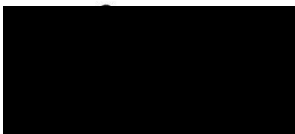


MANCHESTER LIFE PLOT A / PHOENIX IRON WORKS PHASE 2 GROUND INVESTIGATION REPORT

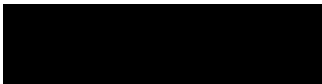
Curtins Ref:	080866-CUR-XX-XX-T-GE-00003
Revision:	P01
Issue Date:	07 February 2025
Client Name:	MACE
Client Address:	6 th Floor, 42 Fountain Street, Manchester, M2 2BE
Site Address:	Land off Jersey Street, Ancoats, Manchester, M4 6JW

Rev	Description	Issued by	Checked	Date
P01	Issue	LW	JL	07 February 2025

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EXECUTIVE SUMMARY

Appointment	Curtins were instructed by Mace to undertake an intrusive post-demolition ground investigation at the proposed development site in land off Jersey Street, Ancoats, Manchester, M4 6JW. The site is approximately centred on National Grid Reference 385144, 398722 and covers an area of approximately 0.64 Ha. It is understood that development proposals comprise the construction of a U-shaped residential block circa 5-9 storeys with some commercial premises on the ground floor and retention/rebuild of 2-3 No. one-storey units in the south, with associated hardstanding and soft landscaping areas.
Current Site Status	The site is located north of Jersey Street, south of Naval Street, east of Radium Street and west of Poland Street. The site is currently occupied by hardstanding in the centre and south-east of the site, three disused warehouse buildings in the south-west, and a Made Ground surface layer in the north associated with the demolition of previous buildings. The site is surrounded by a mixture of brick walls and metal fencing. The topography of the site is relatively flat, with a gentle slope from the north to the south.
Summary of Phase 1 Preliminary Risk Assessment	In earliest mapping (1893) the site is comprised entirely of buildings, intersected by a canal in the centre from east to west. An iron works (Phoenix Iron Works) was present in the south-east, and a canal wharf was located in the north off the Bengal Canal Arm. By 1908, the canal wharf had been infilled and divided into a number of smaller buildings referred to as 'Iron Works'. The buildings in the south-west of the site were referred to as a Glass Works. By 1952 – 1955, the Bengal Arm of the Canal had been infilled. There were no significant changes on site up until 2014, when the old Phoenix Iron Works building was demolished, and in 2024 the buildings spanning the north of the site were demolished, with site comprising unoccupied land in the north, hardstanding in the centre and south-east and 3 No. unused warehouse buildings in the south-west. The immediate surrounding area, in earliest mapping (1893) was significantly developed, comprising a mixture of residential, commercial and industrial buildings. Mills were located to the east and south-east of the site, with the Flint Glass Works located to the south; residential, commercial and a school were located to the north and west. By 1908, a Glass Works was located to the north-east and south of the site, with a Corporation Yard to the east and Cotton Mills to the west and south-west of the site. By 1922, the Glass Works to the south was labelled as a Waterproof Factory, and the Glass Works to the north-east as a Printing Works. By 1949, residential properties to the north had been demolished; the Calico Printing Works was present to the north-east, with a Corporation Yard to the east; derelict unused land to the south-east; a clothing factory and wastepaper factory to the south; a cotton mill to the south-west and a Soap Works to the west. By 1981, various Works, Depots, Factories, Warehouses and Builder's Yards were located surrounding the site which remains relatively unchanged to 2024, with several of these buildings being repurposed into offices, commercial space and residential buildings, land to the east and south-east comprise the developments known as Manchester Life Plot B and Plot C. BGS mapping indicates that geology on the site comprises Glacial Till (Secondary Undifferentiated Aquifer) underlain by the Manchester Marls Formation (Secondary B Aquifer). Made Ground is anticipated at the site surface due to historical structures on site which have since been demolished. The E3P (2020) Phase I Geoenvironmental Site Assessment confirms the site is situated in a lower probability radon area where <1% of homes are estimated to be at or above the Radon Action Level. Therefore, no radon protective measures are necessary. The UK Health Security Agency Radon mapping places the site within an intermediate probability radon area where 5-10% of homes are estimated to be at or above the Radon Action Level.
Fieldworks Undertaken	E3Ps 2019 ground investigation works were undertaken between the 18th to 20th of November 2019, and comprised of 5 No. mechanically excavated trial pits, 3 No. Mechanically excavated trial trenches, 5 No. window sample boreholes and 3 No. cable percussive boreholes. E3P installed 4 No. window samples with ground gas and groundwater monitoring standpipes, with 6 No. return monitoring visits undertaken between the 9th of December 2019 and 7th of April 2020. Curtins 2021 pre-demolition ground investigation works were undertaken between the 18th of January to 9th of February 2021 and comprised 2 No. rotary boreholes. Curtins 2024 post-demolition ground investigation works were undertaken between the 4th and 14th of November 2024, comprising 9 No. mechanically excavated trial pits, 7 No. window sample boreholes, and 3 No. cable percussive boreholes with rotary follow on. Ground gas and groundwater monitoring standpipes were installed within 3 No. Cable Percussive with Rotary follow-on Boreholes and 5 No. Window Sample Boreholes. 4 No. return monitoring visits were undertaken between the 26th of November 2024 and 16th of January 2025.
Encountered Ground Conditions	Made Ground was encountered in all exploratory hole locations from ground level (50.96m to 49.47m AOD) to a maximum proven depth of 3.10m bgl (47.52m to 46.68m AOD). Three distinct types of Made Ground were encountered: General Made Ground, Canal Infill and Demolition Rubble. Predominantly cohesive Glacial Till deposits were encountered within 25 No. locations, from depths of between 0.50m to 3.10m bgl (48.77m to 46.68m AOD) with a maximum proven thickness of 20.90m (CP/RC03). Cohesive Glacial Till deposits described as brownish grey slightly gravelly slightly sandy to sandy clay. Granular Glacial Till Deposits was encountered locally within CP/RC03, between 13.40m to 18.90m bgl (37.22m – 31.72m AOD), described as brown clayey sand and gravel. Underlying Glacial Till deposits, the Manchester Marls Formation was encountered within 5 No. locations (RA-1, RA-2, CP/RC01, CP/RC02 and CP/RC03), encountered as weathered bedrock from 20.00m to 23.00m bgl (29.00m to 28.26m AOD) and as competent deposits of the Manchester Marls Formation from 20.00m to 24.00m (29.97m to 26.62m AOD). Weathered Bedrock encountered comprised weathered sandstone recovered as a clay or weathered mudstone recovered as a clay or Sands & Gravels. Competent Manchester Marls Formation deposits were encountered as extremely to very weak mudstone and as weak to strong fine to medium grained sandstone. Perched groundwater appears at shallow depths within Made Ground or granular sections of the Glacial Till Deposits. Groundwater encountered within the deeper monitoring wells represents an established groundwater body, likely the

Environmental Laboratory Testing and Ground Gas Monitoring Results	Secondary B Aquifer of the Manchester Marls Formation. This groundwater appears to be sub-artesian, with a recharging at a rate of approximately 1.00m per minute. Environmental soil results have been screened against 'Commercial' GACs. 43 No. exceedances of Commercial General Assessment Criteria were identified within soil analysis results, Asbestos Containing Materials (ACMs) were encountered in 5 No. locations with quantifications ranging from <0.001% to 0.0014% w/w. Groundwater results have been screened against UK DWS and Freshwater EQS. Exceedances were identified in WS02, WS03, WS08, WS108, and WS110, for Metals and PAHs. 6 No. ground gas monitoring visits have been undertaken by E3P and 4 No. by Curtins. Methane concentrations of 1.8% v/v were recorded in WS07 on the second visit (flooded monitoring response zone), before reaching a steady state of <0.1% v/v. Methane concentrations were recorded below the limit of detection of the monitoring instrument throughout the monitoring period in all other locations across each visit. Maximum carbon dioxide concentrations were recorded at 2.2% v/v in CP03 on the first visit. The Gas Screening Value for the site is taken as 0.0022 l/hr for carbon dioxide, which corresponds with a Characteristic Situation 1 (CS-1) gas regime for the site, where no gas protection measures are required.
Ground Contamination and Ground Gas Assessment	A Moderate risk rating is identified to site end-users and a Moderate / Low risk rating identified for construction workers, from contamination in soils from direct contact, dermal uptake, soil and dust ingestion and inhalation with Made Ground soils. In the Curtins ground investigation, 43 No. exceedances of Commercial General Assessment Criteria were identified within soil analysis results, Asbestos Containing Materials (ACMs) were encountered in 5 No. locations with quantifications ranging from <0.001% to 0.0014% w/w. A Moderate / Low risk rating is identified to controlled waters (Groundwater and Surface Waters) following the ground investigation given the site is not situated within a Source Protection Zone and Contamination migration over and through interbedded cohesive superficial soils is unlikely. Furthermore, sources of contamination (namely Canal Infill Made Ground) identified in the site soils are to be removed during groundworks and limited pathways were identified to the Secondary B Aquifer in the bedrock due to the predominantly cohesive superficial deposits. Piling foundation solution may require a specific Piling Risk Assessment to ensure no migration of contamination. A Low risk rating is identified to site end users and construction workers from ground gases ground gases following the monitoring visits. The site is classified as a Characteristic Situation 1 (CS-1) gas regime, not requiring gas protection measures. A Moderate / Low risk rating is identified to Volatile contaminants following the ground investigation given the presence of exceedances identified for PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), and TPHs (Aromatic EC>21 - EC35 TPHs) controlled waters. It would be deemed appropriate to allow for vapour protection measures/membrane for the proposed buildings to remove the pathway.
Geotechnical Assessment	The Made Ground deposits encountered on site are not considered to be a suitable founding stratum. Given the loose and soft deposits encountered, it is likely that a piled foundation solution may be used to transfer the loads to the deeper Manchester Marls Formation Bedrock, which was encountered within CP/RC01, CP/RC02 and CP/RC03 from depths of 20.00m to 24.00m bgl (29.97m to 26.62m AOD). A suspended floor slab is recommended in conjunction with a piled solution to bear on the pile caps with a network of beams which will minimise any differential settlement. The preliminary design of buried concrete according to Table C2 of BRE Special Digest 1:2005 should be in accordance with Class DS-1 AC-1.
Recommendations	Based on the findings of the ground investigation, the following recommendations are made: 1. A Remediation Strategy to address the contamination and asbestos found within Made Ground. Recommendations of the Strategy are likely to include excavation of contaminated material in the canal arm as part of enabling works, provision of vapour protection measures/membrane within all proposed buildings on site. and installation of a suitable engineered capping layer in soft landscaped areas. 2. Construction workers to be provided with appropriate PPE and sanitary facilities with reference to environmental testing certificates appended herein. 3. An earthworks strategy to assist with ground preparation before construction. 4. Piling Risk Assessment to ensure no migration of contamination. 5. It is recommended that specialist piling contractors are contracted as to the suitability and carrying capacity of the piles in the ground conditions pertaining to the site. 6. Where unexpected contamination is encountered, seek the advice of a qualified and experienced contaminated land consultant, and inform the Local Authority Environmental Health Officer, in accordance with the requirements of a Construction Management Plan.

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1 INTRODUCTION

1.1 Project Background

Curtins were instructed by Mace to undertake an intrusive supplementary post-demolition ground investigation at the proposed development site in land off Jersey Street, Ancoats, Manchester, M4 6JW. The site is approximately centred on National Grid Reference 385144, 398772 and covers an area of approximately 0.64 Ha.

It is understood that development proposals comprise the construction of a U-shaped residential block circa 5-9 storeys with some commercial premises on the ground floor and retention/rebuild of 2-3 No. one storey units in the south, with associated hardstanding and soft landscaping areas.

Previous reports have been produced for the site, listed below:

- **E3P** (2020) Phase I Geoenvironmental Site Assessment Manchester Life Phase 3 (Report Ref. 13-729-R1) Dated February 2020.
- **E3P** (2020) Phase II Geoenvironmental Site Assessment, Land at Jersey Street, Ancoats, Manchester, Parcel A (Report Ref. 13-350-R3) Dated February 2020.
- **E3P** (2020) Ground Gas Addendum Report, Land at Jersey Street, Ancoats, Manchester, Parcel A (Report Ref. 13-729-R3-A) Dated April 2020.
- **Curtins** (2021) Letter Report for Back of Ancoats, Plot A (Report Ref. 076740-CUR-00-XX-RP-GE-001-V01) Dated 13th May 2021.
- **Curtins** (2024) Initial Preliminary Waste Classification Assessment Letter Report for Phoenix Ironworks, Manchester Life Plot A (Report Ref. 080866-CUR-XX-XX-T-GE-00002-P01). Dated 12th December 2024.

1.2 Scope of Services

This supplementary post-demolition ground investigation aims to further characterise the geo-environmental and geotechnical conditions for the proposed development site, following demolition of the existing buildings in the north of the site into the underlying bedrock, to aid pile design and understand environmental ground conditions.

Two previous ground investigations have been undertaken at the site. The information in these reports has been extracted, reviewed and interpreted collectively to provide an overarching site wide Phase 2 Ground Investigation report. Previous information is reviewed in the context of current guidance documents and Curtins current assessment criteria. Specifically, this site wide Phase 2 report is intended to determine:

- a) If there is a risk of the proposed end user being adversely impacted upon by potential contamination in shallow site soils that may be present on the site due to its known current, recent and historical use;
- b) If there is a risk of groundwater and/or surface water being adversely impacted upon by potential contamination that may be present on the site due to its known current, recent and historical use;
- c) If there is a risk to the end user from soil gases including methane, carbon dioxide, carbon monoxide and hydrogen sulphide; and,
- d) Likelihood of the proposed works being adversely impacted by potential geo-hazards across the site.
- e) Engineering recommendations for the proposed development.

1.3 Limitations

Curtins had no involvement with the scope or undertaking of previous investigations carried out by third party consultants and therefore cannot provide assurance of accuracy or quality. Notwithstanding, reliance is understood to have been provided on these reports for Curtins use.

Detailed flood risk assessment, ecology and archaeological studies are outside the scope of this report.

2 PHASE 1 PRELIMINARY SITE ASSESSMENT SUMMARY

This section presents a summary of the current site setting, history, geology, and hydrogeology/hydrology. Information for this site has been obtained from the E3P (2020) Phase I Geoenvironmental Site Assessment Report (Ref. 1) along with information gathered from freely available online sources.

This information will feed into the geotechnical assessment (refer to *Section 12*) and geo-environmental risk assessments (refer to *Sections 7, 8 and 9*).

2.1 Current Setting

The site is located north of Jersey Street, south of Naval Street, east of Radium Street and west of Poland Street, as seen in Figure 1. The site is currently occupied by hardstanding in the centre and south-east of the site, three disused warehouse buildings in the south-west and a Made Ground surface layer in the north associated with the demolition of previous buildings. The site is surrounded by a mixture of brick walls and metal fencing.

To the north of the site are commercial/industrial warehouses, to the east of the site is a small trading estate with commercial warehouses along with the Manchester Life Plot B / Eliza Yard construction site. To the south of the site is a three-storey red brick building housing the Colony Flint Glass Works Co-working and Office Space, with some commercial businesses, to the west of the site is a three-storey brick building housing several businesses, with further red brick buildings further west.

The topography of the site is relatively flat, with a gentle slope from the north to the south.



*Figure 1 – Site Location Plan, approximate site boundary shown in red (Ref: Google Satellite).
Buildings in the north (blue area) of the site have since been demolished.*

The site surrounding land use is summarised in *Table 1*.

Table 1 – Surrounding Area

Surrounding Area	N	Naval Street with commercial and industrial warehouses.
	E	Poland Street with a trading estate and construction site.
	S	Jersey Street with an office building with commercial space.
	W	A 3-storey brick building housing commercial businesses, Radium Street and further commercial and office buildings beyond.

2.2 Previous Site Use

A review of the available historical map information for the site, as presented within E3P (2020) Phase I Environmental Site Assessment (Ref. 1) and freely available online sources has been undertaken with specific reference to potential sources of contamination and geohazards.

In earliest mapping (1893) the site is comprised entirely of buildings, intersected by a canal in the centre from east to west. An iron works was present in the south-east, and a canal wharf was located in the north off the Bengal Canal Arm. By 1908, the canal wharf had been infilled and divided into a number of smaller buildings referred to as 'Iron Works'. The buildings in the south-west of the site were referred to as a Glass Works.

By 1952 – 1955, the Iron Works in the south-east of the site was labelled as Phoenix Iron Works, the structures in the north-east referred to as Phoenix Works (engineering), a garage was constructed in the north-west and the Bengal Arm of the Canal had been infilled. Between 1958 – 1985, the garage in the north-west and a warehouse in the centre of the site were labelled as depots, with an additional depot constructed to the south. An engineering works building was constructed in the central west of the site. The depot in the centre of the site was demolished by mapping from 1979 – 1990, and in mapping from 1988 – 1989, the buildings in the south-east were labelled as a warehouse. There were no significant changes on site up until 2014, when the old Phoenix Iron Works building was demolished, and in 2024 the buildings spanning the north of the site were demolished, with site comprising unoccupied land in the north, hardstanding in the centre and south-east and 3 No. unused warehouse buildings in the south-west.

The immediate surrounding area, in earliest mapping (1893) was significantly developed, comprising a mixture of residential, commercial and industrial buildings. Mills were located to the east and south-east of the site, with the Flint Glass Works located to the south; residential, commercial and a school were located to the north and west. By 1908, a Glass Works was located to the north-east and south of the site, with a Corporation Yard to the east and Cotton Mills to the west and south-west of the site. By 1922, the Glass Works to the south was labelled as a Waterproof Factory, and the Glass Works to the north-east as a Printing Works.

By 1949, residential properties to the north had been demolished, with a depository further north; the Calico Printing Works was present to the north-east, with a Corporation Yard to the east; derelict unused land to the south-east; a clothing factory and wastepaper factory to the south; a cotton mill to the south-west and a Soap Works to the west. By 1981, various Works, Depots, Factories, Warehouses and Builder's Yards were located surrounding the site which remains relatively unchanged to 2024, with several of these buildings being repurposed into offices, commercial space and residential buildings, land to the east and south-east comprises the developments known as Manchester Life Plot B and Plot C.

2.3 Published Geology

A review of British Geological Survey (BGS) map, 1:50,000 Scale, Bedrock and Superficial Editions, Manchester, Sheet 085, 2011, indicates the following geological sequence:

- Glacial Till overlying;
- Manchester Marls Formation.

2.3.1 Made Ground Deposits

The BGS maps do not indicate Made Ground on site, however following review of historic mapping records, and with consideration of historic development on-site including the infilling of the Bengal Canal Arm, it is likely that Made Ground deposits will be present at the site.

2.3.2 Superficial Deposits

Superficial deposits are recorded as Glacial Till, described as a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.

2.3.3 Bedrock Deposits

Bedrock deposits are indicated to comprise the Manchester Marls Formation, which generally comprises red marl (calcareous mudstone and siltstone) with thin beds of marine limestone and dolomite, locally green and sandy in places with local breccias and pebbly beds.

2.3.4 Mining and Quarrying

The site is situated within a Coal Mining Reporting Area however, it is not within a Development High Risk Area.

The E3P (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) obtained a Mine Remediation Authority Mining Report which confirmed the site is within a surface area that could have been affected by past underground mining from a number of seams, however, is not within an area affected by probably unrecorded shallow workings, with no known coal mine entries within the site boundary or within 100m of the site boundary, with no faults, fissures or break lines recorded.

The E3P (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) recorded no natural or manmade cavities within 1km of the site boundary.

2.3.5 Other Pertinent Existing Geological Records

The E3P (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) confirms that there is 'no hazard to low risk' from the following ground stability hazards on and around the site: collapsible ground, compressible ground, running sands, landslides, shrinking or swelling clay and ground dissolution.

2.4 Hydrogeology and Hydrology

The Manchester Marls Formation bedrock is classified as a Secondary B Aquifer, defined as:

"Mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (fissures) and openings or eroded layers."

The Glacial Till deposits are classed as a Secondary Undifferentiated Aquifer, defined where:

"Aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type."

There are no licensed potable groundwater abstraction points located within 1km of the site.

Site is not located within a designated Source Protection Zone

The closest surface water feature is recorded to be the Rochdale Canal, located approximately 52m south of the site.

2.5 Landfill, Pollution & Ground Gas Sources

A review of existing information within the E3P (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) no current or historical landfill sites within 250m of the site. There are areas of potentially infilled land (Bengal Canal Arm and associated wharf) located within the site boundary.

The E3P (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) confirms the site is situated in a lower probability radon area where <1% of homes are estimated to be at or above the Radon Action Level. Therefore, no radon protective measures are necessary.

The UK Health Security Agency Radon mapping places the site within an intermediate probability radon area where 5-10% of homes are estimated to be at or above the Radon Action Level.

Notwithstanding, where a basement is to be constructed, the advice of a Radon specialist must be obtained.

2.6 Unexploded Ordnance (UXO) Risk Assessment

It should be noted that the following assessment is only applicable to ground investigation works completed by Curtins only. This includes trial pitting and boreholes to determine the nature of the ground conditions for geo-environmental and geotechnical information. Where the client is looking to determine the risk from UXO throughout the entire enabling works and construction phase of the below ground level development, the principal contractor appointed for the enabling and construction works must obtain their own Detailed UXO Risk Assessment Report to advise their specific works.

The risk presented by Unexploded Ordnance, identified using preliminary Unexploded Bomb (UXB) risk maps indicates that the site is situated in a designated **Moderate**-Risk area in respect to the potential presence of UXB as a result of World War Two bombing.

Historical mapping did not indicate any ruins, or buildings that no longer shown during WWII, on the site – one small area of clearance (<2m²) was noted in the north-west of the site within an industrial yard. One small area of ruins was identified approximately 85m north of the site. Analysis of online historical mapping does not indicate any bomb strikes within the site boundary or within the immediate surrounding area. There are no Luftwaffe Targets, Industry, Military, Transport, Utilities or Airfield sites within 250m of the site. Additionally, structures recorded in pre-war mapping associated with the site are recorded in post-war mapping. The presence of these structures on site limits the potential that UXO strikes would have not been recorded during this period.

The site has undergone construction and significant demolition post war, further limiting the potential of encountering UXO during the ground investigation.

It is considered that the risk associated with encountering UXO at the site during Curtins' ground investigation, as described in this report is **Low**. And on this basis during the ground investigation, it was recommended that a site specific UXO Awareness Briefing was given to all personnel conducting intrusive works. This would inform staff how to identify UXO, the relevant working procedures and contingency measures.

The Principal Contractor should undertake their own risk assessments with respect to encountering UXO during construction, and where required procure their own Detailed UXO Risk Assessment Report, with specific reference to their scope of works.

If unexploded ordnance is discovered during any works, stop immediately, prevent access to the area, and inform the police. If the site boundary or location changes, then the UXO risk should be reassessed.

2.7 Summary of Phase 1 PCSM

A summary of potential pollutant linkages at the development site identified in the E3P (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) presented in *Table 2*, were identified as requiring further investigation to enable the safe redevelopment of the site.

Table 2 – Summary of Phase 1 PCSM

Source	Pathway	Receptor	Risk
Significant sources of on-site contamination: - Made Ground associated with Phoenix Iron Works, Phoenix Works (engineering), garage, warehouse, depots and engineering works (associated leakages and spillages). - Potential for Made Ground of unknown composition due to infilling of the Bengal Canal Arm.	Direct contact, ingestion, inhalation (dust and vapours)	End-user of site. Off-site Receptors.	High - Moderate
	Vertical migration through the superficial deposits (soils) May occur due to existing service corridors, basements, and physical processes including; capillary action and downwards into the natural deposits through infiltration.	Water Environment (Groundwater) Secondary Undifferentiated Aquifer in superficial deposits. Secondary B Aquifer in bedrock deposits Site is not located within a designated Source Protection Zone No potable groundwater abstractions within 250m	Moderate
	Horizontal Migration over and through the superficial deposits (soils) May occur due to the influence of perched or natural groundwater flow patterns and natural or man-made high permeability zones, e.g. sand lenses or drainage runs.	Water Environment (Surface Water) Nearest surface water feature is located 52m south of the site.	Moderate
Significant sources of ground gas: - Potential for Made Ground from construction and demolition onsite. - Potential for Made Ground due to infilling of the Bengal Canal Arm.	Vertical and horizontal migration through existing service corridors and the underlying superficial deposits	End-user of site. Buildings. Off-site Receptors.	Moderate

Potential contaminants of concern associated with the sources identified within the Conceptual Site Model include but are not limited to broad range aliphatic and aromatic hydrocarbons present within any fuel oils; polycyclic aromatic hydrocarbons (PAHs); inorganic compounds including heavy metals; VOCs/SVOCs; asbestos present in discarded building materials and Made Ground.

Potential contaminants associated with the airborne dust/particulates include but are not limited to polycyclic aromatic hydrocarbons and inorganic compounds including toxic metals and asbestos, that are also accounted for by potential onsite contaminants of concern.

The qualitative risk assessment determined the above risks associated with the proposed development of the site warrant further investigation.

It was recommended that a ground investigation is conducted to both confirm this assessment and provide data in support of the structural and civil engineering design. The scope of the investigation undertaken in detailed in *Section 4*.

3 PREVIOUS REPORTS

Five reports have been produced for the site, listed below:

- **E3P** (2020) Phase I Geoenvironmental Site Assessment Manchester Life Phase 3 (Report Ref. 13-729-R1) Dated February 2020.
- **E3P** (2020) Phase II Geoenvironmental Site Assessment, Land at Jersey Street, Ancoats, Manchester, Parcel A (Report Ref. 13-350-R3) Dated February 2020.
- **E3P** (2020) Ground Gas Addendum Report, Land at Jersey Street, Ancoats, Manchester, Parcel A (Report Ref. 13-729-R3-A) Dated April 2020.
- **Curtins** (2021) Letter Report for Back of Ancoats, Plot A (Report Ref. 076740-CUR-00-XX-RP-GE-001-V01) Dated 13th May 2021
- **Curtins** (2024) Initial Preliminary Waste Classification Assessment Letter Report for Phoenix Ironworks, Manchester Life Plot A (Report Ref. 080866-CUR-XX-XX-T-GE-00002-P01). Dated 12th December 2024.

A summary of the dates and aims of these investigations is provided below.

Curtins have been provided with reliance on all previous reports. The information in these reports has been extracted, reviewed and interpreted in Curtins site assessments in subsequent sections, to provide an overarching site wide Phase 2 Ground Investigation report. Previous information is reviewed in the context of current guidance documents and Curtins current assessment criteria.

3.1 E3P Phase I & II Geoenvironmental Site Assessment

The E3P Phase II Geoenvironmental Site Assessment Report (Ref. 2) was produced in February 2020 following intrusive ground investigation works in 2019.

3.1.1 Scope of Works

The scope of works comprised:

- 3 No. Cable Percussive Boreholes to a maximum depth of 19.50m bgl,
- 5 No. Window Sample Boreholes to a maximum depth of 5.45m bgl,
- 5 No. Mechanically Excavated Trial Pits to a maximum depth of 3.20m bgl, and
- 3 No. Mechanically Excavated Trial Trenches to a maximum depth of 2.20m bgl.

3.1.2 Report Recommendations

The E3P 2019 ground investigation report (Ref. 1) recommended further ground investigation works at the site following the demolition of structures, and improved access. As well as this, E3P also recommended the following further assessments: a supplementary vapour risk assessment; a geotechnical earthworks strategy; and, a remediation and earthworks strategy. The report made the following recommendations:

- Minimum 300mm clean capping within landscaped areas within private dwellings and public open spaces
- Completion of ground gas monitoring
- Supplementary vapour risk assessment
- Geotechnical earthworks strategy
- Remediation and enabling works strategy
- Further investigation of the north of Plot A upon demolition of structures/access.

3.2 E3P Ground Gas Addendum Report

The E3P Ground Gas Addendum Report (Ref. 3) was produced in April 2020 following the earlier production of the Phase II Geoenvironmental Site Assessment Report (Ref. 2).

A Gas Screening Value for the monitoring wells was calculated and confirmed that the site could be classified as a Characteristic Situation 1 (CS-1), with no gas protection measures required.

3.3 Curtins Pre-Demolition Letter Report

The Curtins pre-demolition Letter Report for 'Back of Ancoats, Plot A' was produced in May 2021 (Ref. 4).

The intrusive ground investigation was undertaken following the E3P ground investigation to assess and improve the knowledge of the site with respect to the ground conditions, and to aid contamination risk assessment and foundation design.

3.3.1 Scope of Works

The scope of works comprised two rotary cored boreholes (R-A1 and R-A2) advanced to 30.00m bgl, with the following samples taken:

- 2 No. soil samples from Made Ground soils scheduled for environmental chemical analysis to further assess the contamination risk presented to site end users and construction workers in that area of the site,
- 5 No. 2:1 Water Soluble Sulphate,
- 5 No. pH Value, and
- 11 No. Point Load Tests.

3.3.2 Report Recommendations

The foundation assessment recommended that foundations would need to be taken down below any Made Ground and low strength superficial soils and be placed in the firm to very stiff cohesive Glacial Till deposits encountered, at depths of at least 3.00m bgl (Approximately 50.00m AOD). It was deemed that piled foundations may be considered the best option to take the load of the structure to suitable bearing soils at depth, specifically driven/Continuous Flight Auger (CFA) piles would be most suitable. It was deemed likely that ground bearing slabs with relatively low imposed load could be founded on suitable firm to very stiff clays, subject to the removal of soft spots and Made Ground.

3.4 Curtins Initial Preliminary Waste Classification Assessment Letter Report

Curtins undertook a preliminary waste classification of soils for potential disposal at Phoenix Ironworks in December 2024 (Ref. 5). In total 29 No. samples were screened using the Waste Classification Tool, HazWasteOnline from all phases of ground investigation:

- E3P 2019 Ground Investigation – 8 No. samples
 - 6 No. samples were obtained from Made Ground
 - 2 No. samples were obtained from natural deposits.
- Curtins 2021 Pre-Demolition Ground Investigation – 2 No. Samples
 - 2 No. samples were obtained from Made Ground
- Curtins 2024 Post-Demolition Ground Investigation – 19 No. Samples
 - 19 No. samples were obtained from Made Ground

Based on the preliminary WM3 screen assessment of the 29 No. soil samples screened, 14 No. returned Hazardous Waste, and should be classified as such if removed from site due to the results of the WM3 screen undertaken.

5 No. samples identified also contain asbestos loose fibres (<0.001% to 0.014%) as outlined in Table 2. WM3 states; if the waste contains fibres that are free and dispersed then the waste will be hazardous if the waste as a whole contains 0.1% or more asbestos. If the waste contains any identifiable pieces of suspected asbestos containing material, they must be assessed separately; the waste is hazardous if the concentration of asbestos in the piece of asbestos containing material is 0.1% or more. Therefore, the concentrations of asbestos loose fibres recorded in WS02 would not result in the material being classified as hazardous waste.

4 PHASE 2 INVESTIGATION SCOPE OF WORKS

Three separate ground investigations have been undertaken at the site as summarised below.

As outlined, the information in these reports has been extracted, reviewed and interpreted collectively to provide an overarching site wide Phase 2 Ground Investigation report. Previous information is reviewed in the context of current guidance documents and Curtins current assessment criteria.

4.1.1 Curtins 2024 Supplemntary Post-Demolition Investigation

Curtins supplementary intrusive ground investigation was conducted between the 4th and 14th of November 2024, as summarised below. This was caried out following demolition of buildings in the north.

The scope of the Curtins ground investigation was designed in general accordance with current UK guidance including the Land Contamination Risk Management (2020) (Ref. 6), BS 5930:2015+A1:2020 Code of Practice for Ground Investigations (Ref. 7), BS 10175 Investigation of Potentially Contaminated Sites (Ref. 8), ICE UK Specification for Ground Investigation (2012) (Ref. 9) and with techniques outlined in Eurocodes 7 - BS EN 1997-1:2007 (Ref. 10).

The scope and rationale of the Curtins post-demolition ground investigation are summarised in *Table 3*.

Table 3 – Curtins 2024 Scope of Works and Rationale

Exploratory Hole Type	Exploratory Hole Reference	Exploratory Hole Depth (m bgl)	Rationale
Cable Percussive Boreholes with Rotary Follow-On	CP/RC01	30.30	Confirm shallow and deeper ground conditions. Collect soil and rock samples for chemical and geotechnical testing. Undertake in-situ testing. Install boreholes for groundwater monitoring in 3 No. boreholes.
	CP/RC02	30.00	
	CP/RC03	30.00	
Window Sample Boreholes	WS02	5.45	Confirm shallow ground conditions. Collect soil samples for chemical testing. Undertake in-situ testing. Install boreholes for gas and groundwater monitoring in 5 No. boreholes.
	WS03	5.45	
	WS04	5.45	
	WS05	5.45	
	WS06	4.45	
	WS07	5.45	
	WS08	5.45	
Mechanically Excavated Trial Pit	TP01	3.00	Confirm shallow ground conditions. Collect soil samples for chemical testing. Investigate the depth and nature of the canal infill materials.
	TP02	3.00	
	TP03	3.00	
	TP04	3.00	
	TP05	3.00	
	TP06	3.00	
	TP07	3.10	
	TP08	3.00	
	TP09	3.00	

Potential sources of on-site contamination are further discussed in *Section 8*.

4.1.2 Historical Investigations

E3P conducted an intrusive ground investigation between the 18th to 20th of November 2019.

The scope and rationale of the E3P ground investigation is summarised in Table 4.

Table 4 – E3P 2019 Scope of Works and Rationale

Exploratory Hole Type	Exploratory Hole Reference	Exploratory Hole Depth (m bgl)	Rationale
Mechanically Excavated Trial Pit	TP102 TP103 TP112 TP113 TP114	3.20 2.40 0.90 1.60 1.50	Investigation of Former Works.
Window Sample Borehole	WS103 WS104 WS105 WS108 WS110	1.20 1.00 1.00 5.45 5.45	
Mechanically Excavated Trial Trench	TT105 A TT105 B TT106 A	2.20 2.20 2.20	
Cable Percussive Borehole	CP107 CP108 CP109	14.00 19.50 19.50	

Curtins conducted a pre-demolition intrusive ground investigation between the 18th of January to the 9th of February 2021. The Curtins pre-demolition ground investigation is summarised in *Table 5*.

Table 5 – Curtins 2021 Scope of Works and Rationale

Exploratory Hole Type	Exploratory Hole Reference	Exploratory Hole Depth (m bgl)	Rationale
Rotary Boreholes	R-A1 R-A2	30.00 30.00	To improve the knowledge of the ground conditions and to aid contamination assessment and foundation design following E3Ps ground investigation.

4.2 Soil Logging and Sampling

Curtins exploratory borehole arisings were logged on site by a qualified Engineer. All Curtins exploratory holes were logged in accordance with the requirements of BS 5930:2015+A1:2020 (Ref. 7) including recording observed visual and olfactory indications of contamination. Curtins exploratory hole logs are provided in *Appendix B*.

4.3 Monitoring Well Installations

Ground gas and groundwater monitoring pipes were installed within 4 No. window sample boreholes as part of the E3P ground investigation.

Ground gas and groundwater monitoring slotted 50 mm diameter pipes were installed within 3 No. cable percussive with rotary follow on boreholes and 5 No. window sample borehole as part of the Curtins 2024 post-demolition ground investigation. A bentonite seal was placed above and below the screened section of the borehole to minimise potential for downward migration of contaminants and the creation of a preferential migratory pathway. A gravel aggregate surround was installed in the annulus between the sides of the borehole and the slotted sections of pipe. The monitoring wells were primarily designed to assess the potential for ground gas and water monitoring.

The installed response zones are summarised in *Table 6* below.

Table 6 – Monitoring Well Response Zones

Exploratory Hole Ref	Response Zone(s) m bgl (m AOD)	Strata Description
E3P 2019 Ground Investigation		
WS103	0.50 – 1.20 (49.50 – 48.80)	Granular Made Ground
WS104	0.50 – 0.70 (49.68 – 49.48)	Granular Made Ground
WS108	1.00 – 4.00 (48.65 – 45.65)	Cohesive Glacial Till
WS110	1.00 – 5.00 (48.67 – 44.67)	Cohesive Glacial Till
Curtins 2024 Post-Demolition Ground Investigation		
CP/RC01	23.50 – 29.50 (26.26 – 20.26)	Manchester Marls Formation Interbedded sandstone and mudstone
CP/RC02	22.50 – 30.00 (27.00 – 19.50)	Manchester Marls Formation Interbedded sandstone and mudstone
CP/RC03	13.00 – 19.00 (37.62 – 31.62)	Granular Glacial Till Sand and Gravel
WS02	2.00 – 5.00 (47.47 – 44.47)	Cohesive Glacial Till
WS03	0.50 – 2.50 (49.28 – 47.28)	Made Ground (Canal Infill)
WS04	2.00 – 4.50 (48.14 – 45.64)	Cohesive Glacial Till
WS07	1.00 – 3.00 (49.00 – 47.00)	Cohesive Made Ground
WS08	0.50 – 2.50 (49.49 – 47.49)	Made Ground (Canal Infill)

Copies of borehole logs can be referred to in *Appendix B* of this report.

4.4 Post Investigation Monitoring

4.4.1 Ground Gas and Groundwater Monitoring

E3P conducted six gas and groundwater level monitoring visits, undertaken between the 9th of December 2019 and the 7th of April 2020.

Curtins have conducted four gas and groundwater level monitoring visits as part of the post-demolition ground investigation, these visits were undertaken between the 26th of November 2024 and 16th of January 2025, in order to assess the groundwater and gas conditions as identified in the Preliminary Conceptual Site Model.

5 LABORATORY ANALYSIS

Representative soil samples were selected by Curtins (2021 and 2024) for laboratory geotechnical and chemical testing, based on field observations, to inform the proposed works.

Selected environmental soil samples were placed in laboratory provided containers and stored in cool boxes prior to being transported to the nominated laboratory under the laboratory's chain of custody documentation. The laboratory selected by Curtins for chemical analysis was Envirolab (UKAS and MCERTS accredited), and for geotechnical analysis was i2 Analytical (UKAS and MCERTS accredited).

Sampling positions were generally located in a non-targeted, systematic array to give adequate and representative coverage of the site's proposed end use and the immediate environmental setting.

E3P (2020) selected soil samples and sent them to i2 Analytical (UKAS and MCERTS accredited) for environmental analysis.

5.1 Environmental Chemical Analysis

The contaminants of concern potentially present on the site were considered to include, amongst others; organic matter, fill, hydrocarbons (e.g. fuel/oils) the extent of which is captured by the broad environmental testing suite listed in *Table 7*.

Table 7 – Curtins Environmental Chemistry Analysis Suite: Soils

Suite Ref	Analyte	LOD
Curtins Soils Suite A	Asbestos Screen, pH and Soil Organic Matter (SOM)	-
	Arsenic, Chromium, Chromium VI, Copper, Lead, Selenium, Zinc, Nickel	1 to 5 mg/kg
	Boron (water soluble)	1 mg/kg
	Cadmium	0.5 mg/kg
	Mercury	0.17 mg/kg
	Cyanide (total)	1 mg/kg
	Phenols (screen)	0.2 mg/kg
	PAHs (USEPA 16)	0.1 to 0.8 mg/kg
	TPH (Aro/Alk Split)	0.01 to 0.1 mg/kg
	Water Soluble 2:1 Sulphate	0.01 g/l

A total of 29 No. samples were collected during all phases of ground investigations undertaken across the site:

- E3P 2019 Ground Investigation – 8 No. samples
 - 6 No. samples were obtained from Made Ground
 - 2 No. samples were obtained from natural deposits.
- Curtins 2021 Pre-Demolition Ground Investigation – 2 No. Samples
 - 2 No. samples were obtained from Made Ground
- Curtins 2024 Post-Demolition Ground Investigation – 19 No. Samples
 - 19 No. samples were obtained from Made Ground

Curtins scheduled for chemical analysis as described in *Table 5*.

E3P submitted 8 No. environmental samples for the following tests: metals; pH, total sulphate, water-soluble sulphate (2:1 extract); sulphide; cyanide; phenols; total and speciated polycyclic aromatic hydrocarbons (PAHs); semi volatile

organic compounds (SVOCs); volatile organic compounds (VOCs); asbestos identification and quantification; and speciated and banded total petroleum hydrocarbons (TPH).

5.2 Groundwater Analysis

As detailed in *Section 2.7*, E3Ps (2020) Phase I Geoenvironmental Site Assessment (Ref. 1) assessed a Moderate risk to groundwater receptors due to the contaminative history of the site.

3 No. groundwater samples were collected from selected boreholes during the fourth round of gas monitoring during Curtins additional 2024 ground investigation. E3P took 2 No. groundwater samples from selected boreholes .

Water samples were tested for a suite in line with that identified for soils given the source material identified and the strata. These are listed within *Table 8* below.

Table 8 – Environmental Chemistry Analysis Suite: Waters

Suite Ref	Analyte	LOD
Curtins Water Suite A	pH	-
	Cyanide (total)	0.005 mg/l
	Sulphide, Sulphate	0.1 – 1 mg/l
	Dissolved Organic Carbon	2 mg/l
	Arsenic, Chromium, Selenium	1 µg/l
	Nickel, Zinc	2 µg/l
	Copper	4 µg/l
	Mercury	0.1 µg/l
	Cadmium	0.2 µg/l
	Calcium	1 mg/l
	PAHs (USEPA16)	0.01 µg/l
	TPH (Aro/Alk Split)	0.001 – 0.002 µg/l

E3P submitted 2 No. groundwater samples for the following tests: pH; total cyanide; phenols; heavy metals/metalloids; total and speciated polycyclic aromatic hydrocarbons (PAHs), speciated and banded total petroleum hydrocarbons (TPH); and, monoaromatics and oxygenates.

5.3 Geotechnical Analysis

Curtins soil samples for testing were prepared in accordance with BS 1377 - 2:2002 Part 2. The geotechnical testing undertaken by both E3P and Curtins is summarised in *Table 9*.

Table 9 – Geotechnical Testing Soils

Test Type.	E3P 2020 Quantity	Curtins 2021 Quantity	2024 Quantity	Total Quantity	Standard
In Situ Testing					
Standard Penetration Test	39	13	78	130	BS 5930:2015+A1:2020 (Clause 41)

Laboratory Testing					
pH	5	5	19	29	BS 1377 1990, Part 3 (Clause 9.4 & 9.5)
Water Soluble Sulphate 2:1 SO ₄	5	5	19	29	BS 1377 1990, Part 3 (Clause 5.3 & 5.5)
Moisture Content	2	-	19	21	BS 1377-2: 2022 (Clause 5.2 & 6)
Atterberg Limits 4 Point	2	-	18	20	BS 1377-2: 2022 (Clause 5.2 & 6)
Particle Size Distribution (wet sieve) with Sedimentation	-	-	3	3	BS 1377-2:2022 (Clause 10)
Quick Undrained Triaxial	1	-	5	6	BS EN ISO 17982-8:2018, BS 1377-2:2022 (Clause 28)
Point Load Tests	-	11	21	32	ISRM: 2007, pages 125-132
Uniaxial Compressive Strength Test (USC) of Rock	-	-	2	2	ISRM, 2007, p153, part 1
Uniaxial Compressive Strength Test (USC) of Soil	-	-	4	4	BS EN ISO 17892-7: 2018

The results of the geotechnical testing are summarised in *Section 7* of this report. Copies of the Curtins geotechnical testing certificates are presented in *Appendix D*, with E3Ps geotechnical testing certificates provided within their appendices in Ref. 2.

6 GROUND CONDITIONS

The ground conditions across the site, determined during the three phases of site investigation works, generally comprised Made Ground overlying variable thicknesses of granular and cohesive Glacial Till Deposits, overlying sandstone or mudstone of the Manchester Marls Formation.

6.1 General

A summary of the ground conditions encountered during the E3P and Curtins pre and post-demolition site investigation works is presented in *Table 10*, with detailed information presented in the Curtins exploratory hole logs included in *Appendix B*, and within the appendices of E3Ps Phase II Geoenvironmental Assessment Report (Ref. 2).

Table 10 – Summary of Ground Conditions Encountered

Strata	Depth to Top of Strata m bgl (m AOD)	Recorded Thickness (m)		Description
		Min	Max	
Made Ground	0.00 (50.96 – 49.47)	0.0.40	3.10	Surface Cover: Concrete / Tarmacadam
				Sub-base: Slightly clayey sandy gravel
				General: Interbedded cohesive and granular deposits.
				Canal Infill: Black sandy clayey gravel/gravelly clay with strong hydrocarbon odour and an iridescent sheen.
				Demolition Rubble: Dark grey/dark brown sandy gravelly clay with cobbles and boulders.
Glacial Till Deposits	0.50 – 3.10 (48.77 – 46.68)	17.90	20.90	Brownish grey slightly gravelly slightly sandy to sandy clay. OR Locally Brown clayey sand and gravel.
Manchester Marls Formation	20.00 – 24.00 (29.97 – 26.62)	0.40	10.00*	Weathered: Weathered sandstone recovered as a clay OR Weathered mudstone recovered as a clay or Sands & Gravels
				Competent: Sandstone and Mudstone

*Full extent of strata not proven.

It should be noted that E3P did not record ground levels of their exploratory borehole locations, as such, ground levels were estimated from LiDAR data.

6.2 Made Ground

Made Ground was encountered in all exploratory hole locations from ground level (50.96m – 49.47m AOD) to a maximum proven depth of 3.10m bgl (47.52m – 46.68m AOD) in WS05 and CP/RC03. Thicknesses ranged from 0.60m (TP113, TP114, WS108 and WS110) to 3.10m (WS05 and CP/RC03).

A summary of the Made Ground encountered during the E3P and Curtins pre and post-demolition site investigation works is presented in *Table 11*, with detailed information presented in the Curtins exploratory hole logs included in *Appendix B*, and within the appendices of E3Ps Phase II Geoenvironmental Assessment Report (Ref. 2).

Table 11 – Summary of Made Ground Encountered

Strata	Depth to Top of Strata m bgl (m AOD)	Recorded Thickness (m)		Description	Locations Encountered
		Min	Max		
Surface Cover	0.00 (50.96 – 49.47)	0.20	0.60	Concrete	WS02, TP05, TP09, TP102, TP103, TP112, TP113, TP114, WS103, WS104, WS105, WS108, WS110, TT105 A, TT105 B and, TT106 A.
				Tarmac (TP04)	TP04
Subbase	0.07 – 0.47 (50.40 – 49.50)	0.09	0.32	Clayey sandy gravel of limestone.	TP04
General Made Ground	Granular 0.00 – 1.65 (50.09 – 48.97)	0.12	2.10	Clayey sands and gravels with frequent cobbles. OR Black gravelly ash with frequent cobbles.	All exploratory hole locations
	Cohesive 0.00 – 1.40 (50.96 – 48.38)	0.80	2.90	Slightly to very sandy gravelly cobbly clay.	
Canal Infill	0.40 – 1.40 (49.59 – 48.78)	0.40	2.48	Black sandy clayey gravel/gravelly clay with strong odour of diesel and an iridescent sheen.	TT105A, TT105B, TT106A, WS03, WS05, WS08, TP01, TP02, TP03, TP05, TP08 and TP09
Demolition Rubble	0.00 (50.96 – 50.83)	1.39	1.84	Dark grey/dark brown sandy gravelly clay with cobbles and boulders.	TP06 and TP07

*Full extent of strata not proven.

6.2.1 Surface Covering & Subbase

Made Ground comprised a surface covering of concrete with metal rebar 17 No. locations with a maximum thickness of 0.60m in TT106 A, and dark grey tarmac in TP04 with a thickness of 0.07m.

Subbase materials were often found directly beneath the surface coverings, comprising yellowish grey/yellowish brown/brown/grey sandy gravel of limestone, with a maximum thickness of 0.32m (TP04).

6.2.2 General Made Ground

General Made Ground was encountered in all exploratory locations. Granular and cohesive Made Ground was encountered from ground level to 0.47m bgl, with a maximum proven thickness of 3.10m in WS05 and CP/RC03.

Granular Made Ground encountered comprised dark brown and black clayey gravelly cobbly fine to coarse sand and dark brown/orangish brown very clayey sandy cobbly gravel.

Cohesive Made Ground encountered comprised soft to very stiff dark brown/dark greyish brown/black/brown slightly to very sandy gravelly cobbly clay. Gravel comprised

E3P described Made Ground as black gravelly ash with frequent cobbles.

Anthropogenic material comprised of brick, limestone, sandstone, slate, concrete, tile, textiles, broken glass, ceramic, pottery, wood, charcoal, metal, mudstone, asphalt and clinker. Not all gravel and cobble constituents were encountered within each location, for more detailed information refer to Curtins exploratory hole logs included in *Appendix B*, and within the appendices of E3Ps Phase II Geoenvironmental Assessment Report (Ref. 2).

6.2.3 Demolition Rubble

Demolition rubble and discarded materials were encountered within TP06 and TP07 only in the north-eastern portion of the site. This material was encountered from ground level (50.96 – 50.83m AOD) to a maximum depth of 1.84m bgl.

This material comprised dark grey and dark brown sandy gravelly clay with frequent cobbles and boulders.

Anthropogenic material comprised of typical demolition rubble. Gravel comprised brick, concrete, metal, slate, charcoal, broken glass, ceramic, timber, wires, metal chains, plastic, foam, textile, wood and timber. Cobbles comprised concrete paving slabs, broken metal pipes, paint cans, timber and whole bricks. Boulders comprised concrete paving slabs, whole bricks, metal pipes, copper pipes, breeze blocks, sandstone bricks and timber.

6.2.4 Relic Foundations

Several exploratory hole locations on site contained material indicative of historic ground floor slabs and building foundations, these are discussed further in section 6.5

6.2.5 Canal Infill

Made Ground in the location of the historical Bengal Canal Arm is distinctly different from other Made Ground encountered on site.

Made Ground comprising Canal Infill materials or similar was encountered within TT105A, TT105B, TT106A, WS03, WS05, WS08, TP01, TP02, TP03, TP05, TP08 and TP09, encountered from depths of 0.40m to 1.40m bgl (49.59 – 48.78m AOD), with a maximum thickness of 2.48m (TP01).

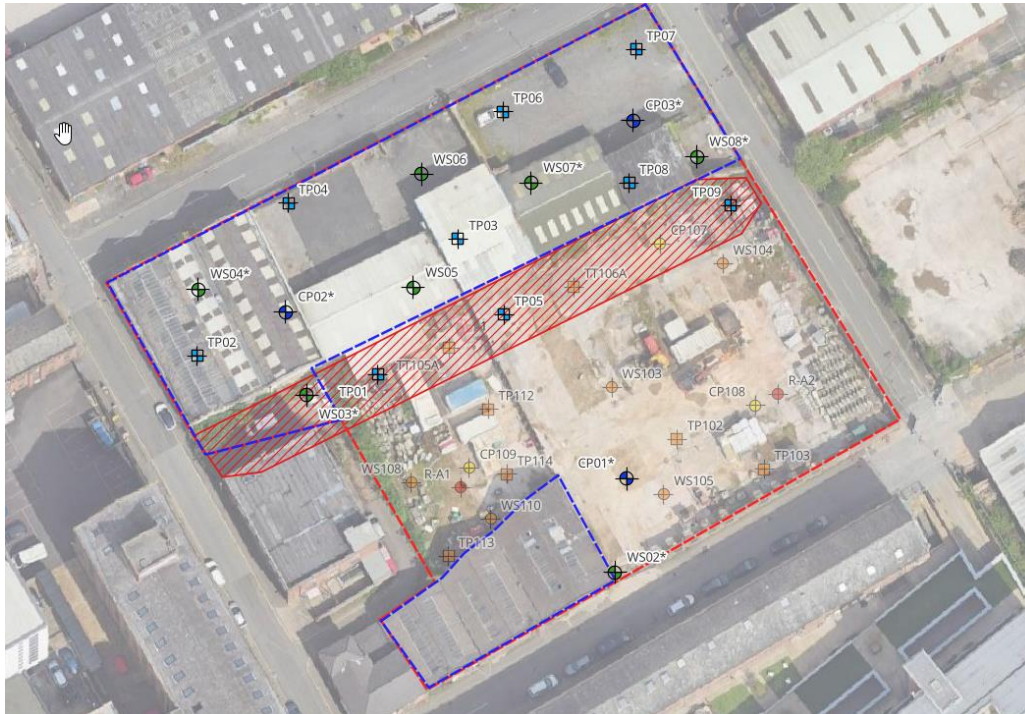


Figure 2 – Borehole Plan extract showing Historical Canal Arm location (red hatch)

TT105A, TT105B, TT106A, WS03, TP01, TP05 and TP09 were advanced directly within the known footprint of the historic infilled canal, with WS05, WS08, TP02, TP03 and TP08 containing similar materials at a lower quantity.

Granular canal infill material was described as black sandy clayey gravel of charcoal, brick, sandstone and metal with a strong hydrocarbon odour (also noted as 'diesel' and 'kerosene' odour in field observations) and an iridescent sheen on arisings.

Cohesive canal infill material was described as black sandy gravelly clay with cobbles and boulders. Gravel comprised brick, metal, wire, nails, wood, sandstone, mudstone, charcoal, ceramic, clinker and broken glass. Cobbles of whole bricks. Boulders of wooden planks. The material had a strong hydrocarbon/diesel/kerosene odour and iridescent sheen on arisings.

PID readings taken within this material range from 4.8ppm to 42.3ppm.

6.3 Glacial Till Deposits

Glacial Till Deposits were encountered within TP102, TP113, TP114, WS108, WS110, CP107 – CP109, WS02 – WS08, TP02 – TP08, and CP/RC01 – CP/RC03. These deposits were encountered from depths between 0.50m bgl to 3.10m bgl (48.77m to 46.68m AOD), with a maximum thickness of 20.90m (CP/RC03).

The Glacial Till Deposits comprise predominantly cohesive material, described as soft brownish grey slightly gravelly slightly sandy to sandy clay with gravel of sandstone, mudstone and siltstone, or as firm to very stiff brownish grey/brown/grey slightly silty slightly sandy to sandy slightly gravelly clay with gravel of sandstone, mudstone, siltstone and rare coal.

Granular Glacial Till Deposits were encountered within CP/RC03 between 13.40m to 18.90m bgl (37.22m – 31.72m AOD), described as dense, brown clayey sand and gravel with gravel of sandstone, siltstone and mudstone, and as dense brown clayey slightly gravelly sand with gravel of sandstone and mudstone.

E3P (2020, Ref. 2) concluded that they had encountered dense red sandstone at 13.20m to 14.00m bgl in CP107, at 18.70m to 19.50m bgl in CP108 and at 18.80m to 19.50m bgl in CP109, confirmed by 2 No. SPT refusals and chiselling for 1 hour at each location. Following Curtins 2021 and 2024 intrusive ground investigation, Curtins conclude that it is unlikely that E3P encountered competent bedrock, and that this is more likely to comprise dense granular Glacial Till deposits or weathered bedrock also encountered at similar depths within the Curtins 2021 and 2024 ground investigations.

6.4 Manchester Marls Formation

Bedrock deposits of the Manchester Marls Formation were encountered within the 2021 and 2024 Curtins ground investigations, encountered as Weathered Bedrock from 20.00m to 23.00m bgl (29.00m to 28.26m AOD) and as competent deposits of the Manchester Marls Formation encountered from 20.00m to 24.00m (29.97m to 26.62m AOD).

6.4.1 Weathered Bedrock

Weathered Bedrock comprised dense grey, brown and reddish brown slightly clayey sand and gravel of mudstone; or, as highly weathered extremely weak to very weak reddish-brown/light grey/brown fine to medium grained sandstone recovered as gravelly/clayey sand and very sandy clay.

6.4.2 Competent Bedrock

Competent Manchester Marls Formation deposits were encountered as extremely to very weak reddish brown mottled light grey mudstone and as weak to strong reddish brown and grey fine to medium grained sandstone.

6.5 Obstructions Encountered

Several obstructions indicative of relic foundations was encountered on site by both E3P (Ref. 2) and Curtins, as described in *Section 6.2.4* and below:

- A grey concrete layer was encountered between 1.29m and 1.39m bgl (49.97m to 49.57m AOD) within TP07.
- Sandstone masonry was encountered between 0.96m and 1.84m bgl (49.87m to 48.99m AOD) within TP06.
- A grey concrete layer was encountered between 0.30m and 0.60m bgl (49.46m to 49.16m AOD) within CP/RC01.

- A section of brick wall was encountered at 0.50m bgl (~49.53m AOD) within TP102.
- TP103 was terminated early due to a brick wall and suspected ground floor slab.
- TP112 was terminated early due to a concrete block circa 0.70m bgl (~48.98m AOD) in the centre of the trial pit.
- A suspected concrete floor slab was encountered in WS103 at 1.20m bgl (~48.80m AOD).
- A suspected concrete floor slab was encountered in WS104 at 1.00m bgl (~49.18m AOD).
- A suspected concrete floor slab was encountered in WS105 at 1.00m bgl (~48.89m AOD).

6.6 Groundwater

6.6.1 Water Strikes

7 No. water strikes were encountered during the E3P 2019 (Ref. 1) Ground Investigation, these are described in *Table 12* below.

Table 12 – Water Strikes during E3P's 2019 Ground Investigation

Borehole	Strata	Depth of Strike m bgl (m AOD)	Remarks
TT105 A	Made Ground	1.20 (48.47)	Rapid Ingress
TT105 B	Made Ground	1.20 (48.47)	Rapid Ingress
TT106	Made Ground	1.20 (48.82)	Slow Ingress
WS108	Glacial Till	1.00 (48.65)	Slow Ingress
		1.40 (48.25)	
		2.00 (47.65)	
		3.00 (46.65)	

11 No. water strikes were encountered during the Curtins post-demolition ground investigation, these are described in *Table 13* below.

Table 13 – Water Strikes during Curtins post-demolition Ground Investigation

Borehole	Strata	Depth of Strike m bgl (m AOD)	Remarks
WS02	Made Ground	1.40 (48.07)	Perched water, slow seepages.
	Glacial Till	2.15 (47.32)	
WS03	Made Ground (Canal Infill)	0.57 (49.21)	Perched water, slow seepage.
WS05	Made Ground (Canal Infill)	1.20 (48.58)	Perched water, slow seepage.
WS08	Made Ground	0.20 (49.79)	Perched water, slow seepage.
TP01	Made Ground (Canal Infill)	0.60 (49.19)	Perched water, fast influx causing the sides of the trial pit to collapse.
TP02	Made Ground	1.07 (49.23)	Perched water, slow seepage.

Borehole	Strata	Depth of Strike m bgl (m AOD)	Remarks
TP03	Made Ground (Canal Infill)	0.85 (49.24)	Perched water, medium influx causing the sides of the trial pit to collapse.
TP05	Made Ground (Canal Infill)	0.60 (49.26)	Perched water, medium influx.
TP06	Glacial Till	1.84 (48.99)	Perched water, slow seepage.
TP09	Made Ground (Canal Infill)	0.99 (48.71)	Perched water, fast influx causing the sides of the trial pit to collapse.

6.6.2 Groundwater Monitoring

Six groundwater monitoring visits were undertaken between the 9th of December 2019 and 7th of April 2020 as part of the E3P ground investigation, the results of which are presented in *Table 14*.

Table 14 – E3P Groundwater Monitoring Results

Borehole	Installation Strata	Response Zone(s) m bgl	Depth m bgl					
			09/12/19	05/02/20	24/02/20	12/03/20	23/03/20	07/04/20
WS103	Made Ground (General)	0.50 – 1.20 (49.50 – 48.80)	1.00	0.86	0.84	0.85	0.97	0.98
WS104	Made Ground (General)	0.50 – 0.70 (49.68 – 49.48)	Dry	Dry	Dry	*	Dry	Dry
WS108	Glacial Till	1.00 – 4.00 (48.65 – 45.65)	0.87	-	-	-	-	-
WS110	Glacial Till	1.00 – 5.00 (48.67 – 44.67)	-	-	-	-	-	-

-Monitoring well damaged and could not be monitored.

*Monitoring well could not be located

Four groundwater monitoring visits have been undertaken between the 26th of November 2024 and 16th of January 2025, the results of which are presented in *Table 15*.

Table 15 – Curtins Post-Demolition Groundwater Monitoring Results

Borehole	Installation Strata	Response Zone(s) m bgl (m AOD)	Depth m bgl (m AOD)			
			26/11/24	12/12/24	07/01/25	16/01/2025
WS02	Glacial Till	2.00 – 5.00 (47.47 – 44.47)	2.17 (47.30)	2.17 (47.30)	2.15 (47.32)	2.17 (47.30)
WS03	Made Ground (Canal Infill)	0.50 – 2.50 (49.28 – 47.28)	0.74 (49.04)	0.78 (49.00)	0.69 (49.09)	0.79 (48.99)
WS04	Glacial Till	2.00 – 4.50 (48.14 – 45.64)	1.02* (49.12)	1.09* (49.05)	-	1.04* (49.10)
WS07	Made Ground (General)	1.00 – 3.00 (49.00 – 47.00)	0.57* (49.43)	0.59* (49.41)	0.56* (49.44)	0.58* (49.42)
WS08	Made Ground (Canal Infill)	0.50 – 2.50 (49.49 – 47.49)	0.83 (49.16)	0.88 (49.11)	0.66 (49.33)	0.95 (49.04)

Borehole	Installation Strata	Response Zone(s) m bgl (m AOD)	Depth m bgl (m AOD)			
			26/11/24	12/12/24	07/01/25	16/01/2025
CP/RC01	Manchester Marls Formation	23.50 – 29.50 (26.26 – 20.26)	4.20* (45.56)	4.04* (45.72)	2.58* (47.18)	2.62* (47.14)
CP/RC02	Manchester Marls Formation	22.50 – 30.00 (27.50 – 20.00)	21.89* (28.11)	22.00* (28.00)	21.57 (28.43)	21.95 (28.05)
CP/RC03	Glacial Till	13.00 – 19.00 (37.62 – 31.62)	14.91 (35.71)	14.49 (36.13)	13.91 (36.71)	15.39 (35.23)

*Flooded response zones

-Monitoring well submerged in a puddle, flooded at the surface upon removing bung, unable to monitor.

Groundwater was encountered during post-ground investigation monitoring visits ranging from 0.56m to 22.00m bgl (49.44m to 28.00m AOD). The groundwater levels within each borehole remained relatively stable throughout the monitoring period (26th November 2024 to 16th January 2025). Monitoring visits found that WS04, WS07 and CP/RC01 were all flooded throughout the entire monitoring period, with the groundwater rising above the installed response zones. Based on the strata descriptions, water strike depths and monitoring data, it can be concluded that the majority of the water strikes are perched water contained within Made Ground or granular sections of the Glacial Till Deposits.

The groundwater encountered within the deeper monitoring wells represents an established groundwater body, likely the Secondary B Aquifer identified within *Section 2.4*. This groundwater appears to be sub-artesian. Upon purging this monitoring well prior to groundwater sampling, it was determined to be recharging at a rate of approximately 1.00m per minute.

6.7 Observed Potential Contamination

Visual and olfactory evidence of contamination was identified within Made Ground deposits comprising Canal Infill materials or similar within WS03, WS05, WS08, TP01, TP02, TP03, TP05, TP08 and TP09, encountered from depths of 0.40m to 1.40m bgl (49.59 – 48.78m AOD), with a maximum thickness of 2.48m (TP01).

Table 16 – Visual and Olfactory Evidence of Contamination during Curtins Ground Investigation

Borehole	Strata	Depths m bgl (m AOD)	Description
WS03	Made Ground (Canal Infill)	0.57 – 2.50 (49.21 – 47.28)	Very strong hydrocarbon odour (possibly diesel and kerosene).
WS05	Made Ground	1.00 – 1.40 (48.78 – 48.38)	Slight hydrocarbon odour (possibly diesel and kerosene).
WS08	Made Ground (Canal Infill)	0.40 – 2.50 (49.59 – 47.49)	Very strong hydrocarbon odour (possibly diesel and kerosene). Colourless sheen on arisings.
TP01	Made Ground (Canal Infill)	0.52 – 3.00 (49.27 – 46.79)	Strong hydrocarbon odour (possibly diesel). Iridescent sheen on arisings. PID reading of 42.3ppm.
TP02	Made Ground	1.40 – 2.08 (48.90 – 48.22)	Hydrocarbon odour (possibly diesel). PID reading of 12.0ppm.
TP03	Made Ground	0.84 – 1.99 (49.25 – 48.10)	Faint hydrocarbon odour (possibly diesel). PID reading of 5.4ppm.
TP05	Made Ground (Canal Infill)	0.60 – 2.40 (49.26 – 47.46)	Strong hydrocarbon odour (possibly diesel). Iridescent sheen on arisings. PID reading of 32.5ppm.
TP08	Made Ground	0.83 – 1.63 (49.46 – 48.66)	Faint odour of hydrocarbons (possibly diesel).. PID of 4.8ppm.

TP09	Made Ground (Canal Infill)	0.68 – 0.99 (49.29 – 48.98)	Hydrocarbon odour (possibly diesel).. PID reading of 12.7ppm.
		0.99 – 3.00 (48.98 – 46.97)	Strong hydrocarbon odour (possibly diesel). Iridescent sheen on arisings. PID reading of 30.7ppm.

Visual and olfactory evidence of contamination was identified by E3P (Ref. 2) in TT105 A, TT105 B and TT106 A, described as a hydrocarbon odour and sheen within Made Ground, likely the Canal Infill described in *Section 6.2.5*.

Table 17 – Visual and Olfactory Evidence of Contamination during E3P Ground Investigation

Borehole	Strata	Depths m bgl	Description
TT105 A	Made Ground	0.30 – 1.80	Strong hydrocarbon odour and sheen.
TT105 B	Made Ground	0.30 – 1.80	Strong hydrocarbon odour and sheen.
TT106 A	Made Ground	0.60 – 1.80	Strong hydrocarbon odour and sheen.

7 GROUND MODEL

7.1 Made Ground

Due to the variable nature of Made Ground in terms of strength and composition, this layer is not deemed to be a suitable founding stratum. As such, limited geotechnical testing was undertaken on this stratum and geotechnical design parameters have not been derived for the Made Ground.

The geotechnical test results recorded within Made Ground are summarised in *Table 18*:

Table 18 – Summary of Geotechnical and Geochemical Test Results – Made Ground

Parameter	No. of Tests	Results	
		Min	Max
In Situ Tests			
SPT 'N' Value (uncorrected)	16	0	16
Laboratory Tests			
Moisture Content (%)*	19	11.2	48.80
pH*	22	7.06	9.39
Water Soluble Sulphate (mg/l)*	22	50	1270

*Taken from environmental laboratory results

7.2 Glacial Till Deposits

The geotechnical test results recorded within the Glacial Till Deposits are summarised in *Table 19*:

Table 19 – Summary of Geotechnical Test Results – Glacial Till Deposits

Parameter		No. of Tests	Min	Results	Max
In Situ Tests					
SPT 'N' Value (uncorrected) – Granular		4	50+		
SPT 'N' Value (uncorrected) – Cohesive		103	1	50+	
Laboratory Tests – General					
Granular Glacial Till Deposits					
Moisture Content (%)		1	7.3		
pH		1	8.7		
Water Soluble Sulphate (mg/l)		1	44.6		
Particle Size Distribution (wet sieve)		2	See Appendix D		
Cohesive Glacial Till Deposits					
Atterberg Limits	Liquid Limit (%)	20	34	58	

Parameter		No. of Tests	Results	
			Min	Max
	Plastic Limit (%)	20	16	25
	Plasticity Index (%)	20	18	33
	Modified Plasticity Index (%) ¹	20	9	31
Moisture Content (%)		20	16	23
pH		16	8.1	8.96
Water Soluble Sulphate (mg/l)		16	19.5	185.0
Quick Undrained Triaxial		5	Discussed in subsequent Section (7.2.2)	

(1) Modified plasticity index in accordance with the NHBC Technical Standards, 2024, Chapter 4.2.

7.2.1 Granular Glacial Till Deposits

The SPT 'N' (uncorrected) results for the granular Glacial Till Deposits indicate a dense material, with N values of 50+ (Refusal). The SPT 'N' (uncorrected) results are presented on Figure 3.

Two Particle Size Distribution tests were undertaken on samples of granular Glacial Till Deposits. The grading results are similar to the descriptions provided on the exploratory hole logs. The results in *Appendix D*.

The Angle of Shearing Resistance (ϕ) for the granular Glacial Till Deposits has been determined using the relationship between SPT N values (Ref. 19). A conservative ϕ of 40° is recommended based on the SPT Plot.

A characteristic weight density of 18kN/m³ is recommended based on the SPT N results for soils below the groundwater table and 17kN/m³ is recommended based for soils above the groundwater table (BS 8004:2015+A1:2020, Ref. 11).

7.2.2 Cohesive Glacial Till Deposits

The SPT 'N' (uncorrected) results for the cohesive Glacial Till Deposits range between 1 and 50+ (Refusal). The SPT 'N' (uncorrected) results are presented on Figure 3.

A total of 20 No. Atterberg Tests were undertaken within the cohesive Glacial Till Deposits and the modified results suggest that the clay is generally of low to high plasticity with a low to medium volume change potential in accordance with guidance from the BRE Digest 240 (Ref. 12). A Casagrande Chart of Plasticity Index plotted against Liquid Limit is provided as Figure 2.

The undrained shear strength (c_u) of the cohesive Glacial Till Deposits has been estimated through the relationship between SPT 'N' Values and Plasticity Indices.

The estimated undrained shear strength (c_u) of the cohesive Glacial Till Deposits is determined using the relationship between SPT N_{60} values and the Plasticity Index (PI) (Ref. 13) as presented in **Equation 1**:

$$c_u = SPT N_{60} \times f_1 \quad \text{[Equation 1]}$$

Where:
 $SPT N_{60}$ is Corrected Standard Penetration Test
 f_1 is the Stroud factor

In the absence of an SPT Energy Certificate uncorrected SPT N values have been used. A Stroud factor f_1 value of 5.4 was chosen for an average PI of 25%. Therefore, for SPT N values between 0 and 50+ (Refusal), estimated c_u values range between 0kPa and 270kPa, indicating extremely low to very high strength clay.

Characteristic weight densities ranging between 17kN/m^3 and 20kN/m^3 are recommended depending on the strength of the clay, based on BS 8004:2015+A1:2020 (Ref. 11).

Five Quick Undrained Triaxial tests were undertaken on samples of cohesive Glacial Till Deposits and the results range between 111kPa and 394kPa , indicating high to very high strength clay. The relationship between undrained shear strength and depth is presented in Figure 4.

It should be noted that care should be taken in using linear stiffness values derived from relationships as they do not necessarily reflect the non-linear nature of soil stiffness. The actual stiffness will be strain dependent and non-linear and should be considered in detailed design of sensitive structures.

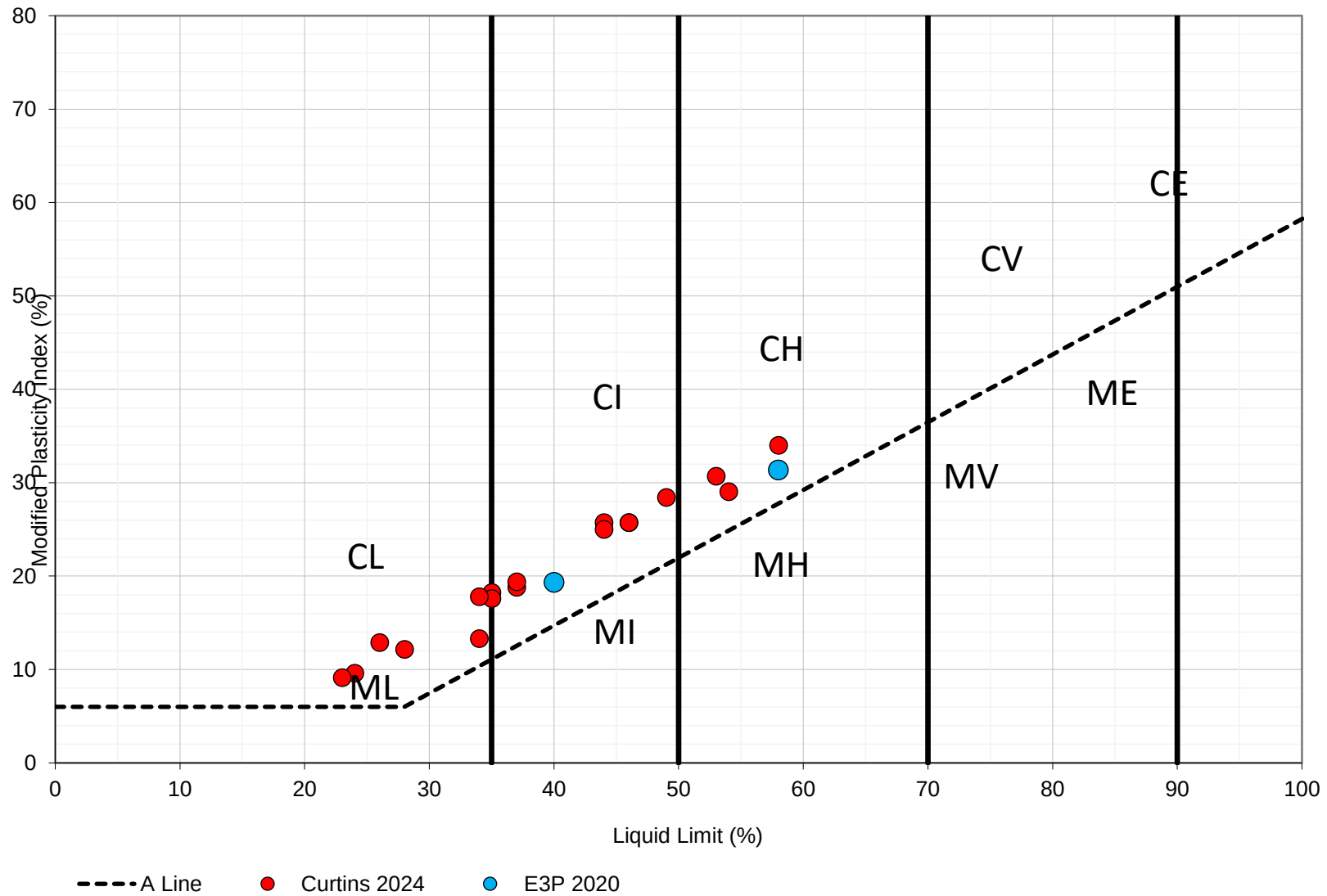


Figure 3 – Casagrande Chart for Cohesive Glacial Till Deposits

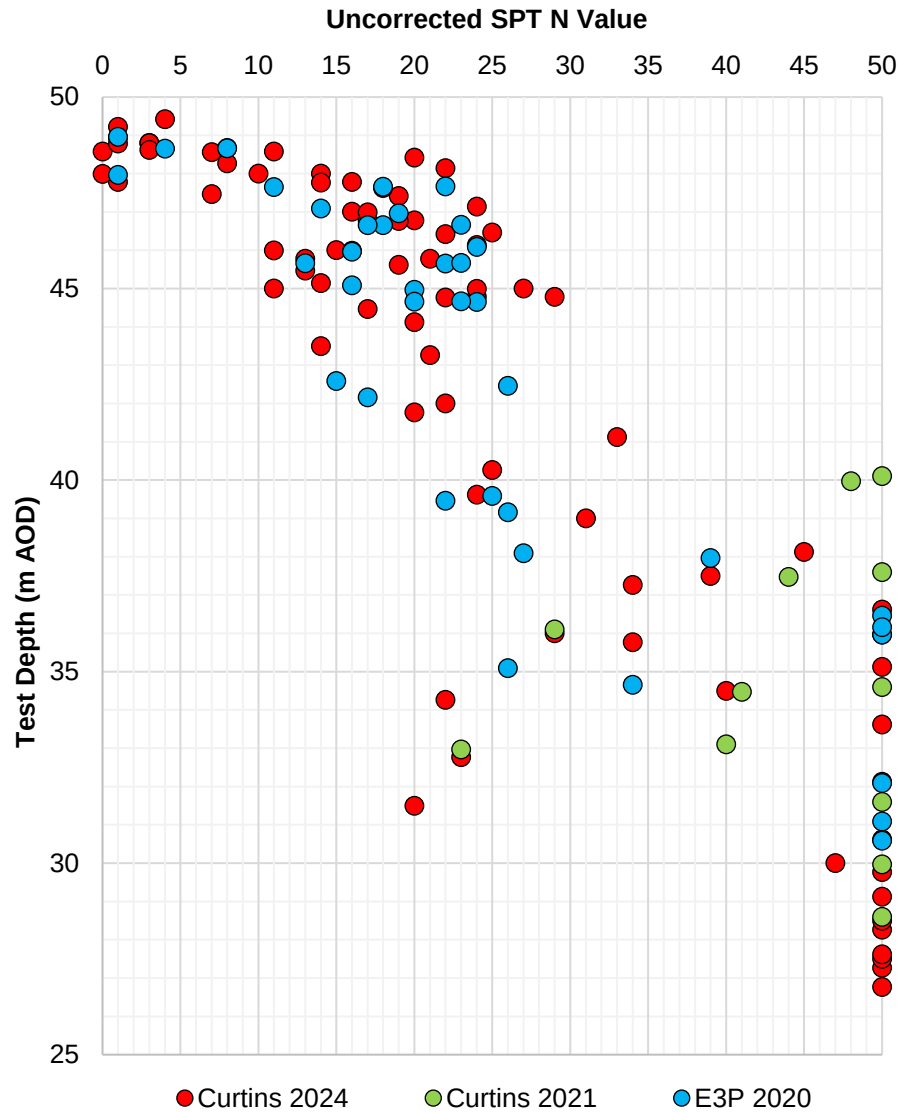


Figure 4 – SPT 'N' Values (uncorrected) vs. Depth (m AOD)

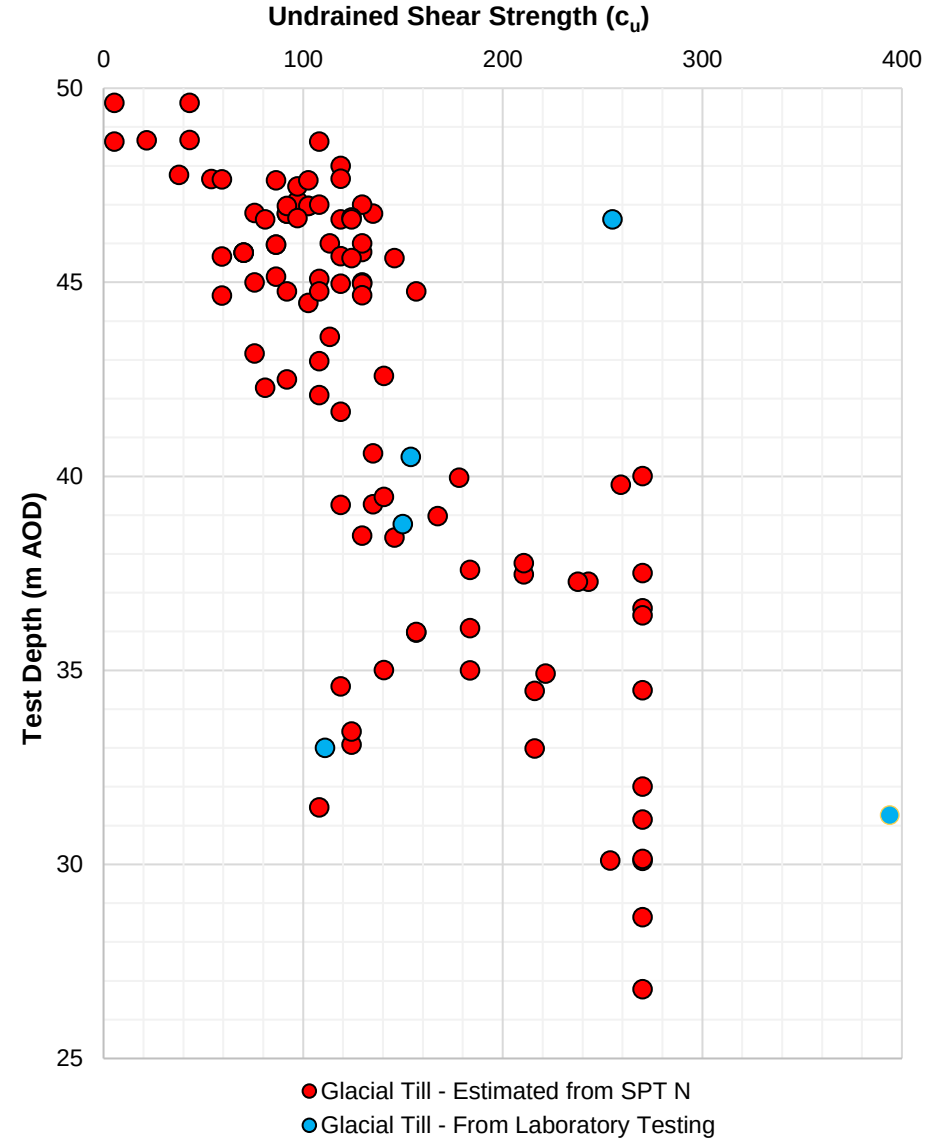


Figure 5 – Relationship between Undrained Shear Strength and Depth (m AOD)

7.3 Manchester Marls Formation

7.3.1 Weathered Bedrock

Weathered bedrock were encountered in 3 No. of the exploratory holes on site. Due to the variable nature of the weathered bedrock, limited geotechnical testing was undertaken in this stratum.

The geotechnical test results recorded within the Weathered bedrock are summarised in *Table 20*.

Table 20 – Summary of Geotechnical Test Results – Weathered bedrock

Parameter	No. of Tests	Results	
		Min	Max
In Situ Tests			
SPT 'N' Value (uncorrected)	4	50+	
Laboratory Tests			
Moisture Content (%)	4	4.2	7.8
pH	4	8.7	8.8
Water Soluble Sulphate (mg/l)	4	20.5	35.2
Particle Size Distribution (wet sieve)	1	See <i>Appendix D</i>	

7.3.2 Competent Bedrock

The geotechnical test results recorded within the Manchester Marls Formation Deposits are summarised in *Table 21*.

Table 21 – Summary of Geotechnical Test Results – Manchester Marls Formation

Parameter		No. of Tests	Results	
			Min	Max
In Situ Tests				
SPT 'N' Value (uncorrected)		3	50+	
Laboratory Tests				
UCS of Soil (kPa)**		4	0.33	0.49
Mudstone*				
Point Load Indices (Is50)	Axial Plane	7	0.01	0.30
	Diametral Plane	11	0.01	0.30
UCS of Rock (mPa)		1	6.85	
Sandstone				
Point Load Indices (Is50)	Axial Plane	6	0.25	5.47

	Diametral Plane	17	0.16	4.99
UCS of Rock (mPa)		1	13.00	

*Two samples described by Curtins as mudstone interpreted as siltstone by i2 Analytical.
**Rock behaving as soil.

The Rock Quality Designation (RQD) recorded in the Mudstone cored samples ranged from 0% to 100% which classifies it as of very poor to excellent rock mass quality. Total Core Recovery (TCR) and Solid Core Recovery (SCR) vary between core runs, as shown in Figure 5.

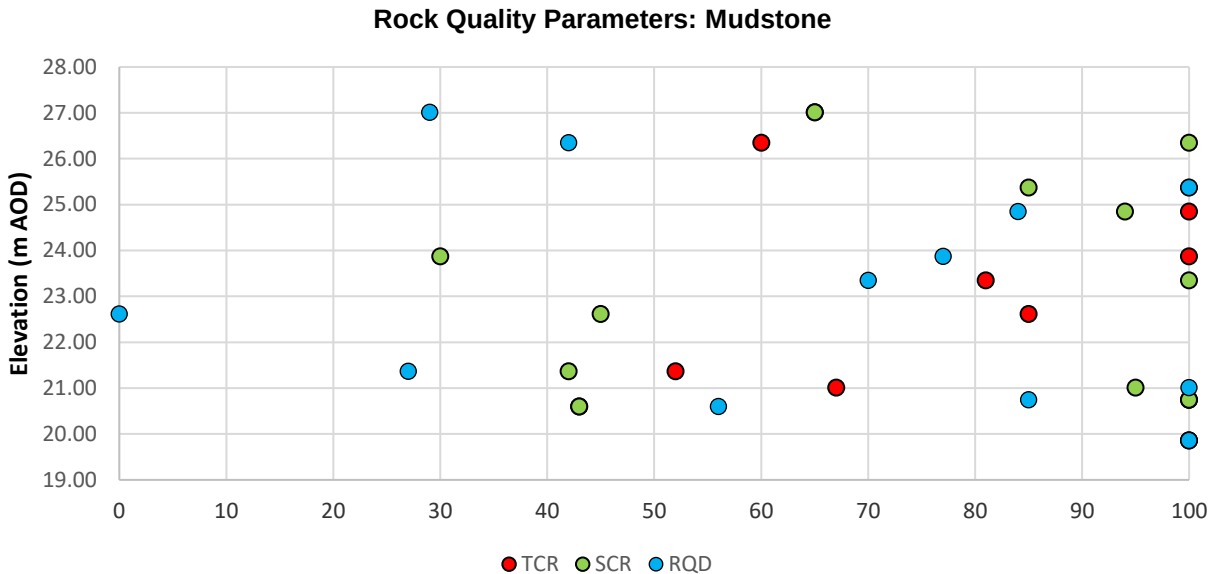


Figure 6 – Rock Quality Parameters of Mudstone vs. Elevation (m AOD)

The Rock Quality Designation (RQD) recorded in the Sandstone cored samples ranged from 0% to 100% which classifies it as of very poor to excellent rock mass quality. Total Core Recovery (TCR) and Solid Core Recovery (SCR) vary between core runs, as shown in Figure 6.

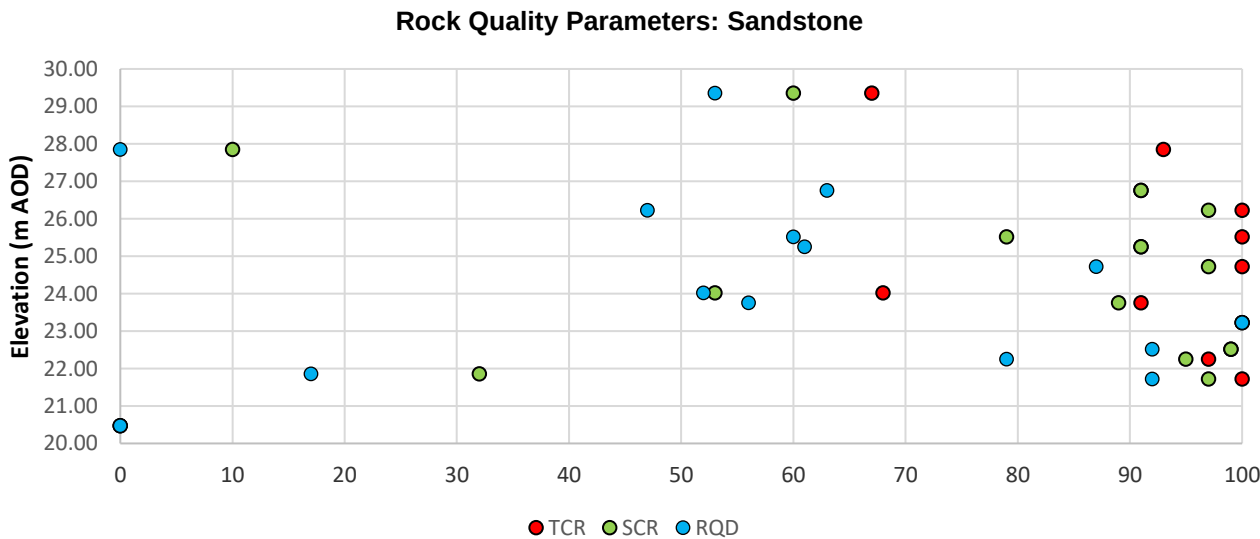


Figure 7 – Rock Quality Parameters of Sandstone vs. Elevation (m AOD)

The Quality Classification based on Rock Quality Designation (RQD) is shown in Figure 7 below.

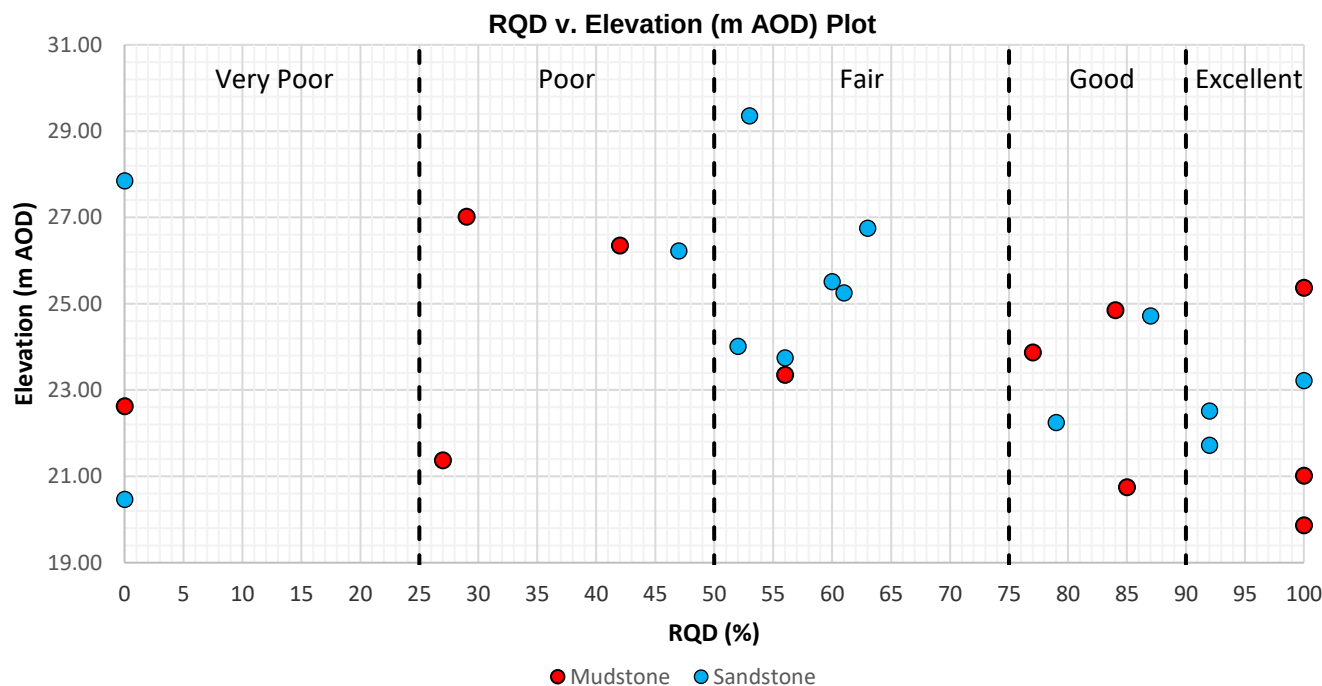


Figure 8 – Rock Quality Designation vs. Elevation (m AOD)

7.4 Aggressive Ground Conditions

The classification of the site in terms of concrete in aggressive ground is based on the guidance provided in Table C2 of the Building Research Establishment (BRE) Special Digest 1, 3rd edition of 2005 (Ref. 14). A summary of the results obtained are summarised in *Table 22*, details the classification.

Table 22 – BRE Suite Results Summary

Stratum	Quantity	Range
Made Ground: Canal Infill	pH	7.47 – 7.98
	Water Soluble Sulphate (mg/l)	80 - 370
Made Ground: Demolition Rubble	pH	8.02 – 8.27
	Water Soluble Sulphate (mg/l)	60 - 530
Made Ground: General	pH	7.06 – 9.39
	Water Soluble Sulphate (mg/l)	50 - 1270
Glacial Deposits	pH	8.1 – 8.8
	Water Soluble Sulphate (mg/l)	19.5 – 185
Manchester Marls Formation	pH	8.7 – 8.9
	Water Soluble Sulphate (mg/l)	20.5 – 35.2

In accordance with the recommendations of BRE SD1, the conditions of the soils at the site would classify as Design Sulphate Class DS-1 AC-1, when considering the most appropriate type of concrete to be used at the site in order to resist chemical attack (assuming non pyritic soils / no groundwater data available).

8 GROUND AND GROUNDWATER CONTAMINATION ASSESSMENT

This section of the report includes the assessment of the potential contamination, solid, liquid and gas, identified on the subject site which may present a risk to the proposed end users, associated utilities, and the wider environment.

In LCRM guidance published by the Environment Agency (Ref.3), the risk to human health or controlled waters is determined through an assessment of pollutant linkages between a source of contamination (within the ground or groundwater either on or off site) and a sensitive receptor such as end users of the site, building materials, edible plants grown in gardens or groundwater abstracted for drinking. This is termed a source-pathway-receptor relationship. The same model is applied to the assessment of risk arising from ground gases as detailed within BS8576:2013 (Ref. 15).

These models have a common approach, which is one of a tiered assessment. At each stage of the assessment further detail can be applied to the conceptual site model to provide a detailed interpretation on a site by site basis. As part of the planning process this approach is adopted to establish either if the site is 'suitable for use' or whether additional work or else remedial work is required for the site to be deemed so.

The sub-sections hereafter therefore incorporate the second Tier (Tier 2) of the approach described in EA guidance, otherwise referred to as the Generic Quantitative Risk Assessment (GQRA). The GQRA builds on the qualitative risk assessment (Tier 1) presented in the Phase 1 Desk Study (Ref. 1), in conjunction with observations made during the ground investigation and is based solely on the results of the chemical and other testing data obtained as part of Curtins ground investigation. The GQRA is used to build/refine the Conceptual Site Model (CSM) for the site as detailed and presented in Section 9.0 of this report.

More detail on Curtins risk assessment methodology, rationale and hierarchy for human health risk assessment is enclosed in Appendix G.

8.1 Human Health QGRA

8.1.1 Adopted Soil Human Health GACs Screening Methodology

The proposed site end use a U-shaped residential block circa 5-9 storeys with mixed residential and commercial premises on the ground floor and retention/rebuild of 2-3 No. one storey units in the south, with associated hardstanding and soft landscaping areas is most analogous with a '*Residential without Plant Uptake*' end-use scenario.

An assessment has been undertaken against the following GACs, in order of preference:

1. DEFRA Category 4 Screening Levels.
2. LQM/CIEH 2015 S4ULs for Human Health Risk Assessment,
3. Environment Agency Soil Guideline Values,
4. CL:AIRE, AGS, EIC. Soil Generic Assessment Criteria for Human Health Risk Assessments,

In September 2017 Public Health England (PHE) (Ref. 25) published guidance for the use of a surrogate marker approach to assess the risk posed by soil contamination with the genotoxic polycyclic aromatic hydrocarbons (PAHs). The guidance indicates that the use of a marker compound, such as Benzo(a)pyrene, provides a consistent indicator of the amount of PAHs in soil. Where PAH concentrations are present within pre-determined ratios in soil, provided in the guidance, this approach may be used, comparing soil concentrations of the marker compound with a Category 4 Screening Level, or site specific assessment criteria.

A review of the ground conditions identified four distinct soil types that can be utilised to allow use of the surrogate marker approach:

- Soil Type 1 – Made Ground (Canal Infill)
- Soil Type 2 – Made Ground (General)
- Soil Type 3 – Made Ground (Demolition Fill)
- Soil Type 4 – Glacial Till

Following a review of the concentrations of PAHs within each of these soil types, the PAH mixtures are within the acceptable ratios as detailed in Public Health England (2017) guidance for Soil Type 1 and Soil Type 3. As such, and as detailed in the *Appendix F*, benzo(a)pyrene concentrations may be used as a surrogate marker to assess the risk to human health from the seven genotoxic PAHs for these 2 soil types (Soil Type 1 and Soil Type 3). An individual compound assessment will be undertaken for Soil Type 2 and Soil Type 4.

The soil organic matter (SOM) content has an influence on the volatilisation of organic contaminants (i.e., the higher the SOM, the lower the volatilisation rate and therefore inhalation exposure risk). Soil organic matter (SOM) values for the site soils ranged from 1.4% to 20.1%. Consideration of the geometric mean results in a calculated value of 10.01%.

As such a comparison against Tier 1 thresholds for a SOM of 6% for all the samples has been adopted for '*Residential without Plant Uptake*' end-use. The adopted GAC's are listed in *Appendix F*.

8.1.2 Generic Assessment Criteria Screening of Soil Laboratory Results

The results of the environmental testing can be referred to in *Appendix C*, with testing undertaken on a total of 29 soil samples across all phases of ground investigation:

- E3P 2019 Ground Investigation – 8 No. samples
 - 6 No. samples were obtained from Made Ground
 - 2 No. samples were obtained from natural deposits.
- Curtins 2021 Pre-Demolition Ground Investigation – 2 No. Samples
 - 2 No. samples were obtained from Made Ground
- Curtins 2024 Post-Demolition Ground Investigation – 19 No. Samples
 - 19 No. samples were obtained from Made Ground

With respect to the '*Residential without Plant Uptake*' end use, soil chemical analysis results recorded several exceedances when compared against GAC screening thresholds, detailed in *Table 23* below.

Table 23 – Summary of Exceedances

Determinant	Exploratory Hole ID	Depth (m bgl)	Concentration (mg/kg)	Residential without Plant Uptake GAC (6% SOM)
Soil Type 1 – Made Ground (Canal Infill)				
Cyanide	WS03	0.80	40	24
	TP05	0.75	56	
Arsenic	TP05	0.75	133	40
	TP09	1.00	94	
Lead	WS03	0.80	686	310
	WS05	1.20	644	
	TP01	2.50	460	
	TP05	0.75	1010	
	TP09	1.00	633	
Nickel	TP05	0.75	300	180
Benzo(a)Pyrene	TP05	0.75	61.9	5.3 [Surrogate Marker Approach]
	TP09	1.00	15.3	

Determinant	Exploratory Hole ID	Depth (m bgl)	Concentration (mg/kg)	Residential without Plant Uptake GAC (6% SOM)
TPHs Aromatic EC>21 - EC35	TT105 A (E3P)	2.00	2200	1900
Soil Type 2 – Made Ground (General)				
Lead	CP/RC03	0.50	444	310
	WS02	0.30	542	
	TP04	0.75	462	
	R-A1	0.40	1240	
	WS104 (E3P)	0.70	590	
	TP112 (E3P)	0.50	410	
Benzo(a)Pyrene	CP/RC02	1.00	13.3	3.2 [Individual Compound Assessment]
	WS04	0.25	23.7	
	WS07	0.70	6	
	TP02	0.10	13.3	
Benzo(a)anthracene	CP/RC02	1.00	15.7	15
	WS04	0.25	31.3	
Benzo(b)fluoranthene	CP/RC02	1.00	17.2	4
	WS04	0.25	31.8	
	WS07	0.70	7.5	
	TP02	0.10	16	
Chrysene	WS04	0.25	42.1	32
Dibenzo(ah)anthracene	CP/RC02	1.00	2.01	0.32
	WS02	0.30	0.45	
	WS04	0.25	3.78	
	WS07	0.70	0.9	
	TP02	0.10	1.91	
	R-A1	0.40	0.32	
	WS104 (E3P)	0.70	0.51	
	TP112 (E3P)	0.50	3.3	
TPHs Aromatic EC>21 - EC35	TP02	0.10	2940	1900
Soil Type 3 – Made Ground (Demo Fill)				

Determinant	Exploratory Hole ID	Depth (m bgl)	Concentration (mg/kg)	Residential without Plant Uptake GAC (6% SOM)
Lead	TP06	0.50	624	310
	TP07	1.00	398	
Benzo(a)Pyrene	TP06	0.50	12.9	5.3 [Surrogate Marker Approach]
	TP07	1.00	6.39	

Concentrations of SVOC's and VOC's tested were recorded below laboratory limits of detection, with the exception of Dibenzofuran, Carbazole, Bis(2-ethylhexyl)phthalate, 2,4-Dinitrotoluene, Bis(2-chloroisopropyl)ether, n-Dibutylphthalate, Perylene, Carbon Disulphide, Chloroform, Tetrachloroethene, m & p Xylene, 1,2,4-Trimethylbenzene, and 4-Isopropyltoluene. No GAC thresholds are available for these determinants, with the exception of Tetrachloroethene (0.0039mg/kg in WS03 at 0.80m) which was recorded below the relevant GAC threshold (0.32mg/kg).

No asbestos containing materials (ACMs) were identified during the ground investigation. However, asbestos was recorded within 5 No. environmental samples during laboratory analysis. Asbestos type and quantification results are detailed in *Table 24*.

Table 24 – Positive Identification of Asbestos Fibres

Location ID	Depth (m bgl)	Strata	Asbestos Type	Quantification (% ^w / _w)
CP/RC02	1.00	Soil Type 2 – Made Ground (General)	Chrysotile Loose Fibres	0.001
WS05	1.20	Soil Type 1 – Made Ground (Canal Infill)	Amosite & Chrysotile Loose Fibres	0.014
WS08	0.50	Soil Type 1 – Made Ground (Canal Infill)	Chrysotile Loose Fibres	<0.001
TP07	1.00	Soil Type 3 – Made Ground (Demo Fill)	Amosite & Chrysotile	<0.001
TP112 (E3P)	0.50	Soil Type 2 – Made Ground (General)	Chrysotile	0.008

8.2 Controlled Waters GQRA

A model for assessing the potential for pollution of controlled waters and for deriving a safe concentration in ground and groundwater is the Environment Agency's publication "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" (Ref. 32).

In relation to the standards for controlled waters, there are currently no generic groundwater standards or surface water standards that are necessarily applicable to all sites.

However, dependant on the receptor identifies as being at risk, the UK Drinking water Standards (UK DWS) (Ref. 33), and or the Water Framework Directive Environmental Quality Standards (WFD EQS) (Ref. 34) can be utilised as primary screening values in a Level 1 Assessment. There can also be supplemented by World Health Organisation (WHO) guidelines (Ref. 35) where WFD EQS or DWS water quality standards (WQS) do not exist.

8.2.1 Adopted Controlled Waters Tier 1 Screening Values and Methodology

With respect to the underlying Secondary Undifferentiated Aquifer within the superficial deposits and the Secondary B Aquifer within the bedrock deposits, some exceedances are noted within groundwater samples as detailed within *Tables 19 and 20*.

The results of laboratory analysis of groundwater have been assessed against the UK Drinking Water Standards as the site is underlain by a Secondary B Aquifer and a Secondary Undifferentiated Aquifer and the WFD Environmental Quality Standards, due to the close proximity to the Rochdale Canal.

8.2.2 Generic Assessment Criteria Screening of Groundwater Laboratory Results

E3P window samples (WS108 and WS110) were installed within natural superficial glacial deposits, with 2 No. groundwater samples taken.

In regard to *Table 25*, 3 No. exceedances are noted within E3Ps groundwater samples.

Table 25 – E3P: Table of Exceedances Recorded Against the Respective GACs

Determinant	GAC Screening Value (µg/l)		Concentration (µg/l)	
	Freshwater EQS	DWS Threshold	WS108	WS110
Arsenic (µg/l)	50	10	28.6	-
Lead (µg/l)	14	10	-	18
pH	6 – 9		-	7.6 – 12

E3P recovered groundwater samples show exceedances of UK Environmental Quality Standards for 1 No. sample with an exceedance of Lead. The groundwater samples show exceedances of UK Drinking Water Standards in 2 No. water samples, with exceedances in Arsenic, Lead and pH.

Curtins window sample WS02 was installed within the natural superficial glacial deposits, with WS03 and WS08 targeting within the Made Ground, namely Canal Infill Made Ground to evaluate the presence of any contaminants. 3 No. samples were taken by Curtins during the additional ground investigation.

With respect to *Table 26*, 8 No. exceedances are noted within Curtins groundwater samples.

Table 26 – Curtins: Table of Exceedances Recorded Against the Respective GACs

Determinant (µg/l)	GAC Screening Value (µg/l)		Concentration (µg/l)		
	Freshwater EQS	DWS Threshold	WS02	WS03	WS08
Nickel	4	20	4	4	12
Zinc	10.9	5000	3	18	14
Anthracene	0.1	-	<0.1	<0.1	0.47
Benzo(a)pyrene	0.00017	0.01	<0.1	0.08	0.01

Curtins recovered groundwater samples show exceedances of UK Environmental Quality Standards in 8 No. instances, including Nickel, Zinc, Anthracene and Benzo(a)pyrene. The groundwater samples show exceedances of UK Drinking Water Standards in 2 No. samples of Benzo(a)pyrene.

9 GROUND GAS ASSESSMENT

The assessment of risk presented by ground gases is assessed with reference to guidance published by CIRIA (Assessing Risks Posed by Hazardous Ground Gases to Buildings, C665 (Ref. 26), BSI Publication Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings BS8485:2019 (Ref. 27) and other broadly accepted references such as the Ground Gas Handbook 2009 (Ref. 28).

The ground gas risk assessment adopts a tiered approach. In the first instance this involves a re-evaluation of the Conceptual Site Model described within *Section 2.7* and thereafter validating this conceptual model with the ground gas data, the semi-quantitative risk assessment.

9.1 Ground Gas Monitoring Results

To characterise the site's ground gas regime and validate the qualitative assessment of ground gas risk standpipe installations were incorporated within 4 No. borehole locations as part of the E3P and, 8 No. borehole locations as part of the Curtins ground investigation as detailed in *Section 4.2*.

Four ground gas monitoring visits were undertaken between the 9th of December 2019 and 7th of April 2020 as part of E3Ps ground investigation, and four ground gas monitoring visits were undertaken between the 26th of November 2025 and 16th of January 2025 as part of the Curtins ground investigation.

Barometric pressures recorded between 999mb and 1033mb with falling, rising and steady barometric pressures recorded within the E3P ground investigation. The results are contained within E3Ps gas addendum report (Ref. 3), and are summarised in *Table 18*.

Within the Curtins ground investigation, barometric pressure was recorded between 988mb and 1026mb. Rising barometric pressure was recorded on the first visit, falling on the second visit and steady on the third visit. The results log sheets are contained within *Appendix E*, E3P's ground gas addendum report (Ref. 3) and summarised in *Table 27*.

Table 27 – Summary of Ground Gas Monitoring Results

Exploratory Hole ID	Installation Strata	Maximum Methane Concentration (%)	Maximum Carbon Dioxide Concentration (%)	Minimum Steady Oxygen Concentration (%)	Maximum Gas Flow (l/hr)	
					Maximum	Steady State
E3P 2020						
WS103	Made Ground (General)	<0.1	0.85	18.0	1.83	
WS104	Made Ground (General)	<0.1	<0.1	19.5	0.52	
WS108	Glacial Till	<0.1	1.1	15.3	2.38	
WS110	Glacial Till	<0.1	<0.1	15.1	1.37	
Curtins 2025						
CP/RC01*	Manchester Marls Formation	<0.1	1.0	18.0	1.5	0.3
CP/RC02	Manchester Marls Formation	<0.1	0.1	13.3	<0.1	<0.1
CP/RC03	Glacial Till	<0.1	2.2	14.5	<0.1	<0.1
WS02	Glacial Till	0.2	0.3	18.1	0.2	<0.1

WS03	Made Ground (Canal Infill)	0.7	0.4	18.2	<0.1	<0.1
WS04*	Glacial Till	<0.1	1.0	14.9	-10.8	<0.1
WS07*	Made Ground (General)	1.8	1.5	16.5	6.4	<0.1
WS08	Made Ground (Canal Infill)	0.1	0.9	15.6	<0.1	<0.1

*Flooded monitoring response zones.

Maximum methane concentrations of 1.8% v/v were recorded in WS07 on the second visit, before reaching a steady state of <0.1% v/v methane.

Maximum Carbon Dioxide concentrations were recorded at 2.2% v/v in CP03 on the first visit.

Hydrogen Sulphide and Carbon Monoxide were recorded below the limit of detection in all locations throughout the monitoring period.

Maximum peak flows were recorded in WS04 as -10.8 l/hr, in WS07 at 6.4 l/hr and in CP01 at 1.5 l/hr, with steady state flow rates of <0.1 l/hr. The remainder of the monitoring positions recorded both peak and steady state air flow rates of <0.1 l/hr. E3P recorded their flow rates ranging between 0.52 l/hr and 2.38 l/hr, with no distinction between peak and steady state flow.

9.2 Ground Gas Assessment

The E3P (2020) Preliminary Conceptual Site Model (PSCM) (Ref. 1) identified a Moderate ground gas risk from Made Ground from construction and demolition on site, along with the infilling of the Bengal Canal Arm. Noxious and asphyxiate gases were attributed to include, but are not limited to, carbon dioxide, carbon monoxide, methane and hydrogen sulphide.

The ground investigations found three distinct types of Made Ground soils; general Made Ground, canal infill and demolition rubble with varying putrescible content. Made Ground was encountered from ground level to maximum proven depths of 3.10m bgl. Natural deposits of granular and cohesive Glacial Till Deposits with negligible organic or putrescible content were encountered directly underlying the Made Ground, encountered from 0.50m to 3.10m bgl.

The development plans indicate that redevelopment of the site will comprise the construction of a U-shaped residential block circa 5-9 storeys with some commercial premises on the ground floor and retention/rebuild of 2-3 No. one storey units in the south, with associated hardstanding and soft landscaping areas. The risk assessment considers the monitoring data from borehole installations within the site, and the assessment has been undertaken with guidance within BS8485:2019 (Ref. 27).

Using the available data set including air flow rates and gas concentrations, the hazardous gas flow rates (Q_{hg}) can be evaluated. Q_{hg} can be derived for both individual 'borehole' and 'worst case check' scenarios, and a comparison made in support of an appropriate assessment of ground gas risk. For a 'borehole' scenario (highest hazardous gas flow rate that is realistically possible, i.e. in a single borehole) steady state flow rates and peak gas concentrations are adopted, discounting any anomalous results, whilst for a 'worst case check' scenario (highest Q_{hg} across the entire dataset for well screens in the same strata irrespective of location and discrete monitoring events) maximum air flow rates and gas concentrations are adopted (discounting any deemed to be unrepresentative such as peak flows in flooded boreholes). Engineering judgement may be used to determine whether peak air flow rates or steady air flow rates may be used in the assessment.

Elevated concentrations may be recorded where the screened section of the monitoring well is flooded, as groundwater can contain dissolved gases at much greater concentrations than soil pore space. The dissolved gas can come out of solution when the headspace pressure drops when monitoring well taps are opened. Elevated methane and carbon dioxide may also be sourced from organic matter degradation in flooded monitoring wells. As such, elevated gas concentrations and peak flow rates recorded where the screened section of the monitoring well is flooded are not considered to be representative of site conditions, and therefore are not considered in the following assessments, with

steady state volumes being prioritised. Flooded response zones were identified in CP/RC01 (all visits), WS04 (all visits) and WS07 (all visits).

9.2.1 Ground Gas Assessment

An assessment has been undertaken to determine the risk to site end users and maintenance workers from ground gas migration, build up and inhalation.

Consideration of the quantity of monitoring data, range of barometric states, and weather conditions across both site investigations, it is deemed that the available dataset is representative of the gas regime pertaining to the development site.

Given the proposed end use of the site, and main risk (asphyxiation) driven by long terms gas flow into the buildings, the steady state flow rates are deemed suitable for use when deriving the Q_{hg} and Gas Screening Value (GSV) for the site.

Evaluation of the 'borehole' scenario for methane records a calculated maximum Q_{hg} of 0.0018 l/hr, based on a methane concentration of 1.8% and an air flow rate of <0.1 l/hr in WS07.

Evaluation of the 'borehole' scenario for carbon dioxide records a calculated maximum Q_{hg} of 0.0022 l/hr, based on a carbon dioxide concentration of 2.2% and an air flow rate of <0.1 l/hr in CP03.

Evaluation of the 'worst case' scenario results in a calculated maximum Q_{hg} of 0.141 l/hr for carbon dioxide.

The Gas Screening Value (GSV) for the site is taken as 0.0022 l/hr.

In absence of a ground gas generating source within the Glacial Till beneath the site, it is considered unlikely that a risk will be posed to the development. With further consideration of the ground gas monitoring data obtained during this investigation, ground gas concentrations are typically low, with limited air flow emissions from monitoring wells.

Typically, where methane is recorded at elevated concentrations (>1%), as recorded in WS07, the Characteristic Situation would be upgraded to a CS-2. However, this well recorded an elevated concentration once on the second visit, which dropped to a steady state of <0.1l/hr, as well as this the wells response zone remained flooded throughout the entire monitoring programme. This result was deemed to be an anomaly, and not representative of the site.

It is therefore determined that the borehole scenario Q_{hg} for carbon dioxide may be used as the GSV for the site, which may be classified with a Characteristic Situation 1 (CS-1) gas regime, where gas protection measures are not required.

The potential risks from ground gases to the excavations are to be dealt with by the Contractor, in accordance with the Confined Space Regulations, during construction. Appropriate ground gas monitoring and safety measures should be in place during the works, as the potential presence of ground gases could pose a risk in any confined spaces of deep excavations.

9.2.2 Volatiles/Hydrocarbon Impacted Ground

Hydrocarbon contamination was identified during the site investigation, in particular in the vicinity of the historical canal arm, comprising of PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), and TPHs (Aromatic EC>21 - EC35 TPHs)

It would be deemed appropriate to allow for vapour protection measures/membrane for the proposed buildings, this would allow the pathway for indoor air inhalation to be appropriately mitigated by the introduction of a membrane in the building construction, particularly due to the presence of this hydrocarbon impacted material. This would be required in combination with removal of VOC impacted soil as per below.

10 REVISED CONCEPTUAL SITE MODEL

The Preliminary Conceptual Site Model (PCSM) presented in *Section 2.7* of this report has been revised following the GQRA in *Section 7* and *Section 8*. The Revised Conceptual Site Model (CSM) is summarised in the table overleaf.

The CSM details the source-pathway-receptor linkages or potential pollutant linkages (PPL) that have been identified as relevant for the site. The GQRA details the associated level of risk relating to these potential pollutant linkages.

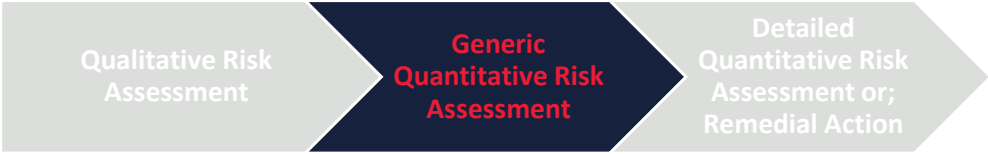
The CSM follows the framework outlined within CIRIA C552 (Ref. 30) which is summarised within *Appendix G*.

The 'risk rating' within the CSM refers to the risk that the source, pathway, receptor linkage or PPL is complete. Unless specifically stated it does not necessarily refer to an immediate risk and is intended to be used as a tool to assess the necessity for further assessment/investigation.

Risks presented by Mining are discussed and assessed within *Section 2.3.4*.

Risks presented by Unexploded Ordnance are discussed and assessed in *Section 2.6*.

Under current health and safety legislation, employers are required to carry out their own appropriate risk assessments and mitigation to protect themselves and their employees, other human receptors, and the environment from potential contamination. Such risks must be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015 (Ref. 31) which require that potential risks to human health and the environment from construction activities are appropriately identified and all necessary steps taken to eliminate / manage that risk. It has been assumed that any future construction works on site will be undertaken in compliance with these requirements. Reference should be given to the environmental testing results discussed within *Section 7* and presented within *Appendix C*.



- The table below represents the Second stage in the land quality risk assessment process; the Revised Conceptual Site Model following the Quantitative Risk Assessment.
- For a development site to be deemed ‘suitable for use’ the level of risk needs to be brought down to acceptable levels, i.e. low to very low risk. The purpose of each stage of risk assessment is ultimately to establish if there is a requirement for additional levels of assessment to be made to have sufficient confidence to support a risk characterisation or management decision, e.g., remedial action.

Conceptual Site Model			Qualitative Risk Assessment			Comments	Actions	
Source	Pathway(s)	Receptor(s)	Consequence	Likelihood of Occurrence	Risk Rating			
Potential contamination within Made Ground Soils as a result of the construction and demolition of buildings on site (Phoenix Iron Works) and infilling of the Bengal Canal Arm.	Direct contact and dermal uptake, soil and dust ingestion, dust & migration inhalation Vertical and horizontal migration through the superficial deposits (soils).	End user of site Residents.	Medium Chronic health risk.	Likely	Moderate	Significant visual and olfactory contamination has been identified across the site, comprising hydrocarbon odours, and iridescent sheens on arisings, Exceedances identified above ‘ <i>Residential without Plant Uptake</i> ’ end use General Assessment Criteria were identified across the site for Metals (Arsenic, Lead, Nickel), Cyanide, PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), TPHs (Aromatic EC>21 - EC35 TPHs) Asbestos fibres have been identified on site in 5 No. locations, with quantifications ranging from <0.001% to 0.0014% w/w. Some areas of the site to be covered by hardstanding which would break a source pathway receptor linkage, however some areas will contain soft landscaping.	Remediation Strategy to address the pathways to vulnerable receptors. Construction workers to be provided with appropriate PPE and sanitary facilities.	
		Construction Workers		Low	Moderate / Low			
		Horizontal migration over and through the superficial deposits (soils).	Controlled Waters (groundwater) Secondary Undifferentiated Aquifers in superficial deposits. Secondary B Aquifer in bedrock deposits Site is not located within a designated Source Protection Zone No potable groundwater abstractions within 1000m	Medium Pollution of sensitive groundwater.	Low	Moderate / Low	The exceedances encountered within groundwater sampled from window samples installed within Made Ground (WS03 and WS08), are likely representative of the material itself. The canal infill material is to be removed from site, therefore removing the source of contamination. The exceedances encountered within groundwater sampled from window samples installed within natural superficial deposits (WS02, WS108 and WS110) likely arose from perched water accumulating at the base of Made Ground material immediately underlain by predominantly cohesive superficial deposits with some granular constituents. The predominantly cohesive superficial deposits are likely to be sufficient at removing the pathway from the source to the receptor (Secondary B Aquifer in the bedrock).	Removal of Canal Infill Material from site. Piling Risk Assessment to ensure no migration of contaminants.
	Direct contact and dermal uptake, soil and dust ingestion, dust & migration inhalation.		Controlled Waters (surface water) Nearest surface water feature is 52m south of the site, the Rochdale Canal.				Medium Pollution of sensitive water resources.	
Made Ground during construction, demolition and the infilling of the Bengal Canal Arm contamination as source material for the generation of ground gas.	Vertical and horizontal migration through existing service corridors and Made Ground.	End users of site Residents, visitors and maintenance workers.	Medium Chronic health risk.	Unlikely	Low	The potential for gas generation within the Glacial Till is low. The GSV for the site is taken as 0.0022 l/hr for carbon dioxide. The gas regime for the site is taken as Characteristic Situation 1 (CS-1), not requiring gas protection measures.	No further action required.	

Conceptual Site Model			Qualitative Risk Assessment			Comments	Actions
Source	Pathway(s)	Receptor(s)	Consequence	Likelihood of Occurrence	Risk Rating		
Volatile contaminants such as PAHs, hydrocarbons	Inhalation of vapours. Migration through permeable strata and preferential pathways.	End users of site <i>Residents, visitors and maintenance workers.</i>	Medium Pollution of sensitive water resources.	Low	Moderate / Low	Exceedances identified PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), and TPHs (Aromatic EC>21 - EC35 TPHs) Exceedances of groundwater within Made Ground likely to be removed (Canal Infill material), and exceedances of groundwater within natural superficial deposits likely to represent perched water which has accumulated at the boundary between more granular Made Ground deposits and more cohesive superficial deposits.	Removal of Canal Infill Material from site. Vapour protection measures/membrane

11 SUMMARY OF POTENTIAL POLLUTANT LINKAGES

A **Moderate** risk rating is identified to site end-users and a **Moderate / Low** risk rating identified for construction workers, from contamination in soils from direct contact, dermal uptake, soil and dust ingestion and inhalation with Made Ground soils. In the Curtins ground investigation, 43 No. exceedances of Commercial General Assessment Criteria were identified within soil analysis results, including Metals (Arsenic, Lead, Nickel), Cyanide, PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), TPHs (Aromatic EC>21 - EC35 TPHs). Asbestos Containing Materials (ACMs) were encountered in 5 No. locations with quantifications ranging from <0.001% to 0.0014% w/w. Significant visual and olfactory contamination has been identified across the site, comprising hydrocarbon odours, and iridescent sheens on arisings.

A **Moderate / Low** risk rating is identified to controlled waters (Groundwater and Surface Waters) following the ground investigation given the site is not situated within a Source Protection Zone and Contamination migration over and through interbedded cohesive superficial soils is unlikely. Furthermore, sources of contamination (namely Canal Infill Made Ground) identified in the site soils are to be removed during groundworks and limited pathways were identified to the Secondary B Aquifer in the bedrock due to the predominantly cohesive superficial deposits. Piling foundation solution may require a specific Piling Risk Assessment to ensure no migration of contamination.

A **Low** risk rating is identified to site end users and construction workers from ground gases ground gases following the monitoring visits. The site is classified as a Characteristic Situation 1 (CS-1) gas regime, not requiring gas protection measures.

A **Moderate / Low** risk rating is identified to Volatile contaminants following the ground investigation given the presence of exceedances identified for PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), and TPHs (Aromatic EC>21 - EC35 TPHs) controlled waters. It would be deemed appropriate to allow for vapour protection measures/membrane for the proposed buildings to remove the pathway.

12 ENGINEERING ASSESSMENT AND RECOMMENDATIONS

12.1 Introduction

This section will assess the relevant geotechnical issues for the proposed development comprising the construction of the U-shaped residential block circa 5-9 storeys with some commercial premises on the ground floor, retention/rebuild of 2-3 No. one storey units in the south, with the construction of some associated hardstanding and soft landscaping areas.

Structural details and loadings have not yet been provided. It should be noted that detail may change in the development of designs beyond the issue of this Phase 2 Report and the Construction Designer should satisfy themselves regarding the adequacy of their design and proposed approach to construction by reference to the on-going project design proposals, the site investigation information, and their own examination of the site.

12.2 Summary of Ground Conditions

The ground conditions encountered during the three phases of ground investigation generally comprised of Made Ground (general, canal infill and demolition rubble) overlying predominantly cohesive Glacial Till deposits, overlying Weathered Bedrock, overlying the Manchester Marls Formation Bedrock.

Groundwater was encountered during the ground investigations as 18 No. water strikes detailed within *Section 6.6*. Post-ground investigation monitoring visits encountered perched water ranging between 0.56m to 2.17m bgl (49.44m to 47.30m bgl) within shallow window sample installations; between 13.91m to 14.91m bgl (36.71m to 35.71m AOD) within CP03 installed within granular Glacial Till; and, between 21.57m and 22.00m bgl (28.43m to 28.00m AOD) within CP02 installed within the Manchester Marls Formation.

Groundwater was encountered between 2.58m to 4.20m bgl (47.18m to 45.56m AOD) within CP01 installed within the Manchester Marls Formation and was found to be recharging at a rate of approximately 1.00m per minute when purged.

The geotechnical parameters recommended for use in preliminary designs based on the ground conditions encountered are discussed in *Section 5* and *Section 6*.

12.3 Obstructions

Several obstructions indicative of relic foundations was encountered on site by both E3P (Ref. 2) and Curtins, as described in *Section 6.2.4* and *6.5*:

- A grey concrete layer was encountered between 1.29m and 1.39m bgl (49.97m to 49.57m AOD) within TP07.
- Sandstone masonry was encountered between 0.96m and 1.84m bgl (49.87m to 48.99m AOD) within TP06.
- A grey concrete layer was encountered between 0.30m and 0.60m bgl (49.46m to 49.16m AOD) within CP/RC01.
- A section of brick wall was encountered at 0.50m bgl (~49.53m AOD) within TP102.
- TP103 was terminated early due to a brick wall and suspected ground floor slab.
- TP112 was terminated early due to a concrete block circa 0.70m bgl (~48.98m AOD) in the centre of the trial pit.
- A suspected concrete floor slab was encountered in WS103 at 1.20m bgl (~48.80m AOD).
- A suspected concrete floor slab was encountered in WS104 at 1.00m bgl (~49.18m AOD).
- A suspected concrete floor slab was encountered in WS105 at 1.00m bgl (~48.89m AOD).

Further obstructions are likely to be present associated with the historical structures on site.

12.4 Potential for Soft / Loose Soils

Low strength and/or loose soils were identified between ground level and 2.00m bgl (50.96m and 47.78m AOD) as identified from SPT data. The presence of these should be considered when undertaking excavations and earthworks activities. In particular attention should be drawn to the location of the old canal arm, where poor ground conditions are prominent.

12.5 Excavations

Given the nature of the Made Ground and Glacial Till Deposits (granular and cohesive), instability in shallow excavations cannot be discounted, especially in granular layers. This may escalate further if there is shallow perched groundwater ingress. Sump pumping is likely to be a suitable dewatering technique.

Post-cut side support for safety purposes should of course be provided to all excavations which appear unstable, and those >1.20m deep, in accordance with Health and Safety Regulations. Suitable side slope batters may be required. These must be designed by a suitably qualified temporary works contractor for any excavations.

All excavation temporary works shall be designed by a suitably qualified temporary works contractor for any excavations.

12.6 Foundation Design

The new structure is circa 5 to 9 storeys, building loads have not been provided but expected to be significant given the height of the structure.

It is recommended that a piled foundation solution is adopted to transfer the loads to competent strata. Given the anticipated loads piles would likely need to extent to the deeper Manchester Marls Formation Bedrock, which was encountered within CP/RC01, CP/RC02 and CP/RC03 from depths of 20.00m to 24.00m bgl (29.97m to 26.62m AOD).

It is recommended that specialist piling contractors are contracted as to the suitability and carrying capacity of the piles in the ground conditions pertaining to the site.

A piling risk assessment should be carried out to assess contamination risks associated with a piled solution.

12.7 Ground Floor Slabs

A suspended floor slab is recommended in conjunction with a piled solution to bear on the pile caps with a network of beams which will minimise any differential settlement.

12.8 Chemical Attack on Buried Concrete

The site has been assessed in accordance with BRE Special Digest 1 (Ref. 14) and the soils classify as DS-1 AC-1.

13 CONCLUSION AND RECOMMENDATIONS

13.1 Geotechnical

The Made Ground deposits encountered on site are not considered to be a suitable founding stratum.

At the time of writing, no loads have been provided. Given the loose and soft deposits encountered, it is likely that a piled foundation solution may be used, likely requiring transfer of loads to the deeper Manchester Marls Formation Bedrock, which was encountered within CP/RC01, CP/RC02 and CP/RC03 from depths of 20.00m to 24.00m bgl (29.97m to 26.62m AOD).

It is recommended that specialist piling contractors are contacted as to the suitability and carrying capacity of the piles in the ground conditions pertaining to the site.

As piled foundations are anticipated, a suspended floor slab is recommended to bear on the pile caps with a network of beams which will minimise any differential settlement.

The preliminary design of buried concrete according to Table C2 of BRE Special Digest 1:2005 should be in accordance with Class DS-1 AC-1.

13.2 Ground Contamination

A revised tabulated revised Conceptual Site Model has been derived following the findings on the Generic Quantitative Risk Assessment and is presented in Section 10.

A **Moderate** risk rating is identified to site end-users and a **Moderate / Low** risk rating identified for construction workers, from contamination in soils from direct contact, dermal uptake, soil and dust ingestion and inhalation with Made Ground soils. In the Curtins ground investigation, 43 No. exceedances of Commercial General Assessment Criteria were identified within soil analysis results, Asbestos Containing Materials (ACMs) were encountered in 5 No. locations with quantifications ranging from <0.001% to 0.0014% w/w. Significant visual and olfactory contamination has been identified across the site, comprising hydrocarbon odours, and iridescent sheens on arisings.

A **Moderate / Low** risk rating is identified to controlled waters (Groundwater and Surface Waters) following the ground investigation given the site is not situated within a Source Protection Zone and Contamination migration over and through interbedded cohesive superficial soils is unlikely. Furthermore, sources of contamination (namely Canal Infill Made Ground) identified in the site soils are to be removed during groundworks and limited pathways were identified to the Secondary B Aquifer in the bedrock due to the predominantly cohesive superficial deposits.

A **Low** risk rating is identified to site end users and construction workers from ground gases ground gases following the monitoring visits. The site is classified as a Characteristic Situation 1 (CS-1) gas regime, not requiring gas protection measures.

A **Moderate / Low** risk rating is identified to Volatile contaminants following the ground investigation given the presence of exceedances identified for PAHs (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene, Dibenzo(ah)anthracene), and TPHs (Aromatic EC>21 - EC35 TPHs) controlled waters. It would be deemed appropriate to allow for vapour protection measures/membrane for the proposed buildings to remove the pathway.

13.2.1 Remedial Actions

Potential remedial actions included within a Remediation Strategy would include:

- Appropriate PPE for all construction workers and suitable asbestos management measures.
- Engineered capping to serve as physical barrier between Made Ground and site surface in soft landscaped areas preventing direct contact, dermal uptake and limiting the derivation of dust. Prohibitive access restrictions to be in place in areas which cannot be remediated to the specification outlined.
- Provision of vapour protection measures/membrane within all proposed buildings on site.
- Removal of canal arm impacted soils (risk to groundwaters and potential of vapours).

13.3 Recommendations

Based on the findings of the ground investigation, the following recommendations are made:

1. A Remediation Strategy to address the contamination and asbestos found within Made Ground. Recommendations of the Strategy are likely to include excavation of contaminated material in the canal arm as part of enabling works, provision of vapour protection measures/membrane within all proposed buildings on site. and installation of a suitable engineered capping layer in soft landscaped areas.
2. Construction workers to be provided with appropriate PPE and sanitary facilities with reference to environmental testing certificates appended herein.
3. An earthworks strategy to assist with ground preparation before construction.
4. Piling Risk Assessment to ensure no migration of contamination.
5. It is recommended that specialist piling contractors are contracted as to the suitability and carrying capacity of the piles in the ground conditions pertaining to the site.
6. Where unexpected contamination is encountered, seek the advice of a qualified and experienced contaminated land consultant, and inform the Local Authority Environmental Health Officer, in accordance with the requirements of a Construction Management Plan.

14 REFERENCES

1. **E3P** (2020) Phase I Geoenvironmental Site Assessment Manchester Life Phase 3 (Report Ref. 13-729-R1) Dated February 2020.
2. **E3P** (2020) Phase II Geoenvironmental Site Assessment, Land at Jersey Street, Ancoats, Manchester, Parcel A (Report Ref. 13-350-R3) Dated February 2020.
3. **E3P** (2020) Ground Gas Addendum Report, Land at Jersey Street, Ancoats, Manchester, Parcel A (Report Ref. 13-729-R3-A) Dated April 2020.
4. **Curtins** (2021) Letter Report for Back of Ancoats, Plot A (Report Ref. 076740-CUR-00-XX-RP-GE-001-V01) Dated 13th May 2021.
5. **Curtins** (2024) Initial Preliminary Waste Classification Assessment Letter Report for Phoenix Ironworks, Manchester Life Plot A (Report Ref. 080866-CUR-XX-XX-T-GE-00002-P01) Dated 12th December 2024.
6. **Environmental Agency** (2020) Land Contamination Risk Management (LCRM).
7. **British Standards Institution/BSI**. (2020) Code of Practice for Site Investigations (report no.BS5930).
8. **British Standards Institution/BSI**. (2011) Investigation of Potentially Contaminated Sites (report no. BS10175).
9. **ICE** (2022) UK Specification for Ground Investigation, Third Edition
10. **British Standards Institution/BSI**. (2007) Eurocode 7: Geotechnical Design (report no. BS EN 1997-1:2007).
11. **BSI Standards Publication** (2015) BS 8004:2015 Code of practice for foundations.
12. **Building Research Establishment** (1993) BRE Digest 240: Low Rise Buildings on Shrinkable Clay Soils: Part 1
13. **Stroud, M. a. B. F.** (1975) The Standard Penetration Test and the Engineering Properties of Glacial Materials.
14. **Building Research Establishment**. (2005) BRE Special Digest 1, 'Concrete in Aggressive Ground'. 2005.
15. **British Standards Institution/BSI**. (2016) Methods of test for soils for civil engineering purposes. General requirements and sample preparation (report no. BS1377-1).
16. **NHBC Standards** (2011). NHBC Standards 2011 – Part 4 Foundations section 4.2.
17. **CIRIA** (1995) The Standard Penetration Test (SPT): Methods and Use (R143) (ISBN: 978-0-86017-419-6).
18. **ICE** (2012) Manual of Geotechnical Engineering: Volume 1 (ISBN: 978-0-7277-5707-4).
19. **Peck, Hanson and Thornburn** (1947) Foundation Engineering, 2nd Edition
20. **British Standards Institution/BSI** (2013) Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs) (report no. BS58576).
21. **Environmental Agency**. (2009) Contaminated Land Exposure Assessment (CLEA) v1.071 model.
22. **Environment Agency**. (2009) Human Health Toxicological Assessment of Contaminants in Soil (report no. SC050021/SR2).
23. **Environment Agency**. (2009) Updated Technical Background to the CLEA Model (report no.SC050021/SR3).
24. **Department of Environment Food and Rural Affairs (DEFRA)**. (2012) Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (report no. PB13735).
25. **Public Health England** (2017) Contaminated land information sheet: risk assessment approaches for polycyclic aromatic hydrocarbons (PAHs)
26. **CIRIA C665** (2007) Assessing Risks Posed by Hazardous Ground Gases to Buildings.
27. **British Standards Institution/BSI** (2015) Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings (report no. BS8485:2019).
28. **Wilson, S., Card, G., and Haines, S.** (2009) Ground Gas Handbook.
29. **NHBC** (2023) Hazardous Ground Gas - An essential guide for housebuilders
30. **CIRIA C552**. (2001) Contaminated Land Risk Assessment. A Guide to Good Practice.
31. **CITB**. (2015) Construction (Design and Management) Regulations.
32. **Environment Agency** (2006) Remedial Targets Methodology - Hydrogeological Risk Assessment for Land Contamination (report no.ea/br/e/std/vr10thanni).
33. **European Union** (1998) Drinking Water Directive (Council Directive 98/83/EC)
34. **The Water Framework Directive** (Standards and Classification) Directions (England and Wales)
35. **World Health Organisation** (2017) Guidelines for Drinking Water Quality, 4th edition.

15 APPENDICES

Appendix A – Drawings

Appendix B – Exploratory Hole Logs

Appendix C – Chemical Laboratory Test Results

Appendix D – Geotechnical Laboratory Test Results

Appendix E – Ground Gas Monitoring Results

Appendix F – GAC Screening Thresholds

Appendix G – Risk Assessment Methodology

Appendix A – Drawings



 Approximate Site Ownership Line

2024 Exploratory Hole Location

* Denoting Borehole Installation

 CP

 TP

 WS

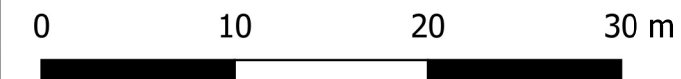
Historical Boreholes

 CP (E3P 2019)

 TP (E3P 2019)

 WS (E3P 2019)

 RC (Curtins 2021)



Curtins

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Structures - Civils - Environmental - Infrastructure - Transport Planning - Sustainability - Expert Advisory Services
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Status					INFORMATION														
Project:										Manchester Life Plot A									
Drg Title:										Exploratory Hole Location Plan									
Scale:			Size:			Issue Date:			Drawn:			Checked:							
NTS			A3			18/11/2024			LW			JL							
Drg No:								080866-CUR-XX-XX-D-GE-80003								Rev:		P01	
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Appendix B – Exploratory Hole Logs



Borehole Log

Borehole No.

R-A1

Sheet 1 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 49.97

Scale
1:40

Client: Manchester Life

Dates: 28/01/2021 - 01/02/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	ES		0.25	49.72		MADE GROUND: Concrete.	1
								MADE GROUND: Dark greyish brown gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of brick, sandstone, scrap metal, clinker, ash and wood. Strong hydrocarbon odour. <u>At 0.50m boulder.</u> <u>At 0.70 dark grey/black water with iridescent sheen.</u>	2
					2.10	47.87		Soft brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone.	3
									4
									5
									6
									7
									8

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-A1

Sheet 2 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 49.97

Scale
1:40

Client: Manchester Life

Dates: 28/01/2021 - 01/02/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.00		N=48 (3,7/11,11,13,13)	10.50	39.47			9
		12.50		N=44 (2,6/8,12,12,12)				Very stiff brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone and coal fragments.	10
		14.00		N=50 (7,11/50 for 230mm)				From 12.50 to 15.30m no recovery.	11
		15.50		N=41 (7,9/41 for 255mm)	15.50	34.47		Very stiff brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is angular to subrounded fine to medium of sandstone.	12
								Continued on next sheet	13
									14
									15
									16

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-A1

Sheet 3 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 49.97

Scale
1:40

Client: Manchester Life

Dates: 28/01/2021 - 01/02/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		17.00		N=23 (5,6/3,8,9,3)				From 17.00 to 18.50m no recovery.	17
								From 18.50 to 18.90m recovered as non-intact core of angular to subangular cobbles.	18
								From 18.90 to 20.00m no recovery.	19
		20.00		50 (25 for 105mm/50 for 30mm)	20.00	29.97		Highly weathered very weak reddish brown fine to medium grained SANDSTONE, recovered as gravelly fine to medium sand.	20
								From 20.55 to 21.10m core intact - weak fine grained sandstone.	21
								From 21.50 to 22.50m no recovery (due to faulty geobore equipment).	22
					22.50	27.47		Weak reddish brown fine grained SANDSTONE with localised thin laminations of mudstone. 22.50 to 23.43m 0 - 10 degrees closely spaced to medium spaced, planar rough.	23
								From 23.43 to 23.58m recovered as non-intact core of very sandy angular to subangular cobbles. 23.58 to 23.98m 5 - 20 degrees very closely spaced to closely spaced, locally extremely closely spaced, planar rough.	24

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-A1

Sheet 4 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 49.97

Scale
1:40

Client: Manchester Life

Dates: 28/01/2021 - 01/02/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								From 23.98 to 24.33m recovered as non-intact core of sandy angular gravel and angular cobbles.	
								24.33 to 28.09m 0 - 15 degrees closely spaced to medium spaced, planar rough to smooth and 1 No. discontinuity 90 degrees, planar rough.	
								From 24.96 to 25.15m grey medium grained sandstone.	25
								From 25.15 to 25.50m weathered fine grained sandstone.	
								From 25.50 to 25.67m light grey.	
								From 25.67 to 25.80m weathered fine grained sandstone.	
					26.00	23.97		Medium strong light grey and reddish brown fine grained SANDSTONE with closely spaced to medium spaced thin to thick bands of extremely weak brown mudstone.	26
									27
								From 28.09 to 28.14m recovered as non-intact core of angular coarse gravel.	28
								28.14 to 29.00m 0 - 10 degrees medium spaced, planar smooth.	
								From 29.00 to 30.00m no recovery.	29
					30.00	19.97		End of borehole at 30.00 m	30
									31
									32

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-A2

Sheet 1 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.10

Scale
1:40

Client: Manchester Life

Dates: 26/01/2021 - 28/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.80	ES		0.20	49.90		MADE GROUND: Concrete.	1
								MADE GROUND: Dark brown gravelly slightly clayey fine to coarse sand with low cobble content. Gravel is angular to subangular fine to coarse of brick, ash and glass. Cobbles are angular to subangular of brick.	
					1.30	48.80		MADE GROUND: Red brown and grey concrete and brick layer.	
					2.20	47.90		Soft brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium of sandstone.	
									2
									3
									4
									5
									6
									7
									8

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.





Borehole Log

Borehole No.

R-A2

Sheet 2 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.10

Scale
1:40

Client: Manchester Life

Dates: 26/01/2021 - 28/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.00		N=50 (2,4/8,11,16,15)	10.00	40.10		Stiff to very stiff brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of sandstone and coal fragments.	9
		12.50		N=50 (3,5/50 for 275mm)				From 11.85 to 14.00m no recovery.	10
		14.00		N=29 (1,3/6,6,7,10)				From 14.40 to 15.50m no recovery.	11
		15.50		50 (2,4/50 for 200mm)				From 15.75 to 20.00m no recovery.	12
								Continued on next sheet	13
									14
									15
									16

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.





Borehole Log

Borehole No.

R-A2

Sheet 3 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.10

Scale
1:40

Client: Manchester Life

Dates: 26/01/2021 - 28/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		17.00		N=40 (1,0/1,2,16,21)					17
		18.50		50 (5,17/50 for 95mm)	18.80 19.00	31.30 31.10		Dense brown fine to coarse SAND. Very stiff brown slightly sandy CLAY. Sand is fine to coarse.	18 19
		21.50		50 (25 for 50mm/50 for 40mm)	20.90	29.20		Highly weathered extremely weak reddish brown medium grained SANDSTONE, recovered as a slightly clayey medium sand. From 20.90 to 21.00m recovered as non-intact core of angular fine to coarse gravel and angular cobbles. From 21.00 to 21.50m no recovery. From 21.50 to 21.65m medium strong medium grained sandstone.	20 21
					23.00	27.10		Highly weathered light grey and brown fine grained SANDSTONE, recovered as a stiff very sandy clay. From 23.00 to 23.40m recovered as non-intact core of sandy angular fine to coarse gravel and angular cobbles.	22 23
					23.55	26.55		23.50 to 26.00m 5 - 20 degrees closely spaced to medium spaced, planar smooth. Weathered very weak brown thinly laminated	23 24

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.





Borehole Log

Borehole No.

R-A2

Sheet 4 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.10

Scale
1:40

Client: Manchester Life

Dates: 26/01/2021 - 28/01/2021

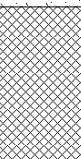
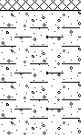
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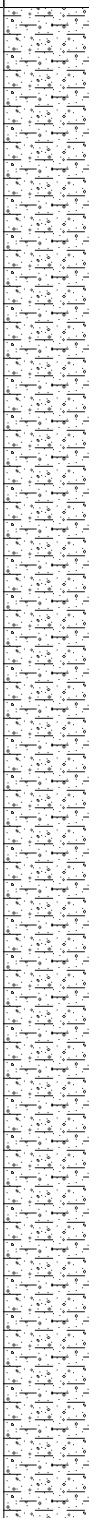
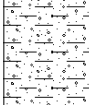
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								MUDSTONE. <i>From 24.00 to 24.50m no recovery.</i>	
									25
					26.30	23.80		26.00 to 27.50m 0 - 10 degrees closely spaced to medium spaced, planar to stepped smooth to rough and 1 No. discontinuity 25 degrees, planar rough.	26
					26.80	23.30		Medium strong reddish brown fine to medium grained SANDSTONE.	
								Very weak thinly laminated purplish brown MUDSTONE.	27
					27.50	22.60		Weak purplish brown mottled grey fine to medium grained SANDSTONE. <i>From 27.50 to 27.80m recovered as non-intact core of angular cobble.</i>	
								27.80 to 28.30m 0 - 10 degrees closely spaced, planar rough.	28
								From 28.30 to 28.45m recovered as non-intact core of angular fine to coarse gravel and angular cobbles. <i>From 28.45 to 29.00m no recovery.</i>	
					29.00	21.10		Weak brown thinly laminated MUDSTONE. 29.00 to 29.65m 0 - 1- degrees closely spaced, planar smooth.	29
								From 29.65 to 30.00m no recovery.	
					30.00	20.10		End of borehole at 30.00 m	30
									31
									32

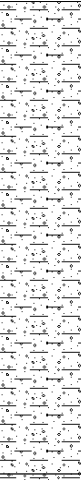
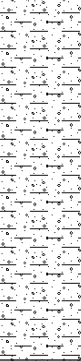
Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush.



								Rotary Core Log			Borehole No. CP/RC01 Sheet 1 of 4	
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385158.19 - 398752.44			Hole Type CP+RC			
Location: Jersey Street, Manchester, M4 6JW				Level: 49.76			Scale 1:40					
Client: Mace				Dates: 07/11/2024 - 14/11/2024			Logged By LW					
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description		
				TCR	SCR	RQD						
		0.30	ES				0.30	49.46		MADE GROUND: Greyish brown, clayey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of limestone, brick, metal, ceramic and glass.	1	
						0.60	49.16			MADE GROUND: Grey concrete.		
		2.00 - 2.45	D							MADE GROUND: Dark brown sandy gravelly clay with occasional cobbles. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of brick, ceramic, metal, broken glass and sandstone. Cobbles of angular brick.	2	
								SPT at 1.20m bgl N = 7 (1,3/2,1,1,3)				
		3.00 - 3.45	D				3.00	46.76		Stiff, brown mottled grey, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone and mudstone.	3	
								SPT at 3.00m bgl N = 19 (3,4/4,4,7,4)				
		4.00 - 4.45	U							U100 at 4.00m bgl, 16 Blows 100% Recovery.	4	
		5.00 - 5.45	D							SPT at 5.00m bgl N = 22 (4,4/4,5,6,7)		
	6.50 - 6.95	B							SPT at 6.50m bgl N = 21 (2,4/4,5,6,6)	7		
	8.00 - 8.45	D										8
Continued on next sheet												
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.00m bgl, RC from 22.00 to 30.30m bgl. Borehole completed at 30.30m bgl. Coordinates and levels surveyed in on site.												
												

							Rotary Core Log				Borehole No. CP/RC01 Sheet 2 of 4	
Project Name: Manchester Life Plot A				Project No. 080866			Co-ords: 385158.19 - 398752.44				Hole Type CP+RC	
Location: Jersey Street, Manchester, M4 6JW							Level: 49.76				Scale 1:40	
Client: Mace							Dates: 07/11/2024 - 14/11/2024				Logged By LW	
Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description		
				TCR	SCR	RQD						
		9.50 - 9.95	D							SPT at 8.00m bgl N = 20 (2,4/4,4,6,6)		
										SPT at 9.50m bgl N = 25 (4,4/4,5,7,9)		
		11.00 - 11.45	U							U100 at 11.00m bgl. 37 Blows 100% Recovery		
		12.50 - 12.95	D							SPT at 12.50m bgl N = 34 (4,6/7,9,9,9)		
		14.00 - 14.45	D							SPT at 14.00m bgl N = 34 (4,4/5,9,10,10)		
		15.50 - 15.95	B							SPT at 15.50m bgl N = 22 (4,5/5,5,6,6)		
Continued on next sheet												
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.00m bgl, RC from 22.00 to 30.30m bgl. Borehole completed at 30.30m bgl. Coordinates and levels surveyed in on site.												
												

							Rotary Core Log			Borehole No. CP/RC01 Sheet 3 of 4	
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385158.19 - 398752.44			Hole Type CP+RC		
Location: Jersey Street, Manchester, M4 6JW				Level: 49.76			Scale 1:40		Logged By LW		
Client: Mace				Dates: 07/11/2024 - 14/11/2024							
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		17.00 - 17.45	D							SPT at 17.00m bgl N = 23 (4,5/5,6,6,6)	17
		18.50 - 18.95	U				18.50	31.26		Stiff, brown, very sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone and mudstone.	18
		19.00 - 19.50	B							U100 at 18.50m bgl. 50 Blows 100% Recovery	19
		20.00 - 20.45	D				19.50	30.26		Firm, sandy, gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone and mudstone.	20
		21.50 - 21.95	D				21.50	28.26		Dense, brown and reddish brown SAND & GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular of mudstone. (Residual Soils).	21
		22.00 - 23.50	NR				22.40	27.36		Extremely weak reddish brown thickly laminated MUDSTONE. Fractures are closely to medium spaced 0-5 degrees stepped smooth.	22
			7							SPT at 22.50m bgl N = 50 (25 for 10mm/50 for 30mm)	23
			22							SPT at 23.00m bgl N = 50 (12,13/14,20,18 for 65mm)	24
			14				23.60	26.16		Very weak reddish brown fine grained SANDSTONE. Fractures are: 1) closely to medium spaced 5-10 degrees planar rough clay infill. 2) widely spaced 70-90 degrees planar rough clay infill.	25
										From 23.69 to 23.72m, not intact, recovered as coarse subangular gravel of mudstone.	26
Continued on next sheet											
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.00m bgl, RC from 22.00 to 30.30m bgl. Borehole completed at 30.30m bgl. Coordinates and levels surveyed in on site.											
											

Borehole No.
CP/RC01

Project Name: Manchester Life Plot A

Co-ords: 385158.19 - 398752.44

Hole Type
CP+RC

Location: Jersey Street, Manchester, M4 6JW

Level: 49.76

Scale
1:40

Client: Mace

Dates: 07/11/2024 - 14/11/2024

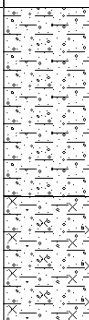
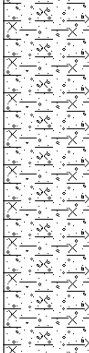
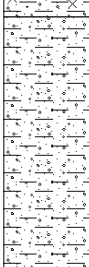
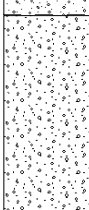
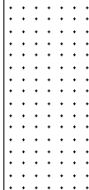
Logged By
LW

Remarks
Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.00m bgl, RC from 22.00 to 30.30m bgl. Borehole completed at 30.30m bgl. Coordinates and levels surveyed in on site.

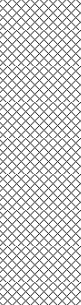
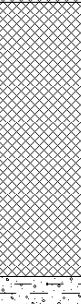
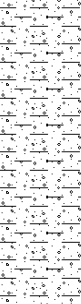
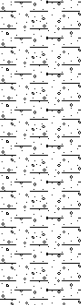
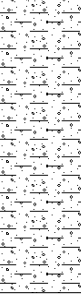


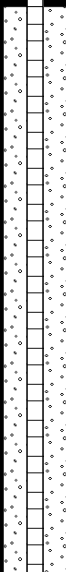
							Rotary Core Log			Borehole No. CP/RC02 Sheet 1 of 4	
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385110.96 - 398771.65			Hole Type CP+RC		
Location: Jersey Street, Manchester, M4 6JW				Level: 50.00			Scale 1:40				
Client: Mace				Dates: 04/11/2024 - 06/11/2024			Logged By LW				
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		1.00	ES							MADE GROUND: Dark brown/dark greyish brown slightly sandy gravelly clay with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of brick, concrete, charcoal, metal rebar, ceramic, tile, pottery and broken glass. Cobbles of angular concrete and whole brick. <i>SPT at 1.20m bgl</i> <i>N = 3 (1, 1/1, 1, 0, 1)</i>	1
		2.00 - 2.45	B				2.00	48.00		Stiff greyish brown and brown mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone, mudstone and rare coal. <i>SPT at 2.00m bgl</i> <i>N = 10 (1, 0/1, 1, 3, 5)</i>	2
		3.00 - 3.45	U							<i>U100 at 3.00m bgl</i> <i>31 Blows 100% Recovery</i>	3
		4.00 - 4.45	D				3.90	46.10		Firm brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone and mudstone. <i>SPT at 4.00m bgl</i> <i>N = 11 (1, 2/2, 2, 3, 4)</i>	4
		5.00 - 5.45	B							<i>SPT at 5.00m bgl</i> <i>N = 11 (1, 1/2, 3, 2, 4)</i>	5
		6.50 - 6.95	D				6.00	44.00		Stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of sandstone and mudstone. <i>SPT at 6.50m bgl</i> <i>N = 14 (1, 2/3, 3, 3, 5)</i>	6
		8.00 - 8.45	B								7
											8
Continued on next sheet											
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.50m bgl, RC from 22.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.											

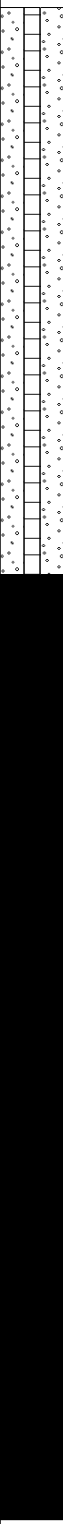
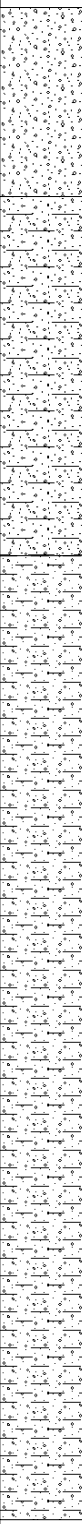
							Rotary Core Log			Borehole No. CP/RC02		
Project Name: Manchester Life Plot A							Project No. 080866		Co-ords: 385110.96 - 398771.65		Sheet 2 of 4 Hole Type CP+RC	
Location: Jersey Street, Manchester, M4 6JW							Level: 50.00		Scale 1:40		Logged By LW	
Client: Mace							Dates: 04/11/2024 - 06/11/2024					
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description		
				TCR	SCR	RQD						
		9.50 - 9.95	U							SPT at 8.00m bgl N = 22 (2,3/3,4,6,9)	9	
										U100 at 9.50m bgl 38 Blows 100% Recovery	10	
		11.00 - 11.45	D							SPT at 11.0m bgl N = 31 (3,4/6,7,8,10)	11	
		12.50 - 12.95	B							SPT at 12.50m bgl N = 39 (4,5/6,9,10,12)	12	
		14.00 - 14.45	D							SPT at 14.00m bgl N = 29 (2,5/4,6,8,11)	14	
		15.50 - 15.95	D							SPT at 15.50m bgl N = 40 (3,4/7,10,11,12)	15	
										Continued on next sheet	16	
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.50m bgl, RC from 22.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.												

							Rotary Core Log				Borehole No. CP/RC02		
Project Name: Manchester Life Plot A							Project No. 080866		Co-ords: 385110.96 - 398771.65		Sheet 3 of 4 Hole Type CP+RC		
Location: Jersey Street, Manchester, M4 6JW							Level: 50.00		Scale 1:40		Logged By LW		
Client: Mace							Dates: 04/11/2024 - 06/11/2024						
Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description			
				TCR	SCR	RQD							
		17.00 - 17.45	U				17.00	33.00		Firm brown silty slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded to rounded of sandstone, siltstone and mudstone. U100 at 17.00m bgl 34 Blows 95% Recovery		17	
		18.50 - 18.95	B							SPT at 18.50m bgl N = 20 (2,3/4,4,5,7)		18	
		20.00 - 20.45	D				19.60	30.40		Stiff brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, rounded of sandstone, siltstone and mudstone. SPT at 20.00m bgl N = 47 (5,7/9,11,13,14)		19	
		21.50 - 21.95	B				21.00	29.00		Dense grey, brown and reddish brown slightly clayey SAND & GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular of grey and reddish brown mudstone. (Residual Soils). SPT at 21.50m bgl N = 50 (7,11/13,18,19 for 30mm)		20	
							22.10	27.90		Completely weathered, extremely weak reddish brown mudstone recovered as firm reddish brown CLAY. (Weathered Bedrock).		21	
							22.50	27.50		Extremely weak thickly laminated reddish brown MUDSTONE. Fractures are medium spaced, 10 degrees stepped smooth clay infill.		22	
							22.96	27.04		From 22.50m to 22.64m, no recovery, potentially due to above SPT. SPT at 22.50m bgl N = 50 (19,6 for 70mm/40,10 for 70mm) Weak thinly laminated reddish brown medium grained SANDSTONE. Fractures are very closely to closely spaced, 1-5 degrees planar rough sand infill.		23	
										From 22.96m to 23.11m sandstone is light grey.		24	
		Continued on next sheet											
		Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.50m bgl, RC from 22.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.											
													

						Rotary Core Log				Borehole No. CP/RC02 Sheet 4 of 4	
Project Name: Manchester Life Plot A						Project No. 080866		Co-ords: 385110.96 - 398771.65		Hole Type CP+RC	
Location: Jersey Street, Manchester, M4 6JW								Level: 50.00		Scale 1:40	
Client: Mace								Dates: 04/11/2024 - 06/11/2024		Logged By LW	
Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		24.00 - 25.50	NR	91	91	61	24.24	25.76		From 24.00m to 24.14m, no recovery.	25
			NI							From 24.14m to 24.24m, not intact, recovered as reddish brown coarse gravel of medium grained sandstone.	
			8							Medium strong reddish brown medium grained SANDSTONE. Fractures are medium spaced, 1-8 degrees planar smooth sand infill.	
		25.50 - 27.00	NR	91	89	56	25.63	24.37		From 25.50m to 25.63m, no recovery.	26
			10							Weak reddish brown medium grained SANDSTONE. Fractures are closely spaced, 0-5 degrees planar smooth and undulating smooth sand infill.	
			11							From 26.21m to 26.24m, not intact, recovered as coarse gravel of sandstone.	
		27.00 - 28.50	NR	97	95	79	28.93	21.07		From 27.00m to 27.05m, no recovery.	27
			6							From 27.05m to 27.19m, 1 vertical fracture 90 degrees planar smooth sand infill.	
			22							From 27.21m to 27.30m, extremely weak reddish brown MUDSTONE. Fractures are closely spaced, 0-5 degrees, stepped smooth clay infill.	
			7								
		28.50 - 30.00	8	100	100	85				From 27.72m to 27.75m, not intact, recovered as reddish brown medium to coarse gravel of mudstone.	28
							30.00	20.00		From 28.68m to 28.82m, extremely weak light grey and reddish brown MUDSTONE. Fractures are closely spaced, 0-2 degrees, planar smooth clay infill.	29
										Extremely weak to weak reddish brown MUDSTONE. Fractures are very closely to medium spaced, 5-30 degrees stepped smooth clay infill.	
										End of borehole at 30.00 m	30
									31		
									32		
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 22.50m bgl, RC from 22.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.											

							Rotary Core Log			Borehole No. CP/RC03 Sheet 1 of 4	
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385161.95 - 398797.51			Hole Type CP+RC		
Location: Jersey Street, Manchester, M4 6JW				Level: 50.62			Scale 1:40				
Client: Mace				Dates: 06/11/2024 - 07/11/2024			Logged By LW / JP				
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.50	ES				1.65	48.97		MADE GROUND: Dark brown and dark greyish brown, slightly sandy, gravelly clay with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick, concrete, ceramic tiles, slate, metal, broken glass, and broken pottery. Cobbles of whole brick.	1
		2.00 - 2.45	D							MADE GROUND: Grey mottled brown clayey sandy gravel with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick. Cobbles are of whole brick.	2
		3.00 - 3.45	D				3.10	47.52		SPT at 3.00m bgl N = 18 (1,1/3,4,5,6) Stiff, brown slightly andy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangualr to subrounded of sandstone and mudstone.	3
		4.00 - 4.45	U								
		5.00 - 5.45	B							U100 at 4.00m bgl 46 Blows 90% Recovery SPT at 5.00m bgl N = 19 (2,2/3,4,5,7)	4
	6.50 - 6.95	D							SPT at 6.50m bgl N = 20 (2,3/4,5,5,6)	5	
	8.00 - 8.45	U									6
											7
											8
Continued on next sheet											
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 24.50m bgl, RC from 24.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.											
											

				Rotary Core Log				Borehole No. CP/RC03 Sheet 2 of 4			
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385161.95 - 398797.51		Hole Type CP+RC			
Location: Jersey Street, Manchester, M4 6JW				Level: 50.62		Scale 1:40					
Client: Mace				Dates: 06/11/2024 - 07/11/2024		Logged By LW / JP					
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 9.95	D							U100 at 8.00m bgl 29 Blows 100% Recovery	9
										SPT at 9.50m bgl N = 33 (3,5/7,8,8,10)	10
		11.00 - 11.45	D							SPT at 11.00m bgl N = 24 (2,3/3,5,7,9)	11
		12.50 - 12.95	D							SPT at 12.50m bgl N = 45 (4,6/8,10,12,15)	12
		14.00 - 14.45	B					13.40	37.22		Dense, brown, clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone, siltstone and mudstone.
		15.50 - 15.95	D							SPT at 14.00m bgl N = 50 (10,15 for 10mm/27,23 for 30mm)	14
										SPT at 15.50m bgl N = 50 (12,13 for 20mm/25,25 for 40mm)	15
										Continued on next sheet	16
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 24.50m bgl, RC from 24.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.											
											

							Rotary Core Log				Borehole No. CP/RC03 Sheet 3 of 4				
Project Name: Manchester Life Plot A				Project No. 080866			Co-ords: 385161.95 - 398797.51				Hole Type CP+RC				
Location: Jersey Street, Manchester, M4 6JW								Level: 50.62				Scale 1:40			
Client: Mace								Dates: 06/11/2024 - 07/11/2024				Logged By LW / JP			
Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description					
				TCR	SCR	RQD									
		17.00 - 17.45	B				17.00	33.62		Dense, brown, clayey, slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone and mudstone. SPT at 17.00m bgl N = 50 (8,10/14,17,19 for 20mm)					
		18.50 - 18.95	D									SPT at 18.50m bgl N = 50 (9,13/19,24,7 for 60mm)			
		19.00 - 19.50	B				18.90	31.72						Stiff to very stiff, brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of sandstone , siltstone and mudstone.	
		20.00 - 20.45	D												
		21.50 - 21.95	B									SPT at 21.50m bgl N = 50 (7,9/12,14,18,6 for 70mm)			
		23.00	D							SPT at 23.00m bgl N = 50 (12,13/14,20,16 for 55mm)					
							24.00	26.62		Continued on next sheet					
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 24.50m bgl, RC from 24.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.															

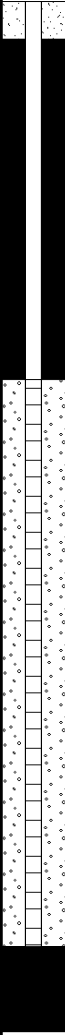
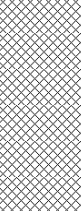
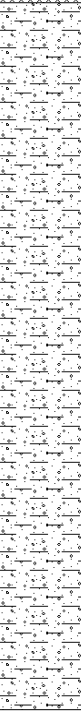


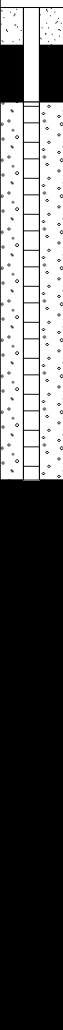
							Rotary Core Log			Borehole No. CP/RC03 Sheet 4 of 4					
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385161.95 - 398797.51			Hole Type CP+RC						
Location: Jersey Street, Manchester, M4 6JW				Level: 50.62			Scale 1:40		Logged By LW / JP						
Client: Mace				Dates: 06/11/2024 - 07/11/2024											
Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description					
				TCR	SCR	RQD									
		24.50 - 26.00	2	100	100	100	29.55	21.07		Extremely weak reddish brown mottled light grey MUDSTONE. Fractures are subhorizontal 5-10 degrees, closely to widely spaced, planar rough.	25				
		26.00 - 27.50	NR	85	85	77				From 26.00 to 26.22m bgl: No Recovery	26				
			2							From 26.91m bgl: Fractures become very closely to closely spaced, 5-15 degrees, stepped smooth with clay infill.	27				
			7												
		27.50 - 28.50	52	30	0	From 27.50 to 27.98m bgl: No Recovery				28					
						9					From 28.28 to 28.50m bgl: Not intact, recovered as a clayey gravel of Mudstone.				
						NI						From 28.50 to 29.10 bgl: No Recovery			
		28.50 - 30.00	NR	60	45	27				From 29.10 to 30.00m bgl: Not intact, recovered as a clayey gravel of Mudstone.	29				
			NI												
			9												
											30.00	20.62		Strong reddish brown and grey SANDSTONE. Fractures are medium spaced 5-10degrees planar smooth sand infill.	30
														End of borehole at 30.00 m	31
										32					

Remarks

Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. CP from ground level to 24.50m bgl, RC from 24.50 to 30.00m bgl. Borehole completed at 30.00m bgl. Coordinates and levels surveyed in on site.

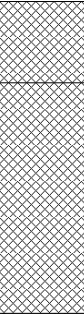
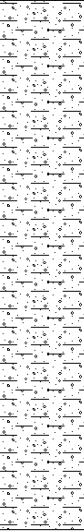


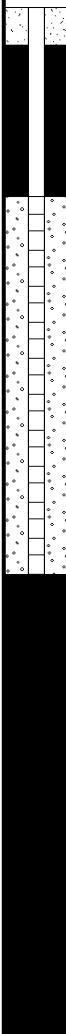
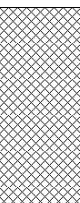
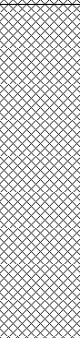
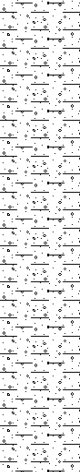
					Borehole Log			Borehole No. WS02 Sheet 1 of 1			
Project Name: Manchester Life Plot A					Project No. 080866		Co-ords: 385156.79 - 398737.65		Hole Type WS		
Location: Jersey Street, Manchester, M4 6JW					Level: 49.47		Scale 1:40		Logged By LW		
Client: Mace					Dates: 05/11/2024 - 05/11/2024						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30	ES		0.21 0.26	49.26 49.21		MADE GROUND: Light grey concrete with metal rebar.	1		
		1.20		N=8 (1,2/2,2,2,2)				MADE GROUND: Red sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of brick.			
		2.00		N=7 (0,0/0,3,2,2)	1.71	47.76		MADE GROUND: Dark brown and black clayey gravelly sand with occasional cobbles. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of brick, broken glass, ceramic, sandstone and metal. Cobbles of angular brick.			
		3.00 3.00 - 3.45	D	N=25 (3,4/5,5,7,8)				Firm - stiff brown and grey mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of mudstone and sandstone.	2		
		4.00		N=13 (2,2/3,4,3,3)					3		
		5.00		N=17 (3,3/4,4,4,5)	5.45	44.02			4		
							End of borehole at 5.45 m		5		
									6		
									7		
									8		
Remarks Breaker used to break through the concrete hardstanding surface layer, hand excavated service pit past this to 1.20m bgl. Perched water encountered at 1.40m bgl and 2.15m bgl, described as slow seepages. Borehole completed at 5.45m bgl. Coordinates and levels surveyed in on site.											

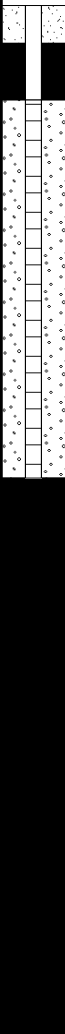
					Borehole Log			Borehole No. WS03 Sheet 1 of 1		
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385108.17 - 398760.88		Hole Type WS		
Location: Jersey Street, Manchester, M4 6JW				Level: 49.78		Scale 1:40		Logged By LW		
Client: Mace				Dates: 05/11/2024 - 05/11/2024						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.17	49.61		MADE GROUND: Light grey slightly clayey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of limestone.	1	
					0.57	49.21				MADE GROUND: Dark brown very sandy gravelly clay with occasional cobbles. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of brick, limestone, concrete, glass and ceramic. Cobbles of brick.
		0.80	ES							MADE GROUND: Black very gravelly sandy clay with cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of clinker, charcoal, brick, broken glass and twigs. Cobbles of brick.
		1.20		N=0 (0,0/0,0,0,0)				MADE GROUND: Black very gravelly sandy clay with cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of clinker, charcoal, brick, broken glass and twigs. Cobbles of brick.	2	
		2.00		N=1 (0,0/1,0,0,0)				(Canal Infill). Very strong odour of diesel and kerosene.		
		2.50			47.28					
		3.00		N=17 (2,2/3,4,5,5)				Stiff grey and brown laminated slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of sandstone and mudstone.	3	
		4.00		N=13 (1,2/2,3,4,4)						4
		5.00		N=29 (4,6/6,6,8,9)						
5.00 - 5.45	D				5.45	44.33		End of borehole at 5.45 m	5	
									6	
									7	
									8	
Remarks Hand excavated service pit from ground level to 1.20m bgl. Perched water encountered at 0.57m bgl, described as a slow seepage. Borehole completed at 5.45m bgl. Coordinates and levels surveyed in on site.										
										

					Borehole Log				Borehole No. WS04 Sheet 1 of 1		
Project Name: Manchester Life Plot A					Project No. 080866		Co-ords: 385096.46 - 398780.77			Hole Type WS	
Location: Jersey Street, Manchester, M4 6JW					Level: 50.14			Scale 1:40			
Client: Mace					Dates: 04/11/2024 - 04/11/2024			Logged By LW			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.25	ES					MADE GROUND: Dark brown/dark greyish brown slightly sandy gravelly clay with occasional cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, ceramic, concrete, wood, charcoal, metal. Cobbles of angular brick.	1		
		1.20		N=1 (1,0/0,0,0,1)							
		2.00		N=22 (3,4/4,5,6,7)	2.00	48.14		Stiff greyish brown and brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subrounded of mudstone, sandstone and rare coal.	2		
		3.00 3.00 - 3.45	D	N=24 (5,5/4,6,6,8)							
		4.00		N=24 (5,5/5,6,6,7)							
	5.00		N=14 (3,2/4,3,3,4)				End of borehole at 5.45 m	3			
				5.45	44.69				4		
									5		
									6		
									7		
									8		
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. Borehole completed at 5.45m bgl. Coordinates and levels surveyed in on site.											

					Borehole Log			Borehole No. WS05 Sheet 1 of 1		
Project Name: Manchester Life Plot A					Project No. 080866		Co-ords: 385126.46 - 398775.83		Hole Type WS	
Location: Jersey Street, Manchester, M4 6JW					Level: 49.78		Scale 1:40		Logged By LW	
Client: Mace					Dates: 05/11/2024 - 05/11/2024					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		1.20	ES	N=11 (3,2/4,3,2,2)	1.00	48.78		MADE GROUND: Dark brown and dark greyish brown slightly sandy gravelly clay with occasional cobbles. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular of brick, concrete, sandstone, slate, charcoal, ceramic, metal. Cobbles of subangular to angular brick.	1	
		1.20			1.40	48.38		MADE GROUND: Black clayey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular to angular of charcoal, brick, ash and clinker.		
		2.00	D	N=16 (1,3/3,3,4,6)	3.10	46.68		(Potential Canal Infill). <i>Slight odour of diesel and kerosene.</i> MADE GROUND: Dark greyish brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular of brick.	2	
		3.00						N=20 (5,4/4,4,5,7)		
		4.00 4.00 - 4.45	N=21 (2,3/4,5,6,6)		5.45	44.33		Stiff brown and grey mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. gravel is fine to coarse subrounded of sandstone and mudstone.	4	
5.00	N=24 (6,5/6,5,7,6)	5								
							End of borehole at 5.45 m		6	
									7	
									8	
Remarks Hand excavated service pit from ground level to 1.20m bgl. Perched water encountered at 1.20m bgl described as a slow seepage. Borehole completed at 5.45m bgl. Coordinates and levels surveyed in on site.										

					Borehole Log			Borehole No. WS06 Sheet 1 of 1		
Project Name: Manchester Life Plot A					Project No. 080866		Co-ords: 385127.50 - 398792.15		Hole Type WS	
Location: Jersey Street, Manchester, M4 6JW					Level: 50.42		Scale 1:40		Logged By LW	
Client: Mace					Dates: 04/11/2024 - 04/11/2024					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.45	ES		0.43	49.99		MADE GROUND: Dark brown sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, concrete, ceramic, pottery, broken glass.	1	
		1.20		N=1 (1,0/0,0,0,1)						
		2.00 2.00 - 2.45	D	N=20 (2,3/4,4,5,7)	1.65	48.77		MADE GROUND: Greyish brown mottled grey slightly slightly gravelly clay. Sand is fine to coarse subangular to subrounded of brick and charcoal.	2	
		3.00		N=19 (3,3/3,5,5,6)						
		4.00		N=22 (3,5/5,5,5,7)						
				4.45	45.97	End of borehole at 4.45 m			3	
									4	
									5	
									6	
									7	
									8	
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. Borehole terminated at 4.45m bgl due to continuous collapse. Coordinates and levels surveyed in on site.										

					Borehole Log			Borehole No. WS07 Sheet 1 of 1			
Project Name: Manchester Life Plot A					Project No. 080866		Co-ords: 385143.38 - 398788.67		Hole Type WS		
Location: Jersey Street, Manchester, M4 6JW							Level: 50.00		Scale 1:40		
Client: Mace							Dates: 05/11/2024 - 05/11/2024		Logged By LW		
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.70	ES		1.10	48.90		MADE GROUND: Dark brown, greyish brown and black slightly sandy gravelly clay with occasional cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, sandstone, glass, ceramic. Cobbles of angular brick.			
		1.20		N=3 (1,0/1,0,1,1)							MADE GROUND: Dark greyish brown slightly sandy gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular of brick.
		2.00		N=14 (1,0/2,3,4,5)	2.90	47.10		Stiff brown and grey laminated slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded of sandstone and mudstone.			
		3.00		N=16 (2,2/3,4,3,6)							
		4.00		N=15 (3,3/3,3,4,5)							
		5.00 5.00 - 5.45	D	N=27 (3,3/5,6,7,9)	5.45	44.55		End of borehole at 5.45 m			
										6	
										7	
										8	
Remarks Hand excavated service pit from ground level to 1.20m bgl. No groundwater encountered. Borehole completed at 5.45m bgl. Coordinates and levels surveyed in on site.											

					Borehole Log			Borehole No. WS08 Sheet 1 of 1		
Project Name: Manchester Life Plot A					Project No. 080866		Co-ords: 385168.52 - 398793.91		Hole Type WS	
Location: Jersey Street, Manchester, M4 6JW					Level: 49.99		Scale 1:40		Logged By LW	
Client: Mace					Dates: 04/11/2024 - 04/11/2024					
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.40	49.59		MADE GROUND: Brown and black sandy gravelly clay with cobbles and occasional roots and rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, broken glass, metal, wood, concrete, tiles. Cobbles of angular brick.	1	
					0.73	49.26				
		1.20		N=1 (1,1/1,0,0,0)				MADE GROUND: Black very clayey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, charcoal, sandstone, twigs, ash, clinker. (Canal Infill). <i>Very strong odour of diesel and kerosene. Colorless sheen on the surface.</i>	2	
		2.00		N=0 (1,0/0,0,0,0)						
					2.50	47.49		MADE GROUND: Black slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of ash, clinker, brick. (Canal Infill). <i>Very strong odour of diesel and kerosene. Colorless sheen on the surface.</i>	3	
		3.00		N=17 (1,2/4,4,4,5)						
4.00 4.00 - 4.45	D	N=16 (2,2/4,3,4,5)				Stiff greyish brown and brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	4			
5.00 5.00	ES	N=24 (3,3/5,5,6,8)								
			5.45	44.54	End of borehole at 5.45 m				5	
										6
										7
										8
Remarks Hand excavated service pit from ground level to 1.20m bgl. Perched water encountered at 0.20m bgl described as a slow seepage. Borehole completed at 5.45m bgl. Coordinates and levels surveyed in on site.										

				Trial Pit Log			Trialpit No TP01 Sheet 1 of 1				
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385121.87 - 398769.10 Level: 49.79		Date 13/11/2024			
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m): Depth 3.00			2.5 		Scale 1:40 Logged LW		
Client: Mace											
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
	Depth	Type	Results								
▼	2.50	ES		0.52	49.27		MADE GROUND: Dark brown clayey sandy gravel with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, concrete, metal, ceramic, tile and textile. Cobbles of angular whole brick.				1
							MADE GROUND: Black gravelly sandy clay with frequent cobbles and boulders. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, wood, glass, metal and lead. Cobbles of angular whole brick. Boulders of thin wooden planks. (Canal Infill). <i>Strong diesel odour, PID = 42.3ppm.</i> <i>Iridescent sheen on arisings.</i>				
				3.00	46.79		End of pit at 3.00 m				3
											4
											5
											6
											7
											8
Remarks: Machine Excavated Trial Pit to 3.00m bgl. Perched water encountered at 0.60m bgl described as a fast influx, sides of the trial pit collapsing. Coordinates and levels surveyed in on site.											
Stability: Unstable											

				Trial Pit Log			Trialpit No TP02 Sheet 1 of 1		
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385093.46 - 398769.66 Level: 50.30		Date 13/11/2024	
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m): Depth 3.00		2.5 		Scale 1:40 Logged LW	
Client: Mace									
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.10	ES					MADE GROUND: Dark greyish brown and black sandy gravelly clay with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular of ash, brick, slate, charcoal, concrete, ceramic, tiles, metal and clinker. Cobbles of angular brick and clinker.		
				1.40	48.90		MADE GROUND: Black slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone, rare brick and charcoal.		
				2.08	48.22		(Potential Canal Infill). <i>Odour of diesel, PID = 12.0ppm.</i> Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular of sandstone and mudstone.		
				3.00	47.30		End of pit at 3.00 m		
Remarks: Machine Excavated Trial Pit to 3.00m bgl. Perched water encountered at 1.07m bgl described as a slow seep. Coordinates and levels surveyed in on site.									
Stability: Stable								AGS	

				Trial Pit Log			Trialpit No TP03 Sheet 1 of 1			
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385133.72 - 398785.01 Level: 50.09		Date 13/11/2024		
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m):		2.5		Scale 1:40		
Client: Mace				Depth 3.00				Logged LW		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
▼	0.25	ES					MADE GROUND: Brown/black clayey gravelly sand with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of ash, brick, concrete, metal, slate, charcoal and ceramic. Cobbles of angular whole brick.			
				0.72	49.37		MADE GROUND: Orangish brown clayey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of clinker and brick. MADE GROUND: Black slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular of brick, twigs, wood and ceramic. (Potential Canal Infill). <i>Faint odour of diesel, PID = 5.4ppm.</i>			
				0.84	49.25					
					1.99	48.10		Stiff grey mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded of sandstone and mudstone.		
				3.00	47.09		End of pit at 3.00 m			
Remarks: Machine Excavated Trial Pit to 3.00m bgl. Perched water encountered at 0.85m bgl described as a medium influx, sides of the trial pit collapsing. Coordinates and levels surveyed in on site.									AGS	
Stability: Unstable										

				Trial Pit Log			Trialpit No TP04 Sheet 1 of 1		
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385109.38 - 398792.30 Level: 50.48		Date 13/11/2024	
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m):		2.5		Scale 1:40	
Client: Mace				Depth 3.00				Logged LW	
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
	0.75	ES		0.07	50.40		MADE GROUND: Dark grey/black tarmac.		
				0.39	50.08		MADE GROUND: Yellowish grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of limestone.		
							MADE GROUND: Dark greyish brown sandy gravelly clay with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, concrete, slate, metal, wood and ceramic. Cobbles of subangular brick and concrete.		
				1.34	49.14		Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded of sandstone and mudstone.		
3.00	47.48	End of pit at 3.00 m							
									1
									2
									3
									4
									5
									6
									7
									8
Remarks: Machine Excavated Trial Pit to 3.00m bgl. No groundwater encountered. Coordinates and levels surveyed in on site.									AGS
Stability: Stable									

				Trial Pit Log			Trialpit No TP05 Sheet 1 of 1			
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385139.87 - 398775.93 Level: 49.86		Date 13/11/2024		
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m):		2.5		Scale 1:40		
Client: Mace				Depth 3.00				Logged LW		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
	0.75	ES		0.21	49.65		MADE GROUND: Grey concrete with metal rebar.			
				0.30	49.56		MADE GROUND: Yellow and grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of limestone.			
				0.60	49.26		MADE GROUND: Dark brown and black clayey gravelly sand with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, ceramic, tile and metal.			
							MADE GROUND: Black clayey gravel. Gravel is fine to coarse subangular to angular of brick, metal, wood, nails and glass.			
							(Canal Infill). <i>Strong diesel odour, PID = 32.5ppm.</i> <i>Iridescent sheen on arisings.</i>			
				2.40	47.46		Stiff brown and grey mottled slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded of sandstone and mudstone.			
				3.00	46.86		End of pit at 3.00 m			
Remarks: Machine Excavated Trial Pit to 3.00m bgl. Perched water encountered at 0.60m bgl described as a medium influx. Coordinates and levels surveyed in on site.									AGS	
Stability: Unstable										

				Trial Pit Log			Trialpit No TP06 Sheet 1 of 1					
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385140.24 - 398803.52 Level: 50.83		Date 13/11/2024				
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m): Depth 3.00			2.5 		Scale 1:40 Logged LW			
Client: Mace												
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description					
	Depth	Type	Results									
	0.50	ES		0.96	49.87		MADE GROUND: Dark grey and dark brown sandy gravelly clay with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular of brick, concrete, metal, slate, charcoal, broken glass, ceramic, timber, wires, metal chains, plastic, foam and timber. Cobbles of concrete paving slabs, broken metal pipes, timber and whole brick.				1	
							(Potential demolition rubble). MADE GROUND: Sandstone masonry. (Potentially related to historical buildings on site)					
					1.84	48.99		Stiff brown and grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded of sandstone and mudstone.				2
					3.00	47.83		End of pit at 3.00 m				3
											4	
											5	
											6	
											7	
											8	
Remarks: Machine Excavated Trial Pit to 3.00m bgl. Perched water encountered at 1.84m bgl described as a slow seep. Coordinates and levels surveyed in on site.											AGS	
Stability: Stable												

				Trial Pit Log			Trialpit No TP08 Sheet 1 of 1			
Project Name: Manchester Life Plot A				Project No. 080866		Co-ords: 385154.31 - 398791.53 Level: 50.30		Date 13/11/2024		
Location: Jersey Street, Manchester, M4 6JW				Dimensions (m):		2.5		Scale 1:40		
Client: Mace				Depth 3.00				Logged LW		
Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
	Depth	Type	Results							
	1.20	ES		0.83	49.46		MADE GROUND: Dark brown very sandy clayey gravel with frequent cobbles. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, metal, wire, ceramic, slate, charcoal and clinker. Cobbles of angular whole brick.			1
				1.63	48.66		MADE GROUND: Black slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of brick, clinker and wood. (Potential canal infill). <i>Faint odour of diesel, PID = 4.8ppm.</i>			
				3.00	47.30		Stiff grey mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.			2
				End of pit at 3.00 m			3			
										4
										5
										6
										7
										8
Remarks: Machine Excavated Trial Pit to 3.00m bgl. No groundwater encountered. Coordinates and levels surveyed in on site.										AGS
Stability: Stable										

Appendix C – Chemical Laboratory Test Results

FINAL ANALYTICAL TEST REPORT

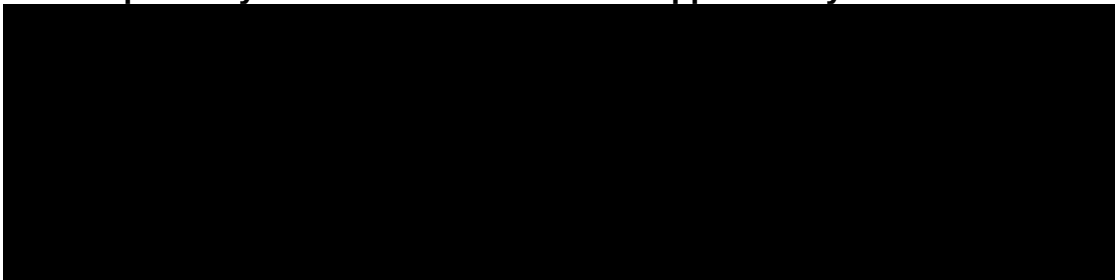
Envirolab Job Number: 21/00803
Issue Number: 1
Date: 03 February, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Siobhán Hyde/Zoe Henderson
Project Name: Ancoats Plot A
Project Ref: B076740
Order No: EBMA2674
Date Samples Received: 28/01/21
Date Instructions Received: 28/01/21
Date Analysis Completed: 03/02/21

Prepared by:

Approved by:



Envirolab Job Number: 21/00803

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00803/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	R-A2									
Depth to Top	0.80									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4AB									
% Stones >10mm _A	15.5							% w/w	0.1	A-T-044
pH _D ^{M#}	8.74							pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.08							g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	2.6							% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	24							mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0							mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.1							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	45							mg/kg	1	A-T-024s
Chromium _D ^{M#}	15							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	87							mg/kg	1	A-T-024s
Mercury _D	<0.17							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	19							mg/kg	1	A-T-024s
Selenium _D ^{M#}	2							mg/kg	1	A-T-024s
Zinc _D ^{M#}	63							mg/kg	5	A-T-024s

Envirolab Job Number: 21/00803

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00803/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	R-A2									
Depth to Top	0.80									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4AB									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

Envirolab Job Number: 21/00803

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00803/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	R-A2									
Depth to Top	0.80									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4AB									
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.03							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.07							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.40							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.40							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.40							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.17							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.14							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.41							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.05							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.59							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.02							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.20							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.25							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.57							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	3.70							mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/00803

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00803/1									
Client Sample No	ES1									
Client Sample ID	R-A2									
Depth to Top	0.80									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4AB									
TPH CWG										
Ali >C5-C6 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	2							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	4							mg/kg	1	A-T-055s
Total Aliphatics _A	7							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1							mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1							mg/kg	1	A-T-055s
Aro >C12-C16 _A	3							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	11							mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	29							mg/kg	1	A-T-055s
Total Aromatics _A	43							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	50							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01							mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/00803
Project:	Ancoats Plot A	Date Received:	28/01/2021 (am)
Clients Project No:	B076740	Cool Box Temperatures (°C):	4.9

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/00931
Issue Number: 1

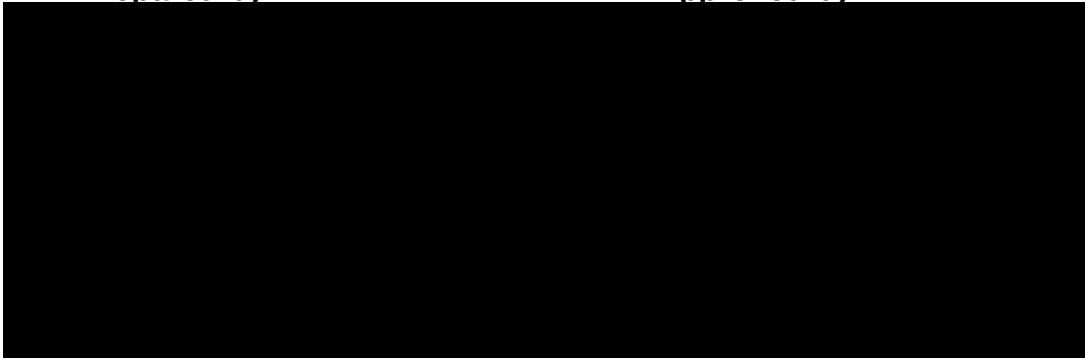
Date: 09 February, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Siobhán Hyde/Zoe Henderson
Project Name: Ancoats Plot A
Project Ref: B076740
Order No: EBMA2682
Date Samples Received: 01/02/21
Date Instructions Received: 01/02/21
Date Analysis Completed: 08/02/21

Prepared by:

Approved by:



Envirolab Job Number: 21/00931

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00931/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	R-A1									
Depth to Top	0.40									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4A									
% Stones >10mm _A	8.9							% w/w	0.1	A-T-044
pH _D ^{M#}	8.96							pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05							g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	7.1							% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	<1							mg/kg	1	A-T-024s
Boron (water soluble) _D	4.6							mg/kg	1	A-T-027s
Cadmium _D ^{M#}	5.8							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	4180							mg/kg	1	A-T-024s
Chromium _D ^{M#}	148							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	1240							mg/kg	1	A-T-024s
Mercury _D	1.46							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	163							mg/kg	1	A-T-024s
Selenium _D ^{M#}	6							mg/kg	1	A-T-024s
Zinc _D ^{M#}	5260							mg/kg	5	A-T-024s

Envirolab Job Number: 21/00931

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00931/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	R-A1									
Depth to Top	0.40									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4A									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

Envirolab Job Number: 21/00931

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00931/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	R-A1									
Depth to Top	0.40									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4A									
PAH-16MS										
Acenaphthene _A ^{M#}	0.58							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.02							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.31							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	2.36							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.09							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	1.55							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.14							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.18							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	6.91							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.32							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	8.09							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	2.39							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.14							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.26							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	19.4							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	9.30							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	52							mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/00931

Client Project Name: Ancoats Plot A

Client Project Ref: B076740

Lab Sample ID	21/00931/1									
Client Sample No	ES1									
Client Sample ID	R-A1									
Depth to Top	0.40									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4A									
TPH CWG										
Ali >C5-C6 _A [#]	<0.05							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	0.15							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<20							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	31							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	211							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1350							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	3880							mg/kg	1	A-T-055s
Total Aliphatics _A	5470							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.05							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	0.06							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<20							mg/kg	1	A-T-055s
Aro >C10-C12 _A	<20							mg/kg	1	A-T-055s
Aro >C12-C16 _A	103							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	1660							mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	1830							mg/kg	1	A-T-055s
Total Aromatics _A	3600							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	9070							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.05							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	0.06							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	0.10							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.05							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	0.11							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.05							mg/kg	0.01	A-T-022s

REPORT NOTES

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Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/00931
Project:	Ancoats Plot A	Date Received:	01/02/2021 (am)
Clients Project No:	B076740	Cool Box Temperatures (°C):	2.4

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

FINAL ANALYTICAL TEST REPORT

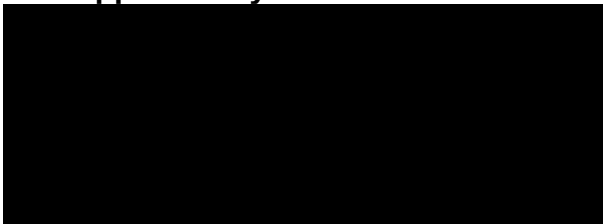
Envirolab Job Number: 24/10960
Issue Number: 1

Date: 20 November, 2024

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Jonathan Lord/Lucy Woods
Project Name: Phoenix Iron Works / Manchester Life Plot A
Project Ref: B080866
Order No: 19246
Date Samples Received: 08/11/24
Date Instructions Received: 11/11/24
Date Analysis Completed: 20/11/24

Approved by:



Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
% Moisture at <40C _A	19.3	18.6	13.9	19.6	11.2	21.0	24.3	% w/w	0.1	A-T-044
% Stones >10mm _A	1.6	<0.1	<0.1	<0.1	41.6	<0.1	2.2	% w/w	0.1	A-T-044
pH _D ^{M#}	7.97	8.16	7.90	8.04	8.96	7.89	7.98	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	1.06	0.34	0.08	1.27	0.50	0.24	0.37	g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1	4	<1	3	40	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	15.0	4.8	6.2	60.7	4.3	41.1	9.0	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	18	6	17	6	9	14	17	mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	2.1	1.1	<1.0	3.5	<1.0	1.4	1.8	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.8	<0.5	10.1	0.6	<0.5	0.9	0.8	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	79	30	131	46	55	246	216	mg/kg	1	A-T-024s
Chromium _D ^{M#}	32	32	39	11	10	61	20	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	192	32	220	141	188	644	686	mg/kg	1	A-T-024s
Mercury _D	0.30	<0.17	<0.17	1.34	0.38	0.25	0.64	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	35	39	54	13	20	49	28	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	116	68	337	171	85	292	528	mg/kg	5	A-T-024s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	Chrysotile	Chrysotile	NAD	Amosite & Amosite & Chrysotile	NAD			A-T-045
Asbestos Matrix (visual) _o	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _o	-	-	Loose Fibres	Loose Fibres	-	Loose Fibres	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _o	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _o	-	-	<0.001	0.001	-	0.014	-	% w/w	0.001	A-T-054

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
PAH-16MS										
Acenaphthene _A ^{M#}	15.1	0.04	<0.10	3.23	3.50	0.77	2.80	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.85	<0.01	<0.10	0.36	0.21	0.20	0.12	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	16.6	0.05	<0.20	5.22	3.62	2.01	2.17	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	31.3	0.11	<0.40	15.7	6.84	2.75	2.48	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	23.7	0.11	<0.40	13.3	6.00	2.48	1.21	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	31.8	0.14	<0.50	17.2	7.50	2.86	1.41	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	15.2	0.07	<0.50	8.25	3.66	1.78	0.52	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	11.2	<0.07	<0.70	6.44	2.63	1.01	0.44	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	42.1	0.11	<0.60	17.4	7.89	3.11	2.14	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	3.78	<0.04	<0.40	2.01	0.90	<0.40	0.13	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	61.7	0.29	<0.80	32.7	15	7.65	19.9	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	10.8	0.02	<0.10	2.21	2.67	1.22	2.22	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	14.6	0.07	<0.30	7.84	3.39	1.71	0.49	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	4.58	<0.03	<0.30	0.55	1.87	<0.30	0.31	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	65.6	0.20	0.50	23.8	15.1	9.15	3.84	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	56.6	0.27	<0.70	30.6	13.8	7.47	16.6	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	406	1.48	<0.80	187	94.6	44.2	56.8	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
SVOC										
4-Bromophenyl phenyl ether _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Hexachlorobenzene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Diethyl phthalate _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Dimethyl phthalate _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Dibenzofuran _A	-	-	<100	-	-	-	369	µg/kg	100	A-T-052s
Carbazole _A	-	-	<100	-	-	-	134	µg/kg	100	A-T-052s
Butylbenzyl phthalate _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate _A	-	-	1920	-	-	-	<500	µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
4-Nitrophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
3+4-Methylphenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
4-Chloro-3-methylphenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2-Nitrophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2-Methylphenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2-Chlorophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2,6-Dinitrotoluene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2,4-Dinitrotoluene _A	-	-	<100	-	-	-	196	µg/kg	100	A-T-052s
2,4-Dimethylphenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2,4-Dichlorophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2,4,6-Trichlorophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2,4,5-Trichlorophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
1,4-Dichlorobenzene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
1,3-Dichlorobenzene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
1,2-Dichlorobenzene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2-Chloronaphthalene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
2-Methylnaphthalene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Acenaphthylene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Acenaphthene _A	-	-	<100	-	-	-	1160	µg/kg	100	A-T-052s
Anthracene _A	-	-	135	-	-	-	1320	µg/kg	100	A-T-052s
Benzo(a)anthracene _A	-	-	495	-	-	-	2910	µg/kg	100	A-T-052s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
Benzo(b)fluoranthene _A	-	-	513	-	-	-	2370	µg/kg	100	A-T-052s
Benzo(k)fluoranthene _A	-	-	130	-	-	-	855	µg/kg	100	A-T-052s
Benzo(a)pyrene _A	-	-	441	-	-	-	2050	µg/kg	100	A-T-052s
Benzo(ghi)perylene _A	-	-	395	-	-	-	1330	µg/kg	100	A-T-052s
Chrysene _A	-	-	460	-	-	-	2920	µg/kg	100	A-T-052s
Fluoranthene _A	-	-	950	-	-	-	8350	µg/kg	100	A-T-052s
Fluorene _A	-	-	<100	-	-	-	891	µg/kg	100	A-T-052s
Indeno(1,2,3-cd)pyrene _A	-	-	346	-	-	-	1240	µg/kg	100	A-T-052s
Phenanthrene _A	-	-	539	-	-	-	3130	µg/kg	100	A-T-052s
Pyrene _A	-	-	999	-	-	-	6450	µg/kg	100	A-T-052s
Naphthalene _A	-	-	<100	-	-	-	178	µg/kg	100	A-T-052s
Dibenzo(ah)anthracene _A	-	-	118	-	-	-	359	µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Phenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Pentachlorophenol _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
n-Dioctylphthalate _A	-	-	<500	-	-	-	<500	µg/kg	500	A-T-052s
n-Dibutylphthalate _A	-	-	1450	-	-	-	158	µg/kg	100	A-T-052s
Nitrobenzene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Isophorone _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Hexachloroethane _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Hexachlorobutadiene _A	-	-	<100	-	-	-	<100	µg/kg	100	A-T-052s
Perylene _A	-	-	130	-	-	-	587	µg/kg	100	A-T-052s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
VOC										
Dichlorodifluoromethane _A	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Chloromethane _A	-	-	<10	-	-	-	<250	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	-	-	<10	-	-	-	<25	µg/kg	1	A-T-006s
Bromomethane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Chloroethane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Dichloromethane _A	-	-	<5	-	-	-	<125	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	-	-	<1	-	-	-	<25 ^U	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	-	-	<1	-	-	-	<25 ^U	µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Bromochloromethane _A [#]	-	-	<5	-	-	-	<125	µg/kg	5	A-T-006s
Chloroform _A [#]	-	-	2	-	-	-	<25 ^U	µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	-	-	<1	-	-	-	<25 ^U	µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	-	-	<2	-	-	-	<50	µg/kg	2	A-T-006s
Benzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Trichloroethene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Dibromomethane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	-	-	<10	-	-	-	<250	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Toluene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	-	-	<1	-	-	-	39 ^U	µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	-	-	<3	-	-	-	<75	µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
Chlorobenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Ethylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
m & p Xylene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
o-Xylene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Styrene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Bromoform _A [#]	-	-	<3	-	-	-	<75	µg/kg	3	A-T-006s
Isopropylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
Bromobenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	-	-	<2	-	-	-	<50	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	-	-	<1	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	-	-	<2	-	-	-	<50	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	-	-	<3	-	-	-	<75	µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	-	-	<1 ^U	-	-	-	<25	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	-	-	<3	-	-	-	<75	µg/kg	3	A-T-006s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS04	WS06	WS08	CP/RC02	WS07	WS05	WS03			
Depth to Top	0.25	0.45	0.50	1.00	0.70	1.20	0.80			
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24	04-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	6AB	6AB	4AB	4AB	4AB	4AB	5A			
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	<0.01	0.09	<0.01	<0.01	<0.01	0.04	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<1	<10	<10	<10	<20	<10	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<10	<1	<10	<10	<10	<20	16	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<10	<1	13	14	<10	<20	19	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	17	<1	34	20	12	<20	34	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	96	<1	753	150	80	1620	598	mg/kg	1	A-T-055s
Total Aliphatics _A	113	<1	799	184	107	1620	667	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	<1	<10	<10	<10	<20	<10	mg/kg	1	A-T-055s
Aro >C10-C12 _A	20	<1	<10	<10	18	<20	14	mg/kg	1	A-T-055s
Aro >C12-C16 _A	174	<1	21	87	94	38	56	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	541	<1	72	424	248	73	189	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	1200	2	64	1240	529	154	300	mg/kg	1	A-T-055s
Total Aromatics _A	1930	2	157	1750	888	266	558	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	2050	2	956	1930	1000	1890	1230	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/8	24/10960/9	24/10960/10					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS02	CP/RC03	CP/RC01							
Depth to Top	0.30	0.50	0.30							
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AB	6AB	5A							
% Moisture at <40C _A	17.5	17.5	11.7					% w/w	0.1	A-T-044
% Stones >10mm _A	4.0	3.9	16.4					% w/w	0.1	A-T-044
pH _D ^{M#}	8.67	8.32	9.39					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.09	1.08	1.02					g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	19.1	6.7	2.4					% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	24	25	3					mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	1.9	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.8	1.0	0.8					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	172	310	43					mg/kg	1	A-T-024s
Chromium _D ^{M#}	22	23	16					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	542	444	63					mg/kg	1	A-T-024s
Mercury _D	0.30	0.43	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	30	33	14					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	96	188	93					mg/kg	5	A-T-024s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/8	24/10960/9	24/10960/10					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS02	CP/RC03	CP/RC01							
Depth to Top	0.30	0.50	0.30							
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AB	6AB	5A							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos Matrix (visual) _D	-	-	-							A-T-045
Asbestos Matrix (microscope) _D	-	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/8	24/10960/9	24/10960/10					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS02	CP/RC03	CP/RC01							
Depth to Top	0.30	0.50	0.30							
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AB	6AB	5A							
PAH-16MS										
Acenaphthene _A ^{M#}	0.29	0.02	0.13					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.12	0.02	0.02					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.64	0.08	0.27					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	2.68	0.29	0.51					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	3.01	0.29	0.42					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	3.44	0.34	0.48					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	1.89	0.19	0.24					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	1.16	0.10	0.18					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	2.65	0.29	0.46					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.45	0.05	0.06					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	5.97	0.58	1.53					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.21	0.03	0.10					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.92	0.19	0.25					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.10	0.05	0.06					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	2.75	0.36	1.32					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	6.12	0.63	1.29					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	33.4	3.51	7.32					mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/10960

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/10960/8	24/10960/9	24/10960/10					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS02	CP/RC03	CP/RC01							
Depth to Top	0.30	0.50	0.30							
Depth To Bottom										
Date Sampled	04-Nov-24	04-Nov-24	04-Nov-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4AB	6AB	5A							
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	1	<1	<1					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	1	<1	<1					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	3	1	3					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	6	2	7					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	21	16	94					mg/kg	1	A-T-055s
Total Aliphatics _A	33	20	103					mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	2	<1	2					mg/kg	1	A-T-055s
Aro >C10-C12 _A	2	1	2					mg/kg	1	A-T-055s
Aro >C12-C16 _A	9	5	4					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	40	21	12					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	161	75	44					mg/kg	1	A-T-055s
Total Aromatics _A	214	101	63					mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	247	121	167					mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	24/10960
Project:	Phoenix Iron Works / Manchester Life Plot A	Date Received:	11/11/2024 (am)
Clients Project No:	B080866	Cool Box Temperatures (°C):	17.1-18.2

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/10960/1	24/10960/2	24/10960/3	24/10960/4	24/10960/5	24/10960/6	24/10960/7	24/10960/8	24/10960/9	24/10960/10
Client Sample No										
Client Sample ID/Depth	WS04 0.25m	WS06 0.45m	WS08 0.50m	CP/RC02 1.00m	WS07 0.70m	WS05 1.20m	WS03 0.80m	WS02 0.30m	CP/RC03 0.50m	CP/RC01 0.30m
Date Sampled	04/11/24	04/11/24	04/11/24	04/11/24	04/11/24	04/11/24	04/11/24	04/11/24	04/11/24	04/11/24
A-T-004s							18/11/2024			
A-T-006s			13/11/2024				14/11/2024			
A-T-007s							15/11/2024			
A-T-019s	15/11/2024	14/11/2024	15/11/2024	15/11/2024	15/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-022s	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024
A-T-024s	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-025w							20/11/2024			
A-T-026s	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-026w							20/11/2024			
A-T-026w (F)							20/11/2024			
A-T-027s	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-030s							15/11/2024			
A-T-031s	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-031w							20/11/2024			
A-T-032s	14/11/2024	14/11/2024	15/11/2024	15/11/2024	14/11/2024	15/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-032w							20/11/2024			
A-T-037w							20/11/2024			
A-T-040s	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-042sTCN	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024
A-T-044	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-045	12/11/2024	12/11/2024	12/11/2024	12/11/2024	12/11/2024	12/11/2024	12/11/2024	12/11/2024	12/11/2024	12/11/2024
A-T-050s	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024	13/11/2024
A-T-050w							20/11/2024			
A-T-052s			14/11/2024				14/11/2024			
A-T-054			15/11/2024	15/11/2024		15/11/2024				
A-T-055s	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
A-T-ANCs							15/11/2024			
Calc-As Recd	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
Calc-no stones							20/11/2024			
Probe (w)							20/11/2024			

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Final Test Report

Envirolab Job Number:
Issue Number:

24/10960
1

Date: 20-Nov-24

Client:

Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager:
Project Name:
Project Ref:
Order No:

Jonathan Lord/Lucy Woods
Phoenix Iron Works / Manchester Life Plot A
B080866
19246

Date Samples Received:
Date Instructions Received:
Date Analysis Completed:

8-Nov-24
11-Nov-24
20-Nov-24

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

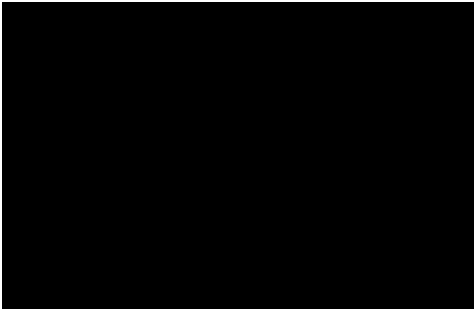
Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only



Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	24/10960/7				
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				WS03				
Depth to Top				0.8				
Depth to Bottom								
Date Sampled				04/11/2024				
Sample Type				Soil - ES				
Sample Matrix Code				5A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.98		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.54		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.12		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	8.6		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	5.21		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	56.9		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	134		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
				mg/l	mg/kg			
Arsenic	A-T-025	N	N	0.016	0.160	0.5	2	25
Barium	A-T-025	N	N	0.071	0.710	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	<0.004	<0.04	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.023	0.230	0.5	10	30
Nickel	A-T-025	N	N	0.002	0.020	0.4	10	40
Lead	A-T-025	N	N	<0.001	<0.01	0.5	10	50
Antimony	A-T-025	N	N	0.004	0.040	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.021	0.210	4	50	200
Chloride	A-T-026	N	N	3	26	800	15000	25000
Fluoride	A-T-026	N	N	0.7	7.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	54	538	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	150	1500	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.5				
Conductivity (µS/cm)	A-T-037	N	N	300				
Mass Sample (kg)				0.261				
Dry Matter (%)	A-T-044	N	N	67.1				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

FINAL ANALYTICAL TEST REPORT

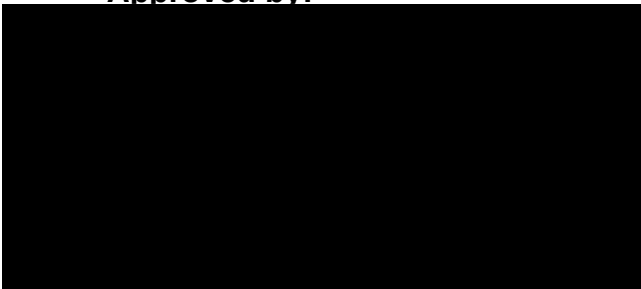
Envirolab Job Number: 24/11250
Issue Number: 1

Date: 27 November, 2024

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Jonathan Lord/Lucy Woods
Project Name: Phoenix Iron Works / Manchester Life Plot A
Project Ref: B080866
Order No: 19385
Date Samples Received: 18/11/24
Date Instructions Received: 19/11/24
Date Analysis Completed: 27/11/24

Approved by:



Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
% Moisture at <40C _A	13.3	16.4	12.8	19.4	14.4	27.5	48.8	% w/w	0.1	A-T-044
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH _D ^{M#}	8.02	8.19	8.27	7.94	7.06	7.86	7.71	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.53	0.05	0.06	0.70	0.11	0.08	0.17	g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1	14	mg/kg	1	A-T-042STCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	11.4	12.2	7.3	20.1	8.6	6.1	29.9	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	7	18	36	23	4	13	94	mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	<1.0	<1.0	2.1	<1.0	1.5	1.3	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.1	0.6	10.6	1.4	<0.5	0.8	5.3	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	66	156	227	109	22	78	407	mg/kg	1	A-T-024s
Chromium _D ^{M#}	27	23	59	25	10	83	57	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	624	462	398	213	48	114	633	mg/kg	1	A-T-024s
Mercury _D	<0.17	0.26	<0.17	0.98	<0.17	0.23	1.37	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	32	44	56	45	14	35	45	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	3	<1	<1	<1	2	mg/kg	1	A-T-024s
Zinc _D ^{M#}	309	66	1360	220	39	134	5330	mg/kg	5	A-T-024s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	Amosite & Chrysotile	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) _o	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _o	-	-	Loose Fibres & Insulation	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _o	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _o	-	-	<0.001	-	-	-	-	% w/w	0.001	A-T-054

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
PAH-16MS										
Acenaphthene _A ^{M#}	3.07	<0.01	0.36	3.00	<0.01	<0.01	10.8	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.45	0.05	0.42	0.69	<0.01	<0.01	2.05	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	6.62	0.02	1.11	4.75	<0.02	0.03	15.6	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	17.3	0.17	5.16	13.3	<0.04	0.07	23.4	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	12.9	0.29	6.39	13.3	<0.04	<0.04	15.3	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	14.8	0.25	7.21	16	0.08	0.08	15.9	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	8.32	0.25	5.91	8.14	<0.05	<0.05	7.42	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	5.57	<0.07	2.74	5.83	<0.07	<0.07	6.41	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	19.8	0.12	6.12	16.6	<0.06	<0.06	26.4	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	1.83	0.06	1.14	1.91	<0.04	<0.04	1.88	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	35.3	0.11	8.66	27.4	<0.08	0.11	70.3	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	2.35	<0.01	0.36	2.69	<0.01	0.03	12.1	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	8.29	0.16	5.37	7.79	<0.03	0.04	6.82	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.78	0.05	<0.30	1.35	0.67	<0.03	5.16	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	26.4	0.14	3.49	18.4	0.22	0.11	27.7	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	30.1	0.19	8.33	27.2	<0.07	0.11	65.8	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	194	1.86	62.8	168	0.97	0.58	313	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
SVOC excluding PAH-16										
4-Bromophenyl phenyl ether _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Diethyl phthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dimethyl phthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dibenzofuran _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Carbazole _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Butylbenzyl phthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate _A	-	-	-	-	-	-	<5000	µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
4-Nitrophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
3+4-Methylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
4-Chloro-3-methylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Nitrophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Methylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Chlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,6-Dinitrotoluene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dinitrotoluene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dimethylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dichlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4,6-Trichlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4,5-Trichlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,4-Dichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,3-Dichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,2-Dichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Chloronaphthalene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Methylnaphthalene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Phenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Pentachlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
n-Dioctylphthalate _A	-	-	-	-	-	-	<5000	µg/kg	500	A-T-052s
n-Dibutylphthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Nitrobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Isophorone _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachloroethane _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachlorobutadiene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Perylene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
VOC										
Dichlorodifluoromethane _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Chloromethane _A	-	-	-	-	-	-	<10	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	-	-	-	-	-	-	<10	µg/kg	1	A-T-006s
Bromomethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Chloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	-	-	-	-	-	-	10	µg/kg	1	A-T-006s
Dichloromethane _A	-	-	-	-	-	-	<5	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromochloromethane _A [#]	-	-	-	-	-	-	<5	µg/kg	5	A-T-006s
Chloroform _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	-	-	-	-	-	-	<2	µg/kg	2	A-T-006s
Benzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Trichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Dibromomethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	-	-	-	-	-	-	<10	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Toluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
Chlorobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Ethylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
m & p Xylene _A [#]	-	-	-	-	-	-	2	µg/kg	1	A-T-006s
o-Xylene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Styrene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromoform _A [#]	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s
Isopropylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	-	-	-	-	-	-	<2	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	-	-	-	-	-	-	4	µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	-	-	-	-	-	-	<2	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP06	TP04	TP07	TP02	TP03	TP08	TP09			
Depth to Top	0.50	0.75	1.00	0.10	0.25	1.20	1.00			
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24			
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES	SOIL - ES			
Sample Matrix Code	4AE	4A	4AB	6AB	6A	6A	6AC			
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<1	<10	<20	<1	<1	<10	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<10	<1	<10	<20	<1	<1	<10	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<10	2	<10	37	1	<1	<10	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<10	4	18	65	2	1	<10	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	459	17	252	246	5	8	900	mg/kg	1	A-T-055s
Total Aliphatics _A	459	23	271	347	8	10	900	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	2	<10	<20	2	<1	<10	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	2	<10	<20	2	<1	<10	mg/kg	1	A-T-055s
Aro >C12-C16 _A	24	6	122	269	5	4	105	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	135	14	537	1150	4	10	410	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	616	96	1350	2940	8	28	645	mg/kg	1	A-T-055s
Total Aromatics _A	775	121	2010	4360	21	41	1160	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	1230	144	2280	4700	29	51	2070	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
% Moisture at <40C _A	43.1	40.5						% w/w	0.1	A-T-044
% Stones >10mm _A	<0.1	<0.1						% w/w	0.1	A-T-044
pH _D ^{M#}	7.47	7.51						pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.18	0.14						g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	46	20						mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2						mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	34.8	27.0						% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	133	23						mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	6.0	1.5						mg/kg	1	A-T-027s
Cadmium _D ^{M#}	6.1	1.0						mg/kg	0.5	A-T-024s
Copper _D ^{M#}	954	143						mg/kg	1	A-T-024s
Chromium _D ^{M#}	264	140						mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1						mg/kg	1	A-T-040s
Lead _D ^{M#}	1010	460						mg/kg	1	A-T-024s
Mercury _D	1.95	0.98						mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	300	51						mg/kg	1	A-T-024s
Selenium _D ^{M#}	4	2						mg/kg	1	A-T-024s
Zinc _D ^{M#}	3000	182						mg/kg	5	A-T-024s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD								A-T-045
Asbestos Matrix (visual) _D	-	-								A-T-045
Asbestos Matrix (microscope) _D	-	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A								A-T-045

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
PAH-16MS										
Acenaphthene _A ^{M#}	9.95	1.71						mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.58	0.24						mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	7.80	1.76						mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	11.4	2.64						mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	6.19	1.60						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	7.05	1.93						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	3.08	0.94						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	2.74	<0.70						mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	13.5	3.26						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.79	<0.40						mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	61.7	12.1						mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	8.15	1.95						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	2.72	0.79						mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	1.30	0.79						mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	12.7	4.49						mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	52	10.2						mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	202	44.4						mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9							
Client Sample No									
Client Sample ID	TP05	TP01							
Depth to Top	0.75	2.50							
Depth To Bottom									
Date Sampled	13-Nov-24	13-Nov-24							
Sample Type	SOIL - ES	SOIL - ES							
Sample Matrix Code	6A	6A							
SVOC excluding PAH-16									
4-Bromophenyl phenyl ether _A	<1000	<1000						µg/kg	100 A-T-052s
Hexachlorobenzene _A	<1000	<1000						µg/kg	100 A-T-052s
Diethyl phthalate _A	<1000	<1000						µg/kg	100 A-T-052s
Dimethyl phthalate _A	<1000	<1000						µg/kg	100 A-T-052s
Dibenzofuran _A	<1000	<1000						µg/kg	100 A-T-052s
Carbazole _A	<1000	<1000						µg/kg	100 A-T-052s
Butylbenzyl phthalate _A	<1000	<1000						µg/kg	100 A-T-052s
Bis(2-ethylhexyl)phthalate _A	<5000	<5000						µg/kg	500 A-T-052s
Bis(2-chloroethoxy)methane _A	<1000	<1000						µg/kg	100 A-T-052s
Bis(2-chloroethyl)ether _A	<1000	<1000						µg/kg	100 A-T-052s
4-Nitrophenol _A	<1000	<1000						µg/kg	100 A-T-052s
3+4-Methylphenol _A	<1000	<1000						µg/kg	100 A-T-052s
4-Chloro-3-methylphenol _A	<1000	<1000						µg/kg	100 A-T-052s
2-Nitrophenol _A	<1000	<1000						µg/kg	100 A-T-052s
2-Methylphenol _A	<1000	<1000						µg/kg	100 A-T-052s
1,2,4-Trichlorobenzene _A	<1000	<1000						µg/kg	100 A-T-052s
2-Chlorophenol _A	<1000	<1000						µg/kg	100 A-T-052s
2,6-Dinitrotoluene _A	<1000	<1000						µg/kg	100 A-T-052s
2,4-Dinitrotoluene _A	<1000	<1000						µg/kg	100 A-T-052s
2,4-Dimethylphenol _A	<1000	<1000						µg/kg	100 A-T-052s
2,4-Dichlorophenol _A	<1000	<1000						µg/kg	100 A-T-052s
2,4,6-Trichlorophenol _A	<1000	<1000						µg/kg	100 A-T-052s
2,4,5-Trichlorophenol _A	<1000	<1000						µg/kg	100 A-T-052s
1,4-Dichlorobenzene _A	<1000	<1000						µg/kg	100 A-T-052s
1,3-Dichlorobenzene _A	<1000	<1000						µg/kg	100 A-T-052s
1,2-Dichlorobenzene _A	<1000	<1000						µg/kg	100 A-T-052s
2-Chloronaphthalene _A	<1000	<1000						µg/kg	100 A-T-052s
2-Methylnaphthalene _A	<1000	<1000						µg/kg	100 A-T-052s
Bis(2-chloroisopropyl)ether _A	<1000	<1000						µg/kg	100 A-T-052s
Phenol _A	<1000	<1000						µg/kg	100 A-T-052s
Pentachlorophenol _A	<1000	<1000						µg/kg	100 A-T-052s
n-Nitroso-n-dipropylamine _A	<1000	<1000						µg/kg	100 A-T-052s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
n-Diethylphthalate _A	<5000	<5000						µg/kg	500	A-T-052s
n-Dibutylphthalate _A	<1000	<1000						µg/kg	100	A-T-052s
Nitrobenzene _A	<1000	<1000						µg/kg	100	A-T-052s
Isophorone _A	<1000	<1000						µg/kg	100	A-T-052s
Hexachloroethane _A	<1000	<1000						µg/kg	100	A-T-052s
Hexachlorobutadiene _A	<1000	<1000						µg/kg	100	A-T-052s
Perylene _A	<1000	<1000						µg/kg	100	A-T-052s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9								
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
VOC										
Dichlorodifluoromethane _A	<25	<25						µg/kg	1	A-T-006s
Chloromethane _A	<250	<250						µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	<25	<25						µg/kg	1	A-T-006s
Bromomethane _A [#]	<25	<25						µg/kg	1	A-T-006s
Chloroethane _A [#]	<25	<25						µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	<25	<25						µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	<25	<25						µg/kg	1	A-T-006s
Dichloromethane _A	<125	<125						µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	<25	<25						µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	<25	<25						µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	<25	<25						µg/kg	1	A-T-006s
Bromochloromethane _A [#]	<125	<125						µg/kg	5	A-T-006s
Chloroform _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	<25	<25						µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	<25	<25						µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	<50	<50						µg/kg	2	A-T-006s
Benzene _A [#]	<25	<25						µg/kg	1	A-T-006s
Trichloroethene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	<25	<25						µg/kg	1	A-T-006s
Dibromomethane _A [#]	<25	<25						µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	<250	<250						µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	<25	<25						µg/kg	1	A-T-006s
Toluene _A [#]	<25	<25						µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	<25	<25						µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	<25	<25						µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	<25	<25						µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	<75	<75						µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	<25	<25						µg/kg	1	A-T-006s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester
Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
Chlorobenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	<25	<25						µg/kg	1	A-T-006s
Ethylbenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
m & p Xylene _A [#]	<25	<25						µg/kg	1	A-T-006s
o-Xylene _A [#]	<25	<25						µg/kg	1	A-T-006s
Styrene _A [#]	<25	<25						µg/kg	1	A-T-006s
Bromoform _A [#]	<75	<75						µg/kg	3	A-T-006s
Isopropylbenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	<25	<25						µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	<25	<25						µg/kg	1	A-T-006s
Bromobenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	<25	<25						µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	<50	<50						µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	216	<25						µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	<86	<25						µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	86	<25						µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	<25	<25						µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	<50	<50						µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	<75	<75						µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	<25	<25						µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	<75	<75						µg/kg	3	A-T-006s

Envirolab Job Number: 24/11250

Client Project Name: Phoenix Iron Works / Manchester Life Plot A

Client Project Ref: B080866

Lab Sample ID	24/11250/8	24/11250/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP05	TP01								
Depth to Top	0.75	2.50								
Depth To Bottom										
Date Sampled	13-Nov-24	13-Nov-24								
Sample Type	SOIL - ES	SOIL - ES								
Sample Matrix Code	6A	6A								
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.05	<0.01						mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.05	<0.01						mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<20	<20						mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<20	<20						mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<20	<20						mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	51	40						mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	2670	1650						mg/kg	1	A-T-055s
Total Aliphatics _A	2720	1700						mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<20	<20						mg/kg	1	A-T-055s
Aro >C10-C12 _A	<20	<20						mg/kg	1	A-T-055s
Aro >C12-C16 _A	188	165						mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	768	669						mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	986	914						mg/kg	1	A-T-055s
Total Aromatics _A	1950	1750						mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	4660	3450						mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.05	<0.01						mg/kg	0.01	A-T-022s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	24/11250
Project:	Phoenix Iron Works / Manchester Life Plot A	Date Received:	19/11/2024 (am)
Clients Project No:	B080866	Cool Box Temperatures (°C):	3.0 & 3.4

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/11250/1	24/11250/2	24/11250/3	24/11250/4	24/11250/5	24/11250/6	24/11250/7	24/11250/8	24/11250/9
Client Sample No									
Client Sample ID/Depth	TP06 0.50m	TP04 0.75m	TP07 1.00m	TP02 0.10m	TP03 0.25m	TP08 1.20m	TP09 1.00m	TP05 0.75m	TP01 2.50m
Date Sampled	13/11/24	13/11/24	13/11/24	13/11/24	13/11/24	13/11/24	13/11/24	13/11/24	13/11/24
A-T-004s							22/11/2024	22/11/2024	22/11/2024
A-T-006s							21/11/2024	25/11/2024	25/11/2024
A-T-007s							22/11/2024	22/11/2024	22/11/2024
A-T-019s	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024
A-T-022s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	22/11/2024	21/11/2024
A-T-024s	25/11/2024	25/11/2024	25/11/2024	25/11/2024	25/11/2024	25/11/2024	27/11/2024	25/11/2024	25/11/2024
A-T-025w							26/11/2024	26/11/2024	26/11/2024
A-T-026s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-026w							26/11/2024	26/11/2024	26/11/2024
A-T-026w (F)							26/11/2024	26/11/2024	26/11/2024
A-T-027s	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024
A-T-030s							25/11/2024	22/11/2024	22/11/2024
A-T-031s	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024
A-T-031w							26/11/2024	26/11/2024	26/11/2024
A-T-032s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	25/11/2024	21/11/2024	21/11/2024
A-T-032w							26/11/2024	26/11/2024	26/11/2024
A-T-037w							26/11/2024	26/11/2024	26/11/2024
A-T-040s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-042sTCN	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-044	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024
A-T-045	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
A-T-050s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	22/11/2024
A-T-050w							26/11/2024	26/11/2024	26/11/2024
A-T-052s							22/11/2024	22/11/2024	22/11/2024
A-T-054			22/11/2024						
A-T-055s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-ANCs							22/11/2024	22/11/2024	22/11/2024
Calc-As Recd	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	22/11/2024	21/11/2024
Calc-no stones							26/11/2024	26/11/2024	26/11/2024
Probe (w)							26/11/2024	26/11/2024	26/11/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Final Test Report

Envirolab Job Number: 24/11250
Issue Number: 1

Date: 27-Nov-24

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Jonathan Lord/Lucy Woods
Project Name: Phoenix Iron Works / Manchester Life Plot A
Project Ref: B080866
Order No: 19385

Date Samples Received: 18-Nov-24
Date Instructions Received: 19-Nov-24
Date Analysis Completed: 27-Nov-24

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Sample Details								
Lab Sample ID	Method	ISO17025	MCERTS	24/11250/7	Landfill Waste Acceptance Criteria Limits			
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				TP09				
Depth to Top				1				
Depth to Bottom								
Date Sampled				13/11/2024				
Sample Type				Soil - ES				
Sample Matrix Code				6AC				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.71		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.04		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.02		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	21.3		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	17.3		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	314		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	1610		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using		
				mg/l	mg/kg	BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.016	0.160	0.5	2	25
Barium	A-T-025	N	N	0.039	0.390	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	<0.004	<0.04	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.013	0.130	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	10	40
Lead	A-T-025	N	N	0.013	0.130	0.5	10	50
Antimony	A-T-025	N	N	0.007	0.070	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.119	1.190	4	50	200
Chloride	A-T-026	N	N	4	41	800	15000	25000
Fluoride	A-T-026	N	N	1.2	12.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	4	44	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	60	600	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	8.1				
Conductivity (µS/cm)	A-T-037	N	N	121				
Mass Sample (kg)				0.344				
Dry Matter (%)	A-T-044	N	N	50.8				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details								
Lab Sample ID	Method	ISO17025	MCERTS	24/11250/8	Landfill Waste Acceptance Criteria Limits			
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				TP05				
Depth to Top				0.75				
Depth to Bottom								
Date Sampled				13/11/2024				
Sample Type				Soil - ES				
Sample Matrix Code				6A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.47		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.04		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.02		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	24.2		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	20.2		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	202		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	2650		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.077	0.770	0.5	2	25
Barium	A-T-025	N	N	0.029	0.290	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	0.007	0.070	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.007	0.070	0.5	10	30
Nickel	A-T-025	N	N	0.003	0.030	0.4	10	40
Lead	A-T-025	N	N	0.023	0.230	0.5	10	50
Antimony	A-T-025	N	N	0.003	0.030	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.037	0.370	4	50	200
Chloride	A-T-026	N	N	5	47	800	15000	25000
Fluoride	A-T-026	N	N	0.8	8.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	5	48	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	58	580	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.4				
Conductivity (µS/cm)	A-T-037	N	N	115				
Mass Sample (kg)				0.332				
Dry Matter (%)	A-T-044	N	N	52.7				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details								
Lab Sample ID	Method	ISO17025	MCERTS	24/11250/9	Landfill Waste Acceptance Criteria Limits			
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				TP01				
Depth to Top				2.5				
Depth to Bottom								
Date Sampled				13/11/2024				
Sample Type				Soil - ES				
Sample Matrix Code				6A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.51		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.17		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.04		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	20.3		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	15.7		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	44.5		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	3130		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.017	0.170	0.5	2	25
Barium	A-T-025	N	N	0.099	0.990	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	<0.004	<0.04	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.015	0.150	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	10	40
Lead	A-T-025	N	N	0.001	0.010	0.5	10	50
Antimony	A-T-025	N	N	0.003	0.030	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.020	0.200	4	50	200
Chloride	A-T-026	N	N	3	26	800	15000	25000
Fluoride	A-T-026	N	N	0.4	4.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	<1.00	<10	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	127	1270	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.8				
Conductivity (µS/cm)	A-T-037	N	N	254				
Mass Sample (kg)				0.293				
Dry Matter (%)	A-T-044	N	N	59.7				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

FINAL ANALYTICAL TEST REPORT

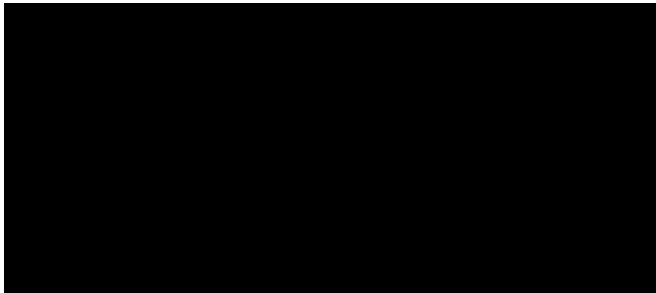
Envirolab Job Number: 25/00350
Issue Number: 1

Date: 24 January, 2025

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Jonathan Lord/Jonathan Provis
Project Name: Phoenix Ironworks
Project Ref: 80866
Order No: 20540
Date Samples Received: 16/01/25
Date Instructions Received: 20/01/25
Date Analysis Completed: 24/01/25

Approved by:



Envirolab Job Number: 25/00350

Client Project Name: Phoenix Ironworks

Client Project Ref: 80866

Lab Sample ID	25/00350/1	25/00350/2	25/00350/3					Units	Limit of Detection	Method ref
Client Sample No	W	W	W							
Client Sample ID	WS02	WS03	WS08							
Depth to Top	2.17	0.79	0.95							
Depth To Bottom	3.48	2.21	1.26							
Date Sampled	16-Jan-25	16-Jan-25	16-Jan-25							
Sample Type	WATER - GW	WATER - GW	WATER - GW							
Sample Matrix Code	N/A	N/A	N/A							
pH (w) _A [#]	7.11	6.93	6.74					pH	0.01	A-T-031w
Hardness Total _A [#]	480	223	322					mg/l Ca CO ₃	4	A-T-049w
Sulphate (w) _A [#]	461	104	215					mg/l	1	A-T-026w
Cyanide (total) (w) _A [#]	<0.005	0.056	0.080					mg/l	0.005	A-T-042wTCN
Phenols - Total by HPLC (w) _A	<0.01	<0.01	<0.01					mg/l	0.01	A-T-050w
Sulphide (w) _A	<0.1	1.1	0.3					mg/l	0.1	A-T-043-w
DOC - Dissolved Organic Carbon (w) _A [#]	<2.0	<2.0	4.1					mg/l	2	A-T-032w
Arsenic (dissolved) _A [#]	3	2	5					µg/l	1	A-T-025w
Boron (dissolved) _A [#]	129	42	61					µg/l	10	A-T-025w
Cadmium (dissolved) _A [#]	<0.2	<0.2	<0.2					µg/l	0.2	A-T-025w
Calcium (dissolved) _A [#]	113	79	113					mg/l	1	A-T-049w
Copper (dissolved) _A [#]	<4	<4	<4					µg/l	4	A-T-025w
Chromium (dissolved) _A [#]	<1	4	<1					µg/l	1	A-T-025w
Lead (dissolved) _A [#]	<1	<1	<1					µg/l	1	A-T-025w
Mercury (dissolved) _A [#]	<0.1	<0.1	<0.1					µg/l	0.1	A-T-025w
Nickel (dissolved) _A [#]	4	4	12					µg/l	2	A-T-025w
Selenium (dissolved) _A [#]	5	<1	<1					µg/l	1	A-T-025w
Zinc (dissolved) _A [#]	3	18	14					µg/l	2	A-T-025w

Envirolab Job Number: 25/00350

Client Project Name: Phoenix Ironworks

Client Project Ref: 80866

Lab Sample ID	25/00350/1	25/00350/2	25/00350/3					Units	Limit of Detection	Method ref
Client Sample No	W	W	W							
Client Sample ID	WS02	WS03	WS08							
Depth to Top	2.17	0.79	0.95							
Depth To Bottom	3.48	2.21	1.26							
Date Sampled	16-Jan-25	16-Jan-25	16-Jan-25							
Sample Type	WATER - GW	WATER - GW	WATER - GW							
Sample Matrix Code	N/A	N/A	N/A							
PAH 16MS (w)										
Acenaphthene (w) _A [#]	<0.01	<0.01	2.07					µg/l	0.01	A-T-019w
Acenaphthylene (w) _A [#]	<0.01	<0.01	0.05					µg/l	0.01	A-T-019w
Anthracene (w) _A [#]	<0.01	<0.01	0.47					µg/l	0.01	A-T-019w
Benzo(a)anthracene (w) _A [#]	<0.01	0.05	0.05					µg/l	0.01	A-T-019w
Benzo(a)pyrene (w) _A [#]	<0.01	0.08	0.01					µg/l	0.01	A-T-019w
Benzo(b)fluoranthene (w) _A [#]	<0.01	0.09	0.01					µg/l	0.01	A-T-019w
Benzo(ghi)perylene (w) _A [#]	<0.01	0.05	<0.01					µg/l	0.01	A-T-019w
Benzo(k)fluoranthene (w) _A [#]	<0.01	0.03	<0.01					µg/l	0.01	A-T-019w
Chrysene (w) _A [#]	<0.01	0.07	0.07					µg/l	0.01	A-T-019w
Dibenzo(ah)anthracene (w) _A [#]	<0.01	<0.01	<0.01					µg/l	0.01	A-T-019w
Fluoranthene (w) _A [#]	0.01	0.13	0.77					µg/l	0.01	A-T-019w
Fluorene (w) _A [#]	<0.01	<0.01	1.47					µg/l	0.01	A-T-019w
Indeno(123-cd)pyrene (w) _A [#]	<0.01	0.05	<0.01					µg/l	0.01	A-T-019w
Naphthalene (w) _A [#]	<0.01	<0.01	0.52					µg/l	0.01	A-T-019w
Phenanthrene (w) _A [#]	<0.01	0.03	3.74					µg/l	0.01	A-T-019w
Pyrene (w) _A [#]	0.02	0.14	0.63					µg/l	0.01	A-T-019w
Total PAH 16MS (w) _A [#]	0.03	0.72	9.86					µg/l	0.01	A-T-019w

Envirolab Job Number: 25/00350

Client Project Name: Phoenix Ironworks

Client Project Ref: 80866

Lab Sample ID	25/00350/1	25/00350/2	25/00350/3					Units	Limit of Detection	Method ref
Client Sample No	W	W	W							
Client Sample ID	WS02	WS03	WS08							
Depth to Top	2.17	0.79	0.95							
Depth To Bottom	3.48	2.21	1.26							
Date Sampled	16-Jan-25	16-Jan-25	16-Jan-25							
Sample Type	WATER - GW	WATER - GW	WATER - GW							
Sample Matrix Code	N/A	N/A	N/A							
TPH CWG (w) with Clean Up										
Ali >C5-C6 (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
Ali >C6-C8 (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
Ali >C8-C10 (w) _A [#]	<5	<5	7					µg/l	5	A-T-055w
Ali >C10-C12 (w) _A [#]	<5	<5	7					µg/l	5	A-T-055w
Ali >C12-C16 (w) _A [#]	<5	7	6					µg/l	5	A-T-055w
Ali >C16-C21 (w) _A [#]	<5	11	15					µg/l	5	A-T-055w
Ali >C21-C35 (w) _A [#]	21	60	134					µg/l	5	A-T-055w
Total Aliphatics (w) _A [#]	21	78	169					µg/l	5	Calc-As Recd
Aro >C5-C7 (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
Aro >C7-C8 (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
Aro >C8-C10 (w) _A	<5	<5	7					µg/l	5	A-T-055w
Aro >C10-C12 (w) _A [#]	<5	<5	11					µg/l	5	A-T-055w
Aro >C12-C16 (w) _A [#]	<5	10	79					µg/l	5	A-T-055w
Aro >C16-C21 (w) _A [#]	9	32	143					µg/l	5	A-T-055w
Aro >C21-C35 (w) _A [#]	<10	78	160					µg/l	10	A-T-055w
Total Aromatics (w) _A [#]	<10	120	400					µg/l	10	Calc-As Recd
TPH (Ali & Aro >C5-C35) (w) _A	30	198	569					µg/l	10	Calc-As Recd
BTEX - Benzene (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
BTEX - Toluene (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
BTEX - m & p Xylene (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
BTEX - o Xylene (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w
MTBE (w) _A [#]	<1	<1	<1					µg/l	1	A-T-022w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street ,
Manchester, UK, M1 5WG

Project No: 25/00350

Date Received: 20/01/2025 (am)

Project: Phoenix Ironworks

Cool Box Temperatures (°C): 10.4 & 10.5

Clients Project No: 80866

Lab Sample ID	25/00350/1	25/00350/2	25/00350/3
Client Sample No	W	W	W
Client Sample ID/Depth	WS02 2.17-3.48m	WS03 0.79-2.21m	WS08 0.95-1.26m
Date Sampled	16/01/25	16/01/25	16/01/25
Deviation Code			
F	✓	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	25/00350/1	25/00350/2	25/00350/3
Client Sample No	W	W	W
Client Sample ID/Depth	WS02 2.17-3.48m	WS03 0.79-2.21m	WS08 0.95-1.26m
Date Sampled	16/01/25	16/01/25	16/01/25
pH (w)	✓	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

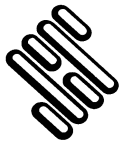
Envirolab Analysis Dates

Lab Sample ID	25/00350/1	25/00350/2	25/00350/3
Client Sample No	W	W	W
Client Sample ID/Depth	WS02 2.17-3.48m	WS03 0.79-2.21m	WS08 0.95-1.26m
Date Sampled	16/01/25	16/01/25	16/01/25
A-T-019w	23/01/2025	23/01/2025	23/01/2025
A-T-022w	21/01/2025	21/01/2025	21/01/2025
A-T-025w	24/01/2025	24/01/2025	24/01/2025
A-T-026w	21/01/2025	21/01/2025	21/01/2025
A-T-031w	21/01/2025	21/01/2025	21/01/2025
A-T-032w	21/01/2025	21/01/2025	21/01/2025
A-T-042wTCN	21/01/2025	21/01/2025	21/01/2025
A-T-043-w	21/01/2025	21/01/2025	21/01/2025
A-T-049w	22/01/2025	22/01/2025	22/01/2025
A-T-050w	23/01/2025	23/01/2025	23/01/2025
A-T-055w	22/01/2025	22/01/2025	22/01/2025
Calc-As Recd	22/01/2025	22/01/2025	22/01/2025

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix D – Geotechnical Laboratory Test Results



STRUCTURAL SOILS LTD
TEST REPORT



1774

Report No. 784838 R1

Date 05-March-2021 Contract 21/01571

Client Envirolab Ltd
Address Units 7 & 8 Sandpits Business Park
Mottram Road
Hyde
SK14 3AR

For the Attention of Holly Neary-King

Samples submitted by client 17/02/2021
Testing Started 19/02/2021
Testing Completed 05/03/2021

Client Reference 21/01571
Client Order No.
Instruction Type Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

Non - UKAS Accredited Tests Undertaken

Point Load Index ISRM:1974-2006

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.

Test were undertaken on samples 'as received' unless otherwise stated.

Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail luke.fisher@soils.co.uk

DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.3 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.29** MN/m²

$I_s(50)$ Strength Anisotropy Index = **1.01** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

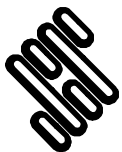
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

C

ate

3.21

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

Results

$$I_s(50) \text{ Mean Axial tests} = 0.37 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.26** MN/m²

$I_s(50)$ Strength Anisotropy Index = **1.46** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

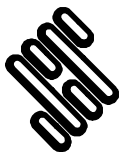
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

Results

Unable to calculate $I_a(50)$ Strength Anisotropy Index from this dataset.

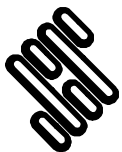
Note:Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Compiled By

Date _____

Contract Ref:

LORNA WHITWORTH

05.03.21

Contract:

21/01571

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

Results

$$I_s(50) \text{ Mean Axial tests} = 0.11 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.04** MN/m²

$I_a(50)$ Strength Anisotropy Index = **3.06** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

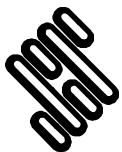
Note: Size Correction Factor (F) calculated using $F = (D_p/50)^{0.45}$ (where D_p is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (x) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



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05.03.21

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DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.25 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.19** MN/m²

$I_a(50)$ Strength Anisotropy Index = **1.37** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

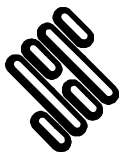
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
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Castleford
W. Yorkshire WF10 1NJ

C

ORNA WHITWORTH

71

Date _____

05.03.21

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.41 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.15** MN/m²

$I_a(50)$ Strength Anisotropy Index = **2.62** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

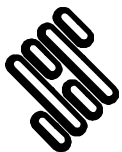
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Contra

By

LORNA WHITWORTH

Date _____

05.03.21

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.01 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.01** MN/m²

$I_a(50)$ Strength Anisotropy Index = **1.1** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

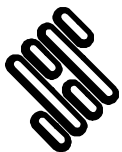
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Contract:

By

LORNA WHITWORTH

Date _____

05.03.21

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DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.68 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.74** MN/m²

$I_a(50)$ Strength Anisotropy Index = **1.09** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

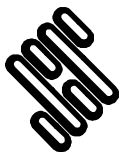
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



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Castleford
W. Yorkshire WF10 1

Compiled By

LORNA WHITWORTH

Date

05.03.21

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.02 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **0.01** MN/m²

$I_a(50)$ Strength Anisotropy Index = **1.89** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

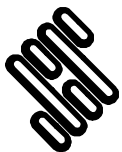
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
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W. Yorkshire WF10 1N

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Date _____

05.03.21

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 5.16 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **4.99** MN/m²

$I_s(50)$ Strength Anisotropy Index = **1.03** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

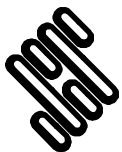
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column:, A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
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W. Yorkshire WF10 1N

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Date _____

05.03.21

Contract Ref:

784838



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

$I_s(50)$ Mean Axial tests = **0.02** MN/m²

$I_c(50)$ Mean Diametral tests = **0.01** MN/m²

$I_a(50)$ Strength Anisotropy Index = **2.79** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

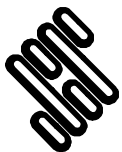
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



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Castleford
W. Yorkshire WF10 1N

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Date

05.03.21

Contract Ref:

784838



TESTING VERIFICATION CERTIFICATE

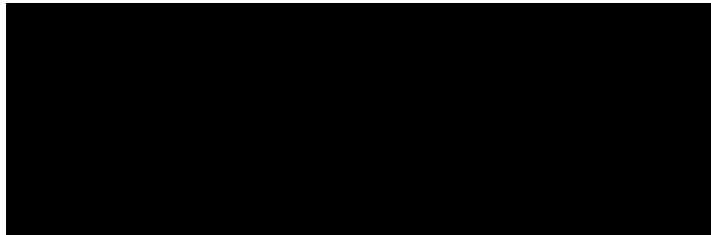
The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **05/03/2021 10:49:13**.

Testing reported after this date is not covered by this Verification Certificate.



(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

21/01571

Job No:

784838



FINAL ANALYTICAL TEST REPORT

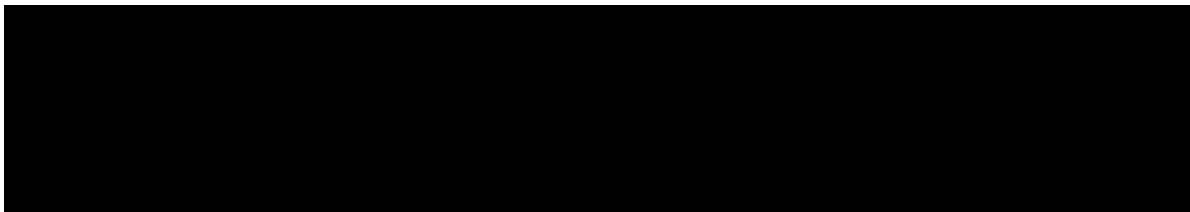
Envirolab Job Number: 21/01571
Issue Number: 1
Date: 11 March, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Siobhán Hyde/Zoe Henderson
Project Name: Ancoats, Plot A
Project Ref: B076740
Order No: EBMA2692
Date Samples Received: 09/02/21
Date Instructions Received: 17/02/21
Date Analysis Completed: 11/03/21

Prepared by:

Approved by:



Envirolab Job Number: 21/01571

Client Project Name: Ancoats, Plot A

Client Project Ref: B076740

Lab Sample ID	21/01571/1	21/01571/2	21/01571/3	21/01571/4	21/01571/5	21/01571/6	21/01571/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	R-A1	R-A1	R-A1	R-A1	R-A1	R-A1	R-A2			
Depth to Top	22.10	24.20	25.23	26.75	27.87	28.68	24.80			
Depth To Bottom	22.32	24.39	25.38	27.16	28.09	29.00	25.06			
Date Sampled	28-Jan-21	28-Jan-21	28-Jan-21	28-Jan-21	28-Jan-21	28-Jan-21	26-Jan-21			
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Sample Matrix Code	7	7	7	7	7	7	7			
% Stones >10mm _A	<0.1	-	-	<0.1	-	-	-	% w/w	0.1	A-T-044
pH _D ^{M#}	8.78	-	-	8.56	-	-	-	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.02	-	-	<0.01	-	-	-	g/l	0.01	A-T-026s
10.03a Point Load (PL) Index of a Single Specimen (Rock Sample) ISRM SM 1974-2006 _A [#]	Appended	-	Appended	-	Appended	-	Appended	N/A		Subcon SS
10.04 Uniaxial / Unconfined Compressive Strength (Rock Sample) ISRM SM 1974-2006 _A [#]	-	Appended	-	Appended	-	Appended	-	N/A		Subcon SS

Envirolab Job Number: 21/01571

Client Project Name: Ancoats, Plot A

Client Project Ref: B076740

Lab Sample ID	21/01571/8	21/01571/9	21/01571/10	21/01571/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	R-A2	R-A2	R-A2	R-A2						
Depth to Top	26.27	27.13	28.16	29.37						
Depth To Bottom	26.57	27.26	28.30	29.52						
Date Sampled	26-Jan-21	26-Jan-21	26-Jan-21	26-Jan-21						
Sample Type	Solid	Solid	Solid	Solid						
Sample Matrix Code	7	7	7	7						
% Stones >10mm _A	-	-	<0.1	-				% w/w	0.1	A-T-044
pH _D ^{M#}	-	-	9.03	-				pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	<0.01	-				g/l	0.01	A-T-026s
10.03a Point Load (PL) Index of a Single Specimen (Rock Sample) ISRM SM 1974-2006 _A [#]	-	Appended	Appended	Appended				N/A		Subcon SS
10.04 Uniaxial / Unconfined Compressive Strength (Rock Sample) ISRM SM 1974-2006 _A [#]	Appended	-	-	-				N/A		Subcon SS

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street ,
Manchester, UK, M1 5WG

Project No: 21/01571

Date Received: 17/02/2021 (am)

Project: Ancoats, Plot A

Cool Box Temperatures (°C): 6.0

Clients Project No: B076740

Lab Sample ID	21/01571/1	21/01571/4	21/01571/10
Client Sample No			
Client Sample ID/Depth	R-A1 22.10-22.32m	R-A1 26.75-27.16m	R-A2 28.16-28.30m
Date Sampled	28/01/21	28/01/21	26/01/21
Deviation Code			
F	✓	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	21/01571/1	21/01571/4	21/01571/10
Client Sample No			
Client Sample ID/Depth	R-A1 22.10-22.32m	R-A1 26.75-27.16m	R-A2 28.16-28.30m
Date Sampled	28/01/21	28/01/21	26/01/21
Sulphate (water sol 2:1)	✓	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.



Curtins
17-19 Whitworth Street West
Manchester

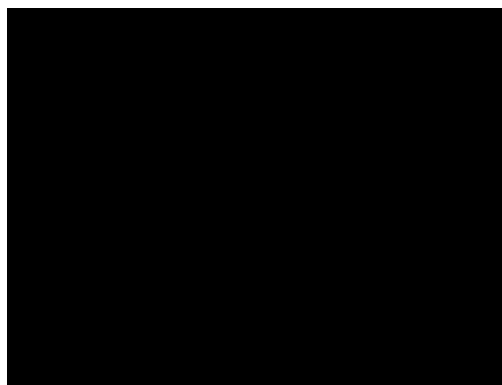
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

e: lucy.woods@curtins.com
jonathan.lord@curtins.com

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

Analytical Report Number : 24-054142

Project / Site name:	Phoenix Iron Works, Manchester Lift Plot A	Samples received on:	15/11/2024
Your job number:	B080866	Samples instructed on/ Analysis started on:	15/11/2024
Your order number:	19386	Analysis completed by:	26/11/2024
Report Issue Number:	1	Report issued on:	28/11/2024
Samples Analysed:	19 soil samples		



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.



Environmental Science

Analytical Report Number: 24-054142

Project / Site name: Phoenix Iron Works, Manchester Lift Plot A

Your Order No: 19386

Lab Sample Number				380860	380861	380862	380863	380864
Sample Reference				WS06	WS08	WS03	WS02	CP01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				2.00-2.45	4.00-4.45	5.00-5.45	3.00-3.45	3.00-3.45
Date Sampled				04/11/2024	04/11/2024	05/11/2024	05/11/2024	07/11/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	17	14	20	16
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.7	8.7	8.6	8.4	8.4
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	160	39	68	370	180
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	81.6	19.5	34.1	185	92
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	4.2	6.9	6.5	19	7.1
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
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 (leachate equivalent)	mg/l	2.5	NONE	17	18	13	31	19
Magnesium (water soluble)	mg/kg	5	NONE	35	35	26	61	39

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



Analytical Report Number: 24-054142

Project / Site name: Phoenix Iron Works, Manchester Lift Plot A

Your Order No: 19386

Lab Sample Number				380865	380866	380867	380868	380869
Sample Reference				CP01	CP01	CP01	CP01	CP02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				9.50-9.95	15.50-15.95	21.50-21.95	23.00-23.45	2.00-2.45
Date Sampled				07/11/2024	08/11/2024	08/11/2024	08/11/2024	04/11/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	10	6.4	7.8	17
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6	8.5	8.7	8.8	8.1
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	150	150	56	41	89
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	74.6	72.5	28.1	20.5	44.6
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	5.4	1.7	2.2	0.8	12
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
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 (leachate equivalent)	mg/l	2.5	NONE	28	15	7.9	10	23
Magnesium (water soluble)	mg/kg	5	NONE	56	30	16	20	46

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



Analytical Report Number: 24-054142

Project / Site name: Phoenix Iron Works, Manchester Lift Plot A

Your Order No: 19386

Lab Sample Number				380870	380871	380872	380873	380874
Sample Reference				CP02	CP02	CP02	CP02	CP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				8.00-8.45	15.50-15.95	21.50-21.95	22.50-22.95	5.00-5.45
Date Sampled				04/11/2024	05/11/2024	05/11/2024	06/11/2024	06/11/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	55.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	8.7	4.2	7.6	18
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6	8.6	8.7	8.9	8.5
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	150	93	70	50	74
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	74.7	46.6	35.2	25.2	36.8
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	6	1.1	1.2	1	9.8
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
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 (leachate equivalent)	mg/l	2.5	NONE	28	12	6.6	13	21
Magnesium (water soluble)	mg/kg	5	NONE	56	24	13	25	41

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



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Environmental Science

Analytical Report Number: 24-054142

Project / Site name: Phoenix Iron Works, Manchester Lift Plot A

Your Order No: 19386

Lab Sample Number				380875	380876	380877	380878
Sample Reference				CP03	CP03	CP03	CP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				11.00-11.45	14.00-14.45	19.00-19.50	23.00-23.45
Date Sampled				07/11/2024	07/11/2024	07/11/2024	07/11/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	51.6	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	7.3	8	16
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.8	8.7	8.8	8.4
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	89	110	180
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	64.6	44.6	54	91.5
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.7	1.9	0.9	2.5
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (leachate equivalent)	mg/l	2.5	NONE	17	10	12	12
Magnesium (water soluble)	mg/kg	5	NONE	33	20	24	24

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



Analytical Report Number : 24-054142

Project / Site name: Phoenix Iron Works, Manchester Lift Plot A

* 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 *
380860	WS06	None Supplied	2.00-2.45	Brown clay and sand
380861	WS08	None Supplied	4.00-4.45	Brown clay
380862	WS03	None Supplied	5.00-5.45	Brown clay
380863	WS02	None Supplied	3.00-3.45	Brown clay
380864	CP01	None Supplied	3.00-3.45	Brown sandy clay
380865	CP01	None Supplied	9.50-9.95	Brown clay
380866	CP01	None Supplied	15.50-15.95	Brown clay
380867	CP01	None Supplied	21.50-21.95	Brown sand with gravel
380868	CP01	None Supplied	23.00-23.45	Brown sandy clay
380869	CP02	None Supplied	2.00-2.45	Brown clay
380870	CP02	None Supplied	8.00-8.45	Brown clay
380871	CP02	None Supplied	15.50-15.95	Brown clay with gravel
380872	CP02	None Supplied	21.50-21.95	Brown sand with gravel and stones
380873	CP02	None Supplied	22.50-22.95	Brown clay and sand
380874	CP03	None Supplied	5.00-5.45	Brown clay
380875	CP03	None Supplied	11.00-11.45	Brown clay
380876	CP03	None Supplied	14.00-14.45	Brown sand with gravel and stones
380877	CP03	None Supplied	19.00-19.50	Brown clay and sand
380878	CP03	None Supplied	23.00-23.45	Brown clay

Analytical Report Number : 24-054142

Project / Site name: Phoenix Iron Works, Manchester Lift Plot A

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	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	L082B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

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 30°C.

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution



4041

**TEST CERTIFICATE****DETERMINATION OF LIQUID AND PLASTIC LIMITS**

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,
cl 5.3, 6

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

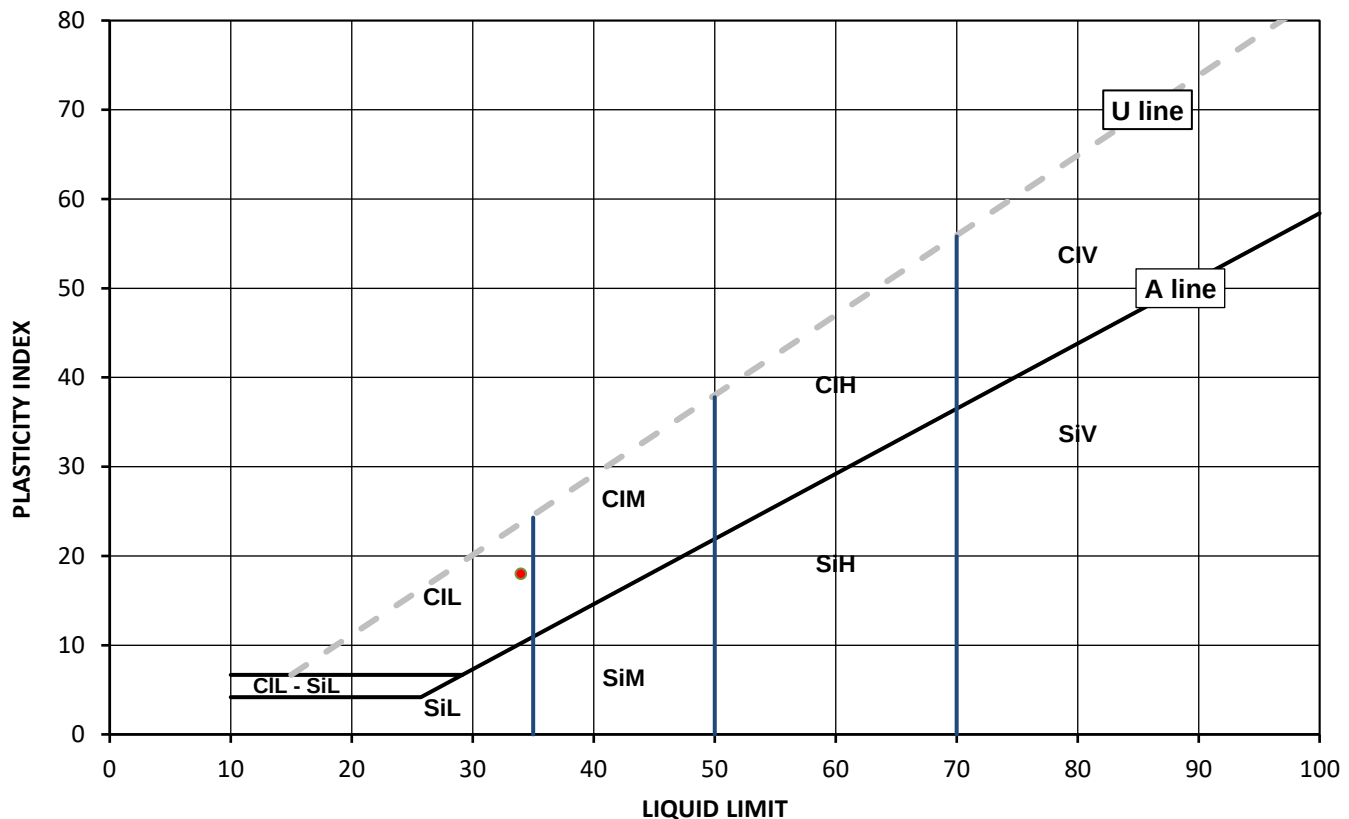
Test Results:

Laboratory Reference: 380843
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 8.00
Depth Base [m]: 8.45
Sample Type: D

Sample Preparation: Tested after >0.425 mm removed by hand;
Cone Type: 80g/30deg

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity index [IL] % #	Consistency index [IC] % #	% Passing 425µm BS Test Sieve
16.6	34	1.030	16	18	0.06	0.94	74



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1:2014+A1:2022, BS 1377-2:2022; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks: Not enough the material to carry out 4 Point Atterberg test/A 1-point test was performed.

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Katarzyna Koziel
Geotechnical Reporting Team Leader
or and on behalf of i2 Analytical Ltd

Date Reported: 30/12/2024

GF 360.13



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

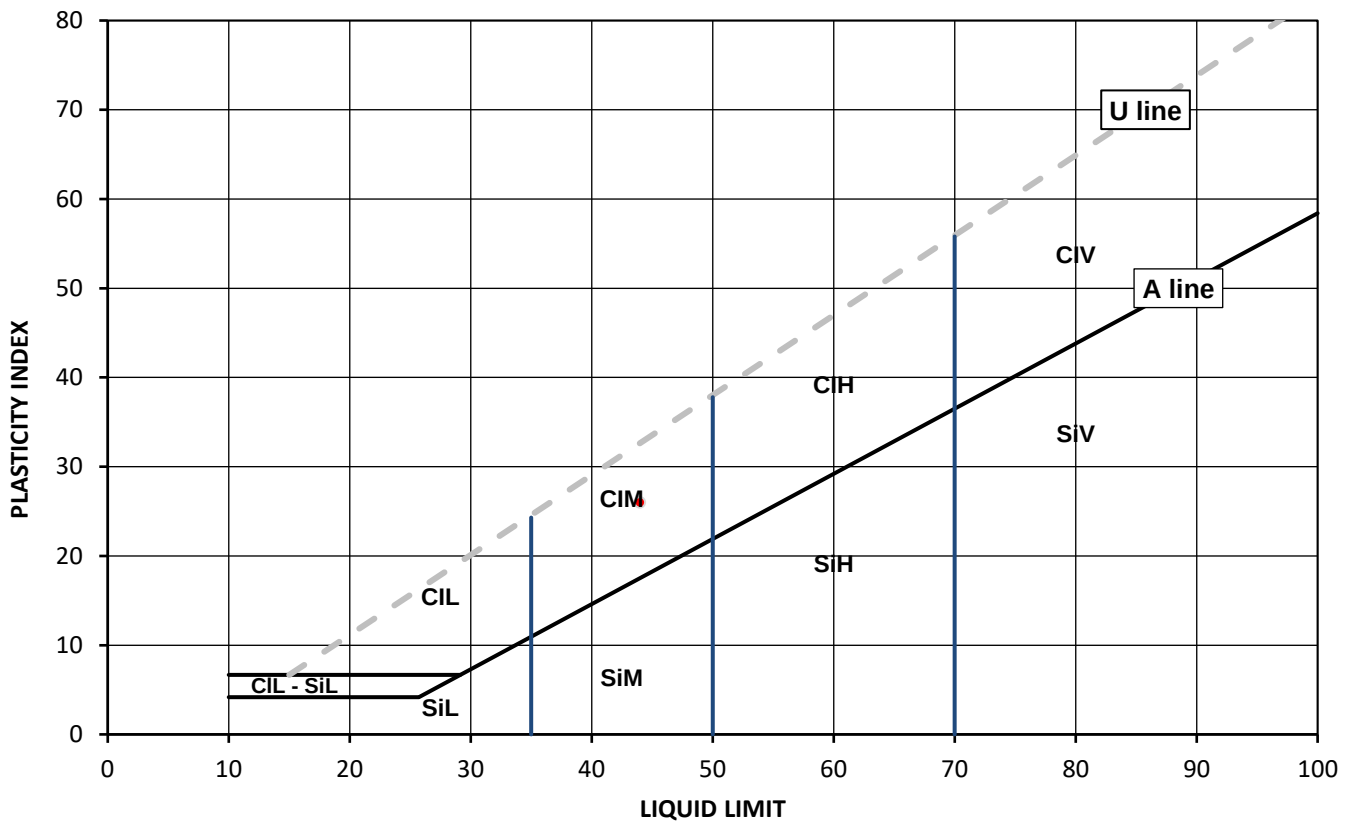
Test Results:

Laboratory Reference: 380799
Hole No.: WS05
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.3	44	18	26	0.04	0.96	99



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		50 to 70
		exceeding 70
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 30/12/2024

GF 337.14



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

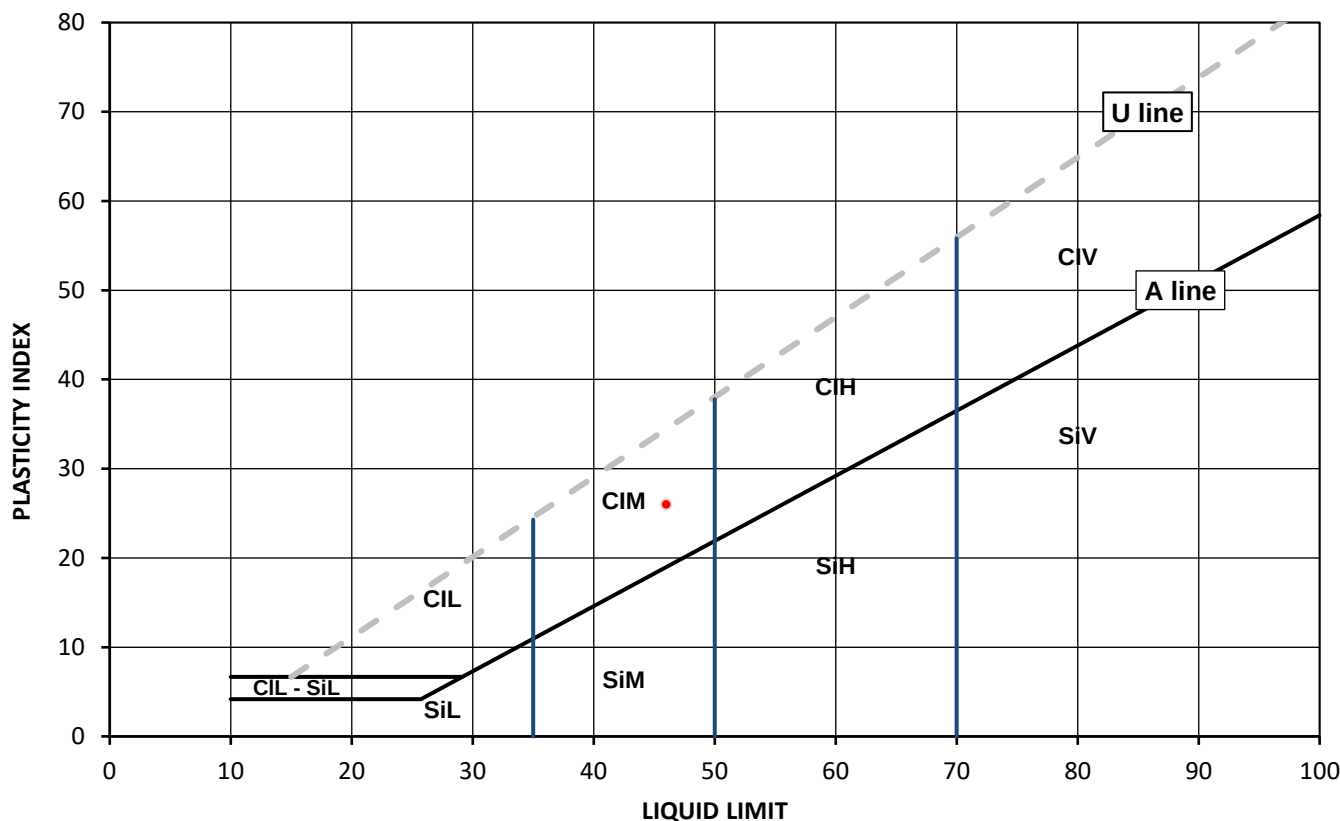
Test Results:

Laboratory Reference: 380800
Hole No.: WS06
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
16.4	46	20	26	-0.15	1.15	99



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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atarzyna Koziel
eotechnical Reporting Team Leader
r and on behalf of i2 Analytical Ltd

Date Reported: 30/12/2024

GF 337.14



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

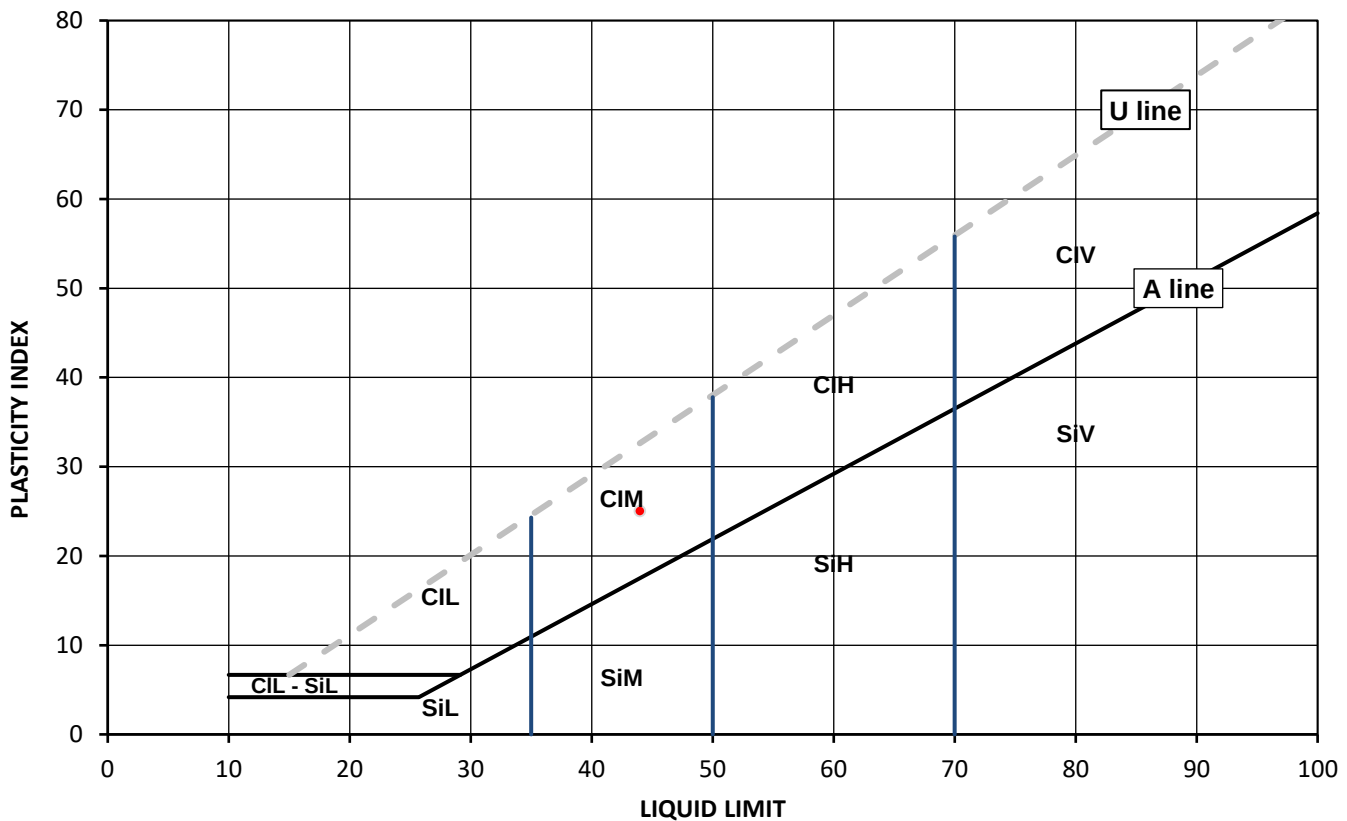
Test Results:

Laboratory Reference: 380801
Hole No.: WS08
Sample Reference: Not Given
Sample Description: Brownish grey sandy CLAY

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

Sample Preparation: Tested in natural condition; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
21.2	44	19	25	0.08	0.92	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
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

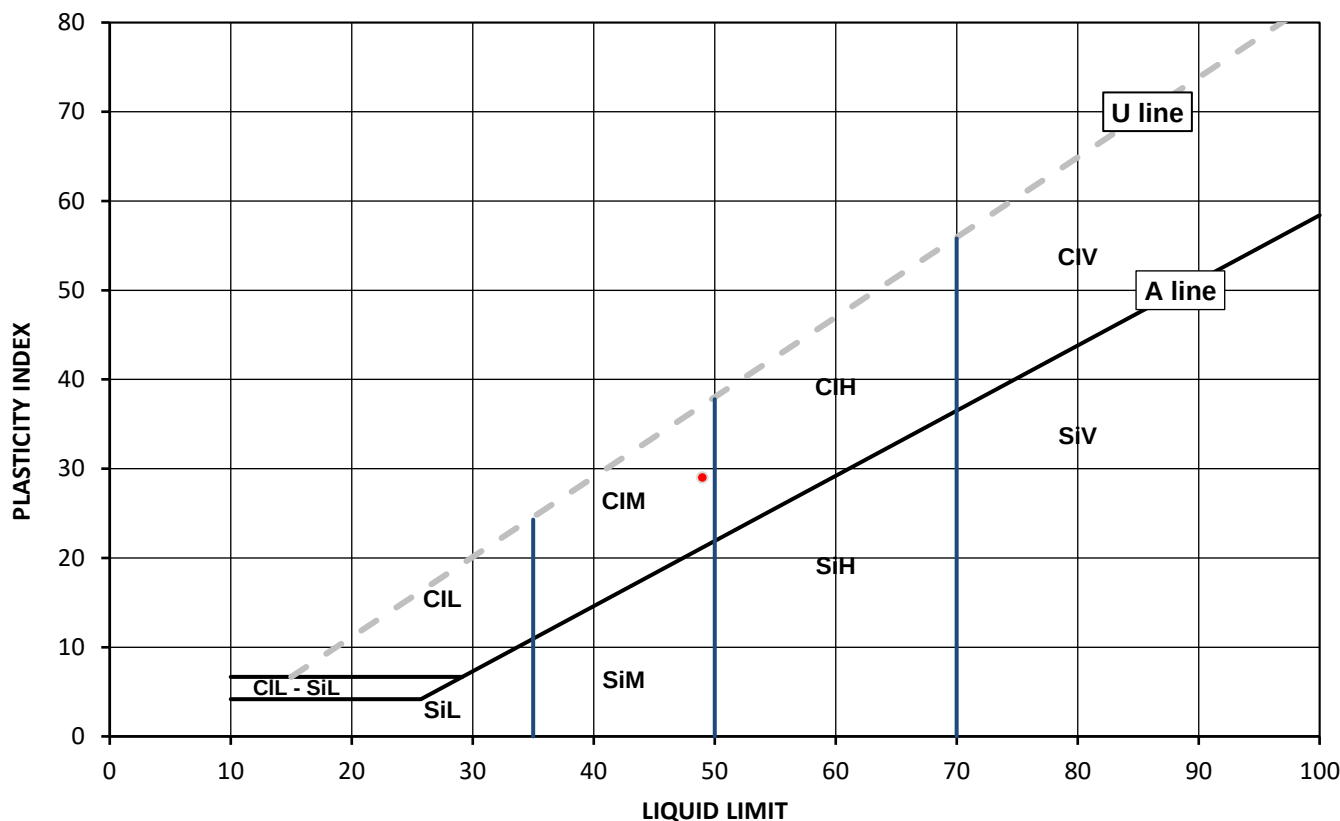
Test Results:

Laboratory Reference: 380802
Hole No.: WS07
Sample Reference: Not Given
Sample Description: Brownish grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 5.00
Depth Base [m]: 5.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
25.6	49	20	29	0.21	0.79	98



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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Date Reported: 30/12/2024

GF 337.14



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

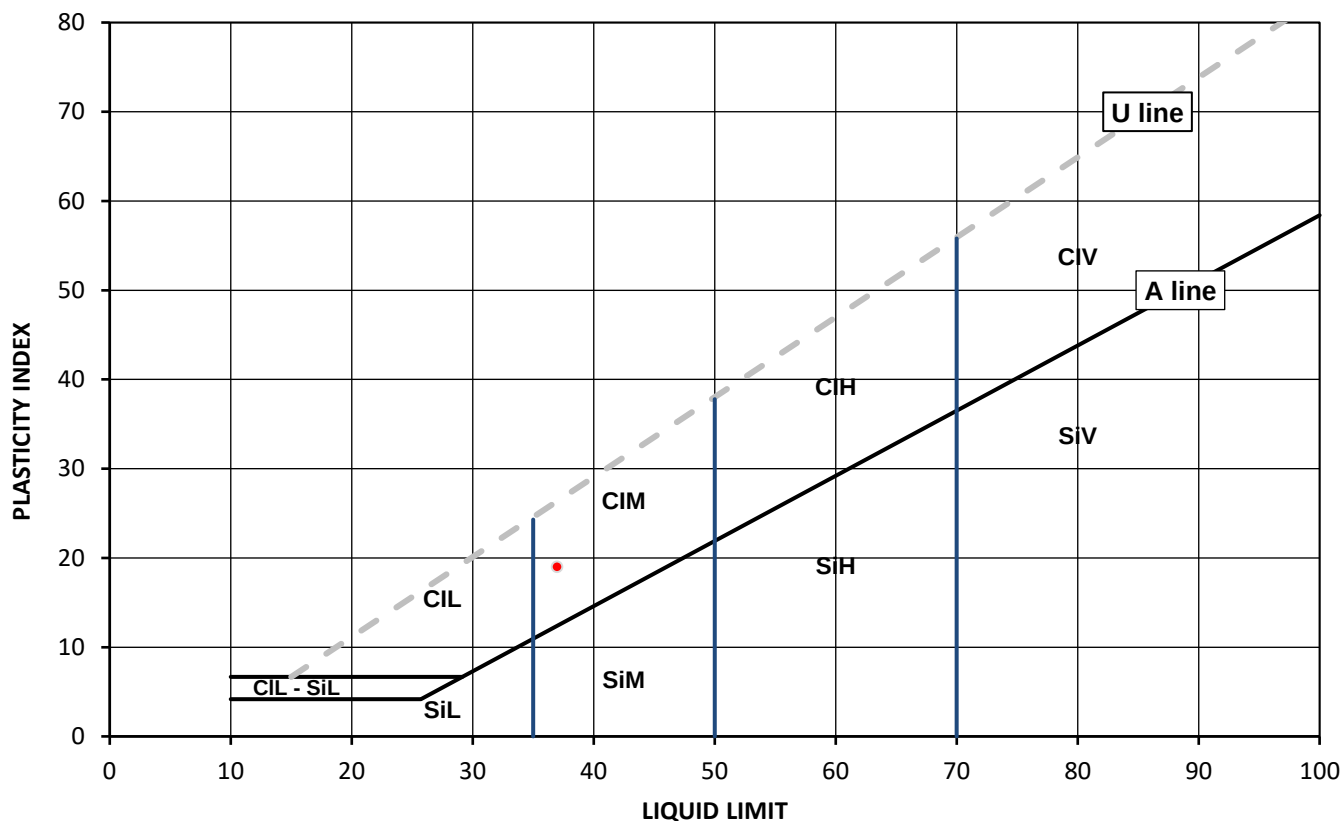
Test Results:

Laboratory Reference: 380803
Hole No.: WS05
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

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

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.8	37	18	19	0.11	0.89	99



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

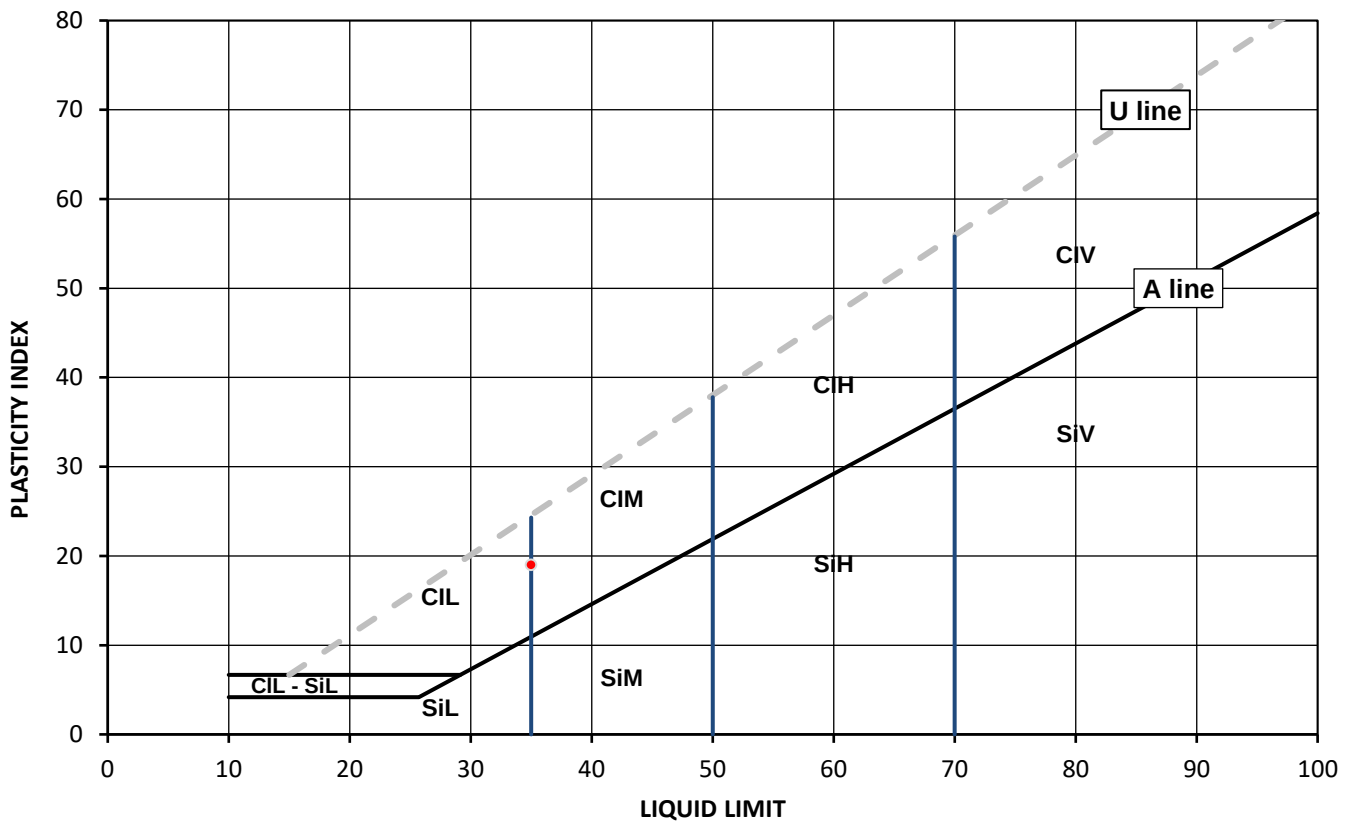
Test Results:

Laboratory Reference: 380804
Hole No.: WS03
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 5.00
Depth Base [m]: 5.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
18.8	35	16	19	0.16	0.84	96



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		50 to 70
		exceeding 70
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 30/12/2024

GF 337.14



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

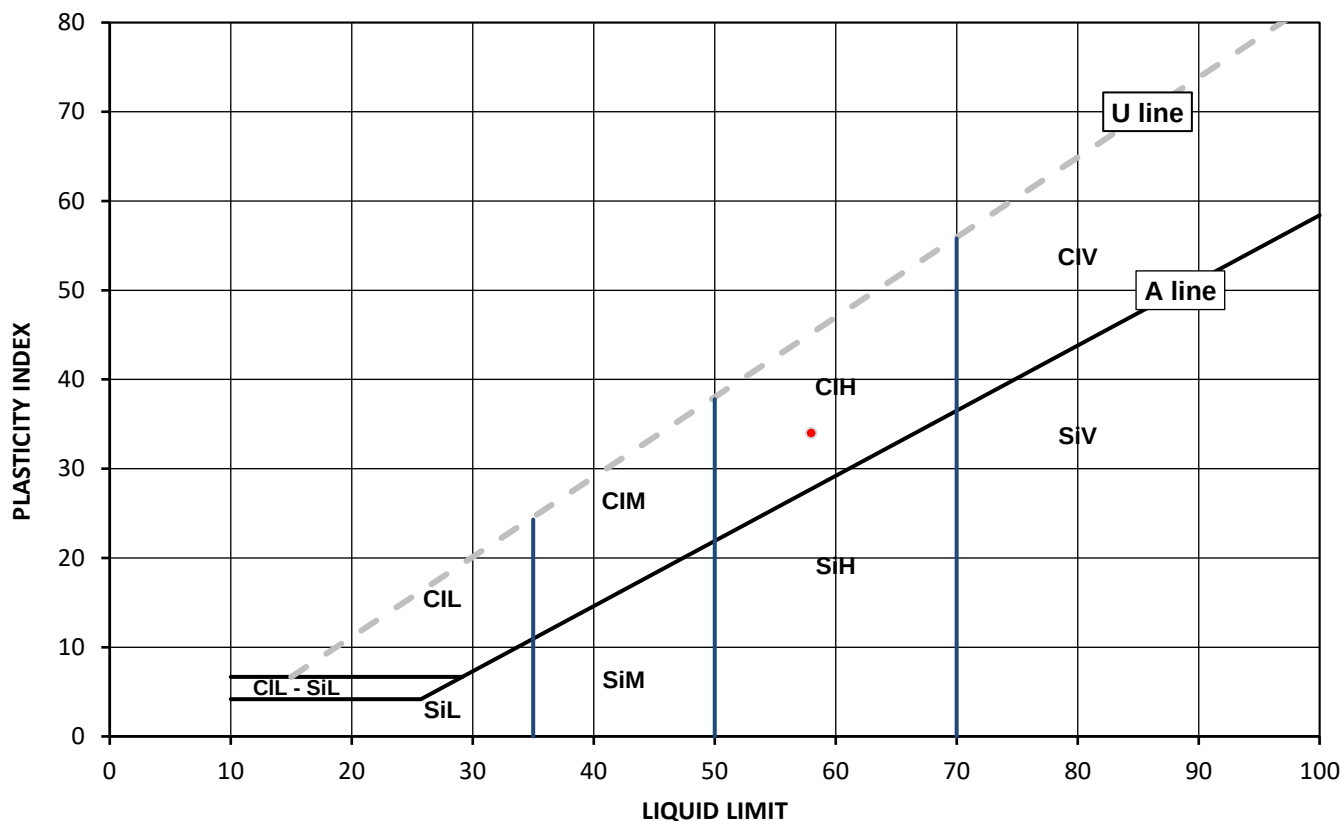
Test Results:

Laboratory Reference: 380805
Hole No.: WS02
Sample Reference: Not Given
Sample Description: Brownish grey slightly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: D

Sample Preparation: Tested in natural condition; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
28.3	58	24	34	0.12	0.88	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
Si	Silt	M	Medium
		H	High
		V	Very high
		O	Organic
			append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

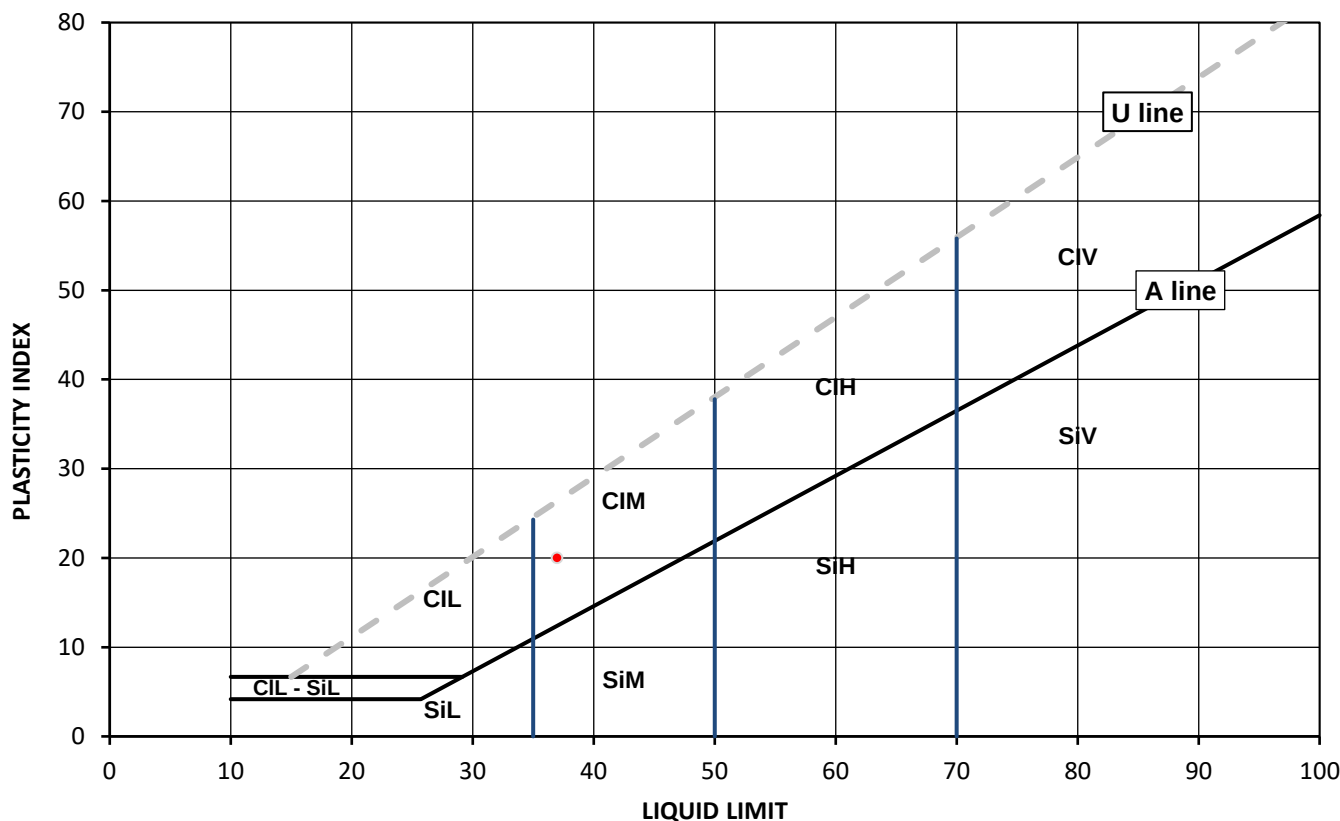
Test Results:

Laboratory Reference: 380842
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
20.8	37	17	20	0.20	0.80	97



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 ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Date Reported: 30/12/2024

GF 337.14



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

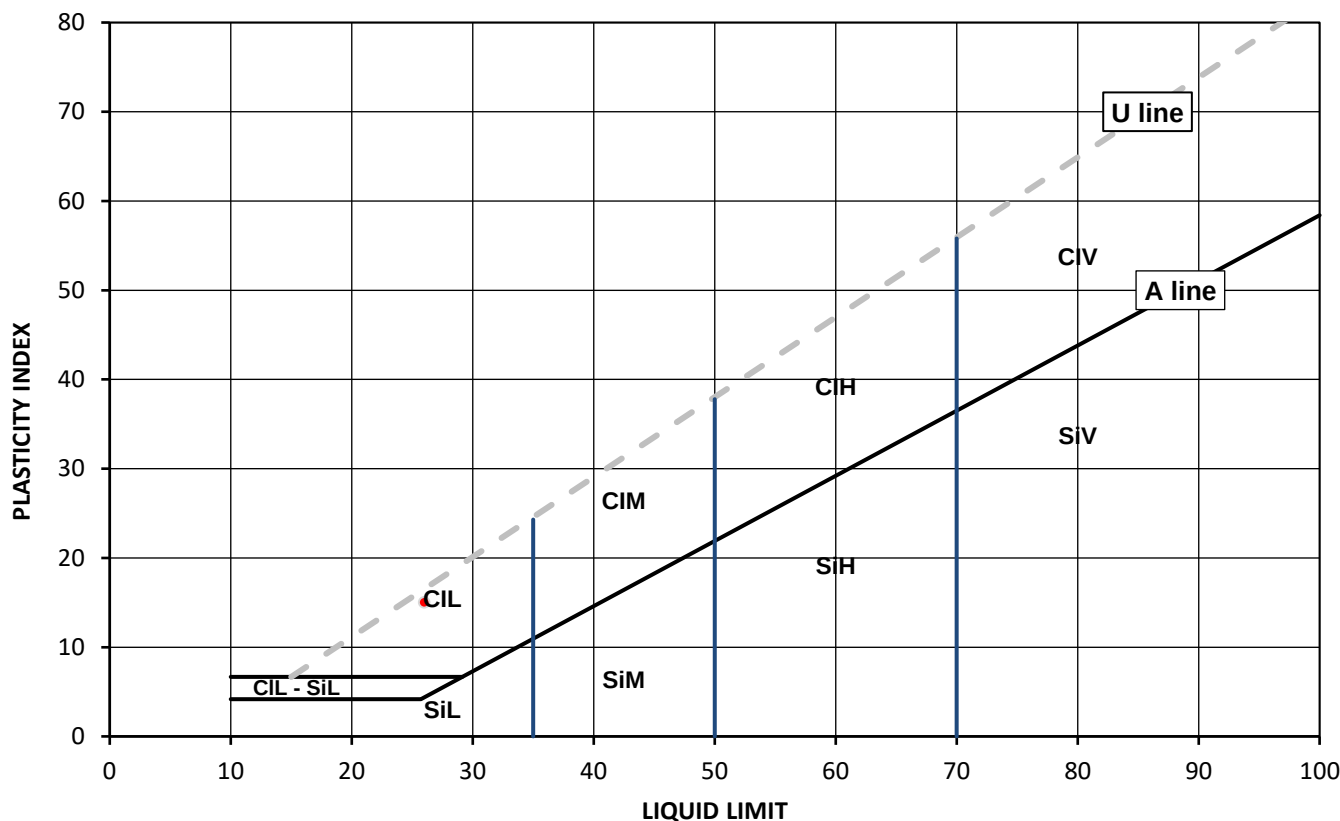
Test Results:

Laboratory Reference: 380844
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 14.00
Depth Base [m]: 14.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
10.3	26	11	15	-0.07	1.07	86



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 ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

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Geotechnical Reporting Team Leader
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TEST CERTIFICATE

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cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 08/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

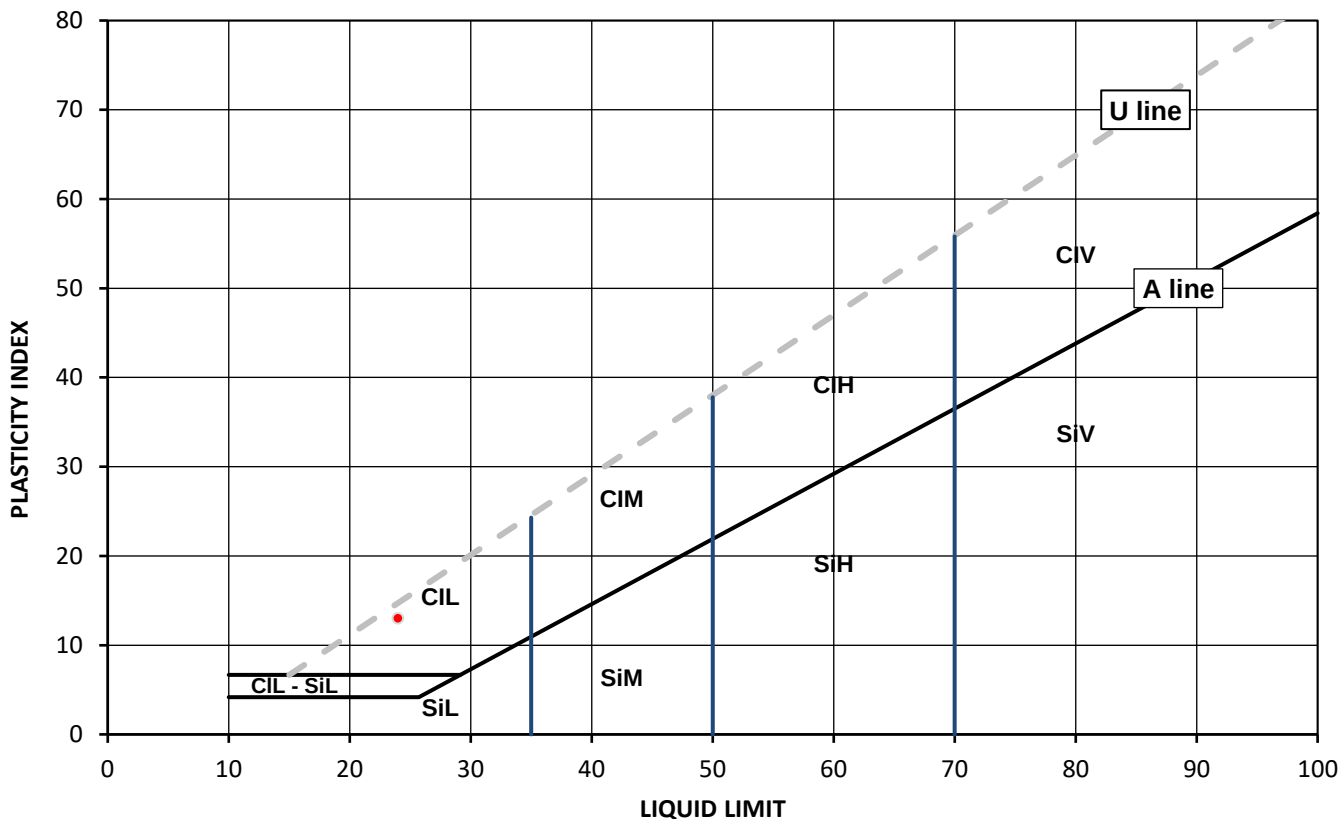
Test Results:

Laboratory Reference: 380845
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Brown slightly gravelly clayey SAND

Depth Top [m]: 19.00
Depth Base [m]: 19.50
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
8.5	24	11	13	-0.15	1.15	74



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

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cl 5.2 and 6

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Brackmills Industrial Estate
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Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

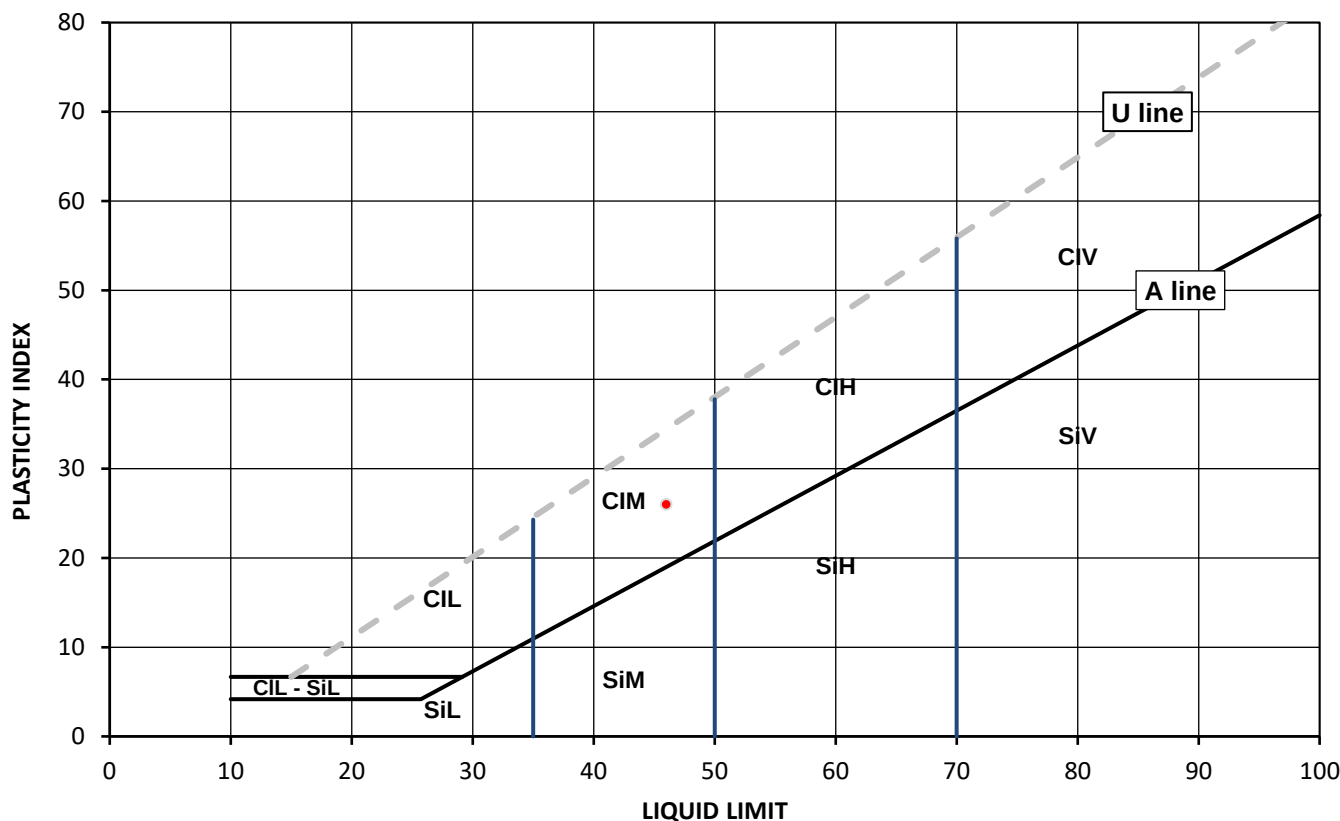
Test Results:

Laboratory Reference: 380846
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
23.3	46	20	26	0.12	0.88	99



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	
	V Very high	
	O Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Date Reported: 30/12/2024

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cl 5.2 and 6

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Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

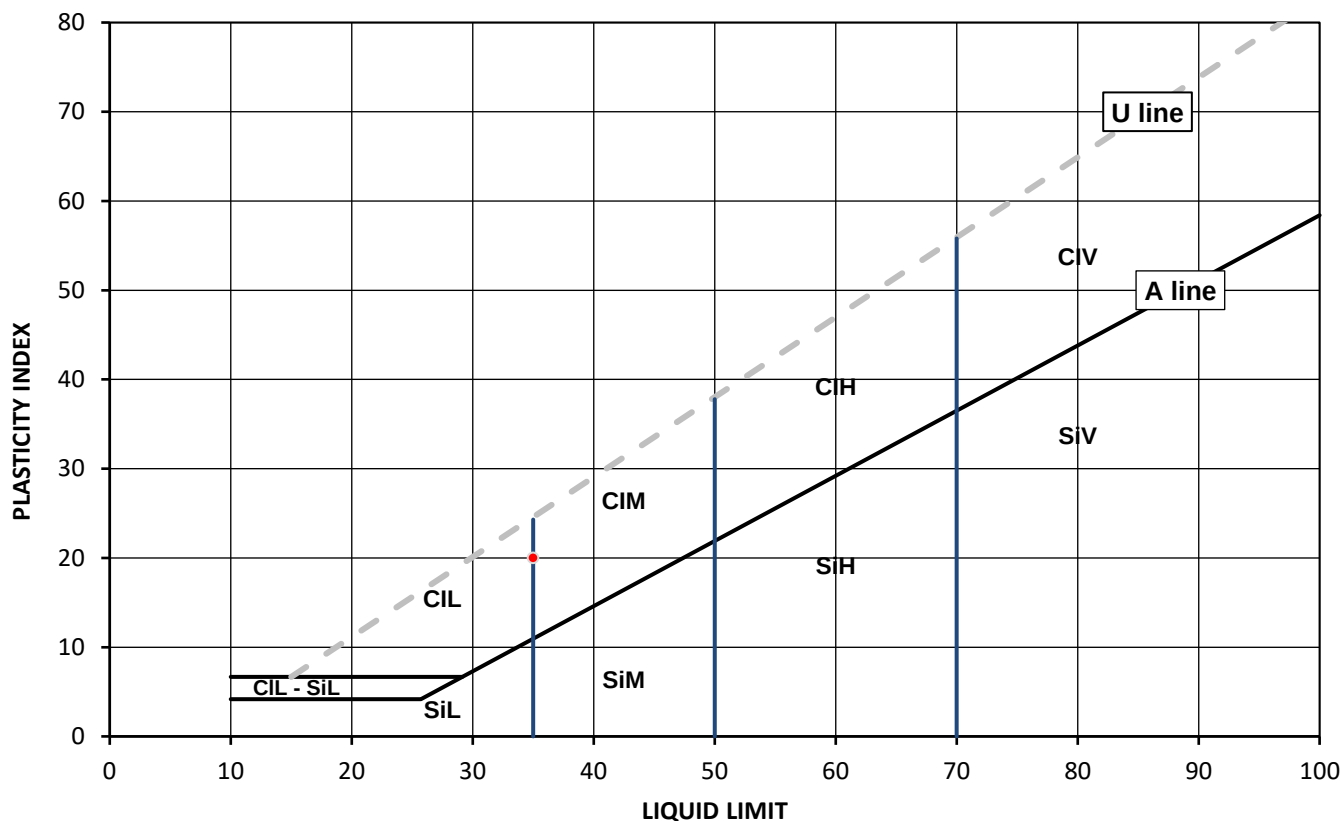
Test Results:

Laboratory Reference: 380847
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 6.50
Depth Base [m]: 6.95
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.1	35	15	20	0.20	0.80	88



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	
	V Very high	
	O Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

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cl 5.2 and 6

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Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

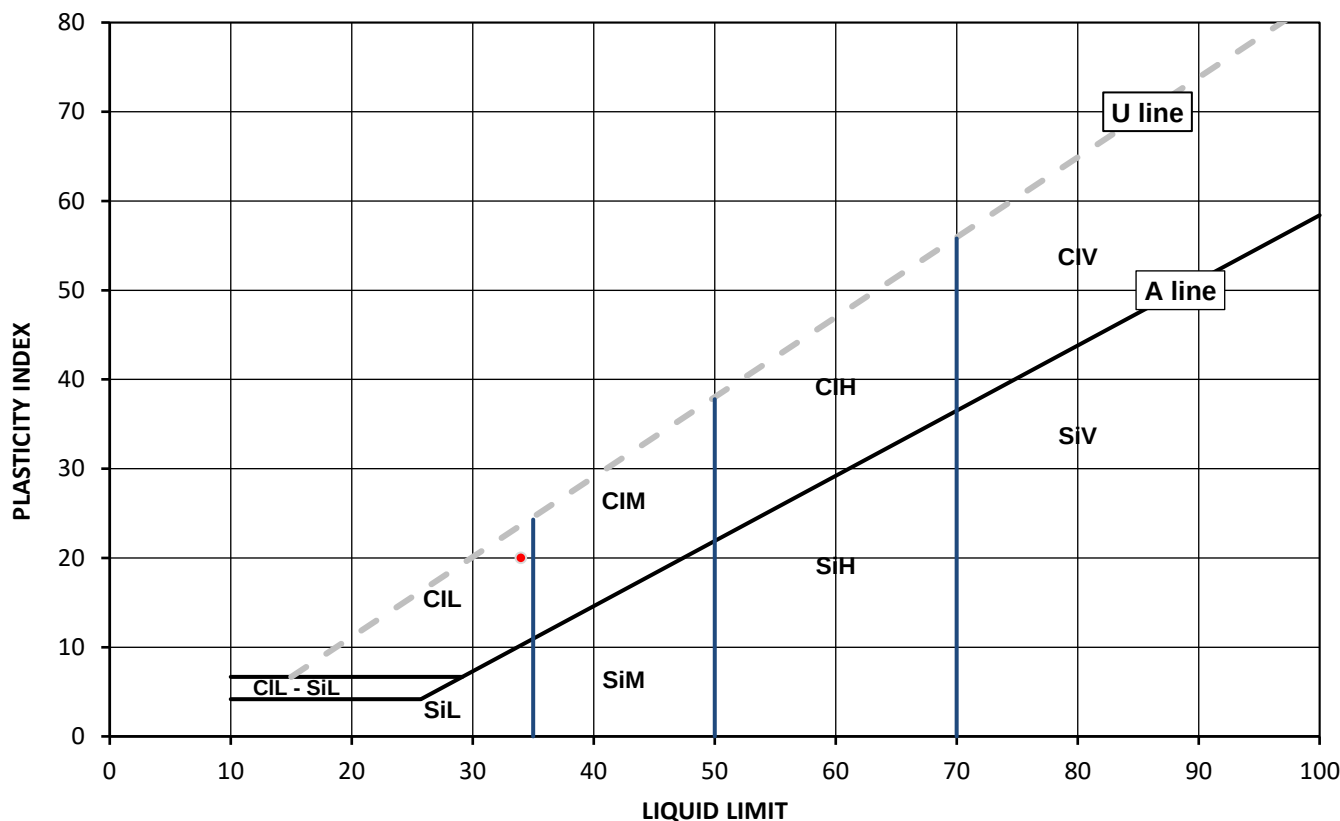
Test Results:

Laboratory Reference: 380848
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 11.00
Depth Base [m]: 11.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
16.3	34	14	20	0.10	0.90	89



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

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Geotechnical Reporting Team Leader
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cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

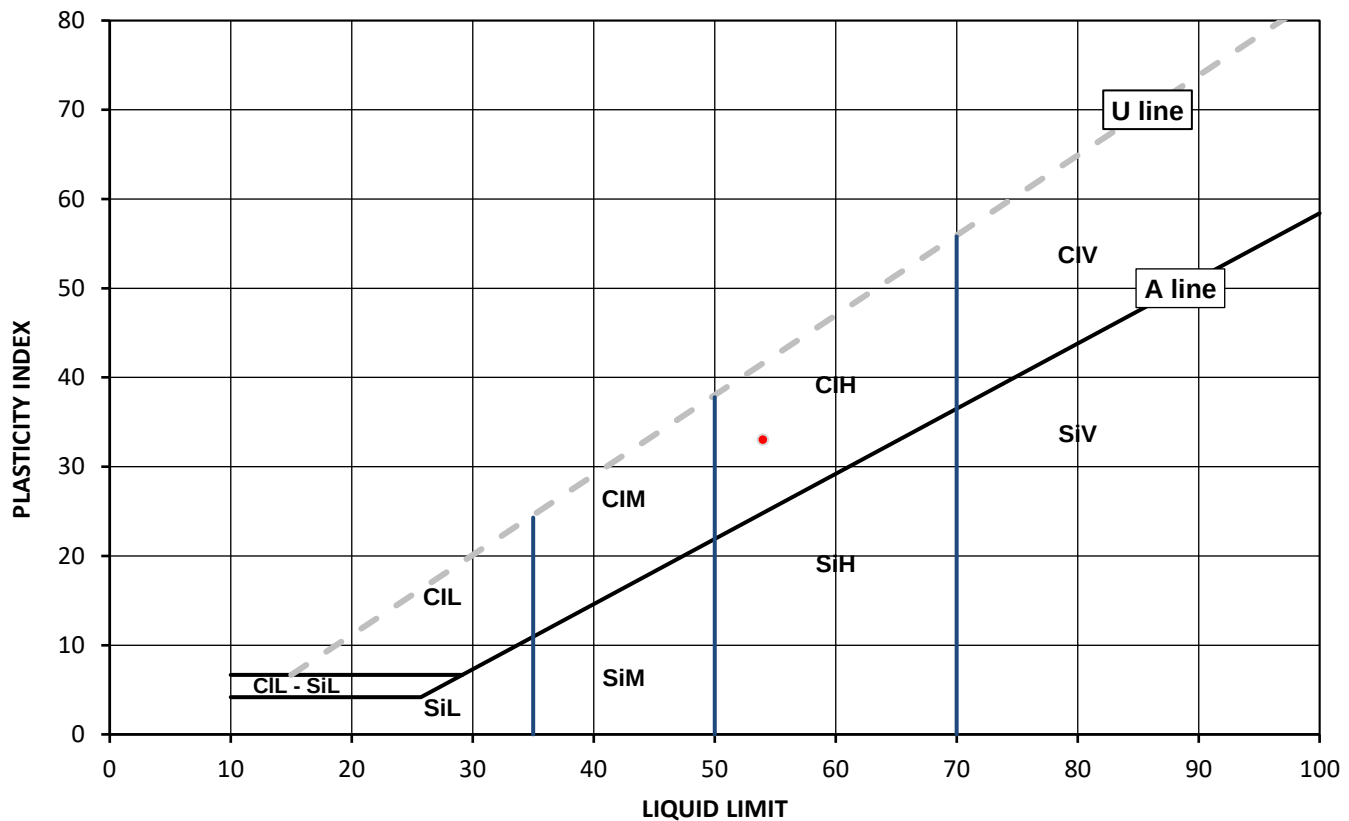
Test Results:

Laboratory Reference: 380849
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 18.50
Depth Base [m]: 18.95
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
24.3	54	21	33	0.09	0.91	98



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 ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

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Date Reported: 30/12/2024

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TEST CERTIFICATE

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cl 5.2 and 6

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 06/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

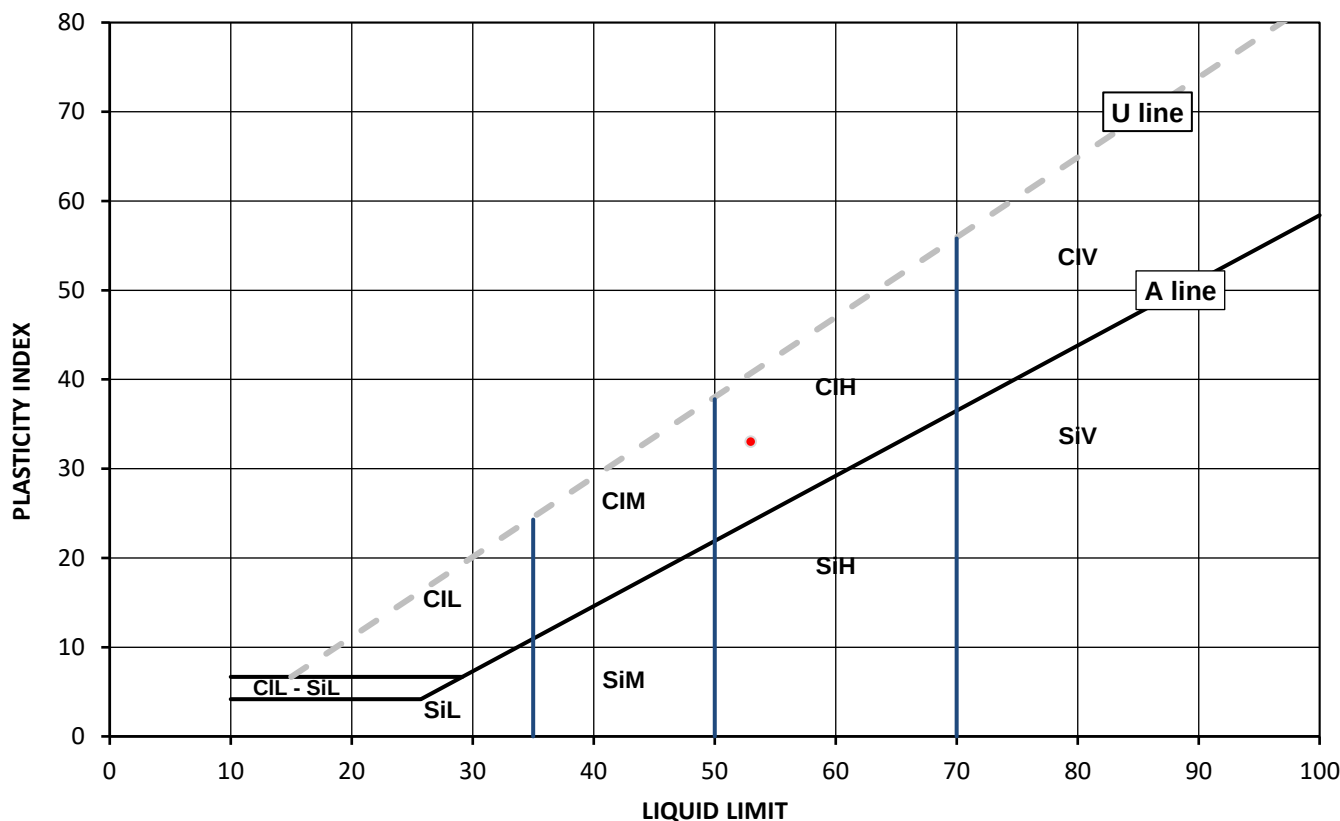
Test Results:

Laboratory Reference: 380851
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 5.00
Depth Base [m]: 5.45
Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
28.8	53	20	33	0.27	0.73	93



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 ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Date Reported: 30/12/2024

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TEST CERTIFICATE

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cl 5.2 and 6

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Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

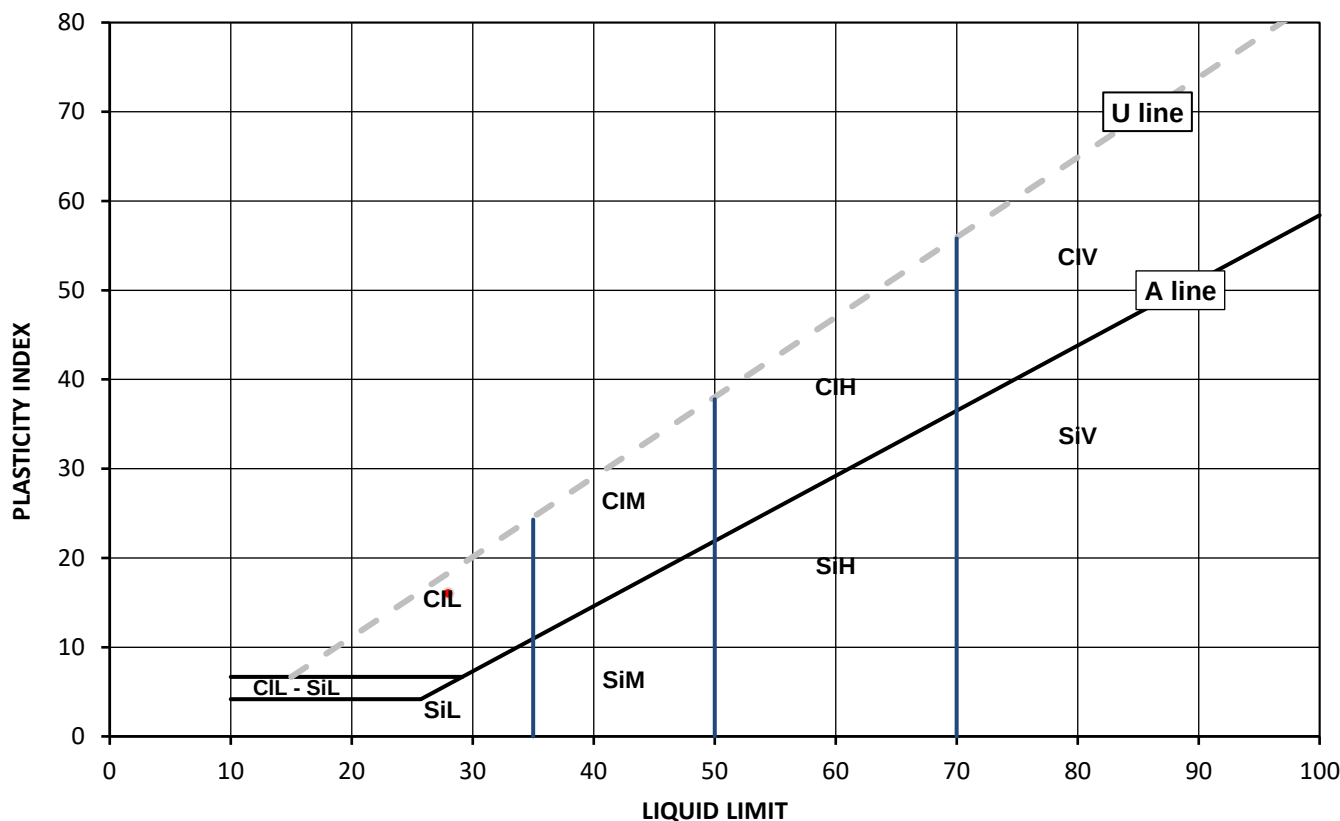
Test Results:

Laboratory Reference: 380852
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Brown slightly gravelly very sandy CLAY

Depth Top [m]: 12.50
Depth Base [m]: 12.95
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425mm; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
11.6	28	12	16	0.00	1.00	76



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 ClHO)
	V Very high	
	O Organic	

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

Signed:

na Koziel
Technical Reporting Team Leader
on behalf of i2 Analytical Ltd

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Reported: 30/12/2024

GF 337.14



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
cl 5.2 and 6

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 26/11/2024
Sampled By: Not Given

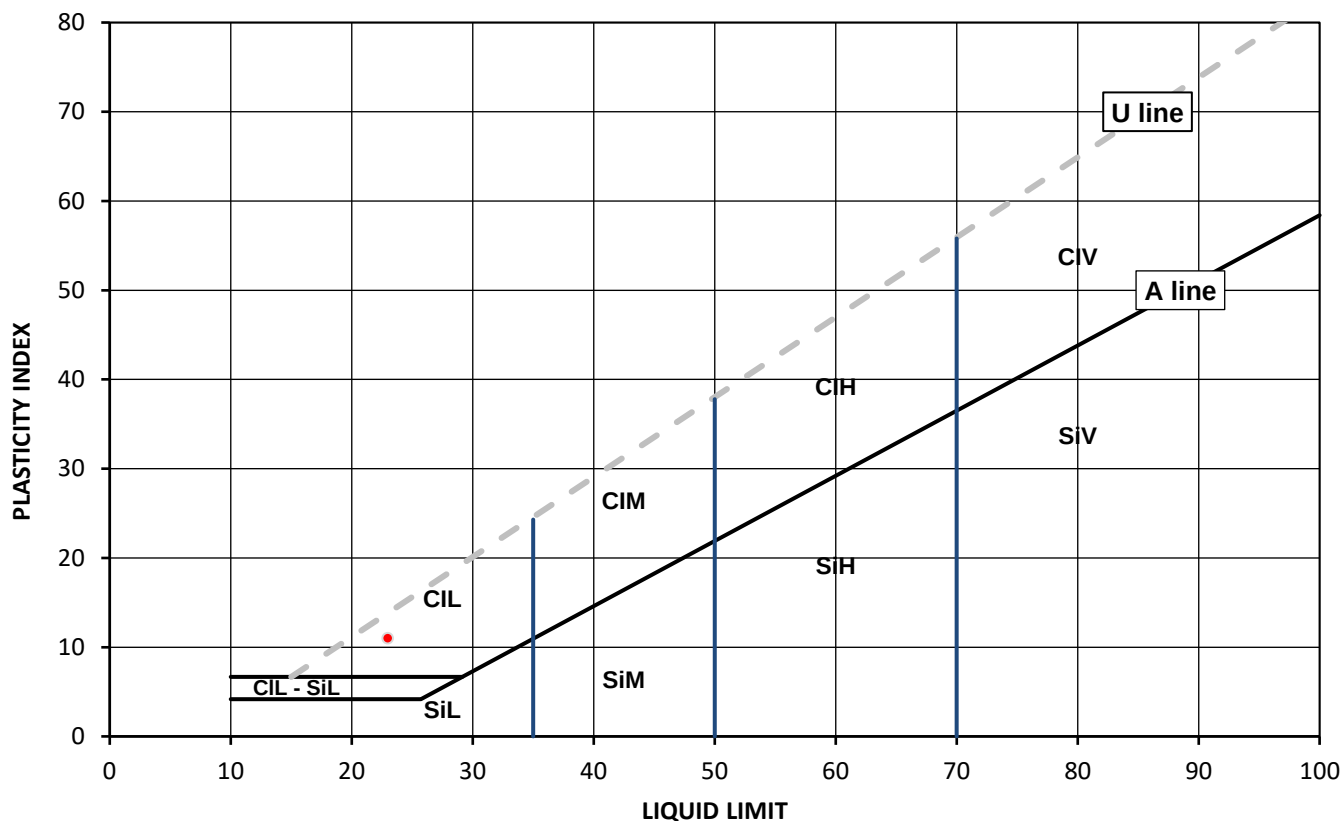
Test Results:

Laboratory Reference: 380855
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Brown slightly gravelly clayey SAND

Depth Top [m]: 19.00
Depth Base [m]: 19.50
Sample Type: B

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
9.1	23	12	11	-0.27	1.27	83



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
	M	Medium
	H	High
	V	Very high
	O	Organic
		50 to 70
		exceeding 70
		append to classification for organic material (eg ClHO)

Note: Water Content by BS EN ISO 17892-1:2014+A1:2022, BS 1377-2:2022; # Non accredited

Remarks:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

BS EN ISO 17892-12:2018+A2:2022, cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022, cl 5.3, 6. BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. Correlation Factor by Clayton C.R.I and Jukes A.W (1978). W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11 - 07/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD
			m	m														
380799	WS05	Not Given	3.00	3.45	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	19.3	99	44	-	18	26	80g/30 deg	R / I			
380800	WS06	Not Given	2.00	2.45	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	16.4	99	46	-	20	26	80g/30 deg	R / I			
380801	WS08	Not Given	4.00	4.45	D	Brownish grey sandy CLAY	Atterberg 4 Point	21.2	100	44	-	19	25	80g/30 deg	N / I			
380802	WS07	Not Given	5.00	5.45	D	Brownish grey slightly gravelly slightly sandy CLAY	Atterberg 4 Point	25.6	98	49	-	20	29	80g/30 deg	R / I			
380803	WS05	Not Given	4.00	4.45	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	19.8	99	37	-	18	19	80g/30 deg	R / I			
380804	WS03	Not Given	5.00	5.45	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	18.8	96	35	-	16	19	80g/30 deg	R / I			
380805	WS02	Not Given	3.00	3.45	D	Brownish grey slightly sandy CLAY	Atterberg 4 Point	28.3	100	58	-	24	34	80g/30 deg	N / I			
380842	CP01	Not Given	3.00	3.45	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	20.8	97	37	-	17	20	80g/30 deg	R / I			
380843	CP01	Not Given	8.00	8.45	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	16.6	74	34	1.030	16	18	80g/30 deg	R			
380844	CP01	Not Given	14.00	14.45	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	10.3	86	26	-	11	15	80g/30 deg	R / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased, D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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.

Signed:



Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 30/12/2024

GF 362.16



SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt
Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11 - 08/11/2024
Date Received: 15/11/2024
Date Tested: 26/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD
			m	m														
380845	CP01	Not Given	19.00	19.50	D	Brown slightly gravelly clayey SAND	Atterberg 4 Point	8.5	74	24	-	11	13	80g/30 deg	R / I			
380846	CP02	Not Given	2.00	2.45	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	23.3	99	46	-	20	26	80g/30 deg	R / I			
380847	CP02	Not Given	6.50	6.95	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	19.1	88	35	-	15	20	80g/30 deg	R / I			
380848	CP02	Not Given	11.00	11.45	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	16.3	89	34	-	14	20	80g/30 deg	R / I			
380849	CP02	Not Given	18.50	18.95	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	24.3	98	54	-	21	33	80g/30 deg	R / I			
380851	CP03	Not Given	5.00	5.45	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	28.8	93	53	-	20	33	80g/30 deg	R / I			
380852	CP03	Not Given	12.50	12.95	D	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	11.6	76	28	-	12	16	80g/30 deg	WR / I			
380855	CP03	Not Given	19.00	19.50	B	Brown slightly gravelly clayey SAND	Atterberg 4 Point	9.1	83	23	-	12	11	80g/30 deg	R / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, WR - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Signed:



Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

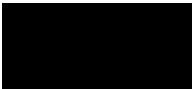
Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11 - 07/11/2024
Date Received: 15/11/2024
Date Tested: 25/11/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type														
380799	WS05	Not Given	3.00	3.45	D	Brown slightly gravelly sandy CLAY		19.3											
380800	WS06	Not Given	2.00	2.45	D	Brown slightly gravelly slightly sandy CLAY		16.4											
380801	WS08	Not Given	4.00	4.45	D	Brownish grey sandy CLAY		21.2											
380802	WS07	Not Given	5.00	5.45	D	Brownish grey slightly gravelly slightly sandy CLAY		25.6											
380803	WS05	Not Given	4.00	4.45	D	Brown slightly gravelly sandy CLAY		19.8											
380804	WS03	Not Given	5.00	5.45	D	Brown slightly gravelly sandy CLAY		18.8											
380805	WS02	Not Given	3.00	3.45	D	Brownish grey slightly sandy CLAY		28.3											
380842	CP01	Not Given	3.00	3.45	D	Brown slightly gravelly sandy CLAY		20.8											
380843	CP01	Not Given	8.00	8.45	D	Brown slightly gravelly very sandy CLAY		16.6											
380844	CP01	Not Given	14.00	14.45	D	Brown slightly gravelly very sandy CLAY		10.3											

Comments:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



SUMMARY REPORT
DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS EN ISO 17892-1:2014+A1:2022, BS 1377-2: 2022, clause 4.1

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



Environmental Science

4041
Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

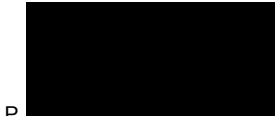
Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11 - 08/11/2024
Date Received: 15/11/2024
Date Tested: 25/11 - 26/11/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC											
		Reference	Depth Top m	Depth Base m	Type														
380845	CP01	Not Given	19.00	19.50	D	Brown slightly gravelly clayey SAND		8.5											
380846	CP02	Not Given	2.00	2.45	D	Brown slightly gravelly slightly sandy CLAY		23.3											
380847	CP02	Not Given	6.50	6.95	D	Brown slightly gravelly sandy CLAY		19.1											
380848	CP02	Not Given	11.00	11.45	D	Brown slightly gravelly very sandy CLAY		16.3											
380849	CP02	Not Given	18.50	18.95	D	Brown slightly gravelly slightly sandy CLAY		24.3											
380851	CP03	Not Given	5.00	5.45	D	Brown slightly gravelly slightly sandy CLAY		28.8											
380852	CP03	Not Given	12.50	12.95	D	Brown slightly gravelly very sandy CLAY		11.6											
380855	CP03	Not Given	19.00	19.50	B	Brown slightly gravelly clayey SAND		9.1											

Comments:

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Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

P

Date Reported: 30/12/2024

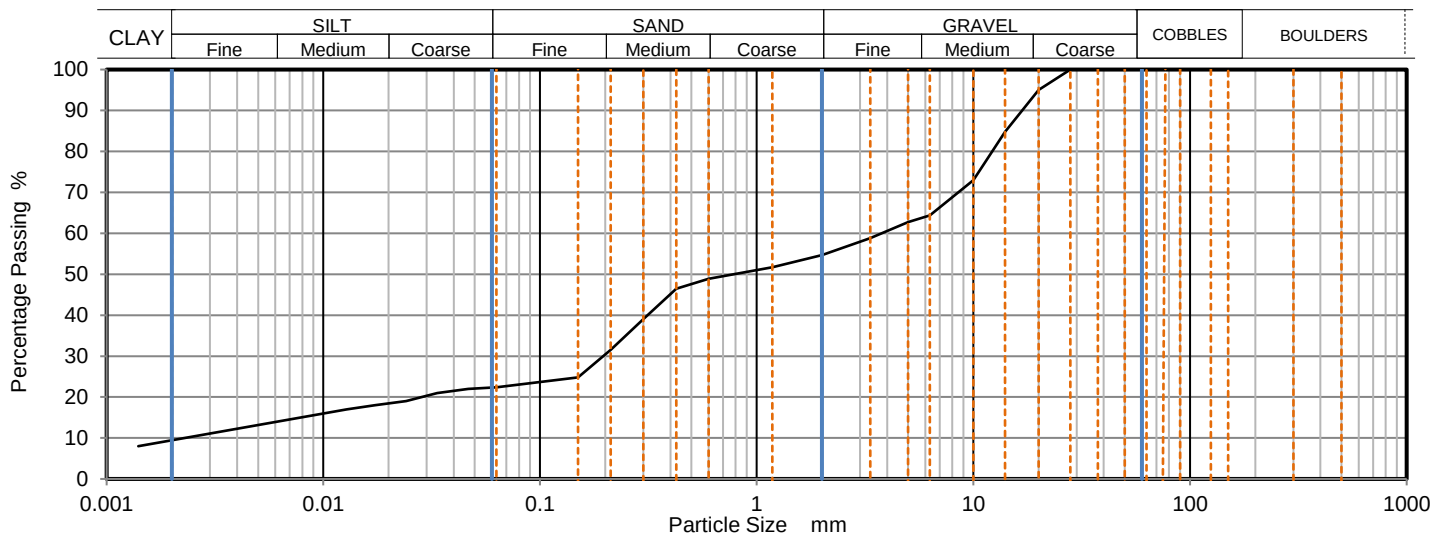
GF 126.18



4041

**TEST CERTIFICATE****DETERMINATION OF PARTICLE
SIZE DISTRIBUTION**Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, ManchesterClient Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 26/11/2024
Sampled By: Not GivenContact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland**Test Results:**Laboratory Reference: 380850
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown gravelly slightly sandy clayey SILT
Sample Preparation: Sample was quartered, oven dried at 107.9 °C and broken down by hand.Depth Top [m]: 21.50
Depth Base [m]: 21.95
Sample Type: B

Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0467	22
300	100	0.0335	21
150	100	0.0241	19
125	100	0.0173	18
90	100	0.0128	17
75	100	0.0014	8
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	85		
10	73		
6.3	64		
5	63		
3.35	59		
2	55		
1.18	52		
0.6	49	Particle density (assumed) 2.65 Mg/m3	
0.425	47		
0.3	39		
0.212	32		
0.15	25		
0.063	22		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	45.00
Sand	32.00
Silt	13.00
Clay	10.00

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

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

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
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.Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



4041



TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10

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



Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

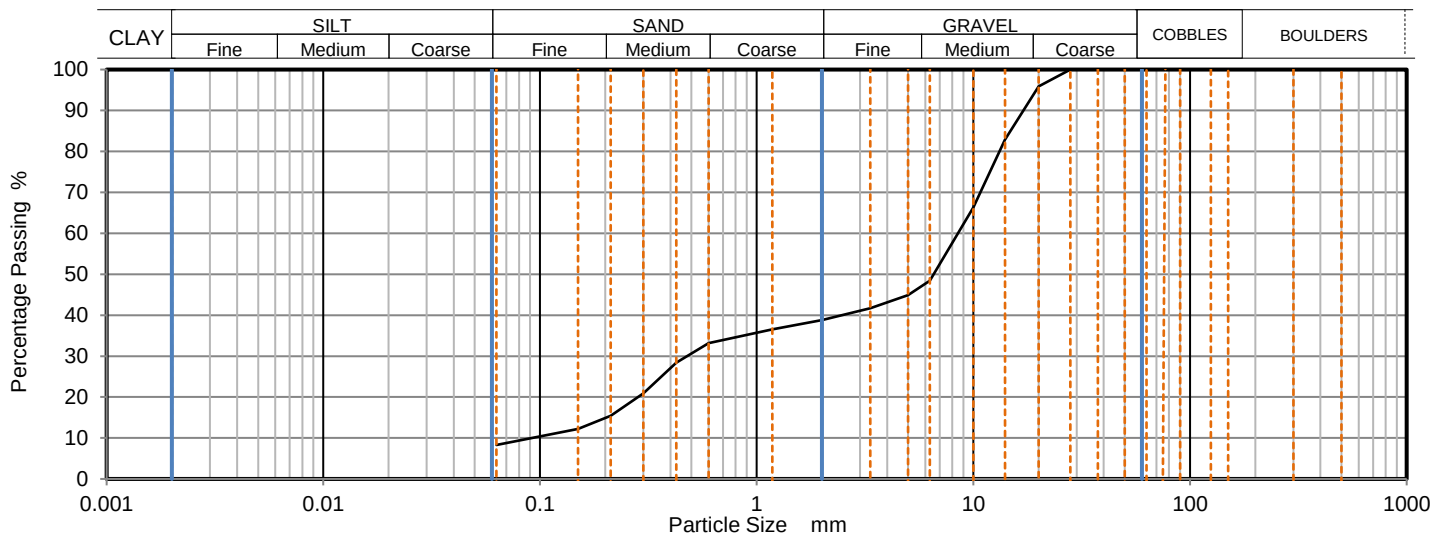
Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 26/11/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 380853
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Brown very sandy clayey GRAVEL
Sample Preparation: Sample was quartered, oven dried at 107.9 °C and broken down by hand.

Depth Top [m]: 14.00
Depth Base [m]: 14.45
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	96		
14	83		
10	66		
6.3	48		
5	45		
3.35	42		
2	39		
1.18	37		
0.6	33		
0.425	28		
0.3	21		
0.212	15		
0.15	12		
0.063	8		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	61.00
Sand	31.00
Fines <0.063 mm	8.00

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

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation 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.

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

Date Reported: 30/12/2024

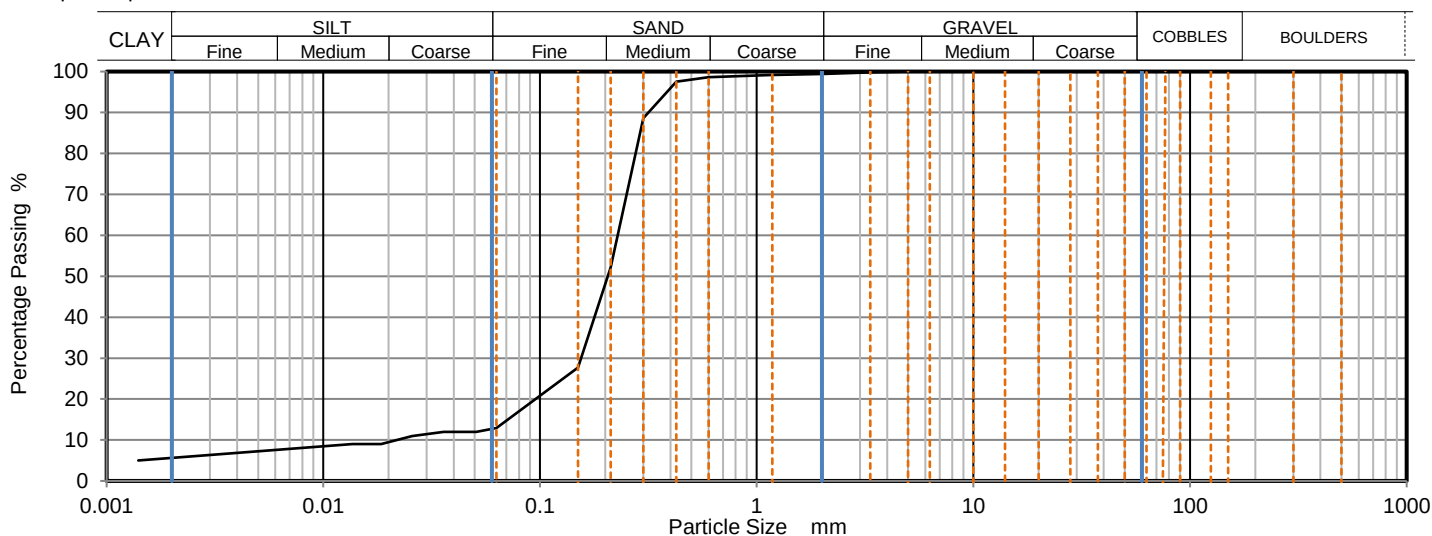
GF 366.11



4041

**TEST CERTIFICATE****DETERMINATION OF PARTICLE
SIZE DISTRIBUTION**Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, ManchesterClient Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 26/11/2024
Sampled By: Not GivenContact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland**Test Results:**Laboratory Reference: 380854
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 107.9 °C and broken down by hand.Depth Top [m]: 17.00
Depth Base [m]: 17.45
Sample Type: B

Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0508	12
300	100	0.0359	12
150	100	0.0257	11
125	100	0.0185	9
90	100	0.0136	9
75	100	0.0014	5
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	99	Particle density (assumed) 2.65 Mg/m3	
0.425	98		
0.3	89		
0.212	52		
0.15	28		
0.063	13		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	1.00
Sand	86.00
Silt	7.00
Clay	6.00

Grading Analysis		
D100	mm	5
D60	mm	0.228
D30	mm	0.155
D10	mm	0.021
Uniformity Coefficient		11
Curvature Coefficient		5

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

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks:



SUMMARY REPORT

DETERMINATION OF POINT LOAD STRENGTH

Tested in Accordance with: ISRM: 2007, pages 125-132

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 06/11 - 14/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Test results

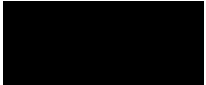
Laboratory Reference	Hole No.	Sample				Description	Remarks (including water content if measured)	Specimen Reference	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P	Equivalent diameter, De	Point Load Strength Index	
		Reference	Depth Top	Depth Base	Type				Type (D, A, I, B)	Direction (L, P or U)		Lne	W	Dps	Dps'			Is	Is(50)
			m	m															
380816	CP01	Not Given	23.93	24.16	C	Brown SANDSTONE	WC = 8.2%	1	D	U	YES	114.2	86.4	86.0	81.0	2.3	83.6	0.32	0.41
380817	CP01	Not Given	24.62	24.82	C	Brown MUDSTONE	WC = 3.4%	1	A	U	YES	-	85.2	69.0	54.0	1.5	76.5	0.25	0.30
380818	CP01	Not Given	25.70	25.84	C	Brown MUDSTONE	WC = 2.8%	1	D	U	YES	74.6	82.8	83.0	74.0	1.4	78.3	0.22	0.27
380820	CP01	Not Given	26.61	26.86	C	Brown MUDSTONE	WC = 10.3%	1	D	U	YES	120.9	85.5	86.0	79.0	1.5	82.2	0.21	0.27
380822	CP01	Not Given	27.55	27.74	C	Brown MUDSTONE	WC = 13.9%	1	D	U	YES	90.4	85.9	87.0	84.0	0.9	85.0	0.12	0.16
380823	CP01	Not Given	28.00	28.13	C	Grey SILTSTONE	WC = 8.0%	1	D	U	YES	71.6	84.7	84.0	81.0	1.7	82.8	0.24	0.30
380828	CP02	Not Given	23.60	23.74	C	Brown SANDSTONE	WC = 9.5%	1	D	U	YES	72.3	85.6	87.0	82.0	1.8	83.8	0.25	0.31
380830	CP02	Not Given	24.66	24.86	C	Orangish brown SANDSTONE	WC = 8.1%	1	D	U	YES	101.7	84.6	85.0	81.0	1.5	82.8	0.21	0.27
380831	CP02	Not Given	25.16	25.30	C	Orangish brown SANDSTONE	WC = 10.5%	1	D	U	YES	72.3	84.8	84.0	82.0	0.9	83.4	0.13	0.16
380832	CP02	Not Given	26.05	26.17	C	Orangish brown SANDSTONE	WC = 8.3%	1	D	U	YES	82.2	85.2	86.0	82.0	1.7	83.6	0.24	0.30

Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;
Dimensions: Dps - Distance between platens (platen separation), Dps' - at failure (see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;
Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Equipment No.: i2 4341 Calibration Date: 15/03/2024 - 15/03/2025

Comments:

Signed:



Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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4041
Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

SUMMARY REPORT
DETERMINATION OF POINT LOAD STRENGTH
Tested in Accordance with: ISRM: 2007, pages 125-132

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



Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 06/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks (including water content if measured)	Specimen Reference	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P kN	Equivalent diameter, De mm	Point Load Strength Index	
		Reference	Depth Top m	Depth Base m	Type				Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is MPa	Is(50) MPa
380833	CP02	Not Given	26.80	Not Given	C	Orangish brown SANDSTONE	WC = 10.1%	1	D	U	YES	55.2	84.9	85.0	83.0	1.2	83.9	0.17	0.22
380834	CP02	Not Given	27.40	27.64	C	Orangish brown SANDSTONE	WC = 6.6%	1	D	U	YES	128.1	84.3	85.0	82.0	1.5	83.1	0.21	0.26
380835	CP02	Not Given	28.21	28.39	C	Orangish brown SANDSTONE	WC = 4.1%	1	D	U	YES	97.6	85.6	86.0	84.0	2.4	84.8	0.33	0.42
380836	CP02	Not Given	28.56	28.66	C	Orangish brown SANDSTONE	WC = 4.8%	1	D	U	YES	78.3	86.6	87.0	82.0	4.0	84.3	0.56	0.71

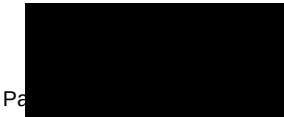
Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;
Dimensions: Dps - Distance between platens (platen separation), Dps' - at failure (see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;
Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Equipment No.: i2 4341 Calibration Date: 15/03/2024 - 15/03/2025

Comments:

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Signed: Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd





SUMMARY REPORT

DETERMINATION OF UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Tested in Accordance with: ISRM, 2007, p153, part 1

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



Environmental Science

4041

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A

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

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 06/11/2024
Date Received: 15/11/2024
Date Tested: 19/12 - 23/12/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Specimen Dimensions (2)				Bulk density (2) Mg/m3	Water Content (1) %	Uniaxial Compression (3)			
		Reference	Depth Top	Depth Base	Type			Diameter	Length	H/D	Orientation of sample			Condition	Stress Rate	Mode of failure	UCS
			m	m													
380829	CP02	Not Given	24.30	24.60	C	Orangish brown SANDSTONE		84.2	223.0	2.6	Vertical	2.22	11.7	as received	0.0359	AC	13.0
380837	CP02	Not Given	29.66	30.00	C	Grey SILTSTONE	Sample is below recommended length to diameter ratio.	86.4	117.4	1.4	Vertical	2.34	5.8	as received	0.0170	S	6.85

Note: 1 - ISRM p87 test 1, water content at 105 ± 3 °C - not accredited, specimen as tested for UCS, 2 - ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density, 3 - ISRM p153 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials, above notes apply unless annotated otherwise in the remarks. Compaction machine: VJ Tech AUTOCON - VJT 51-3011; Mode of failure legend: S - Single shear, MS - multiple shear, AC - Axial cleavage, F - Fragmented

Comments: Replaces Analytical Report Number 24-054140, issue no 1; Additional results of UCS of Rock

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE

UNCONFINED COMPRESSIVE STRENGTH OF SOIL

Tested in Accordance with: BS EN ISO 17892-7: 2018

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 11/11/2024
Date Received: 15/11/2024
Date Tested: 23/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

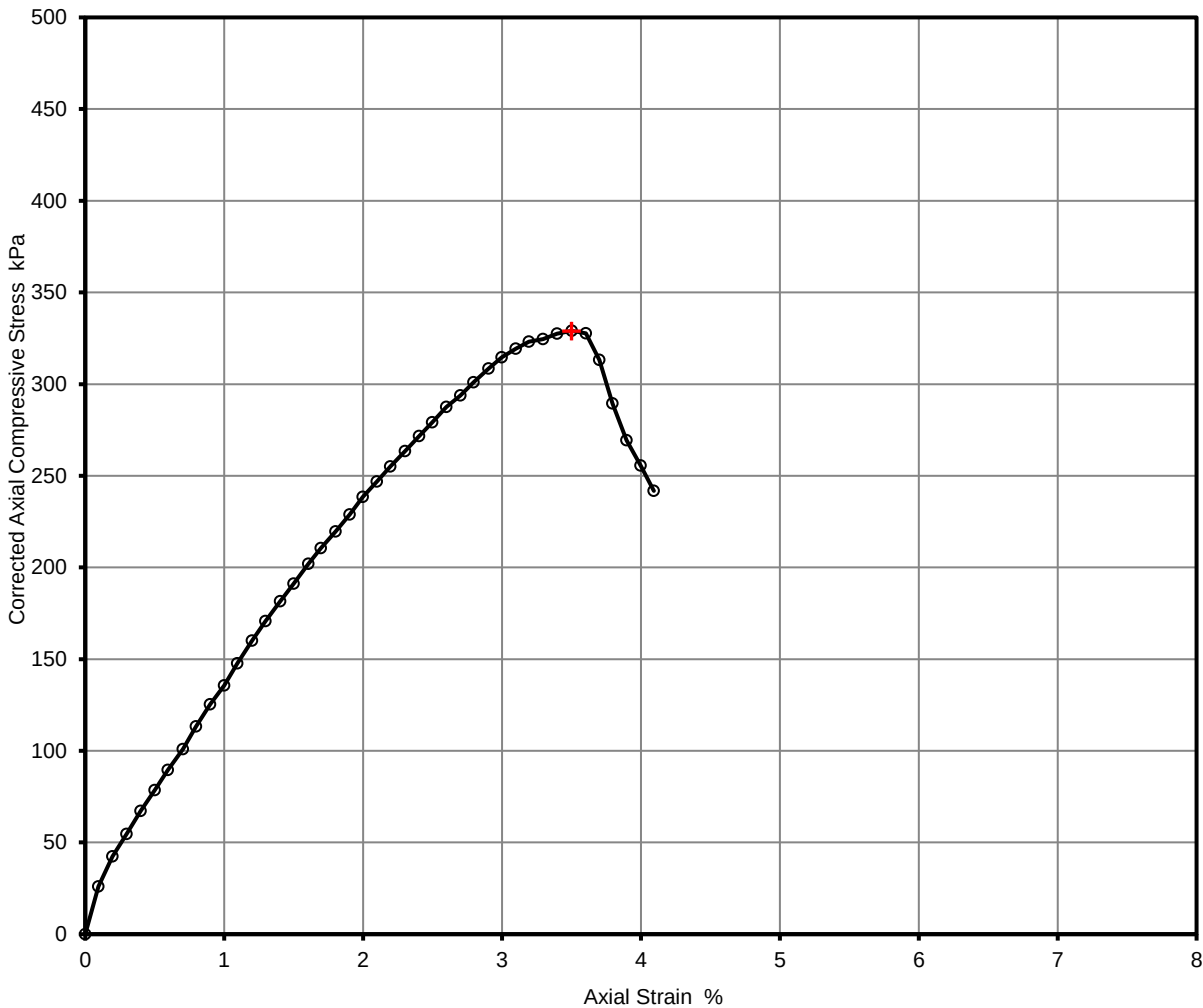
Test Results:

Laboratory Reference: 380814
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Orangish brown slightly silty CLAY

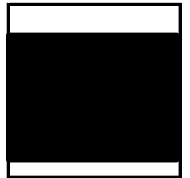
Depth Top [m]: 22.97
Depth Base [m]: 23.28
Sample Type: C

Test Number	1	Rate of Strain	1.0	%/min
Length	178.1 mm	At failure	3.5	%
Diameter	86.5 mm	Axial Strain	329	kPa
Bulk Density	2.40 Mg/m3	Unconfined Compressive Strength	Brittle	
Water content	9.0 %	Mode of Failure		
Dry Density	2.20 Mg/m3			

Axial Compressive Stress v Axial Strain



Position within sample



Note: Axial compressive stress corrected for area change, and membrane effects (if used)

Remarks: Replaces Analytical Report Number 24-054140, issue no 1; Additional results of UCS of Soil

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Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



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TEST CERTIFICATE

UNCONFINED COMPRESSIVE STRENGTH OF SOIL

Tested in Accordance with: BS EN ISO 17892-7: 2018

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 14/11/2024
Date Received: 15/11/2024
Date Tested: 23/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

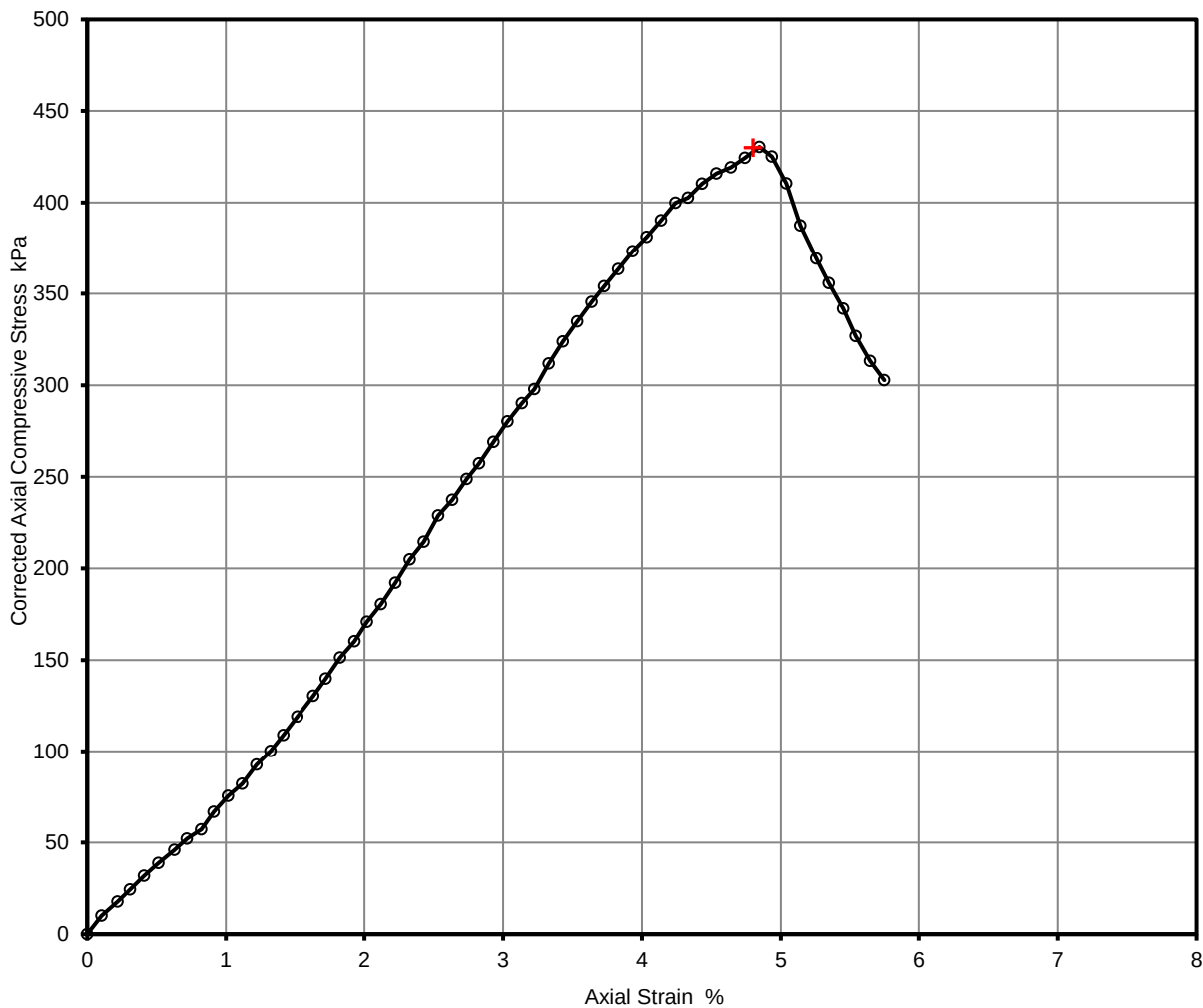
Test Results:

Laboratory Reference: 380821
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Orangish brown slightly silty CLAY

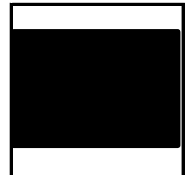
Depth Top [m]: 26.86
Depth Base [m]: 27.17
Sample Type: C

Test Number	1	Rate of Strain	1.0	%/min
Length	77.8	At failure	4.8	%
Diameter	85.4	Axial Strain	430	kPa
Bulk Density	2.31	Unconfined Compressive Strength	Brittle	
Water content	8.2	Mode of Failure		
Dry Density	2.13			

Axial Compressive Stress v Axial Strain



Position within sample



Note: Axial compressive stress corrected for area change, and membrane effects (if used)

Remarks: Sample is below recommended length to diameter ratio
Replaces Analytical Report Number 24-054140, issue no 1; Additional results of UCS of Soil

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

UNCONFINED COMPRESSIVE STRENGTH OF SOIL

Tested in Accordance with: BS EN ISO 17892-7: 2018

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 14/11/2024
Date Received: 15/11/2024
Date Tested: 23/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

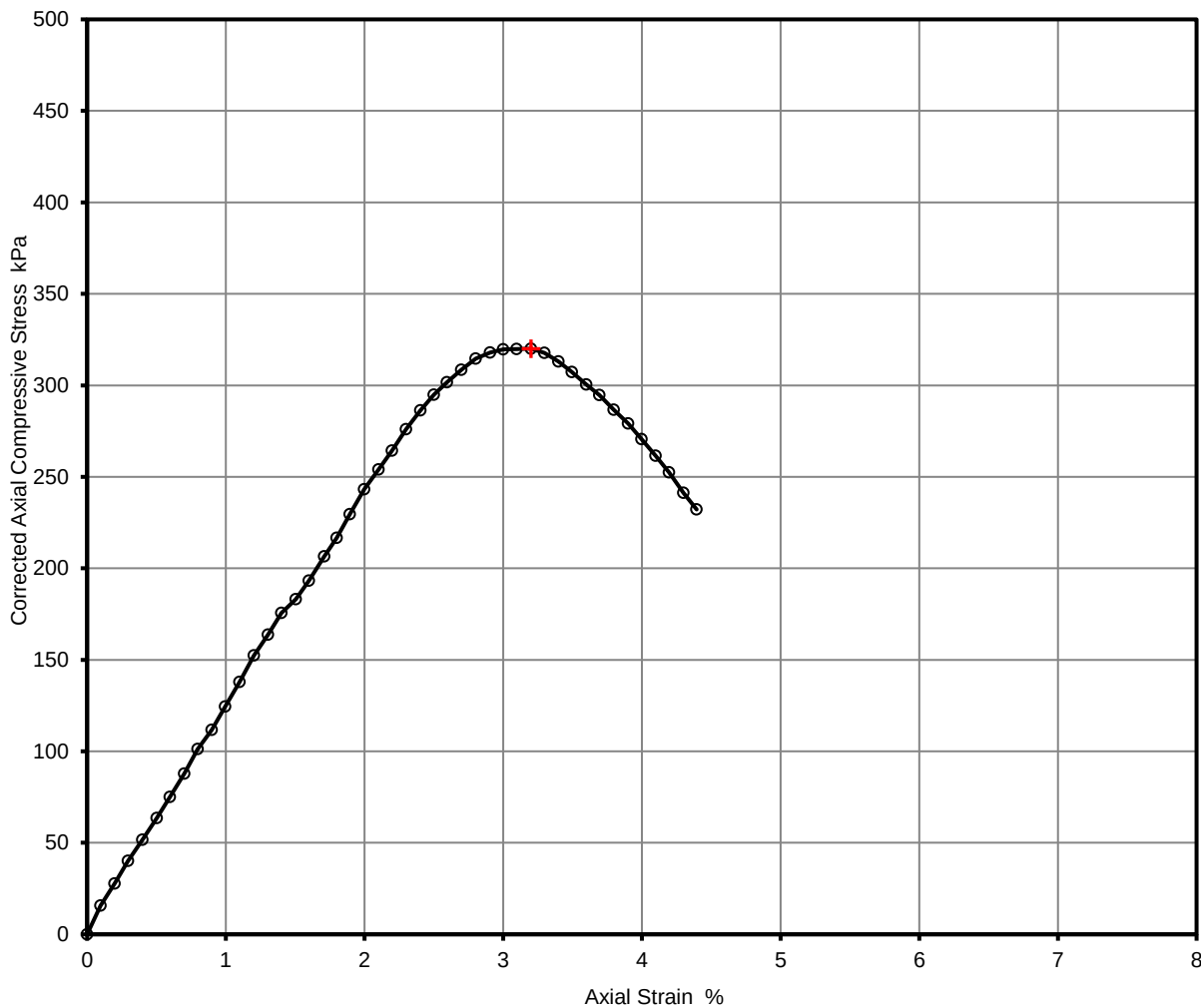
Test Results:

Laboratory Reference: 380824
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Orangish brown slightly silty CLAY

Depth Top [m]: 28.50
Depth Base [m]: 28.80
Sample Type: C

Test Number	1	Rate of Strain	1.0	%/min
Length	135.6 mm	At failure	3.2	%
Diameter	83.6 mm	Axial Strain	320	kPa
Bulk Density	2.30 Mg/m ³	Unconfined Compressive Strength	Brittle	
Water content	12.2 %	Mode of Failure		
Dry Density	2.05 Mg/m ³			

Axial Compressive Stress v Axial Strain



Position within sample



Note: Axial compressive stress corrected for area change, and membrane effects (if used)

Remarks: Sample is below recommended length to diameter ratio
Replaces Analytical Report Number 24-054140, issue no 1; Additional results of UCS of Soil

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

UNCONFINED COMPRESSIVE STRENGTH OF SOIL

Tested in Accordance with: BS EN ISO 17892-7: 2018

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 08/11/2024
Date Received: 15/11/2024
Date Tested: 23/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

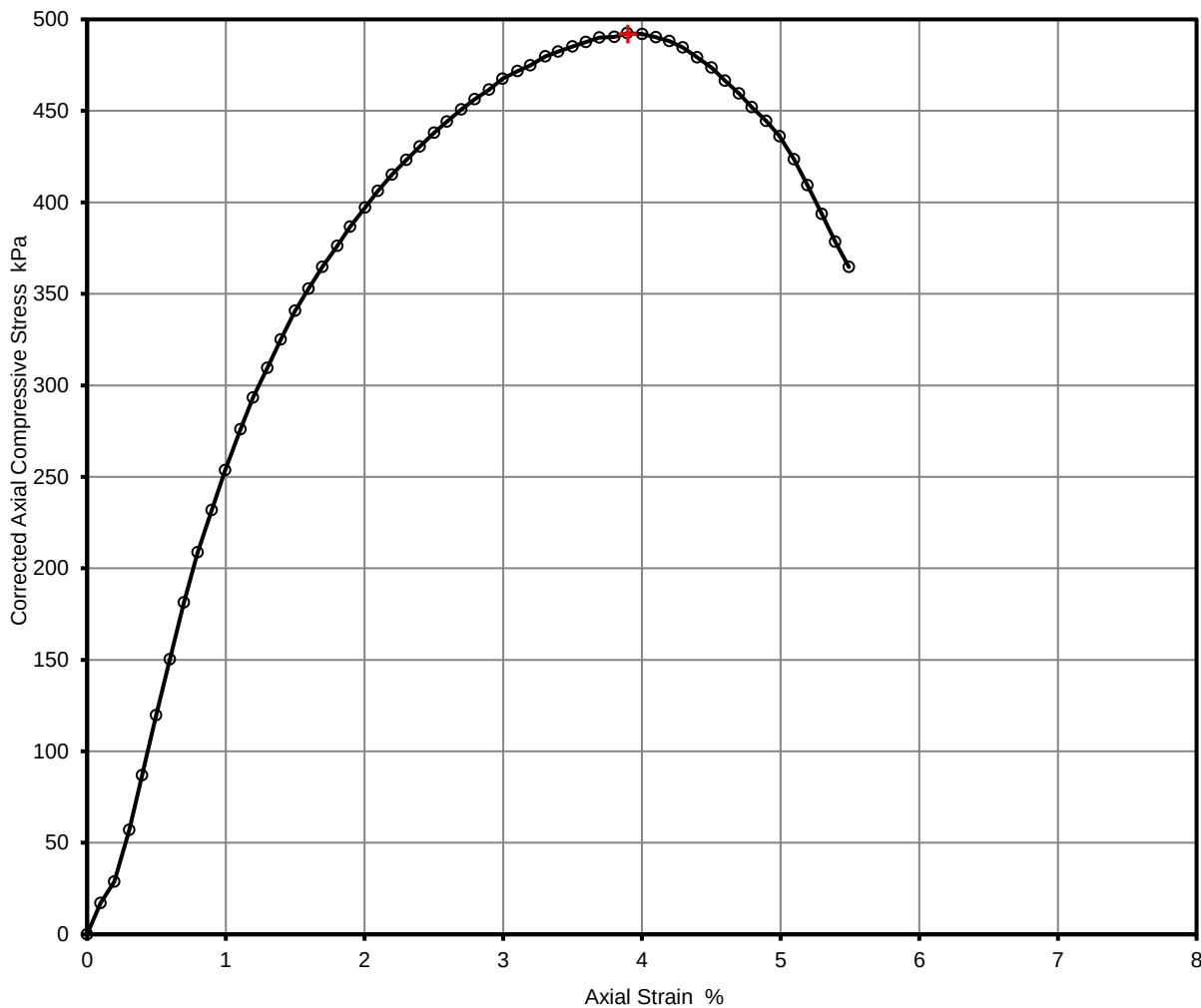
Test Results:

Laboratory Reference: 380839
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Orangish brown slightly silty CLAY

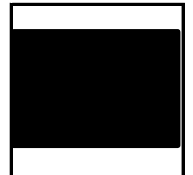
Depth Top [m]: 25.22
Depth Base [m]: 24.55
Sample Type: C

Test Number	1	Rate of Strain	1.0	%/min
Length	184.6	At failure	3.9	%
Diameter	85.5	Axial Strain	492	kPa
Bulk Density	2.32	Unconfined Compressive Strength	Brittle	
Water content	12.9	Mode of Failure		
Dry Density	2.05			

Axial Compressive Stress v Axial Strain



Position within sample



Note: Axial compressive stress corrected for area change, and membrane effects (if used)

Remarks: Replaces Analytical Report Number 24-054140, issue no 1; Additional results of UCS of Soil

Signed:

Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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4041



TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 07/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

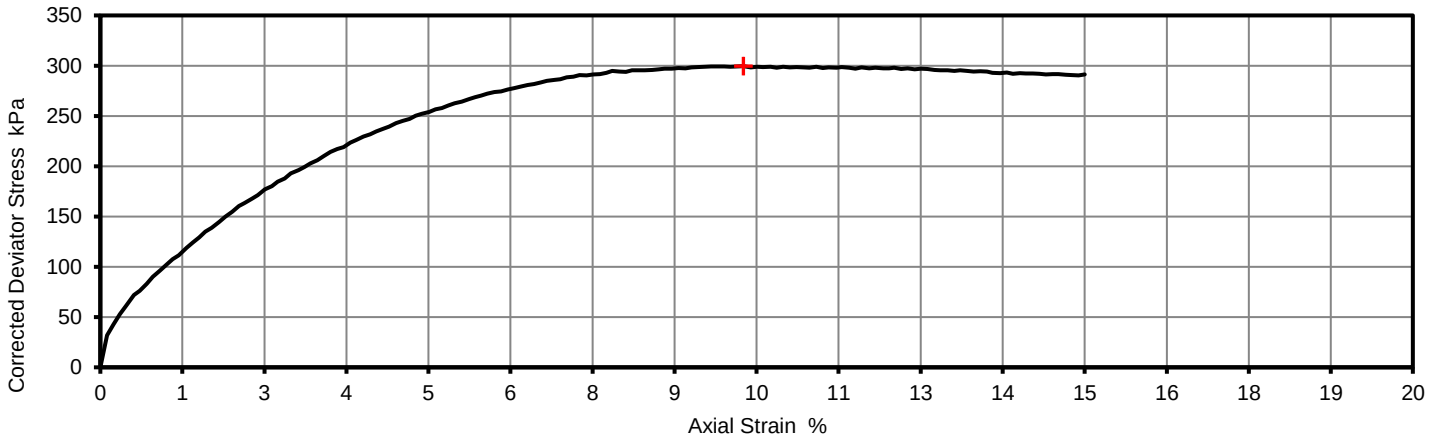
Laboratory Reference: 380807
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Brown slightly gravelly CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

Depth Top [m]: 11.00
Depth Base [m]: 11.45
Sample Type: C

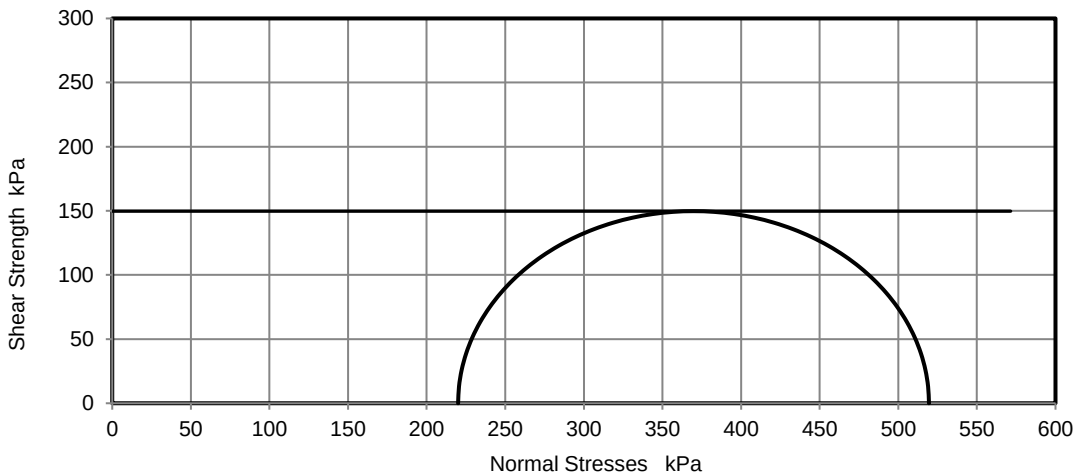
Test Number	1
Depth within Sample	- m
Length	138.87 mm
Diameter	70.08 mm
Length Prior to Shearing	138.87 mm
Bulk Density	2.06 Mg/m ³
Initial Water Content	20.2 %
Final Water Content	21.8 %
Dry Density	1.71 Mg/m ³

Rate of Strain	1.00 %/min
Cell Pressure	220 kPa
Axial Strain at Failure	9.8 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	300 kPa
Undrained Shear Strength, c_u	150 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Compound
Membrane Thickness	0.24 mm
Membrane Correction	1.94 kPa

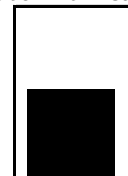
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

Signed:



Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 08/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

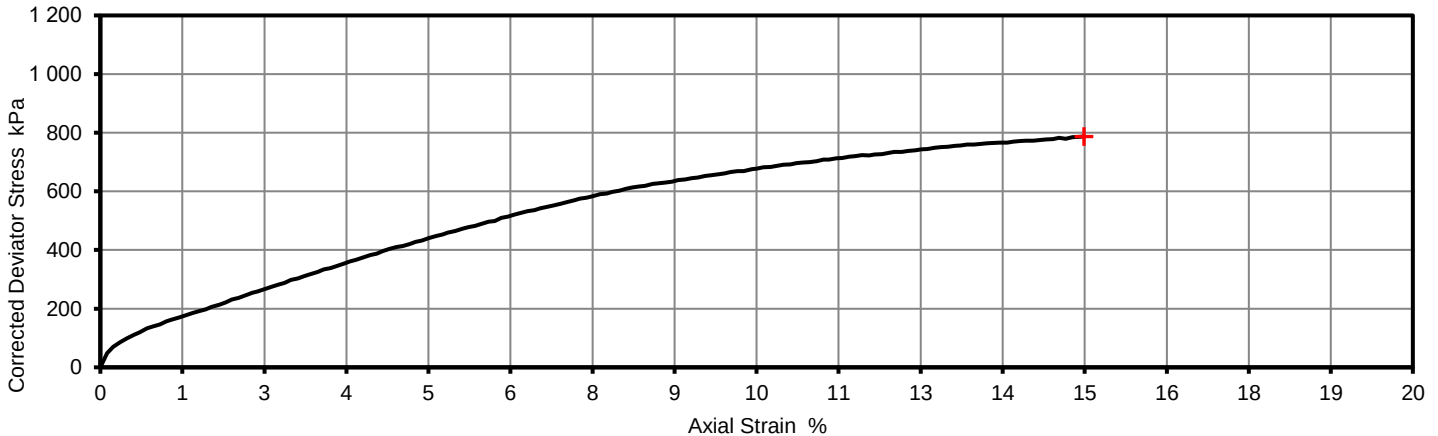
Test Results:

Laboratory Reference: 380808
Hole No.: CP01
Sample Reference: Not Given
Sample Description: Brown very sandy slightly gravelly CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

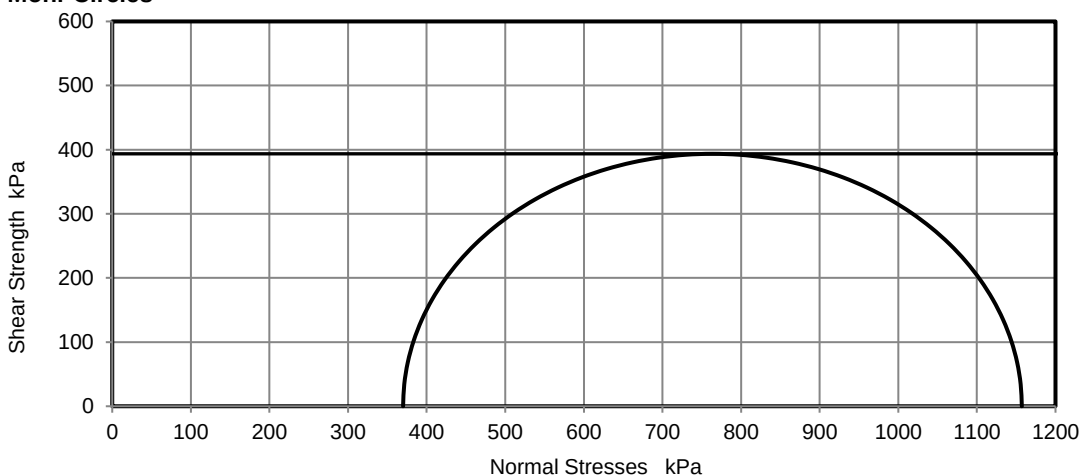
Depth Top [m]: 18.50
Depth Base [m]: 18.95
Sample Type: C

Test Number	1	Rate of Strain	1.00	%/min
Depth within Sample		Cell Pressure	370	kPa
Length	97.22	Axial Strain at Failure	15.0	%
Diameter	49.58	Deviator Stress, ($\sigma_1 - \sigma_3$) _f	787	kPa
Length Prior to Shearing	97.21	Undrained Shear Strength, c_u	394	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Bulk Density	2.23	Mode of Failure	Compound	
Initial Water Content	12.2	Membrane Thickness	0.23	mm
Final Water Content	11.5	Membrane Correction	4.01	kPa
Dry Density	1.99			

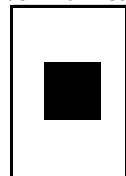
Deviator Stress v Axial Strain



Mohr Circles



Position within sample

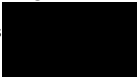


Note: Deviator stress corrected for area change and membrane effects.

Remarks:

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Signed:



Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd



4041



TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 04/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

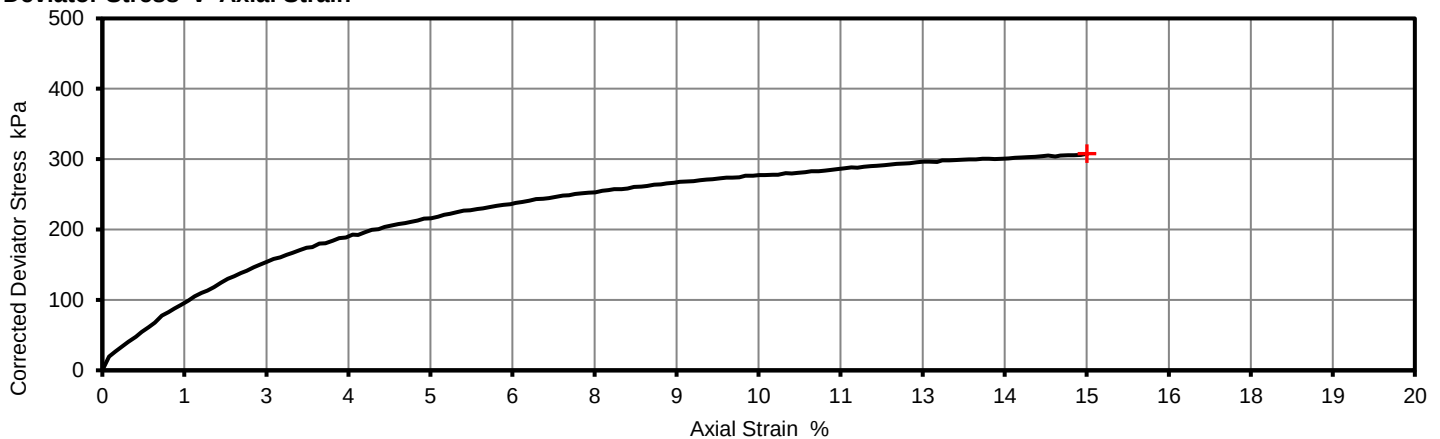
Laboratory Reference: 380810
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown slightly gravelly CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

Depth Top [m]: 9.50
Depth Base [m]: 9.95
Sample Type: C

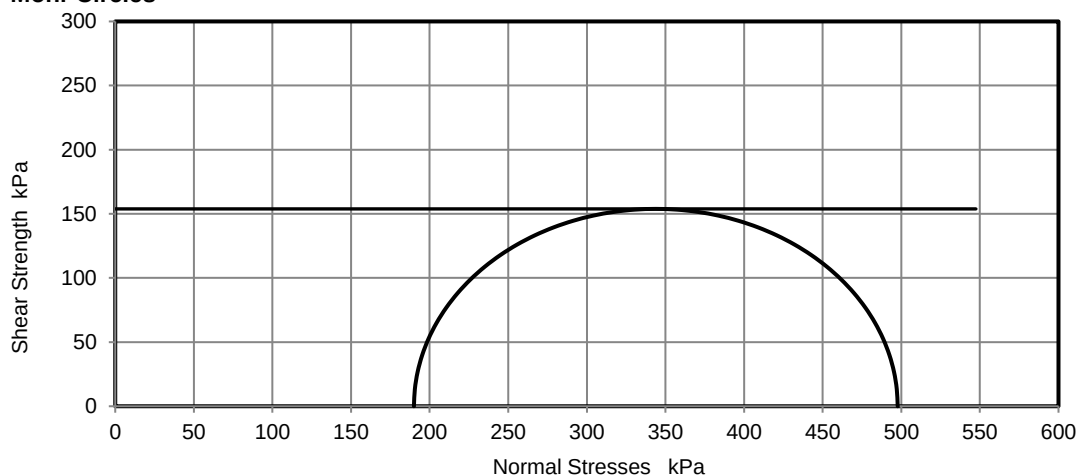
Test Number	1
Depth within Sample	m
Length	138.78 mm
Diameter	69.75 mm
Length Prior to Shearing	138.77 mm
Bulk Density	2.18 Mg/m ³
Initial Water Content	15.9 %
Final Water Content	16.1 %
Dry Density	1.89 Mg/m ³

Rate of Strain	1.00 %/min
Cell Pressure	190 kPa
Axial Strain at Failure	15.0 %
Deviator Stress, ($\sigma_1 - \sigma_3$) _f	308 kPa
Undrained Shear Strength, c_u	154 kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Mode of Failure	Plastic
Membrane Thickness	0.26 mm
Membrane Correction	3.23 kPa

Deviator Stress v Axial Strain



Mohr Circles



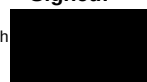
Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

Signed:



Katarzyna Koziel
Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd

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4041



TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 05/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

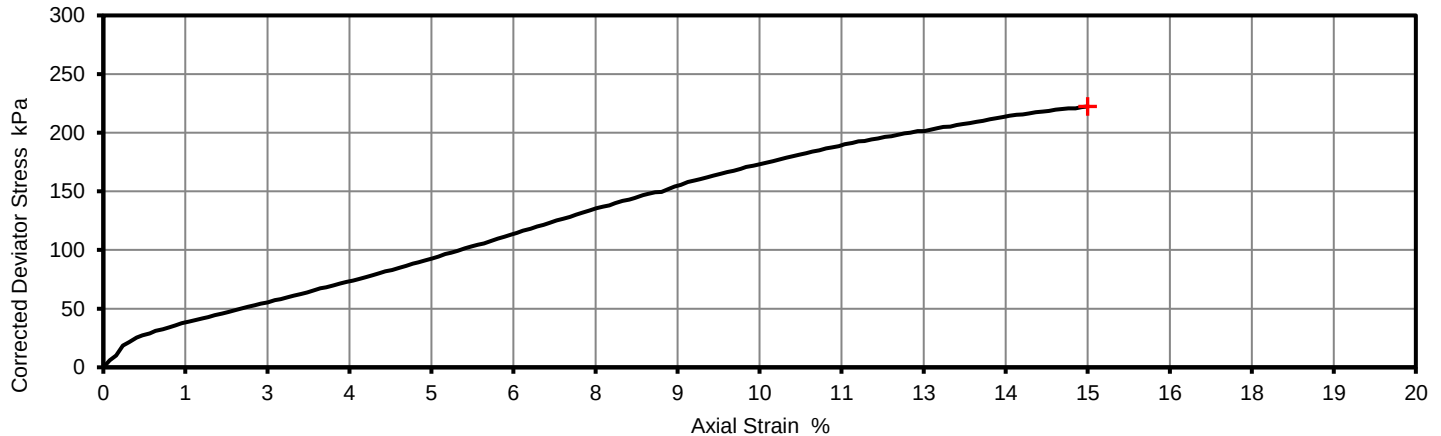
Test Results:

Laboratory Reference: 380811
Hole No.: CP02
Sample Reference: Not Given
Sample Description: Brown CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

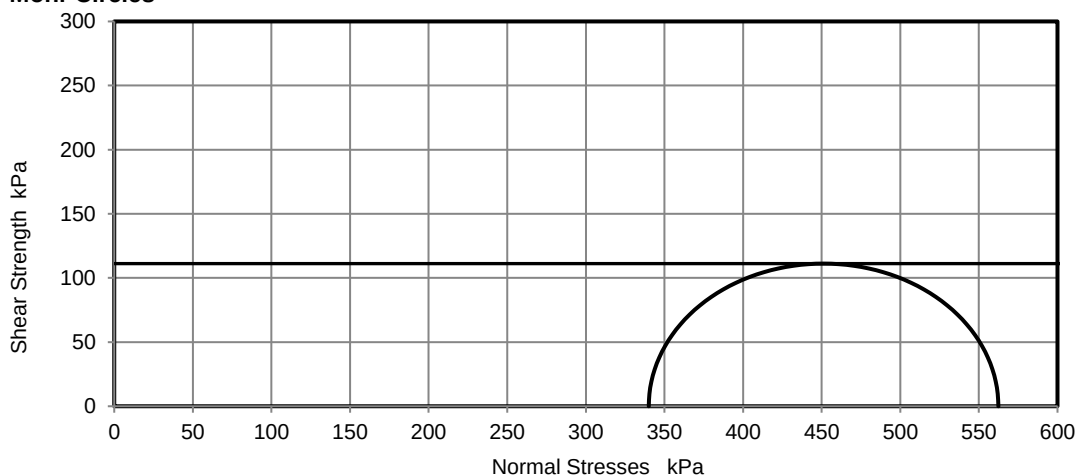
Depth Top [m]: 17.00
Depth Base [m]: 17.45
Sample Type: C

Test Number	1	Rate of Strain	1.00	%/min
Depth within Sample	-	Cell Pressure	340	kPa
Length	204.70	Axial Strain at Failure	15.0	%
Diameter	103.48	Deviator Stress, ($\sigma_1 - \sigma_3$) _f	222	kPa
Length Prior to Shearing	204.69	Undrained Shear Strength, cu	111	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Bulk Density	2.07	Mode of Failure	Plastic	
Initial Water Content	21.5	Membrane Thickness	0.29	mm
Final Water Content	21.9	Membrane Correction	2.43	kPa
Dry Density	1.70			

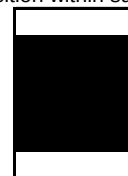
Deviator Stress v Axial Strain



Mohr Circles



Position within sample

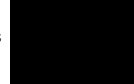


Note: Deviator stress corrected for area change and membrane effects.

Remarks:

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TEST CERTIFICATE

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST

Tested in Accordance with: BS EN ISO 17982-8:2018,
BS 1377-2 Cl. 28:2022

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 06/11/2024
Date Received: 15/11/2024
Date Tested: 17/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

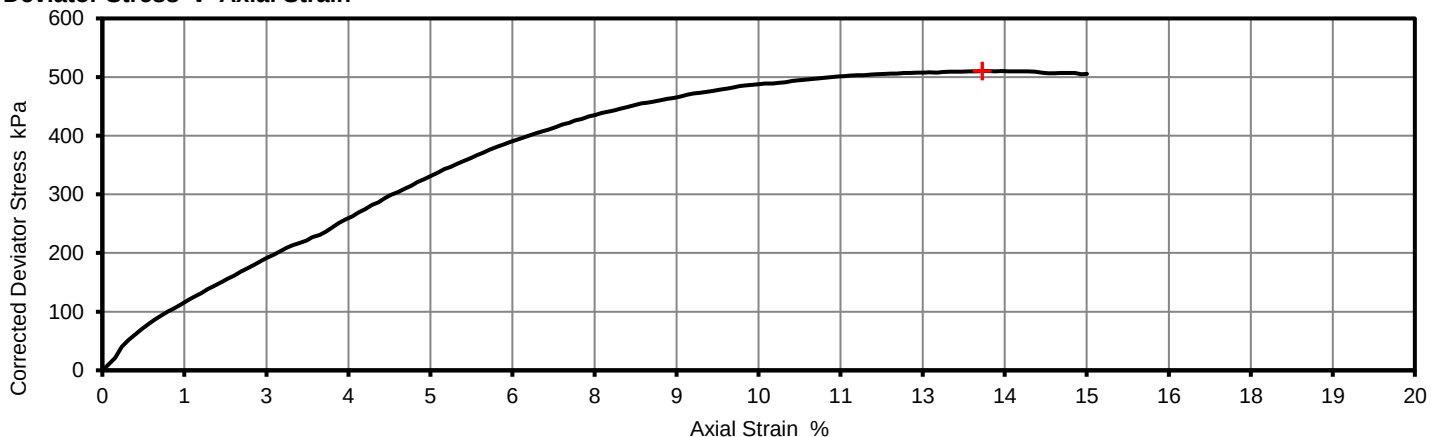
Test Results:

Laboratory Reference: 380812
Hole No.: CP03
Sample Reference: Not Given
Sample Description: Brown slightly gravelly CLAY
Sample Preparation: Sample prepared in accordance with BS EN ISO 17892-8: 2018 Clause 6.2.

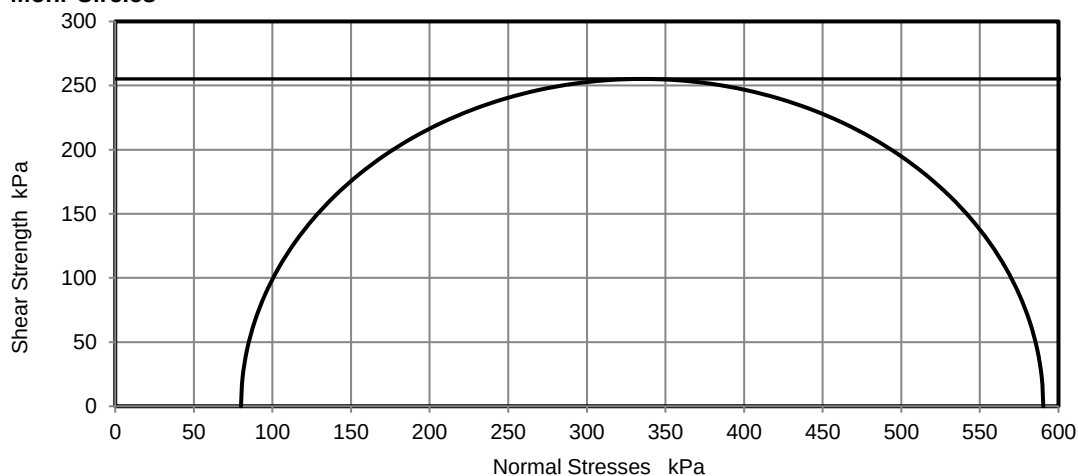
Depth Top [m]: 4.00
Depth Base [m]: 4.45
Sample Type: C

Test Number	1	Rate of Strain	1.00	%/min
Depth within Sample	-	Cell Pressure	80	kPa
Length	204.51	Axial Strain at Failure	13.4	%
Diameter	103.38	Deviator Stress, ($\sigma_1 - \sigma_3$) _f	510	kPa
Length Prior to Shearing	204.48	Undrained Shear Strength, cu	255	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)_f$
Bulk Density	2.12	Mode of Failure	Compound	
Initial Water Content	21.6	Membrane Thickness	0.28	mm
Final Water Content	20.3	Membrane Correction	2.10	kPa
Dry Density	1.74			

Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects.

Remarks:

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Geotechnical Reporting Team Leader
for and on behalf of i2 Analytical Ltd





4041

TEST CERTIFICATE

INCREMENTAL LOADING OEDOMETER TEST

Tested in Accordance with: BS EN ISO 17892-5:2017,
BS 1377-2:2022 Cl. 16 & 17

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



Environmental Science

Client: Curtins
Client Address: 17-19 Whitworth Street West, Manchester

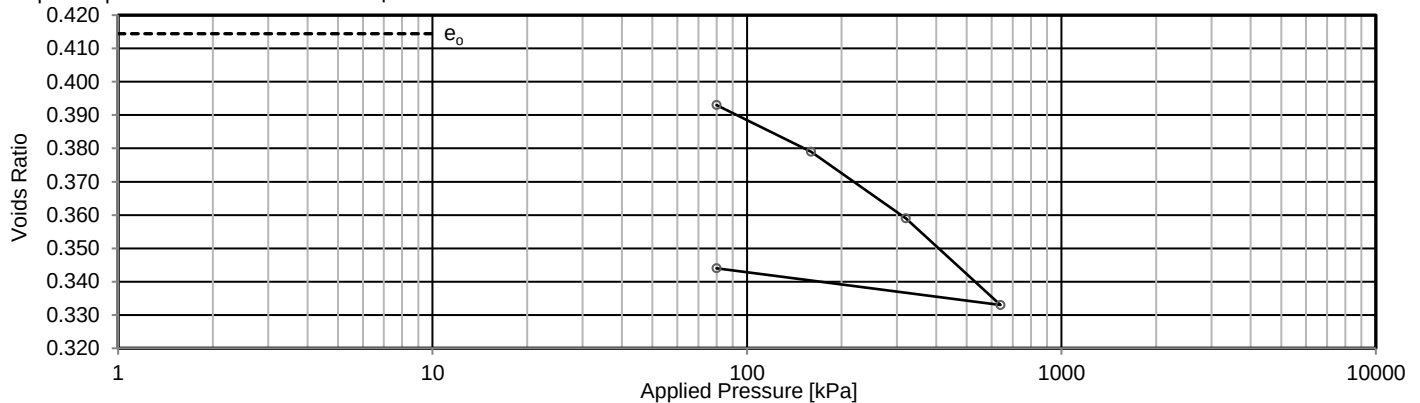
Client Reference: B080866
Job Number: 24-054140-2
Date Sampled: 06/11/2024
Date Received: 15/11/2024
Date Tested: 12/12/2024
Sampled By: Not Given

Contact: Lucy Woods
Site Address: Phoenix Iron Works, Manchester Lift Plot A
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	380813
Hole No.:	CP03
Sample Reference:	Not Given
Sample Description:	Brown slightly gravelly CLAY
Sample Preparation:	Carried out on top of U100

Depth Top [m]: 8.00
Depth Base [m]: 8.45
Sample Type: C



Specimen details	Diameter [mm]	Height [mm]	Water content * [%]	Bulk density [Mg/m3]	Dry density [Mg/m3]	Void ratio -	Degree of saturation [%]	Avg. temp for test [°C]	Swelling pressure [kPa]	Total test time [days]
Initial	50.10	20.00	16.5	2.18	1.87	0.414	105	22	Not measured	5
Final	-	19.01	15.0	2.27	1.97	0.344	115			

Sample orientation

Vertical

Particle density

2.65 Mg/m³

[illegible]

Note: Cv corrected to 20°C, results have been corrected for equipment deformation; * Initial WC calculated from trimmings; ## The parameter has been determined based on an approximate estimation and falls outside the scope of UKAS accreditation

Remarks:

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Appendix E – Ground Gas Monitoring Results

Project: Man Life Plot A / Phoenix **Date:** 26/11/2024
Job Number: B080866 **Visit:** 1
Client: MACE **Weather:** Sunny
Barometric State: Rising **Ground Conditions:** Wet

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
CP01	1006	0.0	0.1	0.0	0.0	0.8	0.7	18.3	0	0	4.20	25.97	
CP02	1007	0.0	0.1	0.0	0.0	0.1	0.0	19.1	0	0	21.89	>30.00	
CP03	1006	0.0	0.1	0.0	0.0	2.2	2.2	14.5	0	0	14.91	18.85	
WS02	1006	0.0	0.1	0.2	0.0	0.2	0.2	18.7	0	0	2.17	5.00	
WS03	1007	0.0	0.1	0.7	0.0	0.4	0.4	19.1	0	0	0.74	2.72	
WS04	1006	-10.8	0.1	0.0	0.0	0.6	0.6	14.9	0	0	1.02	4.54	1
WS07	1006	6.4	0.1	0.0	0.0	1.1	0.9	17.5	0	0	0.57	3.03	2
WS08	1007	0.0	0.1	0.0	0.0	0.2	0.2	18.9	0	0	0.83	2.54	

Notes

- 1 Steady state achieved after 60 seconds.
 2 Steady state achieved after 15 seconds.

Logged by

LW

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated



GAS MONITORING LOG SHEET

Project: Man Life Plot A / Phoenix **Date:** 12/12/2024
Job Number: B080866 **Visit:** 2
Client: MACE **Weather:** Overcast
Barometric State: Falling **Ground Conditions:** Damp

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
CP01	1016	0.0	0.1	0.0	0.0	0.1	0.1	18.90	0	0	4.04	28.17	1
CP02	1025	0.0	0.1	0.0	0.0	0.1	0.0	18.90	0	0	22.00	30+	
CP03	1024	0.0	0.1	0.0	0.0	0.3	0.2	18.70	0	0	14.49	19.37	
WS02	1026	0.0	0.1	0.0	0.0	0.1	0.1	19.00	0	0	2.17	5.01	
WS03	1025	0.0	0.1	0.0	0.0	0.3	0.3	18.90	0	0	0.78	2.75	
WS04	1024	0.0	0.1	0.0	0.0	1.0	0.9	16.90	0	0	1.09	4.55	
WS07	1025	-10.2	0.1	1.8	0.0	1.2	0.8	17.70	0	0	0.59	3.04	2
WS08	1025	0.0	0.1	0.0	0.0	0.2	0.2	18.8	0	0	0.88	2.55	

Notes

- Well was purged 75 times to 17m bgl, hole recharged at approximately 1m per minute
- Steady state gas flow rate of 0 achieved after 10 seconds

Logged by

JP

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated



GAS MONITORING LOG SHEET

Project: Man Life Plot A / Phoenix **Date:** 07/01/2025
Job Number: B080866 **Visit:** 3
Client: MACE **Weather:** Rainy
Barometric State: Steady **Ground Conditions:** Wet

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
CP01	990	1.5	0.3	0.0	0.0	1.0	0.9	18.4	0	0	2.58	28.12	1
CP02	988	0.0	0.1	0.0	0.0	0.0	0.0	13.3	0	0	21.57	30+	
CP03	988	0.0	0.1	0.0	0.0	0.7	0.7	18.7	0	0	13.91	19.37	
WS02	991	0.0	0.1	0.0	0.0	0.3	0.3	18.7	0	0	2.15	5.00	
WS03	988	0.0	0.1	0.0	0.0	0.0	0.0	18.7	0	0	0.69	2.75	
WS04												4.54	2
WS07	988	0.0	0.1	0.5	0.1	0.2	0.2	18.5	0	0	0.56	3.04	3
WS08	990	0.0	0.1	0.0	0.0	0.9	0.9	15.7	0	0	0.66	2.54	

Notes

- 1 Steady state achieved after 45 seconds - monitored for 2 minutes with no change.
- 2 Well completely flooded, submerged in a puddle, opened well, still flooded.
- 3 Steady state methane achieved after 30 seconds.

Logged by

LW

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated



GAS MONITORING LOG SHEET

Project: Man Life Plot A / Phoenix **Date:** 16/01/2025
Job Number: B080866 **Visit:** 4
Client: MACE **Weather:** Overcast
Barometric State: Steady **Ground Conditions:** Wet

Borehole Reference	Barometric Pressure mb	Flow l/hr		Methane %		Carbon Dioxide %		Oxygen %	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Water Level m bgl	Borehole Base m bgl	Note
		Max	SS	Max	SS	Max	SS						
CP01	1026	0.3	0.0	0.0	0.0	0.8	0.8	18.0	0	0	2.62	28.09	1
CP02	1027	0.0	0.0	0.0	0.0	0.0	0.0	16.8	0	0	21.95	30+	
CP03	1026	0.0	0.0	0.0	0.0	0.5	0.5	17.7	0	0	15.39	19.35	
WS02	1026	0.2	0.0	0.0	0.0	0.3	0.3	18.1	0	0	2.17	4.97	2
WS03	1027	0.0	0.0	0.0	0.0	0.2	0.2	18.2	0.0	0.0	0.79	2.75	
WS04	1027	-6.7	0.0	0.0	0.0	0.2	0.2	17.9	0	0	1.04	5.45	3
WS07	1027	-4.3	0.0	0.3	0.0	1.5	0.8	16.5	0	0	0.58	3.00	4
WS08	1026	0.0	0.0	0.1	0.0	0.9	0.9	15.6	0	0	0.95	2.54	

Notes

- 1 Steady state gas flow rate of 0 achieved instantly
- 2 Steady state gas flow rate of 0 achieved after 2 seconds
- 3 Steady state gas flow rate of 0 achieved after 14 seconds
- 4 Steady state gas flow rate of 0 achieved after 5 seconds

1% gas volume = 10,000 ppm

Flow rate, methane and carbon dioxide reported as 'maximum' (max) and 'steady state' (SS) readings.

All other gases recorded at 'steady state' unless otherwise stated

Logged by

JP

Appendix F - GAC Screening Thresholds

Human Health GQRA Rationale and Hierarchy

Background

Detailed guidance on human health risk assessment is available within several documents, published by both the Environment Agency, Defra, CL:AIRE, LQM/CIEH and Public Health England as referenced below (references a-h).

A Generic Quantitative Risk Assessment (GQRA) is carried out for the Potential Contaminant Linkages (PCLs) investigated by screening of soil contamination data against relevant Generic Assessment Criteria where available.

Generic Assessment Criteria are available for a range of different land use scenarios, soil organic matter (SOM) and soil types. Curtins have adopted available GACs for a sandy loam soil at 1%, 2.5% and 6% SOM using various sources.

GAC Hierarchy

A summary of and hierarchy for adopted GACs is identified below:

- i) **Category 4 Screening Levels (C4SLs):** In March 2014 Defra published C4SLs for arsenic, benzene, benzo(a)pyrene, cadmium, hexavalent chromium, and lead as part of the 'Phase 1 Project'. These values were derived to support the revised Part 2A Statutory Guidance issued in 2012 in which four categories of contaminated land are included, ranging from Category 1 (significant/high risk) to Category 4 (low risk). In 2018 the 'Phase 2 Project' commenced which aims to develop C4SLs for a range of further contaminants. Currently available Phase 2 C4SLs include vinyl chloride, trichloroethene, tetrachloroethene, naphthalene, cis-1,2 dichloroethene, trans 1, 2 dichloroethene and per / polyfluoroalkyl substances (PFAS) . Where contaminant concentrations do not exceed C4SLs, there is no risk that the land poses a significant possibility of significant harm (SPoSH) or the level of risk is low, as such land can be demonstrated to be in Category 4 and cannot be determined as contaminated land. The C4SLs are proposed to be more pragmatic (whilst still strongly precautionary) in comparison with SGVs and S4UL's outlined below.
- ii) **Suitable for Use Levels (S4ULs):** In 2015 LQM and the Chartered Institute of Environmental Health published generic assessment criteria for 89 substances including metals, BTEX, TPH, polycyclic aromatic hydrocarbons, phenols, chlorinated solvents and other volatile organic compounds. The S4ULs represent a minimal risk to long term human health, derived using health criteria values. The methodology for deriving the S4ULs is based on the Environment Agency CLEA model with consideration of developments in UK human health exposure assessment, in particular the additional land uses and exposure assumptions.
- iii) **Other Supplementary Screening Criteria:** In addition to those developed by LQM/CIEH (outlined above), other third party organisations have derived SSVs for a wider range of contaminants and land uses using the CLEA Model. Curtins have adopted these numbers where applicable, including those developed EIC/AGS/CL:AIRE and SoBRA published thresholds.

Alternative Assessment Approaches

PAH – Benzo(a)pyrene Surrogate Marker Assessment

In September 2017 Public Health England (PHE) (Ref. h) published guidance for the use of a surrogate marker approach to assess the risk posed by soil contamination with the genotoxic polycyclic aromatic hydrocarbons (PAHs). The guidance indicates that the use of a marker compound, such as Benzo(a)pyrene, provides a consistent indicator of the amount of 7 other genotoxic PAHs commonly tested for in soil including benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(123cd)pyrene and benzo(ghi)perylene.

Where PAH concentrations of these 8 no. PAHs are present within pre-determined ratios in soil, provided in the guidance, this approach is used, comparing soil concentrations of the marker compound with a Category 4 Screening Level, or site specific assessment criteria. An individual compound assessment is carried out for other PAH compounds not considered in the PHE guidance.

An individual compound assessment is carried out for all PAH compounds where pre-determined ratios are not met for the surrogate marker approach.

Notes

Curtins Generic Assessment Criteria provide further information and notes to be read in conjunction with this assessment rationale.

Human Health GQRA Rationale and Hierarchy



References

- a) Environmental Agency. (2009) Contaminated Land Exposure Assessment (CLEA) v1.071 model.
- b) Environment Agency. (2009) Human Health Toxicological Assessment of Contaminants in Soil (report no. SC050021/SR2).
- c) Environment Agency. (2009) Updated Technical Background to the CLEA Model (report no.SC050021/SR3).
- d) Environment Agency (2005) The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils Science Report P5-080/TR3.
- e) Department of Environment Food and Rural Affairs (DEFRA). (2012) Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (report no. PB13735).
- f) CL:AIRE (2014) Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, SP1010 Rev 2.
- g) LQM & CIEH (2015) S4ULs for Human Health Risk Assessment.
- h) Public Health England (2017) Contaminated Land Information Sheet: Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)

Contaminants	Residential with Home Grown Produce	Residential Without Home Grown Produce	Allotments	Commercial	Public open space (Residential)	Public park POS _{park}	Solubility Saturation Limit (mg/kg)	Vapour Satuation Limit (mg/kg)
Metals, Semi-Metals & non-metals								
Antimony	-	550	-	7500	-	-		
Arsenic	37	40	49	640	79	170		
Beryllium	1.7	1.7	35	12	2.2	63		
Boron	290	11000	45	240000	21000	46000		
Cadmium	22	150	3.9	410	220	880		
Chromium III	910	910	18000	8600	1500	33000		
Chromium VI	21	21	170	49	21	250		
Copper	2400	7100	520	68000	12000	44000		
Lead	200	310	80	2300	630	1300		
Mercury (elemental)	1.2	1.2	21	58	16	30		25.8
Mercury (inorganic)	40	56	19	1100	120	240		
Methylmercury	11	15	6	320	40	68		
Nickel	130	180	53	980	230	800		
Selenium	250	430	88	12000	1100	1800		
Vanadium	410	1200	91	9000	2000	5000		
Zinc	3700	40000	620	730000	81000	170000		
Inorganic Compounds								
Cyanide	24	24	24	1400	24	24		
Organic contaminants								
Aliphatic Risk Banded Hydrocarbons - TPH CWG method								
Aliphatic EC5 - EC6 TPHs	42	42	730	3200	570000	95000	304	
Aliphatic EC>6 - EC8 TPHs	100	100	2300	7800	600000	150000	144	
Aliphatic EC>8 - EC10 TPHs	27	27	320	2000	13000	14000	78	
Aliphatic EC>10-EC12 TPHs	130	130	2200	9700	13000	21000	48	
Aliphatic EC>12-EC16 TPHs	1100	1100	11000	59000	13000	25000	24	
Aliphatic EC>16 - EC35 TPHs	65000	65000	260000	1600000	250000	450000	8.48	
Aliphatic EC>35 - EC44 TPHs	65000	65000	260000	1600000	250000	450000	8.48	
Aromatic Risk Banded Hydrocarbons - TPH CWG method								
Aromatic EC5 - EC7 TPHs	70	370	13	26000	56000	76000	1220	
Aromatic EC>7 - EC8 TPHs	130	860	22	56000	56000	87000		869
Aromatic EC>8 - EC10 TPHs	34	47	8.6	3500	5000	7200		613
Aromatic EC10 - EC12 TPHs	74	250	13	16000	5000	9200	364	
Aromatic EC12 - EC16 TPHs	140	1800	23	36000	5100	10000	169	
Aromatic EC>16 - EC21 TPHs	260	1900	46	28000	3800	7600		
Aromatic EC>21 - EC35 TPHs	1100	1900	370	28000	3800	7800		
Aromatic EC>35 - EC44 TPHs	1100	1900	370	28000	3800	7800		
Long Chain Aliphatic and Aromatic Hydrocarbons								
Aliphatic and Aromatic EC >44-70	1600	1900	1200	28000	3800	7800		
Aromatic Hydrocarbons								
Benzene	0.2	0.89	0.039	27	140	190		
Ethyl benzene	47	83	16	5700	24000	17000		518
Toluene	130	880	22	56000	56000	87000		869
Xylene	56	79	28	5900	41000	17000	478 (o-xylene) 576 (p-xylene)	625 (m-xylene)
MTBE	49	73	23	7900			20400	
Phenol	280	750	66	760	760	760		
Polycyclic Aromatic Hydrocarbons (PAH) - Benzo(a)pyrene Surrogate Marker Approach, with reference to C4SL PAH Surrogate Marker Check Sheet where appropriate								
Benzo(a)Pyrene (C4SL Surrogate Marker Approach)	5	5.3	5.7	77	10	21		
Naphthalene	15	15	65	1600	11000	800	76.4	
Acenaphthylene	170	2900	28	83000	15000	29000	86.1	
Acenaphthene	210	3000	34	84000	15000	29000	57	
Fluorene	170	2800	27	63000	9900	20000	30.9	
Phenanthrene	95	1300	15	22000	3100	6200	36	
Anthracene	2400	31000	380	520000	74000	150000		1.17
Fluoranthene	280	1500	52	23000	3100	6300		
Pyrene	620	3700	110	54000	7400	15000		
Polycyclic Aromatic Hydrocarbons (PAH) - Individual Compound Assessment								
Naphthalene	15	15	65	1600	11000	800	76.4	
Acenaphthylene	170	2900	28	83000	15000	29000	86.1	
Acenaphthene	210	3000	34	84000	15000	29000	57	
Fluorene	170	2800	27	63000	9900	20000	30.9	
Phenanthrene	95	1300	15	22000	3100	6200	36	
Anthracene	2400	31000	380	520000	74000	150000		1.17
Fluoranthene	280	1500	52	23000	3100	6300		
Pyrene	620	3700	110	54000	7400	15000		
Benzo(a)anthracene	7.2	11	2.9	170	29	49		
Chrysene	15	30	4.1	350	57	93		
Benzo(b)fluoranthene	2.6	3.9	0.99	44	7.1	13		
Benzo(k)fluoranthene	77	110	37	1200	190	370		
Benzo(a)pyrene (only)	2.2	3.2	0.97	35	5.7	11		
Indeno(123cd)pyrene	27	45	9.5	500	82	150		
Dibenzo(ah)anthracene	0.24	0.31	0.14	3.5	0.57	1.1		
Benzo(ghi)perylene	320	360	290	3900	640	1400		
Chlorinated Aliphatic Hydrocarbons								
Chloroethene (Vinyl chloride)	0.0064	0.015	0.0017	1.1	7.8	18		
1,1-Dichloroethene (DCE)	0.23	0.23	2.8	26			2230	
Cis 1,2, Dichloroethene (DCE)	0.46	0.5	0.89	38	3800	2800	3940	
Trans 1,2, Dichloroethene (DCE)	0.9	0.93	3.7	69	13000	5600	3420	
Trichloroethene (TCE)	0.0093	0.0097	0.032	0.73	76	41		
Tetrachloroethene (PCE)	0.31	0.32	2	24	3200	1400		
1,1,1,2 Tetrachloroethane	1.2	1.5	0.79	110	1400	1500		
1,1,1 Trichloroethane	8.8	9	48	660	140000	57000		1425
1,2-Dichloroethane (Ethylene Dichloride)	0.11	0.16	0.054	12	300	300		
Tetrachloromethane	0.026	0.026	0.45	2.9	890	190		
Trichloromethane (Chloroform)	0.91	1.2	0.42	99	2500	2600		
Per- and Polyfluoroalkyl Substances (PFAS)								
Perfluorooctanoic Acid (PFOA)	0.0076	0.041	0.0014	0.6	0.079	0.17		
Perfluorononanoic Acid (PFNA)	0.013	0.041	0.0027	0.6	0.079	0.17		
Perfluorohexane Sulfonic Acid (PFHxS)	0.0081	0.041	0.0015	0.6	0.079	0.17		
Perfluorooctane Sulfonic Acid (PFOS)	0.0073	0.041	0.0013	0.6	0.079	0.17		

Contaminants	Residential with Home Grown Produce	Residential Without Home Grown Produce	Allotments	Commercial	Public open space (Residential)	Public park POS _{park}	Solubility Saturation Limit (mg/kg)	Vapour Satuation Limit (mg/kg)
Metals, Semi-Metals & non-metals								
Antimony		550		7500				
Arsenic	37	40	49	640	79	170		
Beryllium	1.7	1.7	35	12	2.2	63		
Boron	290	11000	45	240000	21000	46000		
Cadmium	22	150	3.9	410	220	880		
Chromium III	910	910	18000	8600	1500	33000		
Chromium VI	21	21	170	49	21	250		
Copper	2400	7100	520	68000	12000	44000		
Lead	200	310	80	2300	630	1300		
Mercury (elemental)	1.2	1.2	21	58	16	30		25.8
Mercury (inorganic)	40	56	19	1100	120	240		
Methylmercury	11	15	6	320	40	68		
Nickel	130	180	53	980	230	800		
Selenium	250	430	88	12000	1100	1800		
Vanadium	410	1200	91	9000	2000	5000		
Zinc	3700	40000	620	730000	81000	170000		
Inorganic Compounds								
Cyanide	24	24	24	1400	24	24		
Organic contaminants								
Aliphatic Risk Banded Hydrocarbons - TPH CWG method								
Aliphatic EC5 - EC6 TPHs	78	78	1700	5900	590000	130000	558	
Aliphatic EC>6 - EC8 TPHs	230	230	5600	17000	610000	220000	322	
Aliphatic EC>8 - EC10 TPHs	65	65	770	4800	13000	18000		190
Aliphatic EC>10-EC12 TPHs	330	330	4400	23000	13000	23000		118
Aliphatic EC>12-EC16 TPHs	2400	2400	13000	82000	13000	25000	59	
Aliphatic EC>16 - EC35 TPHs	92000	92000	270000	1700000	250000	480000	21	
Aliphatic EC>35 - EC44 TPHs	92000	92000	270000	1700000	250000	480000	21	
Aromatic Risk Banded Hydrocarbons - TPH CWG method								
Aromatic EC5 - EC7 TPHs	140	690	27	46000	56000	84000	2260	
Aromatic EC>7 - EC8 TPHs	290	1800	51	110000	56000	95000	1920	
Aromatic EC>8 - EC10 TPHs	83	110	21	8100	5000	8500		1500
Aromatic EC10 - EC12 TPHs	180	590	31	28000	5000	9700	899	
Aromatic EC12 - EC16 TPHs	330	2300	57	37000	5100	10000	419	
Aromatic EC>16 - EC21 TPHs	540	1900	110	28000	3800	7700		
Aromatic EC>21 - EC35 TPHs	1500	1900	820	28000	3800	7800		
Aromatic EC>35 - EC44 TPHs	1500	1900	820	28000	3800	7800		
Long Chain Aliphatic and Aromatic Hydrocarbons								
Aliphatic and Aromatic EC >44-70	1800	1900	2100	28000	3800	7800		
Aromatic Hydrocarbons								
Benzene	0.17	0.7	0.034	47	72	100		
Ethyl benzene	110	190	39	13000	24000	22000		1220
Toluene	290	1900	51	110000	56000	95000		1920
Xylene	130	180	67	14000	42000	23000	1120	1470
MTBE	84	120	44	13000			33100	
Phenol	550	1300	140	1500	1500	1500		
Polycyclic Aromatic Hydrocarbons (PAH) - Benzo(a)pyrene Surrogate Marker Approach, with reference to C4SL PAH Surrogate Marker Check Sheet where appropriate								
Benzo(a)Pyrene (C4SL Surrogate Marker Approach)	5	5.3	5.7	77	10	21		
Naphthalene	36	36	130	3700	15000	1200	183	
Acenaphthylene	420	4600	69	97000	15000	30000	212	
Acenaphthene	510	4700	85	97000	15000	30000	141	
Fluorene	400	3800	67	68000	9900	20000	76.5	
Phenanthrene	220	1500	38	22000	3100	6200		
Anthracene	5400	35000	950	540000	74000	150000		
Fluoranthene	560	1600	130	23000	3100	6300		
Pyrene	1200	3800	270	54000	7400	15000		
Polycyclic Aromatic Hydrocarbons (PAH) - Individual Compound Assessment								
Naphthalene	36	36	130	3700	15000	1200	183	
Acenaphthylene	420	4600	69	97000	15000	30000	212	
Acenaphthene	510	4700	85	97000	15000	30000	141	
Fluorene	400	3800	67	68000	9900	20000	76.5	
Phenanthrene	220	1500	38	22000	3100	6200		
Anthracene	5400	35000	950	540000	74000	150000		
Fluoranthene	560	1600	130	23000	3100	6300		
Pyrene	1200	3800	270	54000	7400	15000		
Benzo(a)anthracene	11	14	6.5	170	29	56		
Chrysene	22	31	9.4	350	57	110		
Benzo(b)fluoranthene	3.3	4	2.1	44	7.2	15		
Benzo(k)fluoranthene	93	110	75	1200	190	410		
Benzo(a)pyrene (only)	2.7	3.2	2	35	5.7	12		
Indeno(123cd)pyrene	36	46	21	510	82	170		
Dibenzo(ah)anthracene	0.28	0.32	0.27	3.6	0.57	1.3		
Benzo(ghi)perylene	340	360	470	4000	640	1500		
Chlorinated Aliphatic Hydrocarbons								
Chloroethene (Vinyl chloride)	0.01	0.019	0.0031	1.4	7.8	19		
1,1-Dichloroethene (DCE)	0.4	0.41	5.6	46			3940	
Cis 1,2, Dichloroethene (DCE)	0.78	0.84	1.7	64	3800	2400	6610	
Trans 1,2, Dichloroethene (DCE)	1.6	1.7	0.75	120	13000	7000	6170	
Trichloroethene (TCE)	0.02	0.02	0.072	1.5	78	54		
Tetrachlorethene (PCE)	0.7	0.71	4.8	55	3300	1900		
1,1,1,2 Tetrachlorethane	2.8	3.5	1.9	250	1400	1800		
1,1,1 Trichlorethane	18	18	110	1300	140000	76000		2915
1,2-Dichloroethane (Ethylene Dichloride)	0.18	0.24	0.1	17	210	330		
Tetrachloromethane	0.056	0.056	1	6.3	920	270		
Trichloromethane	1.7	2.1	0.83	170	2500	2800		
PFAS								
Perfluorooctanoic Acid (PFOA)	0.0076	0.041	0.0014	0.6	0.079	0.17		
Perfluorononanoic Acid (PFNA)	0.013	0.041	0.0027	0.6	0.079	0.17		
Perfluorohexane Sulfonic Acid (PFHxS)	0.0081	0.041	0.0015	0.6	0.079	0.17		
Perfluorooctane Sulfonic Acid (PFOS)	0.0073	0.041	0.0013	0.6	0.079	0.17		

Contaminants	Residential with Home Grown Produce	Residential Without Home Grown Produce	Allotments	Commercial	Public open space (Residential)	Public park POS _{park}	Solubility Saturation Limit (mg/kg)	Vapour Satuation Limit (mg/kg)
Metals, Semi-Metals & non-metals								
Antimony		550		7500				
Arsenic	37	40	49	640	79	170		
Beryllium	1.7	1.7	35	12	2.2	63		
Boron	290	11000	45	240000	21000	46000		
Cadmium	22	150	3.9	410	220	880		
Chromium III	910	910	18000	8600	1500	33000		
Chromium VI	21	21	170	49	21	250		
Copper	2400	7100	520	68000	12000	44000		
Lead	200	310	80	2300	630	1300		
Mercury (elemental)	1.2	1.2	21	58	16	30		25.8
Mercury (inorganic)	40	56	19	1100	120	240		
Methylmercury	11	15	6	320	40	68		
Nickel	130	180	53	980	230	800		
Selenium	250	430	88	12000	1100	1800		
Vanadium	410	1200	91	9000	2000	5000		
Zinc	3700	40000	620	730000	81000	170000		
Inorganic Compounds								
Cyanide	24	24	24	1400	24	24		
Organic Compounds								
Aliphatic Risk Banded Hydrocarbons - TPH CWG method								
Aliphatic EC5 - EC6 TPHs	160	160	3900	12000	600000	180000	1150	
Aliphatic EC>6 - EC8 TPHs	530	530	13000	40000	620000	320000	736	
Aliphatic EC>8 - EC10 TPHs	150	150	1700	11000	13000	21000		451
Aliphatic EC>10-EC12 TPHs	760	770	7300	47000	13000	24000		283
Aliphatic EC>12-EC16 TPHs	4300	4400	13000	90000	13000	26000	142	
Aliphatic EC>16 - EC35 TPHs	110000	110000	270000	1800000	250000	490000		
Aliphatic EC>35 - EC44 TPHs	110000	110000	270000	1800000	250000	490000		
Aromatic Risk Banded Hydrocarbons - TPH CWG method								
Aromatic EC5 - EC7 TPHs	300	1400	57	86000	56000	92000	4710	
Aromatic EC>7 - EC8 TPHs	660	3900	120	180000	56000	100000		4360
Aromatic EC>8 - EC10 TPHs	190	270	51	17000	5000	9300		3590
Aromatic EC10 - EC12 TPHs	380	1200	74	34000	5000	10000	2150	
Aromatic EC12 - EC16 TPHs	660	2500	130	38000	5000	10000		
Aromatic EC>16 - EC21 TPHs	930	1900	260	28000	3800	7800		
Aromatic EC>21 - EC35 TPHs	1700	1900	1600	28000	3800	7900		
Aromatic EC>35 - EC44 TPHs	1700	1900	1600	28000	3800	7900		
Long Chain Aliphatic and Aromatic Hydrocarbons								
Aliphatic and Aromatic EC >44-70	1900	1900	3000	28000	3800	7900		
Aromatic Hydrocarbons								
Benzene	0.87	3.3	0.18	98	140	230		
Ethyl benzene	260	440	91	27000	25000	27000		2840
Toluene	690	3900	120	180000	56000	100000		4360
Xylene	310	430	160	30000	43000	31000	2620	
MTBE	160	220	90	24000			62700	
Phenol	420	2300	280	3200	3200	3200		
Polycyclic Aromatic Hydrocarbons (PAH) - Benzo(a)pyrene Surrogate Marker Approach, with reference to C4SL PAH Surrogate Marker Check Sheet where appropriate								
Benzo(a)Pyrene (C4SL Surrogate Marker Approach)	5	5.3	5.7	77	10	21		
Naphthalene	85	85	200	8400	17000	1900	432	
Acenaphthylene	920	6000	160	100000	15000	30000	506	
Acenaphthene	1100	6000	200	100000	15000	30000	336	
Fluorene	860	4500	160	71000	9900	20000	183	
Phenanthrene	440	1500	90	23000	3100	6300		
Anthracene	11000	37000	2200	540000	74000	150000		
Fluoranthene	890	1600	290	23000	3100	6400		
Pyrene	2000	3800	620	54000	7400	15000		
Polycyclic Aromatic Hydrocarbons (PAH) - Individual Compound Assessment								
Naphthalene	85	85	200	8400	17000	1900	432	
Acenaphthylene	920	6000	160	100000	15000	30000	506	
Acenaphthene	1100	6000	200	100000	15000	30000	336	
Fluorene	860	4500	160	71000	9900	20000	183	
Phenanthrene	440	1500	90	23000	3100	6300		
Anthracene	11000	37000	2200	540000	74000	150000		
Fluoranthene	890	1600	290	23000	3100	6400		
Pyrene	2000	3800	620	54000	7400	15000		
Benzo(a)anthracene	13	15	13	180	29	62		
Chrysene	27	32	19	350	57	120		
Benzo(b)fluoranthene	3.7	4	3.9	45	7.2	16		
Benzo(k)fluoranthene	100	110	130	1200	190	440		
Benzo(a)pyrene (only)	3	3.2	3.5	36	5.7	13		
Indeno(123cd)pyrene	41	46	39	510	82	180		
Dibenzo(ah)anthracene	0.3	0.32	0.43	3.6	0.58	1.4		
Benzo(ghi)perylene	350	360	640	4000	640	1600		
Chlorinated Aliphatic Hydrocarbons								
Chloroethene (Vinyl chloride)	0.017	0.029	0.0058	2.2	7.8	19		
1,1-Dichloroethene (DCE)	0.82	0.82	12	92			7940	
Cis 1,2, Dichloroethene (DCE)	1.5	1.6	3.6	120	3900	3100	12900	
Trans 1,2, Dichloroethene (DCE)	3.3	3.4	16	260	13000	9100	12600	
Trichloroethene (TCE)	0.043	0.045	0.16	3.4	79	69		
Tetrachloroethene (PCE)	1.6	1.6	11	130	3400	2500		
1,1,1,2 Tetrachloroethane	6.4	8.2	4.4	560	1400	2100		
1,1,1 Trichloroethane	39	40	240	3000	140000	100000		6392
1,2-Dichloroethane (Ethylene Dichloride)	0.31	0.41	0.19	29	310	380		
Tetrachloromethane	0.13	0.13	2.4	14	950	400		
Trichloromethane	3.4	4.2	1.7	350	2500	3100		
PFAS								
Perfluorooctanoic Acid (PFOA)	0.0076	0.041	0.0014	0.6	0.079	0.17		
Perfluorononanoic Acid (PFNA)	0.013	0.041	0.0027	0.6	0.079	0.17		
Perfluorohexane Sulfonic Acid (PFHxS)	0.0081	0.041	0.0015	0.6	0.079	0.17		
Perfluorooctane Sulfonic Acid (PFOS)	0.0073	0.041	0.0013	0.6	0.079	0.17		

- 1) All Values are in mg/kg, reported to 2 significant figures.
- 2) Numbers in bold are C4SLs, Numbers in italics are S4ULs, Numbers underlined are EIC/AGS/CL:AIRE GACs, Numbers in red are SoBRA Acute Generic Assessment Criteria.
- 3) Assumptions and key notes made when deriving the Generic Assessment Criteria are contained within the relevant guidance documents, references:
 - a) Contaminated Land: Applications in Real Environments (2014) SP1010 - Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, Final Project Report (Revision 2b)
 - b) Land Quality Management Ltd. (2015) The LQM/CIEH S4ULs for Human Health Risk Assessment.
 - c) CL:AIRE, EIC, AGS (2010) Soil Generic Assessment Criteria for Human Health Risk Assessment.
 - d) Society of Brownfield Risk Assessment (2020) Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil.
 - e) Environment Agency (2009) Human Health Toxicological Assessment of Contaminants in Soil, Science Report - SC050021/SR2.
- 4) Generic Assessment Criteria listed in the following order of preference: C4SLs, S4ULs, CL:AIRE/AGS/EIC Generic Assessment Criteria, Other relevant Generic Assessment Criteria where GACS associated with the prioritised GACs are not available as outlined further in Curtins Rationale and Hierarchy notes.
- 5) To use Benzo(a)pyrene as a surrogate marker for PAH contamination, the assumptions set out in the relevant C4SL documentation must be met. A C4SL PAH surrogate marker checklist is appended.
- 6) Naphthalene is a volatile PAH. The C4SL values are derived on the basis of chronic exposure and risks to human health, and do not explicitly account for acute risks (e.g. a one off ingestion of a significant amount of soil by a young child) where the inhalation pathway is the main risk driver. Further consideration of the acute risk may be required in external settings (POS_{park} and POS_{resi}) where the GAC is substantially greater than the residential equivalent, to account for the possibility of acute exposure to the ingestion of naphthalene. The theoretical solubility saturation limit of naphthalene in soil is substantially lower than the GAC value, and therefore it is likely that free phase contamination would be present where the GAC is exceeded. In such a situation, it is unlikely that the product would remain in-situ untreated, and consideration of remediation / mitigation methods would be required.
- 7) Where the C4SL surrogate marker checklist indicates the PAH ratios are not suitable, individual PAH compounds must be assessed individually against the relevant contaminant specific assessment criteria.
- 8) Risk associated with additive effects of TPH contamination needs to be assessed in addition to the individual bandings, using the following equation:

$$HI = \sum HQ_i = \sum \frac{\text{Measured concentration, } Fi \text{ (mg/kg)}}{\text{Relevant GAC (mg/kg)}} Fi$$

Where:

HI = Hazard Index

HQ = Hazard Quotient

Fi = Fraction i

Where the HI > 1, there may be a risk to human health.

- 9) Exposure to all xylene isomers to be considered together. Values detailed in this table are the lowest (most conservative) of o-, m- and p- xylene isomers.
- 10) PFAS assessment also uses a hazard index approach to ensure the total exposure from all four PFAS compounds combined does not exceed the LLTC_{oral}. Where the hazard index exceeds 1, further consideration or assessment of the risk is required, even where none of the individual C4SL values are exceeded.
- 11) PFAS C4SL values are interim. The C4SL has been derived using the sum of the four PFAS compounds as the basis of the low level of toxicological concern. The term interim reflects concerns raised by the Committee on Toxicity (COT) and the fact that further work by the COT and others may result in the need for the LLTC to be updated.
- 12) Generic Assessment Criteria assume no free phase contamination is present. Where free phase contamination is present, further assessment may be required.
- 13) Solubility Saturation Limit and Vapour Saturation Limit are provided in accordance with relevant guidance documents. Where these values are exceeded, and the vapour pathway is an important contributing pathway to exposure, then the following should be considered:
 - Free phase contamination may be present
 - Exposure from vapour pathways will be over predicted.
 - Where the vapour pathway is >90% of exposure then it is unlikely that the relevant HCV will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Additional assessment should be undertaken where this is the case, with consideration that:

- Exposure is unlikely to reach the relevant HCV and the risk based on the assumed conceptual model is likely to be negligible.
- Vapour pathway exposure should be calculated using algorithms suitable for free phase or NAPL sources
- Screening could be considered using the lower saturation limit, which is the approach adopted by the USEPA. However, this may not be practical in many cases because of very low limits and is in any case highly conservative.

Where the vapour pathway is the only exposure pathway considered then effective assessment criteria should be derived manually in accordance with guidance outlined in CLEA Science Report SC050021/SR4

Tier 1 Thresholds

Water Contaminants: Initial Assessment of Risk



Introduction

The Generic Assessment Criteria (GAC) employed as Tier 1 Controlled Water Screening criteria are given in Tables 1 and 2. The more conservative available Drinking Water Standards (DWS) and Environmental Quality Standards (EQS) (Freshwater and Saltwater), applicable in England and Wales have been included in the tables.

The list of determinands is non-industry specific and it should be recognised that additional site specific determinands may need to be taken into account. The applicability of these criteria, with regard to the developed Conceptual Site Model, is discussed within the relevant section of the preceding report. Further details on individual GAC can be obtained in the referenced source legislation.

Generic Assessment Criteria

Table 1 – Inorganic Contaminant Controlled Waters Generic Assessment Criteria

Contaminant	Units	Hardness Banding (mg/l CaCO ₃)	EQS (Freshwater)	EQS (Saltwater)	EU DWS	WHO
Arsenic	µg/l	-	50	25	10	10
Boron	µg/l	-	2000	7000	1000	0.3
Cadmium	µg/l	<40	0.08	0.2	5	3
		40- <50	0.08			
		50- <100	0.09			
		100- <200	0.15			
		>200	0.25			
Chromium III	µg/l	-	4.7	-	50	50
Chromium VI	µg/l	-	3.4	0.6		
Copper	µg/l	-	1 bioavailable ⁱ	3.76 Where DOC ⁱⁱ ≤ 1mg	2000	2000
				3.76 + (2.677 x ((DOC/2)-0.5)) Where DOC ⁱⁱ >1mg/l		
Cyanide (Free)	µg/l	-	1	1		
Cyanide (Total)	µg/l	-	1	1	50	70
Iron	µg/l	-	1000	1000	200	300
Lead	µg/l		1.2	1.3	10	10
Mercury	µg/l	-	0.07 ⁱⁱⁱ	0.07 ⁱⁱⁱ	1	1
Nickel	µg/l	-	4 bioavailable ⁱ	8.6	20	70

Tier 1 Thresholds

Water Contaminants: Initial Assessment of Risk



Contaminant	Units	Hardness Banding (mg/l CaCO ₃)	EQS (Freshwater)	EQS (Saltwater)	EU DWS	WHO
Selenium	µg/l	-	-	-	10	10
Sulphate	mg/l	-	400	-	250	-
Sulphide	µg/l	-	0.25	-	-	-
Zinc	µg/l	-	10.9 bioavailable ⁱⁱ + ABC ^v	6.8 dissolved ^{iv} + ABC	5000	3000

i - fraction likely to have toxic effect as determined using the UKTAG Metal Bioavailability Assessment Tool

ii - concentration of dissolved organic carbon in mg/l of the receiving water (as identified in the Conceptual Site Model)

iii - in absence on Annual Average the Maximum Allowable Concentration Used

iv - total dissolved as reported

v - Average Background Concentration (ABC) as listed in Part 2 Table 2 in Ref. 1.

Table 2 – Organic Contaminant Controlled Waters Generic Assessment Criteria

Contaminant	Units	EQS (Freshwater)	EQS (Saltwater)	EU DWS	WHO
Organics					
Phenol (total)	µg/l	7.7	7.7	0.5	-
MTBE	µg/l	-	-	-	15
Total Petroleum Hydrocarbons (TPH)					
Aliphatic C5-C6	µg/l	-	-	-	15000
Aliphatic C6-C8	µg/l	-	-	-	15000
Aliphatic C8-C10	µg/l	-	-	-	300
Aliphatic C10-C12	µg/l	-	-	-	300
Aliphatic C12-C16	µg/l	-	-	-	300
Aliphatic C16-C21	µg/l	-	-	-	300
Aliphatic C21-C35	µg/l	-	-	-	300
Aromatic C6-C7 (benzene)	µg/l	10	8	1	10
Aromatic C7-C8 (toluene)	µg/l	74	74	-	700
Aromatic C8-C10 (ethylbenzene)	µg/l	20	20	-	300
Aromatic C10-C12	µg/l	-	-	-	100
Aromatic C12-C16	µg/l	-	-	-	100
Aromatic C16-C21	µg/l	-	-	-	90
Aromatic C21-C35	µg/l	-	-	-	90
Total Hydrocarbons (Dissolved / Emulsion)	µg/l	-	-	10 (revoked)	300

Tier 1 Thresholds

Water Contaminants: Initial Assessment of Risk



Contaminant	Units	EQS (Freshwater)	EQS (Saltwater)	EU DWS	WHO
BTEX Compounds					
Benzene	µg/l	10	8	1	10
Toluene	µg/l	74	74	-	700
Ethyl-benzene	µg/l	20	20	-	300
Xylene (o+p+m)	µg/l	30	30	-	-
Polycyclic Aromatic Hydrocarbons (PAH)					
Anthracene	µg/l	0.1	0.1	-	-
Benzo(a)pyrene	µg/l	0.00017	0.00017	0.01	0.01
Napthalene	µg/l	2	2	-	-
PAHs Sum of four- benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, indeno(1,2,3- c,d)pyrene	µg/l	-	-	0.1	-

References

- 1 The Water Framework Directive, (Standards and Classification) Directions (England and Wales) [2015]
- 2 Council Directive 76/464/EEC, Council Directive on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (Dangerous Substances Directive) [1976]
- 3 Council Directive 98/83/EC on the quality of water intended for human consumption [1998]
- 4 World Health Organisation (WHO), Guidelines for Drinking Water Quality. Third edition [2004]

Appendix G – Risk Assessment Rationale

The site-specific risk assessment, presented in this report, follows the principle of establishing whether there is a viable linkage between a contaminant source to a potential receptor, via an exposure pathway.

The risk assessment corresponds with the total site area and incorporates both descriptive (qualitative) and, where available, numerical (quantitative) lines of evidence.

Risk assessment is the process of collating known information on a hazard or set of hazards to estimate actual or potential risk to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem, or future construction materials. Receptors can be connected to the source by one or several exposure pathways such as direct contact for example. Risks are managed by isolating the receptor or intercepting the exposure pathway or by isolating or removing the hazard.

Without the three essential components of a source, pathway, and receptor there can be no risk. Therefore, the presence of contaminant source on a site does not necessarily mean there is a risk.

The risk assessment considers the likelihood of a particular event taking place (accounting for the presence of the source and receptor and the viability of the exposure pathway) in conjunction with the severity of the potential consequence (accounting for the potential severity of the hazard and the sensitivity of the receptor).

In the risk assessment the consequence of the hazard has been classified as severe, medium, mild, or minor and the probability (likelihood) of the circumstances occurring classified as high likelihood or low likelihood or unlikely.

The consequences and probabilities are subsequently cross correlated to give a qualitative estimation of the risk using Department of the Environment risk classifications as detailed in the table below and as referenced in CIRIA C552.

		Consequence			
		Severe	Medium	Mild	Minor
Probability (Likelihood)	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

In accordance with DoE guidance, the following categorisation of **consequence** has been developed.

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in “significant harm” as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to an ecosystem or organisation forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in an ecosystem or organism forming part of such ecosystem.	Concentration of a contaminant from site exceeds the generic or site-specific assessment criteria. Leaching of contaminants from a site to a Principal or Secondary A aquifer. Death of a species within a designated nature reserve. Lesser toxic and asphyxiate effects
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services. Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater (Inc. Secondary B aquifers). Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc). Easily repairable effects of damage to buildings, structures, and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

In accordance with DoE guidance, the following categorisation of **probability** has been developed.

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

In accordance with DoE guidance, the following categorisation of **risk** has been developed.

Classification	Definition
Very High Risk	There is a <i>high probability</i> that <i>severe harm</i> could arise to a designated receptor from an identified hazard at the site without appropriate further action.
High Risk	<i>Harm is likely to arise</i> to a designated receptor from an identified hazard at the site without appropriate further action.
Moderate Risk	<i>It is possible</i> that without appropriate further action <i>harm could arise</i> to a designated receptor. It is relatively <i>unlikely</i> that any such harm would be <i>severe</i> , and if any harm were to occur it is <i>more likely</i> that such harm would be <i>relatively mild</i> .
Low Risk	<i>It is possible</i> that <i>harm could arise</i> to a designated receptor from an identified hazard. It is <i>likely</i> that, at worst, if any harm was realised any effects would be <i>mild</i> .
Negligible Risk	The presence of an identified hazard does not give rise to the potential to cause harm to a designated receptor.

The term 'risk' in this instance refers to the risk that the source, pathway, receptor linkage for a given source of contamination is complete. It does not refer to immediate risk to individuals or features present on the site from potential contaminants and is intended to be used as a tool to assess the necessity of further investigation.