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19 Trevor Square
Knightsbridge
London
SW7 1DZ

Desimome Consulting Engineering
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Phase II Contaminated Land Risk Assessment

61 to 65 Spear Street, Manchester

March 2025

Site Ref: 6178/VSE-CLRA v1.00

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Phase II Contaminated Land Risk Assessment

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Phase II Contaminated Land Risk Assessment

1. Introduction

This report is an account of a Phase II Contaminated Land Risk Assessment carried out by GeoAssist Limited at the request of Desimome Consulting Engineering on behalf of the Client Jadebricks Manchester Limited for a proposed building refurbishment with a change of use to residential and the addition of three storeys.

The work was commissioned following acceptance of the quotation and an instruction to proceed issued on behalf of the Client on the 10th February 2025.

The purpose of this Phase II investigation is to provide information following the conclusions of the phase I report covering a larger area and which includes the section of the site covered by this report, to ensure that the site:

- § Is assessed in accordance with the UK government methodology outlined online in Land Contamination Risk Management (LCRM).
- § Satisfies the relevant requirements of the National Planning Policy Framework December 2024.
- § Is suitable for the intended proposed land use. In this case, as a mixed commercial/residential upper Development

The phase I preliminary contaminated land risk assessment report was produced by others and is referenced S220723 and dated August 2022

The approximate grid reference for the centre of the site is 384597, 398557. The particular area of the site scheduled for investigation is outlined with a solid red line on the site plan in Appendix A1. The positions of exploratory holes are also indicated on the plan.

2. Description of the Site

2.1 Present

The site is located to at 61 to 65 Spear Street to the north east of Manchester City Centre (Norther Quarter). A four storey Victorian warehouse structure with a basement occupies the entirety of the site and there is no outside space associated with the site. Most recently the building has been used as office space. The site is rectangular in shape and the general topography of the surrounding area is level. The building frontage and entrance is on Spear Street. Back Spear Street follows the line of the building to the side and rear. To the north-east the building abuts a derelict commercial/retail unit also earmarked for future development. Commercial property surrounds the building in all directions.

2.2 Proposed Development

The proposed development comprises modification to the existing property to accommodate an additional 3 storey roof extension. It is understood the ground/basement floor will be given to commercial space and the upper floors will be repurposed as residential apartments.

3. Review Of Previous Reports

There is no indication that previous subsurface ground investigations have been undertaken on this site.

The issues to be covered in the present investigation are to provide information in respect of any potentially unacceptable geo-environmental risks arising from previous land uses both on site and in the immediate area, and the potential for any sources of contamination to impact both present and future receptors, including:

- Human
- Controlled waters via established pathways
- Property
- Adjoining land

4. Intrusive Investigation

4.1 Intrusive Investigation Objectives

The objectives of the site investigation are to collect data to confirm whether or not the soils beneath the site, in their current state, pose a risk by reason of substances within or under the land that;

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

Data to describe the following parameters has been collected at a suitable spatial resolution in accordance with BS10175, 2011:

- § Soil Characteristics including type of material
- § Chemical profile of the soil.

These data will be used to refine a conceptual site model and confirm the existence of any established pollutant linkages in accordance with Land Contamination Risk Management (LCRM) 2020, as well as The Environment Agency Requirements for Land Contamination Reports, 2005.

4.2 Intrusive Investigation Strategy

The ground investigation was carried out in accordance with British Standard 5930: 2015 Code of Practice for Site Investigations and BS BS10175: 2011 Investigation of potentially contaminated sites.

All fieldwork was supervised by suitably qualified GeoAssist Limited Engineers.

All Analytical testing was carried out in an independent UKAS accredited Laboratory.

4.3 Methods Used For Forming Exploratory Holes

The exploratory holes undertaken across the site as part of this investigation were established using percussive boring methods and hand tool excavation methods. The locations of exploratory holes are marked on the plan in appendix A1. Information obtained from the Phase I Preliminary Contaminated Land Risk Assessment was used to inform a decision on the actual exploratory hole locations whilst taking account of the positions that could be reasonably accessed with the drilling plant available.

4.4 Exploratory Hole Programme

In total three exploratory holes were established across the site. Environmental samples were recovered from WS1 ,TP1 and TP2. The details of the strata in the exploratory holes were recorded by a suitably qualified Professional Engineer.

Upon completion of the fieldwork all of the exploratory holes were backfilled in accordance with the specification in order to prevent the establishment of any potential pollutant pathways.

All intrusive work was carried out generally in accordance with:

- § British standard 5930: 2015 Code of Practice for Site Investigations where appropriate
- § British Standard 10175: 2011 where applicable

The exploratory holes were completed between the 18th February and 03rd March 2025.

4.5 Field Sampling and Testing

A non-targeted exploratory hole layout was selected as the most appropriate strategy for this site as the Phase I report had highlighted the precise location and nature of any potential contaminants of concern was unknown. Representative samples were taken of all the strata encountered in the exploratory holes. Once exposed, samples to be subjected to chemical analysis were immediately placed into a suitable container and stored in a cool dark sample box prior to submission to the laboratory in order to prevent alteration of the composition of the samples. In all cases 500ml wide necked amber glass jars were used with a Teflon faced foamed polyethylene cap liner that offers excellent chemical resistance with the compressibility and sealing properties of polyethylene foam. These containers were filled with sample, sealed and delivered to the laboratory for testing. Samples for volatile compounds were placed into appropriate containers with a screw cap and pierceable septum as supplied by the testing laboratory specifically appropriate to the determinand. These containers were filled with sample sealed and delivered to the laboratory for testing. Observations of groundwater conditions were recorded throughout the fieldwork operations. All other samples were stored in airtight containers and returned to the laboratory for examination and geotechnical testing where necessary.

A photo ionisation detector (PID) was used to indicate the likelihood of the presence of volatile organic compounds during the fieldwork and in the laboratory. The results are indicted on the Borehole logs only where readings in excess of 10ppm were Recorded. None were recorded.

5. Laboratory Investigation

5.1 Contamination Testing

In total 4 soil samples were collected and subjected to elements of the suite of chemical testing as outlined below. All tests were conducted by i2 Analytical Laboratories under UKAS Testing No 1549. The results of all the chemical analysis tests are given in Appendix C1.

Table 5.1 Analytical Determinands

Soils	
Arsenic	Acenaphthene
Boron (water-soluble)	Acenaphthylene
Cadmium	Anthracene
Chromium	Benzo(a)Anthracene
Chromium VI	Benzo(a)Pyrene
Copper	Benzo(b/k)Fluoranthene
Cyanide(Total)	Benzo(ghi)Perylene
Cyanide(free)	Chrysene
Lead	Dibenzo(ah)Anthracene
Mercury	Fluoranthene
Nickel	Fluorene
pH	Indeno(123-cd)Pyrene
Phenols(Mono)	Naphthalene
Selenium	Phenanthrene
SO4(Total)	Pyrene
Sulphide	
Sulphur(Free)	Asbestos screen & ID
Thiocyanate	TPH (where olfactory evidence indicates a requirement)
Zinc	BTEX (where olfactory evidence indicates a requirement)

6. Subsurface Stratigraphy

The subsoil profile obtained from the exploratory hole WS1 consists of concrete overlying granular and cohesive Made Ground to 1.0m depth. The subsoils beneath the made ground consists of an upper slightly gravelly sandy silty clay, stiff in consistency and intermediate in plasticity over an intermediate firm to stiff slightly sandy silty clay intermediate in plasticity with sand and silt inclusions and partings. Seepage groundwater was encountered at 2.50m depth in exploratory hole WS1 which resulted in a reduction in strength of the clay in this area.

WS1 penetrated a stiff to very stiff gravelly sandy silty clay from 7.00m depth to 10.45m depth.

Further details of the subsurface stratigraphy can be found in the exploratory hole log sheets which form Appendix B1 to this report.

Table 6.0 Subsoil Profile Summary WS1 only

Strata	Depth of Strata (m) below ground level	
	Top	Base
Made Ground	Ground Level	1.00
Concrete/Hard standing over variable mixed granular/cohesive Made Ground		
Upper Glacial Deposit	1.00	2.30
Slightly gravelly sandy silty Clay – stiff of intermediate plasticity and compressibility		
Intermediate Glacial Deposit	2.30	7.00
Slightly gravelly sandy silty Clay – firm to stiff of intermediate plasticity and compressibility		
Lower Glacial Deposit – GT	7.00	>10.45
Gravelly sandy silty Clay – stiff to very stiff and intermediate plasticity		

7. Groundwater

Seepage groundwater was encountered at a depth of 2.50m in WS1 and a depth of 1.00m in TP1 during the course of the fieldwork. The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken.

Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.

A high groundwater ingress from 0.30m depth was encountered during the excavation of TP2 which despite excessive localised pumping prevented excavation to expose the base of foundations in this area.

8. Ground Gas

The Phase I report undertaken by others did not identify any credible sources of landfill gas within 250m of the site boundary and identified made ground on site as the only potential source to impact the site. The limited thickness of the made ground encountered (1.00m depth below the basement floor level) together with the fact that the made ground encountered is of low risk and did not contain any materials capable of producing quantities of ground gas that could impact the proposed development indicates that ground gas monitoring is not required for this site.

9. Part IIA Legislation

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) provides a new regime for the control of specific threats to health or the environment from existing land contamination. In accordance with the Act and the statutory guidance document on The Contaminated Land (England) Regulations 2000, the definition of contaminated land is intended to embody the concept of risk assessment. Within the meaning of the Act, land is only “contaminated land” where it appears to the regulatory authority, by reason of substances within or under the land that

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

The guidance defines “risk” as the combination of

- § The probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- § The magnitude (including the seriousness) of the consequences.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- § A source, i.e. a substance that is capable of causing pollution or harm;
- § A receptor (or target). i.e. something which could be adversely affected by the contaminant; and
- § A pathway, i.e. a route by which the contaminant can reach the receptor.

If one of these elements is missing there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

9.1 Assessment Methodology

In order to assess the environmental risk posed by potential contaminants within the near surface soils considering the final levels of the scheme, GeoAssist Limited undertook an initial screen of the laboratory results using GeoAssist Limited Generic Assessment Criteria (GACs) and where applicable Category 4 Screening Levels or Suitable 4 Use Levels as given as part of Appendix C2.

The GeoAssist Limited GACs and Category 4 Screening levels (C4SLs and S4UL herein) are generated in consideration of the proposed end use of the site, in this case as commercial land. Contaminant concentrations below the GACs and or C4SLs levels are considered not to warrant further risk assessment. Concentrations of potential contaminants above the GACs and C4SLs levels require further consideration of the potential pollutant linkages. It should be noted that exceedance of the GACs and or C4SLs levels does not necessarily mean that the site requires remediation, although this is dependent on the nature, type and depth of the contaminant and further justification may be required.

9.2 Soils

For assessment of the soil analysis results with regard to potential human health risks, GeoAssist Limited GACs are selected from the following sources which represent minimal risk to site users:

CLEA Soil Guideline Values (SGVs). These values have been developed by the Department of the Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) using the Contaminated Land Exposure Assessment (CLEA) Model, and are considered to be protective of human health (considered to be a potential receptor on site). To date, SGVs have been published for only a limited suite of contaminants, with SGVs derived for each contaminant for three different land use scenarios namely:

- § residential
- § allotments
- § commercial and industrial.

The proposed assessment of this site is as commercial land as this is considered to be the most appropriate land use scenario for the current and proposed situation on site.

Chartered Institute of Environmental Health Generic Assessment Criteria (LQM CIEH GAC) have been used where available and where CLEA SGVs have not yet been published.

Where CLEA or LQIM CIEH GAC values are not available, Atkins at Risk GAC values have been selected as appropriate all of which represent a minimal risk to receptors.

C4SLs have been used in conjunction with the above GAC and these represent a Low Level of Toxicological Concern (LLTC herein). LLTC represent an intake of low concern that remains suitably protective of health, and definitely does not approach an intake level that could be defined as Significant Possibility of Significant Harm.

The CLEA guidelines state that for each contaminant, apart from lead, the upper 95th percentile of the mean measured concentration should be calculated where appropriate and this value should be compared to the applicable screening value (defined here as the GeoAssist Limited GACs). For Lead impacts the geometric mean should be calculated and compared to the GAC or C4SL.

The CLEA model states that, 'the contamination is assumed to be at or within 1 m of the surface (CLR10 page 10 now withdrawn).' It is considered that at depths greater than 1m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway. Typically, volatile compounds only significantly affect the indoor inhalation pathway.

9.3 Subsoil Deposits

The contaminants that were identified above the GeoAssist Limited GACs, SGVs or C4SLs for a Commercial end use from the GeoAssist Limited investigations are summarised below:

Table 9.3 Summary identified impacts.

Determinand	GAC (mg/kg) Comm./ind.	Total tests	No. of / No. of tests in impacted strata (Made Ground)	No of samples exceeding SGV/GAC/ C4SL	Max Value (mg/kg)	Treat as Hotspot	US95 Value	Further action required
Heavy Metals and Metalloids								
None Identified exceeding Assessment Criteria								
PAH Compounds								
None Identified exceeding Assessment Criteria								

The analytical laboratory test results and analysis are presented in appendix C1 & C2 and have not identified any risks to end users of the Site from elevated levels of anthropogenic contamination within the near surface or deeper natural superficial deposits on the Site. Results have confirmed that no samples were found to exceed the applicable assessment criteria and the site may be considered not to present a significant possibility of significant harm to human health in the context of Part IIA.

The results of all the chemical laboratory analytical tests form appendix C1 to this report and the analysis of the results forms appendix C2 to this report.

General

The assessment of the chemical laboratory analytical tests has identified that the soils on this site pose little risk to present site end users or proposed development site end users or the wider environment when assessed in accordance with the current UK methodology. Consequently, the risk to end users and the wider environment from ground contamination is classified as low given a commercial end use scenario of the site which is deemed to be the most appropriate given the hardstanding cover that will be placed at basement level.

Soakaway Drainage

The lack of any outside space precludes the use of any soakaway type drainage for the disposal of surface water from rooftops.

Groundwater

The results of the soils chemical analysis together with the low permeability underlying superficial deposits and the also indicate that the underlying principle aquifer beneath the site or any close by controlled waters are highly unlikely to be at significant risk from the passage of groundwater through the site.

Water Supply Pipes

The risk to building and services (specifically water supply pipes) from chemical attack is likely to be negligible and as such no special precautions are required to protect the building fabric or services entering the buildings. However, this should be confirmed by a competent person before service routes and locations are finalised.

Off Site Waste Disposal

It is not envisaged that any great quantity of materials will be excavated and disposed of to off site locations as part of the development. It is recommended that the advice of a specialist waste haulage contractor be sought prior to disposal of soil arisings from foundation excavations from the site. It should be noted that disposal at landfill is not the only option for materials leaving the Site and off site recycling of all arisings through a recognised EA hub site using the voluntary code of practice (COP) could present opportunities for savings over traditional landfilling.

10. Conceptual Model

The updated conceptual model based on the information and test results presented in this report including contamination sources, pathways and receptors is presented below.

Table 10.0 Amended Conceptual Site Model based on information as presented within this report.

Potential Source /Hazard	Nature of Hazard (Risk Level to site given a Commercial end use)	Contaminants Associated with Source	Potential Pathway	Potential Receptor
<i>Previous & Present ON SITE Land uses:</i>				
Made Ground	Ground contamination Low Risk	None	~~Dermal Contact~~ ~~Ingestion~~ ~~Inhalation~~	Site Users Construction workers Controlled Waters Wider Environment
	Gas from in-filled ground Low Risk	None	~~Vertical and Lateral Migration~~	Site Users Future Buildings & Services
Made Ground Contamination above UURA Pipeline Or BRE SD 1 Thresholds	Ground contamination Low Risk	None	~~Dermal Contact~~ ~~Ingestion~~ ~~Inhalation~~	Site Users Construction workers Controlled Waters
	Gas from in-filled ground Low Risk	None	~~Vertical and Lateral Migration~~	Site Users Future Buildings & Services

Only sources that have not been present on site in the past or currently are considered within the off site category. Unless the information is deemed to be pertinent to the analysis.

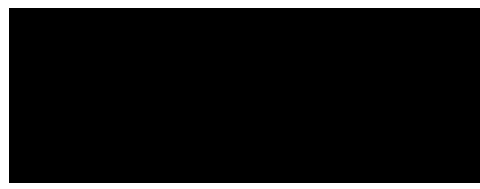
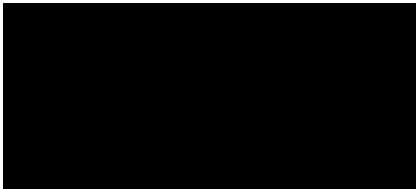
11. Conclusions

Evidence presented elsewhere within this report indicates that there is:

- A Low Risk to end user receptors from soil contamination at the site in its present condition
- The site presents a Low Risk to controlled waters and the wider environment in its present condition
- The proposed development presents a Low Risk to end user receptors from soil contamination.
- The proposed development presents a Low Risk to controlled waters and the wider environment.

11.1 Supplementary Recommendations

Careful observations will be made during site preparation and foundation works to confirm the current assessment of site conditions. Any evidence of contamination not previously identified will be brought to the attention of the LPA as soon as is practicably possible.



Field investigations have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions are, and can be, variable and have only been tested at isolated locations across the site. Therefore the potential exists for ground conditions to be encountered which are different to those considered in this report. Chemical analysis was conducted for a number of parameters based on an expert understanding of the historical and operational data available at the time and it should not be inferred or otherwise, that other chemical species are not present.

This report has been prepared by GeoAssist Limited with all reasonable professional skill, care and diligence within the terms of the contract with Jadebricks Manchester Limited. The report is confidential to Jadebricks Manchester Limited and Desimome Consulting Engineering, their/the named persons advisors and bankers, and GeoAssist Limited accepts no responsibility of whatever nature to third parties to whom this report may be divulged. GeoAssist Limited owns the copyright in this report. All rights are reserved, and unauthorised use is prohibited. Jadebricks Manchester Limited and Desimome Consulting Engineering may use the report for their/her/his own purposes.

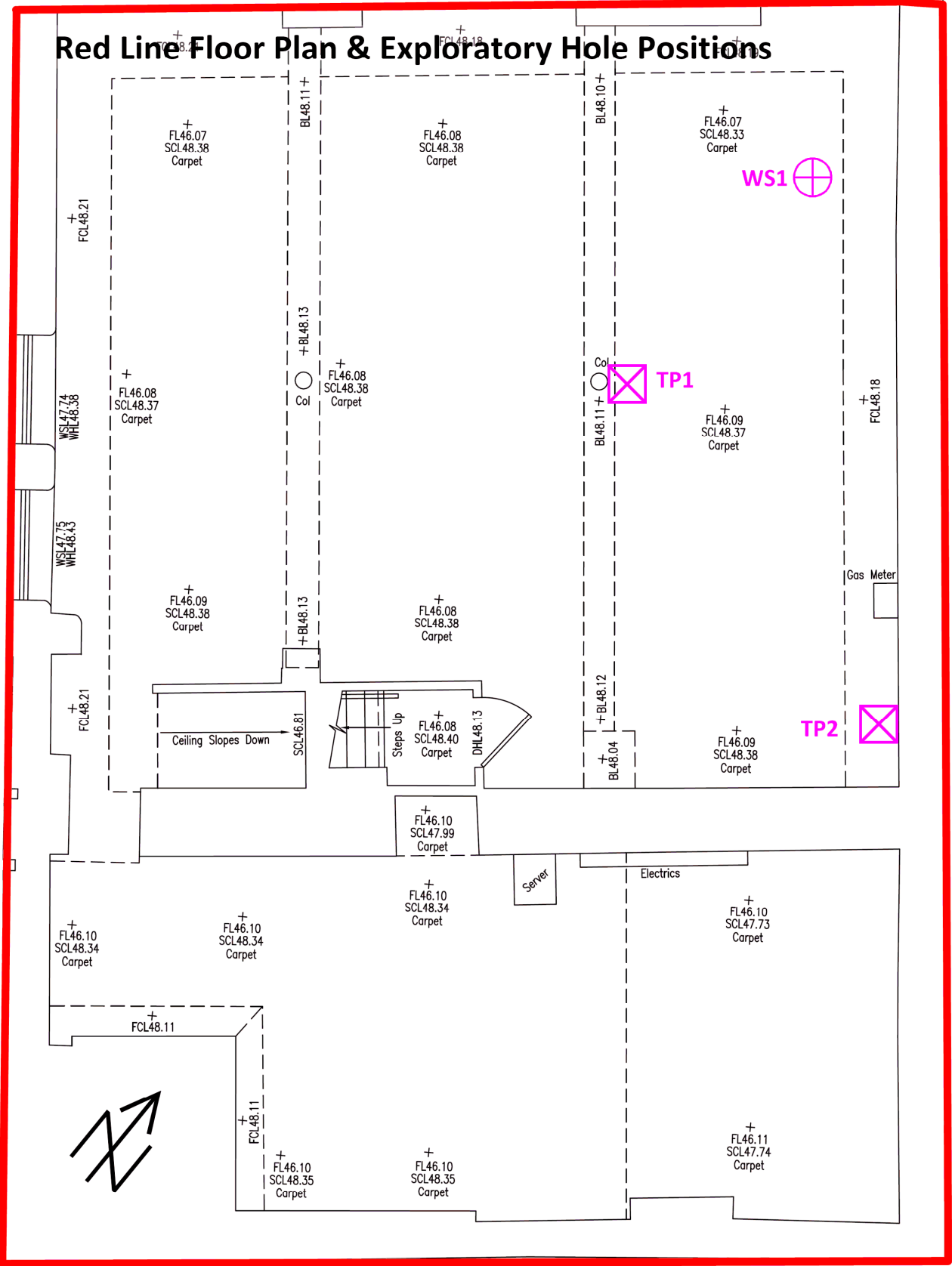
Appendix A

A1 Site Plan with Exploratory Hole Locations

Site Location (Red Line) Plan



Red Line Floor Plan & Exploratory Hole Positions



A1 Site Plan

Site Name	61 to 65 Spear Street
Location	Manchester
GeoAssist Ref	6178VSE
Client	Jadebricks Manchester Limited
	Apartment 2.2, 19 Trevor Square Knightsbridge London SW7 1DZ
Planning Consultant	Desimome Consulting Engineering
NGR (centre of site)	384597,398557
Production Date	March 2025
Survey Method	
Surveyor	Others
Status	Final v1.00
Base Survey	OSGB36

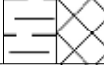
Do Not Scale



Appendix B

B1 Exploratory Hole Logs

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: WS1					
Consultant: Desimome Consulting Engineering		Project: 61 to 65 Spear Street					Sheet: 1					
Client: Jadebricks Manchester Limited		Location: Manchester				Equipment: Archway Dart Rig						
						Ground Level: 46.07 m.AOD						
						Co-ordinates: Easting: (m) Northing: (m)						
						Dates: 18/02/2025 to 19/02/2025						
Lead Driller: M Walton Assistant Driller: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests/Core Records			Field Records		
Site Geotechnical Engineer/Geologist: M Benson							Depth (m) from to	Ref.	Count N/(U)	T %	S %	RQD %
0 CONCRETE with black membrane at base		0.10	45.97									
Grey sandy gravel and concrete fragments - MADE GROUND		0.40	45.67									
Brown gravelly sandy silty clay with sandstone fragments - MADE GROUND		(0.60)										
1 Stiff brown high strength slightly gravelly slightly sandy silty CLAY		1.00	45.07				1.20	MC1				
							1.50	1.95	U1			
							1.70	1.80	D2			
							1.80		MC2			
							2.10		MC3			
2 Brown very silty CLAY with sand inclusions		2.30	43.77									
Firm brown medium strength very silty CLAY		2.50	43.57				2.70	2.80	D3			
		(0.50)					2.70		MC4			
3 Firm to stiff brown medium to high strength slightly gravelly sandy silty CLAY with silt partings		3.00	43.07									
							3.50		MC5			
							3.60	3.70	D4			
							3.60	4.05	U2			
							4.50		MC6			
							5.50		MC7			
							5.60	5.70	D5			
							5.60	6.05	U3			
							6.50		MC8			
		7.00	39.07									
7 Stiff to very stiff brown high to very high strength gravelly sandy silty CLAY							7.20	7.30	D6			
							7.50		MC9			
							8.50		MC10			
							9.50		MC11			
							9.80	9.90	D7			
		10.00	36.07									
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.										Logged: M Benson Date: 19/02/2025 Checked: M Richardson Date: 12/03/2025 Site Ref: 6178/VSE Scale 1:50 nominal		

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: WS1				
Consultant: Desimome Consulting Engineering		Project: 61 to 65 Spear Street					Sheet: 2				
Client: Jadebricks Manchester Limited		Location: Manchester				Equipment: Archway Dart Rig					
				Ground Level: 46.07 m.AOD							
				Co-ordinates: Easting: (m) Northing: (m)							
				Dates: 18/02/2025 to 19/02/2025							
Lead Driller: M Walton Assistant Driller:		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests/Core Records				Field Records
Site Geotechnical Engineer/Geologist: M Benson							Depth (m) from to	Ref.	Count N/(U)		
10 Continued stratum: Stiff to very stiff brown high to very high strength gravelly sandy silty CLAY		(0.45) 10.45		35.62		10.00 10.45	P1		44		P1 at 10.00m - (7,8/10,10,10,14)
Exploratory Hole complete at 10.45m											19/02/2025: On completion of exploratory hole at 10.45m. Casing at 4.00m. Standing water level Nil with casing. On withdrawal of casing exploratory hole backfilled and reinstated.
-11											
-12											
-13											
-14											
-15											
-16											
-17											
-18											
-19											
-20											
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.								Logged: M Benson Date: 19/02/2025 Checked: M Richardson Date: 12/03/2025 Site Ref: 6178/VSE Scale 1:50 nominal			

GeoAssist Limited

Civil, Geotechnical & Environmental
Engineers

Calculation Sheet

Job Name : 6178 / VSE

Job Ref. : 61-65 SPEAR STREET

Originator : MB

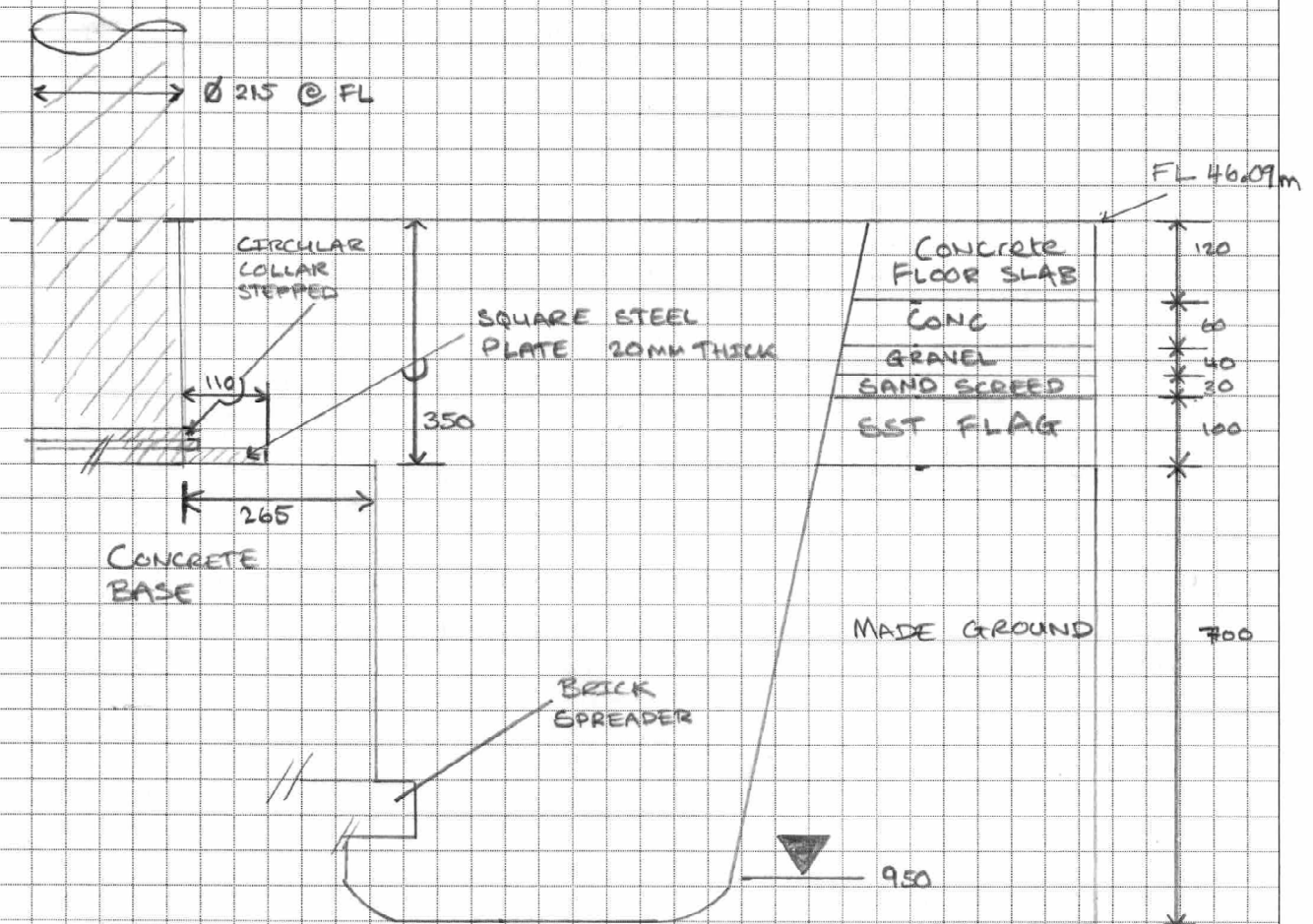
Checked by :

Sheet Number : 1 of 2

Date :

TP1 SECTION

SCALE 1:10



GeoAssist Limited

Civil, Geotechnical & Environmental
Engineers

Calculation Sheet

Job Name : G178 / USE

Job Ref. : G1-65 SPEAR STREET

Originator : MB

Checked by :

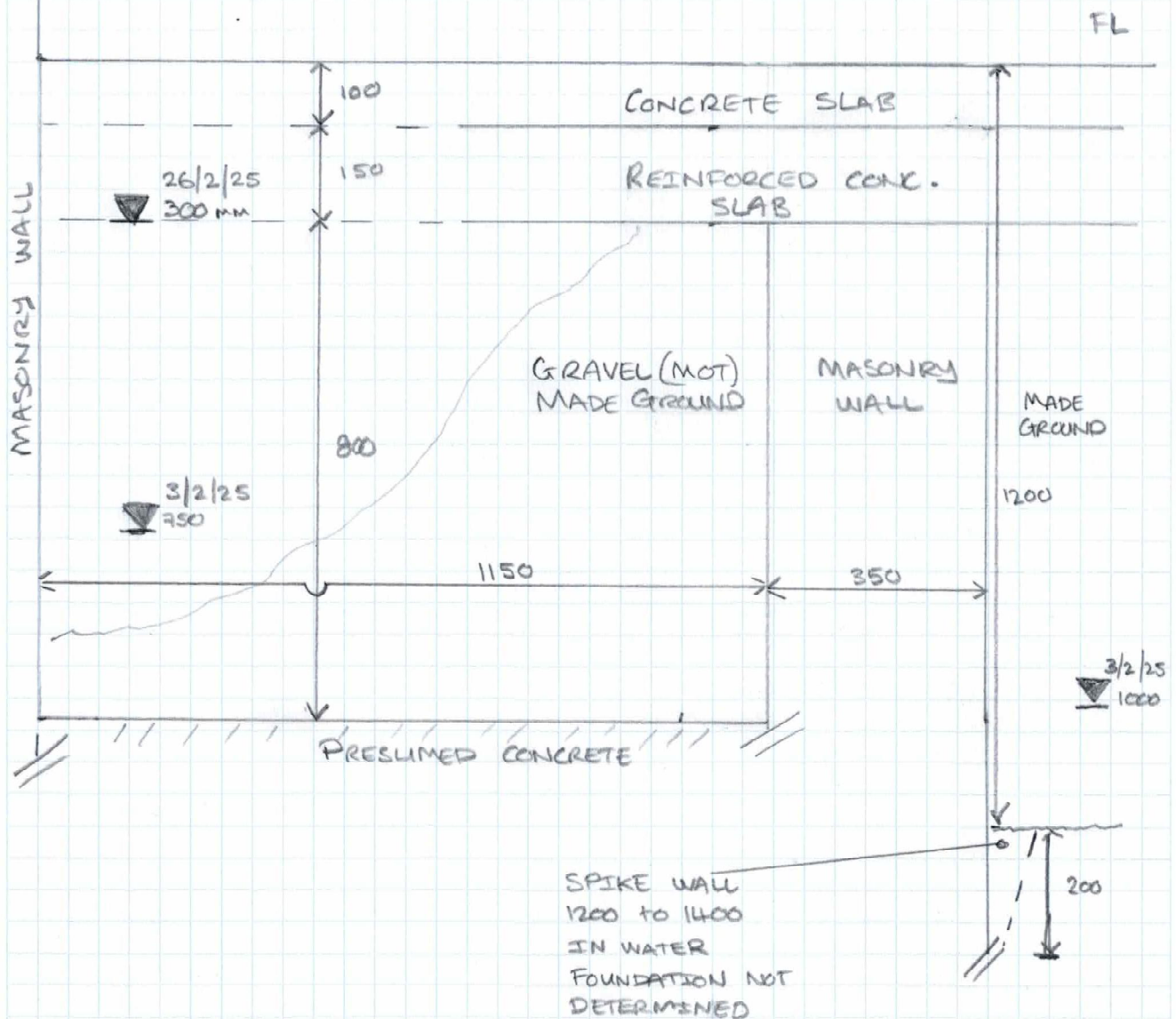
Sheet Number : 1 of 1

Date :

TP2 SECTION

SCALE 1:10

NB SIGNIFICANT VOLUMES OF WATER PUMPED DURING
EXCAVATION



Appendix C

- C1 I2 Analytical Test Results
- C2 Analytical Results with Assessment Criteria



GeoAssist Ltd
Unit 4, Sheffield Street
Heaton Norris
Stockport
Cheshire
SK4 1RU

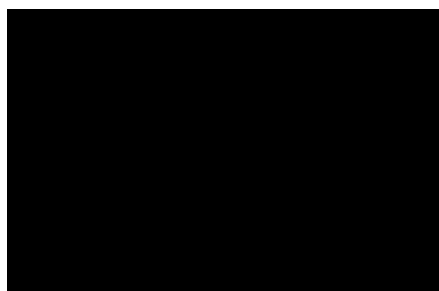
i2 Analytical Ltd.
7 Woodshots Meadow,
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Watford,
Herts,
WD18 8YS

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

e: info@geoassist.co.uk

Analytical Report Number : 25-009812

Project / Site name:	61 to 65 Spear Street, Manchester	Samples received on:	27/02/2025
Your job number:	6178 VSE	Samples instructed on/ Analysis started on:	27/02/2025
Your order number:	2250226	Analysis completed by:	11/03/2025
Report Issue Number:	1	Report issued on:	11/03/2025
Samples Analysed:	4 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
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-009812
Project / Site name: 61 to 65 Spear Street, Manchester
Your Order No: 2250226

Lab Sample Number				466944	466945	466946	466947
Sample Reference				WS1	TP1	TP1	TP2
Sample Number				C2	C1	C2	C1
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.80	0.20	0.90	0.50
Date Sampled				26/02/2025	26/02/2025	26/02/2025	26/02/2025
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	< 0.1	< 0.1	38.6
Moisture Content	%	0.01	NONE	21	0.16	20	3.1
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.6	0.1

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	-	-	DKI	-
Analysis completed	N/A	N/A	N/A	-	-	10/03/2025	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.1	8.2	8.1	11
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	1.36	0.327	0.268	0.082
Sulphide	mg/kg	1	MCERTS	1.3	18	9.1	150
Total Sulphur	mg/kg	50	MCERTS	4400	4700	1200	1800
Total Sulphur	%	0.005	MCERTS	0.442	0.47	0.116	0.18

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.14	0.08
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.15	0.11	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.14	0.1	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.35	1.8	1.1	0.19
Anthracene	mg/kg	0.05	MCERTS	0.06	0.61	0.29	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.56	4	1.9	0.09
Pyrene	mg/kg	0.05	MCERTS	0.61	4.1	2	0.07
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.31	2.6	0.99	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.39	3.3	1.2	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.37	3	1.1	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.16	0.99	0.45	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	2.7	1	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.15	1.3	0.43	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.47	0.11	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.17	2	0.51	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.43	27.3	11.5	< 0.80
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Sample Reference				WS1	TP1	TP1	TP2
Sample Number				C2	C1	C2	C1
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.80	0.20	0.90	0.50
Date Sampled				26/02/2025	26/02/2025	26/02/2025	26/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	35	17	35	2.9
Barium (aqua regia extractable)	mg/kg	1	MCERTS	150	130	130	58
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	0.29	0.98	0.12
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	2.6	1.1	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	< 0.2	1.2
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	7.7	21	4.1
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	11	45	7.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	400	55	160	1400
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.9	< 0.3	6.1	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	10	17	4.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	37	39	28	5.2
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	41	100	170

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	< 0.010	-	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	< 0.010	-	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	< 0.010	-	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	11	-	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	180	-	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	650	-	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	1900	-	-
TPHCWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	-	1300	-	-
TPHCWG - Aliphatic >EC5 - EC40 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	4100	-	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	< 0.010	-	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	< 0.010	-	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	< 0.020	-	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	< 1.0	-	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	73	-	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	620	-	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	6400	-	-
TPHCWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	-	3700	-	-
TPHCWG - Aromatic >EC5 - EC40 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	11000	-	-

TPH Total >EC5 - EC40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	-	15000	-	-
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VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	< 5.0	-	-
Benzene	µg/kg	5	MCERTS	-	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	-	< 5.0	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	< 5.0	-	-
p & m-Xylene	µg/kg	8	MCERTS	-	< 8.0	-	-
o-Xylene	µg/kg	5	MCERTS	-	< 5.0	-	-

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



Analytical Report Number : 25-009812

Project / Site name: 61 to 65 Spear Street, Manchester

* 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 *
466944	WS1	C2	0.8	Brown clay and sand
466945	TP1	C1	0.2	Brown clay
466946	TP1	C2	0.9	Brown sand with gravel
466947	TP2	C1	0.5	Brown sand with stones

Analytical Report Number : 25-009812
Project / Site name: 61 to 65 Spear Street, Manchester

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
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010-PL	D	MCERTS
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
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Hexavalent chromium in soil (low level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS



Analytical Report Number : 25-009812
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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
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 30oC.

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

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

The result for sum should be interpreted with caution

Soils Risk Assessment

Site Reference: 6178 VSE
 Project Site: 61 to 65 Spear Street
 Project Location: Manchester
 Client: Jadebricks Manchester Limited

i2 Reference	Commercial	WS1	TP1	TP1	TP2
Customer Sample Ref:	C4SL / S4UL	C2 - 0.80	C1 - 0.20	C2 - 0.90	C1 - 0.50
	SOM 1% GAC	26/02/2025	26/02/2025	26/02/2025	26/02/2025
Determinand	LQM II				
Arsenic	640	35	17	35	2.9
Boron (water-soluble)	240000	1.7	2.6	1.1	0.7
Cadmium	410	0.2	0.4	0.2	1.2
Chromium*	8600	21	7.7	21	4.1
Chromium VI	49	1.2	1.2	1.2	1.2
Copper	68000	100	11	45	7.4
Cyanide(Total)	-	1	1	1	1
Cyanide(free)**	34	1	1	1	1
Lead	2300	400	55	160	1400
Mercury	58	1.9	0.3	6.1	0.3
Nickel	980	24	10	17	4.8
pH	-	8.1	8.2	8.1	11
Phenols(Mono)	3200	1	1	1	1
Selenium	12000	1	1	1	1.5
SO4(Total)	-	1.36	0.327	0.268	0.082
Sulphide	-	1.3	18	9.1	150
Sulphur(Free)	-	4400	4700	1200	1800
Thiocyanate	-	0	0	0	0
Zinc	730000	140	41	100	170
Acenaphthene	100000	0.05	0.15	0.11	0.05
Acenaphthylene	100000	0.05	0.05	0.05	0.05
Anthracene	540000	0.06	0.61	0.29	0.05
Benzo(a)Anthracene	-	0.31	2.6	0.99	0.05
Benzo(a)Pyrene SM	77	0.31	2.7	1	0.05
Benzo(b)Fluoranthene	-	0.37	3	1.1	0.05
Benzo(ghi)Perylene	-	0.17	2	0.51	0.05
Benzo(k)Fluoranthene	-	0.16	0.99	0.45	0.05
Chrysene	-	0.39	3.3	1.2	0.05
Dibenzo(ah)Anthracene	-	0.05	0.47	0.11	0.05
Fluoranthene	23000	0.56	4	1.9	0.09
Fluorene	71000	0.05	0.14	0.1	0.05
Indeno(123-cd)Pyrene	-	0.15	1.3	0.43	0.05
Naphthalene	1100	0.05	0.05	0.14	0.08
Phenanthrene	23000	0.35	1.8	1.1	0.19
Pyrene	54000	0.61	4.1	2	0.07
PAH(total)	-	3.43	27.3	11.5	0.8
Asbestos	Not-detected	-	-	Not-detected	-
TPH (C6-C8 aliphatic)	40000	-	0.01	-	-
TPH (C8-C10 aliphatic)	11000	-	0.01	-	-
TPH (C10-C12 aliphatic)	47000	-	11	-	-
TPH (C12-C16 aliphatic)	90000	-	180	-	-
TPH (C16-C21 aliphatic)	1800000	-	650	-	-
TPH (C21-C35 aliphatic)	1800000	-	1900	-	-
TPH (C5-C7 aromatic)	86000	-	0.01	-	-
TPH (C7-C8 aromatic)	180000	-	0.01	-	-
TPH (C8-C10 aromatic)	17000	-	0.02	-	-
TPH (C10-C12 aromatic)	34000	-	1	-	-
TPH (C12-C16 aromatic)	38000	-	73	-	-
TPH (C16-C21 aromatic)	28000	-	620	-	-
TPH (C21-C35 aromatic)	28000	-	6400	-	-
Benzene	2.4	-	0.005	-	-
Toluene	7.5	-	0.005	-	-
EthylBenzene	260	-	0.005	-	-
M/P Xylene	310	-	0.008	-	-
O Xylene	330	-	0.005	-	-

All Units mg/kg unless otherwise stated

*Criteria Assumes Chromium III

**Criteria is derived considering acute effects on 1-2yo Female Receptor ingesting a single dose of 3g of soil

***Criteria is derived considering Total TPH (C10 to C35) is formed entirely of a 50:50 Aliphatic and Aromatic Split C8-C10 range

Basis of Assessment Criteria:	EA 2005 WAC (Human Health Value)	C4SL
	LQM S4UL	Atrisk 06