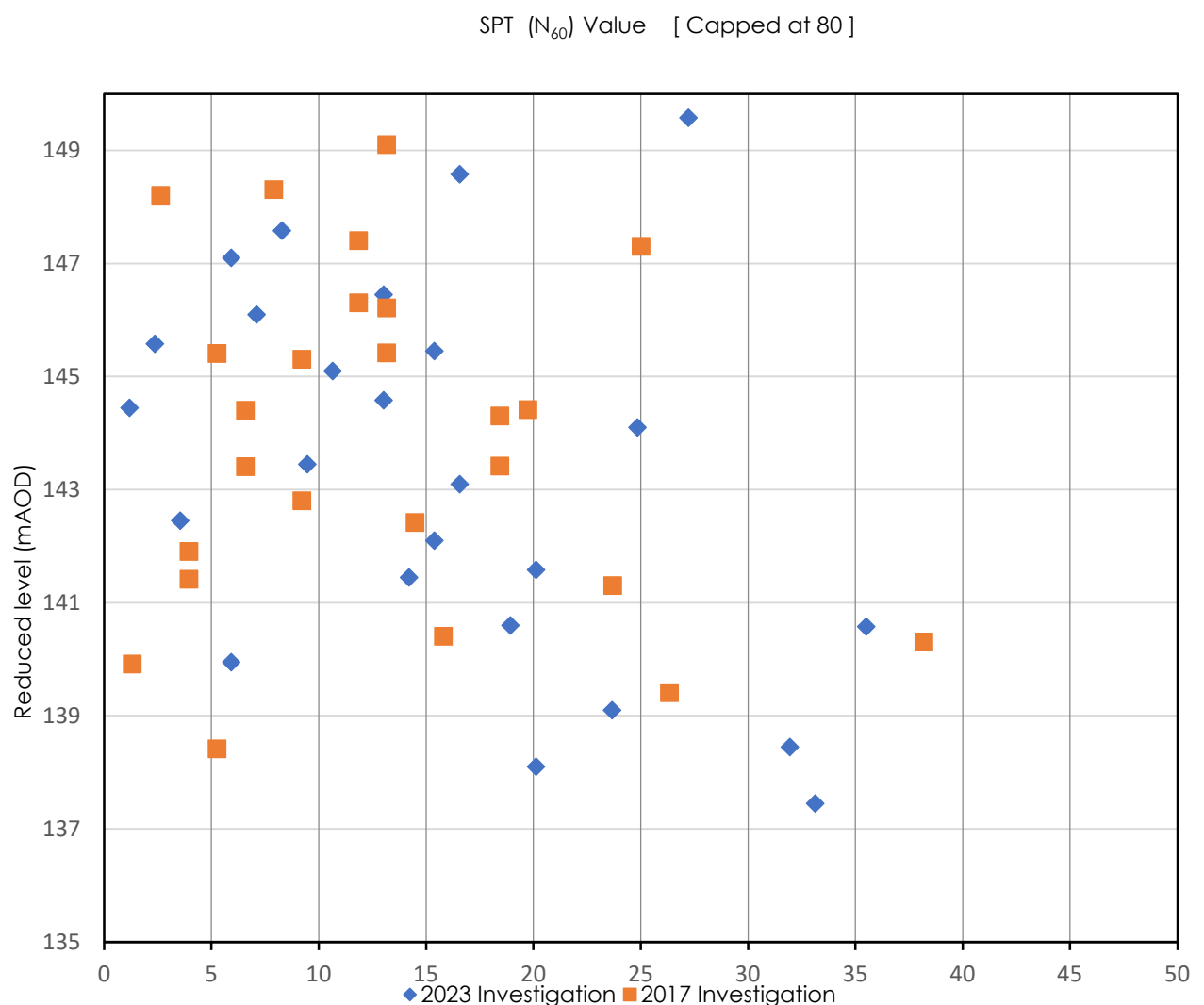
8.14 Graphs presenting the SPT and HSV results are presented within the text of this report later in this section as Figure 8:1 and Figure 8:2 respectively.

In Situ Testing

Standard Penetration Tests

8.15 SPT results undertaken at regular depth intervals in the boreholes are detailed on the exploratory hole records in **Appendix 3**. A plot of corrected SPT 'N' value versus depth is summarised as **Figure 8:1**.

Figure 8.1: Corrected SPT 'N' Value (N₆₀) Versus Depth (mAOD).

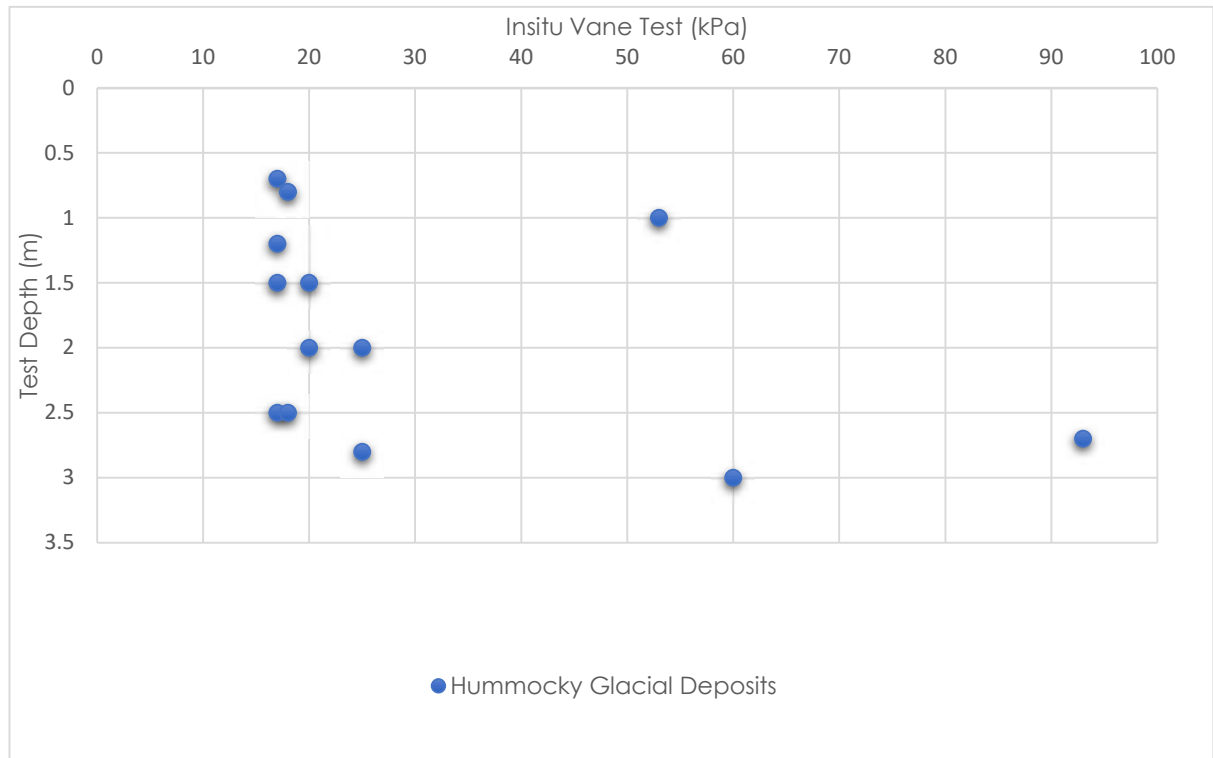


Hand Shear Vane Tests

8.16 A Hand Shear Vane (HSV) was used to estimate the undrained shear strength of the cohesive soils encountered across the site, the full results of the HSV tests are provided on the exploratory hole logs presented as **Appendix 3**. Tests were typically undertaken

on recovered samples to avoid accessing unsupported excavations. A plot of HSV results versus depth is presented as **Figure 8:2** below.

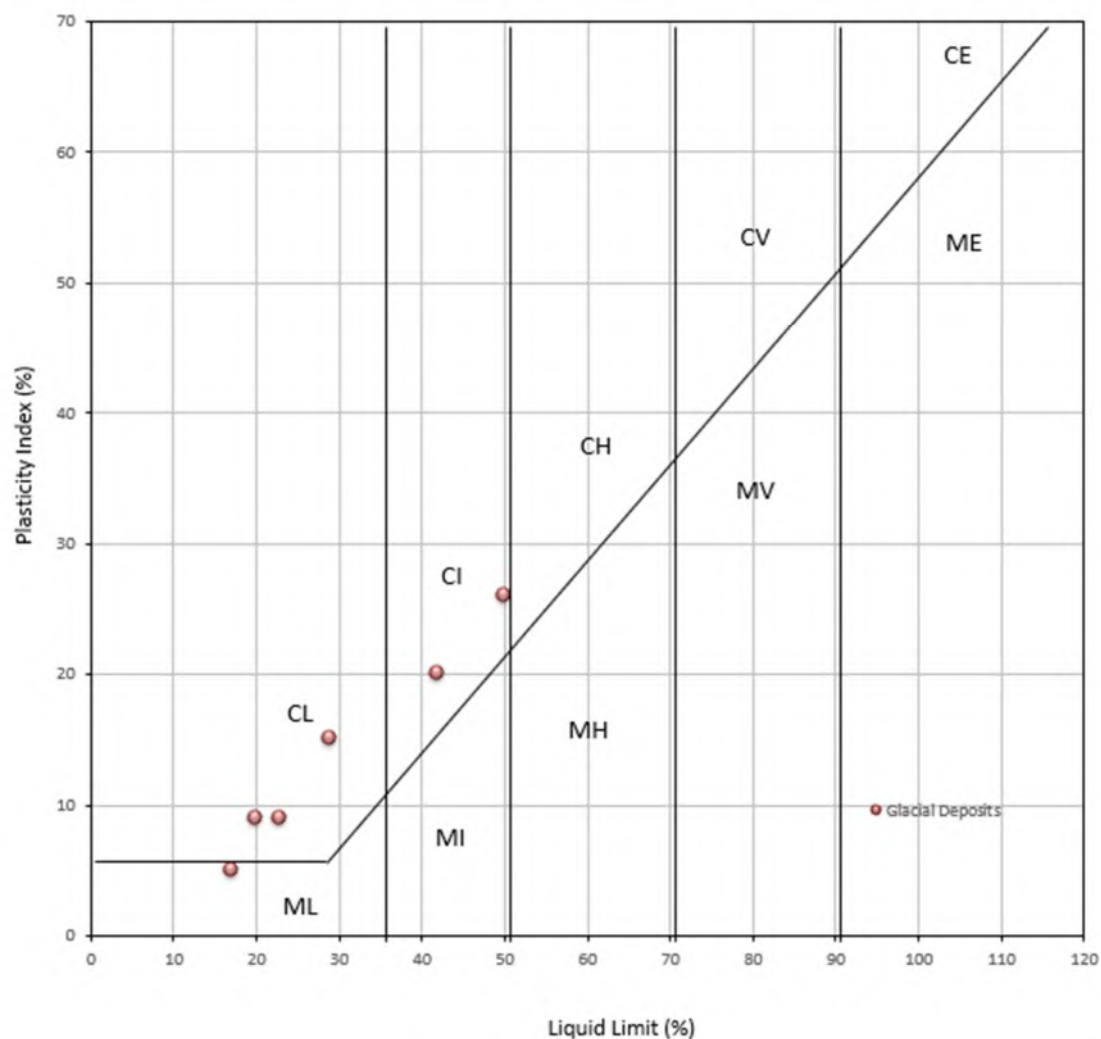
Figure 8.2: In Situ Hand Shear Vane Test Results.



Laboratory Test Results

- 8.17 A total of thirteen moisture content tests were undertaken on samples, and the results ranged from 13% to 28%.
- 8.18 A total of six Atterberg Limits tests were undertaken, with the results giving ranges of between 17% and 50% for the liquid limit, 11% to 24% for the plastic limit and plasticity index value of between 12% and 26%.
- 8.19 Twelve size determinations were completed on samples and the results typically indicated a variably clayey, gravel/sand.
- 8.20 Six 2.5kg hammer and three 4.5kg hammer "compaction" tests were undertaken; the maximum dry density (MDD) ranged from 1.89 to 1.99 Mg/m³ and the optimum moisture content (omc) from 10% to 14% for the 2.5kg tests, with the omc ranging from 1.88 to 2.14Mg/m³, and the MDD ranging from 7.6 to 14 Mg/m³ respectively for the 4.5kg tests.
- 8.21 The geotechnical laboratory testing has indicated Pls to be in the range 5% (low plasticity) and 26% (intermediate plasticity). A Plasticity Chart is presented below as **Figure 8:3**.

Figure 8.3 Plasticity Chart.



8.22 Twelve PSD tests were undertaken on samples from the Hummocky Glacial Deposits, a summary of the results is provided in **Table 8.2** below.

Table 8.2: PSD Results Summary.

Stratum	Location	Depth (m)	Cobble Content (%)	Gravel Content (%)	Sand Content (%)	Clay/ Silt Content (%)	Earthworks Classification
Hummocky Glacial Deposits	BH201	1.00-1.45	0	14	49	38	2A&2B
Hummocky Glacial Deposits	BH201	4.00-4.45	0	2	66	32	2A&2B
Hummocky Glacial Deposits	BH202	0.50-1.00	0	54	31	15	1A
Hummocky Glacial Deposits	BH202	3.50-4.00	0	1	96	3	1A

Stratum	Location	Depth (m)	Cobble Content (%)	Gravel Content (%)	Sand Content (%)	Clay/ Silt Content (%)	Earthworks Classification
Hummocky Glacial Deposits	BH203	1.50-2.00	0	7	59	34	2A&2B
Hummocky Glacial Deposits	BH203	5.50-6.00	0	49	45	6	1A
Hummocky Glacial Deposits	TP201	0.50-1.00	0	1	59	50	2A&2B
Hummocky Glacial Deposits	TP202	3.00-3.50	0	16	67	18	2A&2B
Hummocky Glacial Deposits	TP203	1.00-1.50	0	29	63	9	1A
Hummocky Glacial Deposits	TP204	3.30-3.70	0	1	94	5	1A
Hummocky Glacial Deposits	TP205	0.70-1.20	0	1	25	74	2A&2B
Hummocky Glacial Deposits	TP206	3.60-4.10	0	57	35	8	1A

Hydrogeology

8.23 Water strikes were recorded in every exploratory hole location, summarised below in **Table 8:5**.

Table 8.3: Water Strikes.

Exploratory Hole	Stratum	Depth
BH201	Hummocky Glacial Deposits	2.80m bgl
BH202	Hummocky Glacial Deposits	2.80m bgl
BH203	Hummocky Glacial Deposits	3.30m bgl
TP201	Hummocky Glacial Deposits	3.40m bgl
TP202	Hummocky Glacial Deposits	3.50m bgl
TP203	Hummocky Glacial Deposits	3.00m bgl
TP204	Hummocky Glacial Deposits	3.00m bgl
TP205	Hummocky Glacial Deposits	3.20m bgl
TP206	Hummocky Glacial Deposits	3.00m bgl
TP207	Hummocky Glacial Deposits	3.00m bgl

- 8.24 Dual standpipes were installed in each of the 2023 boreholes, and single standpipes in 2017 boreholes. Groundwater was generally observed to be in hydraulic continuity between the two, although a difference of around 1.5m was observed in BH203. Monitored groundwater levels were recorded in the range of 145.50mAOD and 148.93AOD (see summary and records **Appendix 8**) and the individual maxima and minima are shown in plan on **Drawing 4**.

Contamination Observations

- 8.25 No contamination observations were noted during the subsequent gas and groundwater monitoring period.

9. GEOTECHNICAL ASSESSMENT

Introduction

- 9.1 The proposed development involves the erection of four industrial units/warehouses (Classes E(g)(iii), B2 and B8) with ancillary office space, new access, car parking, servicing, boundary treatments, hard and soft landscaping, drainage works and other associated development (see proposed plan in **Appendix 1**).
- 9.2 The ground conditions were generally recorded as Topsoil overlying soils of Hummocky Glacial Deposits. Hummocky Glacial Deposits comprised multiple layers of clays, silts and loose sand and gravels. Made Ground above these deposits were recorded in TP08, TP15, TP16, TP203, TP204 and TP206. Made Ground is therefore noted in localised parts of the central section of the site as well as the north-eastern area.
- 9.3 Made Ground is not considered a suitable founding stratum due to the potential for excessive differential and/or total settlement under new applied loads.
- 9.4 TP205 was originally done as a trench to show the extent of a possible concrete slab which was noted in the same location of the 2017 investigation in TP08. Based on the fast ingress of water into TP205 it is possible the concrete forms part of a historic drainage culvert. The full extent of this was not found due to rapid infiltration of water from this feature.
- 9.5 Groundwater levels have been recorded at depths between 145.5mAOD bgl and 148.93AOD bgl during the monitoring visits, with highest levels in the south east, and lowest levels in the north and west.

Earthworks

- 9.6 Given the current site topography and proposed development layout, earthworks will be required across the site in order to form suitable platforms for construction.
- 9.7 All earthworks will need to be undertaken in accordance with a suitable specification document, which will need to be prepared to describe the materials and their requirements including placement and acceptability limits.
- 9.8 It is not currently anticipated that contaminated soils will be encountered within site earthworks, with limited (uncontaminated) Made Ground being encountered during the investigation, but this will need to be monitored during construction.
- 9.9 The suitability of cut soils for possible reuse of earthworks materials has been assessed on the basis of the testing carried out as part of this investigation. From the available data all the near-surface cut soils are indicated to vary with both cohesive and granular materials and are anticipated to classify as 2A/2B, (locally 1A) General Cohesive Fill materials for re-use in earthworks. From the moisture content ranges (13-28%) compared with OMC results (7.6-14%) these materials are indicated to be generally wet of optimum, and hence will likely require lime or cement modification in order to achieve adequate compaction.

- 9.10 The materials encountered on site during earthworks may vary from those analysed and presented herein; furthermore, inclement weather or winter working may result in materials being unsuitable for incorporation within the works without modification by lime, cement, or other methods. In particular, cohesive soils are very susceptible to 'wet weather working' and it is recommended that consideration be given to lime and/ or cement stabilisation of these materials if the earthworks are undertaken during inclement weather or the winter period.
- 9.11 Removal of topsoil and localised areas of soft spots and organic clays (TP15) will be required prior to compaction of new fill. The typical depth of topsoil over the site is around 0.5m, which may vary from location to location, noting estimates of topsoil volumes should consider the potential for lateral variation.

Slopes

- 9.12 It is likely that 1v:3h (vertical: horizontal) will be suitable in the long term in natural soils, outside of any soft organic areas, and subject to site-specific analysis.

Retaining Structures

- 9.13 Local retaining structures of up to 1.5m height are anticipated to accommodate local differences in platform level. Gravity retaining structures are anticipated to be suitable for localised retention subject to site-specific analysis.
- 9.14 The proposed retaining wall on the south eastern boundary of the site next to Unit L-1 is constrained by space and height, and gravity solutions are not feasible for this wall. Potential methods include:
- Sheet piles with ground anchors to limit deflection (noting potential requirement for easements).
 - Steel/Concrete Kingposts.
 - Bored pile contiguous wall.
 - Bored pile secant wall.
- 9.15 A specialist piling contractor should be consulted to further assess the most economical and suitable piling solution.
- 9.16 Detailed design of this retaining structure will require careful consideration of construction sequencing and constraints including existing services, land boundaries, potential requirements for anchors, proposed redirection of the existing stream, and impacts on the adjacent roads. Noting the proximity of the proposed Unit L-1 and the requirements for construction and drainage excavations, it is expected that overdig will need to be taken into account in design. At present the permanent retained height is anticipated to be 3.7m high at the maximum south east corner.
- 9.17 The proposed retaining support to the diverted watercourse will need to be assessed to determine a suitable geometry and retaining method.

- 9.18 Groundwater levels are expected to fluctuate, but may need to be retained behind the wall at Unit L-1, which should also be taken into account during design.

Foundation Solutions

- 9.19 The existing soils are highly variable and shallow foundations are not recommended without improvement of the underlying ground (see section below). Shallow pad foundations and ground bearing slabs are anticipated to be suitable after ground improvement under structures and highly loaded areas.

Ground Improvement Techniques

- 9.20 Ground conditions are soft/loose, variable and compressible to around 141mAOD, and ground improvement will be required under structures and heavily loaded areas.
- 9.21 A vibro ground improvement option, such as stone columns, could also be a potential alternative foundation solution that could be considered. A specialist ground improvement contractor should be consulted to design the solution to the required bearing capacity and settlement tolerances.

Floor Slabs

- 9.22 A ground bearing floor slab is feasible following a site strip to remove soft and compressible topsoil and subsoil deposits as well as localised zones of Made Ground, subject to suitable ground improvement below loaded areas.
- 9.23 The ground gas assessment (Section 10) indicates that zoned ground gas protection measures are required in accordance with a CIRIA C665 CS2 situation in the west of the site (Unit L-2). No gas protection measures are required in the east of the site for Units L-1, L-3 and L-4.

Roads and Pavements

- 9.24 Following the advice presented in Table C1 of TRRL report 1132 (1984) and considering the range of plasticity index values of between 5% and 26% a long-term equilibrium CBR value of about 2.5-3.0% is indicated for initial pavement design, subject to proof rolling and excavation of soft spots. This is based on observed soil descriptions and results of laboratory testing.
- 9.25 Additional in situ testing of the subgrade formation should be undertaken during construction to ensure an adequate formation level is reached and to confirm the assumed design value to be detailed in the Earthworks Specification.

Drainage

- 9.26 No soakaway drainage testing has been undertaken at the site. However, the site is anticipated to be affected by seasonal shallow groundwater and so a soakaway drainage solution is unlikely to be a viable option. Instead, an attenuated (tank/pond) solution or a positive drainage solution should be considered instead.

Excavations

Ease of Excavation

- 9.27 Machine excavations utilising a conventional machines are anticipated to be achievable for the majority of the ground conditions and materials that are to be encountered during the earthworks and the construction process. It is anticipated that standard plant breaker equipment will be required for localised areas of buried obstructions in the southern area of the site associated with the former abattoir.

Stability of Excavation

- 9.28 Excavations displayed generally poor stability during the site investigation once granular horizons were encountered (below 3.00m bgl) with running sands a potential issue that will need to be considered during development. The issues will be significantly reduced if works are undertaken during dryer periods such as summer months. The use of temporary support, such as trench boxes may need to be considered. Localised dewatering of excavations may also be required.
- 9.29 Excavation may also become unstable if left open for any significant periods. Where personnel entry is required for inspection; excavations should be sufficiently enlarged, and an assessment of safe temporary angles should be made. Alternatively, temporary shoring should be provided.

Legislation on Personnel Entry to Excavations

- 9.30 No excavations should be entered until full risk assessments and method statements have been completed to include the assessment of required works for entering the excavation, stability assessment of the excavation and any additional safety concerns. Additional stability concerns may include the potential for running sands.
- 9.31 All excavations that are to be entered shall be required to have full temporary shoring erected by a suitably qualified and experienced person, or to have the side walls battered back appropriately.

Groundwater

- 9.32 Longer-term groundwater levels have been recorded at depths of between 145.50m bgl and 148.9m bgl during the monitoring period.
- 9.33 Groundwater is likely to vary seasonally at the site with soft boggy surface conditions and later autumn through to spring (October to April). However, this will be highly dependent upon precipitation totals in the local areas.
- 9.34 Groundwater levels may locally be higher than proposed FFL, particularly in the south east end of the site, requiring long-term lowering of the groundwater level and temporary dewatering during construction. Trench drains to control groundwater close to the south east boundary are recommended. If development, and particularly

excavations are required during wetter periods then groundwater level control, such as dewatering at well points or slit trenches may need to be incorporated.

- 9.35 If active dewatering is required, the potential for induced settlements on site and in the surrounding boundary should be assessed.

Surface Watercourses

- 9.36 The existing stream at the site flows from the south to the north, and it is proposed that this will be diverted around the site as part of the works. Currently the stream enters at an existing culvert, which is expected to be demolished as it is located within the footprint of the proposed southern retaining structure by Unit L-1.
- 9.37 The stream itself is a seasonal feature which responds swiftly to rainfall events, as observed on site during March 2023. It is likely that the stream and the groundwater behave independently at this site, although both are expected to respond to seasonal and weather changes. It is not expected that diversion of the stream will significantly impact the groundwater regime at this site.

Chemical Attack on Buried Concrete

- 9.38 Water soluble sulphate concentrations in soils varied from 5.9mg/l to 25 mg/l with soil pH values ranging from 7.5 to 8.5.
- 9.39 Total sulphur concentrations ranged from 0.005% to 0.069%.
- 9.40 Acid soluble sulphate concentrations ranged between 0.005% and 0.019%.
- 9.41 The results above indicate that the site can be classed as Design Sulphate Class DS-1 and ACEC Class AC-1 for soils.

10. GROUND GAS ASSESSMENT

Introduction

- 10.1 Ground gas assessment has been undertaken to assess the risks associated with ground gases and volatile vapours to new buildings and their occupants. The results obtained have been assessed in line with relevant guidance (notably CIRIA C665).
- 10.2 Based on the desk study and the ground investigation undertaken, the following potential sources of hazardous ground gas have been identified:
- Localised Made Ground deposits.
- 10.3 BWB have undertaken four monitoring visits over a 4-week period.

Historical Gas Monitoring Data

- 10.4 BWB previously completed four rounds of ground gas monitoring between May and June 2017. Steady flow rates were recorded at <0.1 l/hr for all boreholes. Hydrogen Sulphide and carbon monoxide concentrations were not recorded above the limit of detection of the equipment during the monitoring visits. PID concentrations were recorded between 1.3ppm (in BH01 on 31/05/2017) and a maximum of 3.6 ppm (in BH02 on 25/05/2017). Methane values were all recorded as below <0.1 (%v/v). Steady carbon dioxide concentrations recorded ranged between 0.1% v/v (recorded in BH01 on 31/05/2017) and 4.2% v/v (recorded in BH03 on 05/06/2017) with steady methane concentrations were recorded at <0.1%v/v (recorded in all boreholes on all monitoring occasions).
- 10.5 It was concluded that maximum gas screening levels of 0.0036 l/hr were recorded giving a classification of CIRIA Characteristic Situation 1, with no special protective measures required. However, when considering the fact that the data set may be compromised due to flooding of the wells an assessment has been made using the Fraction of Organic Carbon (FOC). The FOC ranges from 0.24% to 5.9%. With FOC concentrations such as these, the Site should be characterised as a Characteristic Situation 2 (CS2) whereby ground gas protection measures are required to be included in the design of new properties. This information is displayed in **Appendix 2**.

Methodology

- 10.6 All boreholes were installed with dual ground gas monitoring wells with response zones set within the Hummocky Glacial Deposits. This allowed an unflooded section of installation to be monitored for ground gas. Exploratory hole records showing monitoring well constructions are presented in **Appendix 3**.
- 10.7 The assessment of potential ground gas generation is based on the observation of trends and changes in gas evolution by the direct measurement of ground gases from gas wells. The works included measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and barometric pressure. A PID survey was undertaken to measure volatile organic compounds within the borehole response zones.

Results

- 10.8 The minimum and maximum steady state concentrations recorded for borehole flow, oxygen, carbon dioxide and methane are summarised below in **Table 10.1**. The full ground gas monitoring results are presented in **Appendix 8**.

Table 10.1: Summary of Recorded Ground Gas Results.

Borehole ID	Targeted Geology	Steady Flow (l/hr)		Carbon Dioxide (%v/v)		Methane (%v/v)		Characteristic Situation
		min.	max.	min.	max.	min.	max.	
BH201	Hummocky Glacial Deposits	0.1	0.2	0.6	1.4	<0.1	<0.1	1
BH202	Hummocky Glacial Deposits	0.1	0.1	1.2	1.4	<0.1	<0.1	1
BH203	Hummocky Glacial Deposits	<0.1	<0.1	6.7	7.0	<0.1	<0.1	1

- 10.9 The atmospheric pressures were recorded as follows:
- Round 1 - 985mB during the site visit, rising to 1000mB over the preceding 12 hours; and
 - Round 2 - 1012mB during the site visit, remaining static at 1012mB over the preceding 12 hours; and
 - Round 3 - 1017mB during the site visit, remaining static at 1017mB over the preceding 12 hours; and
 - Round 4 - 1000mB during the site visit, rising to 1002mB over the preceding 12 hours.
- 10.10 On this basis, the monitoring is considered unlikely to have captured the worst-case gassing scenario at the site as generally, ground gas emissions tend to increase when atmospheric pressure falls and particularly when the pressure drops below 1000mB.
- 10.11 During the monitoring period, steady flow rates ranged between <0.1l/hr (recorded in several boreholes on several occasions) and 0.2 l/hr (BH201 – 28/03/23)).
- 10.12 Hydrogen sulphide, methane, PID and carbon monoxide concentrations were not recorded above the limit of detection of the equipment during the monitoring visits (<1ppm).
- 10.13 Steady carbon dioxide concentrations recorded ranged between 0.6% v/v (recorded in several boreholes on several occasions) and 7.0% v/v (BH203 on 17/03/2023).
- 10.14 Ground gas monitoring results are presented in **Appendix 8**.

Risk Assessment

- 10.15 CIRIA Report 665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" presents current best practice on the assessment of ground gases for commercial and residential buildings (with the exception of low-rise traditional housing). The report presents a risk-based approach based on gas screening levels which depend on both the concentration and emission rate of gas from the ground. Gas screening levels are calculated as follows:

$$\text{Gas screening value (l/hr)} = \frac{\text{gas concentration (\%)} \times \text{measured borehole flow rate (l/h)}}{100}$$

- 10.16 Based on a maximum carbon dioxide concentration of 7.0%v/v and maximum flow of 0.3l/hr, a maximum gas screening level of 0.021 has been calculated, giving a classification of CS1.
- 10.17 BH203 recorded CO₂ above 5% during all four visits. BS8485 and C665 recommends consideration of CS2 gas protection measures where CO₂ concentrations are >5% and methane concentrations >1%. All other CO₂ measurements were below 5%, therefore it is unlikely that there is a significant source of ground gas at the site.
- 10.18 Given that the monitoring is unlikely to have captured the worst-case gassing scenario at the site, it would be advised to zone the site. Unit L-2 in the west of the site is therefore classified as CS2 whereby gas protection measures are required. Further monitoring capturing rapidly falling pressures may lower the gas risk in the west of the site.
- 10.19 Units L-1, L-3 and L-4 in the east of the site are classified as CS1 whereby gas protection measures are not required.

11. HUMAN HEALTH RISK ASSESSMENT

- 11.1 Soil contaminant data have been compared against Generic Site Assessment Criteria (GSAC) developed by BWB using the CLEA model 1.06 and the updated CLEA framework (2009) for assessing risk from soil contamination to human health. Details of the derivation of the GSACs are presented in **Appendix 7**. The results of the soil chemical laboratory results are provided within **Appendix 5**, with a table summarising the results presented as **Appendix 7**.
- 11.2 The GSACs have been developed with the following assumptions which have been changed from the CLEA default parameter set. Soil type is a sandy loam with an organic matter content of 1%. This is considered to be more representative of shallow Made Ground found on most Brownfield sites than the CLEA default of 6% organic matter. The building type for a commercial development is assumed to be a post 1970s office which is representative of new commercial buildings.

Pathways

- 11.3 Contamination data have been compared to generic site assessment criteria (GSAC) for a commercial end use without home grown produce (i.e. using all pathways for that end use) based on an organic matter content of 1%. Details of the derivation of the GSACs are presented in **Appendix 7**.
- 11.4 The site is to be developed for commercial end use and therefore the key receptor is considered to be an adult female worker and GSACs for a commercial industrial end use have been adopted.
- 11.5 Exposure pathways considered in this assessment are presented in **Table 12:1**.

Table 11.1: Commercial Exposure Pathways.

Source	Shallow Soils		Deep Soils
Pathway	Commercial / Industrial with managed landscaped areas	Commercial / Industrial with Hard standing areas	Commercial / Industrial
Ingestion of Soil	✓	✗	✗
Ingestion of site derived household dust	✓	✗	✗
Ingestion of contaminated vegetables	✗	✗	✗
Ingestion of soil attached to vegetables	✗	✗	✗
Dermal contact with Soil	✓	✗	✗
Dermal contact with site derived household dust	✓	✗	✗
Inhalation of fugitive soil dust	✓	✗	✗
Inhalation of fugitive site derived household dust	✓	✗	✗
Inhalation of vapours outside	✓	✓	✓

Source	Shallow Soils		Deep Soils
Inhalation of vapours inside	✓	✓	✓

Sources

- 11.6 When the results were screened against the LQM S4ULS for a commercial end use development no contaminant concentrations were recorded above the screening criteria.

Asbestos

- 11.7 Eight samples of near-surface soils were subject to asbestos identification analysis, none of these returned a positive result as containing asbestos.

Anthrax

- 11.8 All samples analysed for Anthrax in the previous 2017 investigation returned a negative result.

12. UPDATED ENVIRONMENTAL RISK ASSESSMENT

Introduction

12.1 The preliminary conceptual site model presented in **Table 6.1** has been updated based on the above risk assessment. The updated conceptual site model is presented in **Table 13.1** and summarised below.

Table 12.1: Revised Conceptual Site Model .

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
S1: On site: Elevated concentrations of Carbon Dioxide.	P1: Indoor Inhalation of soil-derived ground gases.	R1: Potential future site users.	Sv	UI	M/L	The potential risk to future Site users can be mitigated via the installation of appropriate ground gas protection measures within units in the west of the site. The ground gas protection measures will need to achieve a minimum score of 1.5 points for areas of warehousing and 2.5 points for areas where office and confined spaces are in contact with the ground surface.
		R2: Construction workers and maintenance workers				The risks to construction works and future maintenance workers can be mitigated by the use of appropriate PPE & RPE where entry is required into confined spaces such as man holes. Any entry to a confirmed space will require appropriate risk assessment prior to the works commencing.
VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low						
KEY: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely						

Source	Pathway	Receptor	Con	Prob	Risk	Mitigation/Investigation
Pollutant Linkage Assessment Summary						
When considered in the context of the conceptual site model and the historical activities that have taken place (former abattoir), the proposed development is considered to pose a MODERATE/LOW risk to human health. It is considered that the main driver for the risk rating for human health is high carbon dioxide concentrations. The controlled waters risk assessment has not identified a significant risk to controlled water receptors, the risk is considered to be LOW.						

13. ENVIRONMENTAL LIABILITY ASSESSMENT AND DEVELOPMENT CONSTRAINTS

Statutory Liability

- 13.1 Based on the information available regarding the site, the potential for Statutory Authority action based on "*pollution of controlled water*" or "*significant harm*" as defined by Part IIA of the Environmental Protection Act 1990 is considered to be low/negligible.

Third Party Liability

- 13.2 Based on the information contained in this report, it is the opinion of BWB that the potential for legal action by surrounding landowners, based on the potential for contamination to migrate off-site, is considered to be low/negligible when considering the site setting and surrounding land uses.

Public Relations

- 13.3 The likelihood of public relations being tarnished due to contamination issues at the site are considered to be negligible.

Development Implications

- 13.4 Groundwater levels may locally be higher than proposed FFL, particularly in the south east end of the site, requiring long-term lowering of the groundwater level and temporary dewatering during construction. If development, and particularly excavations are required during wetter periods then groundwater level control, such as dewatering at well points or slit trenches may need to be incorporated. If active dewatering is required, the potential for induced settlements on site and in the surrounding boundary should be assessed.
- 13.5 Given the current site topography and proposed development layout, earthworks will be required across the site in order to form suitable platforms for construction. All earthworks will need to be undertaken in accordance with a suitable specification document, which will need to be prepared to describe the materials and their requirements including placement and acceptability limits.
- 13.6 On the basis of the hazardous ground gas risk assessment, ground gas protection appropriate to a CS2, will need to be included within the design of future properties constructed in the west of the Site. The west of the site (Unit L2) is classified as CS2 whereby ground gas protection measures are required. The east of the site is classified as CS1 and ground gas protection measures are not required (Units L1, L3 and L4).

14. WASTE MANAGEMENT

Waste Classification

- 14.1 Soil samples have been characterised against hazardous waste criteria using Hazwasteonline. The results of the waste classification are presented in **Appendix 9**. The assessment indicates that the soils analysed are likely to be classified as non-hazardous. The waste classification assessment only applies to those soils that have been tested. If other soils are to be disposed of off-site, then further analysis may be required.
- 14.2 Asbestos has not been found at the site. The presence of visible asbestos containing materials in waste or at concentrations exceeding 0.1% by weight will classify the waste as mixed and require disposal as hazardous waste irrespective of the chemical properties of the waste.
- 14.3 Should any soils require disposal off site an assessment of waste classification of the soils for disposal should be made by a competent person. Further chemical analysis may be required to fully characterise waste soils for disposal to landfill or re-use off site. WAC analysis may be required for disposal of soils as inert or hazardous.

15. CONCLUSION AND RECOMMENDATIONS

Conclusions

- 15.1 This report presents a review of desktop study information and an existing BWB Phase 2 report undertaken in 2017, plus the results of a supplementary 2023 intrusive ground investigation for the current scheme layout for Plot L, Kingsway Business Park, Rochdale.
- 15.2 The 2023 ground investigation comprised the advancement of three cable percussive boreholes and seven trial pits with subsequent laboratory analysis of selected soil samples for chemical and geotechnical purposes and four rounds of gas and groundwater monitoring.
- 15.3 The ground conditions were generally recorded as Topsoil overlying variable sands, silts, clays and gravel soils of Hummocky Glacial Deposits, which were recorded to depths of at least 10.45m bgl (depth of borehole termination). Made Ground was found above these deposits in TP08, TP15, TP16, TP203, TP204, and TP206, typically between 0.4m and 1.8m thick.
- 15.4 Groundwater was encountered in the Hummocky Glacial Deposits between 145.5mAOD bgl and 148.93AOD bgl during 2017 and 2023 monitoring rounds. Groundwater levels fall from highest levels in the south eastern side of the site to lowest levels in the north west.

Environmental

- 15.5 Chemical soil analysis has been undertaken of samples from the site and has not identified elevated concentrations of contaminants above their respective screening criteria (in both investigations). All samples analysed for Anthrax in the 2017 investigation (investigated around the former abbatoir in the south of the site) also returned negative.
- 15.6 Ground gas monitoring recorded slightly elevated concentrations of carbon dioxide in BH203 in the west of the site.

Geotechnical

- 15.7 Ground conditions are typically soft/loose and compressible to around 141mAOD, and ground improvement will be required under structures, ground bearing slabs, and heavily loaded areas. Vibro stone columns or rigid inclusions are considered suitable subject to specialist design.
- 15.8 Soft organic material was present locally, but only encountered in one trial pit (TP15) next to the stream and is not expected to be widespread. Most material is anticipated to be suitable for re-use as fill.
- 15.9 Cut/fill works will likely need temporary groundwater control to manage, including active dewatering if works are undertaken during wet periods. Surface conditions are soft and wet.

- 15.10 Water content of site won material likely exceeds optimum moisture content and stabilisation may be required in combination with strict ground and surface water control. Most of the site-won material will likely be natural material plus localised Made Ground, and be suitable for re-use as engineered fill subject to confirmatory testing and control of water content.
- 15.11 Use of the Materials Management Plan (MMP) route will be needed for site-won material re-use.
- 15.12 Ground improvement will be required to support shallow foundations and ground bearing slabs, and other heavily loaded areas.
- 15.13 Proposed slope angles of 1:3 are reasonable to assume in cut and fill outside of soft organic areas or Made Ground, subject to site-specific analysis. Local retaining structures up to 1.5m height supporting soil slopes are also expected to be feasible subject to design.
- 15.14 There is potential for concrete obstructions and existing slabs from demolished buildings (known to be present around TP08 and TP205). While the nature of concrete encountered in TP08 was not proved due to collapse of the trial pit due to water ingress, it is possible this is an unmarked drain rather than a foundation slab. Investigations in TP205 in 2023 were likewise inconclusive due to water ingress.
- 15.15 BWB has assessed the site as requiring measures for buried concrete in line with Design Sulphate Class DS1 and ACEC Class AC1 for soils, in accordance with BRE Special Digest SD1.

Recommendations

Environmental

- 15.16 A gas protection verification plan should be completed detailing mitigation measures and validation expectations for the installation of ground gas protection measures.
- 15.17 Ground gas protection measures in accordance with CS2 must be included within the design of new properties in the west of the Site (Unit L2).

Geotechnical

- 15.18 Ground improvement design will need to be undertaken by a specialist.
- 15.19 Any earthworks will need to be undertaken in accordance with a suitable specification document, which will need to be prepared to describe the materials and their requirements including placement and acceptability limits.
- 15.20 The constraints relating to the proposed south eastern retaining structure limit the potential options for this structure. A specialist pile/wall designer should be consulted to discuss feasibility and options, noting retained height for design will need to take overdig into account.

- 15.21 Allowance should be made for temporary shoring of excavations due to likely stability issues associated with running sands.
- 15.22 Contingency for groundwater control should be considered especially if development is undertaken during the winter months.

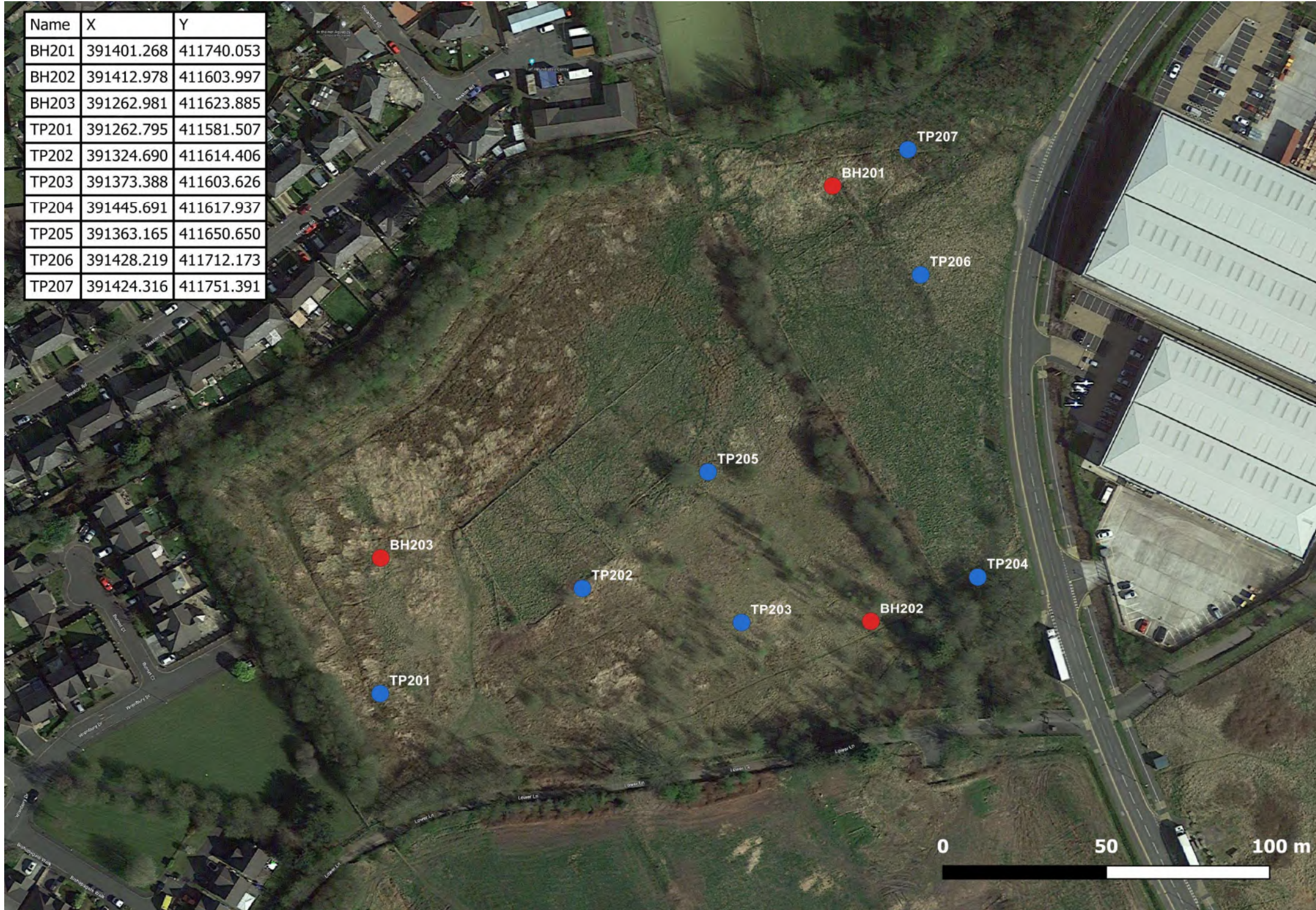
16. REFERENCES

1. British Standards Institute, (BSI), BS 8485:2015+A1:2019, Code of Practice for the characterization and remediation from ground gas in affected developments
2. British Standards Institute, (BSI), BS 8576:2013, Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)
3. British Standards Institute, (BSI), BS 10175:2011+A2:2017, Investigation of Contaminated Sites – Code of Practice
4. British Standards Institute, (BSI), BS5930:2015+A1:2020 Code of practice for ground investigations
5. British Standards Institute, (BSI), BS EN 1997-1:2004+A1:2013, Incorporating corrigendum February 2009, Eurocode 7 – Geotechnical Design – Part 1: General rules.
6. British Standards Institute, (BSI), BS EN 1997-2:2007 Incorporating corrigendum June 2010, Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and testing.
7. Building Research Establishment Special Digest 1 Third Edition. Concrete in Aggressive Ground (2005)
8. Building Research Establishment (BRE) BR211, Radon; Guidance on Protective Measures for New Buildings (2015)
9. Construction Industry Research and Information Association (CIRIA), Report 132, A Guide to Safe working on Contaminated Sites (1996).
10. Construction Industry Research and Information Association (CIRIA). 2001, C522 Contaminated land risk assessment, A guide to good practice.
11. Construction Industry Research and Information Association (CIRIA). 2007, Report C665, Assessing Risk Posed by on Hazardous Ground Gases to Buildings
12. Department for Communities and Local Government (DCLG), 2012, National Planning Policy Framework.
13. Department for Environment Food and Rural Affairs (DEFRA), 2012, Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.
14. Environment Agency report Land Contamination Risk Management, 2020.
15. Environment Agency 2008, Updated technical background to the CLEA model Science Report – SC050021/SR3
16. Environment Agency 2008, Human health toxicological assessment of contaminants in soil Science Report – SC050021/SR2

17. Environment Agency 2009, CLEA Software (Version 1.05) Handbook Better Regulation Science Programme Science report: SC050021/SR4
18. Environment Agency 2008, A review of body weight and height data used within the Contaminated Land Exposure Assessment model (CLEA) Project SC050021/ Technical Review 1
19. Environment Agency, 2006, Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination
20. Health and Safety Executive (HSE) 'Protection of workers and the general public during the Development of Contaminated Land (1991).
21. NHBC Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66: 2008.

DRAWINGS

Drawing 1: Exploratory Hole Location Plan



- NOTES**
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LEGEND

 Cable Percussion borehole

 Trial Pit



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Drawing Title:

Drawing 1 - Exploratory Hole Location Plan

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Drawing 2: Combined Exploratory Hole Location Plan



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LEGEND

-  Cable Percussion borehole (2023)
-  Trial Pit (2023)
-  Cable Percussion borehole (2017)
-  Trial Pit (2017)



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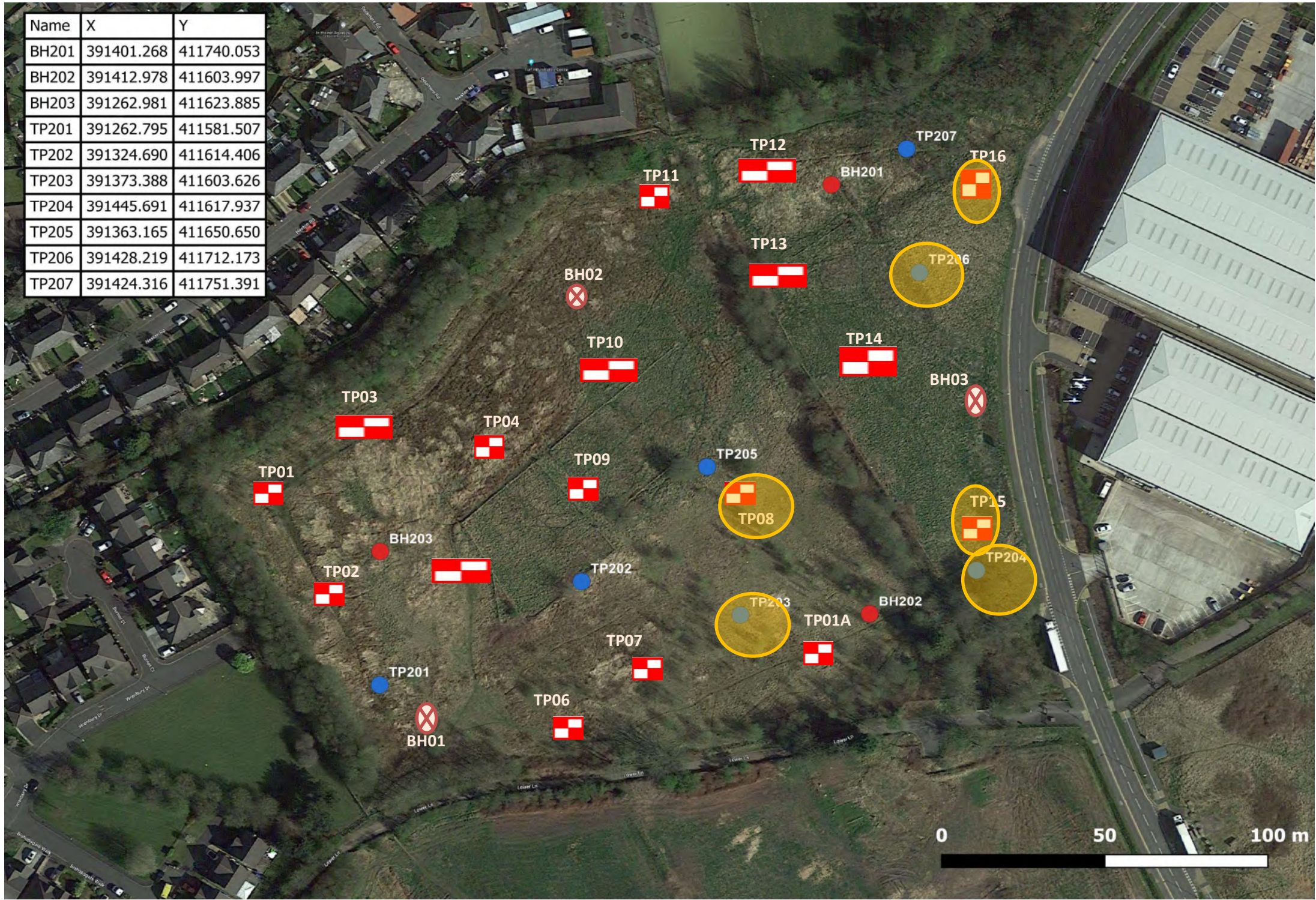
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Drawing 2 - Combined
Exploratory Hole Location

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Drawing 3: Made Ground Location Plan



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LEGEND

-  Cable Percussion borehole (2023)
-  Trial Pit (2023)
-  Cable Percussion borehole (2017)
-  Trial Pit (2017)
-  Location where Made Ground was encountered



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Drawing 3 - Made Ground Location Plan

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Drawing 4: Maximum and Minimum Monitoring Groundwater Level

Name	X	Y
BH201	391401.268	411740.053
BH202	391412.978	411603.997
BH203	391262.981	411623.885
TP201	391262.795	411581.507
TP202	391324.690	411614.406
TP203	391373.388	411603.626
TP204	391445.691	411617.937
TP205	391363.165	411650.650
TP206	391428.219	411712.173
TP207	391424.316	411751.391



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LEGEND

148.93 Maximum GWL (mAOD)
145.50 Minimum GWL (mAOD)

BH201 to BH203 had dual installations which were generally in hydraulic continuity, and maxima and minima shown are the extremes of both installations.



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Drawing 4 - Maximum and Minimum Monitored

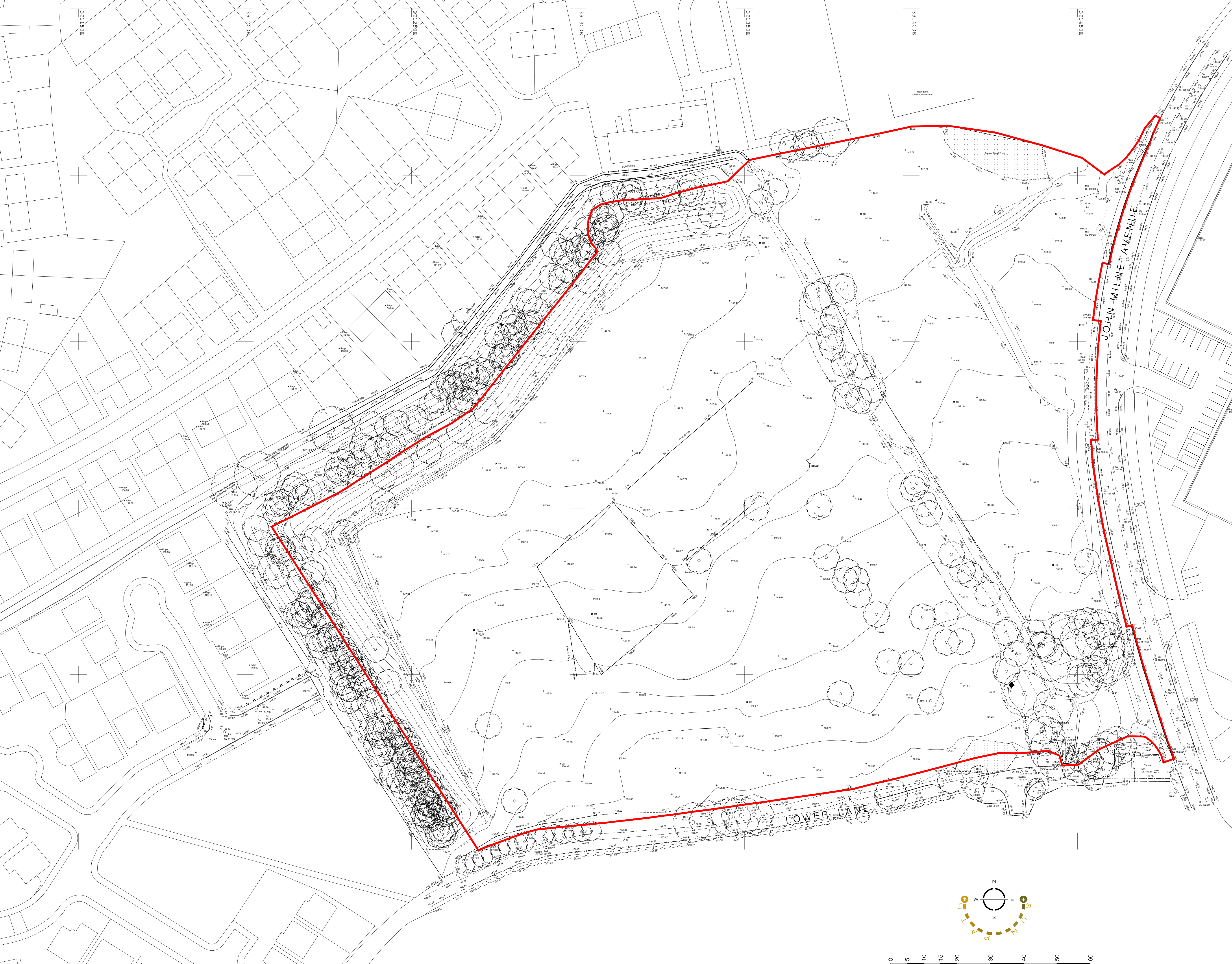
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APPENDICES

APPENDIX 1: Site Masterplan



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6 East Parade | Leeds | LS1 2AD
0113 887 3100
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PROJECT
KINGSWAY BUSINESS PARK
ROCHDALE

TITLE
EXISTING SITE PLAN
PLOT L

SCALE
1:500

DATE
27/02/23

DLA REF	DRAWN	REVIEWED
2022-147	PSL	BLG

PROJECT	ORIGIN/R	ZONE	LEVEL	TYPE	ROLE	NUMBER
KPL	DLA	LS	XX	DR	A	90001

STATUS	REVISION
PLANNING	P01

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Plot L

Unit L-1

GIA (Ground floor and First Floor Offices (≈ 7.5%) = 60,850 Sqft / 5,653.13 Sqm

Building height - 10m to haunch

Car Parking

B8 parking (1 per 100m2 = 57) - Actual = 57 (inc 4 dis at ≈ 6% and 6 EVCP ≈ 10%)

B2 parking (1 per 60m2 = 97) - Additional 38 spaces indicated as dashed bays on yard

Cycle parking ≈ 12 spaces (BREEAM)

M/C parking (1 per 4000m2) = 2 spaces

Unit L-2

GIA (Ground floor and First Floor Offices (≈ 7.5%) = 39,854 Sqft / 3,702.56 Sqm

Building height - 8m to haunch

Car Parking

B8 parking (1 per 100m2 = 38) - Actual = 38 (inc 3 dis at ≈ 6% and 4 EVCP ≈ 10%)

B2 parking (1 per 60m2 = 62) - Additional 24 spaces indicated as dashed bays on yard

Cycle parking ≈ 8 spaces (BREEAM)

M/C parking (1 per 4000m2) = 1 spaces

Unit L-3

GIA (Ground floor and First Floor Offices (≈ 7.5%) = 15,784 Sqft / 1,466.35 Sqm

Building height - 7m to haunch

Car Parking

B8 parking (1 per 100m2 = 14) - Actual = 14 (inc 2 dis at ≈ 6% and 2 EVCP ≈ 10%)

B2 parking (1 per 60m2 = 24) - Additional 10 spaces indicated as dashed bays on yard

Cycle parking ≈ 3 spaces (BREEAM)

M/C parking (1 per 4000m2) = 1 space

Unit L-4

GIA (Ground floor and First Floor Offices (≈ 7.5%) = 21,365 Sqft / 1,984.89 Sqm

Building height - 8m to haunch

Car Parking

B8 parking (1 per 100m2 = 20) - Actual = 20 (inc 2 dis at ≈ 6% and 2 EVCP ≈ 10%)

B2 parking (1 per 60m2 = 34) - Additional 14 spaces indicated as dashed bays on yard

Cycle parking ≈ 5 spaces (BREEAM)

M/C parking (1 per 4000m2) = 1 space

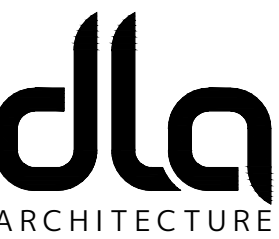
Site plan proposals subject to detailed level / cut and fill / retaining structure assessment and plot drainage connection provision

Plot L Outline Planning consent for B1 / B2 and B8 building use 7m / 9m haunch and FFL of 148.5.

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REVISIONS			
P01	20/03/23	PSL	BLG
ISSUED FOR COMMENT			
P02	17/04/23	PSL	BLG
REVISED TO LATEST BUILDING ARRANGEMENT			
ADDITIONAL SUB STNS AS ADVISED BY BWB			
CONDENSER COMPOUNDS INDICATED			
TIMBER FENCE ADDED BETWEEN UNITS L1 AND L3			
RETAINING WALL ADDED BETWEEN UNIT L1 AND L2 YARD AS BWB			
LEVEL PROPOSALS			
P03	20/04/23	PSL	BLG
ACCESS ROAD REVISED IN LINE WITH BWB SWEEP PATH DRAWINGS			
APPLICATION BOUNDARY REVISED TO INCLUDE LANDSCAPE WORKS			
P04	21/04/23	PSL	BLG
ACCESS ROAD REVISED IN LINE WITH FURTHER BWB UPDATES			
P05	04/05/23	PSL	BLG
UNIT L2 LOADING BAYS AND SPRINKLER TANKS RELOCATED AS			
REQUESTED BY BWB (TELECON 28/04/23)			
RETAINING WALLS REVISED IN LINE WITH BWB PROPOSALS			
ACCESS ROAD AND PLOT ACCESSES REVISED IN LINE WITH BWB			
PROPOSALS RECEIVED 28/04/23			
P06	10/05/23	PSL	BLG
UNIT L4 LEVEL LOADING BAYS MOVED AS REQUESTED BY BWB			
UNIT L2 LEVEL LOADING BAYS ADJUSTED TO COORDINATE WITH			
BUILDING CLADDING PROFILE / ARRANGEMENT			
P07	24/08/23	PSL	BLG
SITE PLAN AND UNITS L1 AND L4 REVISED TO ACCOMMODATE			
BWB LATEST DITCH DIVERSION PROPOSALS			
CYCLE PARKING PROVISION REVISED FOR BREEAM			
P08	01/09/23	PSL	CF
MANUAL SLIDING GATES ADDED TO UNITS 1, 3 AND 4 YARD ENTRANCES			
TO SUIT PROPOSED YARD LEVELS (UNIT 1) AND INCREASED WIDTHS			
(UNITS 3 AND 4)			



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PROJECT
KINGSWAY BUSINESS PARK
ROCHDALE

TITLE
SITE PLAN
PLOT L

SCALE
1:500

DATE
@A1 28/02/23

DLA REF
2022-147

DRAWN
PSL

REVIEWED
BLG

PROJECT
KPL

ORIGIN/R
DLA

ZONE
LS

LEVEL
XX

TYPE
DR

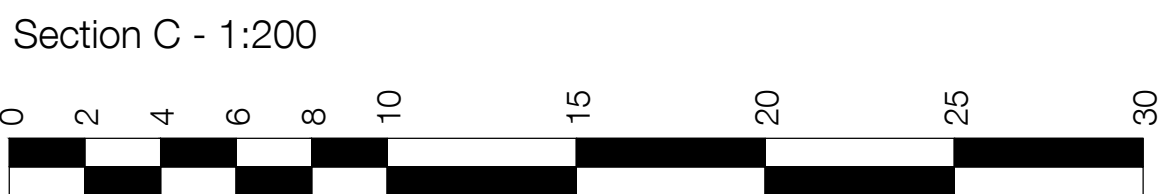
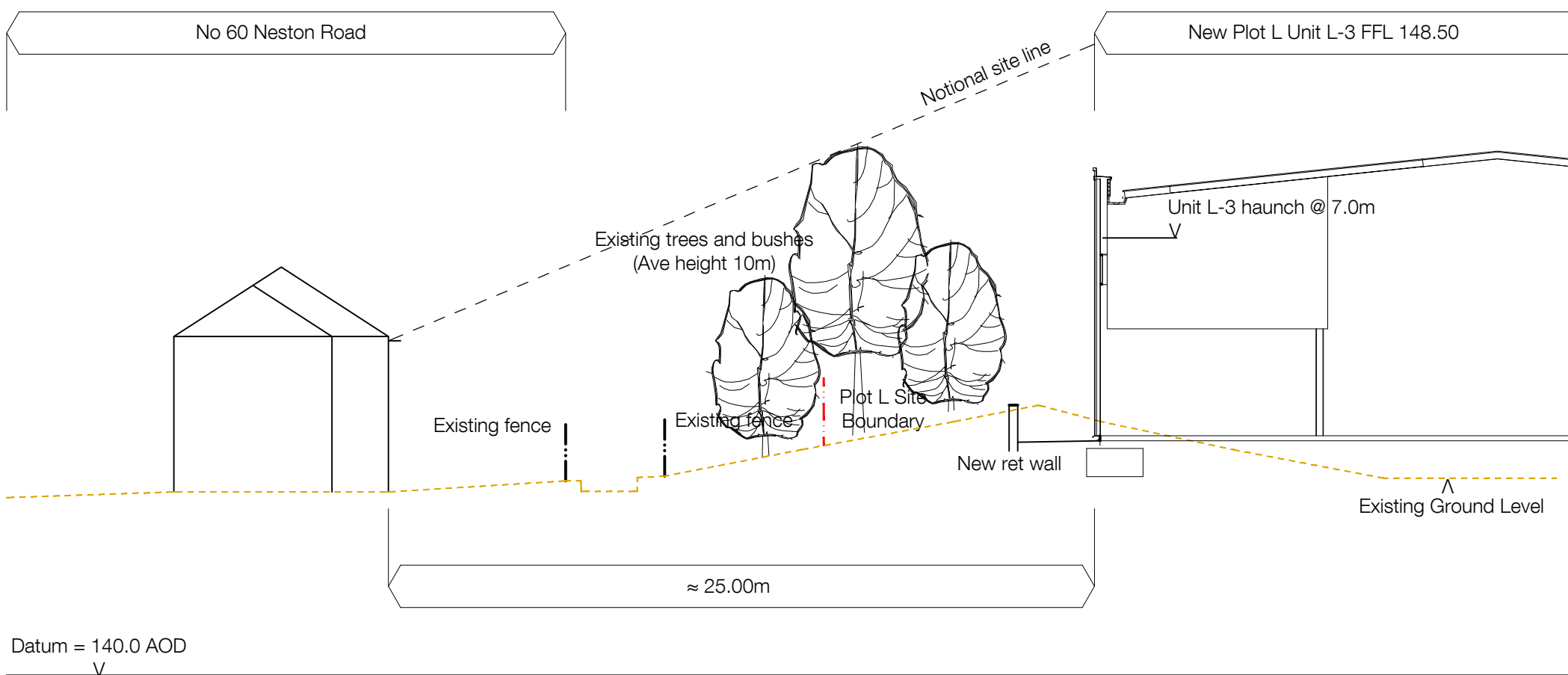
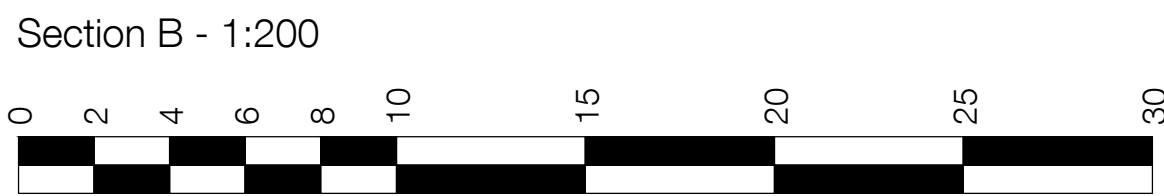
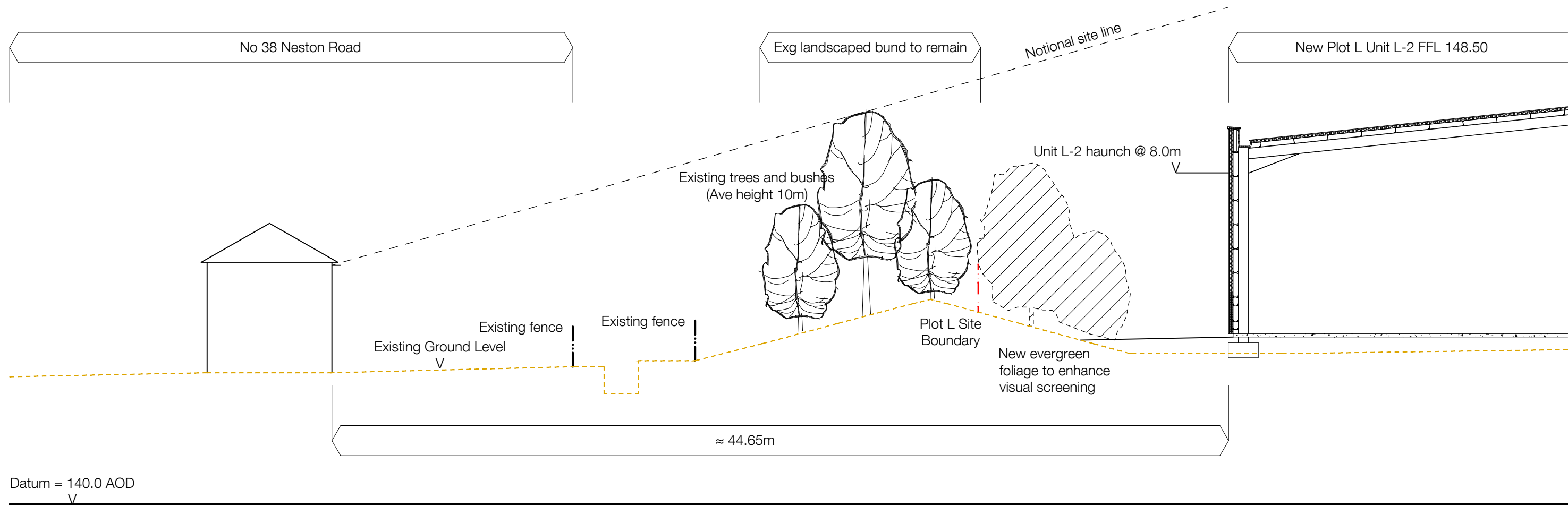
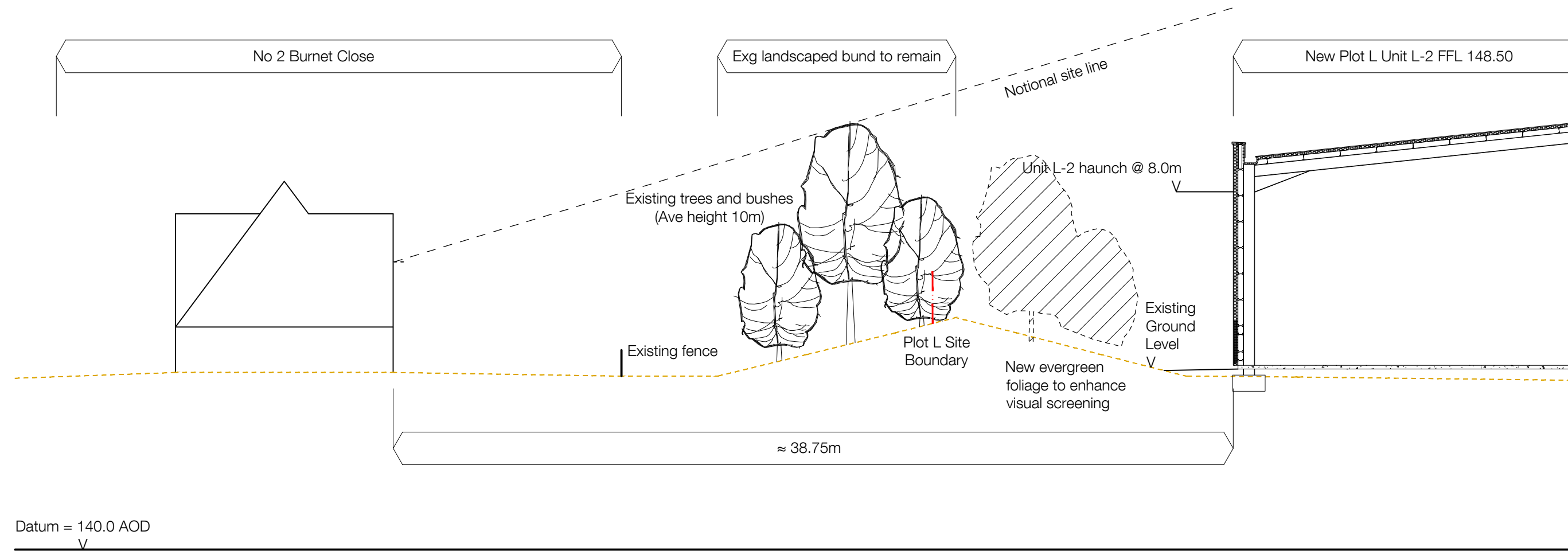
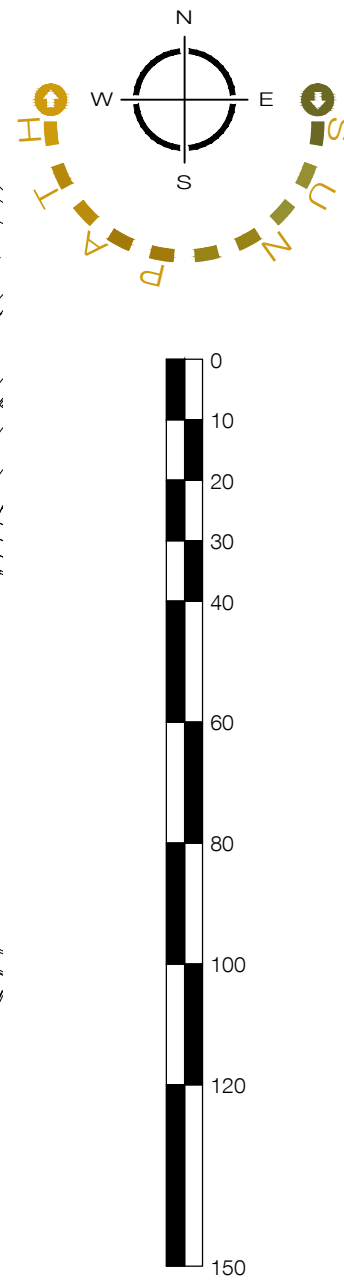
ROLE
A

NUMBER
90002

STATUS
PLANNING

REVISION
P08

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DO NOT SCALE, REFER TO FIGURED DIMENSIONS ONLY				
REVISIONS				
P01	28/02/23	PSL	BLG	
FIRST ISSUE				
P02	21/04/23	PSL	BLG	
UNIT L-3 BUILDING HEIGHT CORRECTED				
APPLICATION BOUNDARY REVISED TO INCLUDE LANDSCAPE WORKS				
P03	24/08/23	PSL	BLG	
REVISED TO LATEST SITE / BUILDING AND DIVERTED DITCH PROPOSALS				
P04	01/09/23	PSL	BLG	
COLOUR CONTEXT TO SITE PLAN ADDED				



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PROJECT
KINGSWAY BUSINESS PARK
ROCHDALE

TITLE
**DETAILED SITE SECTIONS
PLOT L**

SCALE
VARIES @A1

DATE
28/02/23

DLA REF
2022-147

DRAWN
PSL

REVIEWED
BLG

PROJECT
KPL

ORIGIN/R
DLA

ZONE
LS

LEVEL
XX

TYPE
DR

ROLE
A

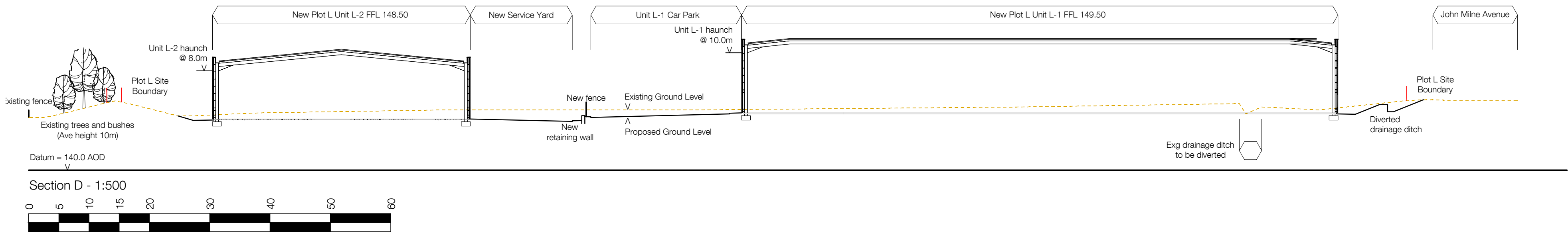
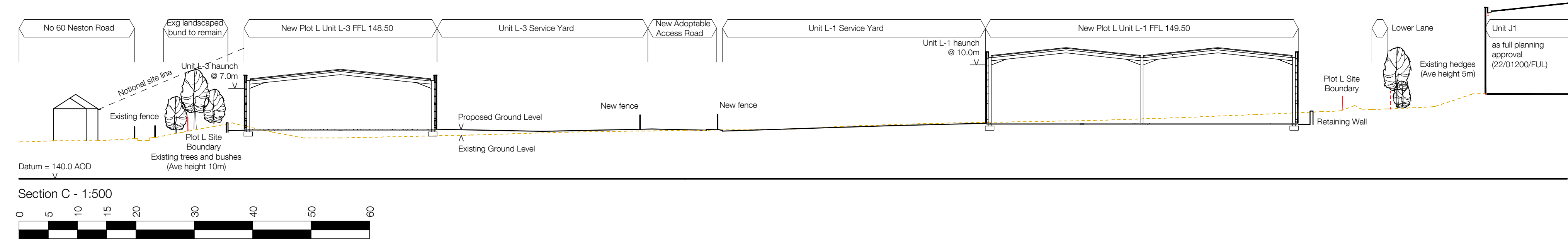
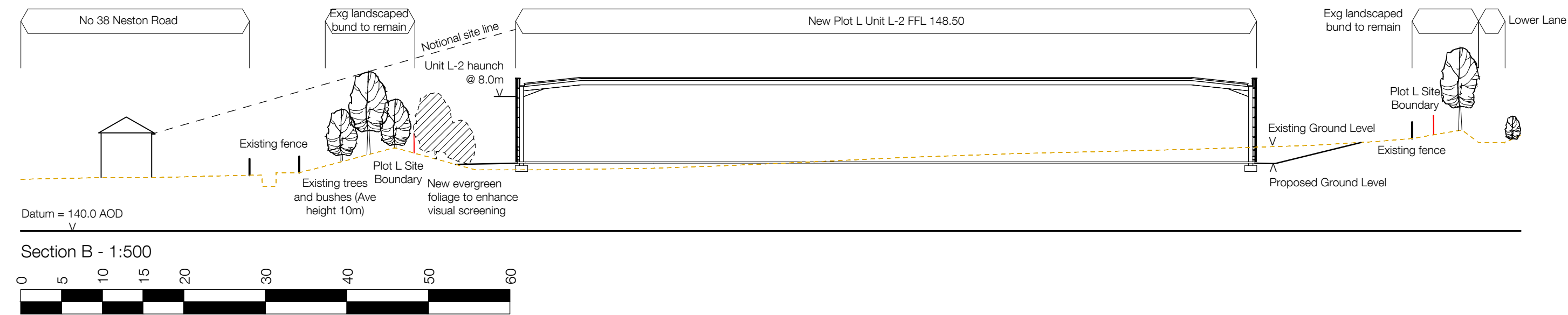
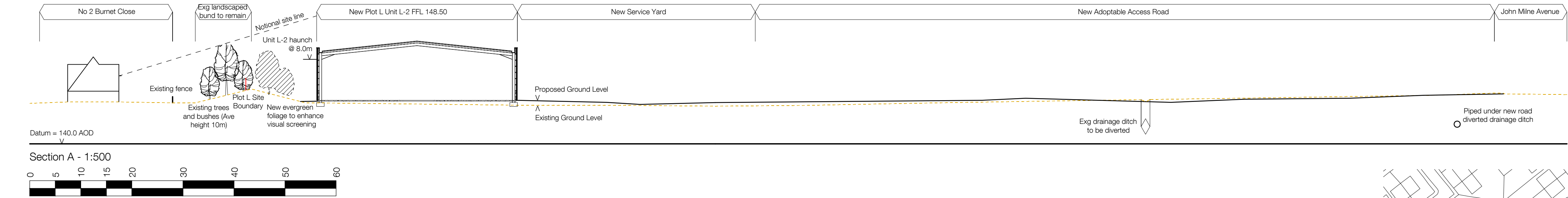
NUMBER
90003

STATUS
PLANNING

REVISION
P04

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REVISIONS			
P01	20/03/23	PSL	BLG
ISSUED FOR COMMENT			
P02	25/04/23	PSL	BLG
BUILDING FFL'S REVISED AS BWB PROPOSALS			
APPLICATION BOUNDARY REVISED TO INCLUDE LANDSCAPE WORKS			
P03	24/08/23	PSL	BLG
REVISED TO LATEST SITE / BUILDING AND DIVERTED DITCH PROPOSALS			
P04	01/09/23	PSL	BLG
COLOUR CONTEXT TO SITE PLAN ADDED			



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PROJECT
**KINGSWAY BUSINESS PARK
ROCHDALE**

TITLE
**SITE SECTIONS
PLOT L**

SCALE
VARIES @A1

DATE
28/02/23

DLA REF
2022-147

DRAWN
PSL

REVIEWED
BLG

PROJECT
KPL

ORIGIN/R
DLA

ZONE
LS

LEVEL
XX

TYPE
DR

ROLE
A

NUMBER
90004

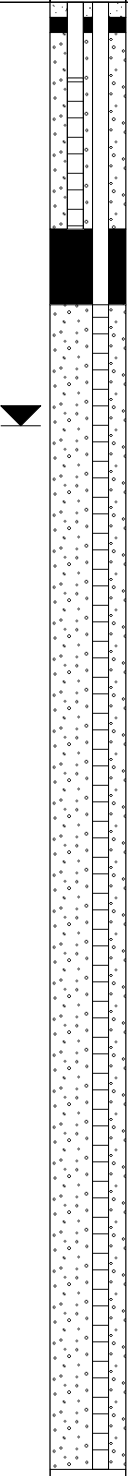
STATUS
PLANNING

REVISION
P04

APPENDIX 2: 2017 Phase 1 and Phase 2 Geo-Environmental Assessment Report

APPENDIX 3: Exploratory Hole Logs

BOREHOLE LOG

LOCATION ID		Project Name: Plot L, Kingsway Business Park				Ground Level (m AOD): 147.45							
BH201		Project Number: 222009A				Eastings: 391400.90							
		Client: Wilson Bowden Developments Ltd				Northings: 411740.65							
Hole Type: CP		Rig: Dando 2000		Start & End Date: 07/03/2023		Engineer: PM		Checker: MH					
Boring		Strata				Samples		In-Situ Tests					
Strike	Well	Level (m AOD) & [Thickness (m)]	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)	
		(0.30)	Shrub over dark brown soft friable silty CLAY with occasional rootlets.			D1	0.00	0.30					
		147.15 (0.30)	(Topsoil)		0.30	ES1	0.00						
		146.85 (1.00)	Soft brown silty CLAY with occasional plant material. (Hummocky Glacial Deposits)		0.60	D2	0.30	0.60					
			Grey slightly gravelly clayey silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse of sandstone. (Hummocky Glacial Deposits)			B1	1.00	1.45	SPT	1.00	N=11 (1,2/3,3,3,2)	1.00m (2.80m bgl)	
						D3	1.00						
			145.85 (1.70)	Grey very sandy angular to subrounded fine to coarse GRAVEL of sandstone and siltstone. (Hummocky Glacial Deposits)		1.60	D4	1.50	1.50				
										SPT	2.00	N=13 (4,3/4,3,3,3)	2.00m (2.80m bgl)
										SPT	3.00	N=1 (0,1/1,0,0,0)	3.00m (2.80m bgl)
			144.15 (0.50)	Brown fine to medium SAND. (Hummocky Glacial Deposits)		3.30							
		143.65 (2.70)	Soft brown sandy silty CLAY. (Hummocky Glacial Deposits)		3.80	B2	4.00	4.45	SPT	4.00	N=8 (1,2/2,2,2,2)	4.00m (2.80m bgl)	
						D5	4.00						
			5.00 - 6.50: Becomes very sandy										
									SPT	5.00	N=3 (1,2/2,1,0,0)	5.00m (2.80m bgl)	
						D6	6.00	6.00	SPT	6.00	N=12 (1,2/2,2,4,4)	6.00m (2.80m bgl)	
		140.95 (1.40)	Brown clayey slightly gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse of sandstone. (Hummocky Glacial Deposits)		6.50								
									SPT	7.50	N=5 (3,2/1,2,1,1)	7.50m (2.80m bgl)	
		139.55 (2.55)	Brown sandy angular to subrounded fine to coarse GRAVEL of sandstone and siltstone. (Hummocky Glacial Deposits)		7.90	B3	8.00	8.45					
						D7	8.00						
									SPT	9.00	N=27 (2,2/3,4,10,10)	9.00m (2.80m bgl)	
Chiseling		Remarks											
From (m bgl)	To (m bgl)	Time (hh:mm)	Reason for Termination:										
			Designation depth reached.										
Groundwater Remarks:			Groundwater encountered at 2.80m bgl.										
Water Added			Other Remarks:										
From (m bgl)	To (m bgl)	Volume (l)	Cleared of buried services. Hand put dug to 1.20m bgl. Installed with dual monitoring standpipe upon completion.										
													

BOREHOLE LOG

Scale 1:50

Sheet 2 of 2

[illegible]

BOREHOLE LOG

Scale 1:50

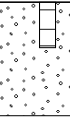
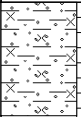
Sheet 1 of 2

LOCATION ID BH202		Project Name: Plot L Kingsway Business Park					Ground Level (m AOD): 150.58																
		Project Number: 222009					Eastings: 391402.71																
		Client: Wilson Bowden Developments Ltd					Northings: 411600.86																
Hole Type: CP		Rig: Dando 2000		Start & End Date: 08/03/2023			Engineer: PM		Checker: MH														
Boring		Strata					Samples			In-Situ Tests													
Strike	Well	Level (m AOD) & [Thickness (m)]	Description	Legend	Depth (m bgl)	Type (blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)											
		[0.40]	Dark brown soft friable slightly gravelly slightly sandy silty CLAY with many rootlets. Gravel is angular to subangular fine to coarse of sandstone and glass. (Topsoil)		0.40	B1	0.00	0.30															
		150.18 [2.40]	Dark brown clayey slightly gravelly fine to medium SAND. Gravel is angular fine coal. (Hummocky Glacial Deposits)		B2	0.50	0.70	SPT					1.00	N=23 (4,4/6,6,6,5)	1.00m (2.80m bgl)								
				147.78 [6.10]	Brown slightly gravelly fine to medium SAND. Gravel is angular fine coal. (Hummocky Glacial Deposits)		2.80								SPT	3.00	N=7 (1,1/0,1,2,4)	3.00m (2.80m bgl)					
						B3	3.50	4.00	SPT	4.00	N=12 (1,0/1,4,3,4)	4.00m (2.80m bgl)											
						D1	4.00	4.00	SPT	5.00	N=2 (1,1/1,0,0,1)	5.00m (2.80m bgl)											
						D2	4.50	4.50	SPT	6.00	N=11 (1,2/1,3,3,4)	6.00m (2.80m bgl)											
									SPT	7.50	N=17 (3,3/4,4,4,5)	7.50m (2.80m bgl)											
									SPT	9.00	N=17 (3,4/4,5,4,4)	9.00m (2.80m bgl)											
		141.68 [1.55]	Firm locally stiff dark brown slightly gravelly silty CLAY. Gravel is angular to subrounded fine to coarse of siltstone. (Hummocky Glacial Deposits)		8.90																		
						B4	9.50	10.00															
Chiseling		Remarks																					
From (m bgl)	To (m bgl)	Time (hh:mm)	Reason for Termination:																				
			Designation depth reached																				
Groundwater Remarks:			Groundwater encountered at 2.80m bgl.																				
Water Added			Other Remarks:																				
From (m bgl)	To (m bgl)	Volume (l)	Cleared of buried services. Hand pit dug to 1.20m bgl. Installed with dual monitoring standpipe upon completion.																				


BWB
A GDF GROUP COMPANY

AGS
REGISTERED USER 2023

BOREHOLE LOG

LOCATION ID		Project Name: Plot L Kingsway Business Park						Ground Level (m AOD): 150.58					
BH202		Project Number: 222009						Eastings: 391402.71					
		Client: Wilson Bowden Developments Ltd						Northings: 411600.86					
Hole Type: CP		Rig: Dando 2000			Start & End Date: 08/03/2023			Engineer: PM		Checker: MH			
Boring		Strata					Samples			In-Situ Tests			
Strike	Well	Level (m AOD) & [Thickness (m)]	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)	
		140.13	Firm locally stiff dark brown slightly gravelly silty CLAY. Gravel is angular to subrounded fine to coarse of siltstone. (Hummocky Glacial Deposits)		10.45	D3 D4	9.80 10.00	9.80 10.00	SPT	10.00	N=30 (4,5/6,7,7,10)	10.00m (2.80m bgl)	
			Hole Terminated at 10.45m bgl.										
Remarks													
Chiselling			Reason for Termination: Designation depth reached										
From (m bgl)	To (m bgl)	Time (hh:mm)											
Groundwater Remarks:			Groundwater encountered at 2.80m bgl.										
Water Added													
From (m bgl)	To (m bgl)	Volume (l)	Other Remarks: Cleared of buried services. Hand pit dug to 1.20m bgl. Installed with dual monitoring standpipe upon completion.										
													

BOREHOLE LOG

LOCATION ID		Project Name: Plot L Kingsway Business Park				Ground Level (m AOD): 148.10							
BH203		Project Number: 222009				Eastings: 391262.91							
		Client: Wilson Bowden Developments Ltd				Northings: 411624.80							
Hole Type: CP		Rig: Dando 2000		Start & End Date: 13/03/2023		Engineer: PM		Checker: MH					
Boring		Strata				Samples		In-Situ Tests					
Strike	Well	Level (m AOD) & [Thickness (m)]	Description	Legend	Depth (m bgl)	Type (U/blows)	From (m)	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)	
		(0.30)	Shrub over dark brown soft friable slightly gravelly slightly sandy silty CLAY with some rootlets. (Topsoil)		0.30	ES1	0.00	0.30					
		147.80 (0.80)	Dark brown slightly clayey slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone and quartz. (Hummocky Glacial Deposits)		1.10	B1	0.50	1.00					
		147.00 (1.90)	Soft brown sandy slightly gravelly silty CLAY. Gravel is angular fine coal. (Hummocky Glacial Deposits)			B2	1.50	2.00	SPT	1.00	N=5 (3,2/2,1,1,1)	1.00m (3.30m bgl)	
									SPT	2.00	N=6 (1,2/1,1,2,2)	2.00m (3.30m bgl)	
		145.10 (0.50)	Brown sandy subangular to subrounded fine to coarse GRAVEL of siltstone, sandstone and quartz. (Hummocky Glacial Deposits)		3.00	B3	3.00	3.50	SPT	3.00	N=9 (2,3/2,3,2,2)	3.00m (3.30m bgl)	
		144.60 (1.60)	Firm dark grey thinly laminated silty CLAY. (Hummocky Glacial Deposits)		3.50	D1	3.50	3.50					
							D2	3.70	3.70	SPT	4.00	N=21 (3,2/3,3,6,9)	4.00m (3.30m bgl)
		143.00 (2.90)	Brown very gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse of siltstone, sandstone and coal. (Hummocky Glacial Deposits)		5.10	D3	5.10	5.10	SPT	5.00	N=14 (4,4/4,4,3,3)	5.00m (3.30m bgl)	
							B4	5.50	6.00				
										SPT	6.00	N=12 (2,2/2,3,4,3)	6.00m (3.30m bgl)
	140.10 (2.45)	Soft locally firm brown sandy silty CLAY. (Hummocky Glacial Deposits)		8.00	D4	8.00	8.00						
									SPT	7.50	N=16 (2,1/2,3,5,6)	7.50m (3.30m bgl)	
									SPT	9.00	N=20 (3,4/5,6,5,4)	9.00m (3.30m bgl)	
Chiseling		Remarks											
From (m bgl)	To (m bgl)	Time (hh:mm)	Reason for Termination:										
			Designation depth reached										
Groundwater Remarks:			Groundwater encountered at 3.20m bgl.										
Water Added			Other Remarks:										
From (m bgl)	To (m bgl)	Volume (l)	Cleared of buried services. Hand pit dug to 1.20m bgl. Installed with dual monitoring standpipe upon completion.										
													

BOREHOLE LOG

Scale 1:50

Sheet 2 of 2

[illegible]

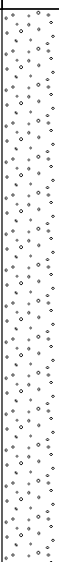
TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

Sheet 1 of 1

LOCATION ID:	Project Name: Plot L Kingsway Business Park		2.20 0.60 Pit Dimensions (m) Degrees Stability: Unstable below 3.00 bgl.		
TP201	Project Number: 222009				
	Client: Wilson Bowden Developments Ltd				
	Plant: 8 Tonne Excavator	Start & End Date: 08/03/2023			
Ground Level (m AOD): 149.45		Eastings & Northings: 391268E 411583N		Engineer: PM	Checker: MH

Strata						Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result	
		0.30m	Shrub over dark brown soft friable sandy silty CLAY with some rootlets. (Topsoil)		0.30	ES	0.00	0.30				
		149.15	Orangish brown and occasional grey mottled clayey fine to medium SAND. (Hummocky Glacial Deposits)			B	0.50	1.00				
		0.80m										
		148.35	Very soft dark brown slightly gravelly sandy silty CLAY with occasional bands of sand. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. (Hummocky Glacial Deposits)		1.10				HSV	1.20	(15, 15, 20)kPa	
		1.60m					B	2.00	2.50	HSV	1.50	(20, 20, 20)kPa
		146.75	Brown gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone and quartz. (Hummocky Glacial Deposits)		2.70	D	2.30	2.30	HSV	2.00	(20, 20, 20)kPa	
		1.00m								HSV	2.50	(10, 15, 25)kPa
		145.75	Hole Terminated at 3.70m bgl.		3.70	B	3.00	3.50				

Remarks

Reason for Termination:

Sides collapsing in

Groundwater Notes:

Seepage at 3.40m.

Other Remarks:

Cleared of buried services. Backfilled with arisings.



TRIAL PIT LOG

Scale: 1:50Sheet 1 of 1

LOCATION ID:	Project Name: Plot L Kingsway Business Park		2.20 0.60 Pit Dimensions (m) Degrees Stability: Unstable below 3.00 bgl.		
TP202	Project Number: 222009				
	Client: Wilson Bowden Developments Ltd				
	Plant: 8 Tonne Excavator	Start & End Date: 08/03/2023			
Ground Level (m AOD): 149.25		Eastings & Northings: 391323E 411604N		Engineer: PM	Checker: MH

Strata					Samples			In-Situ Tests					
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result		
▼		0.60m	Shrub over dark brown slightly clayey slightly gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse of siltstone, mudstone, quartz and sandstone.		0.60	ES	0.20	0.50		1.00	(50, 60, 50)kPa		
		148.65	(Topsoil)			0.90	1.40	HSV				1.50	(20, 15, 15)kPa
		0.30m	Dark brown clayey slightly gravelly silty SAND. Gravel is angular fine coal.										
		148.35	(Hummocky Glacial Deposits)										
			Soft locally firm dark brown and occasional light grey mottled slightly gravelly sandy silty CLAY. Gravel is angular fine to coarse coal. (Hummocky Glacial Deposits)										
1.80m	1.60 - 1.75: Thin band of sand							HSV	2.00	(20, 25, 30)kPa			
		146.55	Brown gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse of siltstone, sandstone, quartz and coal (Hummocky Glacial Deposits)		2.70	B	3.00	3.50					
		0.80m				D	3.20	3.20					
		145.75	Hole Terminated at 3.50m bgl.										

Remarks

Reason for Termination:

Sides collapsing in

Groundwater Notes:

Seepage at 3.50m bgl.

Other Remarks:

Cleared of buried services. Backfilled with arisings.

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TRIAL PIT LOG

Scale: 1:50Sheet 1 of 1

LOCATION ID:	Project Name: Plot L Kingsway Business Park			2.10 0.80 Pit Dimensions (m) Degrees Stability: Unstable below 3.00 bgl.							
TP203	Project Number: 222009										
	Client: Wilson Bowden Developments Ltd										
	Plant: 8 Tonne Excavator	Start & End Date: 08/03/2023									
Ground Level (m AOD): 150.15		Eastings & Northings: 391372E 411604N		Engineer: PM		Checker: MH					
Strata						Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
▼		1.00m	Shrubs over dark brown slightly clayey gravelly fine to medium SAND with high brick and concrete cobble content. Gravel is angular to subangular fine to coarse of brick, concrete, glass, porcelain and siltstone. (Made Ground)		1.00	ES	0.10	0.40		2.70	(90, 100, 90)kPa
		149.15	Brown gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone and quartzite. (Hummocky Glacial Deposits)			B	1.00	1.30			
		1.65m		ES	1.00	1.50					
		147.50		Stiff brown thinly laminated CLAY. (Hummocky Glacial Deposits)	B	2.70	3.20				
		0.35m	D			2.80	2.80				
147.15	Brown gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse of siltstone, sandstone, quartzite and coal. (Hummocky Glacial Deposits)		3.00	3.70							
0.70m	Hole Terminated at 3.70m bgl.										
146.45											
Remarks											
Reason for Termination: Sides collapsing in											
Groundwater Notes: Seepage at 3.00m bgl.											
Other Remarks: Cleared of buried services. Backfilled with arisings.											
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TRIAL PIT LOG

Scale: 1:50Sheet 1 of 1

LOCATION ID:	Project Name: Plot L Kingsway Business Park			2.00 0.70 Pit Dimensions (m) Degrees Stability: Unstable below 3.00 bgl.								
TP204	Project Number: 222009											
	Client: Wilson Bowden Developments Ltd											
	Plant: 8 Tonne Excavator	Start & End Date: 08/03/2023										
Ground Level (m AOD): 150.84		Eastings & Northings: 391444E 411622N		Engineer: PM		Checker: MH						
Strata						Samples		In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result	
▼		1.05m	Shrubs over dark brown slightly sandy gravelly clayey SILT with high brick and concrete cobble content and with occasional rootlets. Gravel sized fragments are angular to subangular fine to coarse of brick, concrete, porcelain and glass. (Made Ground)		1.05	ES	0.10	0.40		3.00	(60, 60, 60)kPa	
		149.79	Grey slightly clayey silty fine to medium SAND. (Hummocky Glacial Deposits)			B	0.50	1.00				
		0.75m										
		149.04	Dark grey gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse of siltstone, sandstone, quartzite and mudstone. (Hummocky Glacial Deposits)		1.80	B	2.00	2.50				
		1.20m										
147.84	Firm locally stiff dark grey slightly sandy silty CLAY. (Hummocky Glacial Deposits)		3.00	HSV	3.00							
0.20m												
147.64	Orangish brown fine to medium SAND. (Hummocky Glacial Deposits)		3.20	B	3.30	3.30						
0.50m				D	3.30	3.70						
147.14	Hole Terminated at 3.70m bgl.				3.70							
Remarks												
Reason for Termination: Sides collapsing in												
Groundwater Notes: Seepage at 3.00m bgl.												
Other Remarks: Cleared of buried services. Backfilled with arisings.												

TRIAL PIT LOG

Scale: 1:50Sheet 1 of 1

LOCATION ID: TP205

Project Name: Plot L Kingsway Business Park

Project Number: 222009

Client: Wilson Bowden Developments Ltd

Plant: 8 Tonne Excavator

Start & End Date: 13/03/2023

2.00

0.70

Pit Dimensions (m)

Degrees

Stability: Unstable below 3.00 bgl.

Ground Level (m AOD): 148.91

Eastings & Northings: 391364E 411651N

Engineer: PM

Checker: MH

Strata				Samples			In-Situ Tests				
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.40m	Shrubs over dark brown soft friable slightly gravelly slightly sandy silty CLAY with occasional rootlets. Gravel sized fragments are angular to subrounded fine to coarse of siltstone and glass. (Topsoil)		0.40	ESES1	0.00	0.40		0.70	(15, 20, 15)kPa
		148.51									
		0.80m	Soft grey slightly gravelly sandy silty CLAY. Gravel is angular fine coal. (Hummocky Glacial Deposits)		1.20	BB1	0.70	1.20			
		147.71									
		0.70m	Brown slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. (Hummocky Glacial Deposits)		1.90	BB2	2.00	2.50			
		147.01									
0.60m	Dark brown slightly gravelly slightly clayey silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. (Hummocky Glacial Deposits)		2.50	DD1	2.50	2.50					
146.41											
1.00m	Dark brown very gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. (Hummocky Glacial Deposits)		3.50								
145.41											
			Hole Terminated at 3.50m bgl.								

Remarks

Reason for Termination:

Sides collapsing in

Groundwater Notes:

Seepage at 3.20m bgl.

Other Remarks:

Cleared of buried services. Backfilled with arisings.

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TRIAL PIT LOG

Scale: 1:50Sheet 1 of 1

LOCATION ID:	Project Name: Plot L Kingsway Business Park		2.10 0.65Pit Dimensions (m) Degrees	
TP206	Project Number: 222009			
	Client: Wilson Bowden Developments Ltd			
	Plant: 8 Tonne Excavator	Start & End Date: 08/03/2023		
Ground Level (m AOD): 149.54		Eastings & Northings: 391428E 411713N		Stability: Unstable below 3.00 bgl.
		Engineer: PM		Checker: MH

Strata					Samples			In-Situ Tests			
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
▼		1.80m	Shrubs over Dark brown gravelly slightly sandy clayey SILT with high brick cobble content. Gravel sized fragments are fine to coarse of brick, stone, porcelain, glass, and plastic. (Made Ground)			ESES1	0.20	0.40			(25, 25, 25)kPa
		147.74	Light grey fine to medium SAND. (Hummocky Glacial Deposits)			BB1	1.00	1.50			
		1.00m				ESES2	1.10	1.40			
		146.74				BB2	1.80	2.30			
		0.20m				DD1	2.00	2.00			
146.54	Soft brown silty CLAY. (Hummocky Glacial Deposits)							HSV	2.80		
1.10m	Dark grey very gravelly silty SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. (Hummocky Glacial Deposits)										BB3
145.44	Hole Terminated at 4.10m bgl.					DD2	3.80	3.80			

Remarks

Reason for Termination:

Sides collapsing in

Groundwater Notes:

Seepage at 3.00m bgl.

Other Remarks:

Cleared of buried services. Backfilled with arisings.

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TRIAL PIT LOG

Scale: 1:50

Sheet 1 of 1

Sheet 1 of 1

LOCATION ID:	Project Name: Plot L Kingsway Business Park		2.10 0.60 Pit Dimensions (m) Degrees Stability: Unstable below 3.00 bgl.		
TP207	Project Number: 222009				
	Client: Wilson Bowden Developments Ltd				
	Plant: 8 Tonne Excavator	Start & End Date: 08/03/2023			
Ground Level (m AOD): 147.61		Eastings & Northings: 391421E 411746N		Engineer: PM	Checker: MH

Strata						Samples			In-Situ Tests		
Groundwater Strike	Backfill	Level (m AOD)	Description	Legend	Depth (m bgl)	Type	From (m)	To (m)	Type	Depth (m)	Result
		0.60m	Shrubs over dark brown soft friable slightly gravelly slightly sandy silty CLAY with occasional rootlets. Gravel is fine to medium angular to subangular siltstone.		0.60	ESES1	0.00	0.40	HSV	0.80	(20, 15, 20)kPa
		147.01	(Topsoil)								
		0.50m	Soft grey sandy silty CLAY with some plant material. (Hummocky Glacial Deposits)		1.10	BB1	0.60	1.10			
		146.51	Grey slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone. (Hummocky Glacial Deposits)								
		1.90m		BB2	2.00	2.50					
			DD1	2.40	2.40						
		144.61	Hole Terminated at 3.00m bgl.		3.00						

Remarks

Reason for Termination:

Sides collapsing in

Groundwater Notes:

Seepage encountered at 3.00m bgl.

Other Remarks:

Cleared of buried services. Backfilled with arisings.



APPENDIX 4: SPT Calibration Certificate

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING UK LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: A1502
Test Date: 24/05/2022
Report Date: 24/05/2022
File Name: AR1502 .spt
Test Operator: MT

Instrumented Rod Data

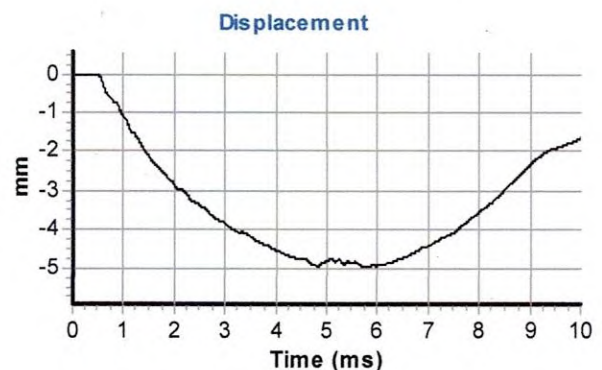
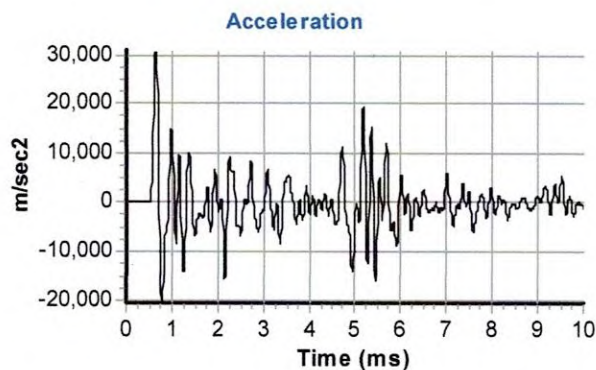
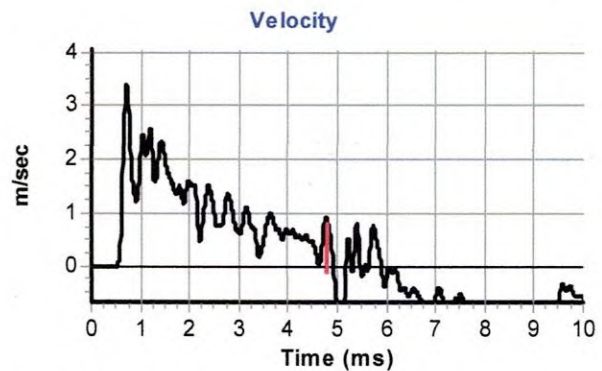
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.5
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 72572
Accelerometer No.2: 72757

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

GEOSITE SURVEYS LTD - 80439



Calculations

Area of Rod A (mm²): 970
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 336

Energy Ratio E_r (%): **71**

Signed: M.TONER
Title: FITTER

APPENDIX 5: Soil Chemical Results Summary

Mike Harper
BWB Consulting Limited
Whitehall Waterfront
2 Riverside Way
Leeds
LS1 4EH

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

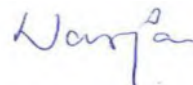
t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: mike.harper@bwbconsulting.com

Analytical Report Number : 23-22431

Project / Site name:	Plot L - Kingsway Business Park	Samples received on:	10/03/2023
Your job number:	222009	Samples instructed on/ Analysis started on:	10/03/2023
Your order number:	4330	Analysis completed by:	20/03/2023
Report Issue Number:	1	Report issued on:	20/03/2023
Samples Analysed:	9 soil samples		

Signed:



Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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

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

Analytical Report Number: 23-22431

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number				2613297	2613298	2613299	2613300	2613301
Sample Reference				BH201	BH201	BH203	TP201	TP202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.03	0.30-0.60	0.00-0.30	0.00-0.30	0.20-0.50
Date Sampled				07/03/2023	07/03/2023	08/03/2023	08/03/2023	08/03/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	35	25	25	24	18
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	MLO	N/A	MLO	MLO	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.9	6.2	5.5	5.6	6.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.0098	0.0069	0.0094	0.0082
Total Sulphur	mg/kg	50	MCERTS	710	240	440	460	340
Organic Matter	%	0.1	MCERTS	15	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	0.022	0.042	0.041	0.027
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.085	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	2.2	4.2	4.1	2.7
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	8.5	-	-	-	-

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.17	< 0.05	0.08	0.14	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.21	< 0.05	0.07	0.17	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.05	0.09	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	< 0.05	0.47	1	0.22
Anthracene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.08	0.16	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.7	< 0.05	0.77	1.7	0.33
Pyrene	mg/kg	0.05	MCERTS	1.6	< 0.05	0.7	1.6	0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.88	< 0.05	0.43	0.85	0.16
Chrysene	mg/kg	0.05	MCERTS	0.88	< 0.05	0.46	1.1	0.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.96	< 0.05	0.49	0.84	0.2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.34	< 0.05	0.2	0.46	0.08
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.78	< 0.05	0.44	0.79	0.16
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.31	< 0.05	0.17	0.31	0.06
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.05	0.11	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.4	< 0.05	0.23	0.44	0.09

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	9.98	< 0.80	4.69	9.7	1.8
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Analytical Report Number: 23-22431

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number	2613297	2613298	2613299	2613300	2613301
Sample Reference	BH201	BH201	BH203	TP201	TP202
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.03	0.30-0.60	0.00-0.30	0.00-0.30	0.20-0.50
Date Sampled	07/03/2023	07/03/2023	08/03/2023	08/03/2023	08/03/2023
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	4.2	13	15	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	94	95	58	76	85
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.95	0.7	0.72	0.8	0.63
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	18	11	12	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	12	30	34	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	14	79	100	61
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	11	11	14	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	19	19	24	19
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	42	64	73	52

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	-	-
o-xylene	µg/kg	5	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-

Petroleum Hydrocarbons

TPH C10 - C40 EH_CU_ID_TOTAL	mg/kg	10	MCERTS	51	14	44	37	20
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TPH2 (C6 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
--	-------	-----	------	-------	-------	-------	-------	-------

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	-	-	-	-	-

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

Analytical Report Number: 23-22431

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number				2613302	2613303	2613304	2613305
Sample Reference				TP203	TP204	TP206	TP206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.40	0.10-0.40	0.20-0.40	1.10-1.40
Date Sampled				08/03/2023	08/03/2023	08/03/2023	08/03/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	18	13	13
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	7.3	10.9	10.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.029	0.17	0.19	0.2
Total Sulphur	mg/kg	50	MCERTS	440	740	1300	1100
Organic Matter	%	0.1	MCERTS	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.022	0.064	0.016	0.019
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.2	6.3	1.6	1.9
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.06	0.11	0.21	0.27
Acenaphthylene	mg/kg	0.05	MCERTS	0.14	0.07	< 0.05	0.06
Acenaphthene	mg/kg	0.05	MCERTS	0.15	0.09	0.17	0.18
Fluorene	mg/kg	0.05	MCERTS	0.16	0.1	0.16	0.19
Phenanthrene	mg/kg	0.05	MCERTS	2.1	0.62	1.1	1.1
Anthracene	mg/kg	0.05	MCERTS	0.29	0.22	0.36	0.27
Fluoranthene	mg/kg	0.05	MCERTS	4	1.2	2	1.7
Pyrene	mg/kg	0.05	MCERTS	3.6	1.2	1.9	1.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	0.74	0.94	0.91
Chrysene	mg/kg	0.05	MCERTS	1.9	0.91	0.91	1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2	0.89	1.2	1.2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1	0.52	0.56	0.53
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.8	0.76	1.2	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.77	0.44	0.58	0.48
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.14	0.14
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1	0.56	0.78	0.59

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	20.8	8.49	12.2	11.2
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Analytical Report Number: 23-22431

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number				2613302	2613303	2613304	2613305
Sample Reference				TP203	TP204	TP206	TP206
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.40	0.10-0.40	0.20-0.40	1.10-1.40
Date Sampled				08/03/2023	08/03/2023	08/03/2023	08/03/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	8.5	11	9.5
Barium (aqua regia extractable)	mg/kg	1	MCERTS	120	100	170	170
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.66	0.75	0.84	0.76
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.4	0.7	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	2.5	0.6
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	12	22	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	40	58	57
Lead (aqua regia extractable)	mg/kg	1	MCERTS	100	110	120	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	16	20	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	23	31	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	97	100	140	120

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-
o-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	< 5.0	-

Petroleum Hydrocarbons

TPH C10 - C40 _{EH, CU, ID, TOTAL}	mg/kg	10	MCERTS	55	990	660	240
TPH2 (C6 - C10) _{HS, ID, TOTAL}	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 _{HS, ID, AL}	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS, ID, AL}	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS, ID, AL}	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH, CU, ID, AL}	mg/kg	1	MCERTS	< 1.0	-	4.2	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH, CU, ID, AL}	mg/kg	2	MCERTS	< 2.0	-	29	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH, CU, ID, AL}	mg/kg	8	MCERTS	< 8.0	-	150	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH, CU, ID, AL}	mg/kg	8	MCERTS	< 8.0	-	140	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH, CU+HS, ID, AL}	mg/kg	10	NONE	< 10	-	330	-
TPH-CWG - Aromatic >EC5 - EC7 _{HS, ID, AR}	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS, ID, AR}	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS, ID, AR}	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH, CU, ID, AR}	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH, CU, ID, AR}	mg/kg	2	MCERTS	< 2.0	-	8.1	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH, CU, ID, AR}	mg/kg	10	MCERTS	< 10	-	70	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH, CU, ID, AR}	mg/kg	10	MCERTS	31	-	140	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH, CU+HS, ID, AR}	mg/kg	10	NONE	41	-	220	-

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

Analytical Report Number : 23-22431

Project / Site name: Plot L - Kingsway Business Park

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2613297	BH201	None Supplied	0.00-0.03	Brown loam and sand with gravel and vegetation.
2613298	BH201	None Supplied	0.30-0.60	Brown clay and sand with gravel and vegetation.
2613299	BH203	None Supplied	0.00-0.30	Brown clay and loam with gravel and vegetation.
2613300	TP201	None Supplied	0.00-0.30	Brown loam and sand with gravel and vegetation.
2613301	TP202	None Supplied	0.20-0.50	Brown loam and sand with gravel and vegetation.
2613302	TP203	None Supplied	0.10-0.40	Brown loam and clay with vegetation and glass
2613303	TP204	None Supplied	0.10-0.40	Brown loam and sand with vegetation and gravel.
2613304	TP206	None Supplied	0.20-0.40	Brown sandy clay with gravel.
2613305	TP206	None Supplied	1.10-1.40	Brown sandy loam with gravel.

Analytical Report Number : 23-22431

Project / Site name: Plot L - Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

Analytical Report Number : 23-22431

Project / Site name: Plot L - Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L0738-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

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

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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Analytical Report Number : 23-22820

Replaces Analytical Report Number: 23-22820, issue no. 1
Client references/information amended.
Sample ID amended for samples 2616184 and 2616185 as per client's request

Project / Site name:	Plot L - Kingsway Business Park	Samples received on:	14/03/2023
Your job number:	222009	Samples instructed on/ Analysis started on:	14/03/2023
Your order number:	4330	Analysis completed by:	24/03/2023
Report Issue Number:	2	Report issued on:	24/03/2023
Samples Analysed:	3 soil samples		

Izabela Wójcik
Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 23-22820

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number				2616184	2616185	2616186
Sample Reference				BH202	BH202	TP205
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.50-0.70	0.00-0.40
Date Sampled				13/03/2023	13/03/2023	13/03/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	63
Moisture Content	%	0.01	NONE	14	28	15
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	N/A	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.1	7.7	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.0063	0.0092
Total Sulphur	mg/kg	50	MCERTS	60	310	410
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.003	0.026	0.027
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.3	2.6	2.7

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.19
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.21
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.3	2.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.4
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.57	3.5
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.61	3.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.37	1.7
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.33	1.5
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.48	2.1
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.13	0.44
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.34	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.22	0.75
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.27	0.93

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	3.62	18.8
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Analytical Report Number: 23-22820

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number	2616184	2616185	2616186
Sample Reference	BH202	BH202	TP205
Sample Number	None Supplied	None Supplied	None Supplied
Depth (m)	0.00-0.30	0.50-0.70	0.00-0.40
Date Sampled	13/03/2023	13/03/2023	13/03/2023
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.3	4.9	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	23	62	120
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.39	0.44	0.66
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	10	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	17	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.3	34	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	9.9	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	13	14	21
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	37	73

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	-	-	< 5.0
o-xylene	µg/kg	5	MCERTS	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	< 5.0

Petroleum Hydrocarbons

TPH C10 - C40 _{EH, CU, 1D, TOTAL}	mg/kg	10	MCERTS	56	30	32
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TPH2 (C6 - C10) _{HS, 1D, TOTAL}	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
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TPH-CWG - Aliphatic >EC5 - EC6 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH, CU, 1D, AL}	mg/kg	1	MCERTS	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH, CU, 1D, AL}	mg/kg	2	MCERTS	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH, CU, 1D, AL}	mg/kg	8	MCERTS	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH, CU, 1D, AL}	mg/kg	8	MCERTS	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH, CU+HS, 1D, AL}	mg/kg	10	NONE	-	-	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH, CU, 1D, AR}	mg/kg	1	MCERTS	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH, CU, 1D, AR}	mg/kg	2	MCERTS	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH, CU, 1D, AR}	mg/kg	10	MCERTS	-	-	12
TPH-CWG - Aromatic >EC21 - EC35 _{EH, CU, 1D, AR}	mg/kg	10	MCERTS	-	-	20
TPH-CWG - Aromatic (EC5 - EC35) _{EH, CU+HS, 1D, AR}	mg/kg	10	NONE	-	-	32

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

Analytical Report Number : 23-22820
Project / Site name: Plot L - Kingsway Business Park

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2616184	BH202	None Supplied	0.00-0.30	Brown clay and sand with gravel.
2616185	BH202	None Supplied	0.50-0.70	Brown clay and loam with vegetation.
2616186	TP205	None Supplied	0.00-0.40	Brown loam and clay with stones and vegetation.

Analytical Report Number : 23-22820

Project / Site name: Plot L - Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Analytical Report Number : 23-22820

Project / Site name: Plot L - Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

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

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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Analytical Report Number : 23-22810

Project / Site name:	Plot L Kingsway Business Park	Samples received on:	14/03/2023
Your job number:	222009	Samples instructed on/ Analysis started on:	15/03/2023
Your order number:	4331	Analysis completed by:	24/03/2023
Report Issue Number:	1	Report issued on:	28/03/2023
Samples Analysed:	6 soil samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 23-22810

Project / Site name: Plot L Kingsway Business Park

Your Order No: 4331

Lab Sample Number				2616125	2616126	2616127	2616128	2616129
Sample Reference				BH201	BH201	BH202	BH202	BH203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	6.00	4.50	10.00	3.50
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	56	< 0.1	< 0.1	< 0.1	60
Moisture Content	%	0.01	NONE	11	13	18	14	7.3
Total mass of sample received	kg	0.001	NONE	0.5	0.8	0.5	0.8	0.8

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	8.2	8.1	8.5	8.1
Total Sulphate as SO ₄	%	0.005	MCERTS	0.014	0.009	< 0.005	0.019	0.009
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.013	0.0059	0.025	0.012
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14	13.2	5.9	25	11.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	3.1	1.3	1.3	2	1.9
Total Sulphur	%	0.005	MCERTS	0.021	0.045	< 0.005	0.068	< 0.005
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	6.8	10	< 5.0	8.6	9.3
Magnesium (leachate equivalent)	mg/l	2.5	NONE	3.4	5.1	< 2.5	4.3	4.7

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

Analytical Report Number: 23-22810

Project / Site name: Plot L Kingsway Business Park

Your Order No: 4331

Lab Sample Number				2616130
Sample Reference				BH203
Sample Number				None Supplied
Depth (m)				8.00
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	14
Total mass of sample received	kg	0.001	NONE	0.8

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5
Total Sulphate as SO ₄	%	0.005	MCERTS	0.014
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.018
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.8
Total Sulphur	%	0.005	MCERTS	0.069
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	8.2
Magnesium (leachate equivalent)	mg/l	2.5	NONE	4.1

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

Analytical Report Number : 23-22810

Project / Site name: Plot L Kingsway Business Park

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2616125	BH201	None Supplied	1.5	Brown sandy clay with gravel and stones.
2616126	BH201	None Supplied	6	Brown sandy clay.
2616127	BH202	None Supplied	4.5	Brown sand.
2616128	BH202	None Supplied	10	Brown clay and sand.
2616129	BH203	None Supplied	3.5	Brown sand with gravel and stones.
2616130	BH203	None Supplied	8	Brown clay and sand.

Analytical Report Number : 23-22810

Project / Site name: Plot L Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

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

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

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

Sample Deviation Report



Analytical Report Number : 23-22810

Project / Site name: Plot L Kingsway Business Park

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH201	None Supplied	S	2616125	a	None Supplied	None Supplied	None Supplied
BH201	None Supplied	S	2616126	a	None Supplied	None Supplied	None Supplied
BH202	None Supplied	S	2616127	a	None Supplied	None Supplied	None Supplied
BH202	None Supplied	S	2616128	a	None Supplied	None Supplied	None Supplied
BH203	None Supplied	S	2616129	a	None Supplied	None Supplied	None Supplied
BH203	None Supplied	S	2616130	a	None Supplied	None Supplied	None Supplied

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Analytical Report Number : 23-22820

Replaces Analytical Report Number: 23-22820, issue no. 1
Client references/information amended.
Sample ID amended for samples 2616184 and 2616185 as per client's request

Project / Site name:	Plot L - Kingsway Business Park	Samples received on:	14/03/2023
Your job number:	222009	Samples instructed on/ Analysis started on:	14/03/2023
Your order number:	4330	Analysis completed by:	24/03/2023
Report Issue Number:	2	Report issued on:	24/03/2023
Samples Analysed:	3 soil samples		

Signed:

Izabela Wójcik

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 23-22820

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number				2616184	2616185	2616186
Sample Reference				BH202	BH202	TP205
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.50-0.70	0.00-0.40
Date Sampled				13/03/2023	13/03/2023	13/03/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	63
Moisture Content	%	0.01	NONE	14	28	15
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	N/A	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.1	7.7	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.0063	0.0092
Total Sulphur	mg/kg	50	MCERTS	60	310	410
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.003	0.026	0.027
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.3	2.6	2.7

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.19
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.21
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.3	2.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.4
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.57	3.5
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.61	3.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.37	1.7
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.33	1.5
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.48	2.1
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.13	0.44
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.34	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.22	0.75
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.27	0.93

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	3.62	18.8
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Analytical Report Number: 23-22820

Project / Site name: Plot L - Kingsway Business Park

Your Order No: 4330

Lab Sample Number				2616184	2616185	2616186
Sample Reference				BH202	BH202	TP205
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.50-0.70	0.00-0.40
Date Sampled				13/03/2023	13/03/2023	13/03/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.3	4.9	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	23	62	120
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.39	0.44	0.66
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	10	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	17	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.3	34	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	9.9	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	13	14	21
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	37	73

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	-	-	< 5.0
o-xylene	µg/kg	5	MCERTS	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	< 5.0

Petroleum Hydrocarbons

TPH C10 - C40 _{EH, CU, 1D, TOTAL}	mg/kg	10	MCERTS	56	30	32
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TPH2 (C6 - C10) _{HS, 1D, TOTAL}	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
--	-------	-----	------	-------	-------	-------

TPH-CWG - Aliphatic >EC5 - EC6 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH, CU, 1D, AL}	mg/kg	1	MCERTS	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH, CU, 1D, AL}	mg/kg	2	MCERTS	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH, CU, 1D, AL}	mg/kg	8	MCERTS	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH, CU, 1D, AL}	mg/kg	8	MCERTS	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH, CU+HS, 1D, AL}	mg/kg	10	NONE	-	-	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH, CU, 1D, AR}	mg/kg	1	MCERTS	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH, CU, 1D, AR}	mg/kg	2	MCERTS	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH, CU, 1D, AR}	mg/kg	10	MCERTS	-	-	12
TPH-CWG - Aromatic >EC21 - EC35 _{EH, CU, 1D, AR}	mg/kg	10	MCERTS	-	-	20
TPH-CWG - Aromatic (EC5 - EC35) _{EH, CU+HS, 1D, AR}	mg/kg	10	NONE	-	-	32

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

Analytical Report Number : 23-22820

Project / Site name: Plot L - Kingsway Business Park

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2616184	BH202	None Supplied	0.00-0.30	Brown clay and sand with gravel.
2616185	BH202	None Supplied	0.50-0.70	Brown clay and loam with vegetation.
2616186	TP205	None Supplied	0.00-0.40	Brown loam and clay with stones and vegetation.

Analytical Report Number : 23-22820

Project / Site name: Plot L - Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Analytical Report Number : 23-22820

Project / Site name: Plot L - Kingsway Business Park

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

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

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

APPENDIX 6: Geotechnical Laboratory Test Results

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

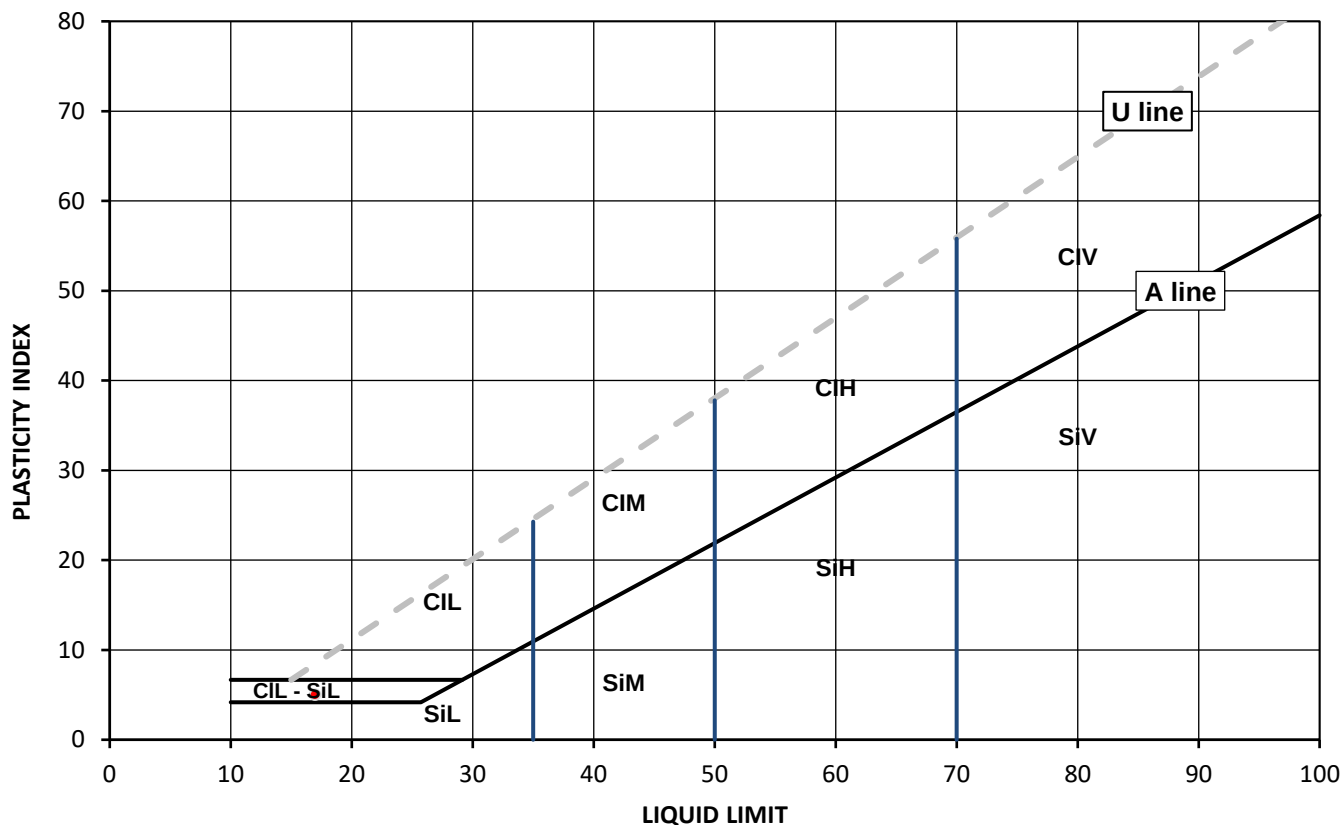
Test Results:

Laboratory Reference: 2616098
Hole No.: BH201
Sample Reference: Not Given
Sample Description: Brown clayey SAND

Depth Top [m]: 4.00
Depth Base [m]: 4.45
Sample Type: B

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	17	12	5	95



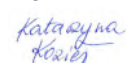
Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	append to classification for organic material (eg CIHO)
	V Very high	
	O Organic	

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Client: BWB Consulting Limited
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Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 23/03/2023
Sampled By: Not Given

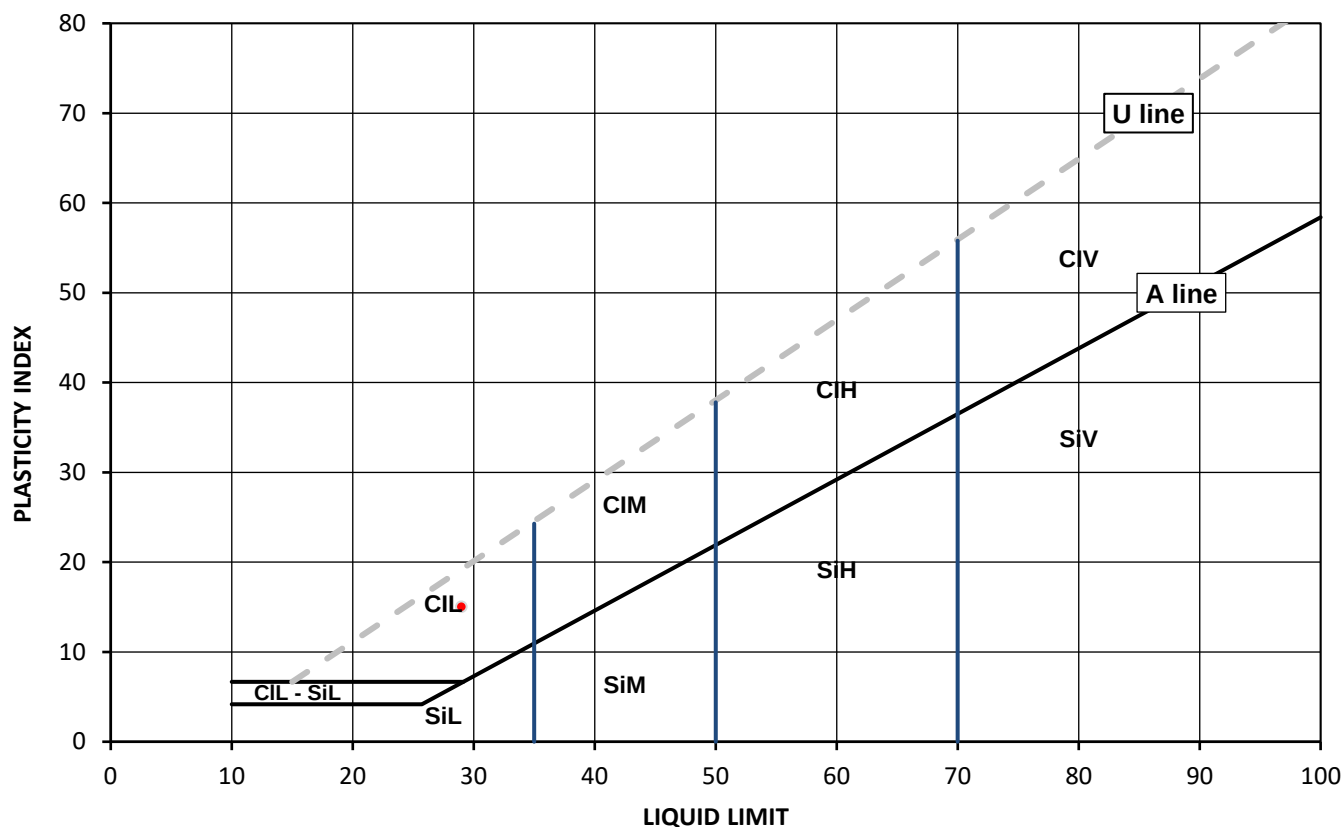
Test Results:

Laboratory Reference: 2616103
Hole No.: BH202
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 9.80
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	29	14	15	97



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	append to classification for organic material (eg CIHO)
	V Very high	
	O Organic	

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

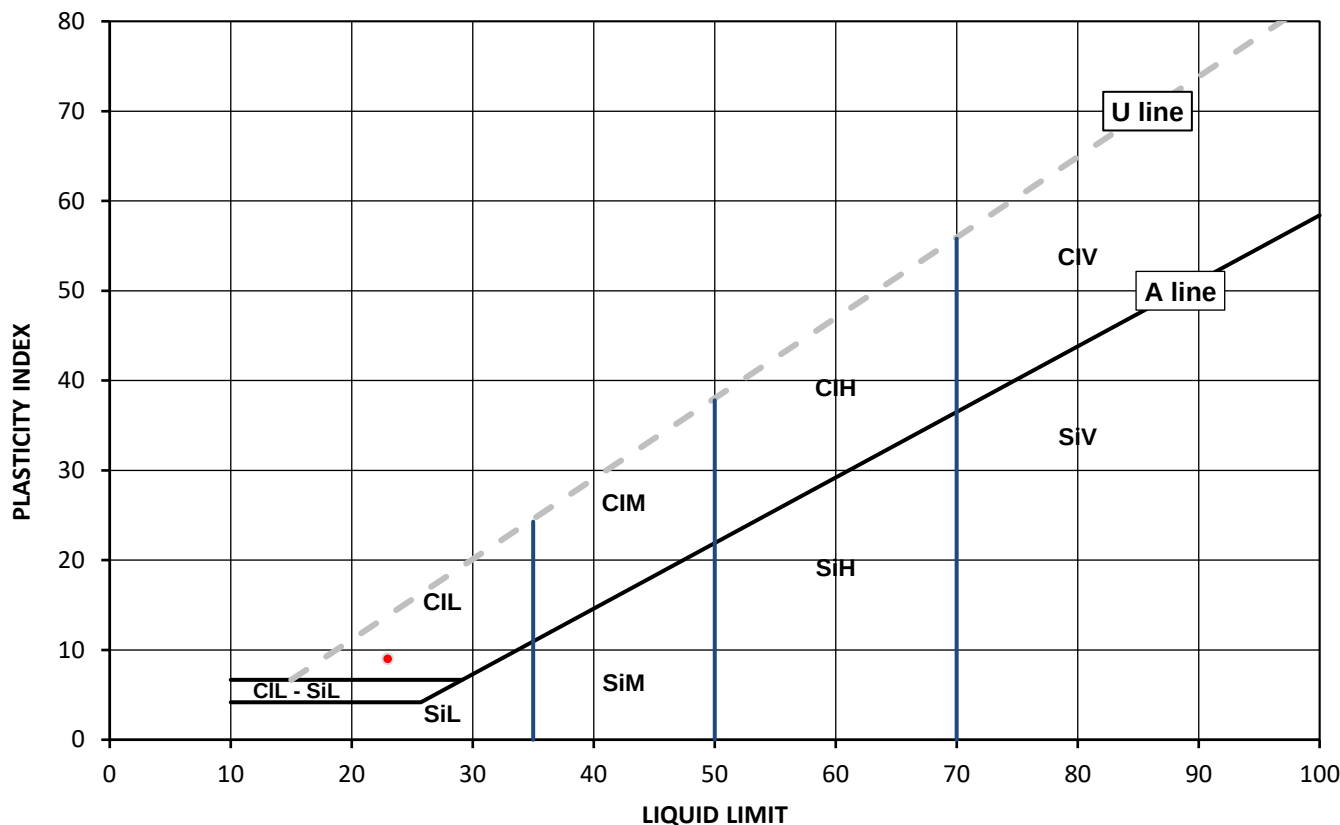
Test Results:

Laboratory Reference: 2616104
Hole No.: BH203
Sample Reference: Not Given
Sample Description: Brown clayey SAND

Depth Top [m]: 1.50
Depth Base [m]: 2.00
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
13	23	14	9	82



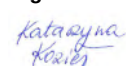
Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



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TEST CERTIFICATE

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Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

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Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 23/03/2023
Sampled By: Not Given

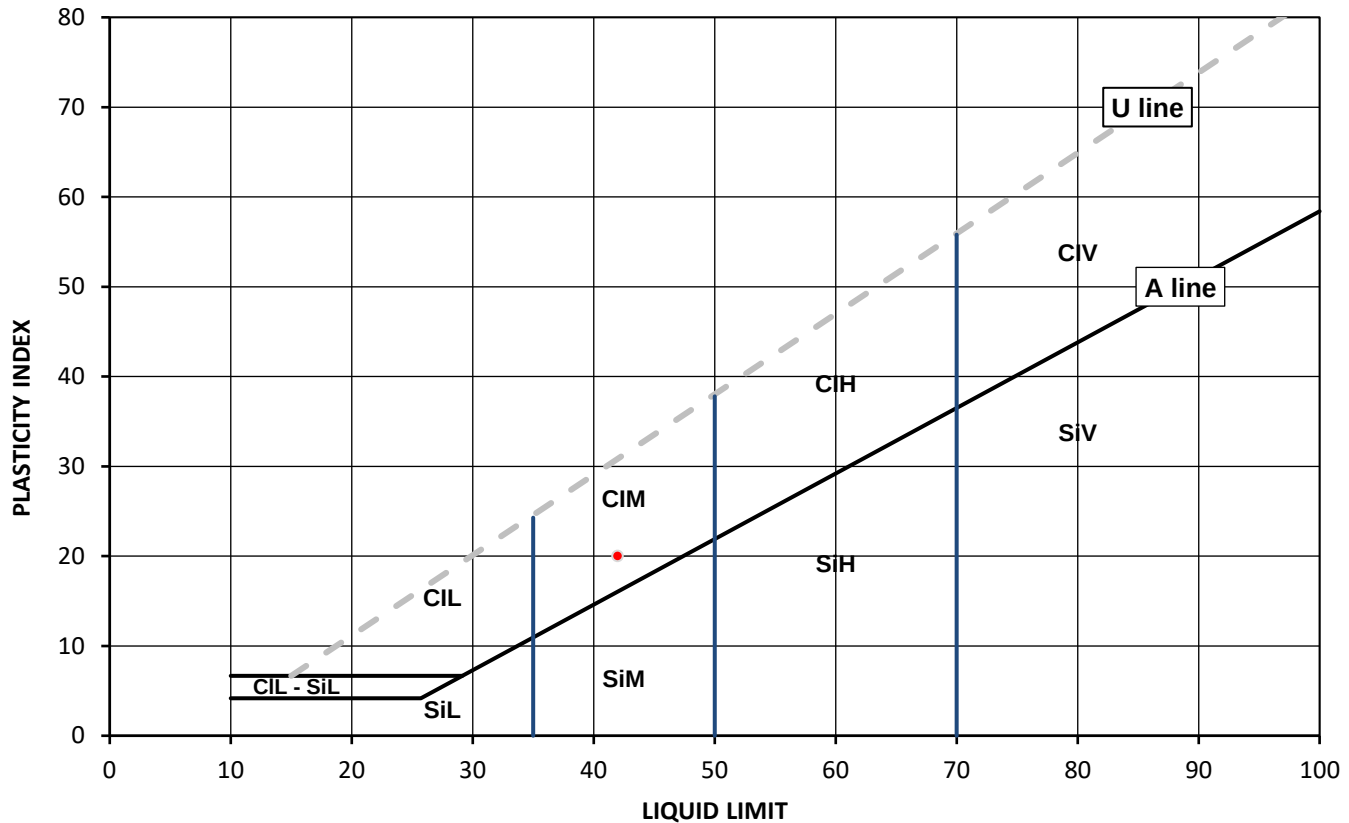
Test Results:

Laboratory Reference: 2616106
Hole No.: BH203
Sample Reference: Not Given
Sample Description: Yellowish brown sandy CLAY

Depth Top [m]: 3.70
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
26	42	22	20	100



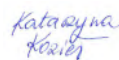
Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



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4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 23/03/2023
Sampled By: Not Given

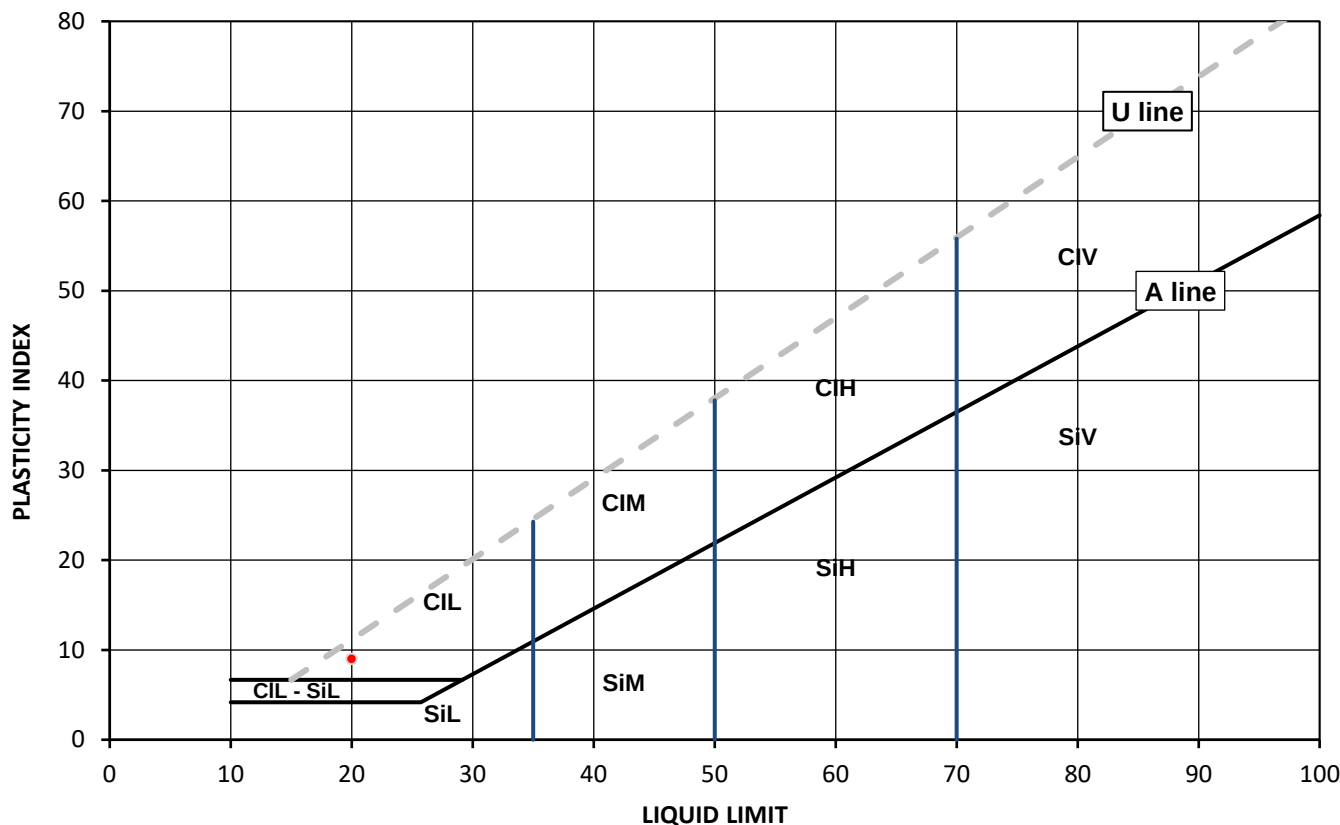
Test Results:

Laboratory Reference: 2616108
Hole No.: TP201
Sample Reference: Not Given
Sample Description: Brown clayey SAND

Depth Top [m]: 2.30
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	20	11	9	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
		50 to 70
		exceeding 70
		append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Reporting Specialist
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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

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Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

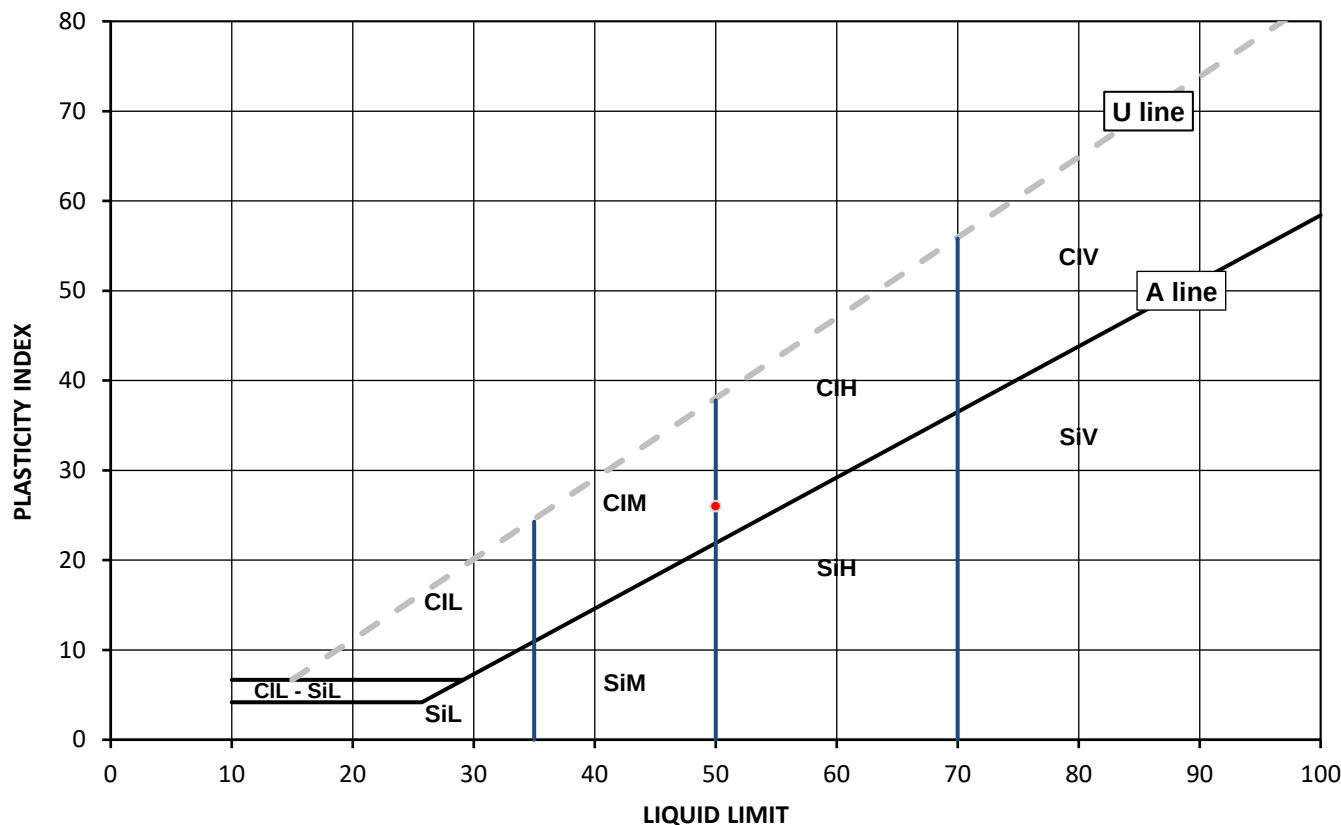
Test Results:

Laboratory Reference: 2616113
Hole No.: TP203
Sample Reference: Not Given
Sample Description: Brown slightly sandy CLAY

Depth Top [m]: 2.70
Depth Base [m]: 3.00
Sample Type: B

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
26	50	24	26	100



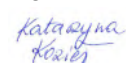
Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



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4041

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Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2
Atterberg by BS 1377-2: 1990:
Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03 - 23/03/2023
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W] %	Water Content BS EN ISO 17892-2 [W] %	Atterberg				Density			Total Porosity# %		
		Reference	Depth Top	Depth Base	Type					% Passing 425um %	WL %	Wp %	Ip %	bulk Mg/m3	dry Mg/m3	PD Mg/m3			
			m	m															
2616098	BH201	Not Given	4.00	4.45	B	Brown clayey SAND	Atterberg 4 Point	17		95	17	12	5						
2616099	BH201	Not Given	8.00	8.45	D	Brown very sandy GRAVEL		17											
2616102	BH202	Not Given	4.00	Not Given	D	Yellowish brown clayey SAND		28											
2616103	BH202	Not Given	9.80	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	17		97	29	14	15						
2616104	BH203	Not Given	1.50	2.00	B	Brown clayey SAND	Atterberg 4 Point	13		82	23	14	9						
2616106	BH203	Not Given	3.70	Not Given	D	Yellowish brown sandy CLAY	Atterberg 4 Point	26		100	42	22	20						
2616108	TP201	Not Given	2.30	Not Given	D	Brown clayey SAND	Atterberg 4 Point	17		100	20	11	9						
2616111	TP202	Not Given	3.20	Not Given	D	Brown very sandy GRAVEL		14											
2616113	TP203	Not Given	2.70	3.00	B	Brown slightly sandy CLAY	Atterberg 4 Point	26		100	50	24	26						
2616114	TP204	Not Given	2.00	2.50	B	Brown gravelly SAND		15											

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Katarzyna
Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2 Atterberg by BS 1377-2: 1990:
Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03 - 23/03/2023
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W] %	Water Content BS EN ISO 17892-2 [W] %	Atterberg				Density			Total Porosity# %		
		Reference	Depth Top m	Depth Base m	Type					% Passing 425um %	WL %	Wp %	Ip %	bulk Mg/m3	dry Mg/m3	PD Mg/m3			
2616118	TP205	Not Given	2.50	Not Given	D	Brown CLAY		17											
2616120	TP206	Not Given	3.80	Not Given	D	Brown very sandy GRAVEL		14											
2616121	TP207	Not Given	2.00	2.50	D	Brownish grey clayey SAND		20											

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

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Leeds, LS1 4EH

Contact: Mike Harper

Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

SUMMARY REPORT**DETERMINATION OF WATER CONTENT**

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client Reference: 222009

Job Number: 23-22808-1

Date Sampled: Not Given

Date Received: 14/03/2023

Date Tested: 22/03 - 23/03/2023

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type							
2616098	BH201	Not Given	4.00	4.45	B	Brown clayey SAND		17	Sample was quartered, oven dried at 109 °C			
2616099	BH201	Not Given	8.00	8.45	D	Brown very sandy GRAVEL		17	Sample was quartered, oven dried at 109 °C			
2616102	BH202	Not Given	4.00	Not Given	D	Yellowish brown clayey SAND		28	Sample was quartered, oven dried at 109 °C			
2616103	BH202	Not Given	9.80	Not Given	D	Brown slightly gravelly very sandy CLAY		17	Sample was quartered, oven dried at 109 °C			
2616104	BH203	Not Given	1.50	2.00	B	Brown clayey SAND		13	Sample was quartered, oven dried at 109 °C			
2616106	BH203	Not Given	3.70	Not Given	D	Yellowish brown sandy CLAY		26	Sample was quartered, oven dried at 109 °C			
2616108	TP201	Not Given	2.30	Not Given	D	Brown clayey SAND		17	Sample was quartered, oven dried at 109 °C			
2616111	TP202	Not Given	3.20	Not Given	D	Brown very sandy GRAVEL		14	Sample was quartered, oven dried at 109 °C			
2616113	TP203	Not Given	2.70	3.00	B	Brown slightly sandy CLAY		26	Sample was quartered, oven dried at 109 °C			
2616114	TP204	Not Given	2.00	2.50	B	Brown gravelly SAND		15	Sample was quartered, oven dried at 109 °C			

Comments:

Signed:

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SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client Reference: 222009

Job Number: 23-22808-1

Date Sampled: Not Given

Date Received: 14/03/2023

Date Tested: 23/03/2023

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type							
2616118	TP205	Not Given	2.50	Not Given	D	Brown CLAY		17	Sample was quartered, oven dried at 109 °C			
2616120	TP206	Not Given	3.80	Not Given	D	Brown very sandy GRAVEL		14	Sample was quartered, oven dried at 109 °C			
2616121	TP207	Not Given	2.00	2.50	D	Brownish grey clayey SAND		20	Sample was quartered, oven dried at 109 °C			

Comments:

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Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

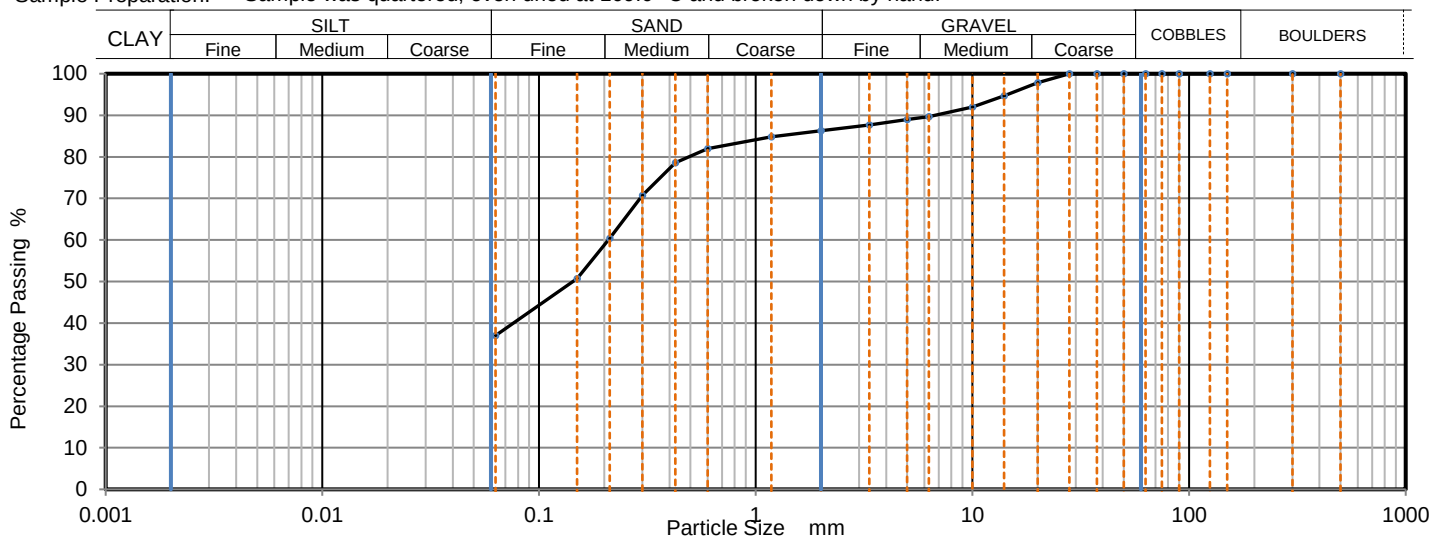
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616097
Hole No.: BH201
Sample Reference: Not Given
Sample Description: Brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 1.00
Depth Base [m]: 1.45
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	95		
10	92		
6.3	90		
5	89		
3.35	88		
2	86		
1.18	85		
0.6	82		
0.425	79		
0.3	71		
0.212	60		
0.15	51		
0.063	38		

Sample Proportions	% dry mass
Very coarse	0
Gravel	14
Sand	49
Fines <0.063mm	38

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 3.3
Curvature Coefficient	

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Katarzyna Koziel

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

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i2 Analytical Ltd
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Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

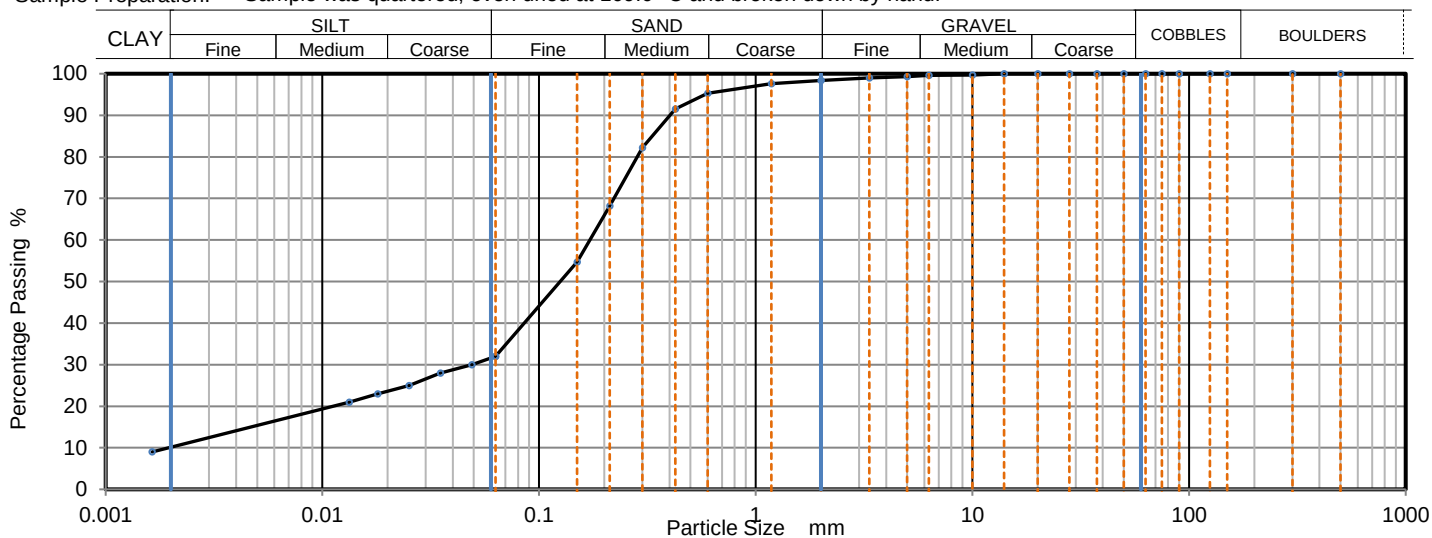
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616098
Hole No.: BH201
Sample Reference: Not Given
Sample Description: Brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 4.00
Depth Base [m]: 4.45
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	32
300	100	0.0489	30
150	100	0.0351	28
125	100	0.0251	25
90	100	0.0180	23
75	100	0.0133	21
63	100	0.0016	9
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99	Particle density (assumed) 2.65 Mg/m3	
2	98		
1.18	98		
0.6	95		
0.425	92		
0.3	82		
0.212	68		
0.15	55		
0.063	32		

Sample Proportions	% dry mass
Very coarse	0
Gravel	2
Sand	66
Silt	22
Clay	10

Grading Analysis		
D100	mm	14
D60	mm	0.172
D30	mm	0.0483
D10	mm	0.00187
Uniformity Coefficient		92
Curvature Coefficient		7.3

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Katarzyna Koziel

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

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Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

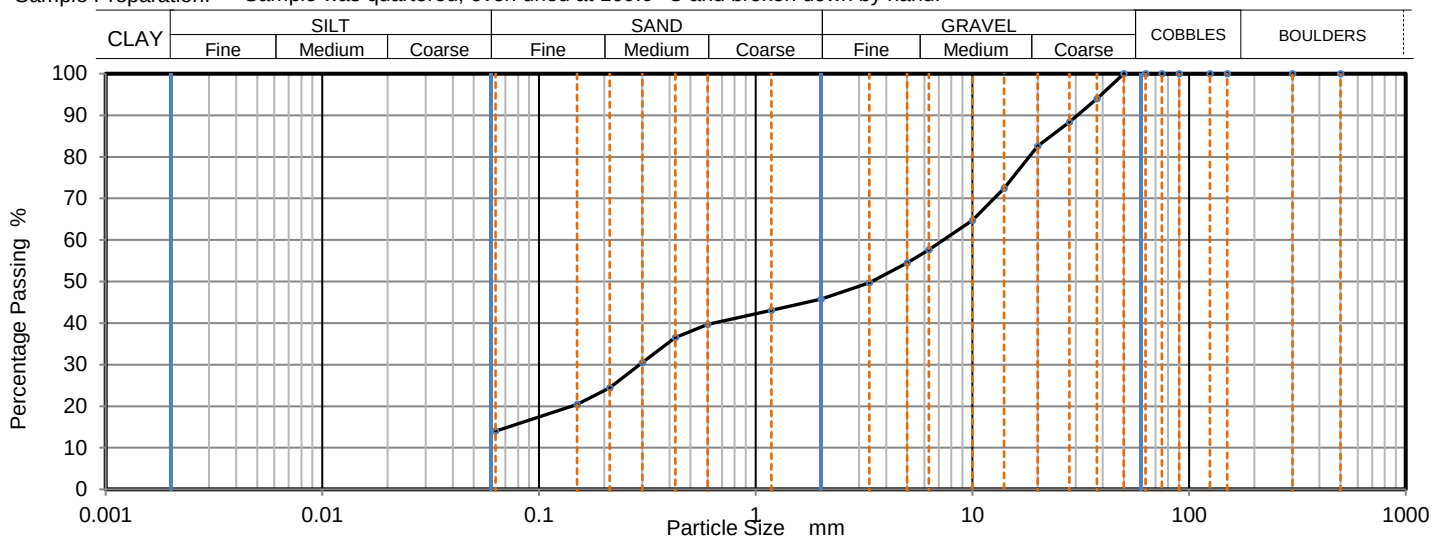
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 21/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616100
Hole No.: BH202
Sample Reference: Not Given
Sample Description: Brown sandy clayey GRAVEL
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 0.50
Depth Base [m]: 1.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	88		
20	83		
14	72		
10	65		
6.3	58		
5	55		
3.35	50		
2	46		
1.18	43		
0.6	40		
0.425	37		
0.3	31		
0.212	24		
0.15	20		
0.063	15		

Sample Proportions	% dry mass
Very coarse	0
Gravel	54
Sand	31
Fines <0.063mm	15

Grading Analysis		
D100	mm	50
D60	mm	7.37
D30	mm	0.291
D10	mm	
Uniformity Coefficient		> 120
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616101

Hole No.: BH202

Sample Reference: Not Given

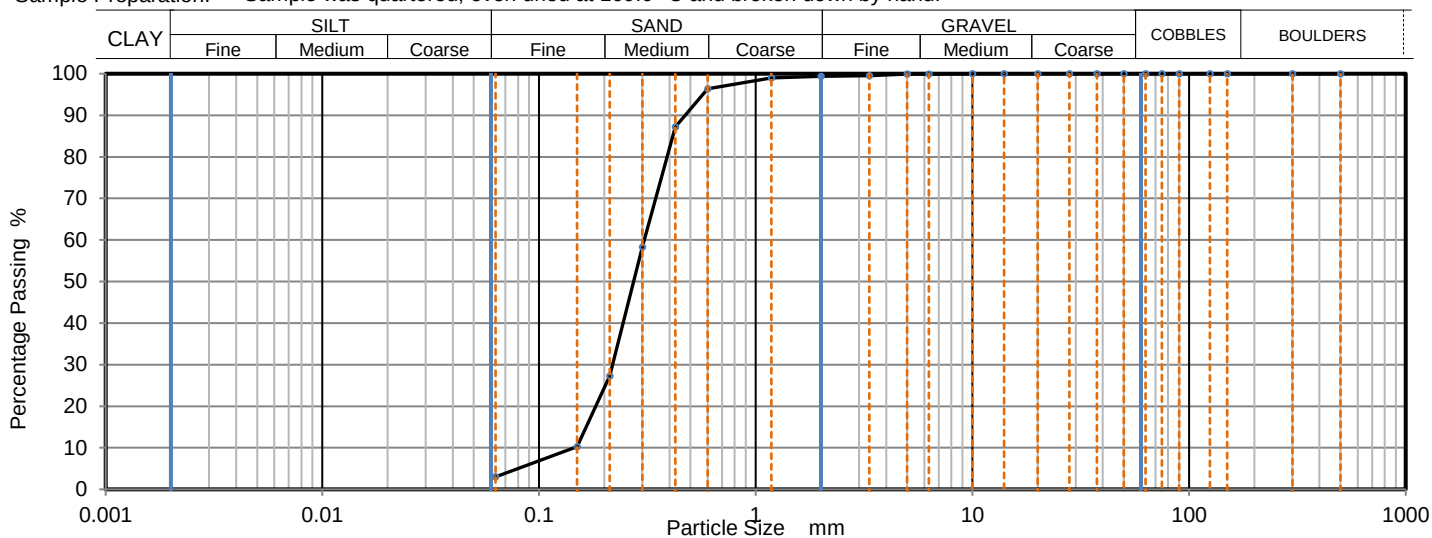
Sample Description: Brown SAND

Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 3.50

Depth Base [m]: 4.00

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	96		
0.425	87		
0.3	58		
0.212	27		
0.15	10		
0.063	3		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	96
Fines <0.063mm	3

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

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Environmental Science

4041

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Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

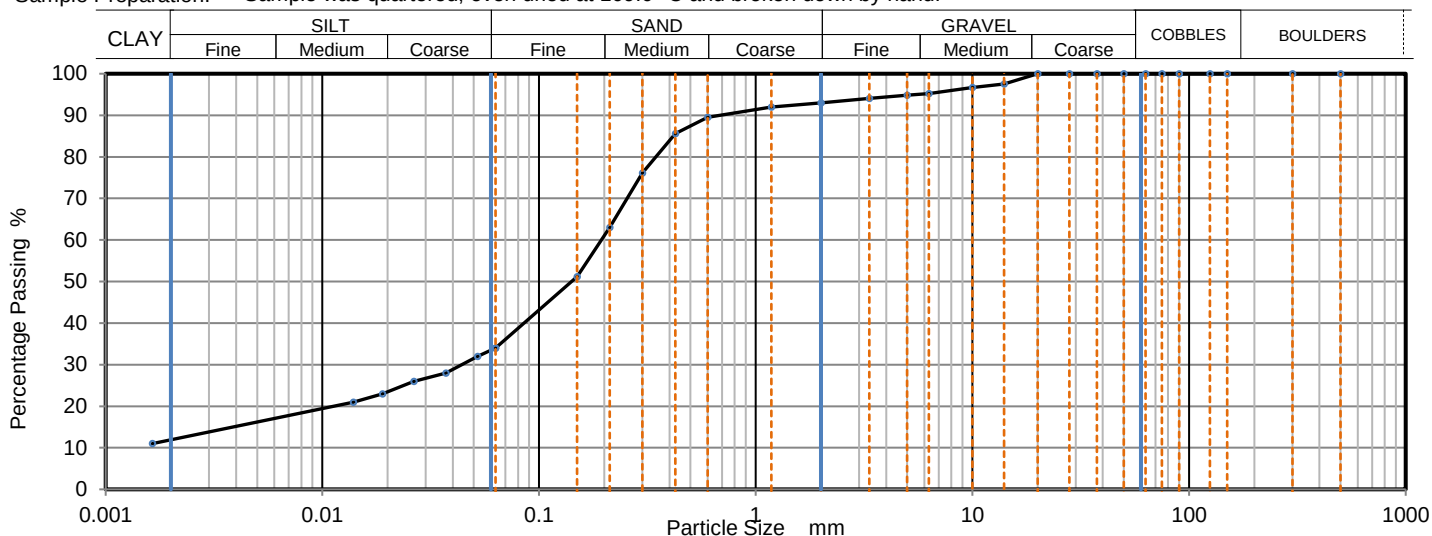
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616104
Hole No.: BH203
Sample Reference: Not Given
Sample Description: Brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 1.50
Depth Base [m]: 2.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	34
300	100	0.0519	32
150	100	0.0372	28
125	100	0.0264	26
90	100	0.0189	23
75	100	0.0139	21
63	100	0.0016	11
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	97		
6.3	95		
5	95		
3.35	94	Particle density (assumed) 2.65 Mg/m3	
2	93		
1.18	92		
0.6	90		
0.425	86		
0.3	76		
0.212	63		
0.15	51		
0.063	34		

Sample Proportions	% dry mass
Very coarse	0
Gravel	7
Sand	59
Silt	22
Clay	12

Grading Analysis		
D100	mm	20
D60	mm	0.194
D30	mm	0.0438
D10	mm	
Uniformity Coefficient		> 120
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
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Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

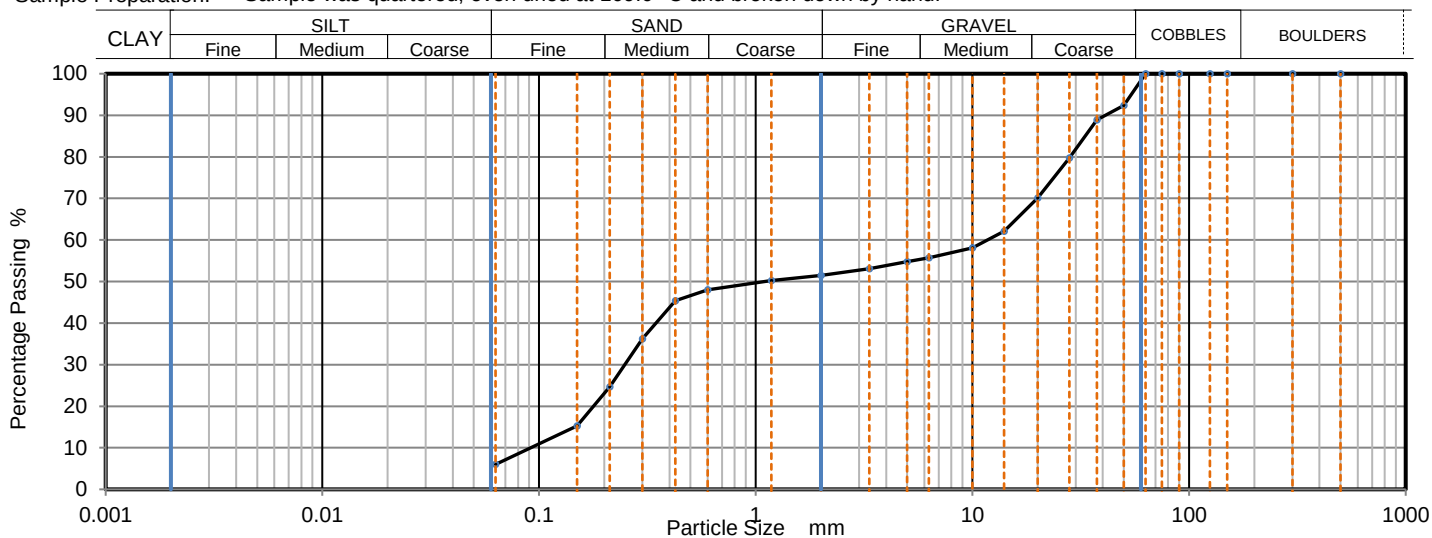
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 21/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616105
Hole No.: BH203
Sample Reference: Not Given
Sample Description: Brown sandy GRAVEL
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 5.50
Depth Base [m]: 6.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	89		
28	80		
20	70		
14	62		
10	58		
6.3	56		
5	55		
3.35	53		
2	52		
1.18	50		
0.6	48		
0.425	45		
0.3	36		
0.212	25		
0.15	15		
0.063	6		

Sample Proportions	% dry mass
Very coarse	0
Gravel	49
Sand	45
Fines <0.063mm	6

Grading Analysis		
D100	mm	63
D60	mm	11.7
D30	mm	0.249
D10	mm	0.0891
Uniformity Coefficient		130
Curvature Coefficient		0.059

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

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Environmental Science

4041

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Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

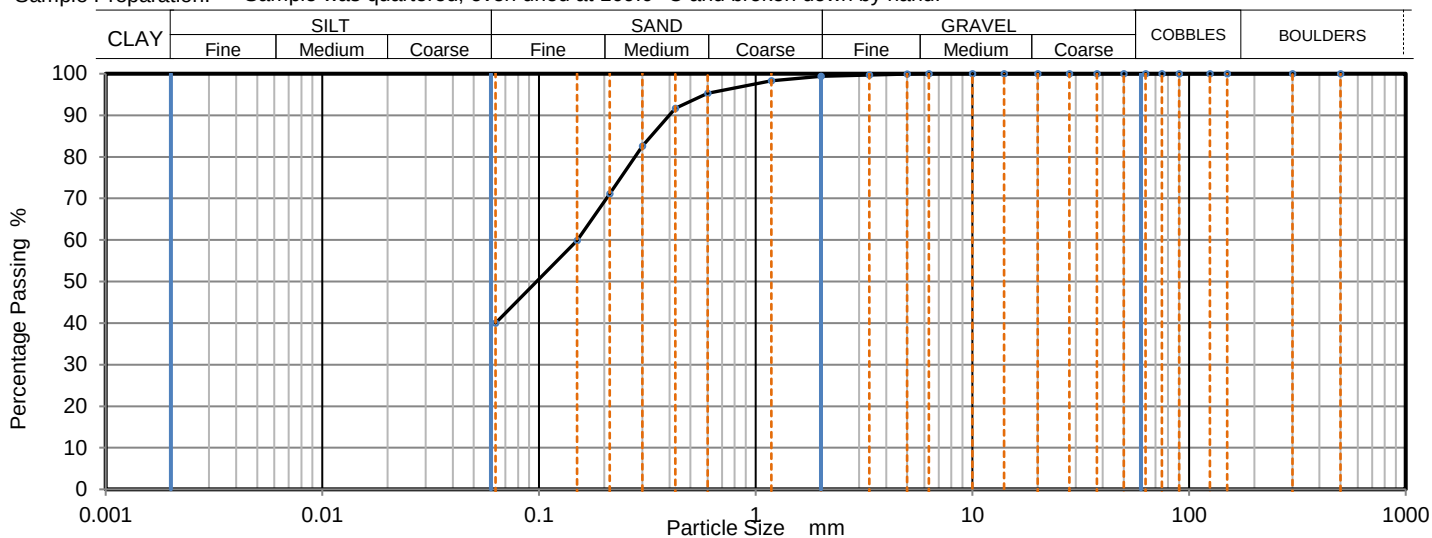
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 21/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616107
Hole No.: TP201
Sample Reference: Not Given
Sample Description: Brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 0.50
Depth Base [m]: 1.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	98		
0.6	95		
0.425	92		
0.3	83		
0.212	71		
0.15	60		
0.063	40		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	59
Fines <0.063mm	40

Grading Analysis		
D100	mm	6.3
D60	mm	0.15
D30	mm	
D10	mm	
Uniformity Coefficient		> 2.4
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

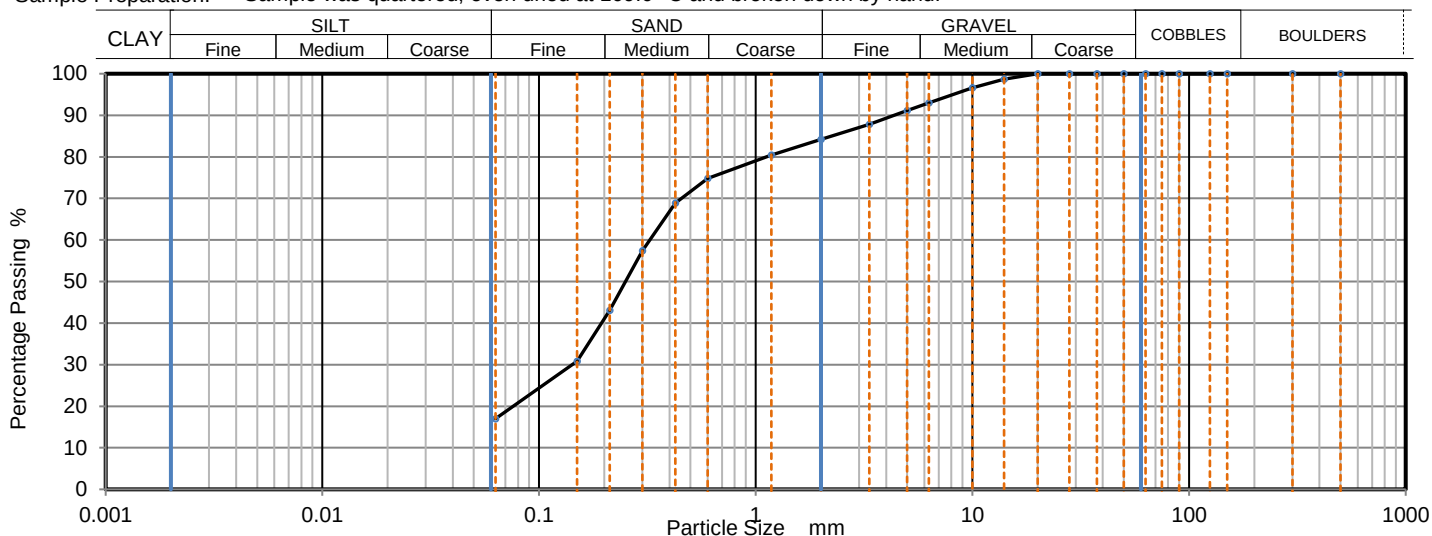
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616110
Hole No.: TP202
Sample Reference: Not Given
Sample Description: Brown slightly clayey gravelly SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 3.00
Depth Base [m]: 3.50
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	97		
6.3	93		
5	91		
3.35	88		
2	84		
1.18	80		
0.6	75		
0.425	69		
0.3	57		
0.212	43		
0.15	31		
0.063	18		

Sample Proportions	% dry mass
Very coarse	0
Gravel	16
Sand	67
Fines <0.063mm	18

Grading Analysis		
D100	mm	20
D60	mm	0.325
D30	mm	0.142
D10	mm	
Uniformity Coefficient		> 5.2
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
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Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

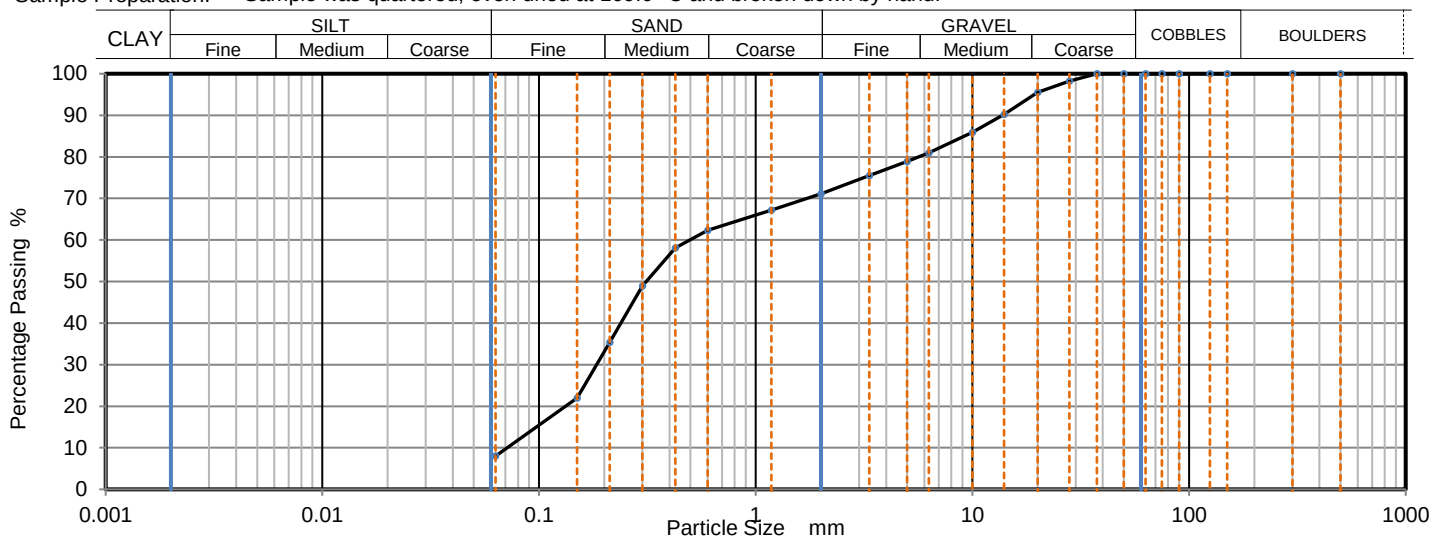
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 21/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616112
Hole No.: TP203
Sample Reference: Not Given
Sample Description: Yellowish brown gravelly SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 1.00
Depth Base [m]: 1.50
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	96		
14	90		
10	86		
6.3	81		
5	79		
3.35	76		
2	71		
1.18	67		
0.6	62		
0.425	58		
0.3	49		
0.212	35		
0.15	22		
0.063	9		

Sample Proportions	% dry mass
Very coarse	0
Gravel	29
Sand	63
Fines <0.063mm	9

Grading Analysis		
D100	mm	37.5
D60	mm	0.497
D30	mm	0.184
D10	mm	0.0689
Uniformity Coefficient		7.2
Curvature Coefficient		0.99

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

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for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 21/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616115

Hole No.: TP204

Sample Reference: Not Given

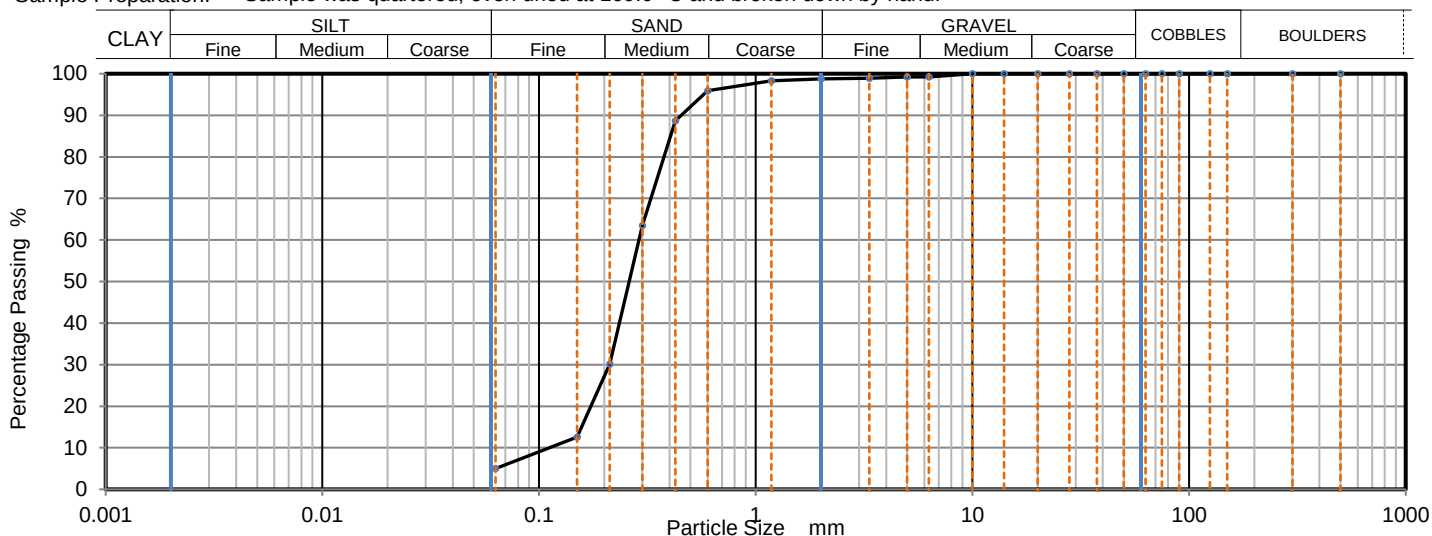
Sample Description: Brown SAND

Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 3.30

Depth Base [m]: 3.70

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	96		
0.425	89		
0.3	64		
0.212	30		
0.15	13		
0.063	5		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	94
Fines <0.063mm	5

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Katarzyna Koziel

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Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

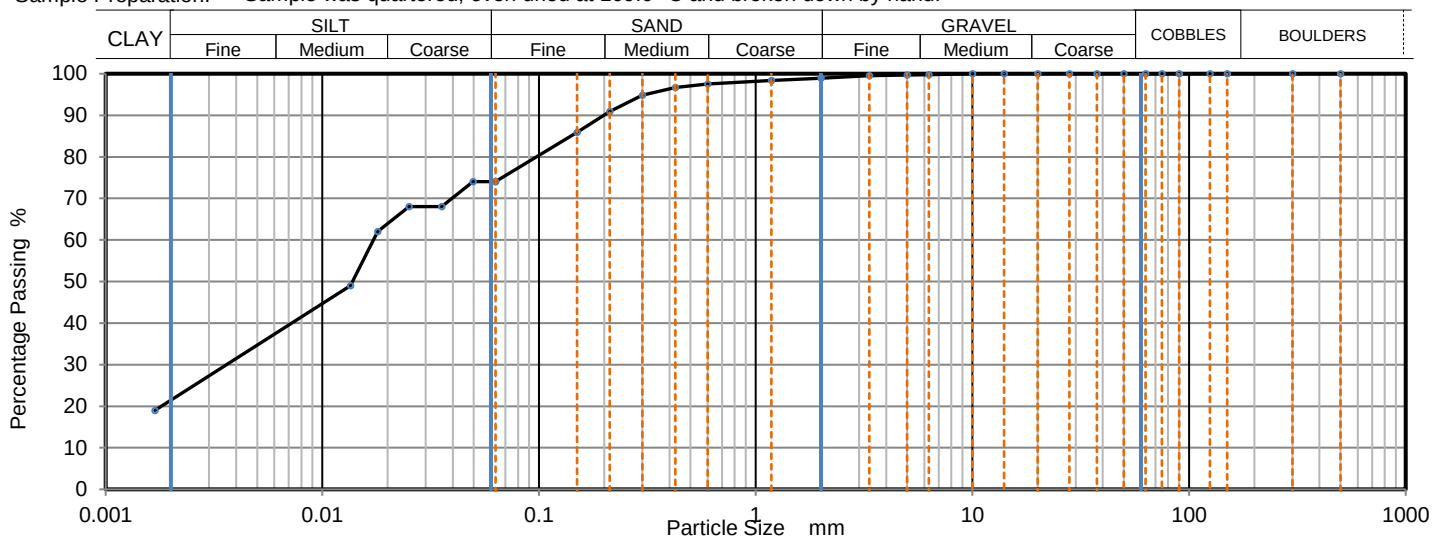
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616116
Hole No.: TP205
Sample Reference: Not Given
Sample Description: Brownish grey sandy silty CLAY with fragments of rootlets
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 0.70
Depth Base [m]: 1.20
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	74
300	100	0.0496	74
150	100	0.0355	68
125	100	0.0251	68
90	100	0.0180	62
75	100	0.0135	49
63	100	0.0017	19
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100	Particle density (assumed) 2.65 Mg/m3	
2	99		
1.18	98		
0.6	98		
0.425	97		
0.3	95		
0.212	91		
0.15	86		
0.063	74		

Sample Proportions	% dry mass
Very coarse	0
Gravel	1
Sand	25
Silt	53
Clay	21

Grading Analysis		
D100	mm	10
D60	mm	0.0173
D30	mm	0.00365
D10	mm	
Uniformity Coefficient		> 10
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

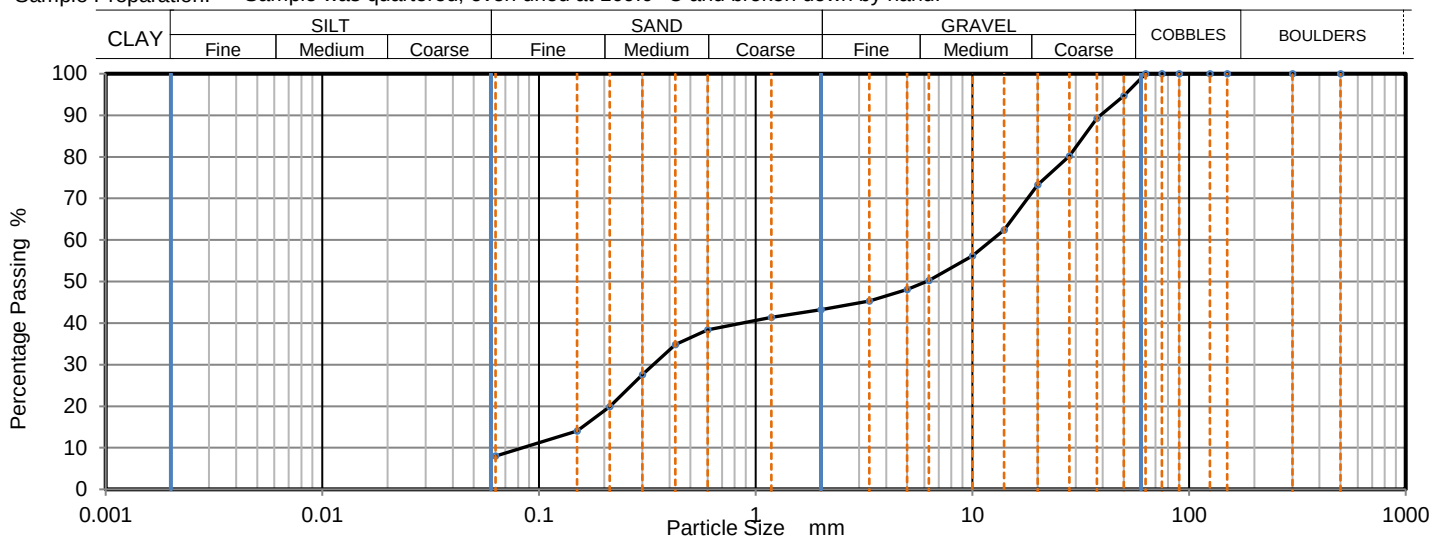
Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 22/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2616119
Hole No.: TP206
Sample Reference: Not Given
Sample Description: Brown sandy GRAVEL
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 3.60
Depth Base [m]: 4.10
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	89		
28	80		
20	73		
14	62		
10	56		
6.3	50		
5	48		
3.35	45		
2	43		
1.18	41		
0.6	38		
0.425	35		
0.3	28		
0.212	20		
0.15	14		
0.063	8		

Sample Proportions	% dry mass
Very coarse	0
Gravel	57
Sand	35
Fines <0.063mm	8

Grading Analysis	
D100	mm 63
D60	mm 12.3
D30	mm 0.337
D10	mm 0.0838
Uniformity Coefficient	150
Curvature Coefficient	0.11

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

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Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**DETERMINATION OF DRY DENSITY/MOISTURE
CONTENT RELATIONSHIP METHOD USING
2.5 KG RAMMER**

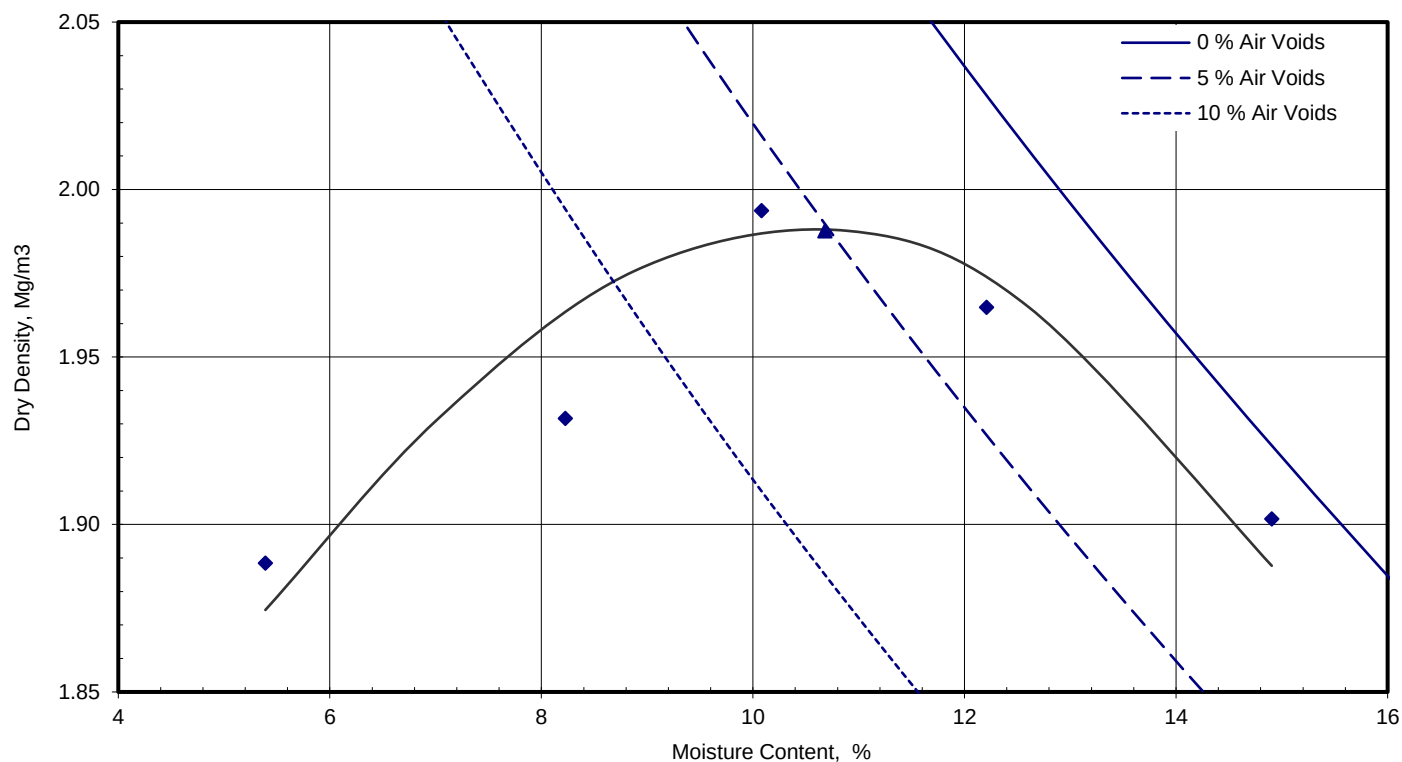
Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EHContact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 28/03/2023
Sampled By: Not Given**Test Results:**Laboratory Reference: 2616110
Hole No.: TP202
Sample Reference: Not Given
Sample Description: Brown slightly clayey gravelly SAND
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.Depth Top [m]: 3.00
Depth Base [m]: 3.50
Sample Type: B

Compaction Point No.		1	2	3	4	5
Moisture Content	%	5.4	8.2	10	12	15
Dry Density	Mg/m³	1.89	1.93	1.99	1.96	1.90

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.70
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	1.99

Optimum Moisture Content	%	11
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Signed:

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*Katarzyna Koziel*Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

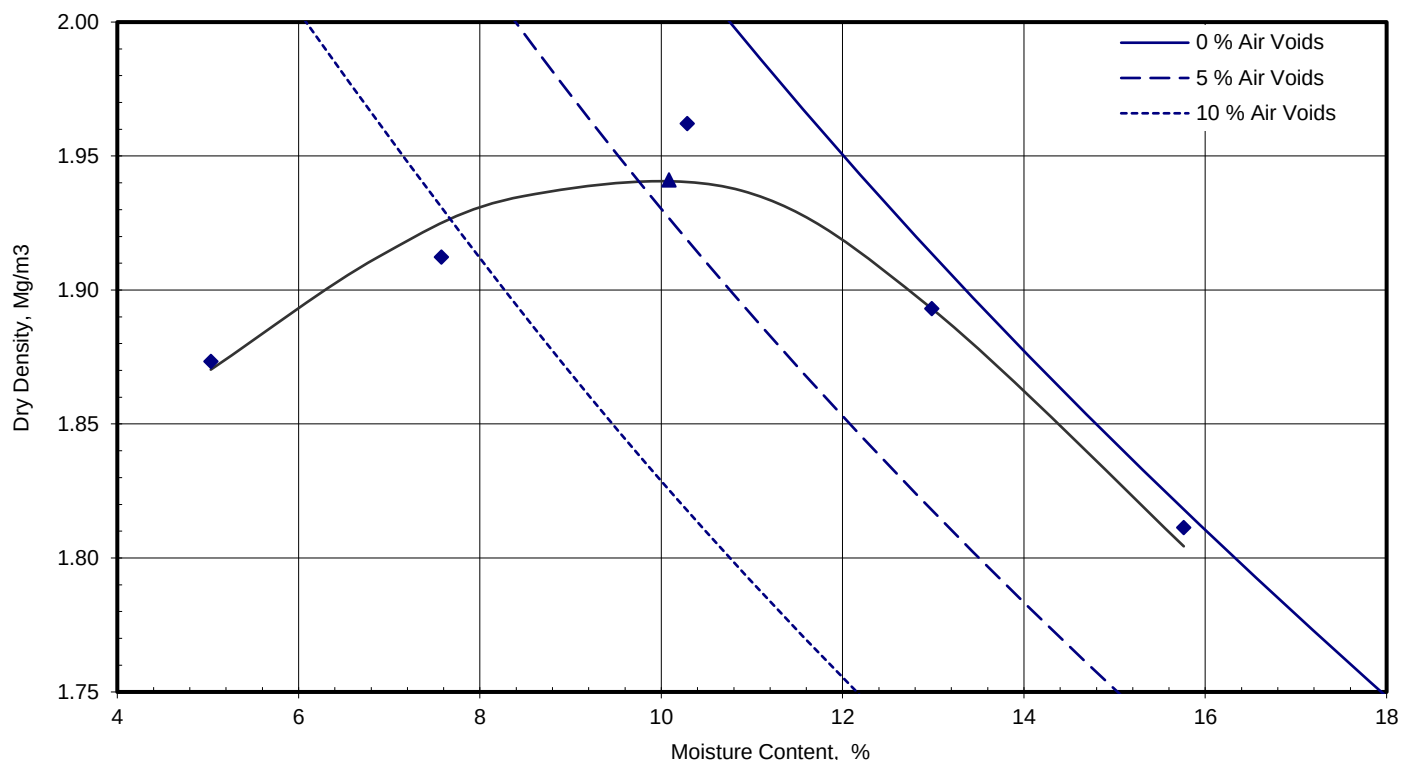
Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 28/03/2023
Sampled By: Not Given

Test Results:

Laboratory Reference: 2616114
Hole No.: TP204
Sample Reference: Not Given
Sample Description: Brown gravelly SAND
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 2.00
Depth Base [m]: 2.50
Sample Type: B


Compaction Point No.		1	2	3	4	5
Moisture Content	%	5.0	7.6	10	13	16
Dry Density	Mg/m³	1.87	1.91	1.96	1.89	1.81

Mould Type	CBR
Samples Used	Single sample tested
Material Retained on 37.5 mm Sieve	10
Material Retained on 20.0 mm Sieve	25
Particle Density - Assumed	2.55
As received Moisture Content	0.0
Maximum Dry Density	1.94

Optimum Moisture Content	%	10
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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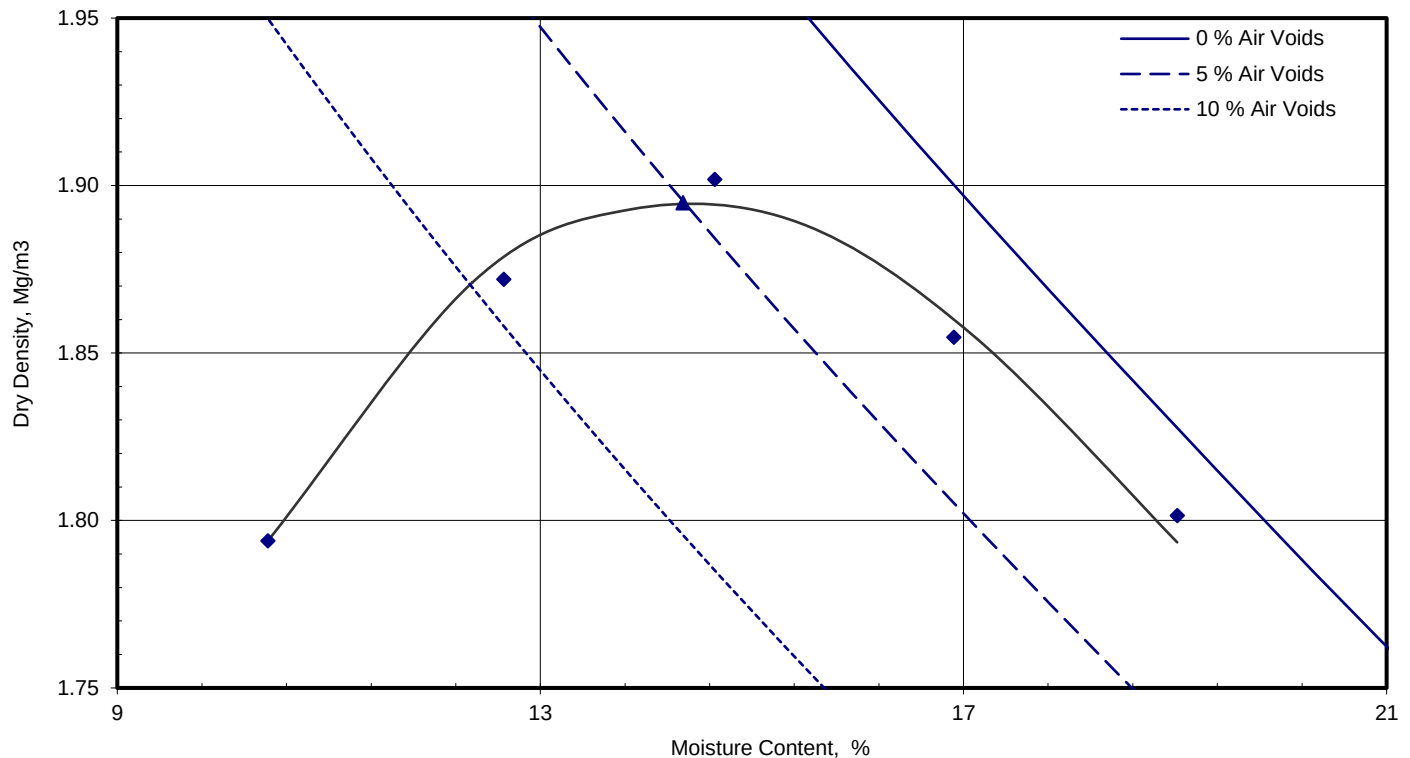
4041

TEST CERTIFICATE**DETERMINATION OF DRY DENSITY/MOISTURE
CONTENT RELATIONSHIP METHOD USING
2.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EBClient: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EHContact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 28/03/2023
Sampled By: Not Given**Test Results:**Laboratory Reference: 2616117
Hole No.: TP205
Sample Reference: Not Given
Sample Description: Brown sandy CLAY
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.Depth Top [m]: 2.00
Depth Base [m]: 2.50
Sample Type: B

Compaction Point No.	1	2	3	4	5
Moisture Content %	10	13	15	17	19
Dry Density Mg/m³	1.79	1.87	1.90	1.85	1.80

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.80
As received Moisture Content	%	19
Maximum Dry Density	Mg/m³	1.89

Optimum Moisture Content	%	14
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.3 using 2.5kg [light] Rammer

Remarks:

Signed:

*Katarzyna Koziel*Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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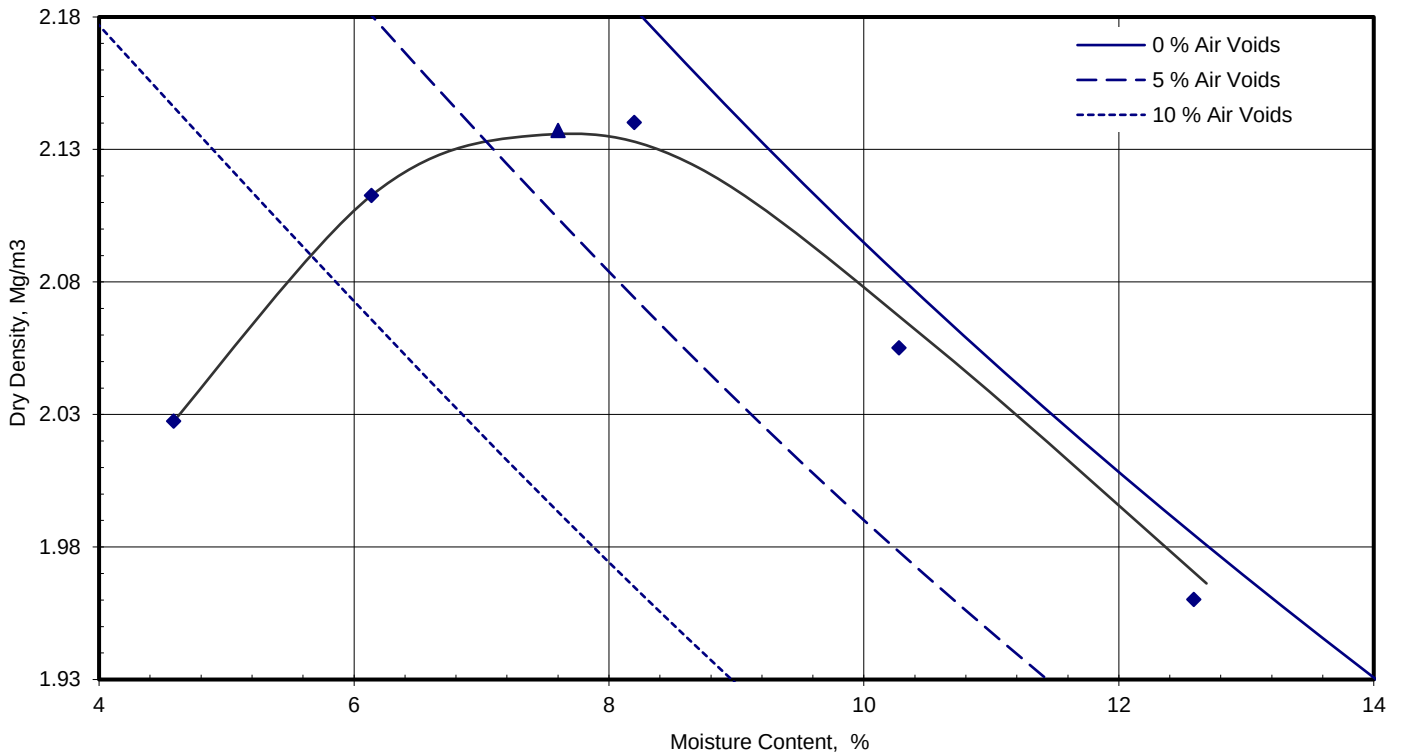
4041

TEST CERTIFICATE**DETERMINATION OF DRY DENSITY/MOISTURE
CONTENT RELATIONSHIP METHOD USING
4.5 KG RAMMER**

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EBClient: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EHContact: Mike Harper
Site Address: Plot L Kingsway Business ParkClient Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 28/03/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:Laboratory Reference: 2616109
Hole No.: TP202
Sample Reference: Not Given
Sample Description: Brown very sandy CLAY
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.Depth Top [m]: 0.90
Depth Base [m]: 1.40
Sample Type: B

Compaction Point No.	1	2	3	4	5	
Moisture Content	%	4.6	6.1	8.2	10	13
Dry Density	Mg/m³	2.03	2.11	2.14	2.06	1.96

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
As received Moisture Content	%	15
Maximum Dry Density	Mg/m³	2.14

Optimum Moisture Content	%	7.6
--------------------------	---	-----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Signed:

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Reporting Specialist
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**DETERMINATION OF DRY DENSITY/MOISTURE
CONTENT RELATIONSHIP METHOD USING
4.5 KG RAMMER**

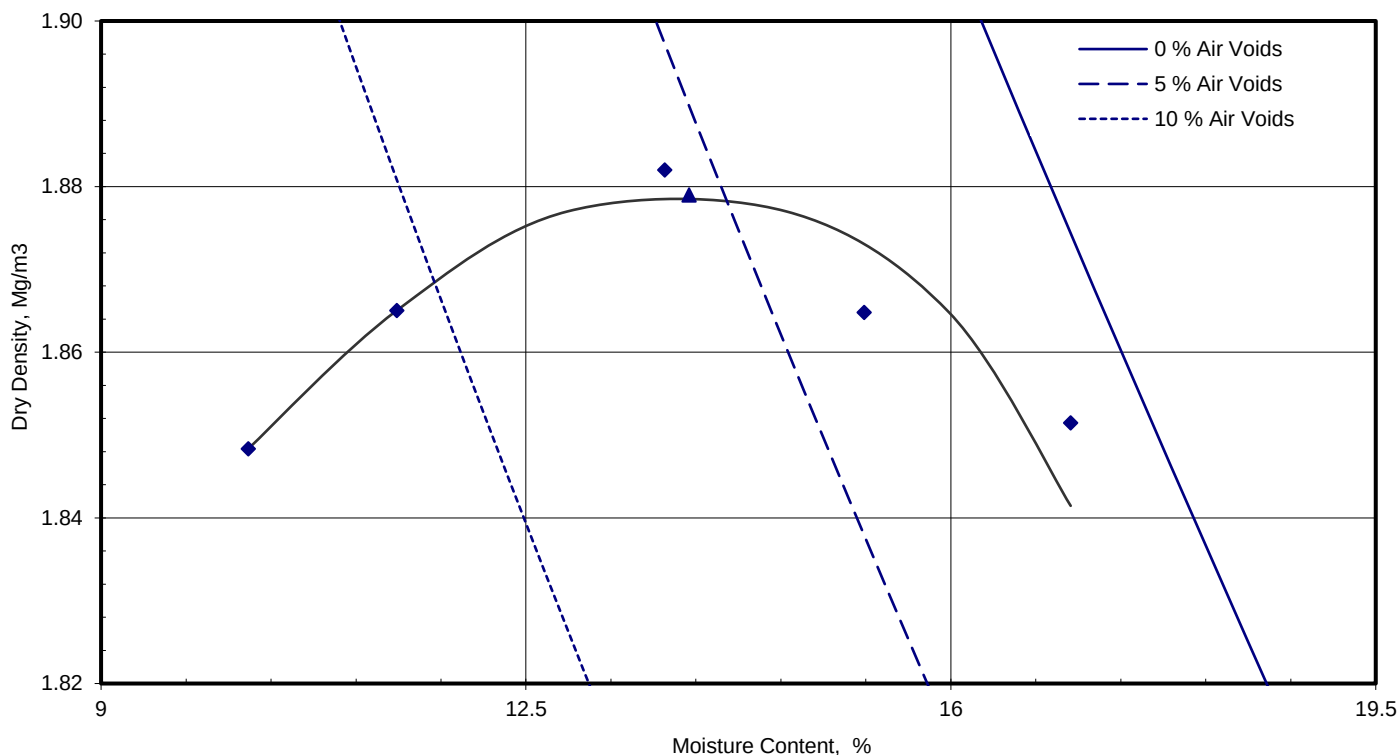
Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EHContact: Mike Harper
Site Address: Plot L Kingsway Business Park

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 28/03/2023
Sampled By: Not Given**Test Results:**Laboratory Reference: 2616113
Hole No.: TP203
Sample Reference: Not Given
Sample Description: Brown slightly sandy CLAY
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.Depth Top [m]: 2.70
Depth Base [m]: 3.00
Sample Type: B

Compaction Point No.		1	2	3	4	5
Moisture Content	%	10	11	14	15	17
Dry Density	Mg/m³	1.85	1.87	1.88	1.86	1.85

Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.75
As received Moisture Content	%	27
Maximum Dry Density	Mg/m³	1.88

Optimum Moisture Content	%	14
--------------------------	---	----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

Signed:

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Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 4.5 KG RAMMER

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: BWB Consulting Limited
Client Address: Whitehall Waterfront, 2 Riverside Way,
Leeds, LS1 4EH

Contact: Mike Harper
Site Address: Plot L Kingsway Business Park

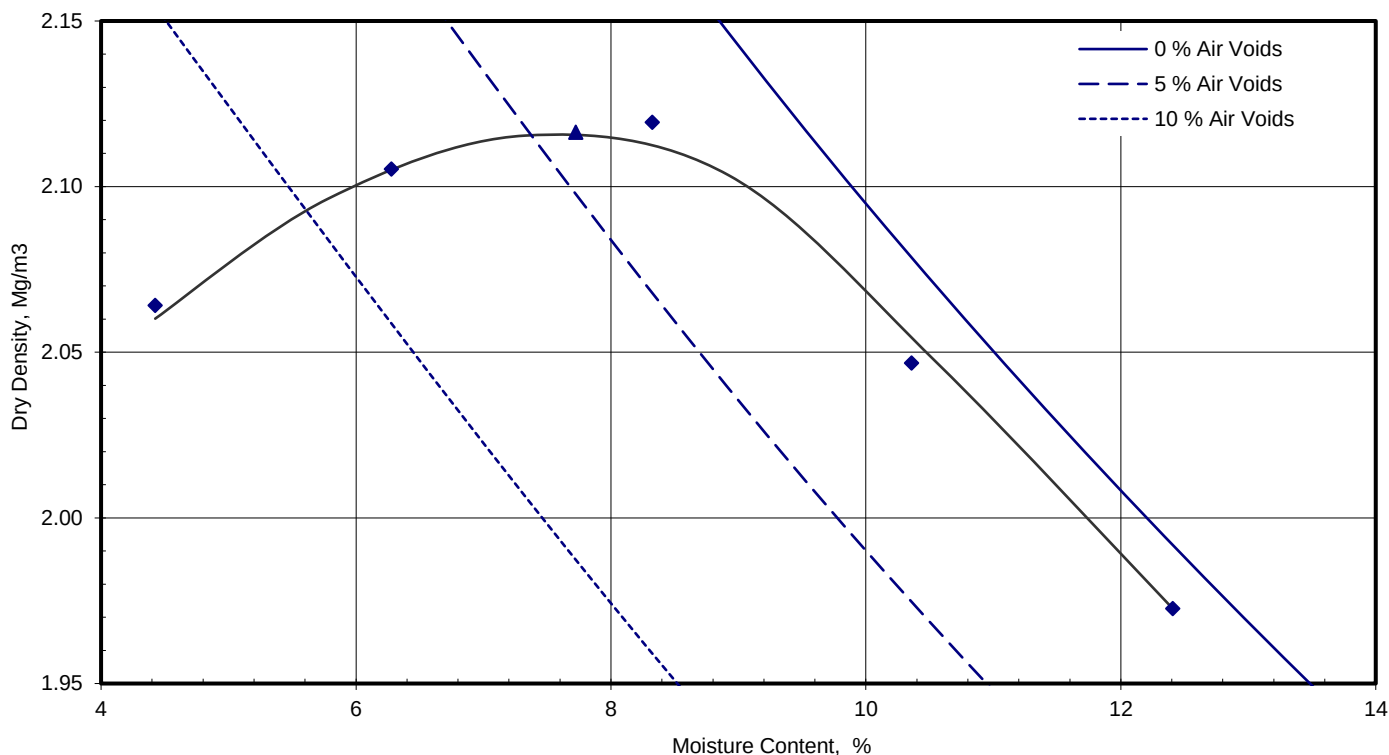
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 222009
Job Number: 23-22808-1
Date Sampled: Not Given
Date Received: 14/03/2023
Date Tested: 28/03/2023
Sampled By: Not Given

Test Results:

Laboratory Reference: 2616119
Hole No.: TP206
Sample Reference: Not Given
Sample Description: Brown sandy GRAVEL
Sample Preparation: Sample was quartered and broken down by hand. Material used was natural.

Depth Top [m]: 3.60
Depth Base [m]: 4.10
Sample Type: B



Compaction Point No.	1	2	3	4	5
Moisture Content %	4.4	6.3	8.3	10	12
Dry Density Mg/m³	2.06	2.11	2.12	2.05	1.97

Mould Type	1 Litre
Samples Used	Single sample tested
Material Retained on 37.5 mm Sieve %	10
Material Retained on 20.0 mm Sieve %	25
Particle Density - Assumed Mg/m³	2.65
As received Moisture Content %	10
Maximum Dry Density Mg/m³	2.12

Optimum Moisture Content %	7.7
----------------------------	-----

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Insufficient amount of material - compacted in 1 litre mould

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Site : Plot L, Kingsway Business Park

Made By : PM

- Clear box - Input required
- Blue box - Results

Job no. : 222009

Date : 28/03/2023

[illegible]

Note 1 - See BS 1377 - Part 3 for details of test procedures.

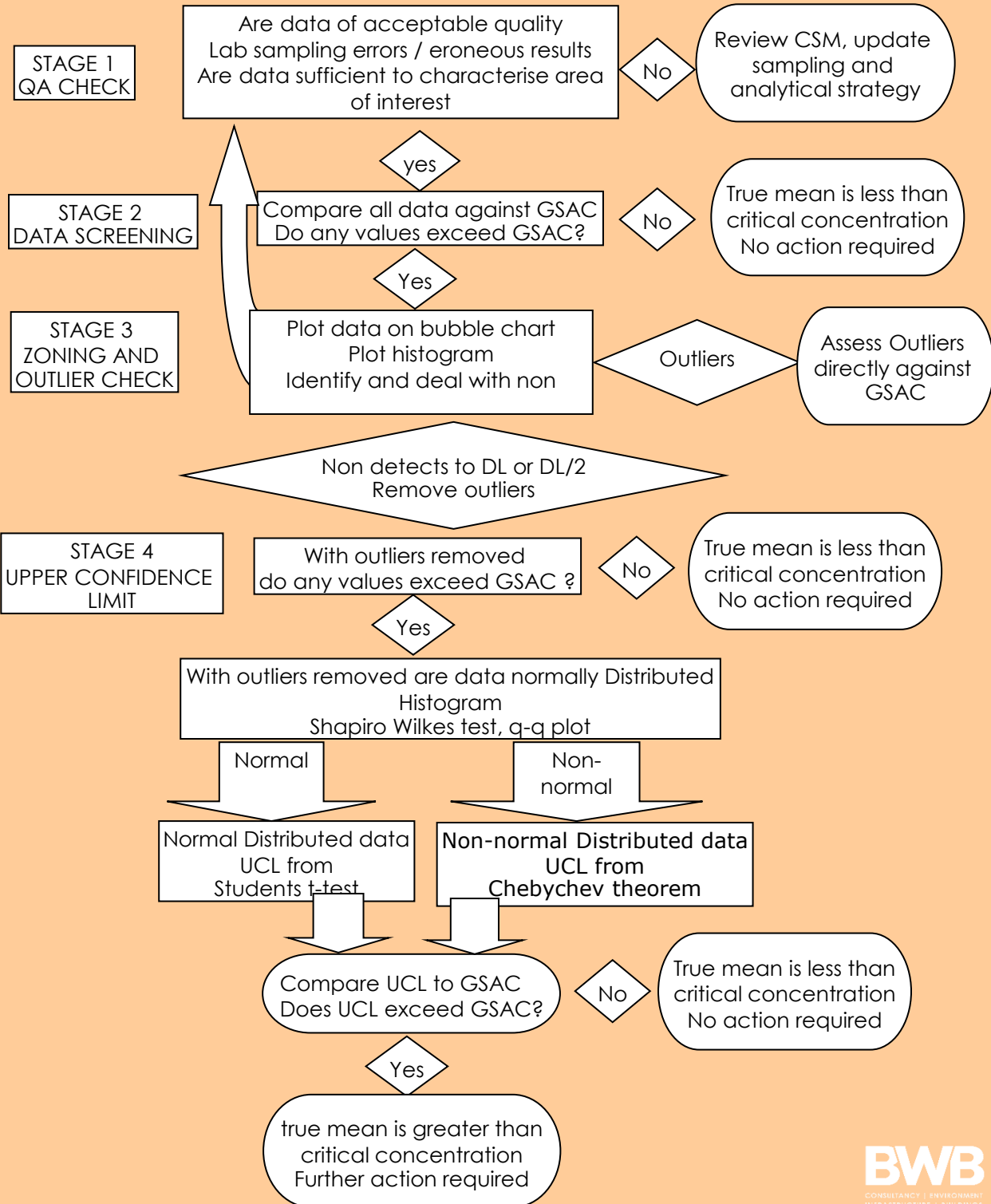
Note 2 - If Oxidisable Sulphide < 0.3% , the ground is probably not pyritic.

If an asterisk is shown in this column, see BRE Special Digest 1 (2005) "Step 8" (p.31).

APPENDIX 7: CLEA Flow Charts and Contaminant Screening Summary Table

STATISTICAL APPROACH FOR ASSESSING RISK TO HUMAN HEALTH FROM CONTAMINATED LAND 2008

CIEH/CLAIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration May 2008



Human Health Generic QRA Worksheet

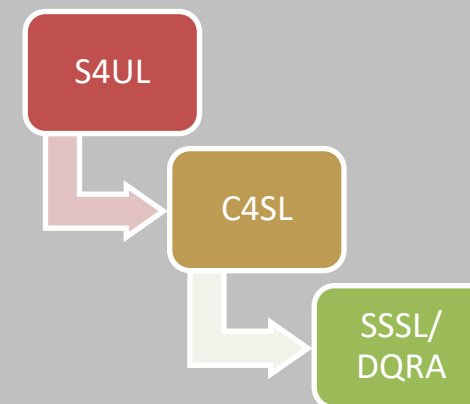


Job Name - Plot L Kingsway Business Park	Job Number - 222009
Description - Commercial Warehousing Units	

GSAC Hierarchy

Define CSM – Is site represented by a standard land use?

Residential with / without homegrown produce
 Commercial / Industrial
 Public Open Space - Residential (S4UL/C4SL only)
 Public Open Space - Park (S4UL/C4SL only)



GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)	LQM_CIEH_S4UL
Key Receptor/CSM (Residential/Commercial/POS)	S4UL Commercial
Organic Matter % (If unknown use 1%)	1

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 Publication Number S4UL3271

V7, December 2018

Generic Assessment Criteria

Job Name - Plot L Kingsway Business Park
Job Number - 222009

S4UL Commercial



	mg/kg	Source
Arsenic	6.40E+02	LQM_CIEH_S4UL
Barium	2.21E+04	LQM_CIEH_S4UL
Beryllium	1.20E+01	LQM_CIEH_S4UL
Boron	2.40E+05	LQM_CIEH_S4UL
Cadmium	1.90E+02	LQM_CIEH_S4UL
Chromium VI	3.30E+01	LQM_CIEH_S4UL
Chromium III	8.60E+03	LQM_CIEH_S4UL
Copper	6.80E+04	LQM_CIEH_S4UL
Lead*	2.33E+03	DEFRA_C4SL
Inorganic Mercury	1.10E+03	LQM_CIEH_S4UL
Nickel	9.80E+02	LQM_CIEH_S4UL
Selenium	1.20E+04	LQM_CIEH_S4UL
Vanadium	9.00E+03	LQM_CIEH_S4UL
Zinc	7.30E+05	LQM_CIEH_S4UL
Cyanide (Free)	4.30E+01	BWB
Cyanide (Complex)	2.13E+02	BWB
Phenols (Total)	4.40E+02	LQM_CIEH_S4UL
Benzene	2.70E+01	LQM_CIEH_S4UL
Toluene	5.60E+04	LQM_CIEH_S4UL
Ethyl benzene	5.70E+03	LQM_CIEH_S4UL
Total Xylene	5.90E+03	LQM_CIEH_S4UL
TPH (EC5-6) aliphatic	3.20E+03	LQM_CIEH_S4UL
TPH (>EC6-8) aliphatic	7.80E+03	LQM_CIEH_S4UL
TPH (>EC8-10) aliphatic	2.00E+03	LQM_CIEH_S4UL
TPH (>EC10-12) aliphatic	9.70E+03	LQM_CIEH_S4UL
TPH (>EC12-16) aliphatic	5.90E+04	LQM_CIEH_S4UL
TPH (>EC16-21) aliphatic	1.60E+06	LQM_CIEH_S4UL
TPH (>EC21-35) aliphatic	1.60E+06	LQM_CIEH_S4UL
TPH (>EC35-44) aliphatic	1.60E+06	LQM_CIEH_S4UL
TPH (>EC6-7) aromatic (benzene)	2.60E+04	LQM_CIEH_S4UL
TPH (>EC7-8) aromatic (toluene)	5.60E+04	LQM_CIEH_S4UL
TPH (>EC8-10) aromatic	3.50E+03	LQM_CIEH_S4UL
TPH (>EC10-12) aromatic	1.60E+04	LQM_CIEH_S4UL
TPH (>EC12-16) aromatic	3.60E+04	LQM_CIEH_S4UL
TPH (>EC16-21) aromatic	2.80E+04	LQM_CIEH_S4UL
TPH (>EC21-35) aromatic	2.80E+04	LQM_CIEH_S4UL
TPH (>EC35-44) aromatic	2.80E+04	LQM_CIEH_S4UL
Total TPH	5.00E+02	LQM_CIEH_S4UL
Naphthalene	1.90E+02	LQM_CIEH_S4UL
Acenaphthylene	8.30E+04	LQM_CIEH_S4UL
Acenaphthene	8.40E+04	LQM_CIEH_S4UL
Fluorene	6.30E+04	LQM_CIEH_S4UL
Phenanthrene	2.20E+04	LQM_CIEH_S4UL
Anthracene	5.20E+05	LQM_CIEH_S4UL
Fluoranthene	2.30E+04	LQM_CIEH_S4UL
Pyrene	5.40E+04	LQM_CIEH_S4UL
Benzo(a)anthracene	1.70E+02	LQM_CIEH_S4UL
Chrysene	3.50E+02	LQM_CIEH_S4UL
Benzo(b)fluoranthene	4.40E+01	LQM_CIEH_S4UL
Benzo(k)fluoranthene	1.20E+03	LQM_CIEH_S4UL
Benzo(a)pyrene	3.50E+01	LQM_CIEH_S4UL
Indeno(1,2,3-c,d)pyrene	5.00E+02	LQM_CIEH_S4UL

Generic Assessment Criteria

Job Name - Plot L Kingsway Business Park
Job Number - 222009

S4UL Commercial
mg/kg



Source

Dibenzo(a,h)anthracene	3.50E+00	LQM_CIEH_S4UL
Benzo(g,hi)perylene	3.90E+03	LQM_CIEH_S4UL
Coal Tar (B(a)P as surrogate marker	1.50E+01	LQM_CIEH_S4UL
Tetrachloroethene (PCE)	1.90E+01	LQM_CIEH_S4UL
Trichloroethene (TCE)	1.20E+00	LQM_CIEH_S4UL
cis -1,2-Dichloroethene	1.40E+01	LQM_CIEH_S4UL
Vinyl Chloride (VC)	5.90E-02	LQM_CIEH_S4UL
1,1,2,2-Tetrachloroethane (PCA)	2.70E+02	LQM_CIEH_S4UL
1,1,1-Trichloroethane (TCA)	6.60E+02	LQM_CIEH_S4UL
1,2-Dichloroethane	6.70E-01	LQM_CIEH_S4UL
Carbon Tetrachloride	2.90E+00	LQM_CIEH_S4UL
Carbon disulphide	1.10E+01	LQM_CIEH_S4UL

[illegible]

[illegible]

Determinand	Number of tests	Range (mg/kg)	S4UL Commercial GSAC (m	Detection Limit (mg/kg)	Min	Max	No. of Exceedances	No. Non detects	< or not
Arsenic	12	<4.2 to 21	6.40E+02	0	4.2	21	0	188	<
Barium	12	<23 to 170	2.21E+04	0	23	170	0	188	<
Beryllium	12	<0.39 to 0.95	1.20E+01	0	0.39	0.95	0	188	<
Boron	12	<0.2 to 0.7	2.40E+05	0	0.2	0.7	0	188	<
Cadmium	12	<0.2 to 2.5	1.90E+02	0	0.2	2.5	0	188	<
Chromium VI	12	<1.8 to 1.8	3.30E+01	0	1.8	1.8	0	188	<
Chromium III	12	<10 to 25	8.60E+03	0	10	25	0	188	<
Copper	12	<12 to 58	6.80E+04	0	12	58	0	188	<
Lead*	12	<9.3 to 130	2.33E+03	0	9.3	130	0	188	<
Inorganic Mercury	12	<0.3 to 0.4	1.10E+03	0	0.3	0.4	0	188	<
Nickel	12	<9.9 to 20	9.80E+02	0	9.9	20	0	188	<
Selenium	12	<1 to 1	1.20E+04	0	1	1	0	188	<
Vanadium	12	<13 to 31	9.00E+03	0	13	31	0	188	<
Zinc	12	<34 to 140	7.30E+05	0	34	140	0	188	<
Cyanide (Free)	12	<1 to 1	4.30E+01	0	1	1	0	188	<
Cyanide (Complex)	12	<1 to 1	2.13E+02	0	1	1	0	188	<
Phenols (Total)	12	<1 to 1	4.40E+02	0	1	1	0	188	<
Benzene	3	<0.005 to 0.005	2.70E+01	0	0.005	0.005	0	197	<
Toluene	3	<0.005 to 0.005	5.60E+04	0	0.005	0.005	0	197	<
Ethyl benzene	3	<0.005 to 0.005	5.70E+03	0	0.005	0.005	0	197	<
Total Xylene	3	<0.01 to 0.01	5.90E+03	0	0.01	0.01	0	197	<
TPH (EC5-6) aliphatic	3	<0.001 to 0.001	3.20E+03	0	0.001	0.001	0	197	<
TPH (>EC6-8) aliphatic	3	<0.001 to 0.001	7.80E+03	0	0.001	0.001	0	197	<
TPH (>EC8-10) aliphatic	3	<0.001 to 0.001	2.00E+03	0	0.001	0.001	0	197	<
TPH (>EC10-12) aliphatic	3	<1 to 4.2	9.70E+03	0	1	4.2	0	197	<
TPH (>EC12-16) aliphatic	3	<2 to 29	5.90E+04	0	2	29	0	197	<
TPH (>EC16-21) aliphatic	3	<8 to 150	1.60E+06	0	8	150	0	197	<
TPH (>EC21-35) aliphatic	3	<8 to 140	1.60E+06	0	8	140	0	197	<
TPH (>EC35-44) aliphatic	0	<0 to 0	1.60E+06	0	0	0	0	199	<
TPH (>EC6-7) aromatic (benzene)	3	<0.001 to 0.001	2.60E+04	0	0.001	0.001	0	197	<
TPH (>EC7-8) aromatic (toluene)	0	<0 to 0	5.60E+04	0	0	0	0	200	<
TPH (>EC8-10) aromatic	3	<0.001 to 0.001	3.50E+03	0	0.001	0.001	0	197	<
TPH (>EC10-12) aromatic	3	<1 to 1	1.60E+04	0	1	1	0	197	<
TPH (>EC12-16) aromatic	0	<0 to 0	3.60E+04	0	0	0	0	200	<
TPH (>EC16-21) aromatic	3	<10 to 70	2.80E+04	0	10	70	0	197	<
TPH (>EC21-35) aromatic	3	<20 to 140	2.80E+04	0	20	140	0	197	<
TPH (>EC35-44) aromatic	0	<0 to 0	2.80E+04	0	0	0	0	200	<
Total TPH	0	<0 to 0	5.00E+02	0	0	0	0	200	<
Naphthalene	12	<0.05 to 0.27	1.90E+02	0	0.05	0.27	0	188	<
Acenaphthylene	12	<0.05 to 0.14	8.30E+04	0	0.05	0.14	0	188	<
Acenaphthene	12	<0.05 to 0.21	8.40E+04	0	0.05	0.21	0	188	<
Fluorene	12	<0.05 to 0.19	6.30E+04	0	0.05	0.19	0	188	<
Phenanthrene	12	<0.05 to 2.1	2.20E+04	0	0.05	2.1	0	188	<
Anthracene	12	<0.05 to 0.4	5.20E+05	0	0.05	0.4	0	188	<
Fluoranthene	12	<0.05 to 4	2.30E+04	0	0.05	4	0	188	<
Pyrene	12	<0.05 to 3.6	5.40E+04	0	0.05	3.6	0	188	<
Benzo(a)anthracene	12	<0.05 to 1.7	1.70E+02	0	0.05	1.7	0	188	<
Chrysene	12	<0.05 to 1.9	3.50E+02	0	0.05	1.9	0	188	<
Benzo(b)fluoranthene	12	<0.05 to 2.1	4.40E+01	0	0.05	2.1	0	188	<
Benzo(k)fluoranthene	12	<0.05 to 1	1.20E+03	0	0.05	1	0	188	<
Benzo(a)pyrene	12	<0.05 to 1.8	3.50E+01	0	0.05	1.8	0	188	<
Indeno(1,2,3-c,d)pyrene	12	<0.05 to 0.77	5.00E+02	0	0.05	0.77	0	188	<
Dibenzo(a,h)anthracene	12	<0.05 to 0.18	3.50E+00	0	0.05	0.18	0	188	<
Benzo(g,h,i)perylene	12	<0.05 to 1	3.90E+03	0	0.05	1	0	188	<
Coal Tar (B(a)P as surrogate mark	12	<0.05 to 1.8	1.50E+01	0	0.05	1.8	0	188	<
Tetrachloroethene (PCE)	0	<0 to 0	1.90E+01	0	0	0	0	200	<
Trichloroethene (TCE)	0	<0 to 0	1.20E+00	0	0	0	0	200	<
cis-1,2-Dichloroethene	0	<0 to 0	1.40E+01	0	0	0	0	200	<
Vinyl Chloride (VC)	0	<0 to 0	5.90E-02	0	0	0	0	200	<
1,1,2,2-Tetrachloroethane (PCA)	0	<0 to 0	2.70E+02	0	0	0	0	200	<

APPENDIX 8: Gas and Groundwater Monitoring Data

Summary of Monitored Groundwater Levels

2017 and 2023 Ground Investigations, Plot L

				19th May 2017		25th May 2017		31st May 2017		5th June 2017		17th March 2023		28th March 2023		5th April 2023		14th April 2023			
Installation	GI	Base of Response Zone (m)	Ground Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	Depth (mbGL)	Level (mAOD)	MAX	MIN
BH01	2017	9.70	150.31	4.37	145.94	4.44	145.87	4.51	145.80	4.53	145.78									145.94	145.78
BH02	2017	9.53	147.42	1.61	145.81	1.71	145.71	1.76	145.66	1.76	145.66									145.81	145.66
BH03	2017	9.97	149.41	1.98	147.43	2.04	147.37	2.09	147.32	2.05	147.36									147.43	147.32
BH201 (S)	2023	1.70	147.45							0.80	146.65	0.50	146.95	0.45	147.00	0.40	147.05			147.05	146.65
BH201 (D)	2023	9.00	147.45							1.00	146.45	0.90	146.55	0.90	146.55	0.90	146.55			146.55	146.45
BH202 (S)	2023	1.90	150.58							1.65	148.93	1.80	148.78	1.80	148.78	1.80	148.78			148.93	148.78
BH202 (D)	2023	9.90	150.58							2.40	148.18	2.00	148.58	1.90	148.68	1.80	148.78			148.78	148.18
BH203 (S)	2023	1.90	148.10							0.90	147.20	1.65	146.45	1.65	146.45	1.65	146.45			147.20	146.45
BH203 (D)	2023	9.80	148.10							2.60	145.50	2.40	145.70	2.40	145.70	2.40	145.70			145.70	145.50

Maxima/Minima
148.93 145.50

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

Weather Conditions	Start	End
(Dry / Raining)	Cloudy	Cloudy
Wind Strength (m/s)	2.0	2.0
Wind Direction (from)	SW	SW
Temperature (°C)	13.0	13.0
Barometric Pressure (h Pa / mB)	985.0	985.0
App 12 Hour Regional Pressure (h Pa / mB)	1000.0	
12 Hour Pressure Trend	Falling	
PID - Air		
PID - Calibration Gas		

Site:		Plot L, Kingsway
Client:		Wilson Bowden Developments
Job No.:		222009
Date:		17 March 2023
Start / End Time:		14:30 - 15:30
Engineer:		OS
Monitoring Equipment:	Gas Meter ID	74235
	PID ID	592-908237
	Dip Tape	BWB00962
	Other	

[illegible]

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

Weather Conditions	Start	End
(Dry / Raining)	Raining	Raining
Wind Strength (m/s)	2.0	2.0
Wind Direction (from)	S	S
Temperature (°C)	7.0	7.0
Barometric Pressure (h Pa / mB)	1012.0	1012.0
App 12 Hour Regional Pressure (h Pa / mB)	1023.0	
12 Hour Pressure Trend	Falling	
PID - Air		
PID - Calibration Gas		

[illegible]

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

**CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS**

Weather Conditions	Start	End
(Dry / Raining)	Raining	Raining
Wind Strength (m/s)	2.0	2.0
Wind Direction (from)	\$	\$
Temperature (°C)	8.0	8.0
Barometric Pressure (h Pa / mB)	1017.0	1017.0
App 12 Hour Regional Pressure (h Pa / mB)	1023.0	
12 Hour Pressure Trend	Falling	
PID - Air		
PID - Calibration Gas		

[illegible]

BWB
CONSULTANCY | ENVIRONMENT
INFRASTRUCTURE | BUILDINGS

Weather Conditions	Start	End
(Dry / Raining)	Raining	Raining
Wind Strength (m/s)	1.0	1.0
Wind Direction (from)	N	N
Temperature (°C)	6.0	6.0
Barometric Pressure (h Pa / mB)	1000.0	1000.0
App 12 Hour Regional Pressure (h Pa / mB)	1002.0	
12 Hour Pressure Trend	Falling	
PID - Air		
PID - Calibration Gas		

Site:		Plot L, Kingsway
Client:		Wilson Bowden Developments
Job No.:		222009
Date:		14/04/2023
Start / End Time:		09:00 - 11:00
Engineer:		OS
Monitoring Equipment:	Gas Meter ID	74235
	PID ID	592-908237
	Dip Tape	8W800962
	Other	

[illegible]

APPENDIX 9: Waste Classification Report

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



KXVIW-BVOKJ-CKKHI

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

222009 Plot L Kingsway

Description/Comments

Project

222009 Plot L Kingsway

Site

222009 Plot L Kingsway

Classified by

Name: **Richard Robinson**
Date: **27 Mar 2023 15:26 GMT**
Telephone: **0115 924 1100**
Company: **BWB Consulting Ltd**
Waterfront House, Station Street
Nottingham
NG2 3DQ

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course
Hazardous Waste Classification
3 year Refresher overdue

Date
08 Dec 2016

Purpose of classification

2 - Material Characterisation

Address of the waste

Kingsway Business Park, Richdale

Post Code N/A

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Constructions

Description of the specific process, sub-process and/or activity that created the waste

Construction

Description of the waste

Soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH201	0.00-0.03	Non Hazardous		3
2	BH201[2]	0.30-0.60	Non Hazardous		6
3	BH203	0.00-0.30	Non Hazardous		9
4	TP201	0.00-0.30	Non Hazardous		12
5	TP202	0.20-0.50	Non Hazardous		15
6	TP203	0.10-0.40	Non Hazardous		18
7	TP204	0.10-0.40	Non Hazardous		21
8	TP206	0.20-0.40	Non Hazardous		24
9	TP206[2]	1.10-1.40	Non Hazardous		27
10	BH202	0.00-0.30	Non Hazardous		30
11	BH202[2]	0.50-0.70	Non Hazardous		33
12	TP205	0.00-0.40	Non Hazardous		36

Related documents

#	Name	Description
1	BWB Contaminated Land Suite WM3	waste stream template used to create this Job

Report

Created by: Richard Robinson

Created date: 27 Mar 2023 15:26 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	39
Appendix B: Rationale for selection of metal species	40
Appendix C: Version	41

Classification of sample: BH201

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH201	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-0.03 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
35%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 35% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☑						
2	arsenic { arsenic trioxide }				21 mg/kg	1.32	20.538 mg/kg	0.00205 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.95 mg/kg	2.775	1.953 mg/kg	0.000195 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				0.2 mg/kg	13.43	1.99 mg/kg	0.000199 %		✓	
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				17 mg/kg	1.462	18.405 mg/kg	0.00184 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				42 mg/kg	1.126	35.028 mg/kg	0.0035 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	110 mg/kg	1.56	127.096 mg/kg	0.00815 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				0.4 mg/kg	1.353	0.401 mg/kg	0.0000401 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				12 mg/kg	1.579	14.04 mg/kg	0.0014 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				62 mg/kg	2.774	127.405 mg/kg	0.0127 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				5.9 pH		5.9 pH	5.9 pH			
			pH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group		TPH		51 mg/kg		37.778 mg/kg	0.00378 %	✓	
16	acenaphthene	201-469-6	83-32-9		0.21 mg/kg		0.156 mg/kg	0.0000156 %	✓	
17	acenaphthylene	205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
18	anthracene	204-371-1	120-12-7		0.23 mg/kg		0.17 mg/kg	0.000017 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6		0.88 mg/kg		0.652 mg/kg	0.0000652 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.78 mg/kg		0.578 mg/kg	0.0000578 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.96 mg/kg		0.711 mg/kg	0.0000711 %	✓	
22	benzo[ghi]perylene	205-883-8	191-24-2		0.4 mg/kg		0.296 mg/kg	0.0000296 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.34 mg/kg		0.252 mg/kg	0.0000252 %	✓	
24	chrysene	601-048-00-0	205-923-4		0.88 mg/kg		0.652 mg/kg	0.0000652 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.09 mg/kg		0.0667 mg/kg	0.00000667 %	✓	
26	fluoranthene	205-912-4	206-44-0		1.7 mg/kg		1.259 mg/kg	0.000126 %	✓	
27	fluorene	201-695-5	86-73-7		0.15 mg/kg		0.111 mg/kg	0.0000111 %	✓	
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.31 mg/kg		0.23 mg/kg	0.000023 %	✓	
29	naphthalene	601-052-00-2	202-049-5		0.17 mg/kg		0.126 mg/kg	0.0000126 %	✓	
30	phenanthrene	201-581-5	85-01-8		1.3 mg/kg		0.963 mg/kg	0.0000963 %	✓	
31	pyrene	204-927-3	129-00-0		1.6 mg/kg		1.185 mg/kg	0.000119 %	✓	
32	phenol	604-001-00-2	203-632-7		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0351 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00378%)

Classification of sample: BH201[2]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH201[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.30-0.60 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 25% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☑						
2	arsenic { arsenic trioxide }				4.2 mg/kg	1.32	4.436	mg/kg	0.000444 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.7 mg/kg	2.775	1.554	mg/kg	0.000155 %	✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686	mg/kg	<0.000269 %		<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				18 mg/kg	1.462	21.046	mg/kg	0.0021 %	✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				12 mg/kg	1.126	10.809	mg/kg	0.00108 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	14 mg/kg	1.56	17.47	mg/kg	0.00112 %	✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				11 mg/kg	1.579	13.9	mg/kg	0.00139 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { zinc chromate }				42 mg/kg	2.774	93.211	mg/kg	0.00932 %	✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				6.2 pH		6.2	pH	6.2 pH		
			PH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group				14 mg/kg		11.2 mg/kg	0.00112 %	✓	
			TPH							
16	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
17	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
18	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
19	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
20	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
21	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
22	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-883-8	191-24-2							
23	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
24	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
25	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
26	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
27	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
28	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							
29	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
30	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
31	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
32	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.0176 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."



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Report created by Richard Robinson on 27 Mar 2023

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00112%)

Classification of sample: BH203

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH203	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
25%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 25% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				13 mg/kg	1.32	13.731 mg/kg	0.00137 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.72 mg/kg	2.775	1.599 mg/kg	0.00016 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %			<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				11 mg/kg	1.462	12.862 mg/kg	0.00129 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	27.021 mg/kg	0.0027 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	79 mg/kg	1.56	98.58 mg/kg	0.00632 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				11 mg/kg	1.579	13.9 mg/kg	0.00139 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				64 mg/kg	2.774	142.036 mg/kg	0.0142 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				5.5 pH		5.5 pH	5.5 pH			
			pH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group		TPH		44 mg/kg		35.2 mg/kg	0.00352 %	✓	
16	acenaphthene	201-469-6	83-32-9		0.07 mg/kg		0.056 mg/kg	0.0000056 %	✓	
17	acenaphthylene	205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
18	anthracene	204-371-1	120-12-7		0.08 mg/kg		0.064 mg/kg	0.0000064 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.43 mg/kg		0.344 mg/kg	0.0000344 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.44 mg/kg		0.352 mg/kg	0.0000352 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.49 mg/kg		0.392 mg/kg	0.0000392 %	✓	
22	benzo[ghi]perylene	205-883-8	191-24-2		0.23 mg/kg		0.184 mg/kg	0.0000184 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.2 mg/kg		0.16 mg/kg	0.000016 %	✓	
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.46 mg/kg		0.368 mg/kg	0.0000368 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.05 mg/kg		0.04 mg/kg	0.000004 %	✓	
26	fluoranthene	205-912-4	206-44-0		0.77 mg/kg		0.616 mg/kg	0.0000616 %	✓	
27	fluorene	201-695-5	86-73-7		0.05 mg/kg		0.04 mg/kg	0.000004 %	✓	
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.17 mg/kg		0.136 mg/kg	0.0000136 %	✓	
29	naphthalene	601-052-00-2	202-049-5	91-20-3	0.08 mg/kg		0.064 mg/kg	0.0000064 %	✓	
30	phenanthrene	201-581-5	85-01-8		0.47 mg/kg		0.376 mg/kg	0.0000376 %	✓	
31	pyrene	204-927-3	129-00-0		0.7 mg/kg		0.56 mg/kg	0.000056 %	✓	
32	phenol	604-001-00-2	203-632-7	108-95-2	<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0321 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00352%)

Classification of sample: TP201



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP201	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
24%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 24% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				15 mg/kg	1.32	15.972 mg/kg	0.0016 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.8 mg/kg	2.775	1.791 mg/kg	0.000179 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %			<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				12 mg/kg	1.462	14.144 mg/kg	0.00141 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				34 mg/kg	1.126	30.871 mg/kg	0.00309 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	100 mg/kg	1.56	125.792 mg/kg	0.00806 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				14 mg/kg	1.579	17.833 mg/kg	0.00178 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				73 mg/kg	2.774	163.317 mg/kg	0.0163 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				5.6 pH		5.6 pH	5.6 pH			
			PH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group				37 mg/kg		29.839 mg/kg	0.00298 %	✓	
			TPH							
16	acenaphthene				0.17 mg/kg		0.137 mg/kg	0.0000137 %	✓	
		201-469-6	83-32-9							
17	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
18	anthracene				0.16 mg/kg		0.129 mg/kg	0.0000129 %	✓	
		204-371-1	120-12-7							
19	benzo[a]anthracene				0.85 mg/kg		0.685 mg/kg	0.0000685 %	✓	
	601-033-00-9	200-280-6	56-55-3							
20	benzo[a]pyrene; benzo[def]chrysene				0.79 mg/kg		0.637 mg/kg	0.0000637 %	✓	
	601-032-00-3	200-028-5	50-32-8							
21	benzo[b]fluoranthene				0.84 mg/kg		0.677 mg/kg	0.0000677 %	✓	
	601-034-00-4	205-911-9	205-99-2							
22	benzo[ghi]perylene				0.44 mg/kg		0.355 mg/kg	0.0000355 %	✓	
		205-883-8	191-24-2							
23	benzo[k]fluoranthene				0.46 mg/kg		0.371 mg/kg	0.0000371 %	✓	
	601-036-00-5	205-916-6	207-08-9							
24	chrysene				1.1 mg/kg		0.887 mg/kg	0.0000887 %	✓	
	601-048-00-0	205-923-4	218-01-9							
25	dibenz[a,h]anthracene				0.11 mg/kg		0.0887 mg/kg	0.00000887 %	✓	
	601-041-00-2	200-181-8	53-70-3							
26	fluoranthene				1.7 mg/kg		1.371 mg/kg	0.000137 %	✓	
		205-912-4	206-44-0							
27	fluorene				0.09 mg/kg		0.0726 mg/kg	0.00000726 %	✓	
		201-695-5	86-73-7							
28	indeno[123-cd]pyrene				0.31 mg/kg		0.25 mg/kg	0.000025 %	✓	
		205-893-2	193-39-5							
29	naphthalene				0.14 mg/kg		0.113 mg/kg	0.0000113 %	✓	
	601-052-00-2	202-049-5	91-20-3							
30	phenanthrene				1 mg/kg		0.806 mg/kg	0.0000806 %	✓	
		201-581-5	85-01-8							
31	pyrene				1.6 mg/kg		1.29 mg/kg	0.000129 %	✓	
		204-927-3	129-00-0							
32	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.037 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."



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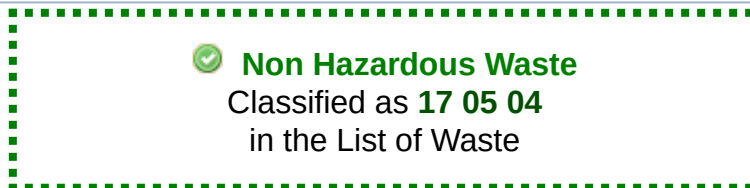
HazWasteOnline™

Report created by Richard Robinson on 27 Mar 2023

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00298%)

Classification of sample: TP202



Sample details

Sample name:	LoW Code:
TP202	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20-0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				11 mg/kg	1.32	12.308 mg/kg	0.00123 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.63 mg/kg	2.775	1.482 mg/kg	0.000148 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %			<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				24 mg/kg	1.462	29.727 mg/kg	0.00297 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	21.945 mg/kg	0.00219 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	61 mg/kg	1.56	80.635 mg/kg	0.00517 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				13 mg/kg	1.579	17.401 mg/kg	0.00174 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				52 mg/kg	2.774	122.251 mg/kg	0.0122 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				6.7 pH		6.7 pH	6.7 pH			
			pH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group		TPH		20 mg/kg		16.949 mg/kg	0.00169 %	✓	
16	acenaphthene	201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
18	anthracene	204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
19	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.16 mg/kg		0.136 mg/kg	0.0000136 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.16 mg/kg		0.136 mg/kg	0.0000136 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.2 mg/kg		0.169 mg/kg	0.0000169 %	✓	
22	benzo[ghi]perylene	205-883-8	191-24-2		0.09 mg/kg		0.0763 mg/kg	0.00000763 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.08 mg/kg		0.0678 mg/kg	0.00000678 %	✓	
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.2 mg/kg		0.169 mg/kg	0.0000169 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
26	fluoranthene	205-912-4	206-44-0		0.33 mg/kg		0.28 mg/kg	0.000028 %	✓	
27	fluorene	201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.06 mg/kg		0.0508 mg/kg	0.00000508 %	✓	
29	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
30	phenanthrene	201-581-5	85-01-8		0.22 mg/kg		0.186 mg/kg	0.0000186 %	✓	
31	pyrene	204-927-3	129-00-0		0.3 mg/kg		0.254 mg/kg	0.0000254 %	✓	
32	phenol	604-001-00-2	203-632-7	108-95-2	<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0283 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."



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Report created by Richard Robinson on 27 Mar 2023

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00169%)

Classification of sample: TP203



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP203	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.10-0.40 m	
Moisture content:	
14%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				10 mg/kg	1.32	11.582 mg/kg	0.00116 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.66 mg/kg	2.775	1.607 mg/kg	0.000161 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %			<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				14 mg/kg	1.462	17.949 mg/kg	0.00179 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				33 mg/kg	1.126	32.592 mg/kg	0.00326 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	100 mg/kg	1.56	136.826 mg/kg	0.00877 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				14 mg/kg	1.579	19.397 mg/kg	0.00194 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				97 mg/kg	2.774	236.046 mg/kg	0.0236 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				7.6 pH		7.6 pH	7.6 pH			
			PH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group				55 mg/kg		48.246 mg/kg	0.00482 %	✓	
			TPH							
16	benzene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
17	ethylbenzene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	toluene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
19	xylene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
20	acenaphthene				0.15 mg/kg		0.132 mg/kg	0.0000132 %	✓	
		201-469-6	83-32-9							
21	acenaphthylene				0.14 mg/kg		0.123 mg/kg	0.0000123 %	✓	
		205-917-1	208-96-8							
22	anthracene				0.29 mg/kg		0.254 mg/kg	0.0000254 %	✓	
		204-371-1	120-12-7							
23	benzo[a]anthracene				1.7 mg/kg		1.491 mg/kg	0.000149 %	✓	
	601-033-00-9	200-280-6	56-55-3							
24	benzo[a]pyrene; benzo[def]chrysene				1.8 mg/kg		1.579 mg/kg	0.000158 %	✓	
	601-032-00-3	200-028-5	50-32-8							
25	benzo[b]fluoranthene				2 mg/kg		1.754 mg/kg	0.000175 %	✓	
	601-034-00-4	205-911-9	205-99-2							
26	benzo[ghi]perylene				1 mg/kg		0.877 mg/kg	0.0000877 %	✓	
		205-883-8	191-24-2							
27	benzo[k]fluoranthene				1 mg/kg		0.877 mg/kg	0.0000877 %	✓	
	601-036-00-5	205-916-6	207-08-9							
28	chrysene				1.9 mg/kg		1.667 mg/kg	0.000167 %	✓	
	601-048-00-0	205-923-4	218-01-9							
29	dibenz[a,h]anthracene				0.18 mg/kg		0.158 mg/kg	0.0000158 %	✓	
	601-041-00-2	200-181-8	53-70-3							
30	fluoranthene				4 mg/kg		3.509 mg/kg	0.000351 %	✓	
		205-912-4	206-44-0							
31	fluorene				0.16 mg/kg		0.14 mg/kg	0.000014 %	✓	
		201-695-5	86-73-7							
32	indeno[123-cd]pyrene				0.77 mg/kg		0.675 mg/kg	0.0000675 %	✓	
		205-893-2	193-39-5							
33	naphthalene				0.06 mg/kg		0.0526 mg/kg	0.00000526 %	✓	
	601-052-00-2	202-049-5	91-20-3							
34	phenanthrene				2.1 mg/kg		1.842 mg/kg	0.000184 %	✓	
		201-581-5	85-01-8							
35	pyrene				3.6 mg/kg		3.158 mg/kg	0.000316 %	✓	
		204-927-3	129-00-0							
36	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.0501 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00482%)

Classification of sample: TP204

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP204	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.10-0.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	confirm TPH has NOT arisen from diesel or petrol				☒					
2	arsenic { arsenic trioxide }				8.5 mg/kg	1.32	9.511 mg/kg	0.000951 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	beryllium { beryllium oxide }				0.75 mg/kg	2.775	1.764 mg/kg	0.000176 %	✓	
	004-003-00-8	215-133-1	1304-56-9							
4	boron { boron tribromide/trichloride/trifluoride (combined) }				0.4 mg/kg	13.43	4.553 mg/kg	0.000455 %	✓	
			10294-33-4, 10294-34-5, 7637-07-2							
5	cadmium { cadmium sulfide }			1	0.4 mg/kg	1.285	0.436 mg/kg	0.0000339 %	✓	
	048-010-00-4	215-147-8	1306-23-6							
6	chromium { chromium(III) oxide (worst case) }				12 mg/kg	1.462	14.863 mg/kg	0.00149 %	✓	
		215-160-9	1308-38-9							
7	copper { dicopper oxide; copper (I) oxide }				40 mg/kg	1.126	38.166 mg/kg	0.00382 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead chromate }			1	110 mg/kg	1.56	145.406 mg/kg	0.00932 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel dihydroxide }				16 mg/kg	1.579	21.417 mg/kg	0.00214 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
12	zinc { zinc chromate }				100 mg/kg	2.774	235.097 mg/kg	0.0235 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
13	pH				7.3 pH		7.3 pH	7.3 pH		
			pH							
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group		TPH		990 mg/kg		838.983 mg/kg	0.0839 %	✓	
16	acenaphthene	201-469-6	83-32-9		0.09 mg/kg		0.0763 mg/kg	0.00000763 %	✓	
17	acenaphthylene	205-917-1	208-96-8		0.07 mg/kg		0.0593 mg/kg	0.00000593 %	✓	
18	anthracene	204-371-1	120-12-7		0.22 mg/kg		0.186 mg/kg	0.0000186 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6		0.74 mg/kg		0.627 mg/kg	0.0000627 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.76 mg/kg		0.644 mg/kg	0.0000644 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.89 mg/kg		0.754 mg/kg	0.0000754 %	✓	
22	benzo[ghi]perylene	205-883-8	191-24-2		0.56 mg/kg		0.475 mg/kg	0.0000475 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.52 mg/kg		0.441 mg/kg	0.0000441 %	✓	
24	chrysene	601-048-00-0	205-923-4		0.91 mg/kg		0.771 mg/kg	0.0000771 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
26	fluoranthene	205-912-4	206-44-0		1.2 mg/kg		1.017 mg/kg	0.000102 %	✓	
27	fluorene	201-695-5	86-73-7		0.1 mg/kg		0.0847 mg/kg	0.00000847 %	✓	
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.44 mg/kg		0.373 mg/kg	0.0000373 %	✓	
29	naphthalene	601-052-00-2	202-049-5		0.11 mg/kg		0.0932 mg/kg	0.00000932 %	✓	
30	phenanthrene	201-581-5	85-01-8		0.62 mg/kg		0.525 mg/kg	0.0000525 %	✓	
31	pyrene	204-927-3	129-00-0		1.2 mg/kg		1.017 mg/kg	0.000102 %	✓	
32	phenol	604-001-00-2	203-632-7		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.127 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0839%)

Classification of sample: TP206



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP206	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.20-0.40 m	
Moisture content:	
13%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				11 mg/kg	1.32	12.853	mg/kg	0.00129 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.84 mg/kg	2.775	2.063	mg/kg	0.000206 %	✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				0.7 mg/kg	13.43	8.319	mg/kg	0.000832 %	✓	
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	2.5 mg/kg	1.285	2.843	mg/kg	0.000221 %	✓	
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				22 mg/kg	1.462	28.455	mg/kg	0.00285 %	✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				58 mg/kg	1.126	57.789	mg/kg	0.00578 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	120 mg/kg	1.56	165.644	mg/kg	0.0106 %	✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				20 mg/kg	1.579	27.956	mg/kg	0.0028 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { zinc chromate }				140 mg/kg	2.774	343.7	mg/kg	0.0344 %	✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				10.9 pH		10.9	pH	10.9 pH		
			PH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group				660 mg/kg		584.071 mg/kg	0.0584 %	✓	
			TPH							
16	benzene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
17	ethylbenzene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	toluene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
19	xylene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
20	acenaphthene				0.17 mg/kg		0.15 mg/kg	0.000015 %	✓	
		201-469-6	83-32-9							
21	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
22	anthracene				0.36 mg/kg		0.319 mg/kg	0.0000319 %	✓	
		204-371-1	120-12-7							
23	benzo[a]anthracene				0.94 mg/kg		0.832 mg/kg	0.0000832 %	✓	
	601-033-00-9	200-280-6	56-55-3							
24	benzo[a]pyrene; benzo[def]chrysene				1.2 mg/kg		1.062 mg/kg	0.000106 %	✓	
	601-032-00-3	200-028-5	50-32-8							
25	benzo[b]fluoranthene				1.2 mg/kg		1.062 mg/kg	0.000106 %	✓	
	601-034-00-4	205-911-9	205-99-2							
26	benzo[ghi]perylene				0.78 mg/kg		0.69 mg/kg	0.000069 %	✓	
		205-883-8	191-24-2							
27	benzo[k]fluoranthene				0.56 mg/kg		0.496 mg/kg	0.0000496 %	✓	
	601-036-00-5	205-916-6	207-08-9							
28	chrysene				0.91 mg/kg		0.805 mg/kg	0.0000805 %	✓	
	601-048-00-0	205-923-4	218-01-9							
29	dibenz[a,h]anthracene				0.14 mg/kg		0.124 mg/kg	0.0000124 %	✓	
	601-041-00-2	200-181-8	53-70-3							
30	fluoranthene				2 mg/kg		1.77 mg/kg	0.000177 %	✓	
		205-912-4	206-44-0							
31	fluorene				0.16 mg/kg		0.142 mg/kg	0.0000142 %	✓	
		201-695-5	86-73-7							
32	indeno[123-cd]pyrene				0.58 mg/kg		0.513 mg/kg	0.0000513 %	✓	
		205-893-2	193-39-5							
33	naphthalene				0.21 mg/kg		0.186 mg/kg	0.0000186 %	✓	
	601-052-00-2	202-049-5	91-20-3							
34	phenanthrene				1.1 mg/kg		0.973 mg/kg	0.0000973 %	✓	
		201-581-5	85-01-8							
35	pyrene				1.9 mg/kg		1.681 mg/kg	0.000168 %	✓	
		204-927-3	129-00-0							
36	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.121 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0584%)

Classification of sample: TP206[2]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP206[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.10-1.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				9.5 mg/kg	1.32	11.1 mg/kg	0.00111 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.76 mg/kg	2.775	1.867 mg/kg	0.000187 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				0.4 mg/kg	13.43	4.754 mg/kg	0.000475 %		✓	
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	0.6 mg/kg	1.285	0.682 mg/kg	0.0000531 %		✓	
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				16 mg/kg	1.462	20.695 mg/kg	0.00207 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				57 mg/kg	1.126	56.793 mg/kg	0.00568 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	110 mg/kg	1.56	151.84 mg/kg	0.00973 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				0.4 mg/kg	1.353	0.479 mg/kg	0.0000479 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				16 mg/kg	1.579	22.365 mg/kg	0.00224 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				120 mg/kg	2.774	294.6 mg/kg	0.0295 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				10.4 pH		10.4 pH	10.4 pH			
			pH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group		TPH		240 mg/kg		212.389 mg/kg	0.0212 %	✓	
16	acenaphthene	201-469-6	83-32-9		0.18 mg/kg		0.159 mg/kg	0.0000159 %	✓	
17	acenaphthylene	205-917-1	208-96-8		0.06 mg/kg		0.0531 mg/kg	0.00000531 %	✓	
18	anthracene	204-371-1	120-12-7		0.27 mg/kg		0.239 mg/kg	0.0000239 %	✓	
19	benzo[a]anthracene	601-033-00-9	200-280-6		0.91 mg/kg		0.805 mg/kg	0.0000805 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.1 mg/kg		0.973 mg/kg	0.0000973 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.2 mg/kg		1.062 mg/kg	0.000106 %	✓	
22	benzo[ghi]perylene	205-883-8	191-24-2		0.59 mg/kg		0.522 mg/kg	0.0000522 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.53 mg/kg		0.469 mg/kg	0.0000469 %	✓	
24	chrysene	601-048-00-0	205-923-4		1 mg/kg		0.885 mg/kg	0.0000885 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.14 mg/kg		0.124 mg/kg	0.0000124 %	✓	
26	fluoranthene	205-912-4	206-44-0		1.7 mg/kg		1.504 mg/kg	0.00015 %	✓	
27	fluorene	201-695-5	86-73-7		0.19 mg/kg		0.168 mg/kg	0.0000168 %	✓	
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.48 mg/kg		0.425 mg/kg	0.0000425 %	✓	
29	naphthalene	601-052-00-2	202-049-5		0.27 mg/kg		0.239 mg/kg	0.0000239 %	✓	
30	phenanthrene	201-581-5	85-01-8		1.1 mg/kg		0.973 mg/kg	0.0000973 %	✓	
31	pyrene	204-927-3	129-00-0		1.5 mg/kg		1.327 mg/kg	0.000133 %	✓	
32	phenol	604-001-00-2	203-632-7		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0737 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0212%)

Classification of sample: BH202



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH202	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				5.3 mg/kg	1.32	6.138 mg/kg	0.000614 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.39 mg/kg	2.775	0.949 mg/kg	0.0000949 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %			<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				10 mg/kg	1.462	12.821 mg/kg	0.00128 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	13.827 mg/kg	0.00138 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	9.3 mg/kg	1.56	12.725 mg/kg	0.000816 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				12 mg/kg	1.579	16.626 mg/kg	0.00166 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				34 mg/kg	2.774	82.738 mg/kg	0.00827 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				6.1 pH		6.1 pH	6.1 pH			
			PH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group				56 mg/kg		49.123 mg/kg	0.00491 %	✓	
			TPH							
16	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
17	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
18	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
19	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
20	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
21	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
22	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-883-8	191-24-2							
23	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
24	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
25	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
26	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
27	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
28	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							
29	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
30	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
31	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
32	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.0199 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."



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HazWasteOnline™

Report created by Richard Robinson on 27 Mar 2023

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00491%)

Classification of sample: BH202[2]

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH202[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50-0.70 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
28%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 28% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☑						
2	arsenic { arsenic trioxide }				4.9 mg/kg	1.32	5.054 mg/kg	0.000505 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.44 mg/kg	2.775	0.954 mg/kg	0.0000954 %	✓		
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				0.2 mg/kg	13.43	2.098 mg/kg	0.00021 %	✓		
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				10 mg/kg	1.462	11.418 mg/kg	0.00114 %	✓		
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	14.953 mg/kg	0.0015 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	34 mg/kg	1.56	41.433 mg/kg	0.00266 %	✓		
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				9.9 mg/kg	1.579	12.216 mg/kg	0.00122 %	✓		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				37 mg/kg	2.774	80.19 mg/kg	0.00802 %	✓		
	024-007-00-3	236-878-9	13530-65-9								
13	pH				7.7 pH		7.7 pH	7.7 pH			
			pH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group		TPH		30 mg/kg		23.438 mg/kg	0.00234 %	✓	
16	acenaphthene	201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
17	acenaphthylene	205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
18	anthracene	204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
19	benzo[a]anthracene	601-033-00-9	200-280-6		0.37 mg/kg		0.289 mg/kg	0.0000289 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.34 mg/kg		0.266 mg/kg	0.0000266 %	✓	
21	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.48 mg/kg		0.375 mg/kg	0.0000375 %	✓	
22	benzo[ghi]perylene	205-883-8	191-24-2		0.27 mg/kg		0.211 mg/kg	0.0000211 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.13 mg/kg		0.102 mg/kg	0.0000102 %	✓	
24	chrysene	601-048-00-0	205-923-4		0.33 mg/kg		0.258 mg/kg	0.0000258 %	✓	
25	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
26	fluoranthene	205-912-4	206-44-0		0.57 mg/kg		0.445 mg/kg	0.0000445 %	✓	
27	fluorene	201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.22 mg/kg		0.172 mg/kg	0.0000172 %	✓	
29	naphthalene	601-052-00-2	202-049-5		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
30	phenanthrene	201-581-5	85-01-8		0.3 mg/kg		0.234 mg/kg	0.0000234 %	✓	
31	pyrene	204-927-3	129-00-0		0.61 mg/kg		0.477 mg/kg	0.0000477 %	✓	
32	phenol	604-001-00-2	203-632-7		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0185 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00234%)

Classification of sample: TP205



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP205	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-0.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	confirm TPH has NOT arisen from diesel or petrol				☒						
2	arsenic { arsenic trioxide }				11 mg/kg	1.32	12.629 mg/kg	0.00126 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
3	beryllium { beryllium oxide }				0.66 mg/kg	2.775	1.593 mg/kg	0.000159 %		✓	
	004-003-00-8	215-133-1	1304-56-9								
4	boron { boron tribromide/trichloride/trifluoride (combined) }				<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %			<LOD
			10294-33-4, 10294-34-5, 7637-07-2								
5	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %			<LOD
	048-010-00-4	215-147-8	1306-23-6								
6	chromium { chromium(III) oxide (worst case) }				25 mg/kg	1.462	31.773 mg/kg	0.00318 %		✓	
		215-160-9	1308-38-9								
7	copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	25.455 mg/kg	0.00255 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
8	lead { lead chromate }			1	130 mg/kg	1.56	176.327 mg/kg	0.0113 %		✓	
	082-004-00-2	231-846-0	7758-97-6								
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				10 mg/kg	1.579	13.735 mg/kg	0.00137 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
12	zinc { zinc chromate }				73 mg/kg	2.774	176.098 mg/kg	0.0176 %		✓	
	024-007-00-3	236-878-9	13530-65-9								
13	pH				7.6 pH		7.6 pH	7.6 pH			
			PH								
14	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
	ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }									
	006-007-00-5									
15	TPH (C6 to C40) petroleum group				32 mg/kg		27.826 mg/kg	0.00278 %	✓	
			TPH							
16	benzene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
17	ethylbenzene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	toluene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
19	xylene				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
20	acenaphthene				0.21 mg/kg		0.183 mg/kg	0.0000183 %	✓	
		201-469-6	83-32-9							
21	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
22	anthracene				0.4 mg/kg		0.348 mg/kg	0.0000348 %	✓	
		204-371-1	120-12-7							
23	benzo[a]anthracene				1.7 mg/kg		1.478 mg/kg	0.000148 %	✓	
	601-033-00-9	200-280-6	56-55-3							
24	benzo[a]pyrene; benzo[def]chrysene				1.5 mg/kg		1.304 mg/kg	0.00013 %	✓	
	601-032-00-3	200-028-5	50-32-8							
25	benzo[b]fluoranthene				2.1 mg/kg		1.826 mg/kg	0.000183 %	✓	
	601-034-00-4	205-911-9	205-99-2							
26	benzo[ghi]perylene				0.93 mg/kg		0.809 mg/kg	0.0000809 %	✓	
		205-883-8	191-24-2							
27	benzo[k]fluoranthene				0.44 mg/kg		0.383 mg/kg	0.0000383 %	✓	
	601-036-00-5	205-916-6	207-08-9							
28	chrysene				1.5 mg/kg		1.304 mg/kg	0.00013 %	✓	
	601-048-00-0	205-923-4	218-01-9							
29	dibenz[a,h]anthracene				0.16 mg/kg		0.139 mg/kg	0.0000139 %	✓	
	601-041-00-2	200-181-8	53-70-3							
30	fluoranthene				3.5 mg/kg		3.043 mg/kg	0.000304 %	✓	
		205-912-4	206-44-0							
31	fluorene				0.16 mg/kg		0.139 mg/kg	0.0000139 %	✓	
		201-695-5	86-73-7							
32	indeno[123-cd]pyrene				0.75 mg/kg		0.652 mg/kg	0.0000652 %	✓	
		205-893-2	193-39-5							
33	naphthalene				0.19 mg/kg		0.165 mg/kg	0.0000165 %	✓	
	601-052-00-2	202-049-5	91-20-3							
34	phenanthrene				2.1 mg/kg		1.826 mg/kg	0.000183 %	✓	
		201-581-5	85-01-8							
35	pyrene				3.1 mg/kg		2.696 mg/kg	0.00027 %	✓	
		204-927-3	129-00-0							
36	phenol				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
Total:								0.0446 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because No significant volatile contamination or calorific materials encountered.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00278%)

Appendix A: Classifier defined and non GB MCL determinands

confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

boron tribromide/trichloride/trifluoride (combined) (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride
Data source: N/A
Data source date: 06 Aug 2015
Hazard Statements: EUH014, Acute Tox. 2; H330, Acute Tox. 2; H300, Skin Corr. 1A; H314, Skin Corr. 1B; H314

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on risk phrases

beryllium {beryllium oxide}

Worst case species based on risk phrases

boron {boron tribromide/trichloride/trifluoride (combined)}

Worst case species based on risk phrases

cadmium {cadmium sulfide}

Worst case species based on risk phrases

chromium {chromium(III) oxide (worst case)}

All chromium VI concentrations below the lab LoD.

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead chromate}

Worst case species based on risk phrases

mercury {mercury dichloride}

Worst case species based on risk phrases

nickel {nickel dihydroxide}

Worst case species based on risk phrases

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on risk phrases

zinc {zinc chromate}

Worst case species based on risk phrases

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2023.73.5544.10256 (14 Mar 2023)

HazWasteOnline Database: 2023.73.5544.10256 (14 Mar 2023)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

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