



NEW VICTORIA OFFICE BLOCK, MANCHESTER

PHASE II SITE APPRAISAL FOR ALAN JOHNSTON PARTNERSHIP LTD ON BEHALF OF MORGAN CAPITAL

Project Ref:
P10056

Date:
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Prepared for:
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This report has been prepared in accordance with GRM's Accredited Quality Procedures

If you have any queries regarding this report please contact the project manager in the first instance.

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Site Appraisal for New Victoria Office Block, Manchester

SUMMARY OF RECOMMENDATIONS

Where further assessment is required, it is indicated with a "Y" in the right hand column.		
Proposed Development	Construction of a new office building (comprising 13 accessible levels including a basement and mezzanine) within the wider New Victoria development.	
CONTAMINATION ASSESSMENT - REMEDIATION / WASTE DISPOSAL		
End Users	No remediation required – assumes vast majority of made ground to be removed and hardstanding throughout. For any limited soft landscaped areas, 300mm of topsoil should be placed to aid plant growth.	
Site Workers	No remediation required.	
Construction Materials	Appropriate concrete specification. Barrier Type water supply pipes required (to be confirmed by water company).	Y
Groundwater	No remediation required.	
Surface Water	No remediation required.	
Waste Disposal	Made Ground soils typically classified as either non-hazardous or hazardous, but allowance to be made for all made ground to be disposed of as hazardous waste. Any natural soils are likely to be inert for disposal purposes.	Y
GEOTECHNICAL ASSESSMENT – FOUNDATIONS		
Ground Treatment Required	None required. For pile foundations, safe working platform would be required – piling matt in the region of 400mm thick likely (if constructed without reinforcement depending on the quality of any earthworks).	Y
Main Bearing Strata	Weak to moderately strong sandstone.	
Nett Allowable Bearing Pressure	For piles – safe working load to be confirmed by piling contractor. For pads – at least 300KN/m ² .	Y
Rockhead	Bedrock varied between 1.9m and 7.5m begl.	
Tree Influence	No.	
Volume Change Potential	Non-shrinkable.	
Likely Foundation Types	CFA or bored pile foundations for thirteen storey building with basement. Pads and ground beams where bearing depth allows.	
Likely Foundation Depth Range	To be confirmed by piling contractor for piles. Commercial decision for pads.	Y
Excavation Hazards	Shallow excavations should generally be unstable – granular made ground soils are liable to collapse without warning. No significant groundwater ingresses expected. Potential for buried concrete floor slabs and brick walls from shallow depths.	
Floor Slab Types	Allowance for suspended basement / floor slab should be made. Working platform for pile foundations could form a suitable base for a ground bearing floor slab should it be engineered to a suitable standard.	
Gas Protection Requirements Radon and/or Landfill	Gas protection measures are not required. No radon gas protection required.	
GEOTECHNICAL ASSESSMENT - GENERAL		
Slope Stability Risk	Negligible.	
Soakaways Potential	Not suitable.	
New Access Roads	None proposed.	
Buried Concrete Class	DS - 2 / AC – 2. FND2 concrete.	
Retaining Walls and Boundary Features	No retaining walls present. Culverted River Irk, new residential development, Corporation Street and Metrolink tram lines form the site boundaries.	
Further Assessment Targets	Piling risk assessment to be undertaken if required.	Y



Other Comments	Piling specialist to confirm appropriate pile type, depth of piles, etc. Liaison with Local Water Supply Company to determine the appropriate water supply pipes at the site. Liaison with adjacent asset owners.	
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This summary is based on the full report that provides the detailed assessment of the ground risks affecting the development and how to manage them. It should not be used in isolation.

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1 INTRODUCTION

1.1 PREAMBLE

GRM Development Solutions Limited (GRM) has been appointed by Alan Johnston Partnership Ltd (Client's Agent), on behalf of Morgan Capital (Client), to undertake a Phase II Site Appraisal for 'New Victoria Office Block, Manchester'.

The following report has been provided to GRM by the Client's Agent and should be read in conjunction with this report:

- VertaseFLI Ltd – New Victoria Manchester, Phase 2 – Phase 1 Preliminary Environmental Assessment – Ref: 1946AJP-001, dated May 2022. This formed Phase I of the assessment and allowed the geotechnical and geo-environmental setting of the site to be determined.

The Phase II works reported within this document comprised an intrusive ground investigation, including geotechnical testing, chemical analysis and gas monitoring. The information gained from the Phase II works will be used to refine the conceptual model for the site and determine the most cost-effective development solutions.

This document is intended to provide information that will assist decision making by identifying and recommending solutions to ground engineering and contamination issues.

GRM Standard Limitations of Reporting are provided in Appendix A of this report.

The development proposals for the site comprise the construction of a new office building within the wider New Victoria residential development. The office building comprises 13 accessible levels including a basement and mezzanine. The proposed development layout plans provided by the Client, on which this report is based, are presented in Appendix B.

In addition, the Client has informed GRM of an existing culvert (owned by Network Rail and containing the River Irk) close to the northern site boundary. Although not contained within the site extents, an 8m wide notifiable zone has been stipulated by Network Rail. The north eastern corner of the new office building encroaches slightly into the notifiable zone.

1.2 OBJECTIVES OF THE SITE APPRAISAL

The principal aims of the Phase II Site Appraisal are as follows:

- a) Obtain information, from easily accessible sources, about the soil and groundwater conditions within the area of the site.
- b) Determine the possible ground-related geotechnical and contamination hazards within the site boundaries that may affect the proposed development.
- c) Provide preliminary development recommendations.

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- d) Provide advice on further works required for the cost-effective reduction of risks to the development and procedures likely to satisfy regulators.

Whilst every effort has been made to pre-empt the likely requirements of the Local Authority and the Environment Agency, they are likely to have specific requirements that will need to be discussed and addressed at a later date.

2 PHASE I DESK STUDY SUMMARY

Project Name.	New Victoria Office Block, Manchester.
Project Reference.	P10056.
Client.	Morgan Capital.
Site Location (address).	Land off Corporation Street (adjacent to Victoria Railway Station), Manchester, M31NX. See Appendix C for a site location and boundary plan.
National Grid Reference.	SJ840989.
Site Area (Ha).	0.21 Ha.
Summary of Proposed Development.	Office building development to include 13 accessible levels including a basement and mezzanine. Very limited landscaped areas.
Client Supplied Information.	➤ Proposed development layout plans. ➤ RIBA Stage 2 Report and concept drawing pack. ➤ VertaseFLI Ltd Phase 1 Preliminary Environmental Assessment Report.
Site Setting.	The site is situated within the construction compound for the adjacent residential development. The northern site boundary is constrained by the Network Rail owned culvert, the eastern boundary is constrained by the new residential development, the southern boundary is constrained by the Corporation Street adopted highway, and the western boundary is constrained by the Metrolink tram lines with Victoria Station beyond. The construction compound site area is predominantly covered by hardstanding with cabins / offices, skips, small scale fuel storage, material storage / stockpiles, car parking and a large newly built substation located in the north east of the site. There are no trees or landscaped areas within the site area. Numerous underground utility services are present.
Site History.	From the earliest OS mapping (1850), Long Millgate (road) is shown running through the middle of the site with commercial buildings on either side. The site is surrounded by primarily commercial and industrial premises, with the River Irk located just to the north of the site along with Victoria Station beyond. By 1908, the northern half of the site is now shown as being part of Victoria Station. Land to the north and west of the site is now entirely occupied by Victoria Station, with the River Irk in a culvert. By

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	the 1980s, the site no longer contains any buildings (with Victoria Station scaled back) although Long Millgate is still present with car parking either side. By 2020/2021, the construction compound now occupies the site area.
Geology.	Made ground (possibly deep) can be expected. Based on the historical development of the site, unknown buried structures or obstructions are possible. No superficial deposits are recorded. Solid geology of the Chester Formation (red, fine to coarse grained sandstone).
Hydrogeology.	The underlying bedrock strata (Chester Formation) is recorded as a Principal Aquifer. There are no recorded groundwater / potable water abstraction licenses within 250m of the site. The closest abstractions relate to operations at Strangeways Brewery approximately 350m north west of the site. The site is not recorded to be within a Groundwater Source Protection Zone.
Hydrology.	No water features identified within the site area. The culverted River Irk is present adjacent to the northern site boundary.
Flooding.	The site is not recorded to be in an area at risk from flooding by rivers or the sea and is not recorded to be within an area at risk from surface water flooding.
Mining and Quarrying.	The site is not at risk from historic coal mining. There is no evidence of any non-coal mineral extraction (via quarrying) having taken place within, or close to, the site area.
Environmental Information.	No recorded licensed landfills or waste management sites are located within 250m of the site area. No recorded pollution incidents to controlled waters within 250m of the site area. There are nineteen active discharge consents recorded within 250m of the site; all relate to storm sewer overflow into the River Irk.
Potential Soil Contamination Sources.	The presence of made ground associated with the historical development of the site (including Victoria Station) is a potential source of soil contamination. The use of the site as a car park is also a potential source of soil contamination due to the impact from petroleum hydrocarbons. A general screen for contaminants (metals, inorganics, hydrocarbons etc), as well as testing for petroleum hydrocarbons and asbestos, should be considered in any testing schedule.

Potential Ground Gas Sources (including Radon).	Made ground. The site has been assessed following the guidelines in 'Radon: guidance on protective measures for new dwellings' (BR211 2015). The site is not within an area recorded to require radon protection measures.
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2.1 PHASE I CONCEPTUAL SITE MODEL

HUMAN HEALTH			
Source	Pathway	Receptor	Level of Risk
Potentially contaminated made ground associated with historic development and later use for car parking.	Indoor and outdoor inhalation of soil dust and asbestos; the ingestion of, and dermal contact with, contaminated soil and soil dust (soft landscaped areas only).	End users.	Low.
		Construction and Maintenance Workers.	
Made ground.	Inhalation of ground gas.	End users.	Low.
Potentially contaminated made ground associated with historic development and later use for car parking.	Migration of contamination through leaks and joints, degradation of pipe materials.	Water supply pipes.	Very Low.

CONTROLLED WATERS			
Potentially contaminated made ground associated with historic development and later use for car parking.	Leaching of contaminants and vertical migration to the groundwater	Principal Aquifer (Chester Formation).	Very Low.
	Leaching of contaminants and lateral migration to surface waters.	Culverted River Irk.	

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3 PHASE II GROUND INVESTIGATION

3.1 FIELDWORK

The ground investigation has been designed in accordance with the general comments outlined in Appendix A (iv).

The ground investigation fieldwork was conducted between the 20th and 29th July 2022. A total of twenty exploratory holes were completed, comprising ten trial pits (TP01-TP10 inclusive), seven rotary open-hole boreholes (ROH1-ROH7 inclusive) and three rotary cored boreholes (ROC1-ROC3 inclusive). The trial pits were progressed to a maximum depth of 3.2m below existing ground level (begl), whilst the rotary boreholes were progressed to a maximum depth of 31.0m begl.

The exploratory holes were positioned to provide an adequate coverage of the site and to provide information with regard to the ground conditions for the proposed structure. Due to the active nature of the site area and lack of space, there were severe restrictions regarding where exploratory holes could be positioned, particularly regarding the location and extent of the trial pits.

The exploratory hole location plan is presented in Appendix D, whilst the exploratory hole logs are presented in Appendix E. Two AEG rotary drilled boreholes from 2016 (from the VertaseFLI Ltd May 2022 report) are also shown on the exploratory hole location plan and the logs included in Appendix E. A rock contour plan using both the GRM and AEG rotary log information is presented in Appendix F.

Five gas and groundwater monitoring standpipes were installed during the site works, with the rationale for these works discussed fully in Section 6. A Gas Monitoring Location Plan, illustrating the locations of the standpipes, is presented in Appendix G. The standpipes will need to remain in place until the beginning of September.

3.2 PROVEN GROUND

The following ground conditions were encountered during the investigation fieldwork:

- Made Ground
- Chester Formation (Solid Strata)

3.2.1 Made Ground

Made ground was encountered in all of the exploratory holes undertaken and the depth generally varied between 1.0m and 7.5m begl, with a general thickness recorded (where proven) of 3.3m.

The made ground generally comprised:

- Asphalt / tarmacadam, concrete, cobbled stone and gravel hardcore formed the hardstanding surface across the site area, with a general thickness of 0.1-0.2m begl.
- Dense, brown, gravelly cobbly SAND. Gravel is fine to coarse, angular to subrounded of brick, concrete, asphalt/tarmac, tile, timber, plastic, quartzite and sandstone. Cobbles of whole bricks, concrete and asphalt/tarmac.
- Medium dense to very dense, brown mottled dark brown / reddish brown / black, slightly clayey, sandy cobbly GRAVEL. Gravel is fine to coarse, angular to subrounded of brick, concrete, asphalt/tarmac, clinker, slag, timber and sandstone. Cobbles of whole bricks and concrete.

The potential for buried concrete floor slabs and brick walls within the made ground fill has been confirmed. The following obstructions were recorded:

- ROH4 – concrete between 0.8m and 1.4m begl.
- ROH7 – concrete between 1.0m and 2.3m begl.
- TP03 – unknown services at 1.3m begl.
- TP04 – concrete slab at 1.0m begl.
- TP05 – unknown pipe at 1.3m begl.
- TP07 – refusal on bricks / concrete at 1.3m begl.
- TP10 – steel pipe at 2.1m begl.

In addition, a suspected void was recorded at ROC2 between 3.5m and 4.5m begl.

3.2.2 Solid Strata

In terms of geotechnical behaviour most solid strata are rocks, although some have remained as, or have become, soil (the latter as part of the weathering process). The solid strata at shallow depths beneath this site may be representative of a soil (which takes the form of weathered rock), becoming less weathered with depth until they are a rock. The weathered rock will have the geotechnical characteristics of a soil.

Chester Formation

These strata were encountered in all of the rotary boreholes and only proven in one trial pit (TP02). The full thickness of these strata was not proven. The depth to bedrock varied between 1.9m and 7.5m begl.

The strata encountered typically comprised:

- Brown / reddish brown, gravelly SAND / sandy GRAVEL of sandstone. Encountered in TP02 and ROH1-ROH7 inclusive.
- Weak becoming moderately strong with depth, thinly to thickly laminated, reddish brown, variably fine to coarse SANDSTONE with pebbles and interbedded mudstone laminations. Encountered in ROH1-ROH7 inclusive and ROC1-ROC3 inclusive.

A rock contour plan is presented in Appendix F. This shows that the bedrock deepens from south to north. It varies from between 1.5m and 3.0m begl in the south of the site to 6.0m to 7.5m begl in the north of the site.

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3.3 CONTAMINATION OBSERVATIONS

The only visual evidence of potential contamination observed within the made ground, was the occasional presence of clinker, asphalt/tarmac, slag or metal fragments.

Olfactory evidence of petroleum hydrocarbon contamination was not encountered during the fieldwork.

3.4 GROUNDWATER OBSERVATIONS

No groundwater ingresses were encountered in any of the trial pits or rotary openhole boreholes.

However, in the rotary cored boreholes, the following groundwater strikes were recorded:

- ROC1 – 16.0m begl, no rise.
- ROC2 – 16.5m begl, no rise.
- ROC3 – 16.0m begl, rising to 14.2m begl after 20 minutes.

Four groundwater monitoring visits were undertaken between the 1st August and 24th August 2022. The results of the monitoring are reported in Appendix H. In summary, standing water was not detected in any installation, on any monitoring visit, with the shallowest well at 3.8m begl. Monitoring of the AEG BHA04, from the 12th February to the 16th March 2016, recorded groundwater at a shallowest depth of 6.16m begl.

Long term monitoring of groundwater levels has not been conducted as part of this investigation and interpreted levels are approximate and may be dependent on seasonal variations.

3.5 GROUND GAS AND VAPOURS

Ground gases are discussed in full in Section 6. In summary, the concentrations of ground gases recorded are included in Appendix H and summarised below:

- Methane not detected.
- Carbon dioxide between 0.0%v/v and 2.7%v/v.
- Oxygen between 15.5%v/v and 21.1%v/v.

No gas flow was recorded during the monitoring programme. The atmospheric pressure varied between 1012 and 1020mb.

3.6 SUMMARY OF FIELDWORK OBSERVATIONS

The fieldwork has revealed/confirmed the following:

Significant Features identified during fieldwork
--

Made ground thickness varies between 1.0m and 7.5m.

Buried concrete obstructions, brick walls, and unknown buried services were recorded.

Occasional visual evidence of potential soil contamination recorded (clinker, asphalt/tarmac, slag, metal) in the made ground.
--

Granular deposits only encountered.

Bedrock varied between 1.9m and 7.5m begl.
--

No significant groundwater ingress recorded during the fieldwork, except for deep groundwater strikes within the sandstone bedrock; standing water not detected in the installations across the site.

Methane concentrations less than 1%v/v and carbon dioxide concentrations below 5%v/v.

4 LABORATORY ANALYSES RATIONALE

4.1 CHEMICAL LABORATORY ANALYSIS

Chemical laboratory analyses were selected to provide the parameters necessary to make an initial assessment of potentially contaminated soils and/or waters, for the budgetary design of the development. The choice of contamination testing was based on the Phase I assessment, identified past uses of the site, site observations and comprised:

- Twenty-five samples of made ground were analysed for a general suite of contaminants (metals, inorganics and speciated PAH).
- Twenty-five samples of made ground were screened for TPHCWG.
- Twenty-five samples of made ground were screened for the presence of asbestos.
- Twelve samples of made ground underwent WAC analysis.

The chemical analysis results are presented in Appendix I. Representative samples from across the area investigated were tested.

4.2 GEOTECHNICAL LABORATORY TESTING

Geotechnical soils testing has been undertaken as part of the ground investigation including the following:

- Twenty-five samples of made ground underwent pH and water soluble sulphate testing.
- Nineteen rock core samples of the Chester Formation sandstone underwent Unconfined Compressive Strength (UCS) testing.
- Forty-five rock core samples of the Chester Formation sandstone underwent Point Load Testing.

Geotechnical tests were selected to provide the parameters necessary for the budgetary design of the development including foundations and infrastructure. The geotechnical test results are presented in Appendix J and summarised in Section 10.2. Representative samples from across the area investigated were tested.

5 QUANTITATIVE RISK ASSESSMENT – HUMAN HEALTH (SOIL)

5.1 INTRODUCTION

The development proposals for the site comprise the construction of a new office building (comprising 13 accessible levels including a basement and mezzanine) within the wider New Victoria development. No significant soft landscaping is anticipated.

Various sources of contamination have been put forward in the earlier text and summarised in the Phase I conceptual model. The material on site identified as being the most likely to be contaminated is the made ground.

The rationale for the end use specific Tier 1 Acceptance Criteria (TAC) used by GRM is outlined in Appendix A (vi) and for this site the chemical analysis results are being compared against the TAC for commercial end use. In order to adopt a conservative approach a Soil Organic Matter (SOM) content of 6% has been used to assess the made ground, as this closely reflects the vast majority of the samples tested.

To provide an initial assessment, benzo(a)pyrene has been used as a surrogate marker compound for genotoxic PAHs with the exception of naphthalene. A copy of the thresholds used in this assessment is presented in Appendix K.

5.2 RISK TO END USERS

The chemical analysis results are presented in Appendix I.

Whilst the number of samples tested is considered sufficient to characterise the made ground, it is not considered appropriate to carry out statistical analysis on this data set. Therefore, the results for the made ground have been compared directly against the TAC for a commercial end use.

The test results for the asbestos screening and petroleum hydrocarbons will be assessed separately.

5.2.1 Analysis of Soil Contamination Data

GRM General Suite

Twenty-five representative samples of the made ground have been analysed for a general suite of contaminants. The recorded concentrations of all the contaminants were below the relevant TAC for a commercial end use, except for Lead. Two of the samples tested had recorded Lead concentrations of between 2600mg/kg (TP07) and 2800mg/kg (TP09), above the TAC of 2330mg/kg.

Asbestos Screening

Twenty-five representative samples of the made ground have been screened for the presence of asbestos. No asbestos has been detected in any of the samples.

Petroleum Hydrocarbons

Twenty-five representative samples of the made ground were tested for banded TPHCWG so that the risk to end users from potential petroleum hydrocarbons could be assessed. The sample analysis did not reveal elevated concentrations of either Aliphatic or Aromatic hydrocarbons in excess of the relevant TAC.

5.2.2 Water Supply Pipes

It is considered that, based on the UKWIR guidance, the concentrations of contaminants recorded to date are such that Barrier Type water supply pipes should be used on the site.

However, it is recommended that the local water supply company for the site be contacted to confirm their requirements with regard to pipe materials.

5.2.3 Summary of Risk to End Users

Made ground has been recorded throughout the site area. Elevated Lead concentrations above the TAC for a commercial end use have been recorded within the made ground at a couple of locations only, at depths of between 1.3m and 2.8m begl. This suggests the elevated concentrations are present only as isolated occurrences, at depth.

As the vast majority of the made ground will be excavated and removed to allow construction of a basement and hardstanding will be present throughout the development, remedial works are not considered to be necessary.

5.3 RISK TO SITE WORKERS

The investigation has not revealed any specific contamination risk to site workers; however, the general comments outlined in Appendix A (vii) should be considered when site specific risk assessments are completed. The use of suitable PPE should be enforced during the ground works stage of construction.

6 QUANTITATIVE RISK ASSESSMENT – HUMAN HEALTH (GROUND GAS)

The gas risk assessment methodology used by GRM is outlined in Appendix A (v).

As the proposed land use is classed as low sensitivity (commercial), five 35mm diameter gas/water monitoring standpipes were installed across the site. The standpipes were installed in the rotary openhole boreholes (ROH1, ROH2, ROH3, ROH5 & ROH7), with response zones in the made ground for all of the installations.

Based on 'BS8576:2013 Guidance on investigations for ground gas – Permanent Gases and Volatile Organic Compounds', the gas hazard is considered to be low (made ground).

The monitoring programme comprised four visits, undertaken between the 1st August and 24th August 2022. The gas monitoring location plan is presented in Appendix G, whilst the gas monitoring results are presented in Appendix H and summarised in Section 3.5.

The primary guidance document to determine if protection measures are required is BS8485:2015+A1:2019 *Code of practice for the design of protective measures from methane and carbon dioxide ground gases for new buildings*. This uses hazardous gas flow rates (Q_{hg}), which are gas concentrations multiplied by borehole flow rates, to derive a Gas Screening Value (GSV) for the site. The gas regime is then determined based on the GSV and other limiting factors such as gas concentrations.

The gas monitoring has been undertaken using a Gas Data GFM436 and LMSXi.

Made Ground

As both flow rate and methane concentrations have been consistently below the monitor's lower limit of detection for the installation within the made ground, a default flow rate of 0.1l/hr and a default methane concentration of 0.1%v/v have been used in the following assessment.

Using the default flow rate of 0.1l/hr and a default maximum methane concentration of 0.1%v/v, a Q_{hg} of 0.0001l/hr has been calculated for methane. Using the same default flow rate, the maximum steady state carbon dioxide concentration of 2.7%v/v equates to a Q_{hg} of 0.0027l/hr. On this basis, the GSV for the made ground is determined as 0.0027l/hr.

As the maximum concentration of methane is <1%v/v, the maximum concentration of carbon dioxide is <5% and the maximum GSV is <0.07l/hr, 'Characteristic Situation 1' or CS1 as outlined in BS8485:2015+A1:2019 is required for the made ground, for which gas protection measures are not required.

Natural Strata

As both flow rate and methane concentrations have been consistently below the monitor's lower limit of detection for the installations within the natural ground, a default

flow rate of 0.1l/hr and a default methane concentration of 0.1%v/v have been used in the following assessment.

Using the default flow rate of 0.1l/hr and a default maximum methane concentration of 0.1%v/v, a Q_{hg} of 0.0001l/hr has been calculated for methane. Using the same default flow rate, the maximum steady state carbon dioxide concentration of 1.1%v/v equates to a Q_{hg} of 0.0011l/hr. On this basis, the GSV for the natural strata is determined as 0.0011l/hr.

As the maximum concentration of methane is <1%v/v, the maximum concentration of carbon dioxide is <5% and the maximum GSV is <0.07l/hr, 'Characteristic Situation 1' or CS1 as outlined in BS8485:2015+A1:2019 is required for the natural strata, for which gas protection measures are not required.

Therefore, gas protection measures for the site are not required. In addition, the desk study risk assessment determined that no radon gas protection measures are required.

6.1 SUMMARY OF RISK FROM GAS

The investigation has not revealed a risk to end users from ground gases and gas protection measures will not be required.

7 QUANTITATIVE RISK ASSESSMENT - CONTROLLED WATERS

The methodology, rationale and guidance GRM have used to assess the risk to controlled waters is set out in Appendix A (viii).

The primary receptor for the site is as follows:

- Solid strata (Chester Formation) – Principal Aquifer.

There are no recorded groundwater / potable water abstraction licenses within 250m of the site and the site is not recorded to be within a Groundwater Source Protection Zone. There are no surface water features within the site area, whilst the culverted River Irk is present adjacent to the northern site boundary. As the River Irk is culverted, it will not be at risk.

The primary pathway is vertical migration to the groundwater.

7.1 INTERPRETATION OF GROUNDWATER OBSERVATIONS AND MONITORING

No groundwater ingresses were encountered in any of the trial pits or rotary openhole boreholes. However, in the rotary cored boreholes, groundwater strikes were recorded at between 16.0m and 16.5m begl.

Four groundwater monitoring visits were undertaken between the 1st August and 24th August 2022. In summary, standing water was not detected in any installation, on any monitoring visit.

As the vast majority of the made ground will be excavated and removed as part of the construction works, and there is a lack of groundwater at shallow depths within the made ground, the risk posed to the underlying Principal Aquifer is considered negligible and so soil leachate analysis has not been undertaken.

7.2 SUMMARY OF RISK TO CONTROLLED WATERS

The risk to the Principal Aquifer (Chester Formation) below the site is negligible.



8 PHASE II CONCEPTUAL SITE MODEL

HUMAN HEALTH			
Source	Pathway	Receptor	Remedial Solution
Made ground (Elevated Lead).	Indoor and outdoor inhalation of soil dust; the ingestion of, and dermal contact with, contaminated soil and soil dust (no significant soft landscaped areas).	End users.	No remediation required (vast majority of made ground to be removed as part of the construction works, all hardstanding).
		Construction workers.	
No significant source identified.	Inhalation of ground gas.	End users.	Gas precautions are not required.
Made Ground (Elevated TPH).	Migration of contamination through leaks and joints, degradation of water pipe materials.	Water supply pipes.	Barrier Type water supply pipes and clean backfill required (to be confirmed by water supply company).

CONTROLLED WATERS			
Made Ground.	Leaching of contaminants and vertical migration to the groundwater.	Principal Aquifer (Chester Formation).	No remediation required.

9 REMEDIATION

9.1 RECOMMENDED REMEDIAL MEASURES AND VALIDATION REQUIREMENTS

9.1.1 Protection of End Users

Soil Contamination

Development proposals for the site comprise the construction of a new office building within the wider New Victoria residential development. The office building comprises 13 accessible levels including a basement and mezzanine. No significant soft landscaping is anticipated.

Made ground has been recorded throughout the site area. Elevated Lead concentrations above the TAC for a commercial end use have been recorded within the made ground at a couple of locations only, at depths of between 1.3m and 2.8m begl. This suggests the elevated concentrations are present only as isolated occurrences, at depth.

As the vast majority of the made ground will be excavated and removed to allow construction of a basement and hardstanding will be present throughout the development, remedial works are not considered to be necessary. If there are to be any limited soft landscaped areas, then placement of topsoil (of up to 300mm thick) as a growing medium will be sufficient.

No topsoil was present within the site area, and therefore importing topsoil material for any soft landscaped areas will be required.

Imported topsoil will require chemical validation to confirm that it is suitable for use. Samples of this material will need to be analysed for a suite of contaminants including metals, inorganics, speciated PAHs and other contaminants such as, speciated hydrocarbons and asbestos depending on the source. The number of samples that require analysis will depend on the volume imported and the source of the materials. Typically, an analysis rate of one sample per 50m³ and one sample per 250m³ (minimum of three samples per source and material type) applies for generated and virgin soils respectively.

Should any material suspected of being significantly contaminated be encountered during the redevelopment of the site, GRM can be contacted to undertake additional investigation if necessary. The local Environmental Health Officer should be contacted and informed of any additional remedial work required.

Ground Gas

It is assessed that gas protection measures for methane or carbon dioxide are not required for the site.

No radon gas protection measures are required.

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9.1.2 Protection of Site Workers

The risk to site workers from soil contamination is negligible. No remedial measures are required. However, the use of suitable PPE should be enforced during the ground works stage of construction.

9.1.3 Protection of Controlled Waters

The risk to controlled waters is considered negligible and no remedial measures are required.

9.1.4 Protection of Water Pipes

It is considered that, based on the UKWIR guidance, the concentrations of contaminants recorded to date are such that Barrier Type water supply pipes should be used on the site.

However, it is recommended that the local water supply company for the site be contacted to confirm their requirements with regard to pipe materials.

9.2 REMEDIATION METHOD STATEMENT

A Remediation Method Statement is not considered to be necessary.

As the site does not need any gas protection measures, a Protection Measures Design and Verification Plan will not be required.

Following your review of this document, we would recommend that a copy of it be forwarded to the Local Authority for comment and approval, prior to commencing development of the site. The Local Authority may choose to include other consultees as part of the planning process (such as the Environment Agency).

Consultation should be undertaken at the earliest possible opportunity to avoid abortive or delayed works.

9.3 DISPOSAL AND CLASSIFICATION

Based on the chemical results, the soils at the site have been classified using the HazWaste Online software, should they require disposal offsite. The Waste Classification Report for the made ground is presented in Appendix L.

At least 50% of the made ground tested has been classified as hazardous, due to either copper, lead, zinc, pH or hydrocarbons.

In summary, the WAC test results have confirmed that the vast majority of the samples that were classified as non-hazardous have failed the inert landfill criteria and therefore would normally need to be disposed of to a non-hazardous landfill. A WAC analysis undertaken on one of the samples classified as hazardous (TP07), confirmed it had failed the hazardous WAC criteria and therefore would require treatment before going to a hazardous landfill. The WAC testing has confirmed that the vast majority of the samples that were classified as hazardous, would be suitable for disposal as hazardous waste without further treatment.

It should be noted that as all the made ground is similar (e.g. granular in nature) and cannot be segregated, and also that the waste classification assessment is representative of the made ground as a whole unit, all the made ground will need to be treated as hazardous waste at this stage and an allowance made for this. It is recommended that any materials to be exported are stockpiled and tested again prior to removal from site, to confirm the waste classification at the point of disposal.

Care should be taken to keep any natural arisings separate from the made ground and construction materials, as natural soils mixed with made ground and / or construction materials may attract additional disposal costs.

Consideration should also be given to sending soils to a treatment facility as this may prove to be more cost effective than disposal.

It is recommended that waste disposal companies are contacted to provide disposal rates based on the chemical data presented in this report.

10 GEOTECHNICAL ASSESSMENT

10.1 INTRODUCTION

The development proposals for the site comprise the construction of a new office building within the wider New Victoria residential development. The office building comprises 13 accessible levels including a basement and mezzanine. The construction of the building will include a reinforced concrete frame with post-tensioned slabs.

Finished floor levels and the levels of any underground engineering works have not been provided.

In addition to the site specific comments below reference should be made to the general comments relating to the Geotechnical Assessment listed in Appendix A (xi to xvi).

10.2 GEOTECHNICAL TESTING

Geotechnical testing has been carried out in the laboratory; the results of this testing are provided in Appendix J. These results are summarised in the tables below:

Laboratory Testing for Chester Formation:

Test Parameter	Range of Results
Unconfined Compressive Strength (UCS)	RC01 – 13.3 to 33.0 MPa RC02 – 3.1 to 37.9 MPa RC03 – 5.8 to 32.2 MPa
Point Load Index ($I_{s(50)}$)	RC01 - 0.01 to 0.973 MPa RC02 - 0.079 to 1.416 MPa RC03 - 0.165 to 0.661 MPa

For the subsequent foundation assessment, non-shrinkable soils are assumed for design purposes.

10.3 ENGINEERING GROUND TREATMENT

Engineering ground treatment is not considered to be necessary. It is therefore considered unlikely that pre-treatment of the surface soils will be required for any small plant/personnel movements.

For a piled foundation solution (see Section 10.6), a suitable working platform (i.e. piling matt) will be required. It is recommended that the design of the working platform is carried out as soon as possible. The working platform certificate requires signing by the Principal Contractor for the site. An allowance for this, and responsibility for the design of the platform (estimated at 400mm thick if constructed without reinforcement depending on the quality of any earthworks), should be made in tender packages and site programmes.

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10.4 EXCAVATION CONDITIONS

Excavation of the materials encountered during the ground investigation should be readily achieved using conventional hydraulic excavation techniques. The potential for buried concrete floor slabs and brick walls within the made ground fill has been confirmed. Refusals due to concrete obstructions and shallow rock strata were recorded, and a breaker or similar plant may be required to excavate the made ground and for deep excavations.

From the ground investigation phases undertaken, it is likely that excavations will be generally unstable in the short term. Some materials such as made ground or granular soils are liable to collapse without warning. This situation is likely to be exacerbated by water ingress. However, no significant groundwater ingresses were recorded during the ground investigations undertaken.

If required, trench stability should be maintained by providing full support to the side walls, in line with the necessary Temporary Works procedures and Code of Practices.

The observed groundwater conditions suggest that only simple dewatering techniques (e.g. conventional sump pumping) will be needed to control any water ingress.

10.5 EXISTING STRUCTURES / SUBSTRUCTURES

At the time of the investigation works, apart from the temporary contractor compound site offices and welfare facility units, no existing permanent structures were on the site.

The potential for buried concrete floor slabs and brick walls has been confirmed. A suspected void was also recorded in one of the exploratory holes (ROC2 between 3.5m and 4.5m begl). There may also be other foundations or buried structures from the previous site use (e.g. associated with demolished buildings), that have not been identified from the investigation works.

An allowance for grubbing out both known and likely unknown substructures should be made. At this stage, it is assumed that the majority of the made ground will be excavated and removed to allow construction of the basement to the new office building.

There are numerous existing underground utility services that will need to be disconnected or diverted, so as not to pose a risk to foundations.

10.6 FOUNDATIONS

Shallow foundations such as trench fill are not considered to be suitable due to the construction of a multi-storey office building which will have high loads and exhibit lateral forces.

Due to the presence of deep made ground and the loads imposed by the proposed development, it is considered that a mixed solution of piles and pads will be the most cost-effective foundation solution with the bearing strata being the sandstone of the Chester Formation.

The salient points of this are explored below.

PILES

The made ground encountered during the investigation works are not suitable for the proposed development to found on. The bearing strata for the piles will be the sandstone rock strata, with the depth to bedrock varying between 1.9m and 7.5m begl.

A piling specialist will need to be approached to provide pile dimensions and safe pile capacities. They are likely to require the provision of the rotary borehole logs to provide information for detailed design. Consideration should be given to nearby structures and infrastructure (including the culverted River Irk close to the northern site boundary), when choosing the appropriate pile type.

Non-displacement piling techniques such as CFA or bored piled foundations are recommended to minimise ground disturbance which could impact adjacent structures and to penetrate remnant obstructions. Larger diameter piles are likely to be necessary due to the likely building loads.

Due to the potential presence of obstructions, allowance should be made for pre-boring, or removal of shallow obstructions for all piles; however, the suggested CFA piling method would minimise this requirement.

Geotechnical testing has been conducted, including Unconfined Compressive Strength (UCS) and Point Load Index testing of the founding sandstone strata, the results of which can be found in Appendix J and summarised in Section 10.2. The piling contractor should take account of these results during pile design.

Due to site constraints and basement depth, a contiguous pile wall is likely to be constructed with piles socketed into the bedrock. Perimeter column loads will be spread between piles with a sufficiently stiff capping beam. As several privately owned assets exist near to the site boundary, it will be necessary to advise the owners of any interaction that may arise during the construction of the substructure and use of the building.

A testing regime and objectives of the works will need agreeing with regulatory and warranting bodies prior to the starting of the works. The pile design will need to be

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justified to the warranting bodies and the justification should be included within the piling contract.

It should be noted that a working platform will be required by the piling contractor.

Pile layouts and ground beams will need to be engineer designed.

PADS

The use of pad foundations for the basement / floor slab, in conjunction with piles, is currently proposed.

Assuming a weak / very weak strength for the shallow sandstone strata that the pad bases will bear onto, a nett allowable bearing pressure of at least 300kN/m^2 (taking into account a lowest recorded UCS value of 3.1MPa) is considered appropriate. If 300kN/m^2 is used for design purposes, then as an example, a maximum column load of 675KN/m can be accommodated on pads 1.5m square or 2700KN/m on pads 3.0m square.

Construction depths for the pad foundations, bearing onto bedrock, are likely to vary between around 1.9m and 7.5m begl.

10.7 FLOOR SLABS

As proposed site levels are currently unknown, allowance for a suspended basement / floor slab should be made.

Alternatively, the working platform for the pile foundations could form a suitable base for a ground bearing floor slab should it be engineered to a suitable standard.

The thickness of the made ground, and correspondingly the depth to bedrock, varies across the site area. This, and differential settlement issues, will need to be taken into account when designing an appropriate basement / floor slab.

Once the development proposals have been clarified, then the type of floor slab can be confirmed, taking into account that gas protection measures (including radon) are not required.

10.8 BURIED CONCRETE

Testing for pH and water soluble sulphate has been undertaken in the made ground.

Based on the recorded water soluble sulphate and pH levels in the made ground soils below the site and assuming mobile groundwater conditions for the site, in accordance with the requirements of BRE Special Digest 1 (2005), 'Concrete in Aggressive

Ground', the Design Sulphate Class for buried concrete at the site should be assumed as DS-2 (worst case) and the ACEC Class as AC-2.

For unreinforced trench fill foundations with a width of greater than 450mm, the classifications above equate to a concrete designated as FND2 in BS8500. However, reinforced foundations should be specified by a designer appropriate for the proposed development.

The results of the water soluble sulphate and pH testing are presented in Appendix I.

10.9 SLOPE STABILITY AND RETAINING STRUCTURES

The site is relatively flat-lying and at present gradients, the risk of slope instability is negligible.

10.10 SOAKAWAY DRAINAGE

The strata encountered during the investigation are not suitable for soakaway drainage and an alternative drainage system should be considered for the disposal of surface water.

10.11 NEW ACCESS ROADS AND EARTHWORKS

With regard to the proposed development layout plan, there will be no access roads within the boundaries of the site.

The made ground is considered unsuitable as a sub-grade, with likely CBR values to be less than 2%. This will apply to the full depth of any made ground remaining within the site following the basement construction works.

Proof rolling and the improvement of soft spots may result in increased CBR values and the incorporation of a geotextile grid into sub-base layers may allow for reduced capping thickness.

Site observations should be confirmed by in situ or laboratory testing in accordance with the adopting Local Authority's preference.

11 FURTHER INVESTIGATION

Further investigation, to determine more accurately the effect of some of the identified hazards on the development, is recommended. This includes the following:

- A piling risk assessment may be required, as the Chester Formation is a Principal Aquifer.
- A piling specialist will need to be approached to confirm the appropriate pile type, provide pile dimensions and safe pile capacities.
- Further testing is recommended to be conducted for waste disposal characterisation, once soils are stockpiled.
- Liaison with the Local Water Supply Company to determine the appropriate water supply pipes at the site.
- Liaison with adjacent asset owners.

A copy of this report should be submitted to the Planning Department of the Local Authority/Local Authority EHO for review, if planning conditions exist for this site.

12 CONCLUSIONS

Assuming compliance with all the recommendations contained within this report (for abridged version see 'Summary of Recommendations' table at the beginning of the report) the site is suitable for the proposed development.

Based on the evidence currently available the site is assessed as being of moderate risk for geotechnical hazards and low risk for contamination hazards.



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GENERAL APPRAISAL COMMENTS

i INFORMATION SOURCES

Where available the following sources have been used for the identification and assessment of potential ground hazards:

- Relevant British Standards
- British Geological Survey (BGS) Geology Map Scale 1:10,000 for local area
- British Geological Survey (BGS) Geology Map Scale 1:50,000/1:63,320
- BGS Memoir
- BGS Borehole Records
- BGS online viewer: <http://www.bgs.ac.uk/data/mapViewers/home.html>
- Environment Agency Groundwater Vulnerability Maps
- Historical Ordnance Survey (OS) Maps
- Environmental Data Report
- Environment Agency Website: <http://www.environment-agency.gov.uk/>
- Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UKWIR, 2010.
- Coal Authority Records / Coal Mining Report
- DEFRA/Environment Agency Contaminated Land publications and DoE Industry Profiles
- BRE Guide BR211 (2015), 'Radon: Guidance on protective measures for new buildings'
- HPA-RPD-033 (2007), 'Indicative Atlas of Radon in England and Wales'
- PHE-CRCE-032 (PHE, 2017), Radon in Homes in England: 2016 Data Report
- CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings'
- BS8485:2015, 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'
- Other technical references used throughout this document are detailed in the text.

ii CONTAMINANTS OF CONCERN

The DoE Industry Profiles are normally used to assess likely contaminants from past land use and potential nearby industrial sources. For land uses where no profile is available, likely contaminants of concern are selected by GRM based on past experience of similar sites, a general screening suite of contaminants covered by CLEA and common contaminants from the Industry Profiles.

- | | | |
|------------|-------------------|--|
| · Arsenic | · Copper | · Water soluble sulphate |
| · Cadmium | · Nickel | · PAH (polycyclic aromatic hydrocarbons) |
| · Chromium | · Zinc | |
| · Lead | · Phenols | |
| · Mercury | · cyanide (total) | |
| · Selenium | · pH | |

Asbestos and PCBs are listed in the vast majority of profiles. PCBs are listed as the profiles expect electricity substations and switch boxes on all industrial sites. There is the potential for asbestos containing material to be mixed up with made ground, following any demolition works.

iii CONCEPTUAL MODEL METHODOLOGY

The consideration of contamination is based upon the principles of risk assessment, using the 'source-pathway-receptor' model in order to establish the presence, or potential presence, of a pollutant linkage.

To create a risk, contamination must have the potential to cause harm to susceptible targets or receptors such as humans, the water environment or the built environment. The potential for harm to occur requires three conditions to be satisfied to form a pollutant linkage:

- The presence of substances that may cause harm (SOURCE).
- The presence of a target which may be harmed (RECEPTOR).
- The existence of a plausible migration route between the source and the receptor (PATHWAY).

In the absence of a plausible pollutant linkage there is no risk. Where a potential linkage is identified in order for it not to pose a risk to the identified receptor it must be broken.

iv INTRUSIVE INVESTIGATION SAMPLING METHODOLOGY

The ground investigation (including fieldwork, sampling, monitoring and laboratory analyses) has been designed to identify and assess potential ground related problems and to allow cost effective solutions to be advised. It has been planned on the basis of the desk study, site inspection and the proposed development layout (where available). All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The exploratory holes have been positioned and advanced to depths to determine the general ground/groundwater/gas conditions below the site. A general grid pattern has been adopted, where possible, to provide sufficient information based on the current proposed layout scheme. Some holes have been targeted at particular hazards identified in the Phase I assessment. The resultant exploratory hole density is considered to be commensurate with the complexity of the site conditions and detail of information required for this phase of the investigation.

v GROUND GAS RISK ASSESSMENT METHODOLOGY

Gas monitoring programmes undertaken by GRM are designed to broadly comply with the recommendations outlined in CIRIA Report C665 'Assessing risks posed by hazardous ground gas to buildings' (2007) and BS8576 'Guidance on Investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs) (2013).

To assess the risks posed by ground gases such as radon, carbon dioxide and methane, the relevant current guidance has been used. For radon the site has been assessed following the guidelines in 'Radon: guidance on protective measures for new dwellings (BR211: 2015)'. For methane and carbon dioxide the primary guidance document used to determine if protection measures are required is *BS8485:2015 Code of practice for the design of protective measures from methane and carbon dioxide ground gases for new buildings*. This uses hazardous gas flow rates (Q_{hg}), which are gas concentrations multiplied by borehole flow rates, to derive a Gas Flow Rate (GSV) for the site. The gas regime is then determined based on the GSV and other limiting factors such as gas concentrations.

Where flow is not recorded during the monitoring a default flow rate of 0.1l/hr will be used in the assessment to produce a positive result.

vi HUMAN HEALTH RISK ASSESSMENT METHODOLOGY

Guidance contained in the Environment Agency's CLEA Reports has been used to assess the risks posed to human health.

For residential developments that include domestic gardens the default Tier 1 Assessment Criteria (TAC) for 'residential land with plant uptake' are used, i.e. a female with a start age class of one and an end age class of six. All pathways are considered including the consumption of home-grown vegetables.

For residential developments that do not include domestic gardens the default Tier 1 Assessment Criteria (TAC) for 'residential land without plant uptake' are used, i.e. a female with a start age class of one and an end age class of six. All pathways are considered except the consumption of home-grown vegetables. For commercial/industrial developments the default Tier 1 Assessment Criteria (TAC) for 'commercial/industrial' are used, i.e. a female with a start age class of sixteen and an end age class of eighteen. All pathways are considered except the consumption of home-grown vegetables.

The TAC used by GRM include Category 4 Screening Levels (C4SLs) published by DEFRA, values calculated by GRM using the CLEA v1.071 risk assessment, and values and Suitable for Use Levels (S4UL) developed by LQM/CIEH. The TAC used in the assessment are selected based on the lowest site specific SOM values returned as part of the chemical analysis.

Where soil chemical analysis results are found to exceed the TAC, Site-Specific Risk Assessments may be undertaken using the CLEA v1.071 risk assessment software using the age classes and pathways described above.

vii **RISK TO SITE WORKERS – GENERAL COMMENTS**

The risks to site workers are similar to those posed to site end users, although likely to be less severe due to the site workers' shorter exposure to the identified contamination. However, site workers (particularly groundworkers) are more likely to come into direct contact with contaminated soils due to the nature of their work. On this basis ground and construction workers should be provided with basic Personal Protective Equipment based on the site's general health and safety risk assessment, but including as a minimum safety footwear, gloves and overalls.

A site specific risk assessment should be carried out for all hazards identified within the ground investigation in accordance with current health and safety legislation. This assessment should identify any measures required to further reduce risks i.e. providing further Personal Protective Equipment, welfare facilities and if necessary preventing access to certain areas.

Demolition and dismantling of existing structures on the site must be carried out to a safe and acceptable standard, in accordance with current UK guidance and best practice. Whilst not ground related, asbestos and hazardous substances surveys should be conducted prior to any demolition.

Any unusual colours, odours and suspicious ground should be reported immediately to site management and then GRM.

Whilst this appraisal has considered the long-term effects of contamination, GRM can also help during the formulation of Health and Safety documentation, if required.

viii **CONTROLLED WATERS RISK ASSESSMENT METHODOLOGY**

Where the desk study and fieldwork do not reveal a potential source of contamination no leachate or groundwater testing will be performed. Where a potential source is identified the testing will comprise leachate testing on the material considered most likely to pose a risk, groundwater testing will be undertaken if water is present at shallow depth.

The UK Drinking Water Standards (UKDWS) or Environmental Quality Standards (EQS) are usually adopted for comparison with the leachate/groundwater test results. When the most sensitive receptor is considered to be the aquifer (groundwater) UKDWS will be adopted as the Initial Tier 1 screening values. Where the most sensitive receptor is a surface water feature the EQS values will be used as Initial Tier 1 Screening values.

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ix CONSTRUCTION MATERIALS RISK ASSESSMENT METHODOLOGY

The 'screening levels' adopted for the assessment of risk to construction materials are taken from the following documents:

- UK Water Industry Research (UKWIR) Contamination thresholds for sub-surface water pipes, for the protection of buried pipes.
- Building Research Establishment (BRE) Special Digest SD1 (2005), 'Concrete in Aggressive Ground', for the protection of buried concrete.

x WASTE DISPOSAL, SITE WASTE MANAGEMENT PLANS AND MATERIAL MANAGEMENT PLANS

Under current Waste Management Regulations, waste soil materials produced from the site will require characterisation to enable it to be disposed of correctly.

The chemical analysis results included in this report should be provided to the relevant landfill operators to establish the characterisation of the waste, confirm its suitability for landfill disposal and provide estimated costings. If material is classified as hazardous, then the site will need to be registered with the Environment Agency prior to the movement of the waste. Depending on the receiving landfill's current permit, further chemical analysis, incorporating Waste Acceptance Criteria (WAC) leachate analysis, may be required.

All materials removed from the site will be classified as 'waste' and therefore must be removed by a suitably licensed carrier of waste. This applies whether or not the waste is contaminated. All waste removed to landfill will attract Landfill Tax.

The developer/builder is likely to be classed as the waste producer and therefore, has a duty of care to ensure that all waste is disposed of appropriately. This includes ensuring the waste carrier is licensed and disposes of the waste to a suitably licensed landfill site. They are also required to keep a paper trail from 'cradle to grave' including copies of the waste disposal tickets.

Efficient materials management on site is recommended as it can lead to significant cost savings when compared to the traditional side casting or single stockpile of arisings. GRM can assist in the production of Material Management Plans under the CL:AIRE Definition of Waste: Code of Practice. The DoWCoP enables:

- The direct transfer and re-use of clean naturally occurring soil materials between sites, and
- The re-use of both contaminated and uncontaminated materials on their site of origin and between sites within defined Cluster projects.

GRM can also undertake the role of Qualified Person and submit the DoW CoP project Declaration.

Likewise making the site as volume neutral as possible will reduce the costs of development. Whilst not a statutory requirement, Site Waste Management Plans allow better waste management practices, help to reduce the amount of waste produced and identify best environmental disposal options. Implementing a Site Waste Management Plan (SWMP) can reduce costs (increasing business profits) and maximise resource efficiency.

xi GEOTECHNICAL ASSESSMENT GENERAL COMMENTS

Where finished floor levels of proposed structures have not been provided by the Client, then for the purposes of initial assessment, GRM will assume that finished levels will not vary appreciably from the existing ground levels. If the depths of any underground engineering works (i.e. sewers, pumping stations

etc.) are unknown they will not be taken in to account in the assessment and it will be assumed that any such works will not compromise foundation or ground stability.

Should the development proposals or finished levels be different from these assumptions then the comments/recommendations in the Geotechnical Assessment may require revising.

It should be noted that the results of window sampling and/or cable percussive boreholes may not give a true indication of a soils actual engineering properties (i.e. stability, mass structure etc). GRM consider that that prior to development trial pitting should be undertaken to confirm the recommendations in the Geotechnical Assessment.

xii GEOTECHNICAL ASSESSMENT – ENGINEERING GROUND TREATMENT

Near surface soils have the potential to be disturbed by weathering and site traffic. Precautions should always be taken to avoid this, as excessive disturbance may leads to more onerous floor slab designs, road cap thickness and increased amounts of off-site disposal etc.

Near surface soils may need treatment or reinforcing to allow safe movement of construction plant and labour. An assessment by the contractor should be undertaken once the type of machinery/plant needed to complete the development is known.

xiii GEOTECHNICAL ASSESSMENT – EXCAVATIONS

Excavation instability (over-break) can result in damage to existing services or structures (e.g. foundations, roads or boundary walls/fences) both on and off-site, as well as increased foundation concrete costs. In order to minimise this, all excavations deeper than 1.2m deep (or any excavation within 1.5m of any existing structure or service) should be supported. Full support should be provided to the full depth of all near vertically sided excavations in made ground, soft and very soft clays and granular soils. A reduction to intermediate support should be acceptable within firm and stiffer natural clays.

Wherever possible, man entry into excavations should be prevented; however, where this is not possible, entry to, and time spent in, excavations should be kept to a minimum.

The build program should be tailored to reflect the impact that deep excavations through potentially unstable strata can have on adjacent properties, so that they are not undermined.

All excavations on site should be in accordance with HSE guidelines and stability should be practically maintained at all times. Reference should be made to HSE construction information sheet No. 8 (Revision 1) 'Safety in Excavations'.

Care should be taken to ensure that falls from excavation faces do not adversely affect the integrity of foundation concrete.

If contaminated water enters excavations it should be removed and transported to an appropriate treatment facility by a suitably licensed carrier before construction begins.

xiv GEOTECHNICAL ASSESSMENT – SUBSTRUCTURES

Where practicable, existing buried construction should be fully removed; however, if this is not practicable all new foundations should be carried down to fully penetrate it and it should be broken well away from all new structures.

There may be existing structures and/or infrastructure in close proximity to the proposed development. New build foundations may be constructed next to pavements with existing underground services beneath them, or excavations may be required near existing footings associated with adjacent properties. These potential hazards need to be taken into consideration when designing foundations and the groundworker needs to be made aware of their potential impact during the redevelopment works. Foundations close to existing underground services or buildings may require alternative foundation techniques (such as piling) to protect the integrity of these structures.

The contractor for the works should carry them out in such a fashion so as to not cause excessive overbreak, concrete usage or undermine existing buildings/roads/ services that are to be retained.

xv GEOTECHNICAL ASSESSMENT – SOAKAWAYS

Soakaway testing in trial pits by GRM is broadly carried out in accordance with BRE DG 365 (2016). The testing comprises the excavation of a test pit to a suitable depth, and the placement of water into the pit. The level of water present is then monitored over time. For borehole installations, the permeability testing (falling head/rising head) is undertaken in accordance with BS5930.

If it is decided to proceed with the use of soakaway drainage, then the following general points should be noted:

- Soakaways should not be placed so that water can be discharged through potentially contaminated made ground.
- The Environment Agency may require soakaways to be sealed systems such that only roof run off falls to soakaway.
- Interceptors are likely to be required for soakaways for highway drainage. The adopting authority for the highways should be consulted at the earliest opportunity regarding the use of soakaways for highways drainage.
- Consideration of site levels and slopes should be taken into account during the design.
- The construction of all soakaways should be in accordance with the current building regulations.
- Soakaways should not be placed within 5m of a proposed building.
- Placement of soakaways needs to be considered so as to avoid ponding of water down slope.
- The base of a soakaway should not be below the highest recorded water level.
- The Environment Agency prefer 1m of dry soil to be present between the base of a soakaway and the water table to provide attenuation for contamination.

xvi GEOTECHNICAL ASSESSMENT – FOUNDATIONS

If soft or hard spots are encountered during foundation excavation then they should be replaced with suitably compacted material or the footings deepened to suitable strata, to avoid differential settlement.

If strata of differing bearing character (e.g. sand and clay) are encountered at foundation levels within the excavations for a single plot then the excavation depths should be altered as appropriate to ensure the foundations rest on a single stratum, or strata that will not induce differential settlement. Where this is impractical then GRM should be contacted to assess a reinforced concrete detail or an alternative foundation solution (e.g. piles or vibro-replacement).

NOTES ON LIMITATIONS

General

GRM Development Solutions Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement had been executed, or with whom an assignment had been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from GRM Development Solutions Limited; a charge may be levied against such approval.

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- a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and
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Phase I Environmental Audits/ Desk Studies

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, GRM Development Solutions Limited reserves the right to review such information and as considered necessary and appropriate to modify the opinions accordingly. It should be noted that any risks identified in a Phase 1 report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits (Contamination Investigations)

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, and controlled waters.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as provisional only and must, in any event, be confirmed by a commercial adviser.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. Whilst exploratory testing is intended to gain an accurate representation of the site, the very nature of sampling and testing is such that it cannot ensure that all localised conditions are detected.

The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Phase II Geo-environmental Investigations (Combined Geotechnical and Contamination Investigations)

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environment risks together with engineering and development implications. If costs have been included in relation to site development a commercial adviser must confirm these.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site for each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time the site work was conducted. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects. The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.



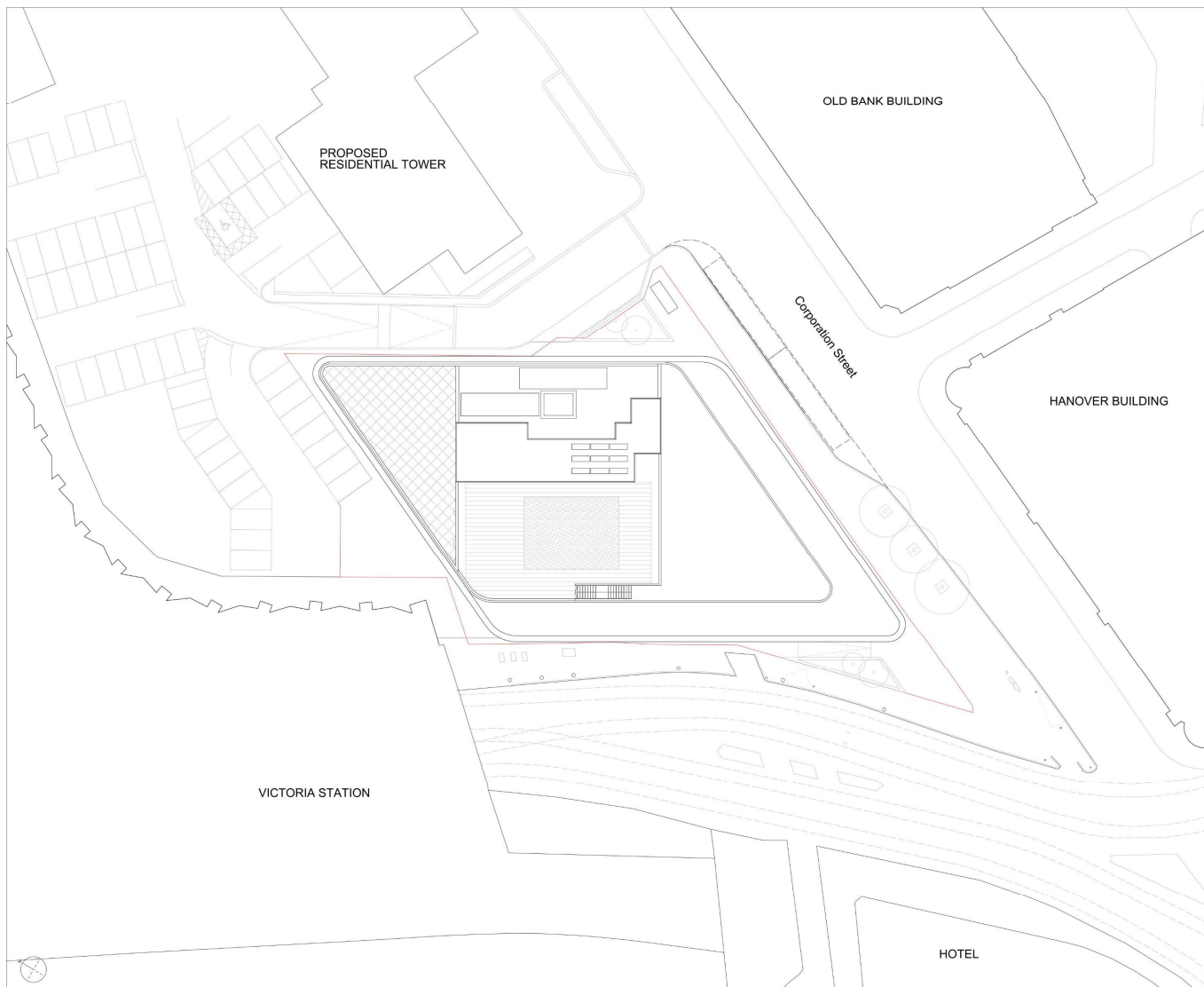
The risk assessment and opinions provided take in to consideration, inter alia, currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.



A P P E N D I X B

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Notes
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Key
Planning Boundary

0m 5m 10m 20m
2.5m

PL 31/05/22 Issued for Planning
Rev Date Description



Project
New Victoria, Manchester

Client
Torireview Ltd.

Date 31.05.2022 Drawing Scale 1:200 @ A1 / 1:400 @ A3

Issuing title
Proposed Site Plan

Drawn EZ Checked NH Approved NH

Drawing Status
Planning

Project	Discipline	Level	Series	Draw No	Rev
13701	A	L11	P00	002	P1

The Centro Building
20 Piccadilly Street
Leeds LS1 1BB
Telephone
+44 (0)113 7427 9911

Piercy&Company

DO NOT SCALE

NOTES:



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Tel: 01283 551 249

info@grm-uk.com www.grm-uk.com

CLIENT:

**AJP / Vinci Construction
(on behalf of Morgan Capital)**

PROJECT:

**New Victoria Office Block,
Manchester**

TITLE:

**Proposed Development Plan –
Proposed Site Layout**

SCALE@SIZE:

NTS

ISSUE:

FINAL

DESIGN/DRAWN:

RHC

DATE:

July 2022

PROJECT No:

P10056

DRAWING No:

Figure 1a

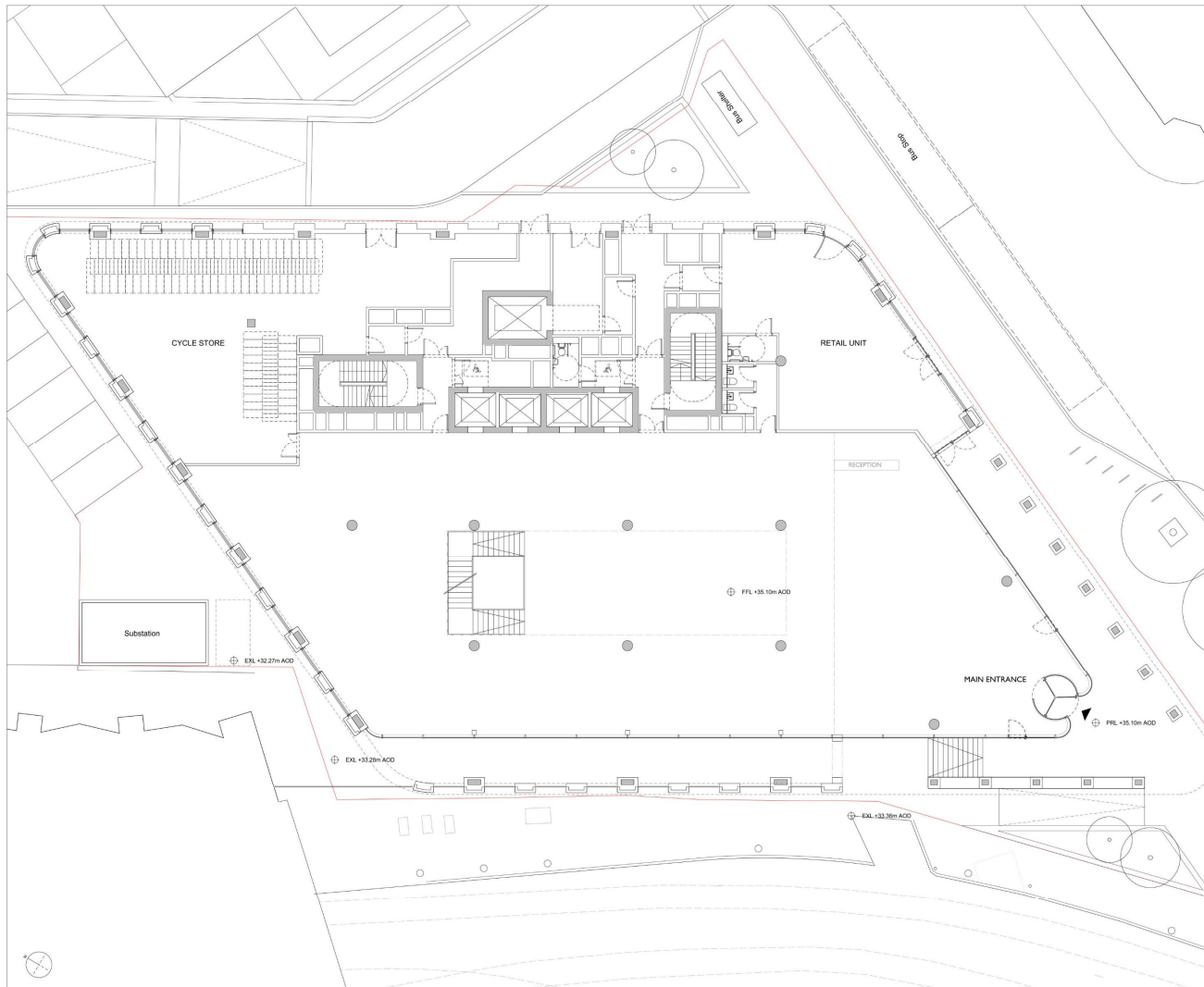
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Key

Planning Boundary

0m 2.5m 5m 10m

Project
New Victoria, Manchester

Client
Torview Ltd.

Date
31.05.2022

Drawing Scale
1:100 @ A1 / 1:200 @ A3

Drawing Title
General Arrangement Proposed Ground Floor Plan

Drawn
EZ

Checked
NH

Approved
NH

Drawing Status
Planning

Project
13701

Discipline
A

Level
00

Series
P03

Drawn No
100

Rev
P1

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Tel: 01283 551 249
info@grm-uk.com www.grm-uk.com

CLIENT:

AJP / Vinci Construction
(on behalf of Morgan Capital)

PROJECT:

New Victoria Office Block,
Manchester

TITLE:

Proposed Development Plan –
General Arrangement Proposed
Ground Floor

SCALE@SIZE:	ISSUE:
NTS	FINAL
DESIGN/DRAWN:	DATE:
RHC	July 2022
PROJECT No:	DRAWING No:
P10056	Figure 1b

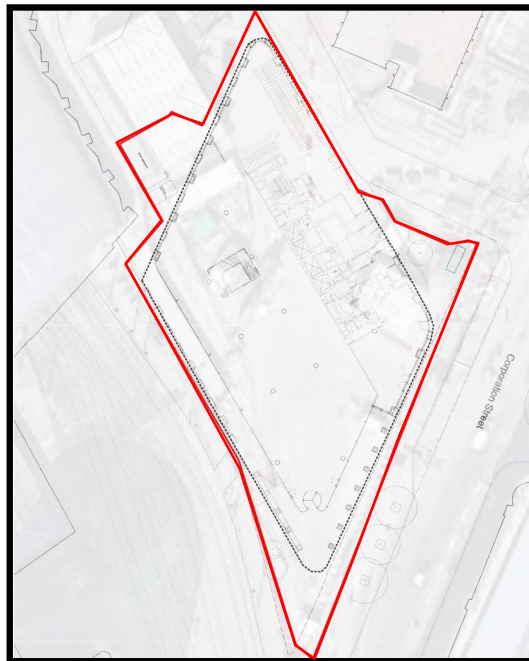
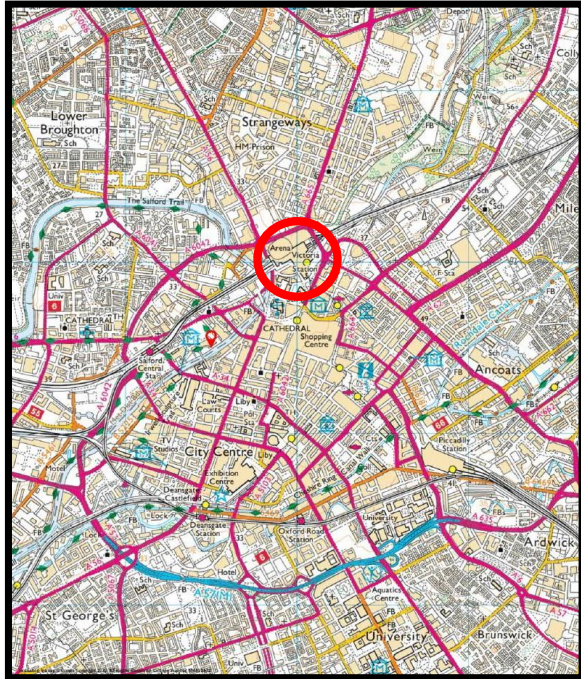
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DO NOT SCALE

NOTES:



Approximate site location



Approximate site boundary



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Burton-on-Trent, Staffordshire

Tel: 01283 551 249

info@grm-uk.com www.grm-uk.com

CLIENT:

**AJP / Vinci Construction
(on behalf of Morgan Capital)**

PROJECT:

**New Victoria Office Block,
Manchester**

TITLE:

Site Location and Boundary Plan

SCALE@SIZE:

NTS

ISSUE:

FINAL

DESIGN/DRAWN:

RHC

DATE:

July 2022

PROJECT No:

P10056

DRAWING No:

Figure 2

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Site Boundary

Building Location

Culvert Location

Exploratory Holes - July 2022

Trial Pit

Rotary Openhole Borehole with Gas/Groundwater Monitoring Installation

Rotary Openhole Borehole

Rotary Cored Borehole

AEG Exploratory Holes - 2016

Rotary Cored Borehole

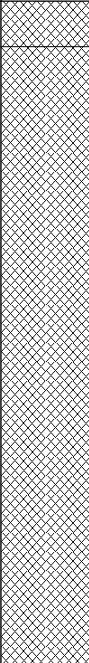
NOTES:		NOTES	
CLIENT:		TITLE:	
Alan Johnson Partnership Ltd / Vinci Construction (on behalf of Morgan Capital)		Exploratory Hole Location Plan - July 2022	
PROJECT:		PROJECT No:	
New Victoria Office Block, Manchester		P10056	
		DATE:	
		July 2022	
		DESIGN/DRAWN:	
		RHC	
		ISSUE:	
		Figure 3	
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP01 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.15			Asphalt/Tarmacadam hardstanding.	
	0.50 0.50	D ES			Dense, brown, slightly clayey. gravelly, cobbly SAND. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick and tile. Cobbles are of whole bricks.			
	1.00 1.00	D ES						
	2.00 2.00	D ES		2.20			End of Pit at 2.200m	
Date Excavated: 22/07/2022 Date Backfilled: 22/07/2022 Shoring: None. Stability: Very unstable throughout. Plant Used: 360 Excavator. Logged by: RP				Groundwater Observations: No groundwater encountered.				
				Trial Pit Dimensions (m): 1.00  3.00		Reason for termination of Trial Pit: Terminated due to collapse and undercutting of pit sidewalls.		
General Remarks:								
Relative density is approximate and determined by observation only.				Version: FINAL		Scale: 1:25		

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP02 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.15			Cobbled stone surface. MADE GROUND	
	0.50 0.50	D ES					Dense, light and dark brown mottled, gravelly, slightly cobbly SAND. Sand is fine to coarse, Gravel is fine to coarse, subangular to rounded of quartzite, sandstone and brick. Cobbles are of whole bricks. MADE GROUND	
	1.00 1.00	D ES					<i>Old brick lined pipe at 1.0m begl.</i>	1
	1.50 1.50	D ES		1.30			Dense, reddish brown, extremely weak, SANDSTONE. Recovered as sandy GRAVELS of sandstone. CHESTER FORMATION	
				1.90			End of Pit at 1.900m	2
								3
								4

Date Excavated: 23/07/2022		Groundwater Observations:	
Date Backfilled: 23/07/2022		No groundwater encountered.	
Shoring: None.			
Stability: Slightly unstable throughout.			
Plant Used: 360 Excavator.		Reason for termination of Trial Pit:	
Logged by: RP		Terminated in rock quality strata.	
General Remarks:			

Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
---	----------------	-------------

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP03 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			Asphalt/Tarmacadam hardstanding. MADE GROUND Dense, brown mottled dark brown, slightly clayey, sandy, cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete, asphalt/tarmacadam and sandstone. Cobbles are of whole bricks and concrete. MADE GROUND	1
	0.50 0.50	D ES						
	1.00 1.00	D ES						
				1.30			Services encountered at 1.3m begl. End of Pit at 1.300m	2
								3
								4

Date Excavated: 22/07/2022		Groundwater Observations:	
Date Backfilled: 22/07/2022		No groundwater encountered.	
Shoring: None.			
Stability: Slightly unstable throughout.			
Plant Used: 360 Excavator.		Reason for termination of Trial Pit:	
Logged by: RP		Terminated due to encountered and unknown services.	

Trial Pit Dimensions (m):

1.00

3.00

General Remarks:

Relative density is approximate and determined by observation only.

Version: FINAL

Scale: 1:25

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP04 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			Asphalt/Tarmacadam hardstanding. MADE GROUND	
	0.50 0.50	D ES					Dense, brown mottled dark brown, slightly clayey, sandy, cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete, asphalt/tarmacadam and sandstone. Cobbles are of whole bricks and concrete. MADE GROUND	
	1.00 1.00	D ES		1.00			End of Pit at 1.000m	1
								2
								3
								4

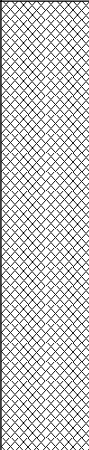
Date Excavated: 22/07/2022		Groundwater Observations:	
Date Backfilled: 22/07/2022		No groundwater encountered.	
Shoring: None.			
Stability: Slightly unstable throughout.			
Plant Used: 360 Excavator.		Reason for termination of Trial Pit:	
Logged by: RP		Terminated on concrete slab at 1.0m begl.	

General Remarks:

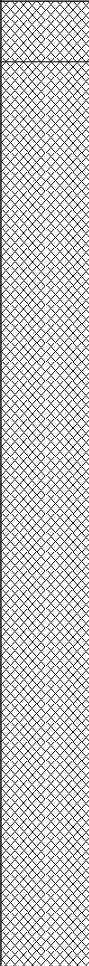
Trial Pit Dimensions (m):

1.003.00

Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP05 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.70 0.70	D ES		1.50			Dense, brown, gravelly, cobbly SAND. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete, asphalt/tarmacadam, timber, plastic, sandstone and quartzite. Cobbles are of whole brick, concrete and asphalt/tarmacadam. MADE GROUND	1
	1.30 1.30	D ES						
								3
								4
Date Excavated: 27/07/2022 Date Backfilled: 27/07/2022 Shoring: None. Stability: Slightly unstable throughout. Plant Used: 360 Excavator. Logged by: RP				Groundwater Observations: No groundwater encountered.				
				Trial Pit Dimensions (m): 1.00  3.00		Reason for termination of Trial Pit: Terminated on large boulders of concrete/tarmac/asphalt and unknown service pipe at 1.5m begl.		
General Remarks:								
Relative density is approximate and determined by observation only.				Version: FINAL		Scale: 1:25		

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP06 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			Concrete hardstanding. MADE GROUND	
	0.50 0.50	D ES					Dense, dark brown and brown mottled reddish brown, slightly clayey, sandy, slightly cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete, clinker, sandstone and quartzite. Cobbles are of whole brick and concrete. Contains rare plastic mesh and rope remains. MADE GROUND	1
	1.00 1.00	D ES						2
	2.00 2.00	D ES						3
	3.00 3.00	D ES		3.20			End of Pit at 3.200m	4

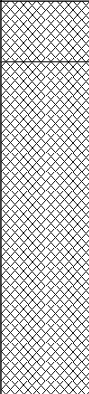
Date Excavated: 23/07/2022		Groundwater Observations:	
Date Backfilled: 23/07/2022		No groundwater encountered.	
Shoring: None.			
Stability: Slightly unstable throughout.			
Plant Used: 360 Excavator.		Reason for termination of Trial Pit:	
Logged by: RP		Maximum depth achieved with excavator.	

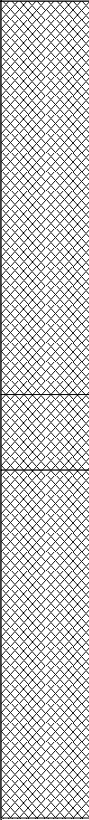
General Remarks:

Trial Pit Dimensions (m):

1.003.00

Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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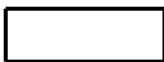
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP07 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			Concrete hardstanding. MADE GROUND	
	0.50 0.50	D ES					Very dense, dark brown mottled black, sandy cobbly slightly bouldery GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete and slag. Cobbles are of whole brick and concrete. Boulders are of concrete and cemented bricks. MADE GROUND	1
	1.00 1.00	D ES						
	1.30 1.30	D ES		1.30			End of Pit at 1.300m	2
								3
								4
Date Excavated: 23/07/2022 Date Backfilled: 23/07/2022 Shoring: None. Stability: Slightly unstable throughout. Plant Used: 360 Excavator. Logged by: RP				Groundwater Observations: No groundwater encountered.				
				Trial Pit Dimensions (m): 1.00  6.00		Reason for termination of Trial Pit: Bucket refusing on boulders and obstructions of bricks and concrete.		
General Remarks:								
Relative density is approximate and determined by observation only.				Version: FINAL		Scale: 1:25		

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP08 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50 0.50	D ES					Dense, brown, sandy, cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete, asphalt and timber. Cobbles are of whole bricks. MADE GROUND	1
	1.00 1.00	D ES		1.30			Asphalt/tarmacadam hardstanding. MADE GROUND	
	1.60 1.60	D ES		1.55			Medium dense, dark brown mottled brown, sandy, slightly cobbly GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete and asphalt. Cobbles are of whole brick. MADE GROUND	2
	2.50 2.50	D ES		2.70			End of Pit at 2.70m	3
								4
Date Excavated: 27/08/2022 Date Backfilled: 27/07/2022 Shoring: None. Stability: Very unstable throughout. Plant Used: 360 Excavator. Logged by: RP				Groundwater Observations: No groundwater encountered.				
				Trial Pit Dimensions (m): 1.00  3.00		Reason for termination of Trial Pit: Terminated due to very unstable strata, no progress being made.		
General Remarks:								
Relative density is approximate and determined by observation only.				Version: FINAL		Scale: 1:25		

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP09 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	

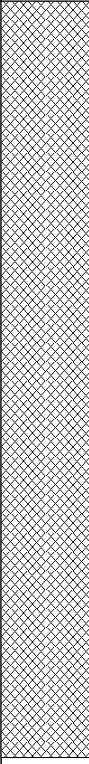
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			Grey GRAVEL. Gravel is fine to coarse subangular of hardcore. MADE GROUND	
	0.50 0.50	D ES					Brown mottled dark brown, very gravelly, slightly cobbly SAND. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick. Cobbles are of whole bricks. MADE GROUND	1
	1.00 1.00	D ES						
				1.50			Brown mottled orangish brow, slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick and quartzite. Contains rare timber posts. MADE GROUND	2
	2.00 2.00	D ES						
	2.80 2.80	D ES		2.90			End of Pit at 2.900m	3
								4

Date Excavated: 27/07/2022		Groundwater Observations:	
Date Backfilled: 27/07/2022		No groundwater encountered.	
Shoring: None.			
Stability: Slightly unstable throughout.			
Plant Used: 360 Excavator.		Reason for termination of Trial Pit:	
Logged by: RP		Maximum depth achieved at position with excavator.	

Trial Pit Dimensions (m):
 1.00  3.00

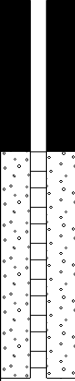
General Remarks:		
Relative density is approximate and determined by observation only.		
Version: FINAL		Scale: 1:25

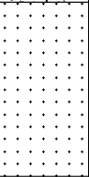
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Trial Pit Log			Trial Pit No TP10 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N	

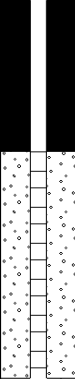
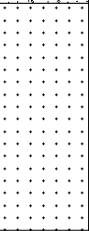
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50 0.50	D ES					Brown, slightly clayey, gravelly, cobbly SAND. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, concrete, quartzite and asphalt/tarmacadam. Cobbles are of concrete, metal, whole bricks and asphalt/tarmacadam. MADE GROUND	
	1.00 1.00	D ES						1
	1.90 1.90	D ES						2
				2.50			Steel pipe blocking excavator bucked between 2.1 to 2.2m begl.	
							End of Pit at 2.500m	3
								4

Date Excavated: 27/07/2022		Groundwater Observations:	
Date Backfilled: 27/07/2022		No groundwater encountered.	
Shoring: None.			
Stability: Very unstable throughout.			
Plant Used: 360 Excavator.		Reason for termination of Trial Pit:	
Logged by: RP		Excavation obstructed by steel pipe and unstable sidewalls.	
General Remarks:			

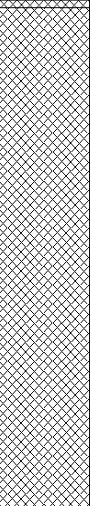
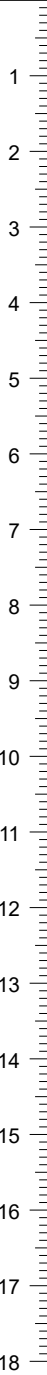
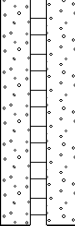
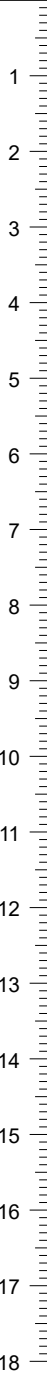
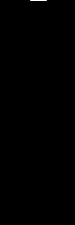
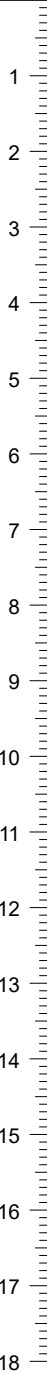
Relative density is approximate and determined by observation only.	Version: FINAL	Scale: 1:25
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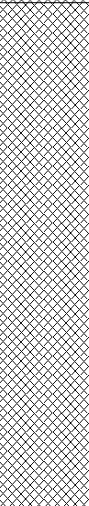
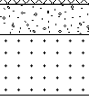
 GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH1 Sheet 1 of 1			
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)			
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N			
Install	Water Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
		0.10			1.00			Cobble stone surface MADE GROUND	
					1.70			Brown, gravelly SAND. MADE GROUND	1
								Brown, gravelly SAND. CHESTER FORMATION	2
								Red SANDSTONE. CHESTER FORMATION	3
									4
		5.00						End of Borehole at 5.000m	5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP			
General Remarks:									
Groundwater Remarks: No groundwater encountered.									
Hole Started: 22/07/2022		Hole Complete: 22/07/2022		Version: FINAL		Scale: 1:100			

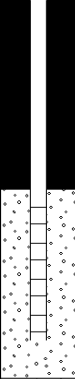
 GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH2 Sheet 1 of 1			
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)			
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N			
Install	Water Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
					0.10			Concrete hardstanding. MADE GROUND	
					1.70			Dark brown gravelly SAND. MADE GROUND	1
					2.70			Brown, gravelly SAND. CHESTER FORMATION	2
					5.00			Red SANDSTONE CHESTER FORMATION	3
								End of Borehole at 5.000m	4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP			
General Remarks:									
Groundwater Remarks: No groundwater encountered.									
Hole Started: 22/07/2022		Hole Complete: 22/07/2022		Version: FINAL		Scale: 1:100			

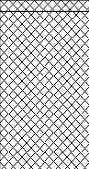
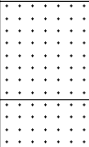
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH3 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester								Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N			
Install	Water Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
					0.10			Asphalt/tarmacadam hardstanding. MADE GROUND	
					1.30			Brown, gravelly SAND. MADE GROUND	1
					2.00			Brown, gravelly SAND. CHESTER FORMATION	2
					5.00			Red SANDSTONE. CHESTER FORMATION	3 4 5
								End of Borehole at 5.000m	6 7 8 9 10 11 12 13 14 15 16 17 18
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP			
General Remarks:									
Groundwater Remarks: No groundwater encountered.									
Hole Started: 22/07/2022		Hole Complete: 22/07/2022		Version: FINAL		Scale: 1:100			

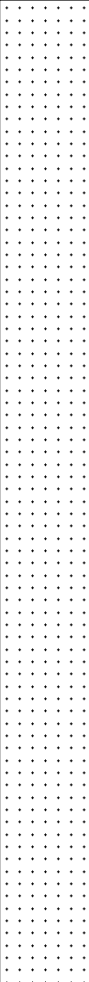
		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH4 Sheet 1 of 1	
Site Name: New Victoria Office Block, Manchester								Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)						GRM Project Ref: P10056		Coordinates E N	
Install	Water Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
					0.40			Concrete hardstanding. MADE GROUND	1
					0.80			Brick and rubble fill. MADE GROUND	
					1.40			Concrete. MADE GROUND	
					2.00			Red SAND and GRAVEL. CHESTER FORMATION	
								Red SANDSTONE. CHESTER FORMATION	
					5.00			End of Borehole at 5.000m	5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
Crew: Dynamic Sampling Uk Ltd.				Equipment: Commaccio Geo 205.			Logger: RP		
General Remarks:									
Groundwater Remarks: No groundwater encountered.									
Hole Started: 29/07/2022		Hole Complete: 29/07/2022		Version: FINAL		Scale: 1:100			

 GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH5 Sheet 1 of 1				
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)				
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N				
Install	Water	Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
						0.10			Asphalt/tarmacadam hardstanding. MADE GROUND	
									Dark brown, gravelly SAND with fragments of brick recovered. MADE GROUND	
						6.70			Brown gravelly SAND.	
						7.00			CHESTER FORMATION	
									Red SANDSTONE.	
						8.00			CHESTER FORMATION	
									End of Borehole at 8.000m	
Crew: Dynamic Sampling Uk Ltd.						Equipment: Commaccio Geo 205.		Logger: RP		
General Remarks:										
Groundwater Remarks: No groundwater encountered.										
Hole Started: 23/07/2022		Hole Complete: 23/07/2022		Version: FINAL		Scale: 1:100				

 GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH6 Sheet 1 of 1			
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)			
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N			
Install	Water Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
					0.10			Asphalt/tarmacadam hardstanding. MADE GROUND	1
					Dark brown, gravelly SAND with fragments of brick recovered. MADE GROUND			2	
								3	
					6.80			Brown gravelly SAND. CHESTER FORMATION	7
				7.20		Red SANDSTONE. CHESTER FORMATION		8	
				8.00		End of Borehole at 8.000m		9	
									10
									11
									12
									13
									14
									15
									16
									17
									18
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP			
General Remarks:									
Groundwater Remarks: No groundwater encountered.									
Hole Started: 23/07/2022		Hole Complete: 23/07/2022		Version: FINAL		Scale: 1:100			

		GRM Development Solutions Ltd Laurus House, First Avenue, Centrum 100, Burton-on-Trent, DE14 2WH Tel (HQ): 01283 551249 Email: info@grm-uk.com		Rotary Openhole				Borehole No. ROH7 Sheet 1 of 1		
Site Name: New Victoria Office Block, Manchester								Ground Level (mAOD)		
Client: AJP / Vinci Construction (on behalf of Morgan Capital)						GRM Project Ref: P10056		Coordinates E N		
Install	Water	Strike	Depth (m)	Flush Returns (%)	Flush Type	Depth (m)	Level (m)	Legend	Stratum Description	
						0.10			Asphalt/tarmacadam hardstanding. MADE GROUND	
						1.00			Dark brown, gravelly SAND with fragments of brick recovered. MADE GROUND	1
									Concrete. MADE GROUND	2
						2.30			Brown, gravelly SAND. CHESTER FORMATION	3
						4.10			Red SANDSTONE. CHESTER FORMATION	4
						5.00			End of Borehole at 5.000m	5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP				
General Remarks:										
Groundwater Remarks: No groundwater encountered.										
Hole Started: 23/07/2022		Hole Complete: 23/07/2022		Version: FINAL		Scale: 1:100				

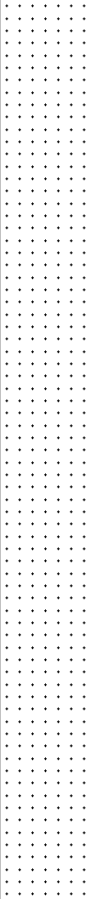
 GRM Development Solution Ltd, Tel (HQ): 01283 551249 Email: info@grm-uk.com Web: www.grm-uk.com		Rotary Core Log				Borehole No. ROC1 Sheet 1 of 2					
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)					
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N					
Install	Water Strikes	Depth (m)	Coring			FI	Depth (m)	Level (m)	Legend	Stratum Description	
			TCR	SCR	RQD						
							0.15			Asphalt/tarmacadam hardstanding. MADE GROUND Brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of brick, sandstone and quartzite. MADE GROUND	1
							2.30			Extremely weak to weak, thinly laminated, reddish brown, medium to coarse SANDSTONE with rare interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION	2
		2.50 - 4.00	63	36	0						3
		4.00 - 5.50	93	64	14						4
		5.50 - 7.00	84	64	16						5
		7.00 - 8.50	96	74	58						6
		8.50 - 10.00	96	88	55	11					7
		10.00 - 11.50	99	90	64	11					8
		11.50 - 13.00	100	86	74	16					9
		13.00 - 14.50	100	88	80	16					10
		14.50 - 16.00	99	92	62	12					11
		16.00 - 17.50	100	84	65	12					12
									Medium strong, thinly laminated, reddish brown, medium to coarse SANDSTONE with occasional pebbles and interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION	13	
									Medium strong, thickly laminated, reddish	14	
										15	
										16	
										17	
										18	
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP					
General Remarks:											
Groundwater Remarks: Groundwater encountered at 16.0m begl.											
Hole Started: 20/07/2022		Hole Complete: 21/07/2022		Version: FINAL		Scale: 1:100					

 GRM Development Solution Ltd, Tel (HQ): 01283 551249 Email: info@grm-uk.com Web: www.grm-uk.com		Rotary Core Log					Borehole No. ROC1 Sheet 2 of 2				
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)				
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056		Coordinates E N				
Install	Water Strikes	Depth (m)	Coring			FI	Depth (m)	Level (m)	Legend	Stratum Description	
			TCR	SCR	RQD						
		17.50 - 19.00	96	92	92	5	31.00			Medium strong, thickly laminated, reddish brown, medium to coarse SANDSTONE with occasional pebbles and interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION	19
		19.00 - 20.50	100	90	86	5					20
		20.50 - 22.00	100	80	65	12					21
		22.00 - 23.50	93	78	56	12					22
		23.50 - 25.00	94	86	74	14					23
		25.00 - 26.50	89	77	72	14					24
		26.50 - 28.00	100	90	88	9					25
		28.00 - 29.50	100	92	80	9					26
		29.50 - 31.00	100	90	70						27
									End of Borehole at 31.000m	28	
										29	
										30	
										31	
										32	
										33	
										34	
										35	
										36	
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP					
General Remarks:											
Groundwater Remarks: Groundwater encountered at 16.0m begl.											
Hole Started: 20/07/2022		Hole Complete: 21/07/2022		Version: FINAL		Scale: 1:100					

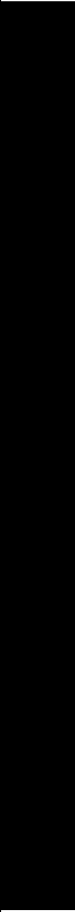
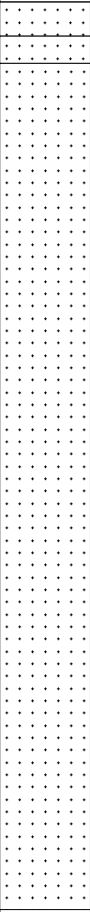
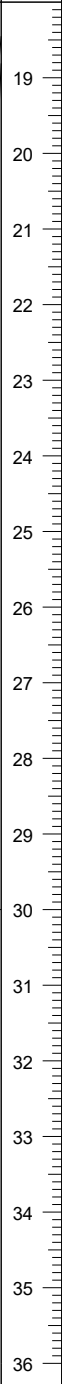
 GRM Development Solution Ltd, Tel (HQ): 01283 551249 Email: info@grm-uk.com Web: www.grm-uk.com		Rotary Core Log				Borehole No. ROC2 Sheet 1 of 2	
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)	
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N	

Install	Water Strikes	Depth (m)	Coring			FI	Depth (m)	Level (m)	Legend	Stratum Description	
			TCR	SCR	RQD						
							0.80			Concrete/asphalt/tarmacadam hardstanding. MADE GROUND	
							1.20			Grey GRAVEL. Gravel is fine to coarse angular to subangular hardcore. MADE GROUND	1
										Brown, sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of brick, concrete, quartzite and sandstone. MADE GROUND	2
										<i>Sampler fell while dynamic sampling from 3.5m to 4.5m begl in suspected void space within granular made ground.</i>	3
											4
		5.00 - 6.00	45	25	21	17	5.00		Weak, thinly laminated, reddish brown, medium to coarse SANDSTONE with abundant pebbles and rarely interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy infill. CHESTER FORMATION	5	
		6.00 - 7.50	86	54	26	17				6	
		7.50 - 9.00	94	86	79					7	
		9.00 - 10.50	91	77	54	13				8	
		10.50 - 12.00	96	80	60	13				9	
						12.50				10	
										11	
										12	
										13	
										14	
										15	
										16	
										17	
										18	

Crew: Dynamic Sampling Uk Ltd.		Equipment: Commaccio Geo 205.		Logger: RP	
General Remarks: Suspected void between 3.5m and 4.5m begl.					
Groundwater Remarks: Groundwater encountered at 16.5m begl.					
Hole Started: 25/07/2022		Hole Complete: 26/07/2022		Version: FINAL	
				Scale: 1:100	

 GRM Development Solution Ltd, Tel (HQ): 01283 551249 Email: info@grm-uk.com Web: www.grm-uk.com		Rotary Core Log					Borehole No. ROC2 Sheet 2 of 2				
Site Name: New Victoria Office Block, Manchester							Ground Level (mAOD)				
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056			Coordinates E N				
Install	Water Strikes	Depth (m)	Coring			FI	Depth (m)	Level (m)	Legend	Stratum Description	
			TCR	SCR	RQD						
		18.00 - 19.50	100	73	62	10	30.00			Medium strong, thinly laminated to very thinly bedded, reddish brown, medium to coarse SANDSTONE with abundant pebbles and rarely interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy infill. CHESTER FORMATION	19
		19.50 - 21.00	98	84	61	10					20
		21.00 - 22.50	100	82	71	7					21
		22.50 - 24.00	90	82	70	7					22
		24.00 - 25.50	96	88	82	6					23
		25.50 - 27.00	100	86	72	6					24
		27.00 - 28.50	100	88	70	10					25
		28.50 - 30.00	100	88	83	10					26
									End of Borehole at 30.000m	27	
										28	
										29	
										30	
										31	
										32	
										33	
										34	
										35	
										36	
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP					
General Remarks: Suspected void between 3.5m and 4.5m begl.											
Groundwater Remarks: Groundwater encountered at 16.5m begl.											
Hole Started: 25/07/2022		Hole Complete: 26/07/2022		Version: FINAL		Scale: 1:100					

 GRM Development Solution Ltd, Tel (HQ): 01283 551249 Email: info@grm-uk.com Web: www.grm-uk.com		Rotary Core Log					Borehole No. ROC3 Sheet 1 of 2				
Site Name: New Victoria Office Block, Manchester								Ground Level (mAOD)			
Client: AJP / Vinci Construction (on behalf of Morgan Capital)					GRM Project Ref: P10056			Coordinates E N			
Install	Water Strikes	Depth (m)	Coring			FI	Depth (m)	Level (m)	Legend	Stratum Description	
			TCR	SCR	RQD						
							0.20			Concrete hardstanding. MADE GROUND	
										Dark brown mottled light brown, slightly clayey, slightly sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of quartzite, brick, concrete and asphalt/tarmacadam. MADE GROUND	1
											2
											3
											4
								5.00		Dark brown and black ashy sand recovered from rotary open hole. MADE GROUND	5
									Rotary open holed to rockhead from 5.0m to 7.5m begl.	6	
											7
											8
											9
		7.50 - 9.00	72	61	53	11	7.50		Weak, thinly laminated, reddish brown, medium to coarse SANDSTONE with rare pebbles and interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION	10	
		9.00 - 10.50	95	78	56	11				11	
		10.50 - 12.00	100	67	41	14				12	
		12.00 - 13.50	98	86	59	14	12.77 13.12		Medium strong, thickly laminated, reddish brown SILTSTONE. Discontinuities are very closely to medium spaced, planar smooth. CHESTER FORMATION	13	
		13.50 - 15.00	99	80	65	11			Medium strong, thinly laminated, reddish brown, fine to coarse SANDSTONE with rare pebbles and interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION	14	
		15.00 - 16.50	100	83	55	11				15	
		16.50 - 18.00	80	54	46	9				16	
										17	
										18	
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP					
General Remarks:											
Groundwater Remarks:											
Groundwater encountered at 16.0m begl, rising to 14.2m begl after 20 mins.											
Hole Started: 27/07/2022			Hole Complete: 28/07/2022			Version: FINAL			Scale: 1:100		

 GRM Development Solution Ltd, Tel (HQ): 01283 551249 Email: info@grm-uk.com Web: www.grm-uk.com		Rotary Core Log				Borehole No. ROC3 Sheet 2 of 2					
Site Name: New Victoria Office Block, Manchester						Ground Level (mAOD)					
Client: AJP / Vinci Construction (on behalf of Morgan Capital)				GRM Project Ref: P10056		Coordinates E N					
Install	Water Strikes	Depth (m)	Coring			FI	Depth (m)	Level (m)	Legend	Stratum Description	
			TCR	SCR	RQD						
		18.00 - 19.50	100	73	59		18.45 18.81			Medium strong, thinly laminated, reddish brown, fine to coarse SANDSTONE with rare pebbles and interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION Medium strong, thinly laminated, reddish brown, fine SANDSTONE with rare pebbles and interbedded mudstone laminations. Discontinuities are closely spaced, undulating rough and smooth planar, rare sandy infill. CHESTER FORMATION Medium strong, thinly laminated, reddish brown, fine to coarse SANDSTONE with rare pebbles and interbedded mudstone laminations. Discontinuities are closely to medium spaced, undulating rough and smooth planar, rare sandy and clayey infill. CHESTER FORMATION	
		19.50 - 21.00	93	70	52	9					
		21.00 - 22.50	87	51	36	10					
		22.50 - 24.00	100	78	65	10					
		24.00 - 25.50	100	85	80	7					
		25.50 - 27.00	93	86	77	8					
		27.00 - 28.50	100	86	83	9					
		28.50 - 30.00	100	81	76						
						30.00			End of Borehole at 30.000m		
Crew: Dynamic Sampling Uk Ltd.			Equipment: Commaccio Geo 205.			Logger: RP					
General Remarks:											
Groundwater Remarks: Groundwater encountered at 16.0m begl, rising to 14.2m begl after 20 mins.											
Hole Started: 27/07/2022		Hole Complete: 28/07/2022		Version: FINAL		Scale: 1:100					



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BOREHOLE RECORD

Status:-

FINAL

Date:- 01/04/2016

Project: Manchester New Victoria Ground Investigation			Exploratory Hole No.	
Client: Muse Developments Ltd		Location: Manchester City Centre E:384095.820 N:398923.950		BHA04
Method (Equipment): Cable Percussion/Rotary Coring (Dando 2000/Massenza MI6)		Ground Level (m(AOD)):	Date:	
		33.859	02/02/2016	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.30 0.30 0.30	PID J1 ES2	3.2ppm		33.759		(0.10) 0.10	MADE GROUND (Macadam over subbase). (MG)	
1.00 1.00 1.20	PID ES3 CB4	4.1ppm N16				(2.90)	MADE GROUND (Dark brown to brown sand and gravel with high cobble content. Sand is medium to coarse. Gravel is fine to coarse subangular to angular and includes slag, brick and concrete. Cobbles include angular brick). (MG)	
2.00 2.00 2.00-2.45	PID ES5 CB6	2.2ppm N5						
3.00 3.00 3.00-3.45	PID ES7 SJ8	1.4ppm 1/0.60		30.859		3.00	Very weak red fine to medium grained SANDSTONE distinctly weathered. (Recovered as red brown clayey slightly gravelly sand).	
4.00 4.00 4.00-4.45 4.00-4.50	PID ES9 SJ10 B11	1.9ppm 1/0.60				(1.50)		
				29.359		4.50	Boring complete at 4.50m BGL - continued by rotary coring.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
02/02/2016	0.00	0.00			4.20	4.50	01:00			(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Double installation: One 50mm diameter and one 19mm diameter slotted standpipe installed to 2.50m and 10.00m respectively.
02/02/2016	1.65	0.00		Dry						
03/02/2016	1.65	0.00		Dry						
03/02/2016	4.50	3.50	150	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: A. Greene	Contract No. PR1531
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ALLIED EXPLORATION & GEOTECHNICS LIMITED

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ROTARY CONTINUATION

Status:-

FINAL

Date:- 01/04/2016

Project: Manchester New Victoria Ground Investigation		Exploratory Hole No. BHA04
Client: Muse Developments Ltd	Location: Manchester City Centre E:384095.820 N:398923.950	
Method (Equipment): Cable Percussion/Rotary Coring (Dando 2000/Massenza MI6)	Ground Level (m(AOD)): 33.859	Date: 02/02/2016
		Sheet: 1 of 4

RUN DETAILS			STRATA					Instrument/ Backfill				
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION						
						Discontinuities Detail	Main					
C Dia (113mm)	4.50	99 (60) 19	29.359		4.50	4.50-5.25m ... non-intact.	Boring complete at 4.50m BGL - continued by rotary coring. Extremely weak red brown medium to coarse grained SANDSTONE destructured. (Recovered as gravelly coarse grained sand). (SSW)					
	14						5.10	5.25	5.25-6.00m ... horizontal closely spaced undulating rough moderately open infilled (sand) discontinuities.	Firm red brown sandy CLAY. (SSW)		
										Very weak to weak red brown medium to coarse grained SANDSTONE unweathered. (SSW)		
	6.00	99 (75) 22	12				6.00-8.00m ... horizontal closely spaced undulating rough moderately open infilled (sand and gravel) discontinuities.					
C Dia (113mm)	7.50								99 (90) 37	8		8.00-10.50m ... horizontal closely to medium spaced undulating rough open to moderately open infilled (sand and gravel) discontinuities.

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
04/02/2016	4.50	3.50		4.00		6.00	S	1/0.00	4.50	6.00	A/M	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Double installation: One 50mm diameter and one 19mm diameter slotted standpipe installed to 2.50m and 10.00m respectively.
						7.50	S	1/0.00	6.00	7.50	A/M	100	
									7.50	9.00	A/M	100	

All dimensions in metres
Scale 1:25

For explanation of symbols and
abbreviations see Key Sheets

Checked by:
N.V.

Logged by:
A. Greene

Contract No.
PR1531



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ROTARY CONTINUATION

Status:-

FINAL

Date:- 01/04/2016

Project: Manchester New Victoria Ground Investigation		Exploratory Hole No.
Client: Muse Developments Ltd	Location: Manchester City Centre E:384095.820 N:398923.950	BHA04
Method (Equipment): Cable Percussion/Rotary Coring (Dando 2000/Massenza MI6)	Ground Level (m(AOD)): 33.859	Date: 02/02/2016 Sheet: 2 of 4

RUN DETAILS			STRATA					Instrument/ Backfill
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
						Discontinuities Detail	Main	
9.00	97 (92) 47						(As sheet 1 of 4). Very weak to weak red brown medium to coarse grained SANDSTONE unweathered.	
C Dia (113mm)			23.359		10.50			
							Borehole complete at 10.50m BGL.	

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
04/02/2016	10.50	4.50		10.00		9.00 10.50	S S	1/0.00 1/0.00	9.00	10.50	A/M	100	
(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Double installation: One 50mm diameter and one 19mm diameter slotted standpipe installed to 2.50m and 10.00m respectively.													

All dimensions in metres
Scale 1:25

For explanation of symbols and
abbreviations see Key Sheets

Checked by:
N.V.

Logged by:
A. Greene

Contract No.
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BOREHOLE RECORD

Status:-

FINAL

Date:- 01/04/2016

Project: Manchester New Victoria Ground Investigation			Exploratory Hole No. BHA05	
Client: Muse Developments Ltd		Location: Manchester City Centre E:384101.087 N:398942.960		
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m(AOD)): 33.723	Date: 03/02/2016	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.30 0.30 0.50-1.00	PID ES1 B3	0.9ppm		33.623	X X X X	(0.10) 0.10	MADE GROUND (Macadam over subbase). (MG)	
1.00 1.00 1.20-1.65	PID ES2 C	1.2ppm N14				(2.40)	MADE GROUND (Dark brown to brown sand and gravel with high cobble content. Sand is medium to coarse. Gravel is fine to coarse subangular to angular and includes slag, brick and concrete. Cobbles include angular brick). (MG)	
2.00 2.00 2.00-2.45	PID ES4 C	583ppm N29		31.223		2.50		
2.50-3.00	B5						Very weak red fine to medium grained SANDSTONE partially weathered. (Recovered as clayey sand). (SSW)	
3.00 3.00 3.00-3.45 3.30	PID ES6 SJ7 C	8.1ppm 1/0.90 1/0.60		30.423		3.30	Borehole complete at 3.30m BGL.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
03/02/2016	0.00	0.00			2.80	3.00	01:00			(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) One 50mm diameter slotted standpipe installed to 2.00m BGL.
03/02/2016	3.30	3.30	150	Dry	3.00	3.30	01:00			

All dimensions in metres
Scale 1:50

For explanation of symbols and
abbreviations see Key Sheets

Checked by:
M.V.

Logged by:
A. Greene

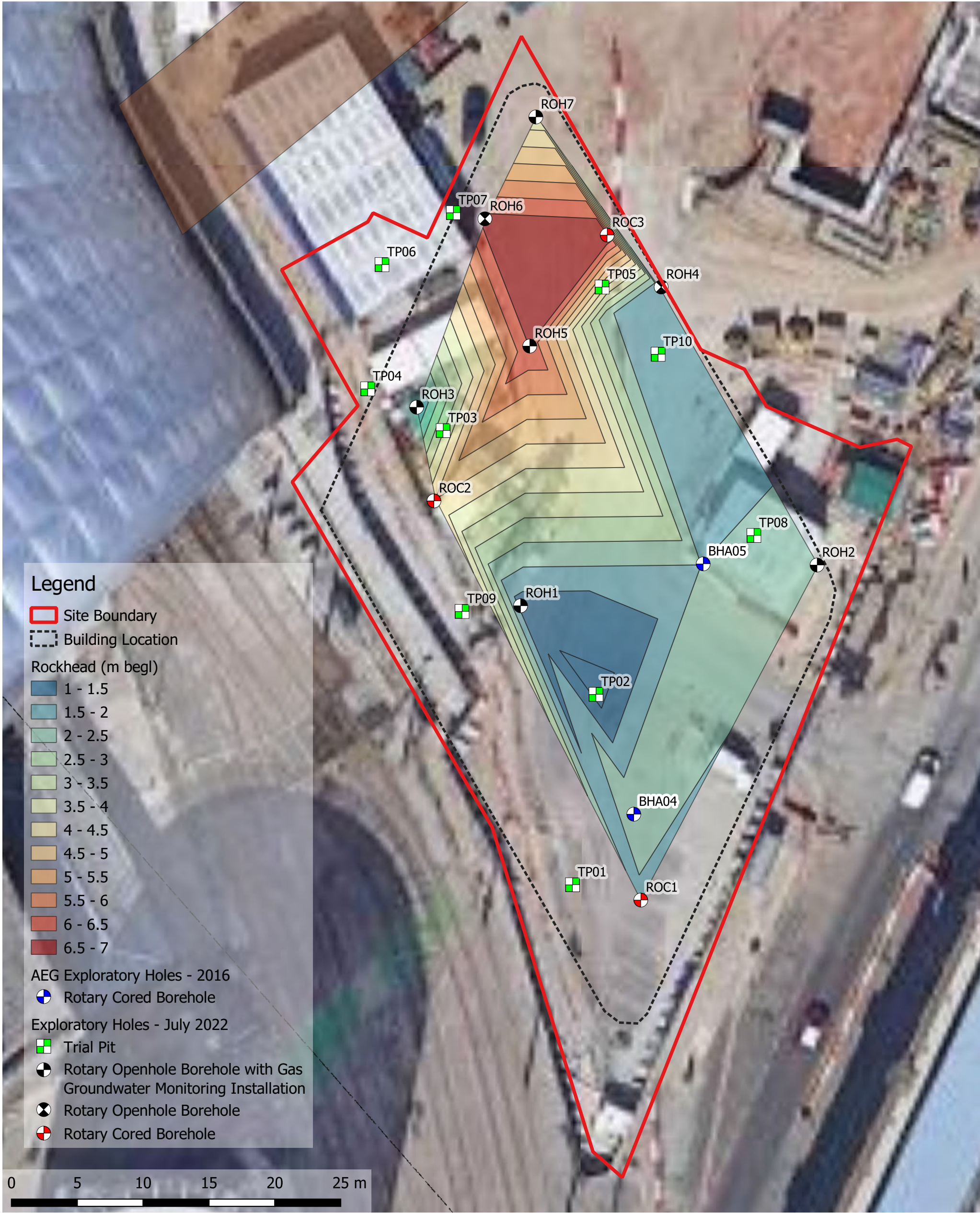
Contract No.
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GRM Development Solutions Limited, Laurus House, First Avenue, Centrum 100, Burton upon Trent, Staffs DE14 2WH
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NOTES:

CLIENT:
Alan Johnson Partnership Ltd / Vinci
Construction (on behalf of Morgan
Capital)

PROJECT:
New Victoria Office Block, Manchester

TITLE:
Rock Contour Plan

PROJECT No:
P10056

DESIGN/DRAWN:
RDH

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DATE:
August 2022

ISSUE:
Figure 4



GRM Development Solutions Ltd
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NOTES:

NOTES

CLIENT: Alan Johnson Partnership Ltd / Vinci Construction (on behalf of Morgan Capital)	TITLE: Gas Monitoring Location Plan	PROJECT No: P10056	DATE: July 2022	 GRM Development Solutions Ltd Tel: 01283 551 249 Fax: 01283 211 968 mail@grm-uk.com www.grm-uk.com
PROJECT: New Victoria Office Block, Manchester		DESIGN/DRAWN: RP	ISSUE: Figure 5	
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In-Situ Gas Monitoring Results

Project Name	New Victoria Office Block, Manchester
Project Number	P10056
Client	Alan Johnston Partnership Ltd
Date	01/08/2022
Weather	Mostly Sunny
Atmospheric Pressure (mb)	1019
Pressure Trend	Steady
Equipment	Gas Data GFM436
Operator	Liam Press

Ground Gas													
Well ID	Response Zone			Methane		CO2		Oxygen		Gas Flow		PID Reading	
	mbegl			%v/v		%v/v		%v/v		l/h		ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
R0H1	2.0	5.0	NS	0.0	0.0	0.3	0.3	19.7	19.7	0.0	0.0	Not Recorded	
R0H2	3.0	5.0	NS	0.0	0.0	0.0	0.0	20.7	20.7	0.0	0.0	Not Recorded	
R0H3	2.0	5.0	NS	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	Not Recorded	
R0H5	2.0	5.0	MG	0.0	0.0	0.2	0.2	18.5	18.5	0.0	0.0	Not Recorded	
R0H7	2.5	5.0	NS	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	Not Recorded	

Groundwater	
Depth to Groundwater	Total Well Depth
mbegl	mbegl
Not Detected	5.1
Not Detected	5.0
Not Detected	5.2
Not Detected	4.7
Not Detected	3.8

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)	
N.D.	Not Detected	a Methane => 1% v/v
N.R.	Not Recorded	b Carbon Dioxide =>5% v/v
PID	Photo-Ionising Detector	MG Made Ground
%	By volume	NS Natural Strata

Ground Material Key

MG	Made Ground
----	-------------



In-Situ Gas Monitoring Results

Project Name	New Victoria Office Block, Manchester
Project Number	P10056
Client	Alan Johnston Partnership Ltd
Date	11/08/2022
Weather	Sunny
Atmospheric Pressure (mb)	1020
Pressure Trend	Falling
Equipment	Gas Data GFM436
Operator	Liam Press

Ground Gas													
Well ID	Response Zone			Methane		CO2		Oxygen		Gas Flow		PID Reading	
	mbegl			%v/v		%v/v		%v/v		l/h		ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
R0H1	2.0	5.0	NS	0.0	0.0	0.8	0.8	20.8	20.8	0.0	0.0	Not Recorded	
R0H2	3.0	5.0	NS	0.0	0.0	0.0	0.0	21.1	21.1	0.0	0.0	Not Recorded	
R0H3	2.0	5.0	NS	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	Not Recorded	
R0H5	2.0	5.0	MG	0.0	0.0	1.3	1.3	17.9	17.9	0.0	0.0	Not Recorded	
R0H7	2.5	5.0	NS	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	Not Recorded	

Groundwater	
Depth to Groundwater	Total Well Depth
mbegl	mbegl
Not Detected	5.1
Not Detected	5.0
Not Detected	5.2
Not Detected	4.7
Not Detected	3.8

Notes		Ground Material Key	
L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)	MG	Made Ground
N.D.	Not Detected	a	Methane => 1% v/v
N.R.	Not Recorded	b	Carbon Dioxide =>5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	By volume	NS	Natural Strata

Comments

WS07 rebung



In-Situ Gas Monitoring Results

Project Name	New Victoria Office Block, Manchester
Project Number	P10056
Client	Alan Johnston Partnership Ltd
Date	18/08/2022
Weather	Cloudy
Atmospheric Pressure (mb)	1015
Pressure Trend	Falling
Equipment	Gas Data LMSXi
Operator	James Wardle

Ground Gas													
Well ID	Response Zone			Methane		CO2		Oxygen		Gas Flow		PID Reading	
	mbegl			%v/v		%v/v		%v/v		l/h		ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
R0H1	2.0	5.0	NS	0.0	0.0	0.2	0.2	20.0	20.0	0.0	0.0	Not Recorded	
R0H2	3.0	5.0	NS	0.0	0.0	0.2	0.2	19.9	19.9	0.0	0.0	Not Recorded	
R0H3	2.0	5.0	NS	0.0	0.0	0.6	0.6	20.0	20.0	0.0	0.0	Not Recorded	
R0H5	2.0	5.0	MG	0.0	0.0	2.1	2.1	15.5	15.5	0.0	0.0	Not Recorded	
R0H7	2.5	5.0	NS	0.0	0.0	0.2	0.2	20.2	20.2	0.0	0.0	Not Recorded	

Groundwater	
Depth to Groundwater	Total Well Depth
mbegl	mbegl
Not Detected	5.1
Not Detected	5.1
Not Detected	5.2
Not Detected	4.7
Not Detected	3.8

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)	
N.D.	Not Detected	a Methane => 1% v/v
N.R.	Not Recorded	b Carbon Dioxide =>5% v/v
PID	Photo-Ionising Detector	MG Made Ground
%	By volume	NS Natural Strata

Ground Material Key

MG	Made Ground
----	-------------



In-Situ Gas Monitoring Results

Project Name	New Victoria Office Block, Manchester
Project Number	P10056
Client	Alan Johnston Partnership Ltd
Date	24/08/2022
Weather	Cloudy
Atmospheric Pressure (mb)	1012
Pressure Trend	Steady
Equipment	Gas Data LMSXi
Operator	James Wardle

Ground Gas													
Well ID	Response Zone			Methane		CO2		Oxygen		Gas Flow		PID Reading	
	mbegl			%v/v		%v/v		%v/v		l/h		ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
R0H1	2.0	5.0	NS	0.0	0.0	0.6	0.6	19.6	19.6	0.0	0.0	Not Recorded	
R0H2	3.0	5.0	NS	0.0	0.0	0.2	0.2	20.0	20.0	0.0	0.0	Not Recorded	
R0H3	2.0	5.0	NS	0.0	0.0	1.1	1.1	19.7	19.7	0.0	0.0	Not Recorded	
R0H5	2.0	5.0	MG	0.0	0.0	2.7	2.7	17.5	17.5	0.0	0.0	Not Recorded	
R0H7	2.5	5.0	NS	0.0	0.0	0.2	0.2	20.2	20.2	0.0	0.0	Not Recorded	

Groundwater	
Depth to Groundwater	Total Well Depth
mbegl	mbegl
Not Detected	5.1
Not Detected	5.0
Not Detected	5.1
Not Detected	4.7
Not Detected	3.8

Notes		Ground Material Key	
L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)	MG	Made Ground
N.D.	Not Detected	a	Methane => 1% v/v
N.R.	Not Recorded	b	Carbon Dioxide =>5% v/v
PID	Photo-Ionising Detector	MG	Made Ground
%	By volume	NS	Natural Strata



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GRM Development Solutions

Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L22/03919/GRM - 22-28325

Your Project Reference:	P10056 New Victoria Office Block, Manchester		
Your Order Number:	P10056	Samples Received / Instructed:	25/07/2022 / 25/07/2022
Report Issue Number:	1	Sample Tested:	25/07 to 03/08/2022
Samples Analysed:	15 soil samples	Report issued:	03/08/2022

Signed



James Gane
Analytical Services Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and these results are not covered by our accreditation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

WAC Testing

Samples were leached in accordance with BS EN 12457-2: 2002.

Eluate Results are reported as L/S 10. These results have been calculated in accordance with BS EN 12457-2:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of issue 10/12/2020

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

L:\DATA\REPORTS\GRM495\L22-03919-GRM - 22-28325.XLSM\TPH Codes



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L22/03919/GRM - 22-28325
Project Reference - P10056 New Victoria Office Block,
Manchester
Analytical Test Results - Soil

NC Reference			253259	253260	253261	253262	253263	253264
Client Sample ID			TP01	TP01	TP01	TP03	TP03	TP04
Client Sample Location			-	-	-	-	-	-
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			0.50	1.00	2.00	0.50	1.00	0.50
Depth - Bottom (m)			0.50	1.00	2.00	0.50	1.00	0.50
Date of Sampling			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Arsenic	(mg/kg)	MCERTS	22	27	< 10	< 10	< 10	< 10
Cadmium	(mg/kg)	MCERTS	1.5	2.5	0.5	0.9	0.8	1.1
Chromium (Total)	(mg/kg)	UKAS	20	32	4.7	7.7	6.3	10
Copper	(mg/kg)	MCERTS	120	140	28	55	49	50
Lead	(mg/kg)	MCERTS	1400	2000	290	140	140	150
Mercury	(mg/kg)	UKAS	2.6	3.1	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	22	24	6.6	14	15	16
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	240	400	47	91	94	110
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	8.9	9.3	8.4	10.5	9.7	10.1
Sulphate (Water soluble)	(mg/l)	u	76	43	22	350	210	610
Acenaphthene	(mg/kg)	MCERTS	2.1	0.80	0.13	1.6	6.6	1.2
Acenaphthylene	(mg/kg)	UKAS	0.32	0.26	0.06	0.24	0.25	0.36
Anthracene	(mg/kg)	UKAS	2.9	1.2	0.25	2.8	9.3	2.7
Benzo (a) anthracene	(mg/kg)	MCERTS	6.7	3.8	0.71	5.4	17	6.5
Benzo (a) pyrene	(mg/kg)	MCERTS	6.4	4.2	0.75	5.5	16	6.5
Benzo (b) fluoranthene	(mg/kg)	MCERTS	6.7	4.3	0.82	6.0	18	7.0
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	3.4	2.4	0.44	3.0	8.4	3.6
Benzo (k) fluoranthene	(mg/kg)	MCERTS	2.8	1.7	0.28	2.3	6.9	2.8
Chrysene	(mg/kg)	MCERTS	7.6	4.4	0.81	6.0	19	6.8
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	1.2	0.66	0.09	0.66	2.0	0.78
Fluoranthene	(mg/kg)	MCERTS	14	7.4	1.3	12	45	14
Fluorene	(mg/kg)	MCERTS	1.5	0.59	0.11	1.1	4.1	1.2
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	2.7	1.8	0.33	2.3	6.4	2.8
Naphthalene	(mg/kg)	MCERTS	0.75	0.34	0.13	0.65	1.2	1.0
Phenanthrene	(mg/kg)	MCERTS	13	5.1	1.1	10	39	10
Pyrene	(mg/kg)	MCERTS	14	7.6	1.3	12	40	14
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	86	47	8.6	72	240	81
SOM (via TOC)	(%)	UKAS	8.7	8.7	3.2	6.2	6.1	5.4
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected



Nicholls Colton Group
7 - 11 Harding Street
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L22/03919/GRM - 22-28325
Project Reference - P10056 New Victoria Office Block,
Manchester
Analytical Test Results - Soil

NC Reference			253265	253266	253267	253268	253269	253270
Client Sample ID			TP04	TP02	TP02	TP02	TP06	TP06
Client Sample Location			-	-	-	-	-	-
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			1.00	0.50	1.00	1.50	0.50	2.00
Depth - Bottom (m)			1.00	0.50	1.00	1.50	0.50	2.00
Date of Sampling			22/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10	< 10	12	< 10
Cadmium	(mg/kg)	MCERTS	0.9	1.3	0.8	0.4	1.0	1.0
Chromium (Total)	(mg/kg)	UKAS	9.9	3.9	2.7	2.1	12	8.3
Copper	(mg/kg)	MCERTS	52	53	36	12	53	64
Lead	(mg/kg)	MCERTS	200	110	88	44	420	290
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	17	14	10	6.3	14	14
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	110	110	54	21	78	120
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	u		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	10.3	9.6	8.7	8.8	9.8	11.6
Sulphate (Water soluble)	(mg/l)	u	410	31	19	13	1100	580
Acenaphthene	(mg/kg)	MCERTS	0.52	28	1.4	0.24	6.8	1.5
Acenaphthylene	(mg/kg)	UKAS	< 0.20	3.8	0.78	< 0.20	1.2	0.40
Anthracene	(mg/kg)	UKAS	1.5	37	3.5	0.49	8.8	2.1
Benzo (a) anthracene	(mg/kg)	MCERTS	4.2	62	8.5	1.2	13	4.3
Benzo (a) pyrene	(mg/kg)	MCERTS	4.2	60	9.2	1.4	13	4.3
Benzo (b) fluoranthene	(mg/kg)	MCERTS	4.7	66	10	1.4	14	4.6
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	2.4	30	5.1	0.76	7.0	2.5
Benzo (k) fluoranthene	(mg/kg)	MCERTS	1.8	26	3.4	0.43	4.9	1.8
Chrysene	(mg/kg)	MCERTS	4.5	66	9.3	1.3	14	4.8
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.62	8.0	1.4	< 0.20	1.4	0.57
Fluoranthene	(mg/kg)	MCERTS	8.5	150	18	2.4	33	10
Fluorene	(mg/kg)	MCERTS	0.47	20	1.2	0.24	7.0	1.4
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	2.0	34	5.4	0.68	4.7	1.9
Naphthalene	(mg/kg)	MCERTS	0.35	8.1	0.33	< 0.20	15	1.2
Phenanthrene	(mg/kg)	MCERTS	4.9	140	12	1.8	40	10
Pyrene	(mg/kg)	MCERTS	8.3	150	18	2.7	30	9.7
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	49	890	110	15	210	61
SOM (via TOC)	(%)	UKAS	8.0	12	5.0	< 1.7	7.1	6.2
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected



L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block,

Manchester

Analytical Test Results - Soil

NC Reference			253271	253272	253273
Client Sample ID			TP06	TP07	TP07
Client Sample Location			-	-	-
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			3.00	0.50	1.30
Depth - Bottom (m)			3.00	0.50	1.30
Date of Sampling			23/07/2022	23/07/2022	23/07/2022
Time of Sampling			-	-	-
Sample Matrix			Sand	Sand	Sand
Determinant	Units	Accreditation			
Arsenic	(mg/kg)	MCERTS	< 10	15	19
Cadmium	(mg/kg)	MCERTS	1.1	1.4	1.6
Chromium (Total)	(mg/kg)	UKAS	6.9	18	16
Copper	(mg/kg)	MCERTS	77	120	180
Lead	(mg/kg)	MCERTS	180	1000	2600
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	14	28	38
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	120	150	170
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	11.8	9.9	9.4
Sulphate (Water soluble)	(mg/l)	u	580	450	330
Acenaphthene	(mg/kg)	MCERTS	1.5	1.0	< 0.20
Acenaphthylene	(mg/kg)	UKAS	0.48	0.45	< 0.20
Anthracene	(mg/kg)	UKAS	2.7	3.6	0.46
Benzo (a) anthracene	(mg/kg)	MCERTS	4.8	9.6	1.3
Benzo (a) pyrene	(mg/kg)	MCERTS	5.0	7.7	1.4
Benzo (b) fluoranthene	(mg/kg)	MCERTS	5.6	8.8	1.5
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	3.0	3.6	0.97
Benzo (k) fluoranthene	(mg/kg)	MCERTS	2.1	3.6	0.65
Chrysene	(mg/kg)	MCERTS	5.3	9.0	1.6
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.72	0.93	0.31
Fluoranthene	(mg/kg)	MCERTS	12	25	2.6
Fluorene	(mg/kg)	MCERTS	1.3	1.0	< 0.20
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	2.4	3.5	0.68
Naphthalene	(mg/kg)	MCERTS	0.93	0.71	0.50
Phenanthrene	(mg/kg)	MCERTS	9.5	11	1.9
Pyrene	(mg/kg)	MCERTS	11	21	2.6
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	68	110	17
SOM (via TOC)	(%)	UKAS	5.0	18	28
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Analytical Test Results - TPH CWG

NC Reference			253259	253260	253261	253262	253263	253264
Client Sample ID			TP01	TP01	TP01	TP03	TP03	TP04
Client Sample Location			-	-	-	-	-	-
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			0.50	1.00	2.00	0.50	1.00	0.50
Depth - Bottom (m)			0.50	1.00	2.00	0.50	1.00	0.50
Date of Sampling			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Aliphatics								
>C ₅ to C ₆ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	0.05	< 0.05	0.07	< 0.04	0.05
>C ₆ to C ₈ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	< 0.04	0.08	< 0.05	0.04	0.07
>C ₈ to C ₁₀ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	12	11	17
>C ₁₆ to C ₂₁ [EH_CU_1D_AL]	(mg/kg)	u	19	17	< 10	20	17	27
>C ₂₁ to C ₃₅ [EH_CU_1D_AL]	(mg/kg)	u	40	72	12	120	98	130
Aromatics								
>C ₅ to C ₇ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₇ to C ₈ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10	12	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	17	48	21
>C ₁₆ to C ₂₁ [EH_CU_1D_AR]	(mg/kg)	u	59	51	28	80	250	150
>C ₂₁ to C ₃₅ [EH_CU_1D_AR]	(mg/kg)	u	160	220	56	410	570	400
Total								
>C ₅ to C ₄₀ [EH_CU+HS_1D_Total]	(mg/kg)	u	310	500	96	840	1200	920

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Mar

Analytical Test Results - TPH CWG

NC Reference			253265	253266	253267	253268	253269	253270
Client Sample ID			TP04	TP02	TP02	TP02	TP06	TP06
Client Sample Location			-	-	-	-	-	-
Client Sample Type			-	-	-	-	-	-
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			1.00	0.50	1.00	1.50	0.50	2.00
Depth - Bottom (m)			1.00	0.50	1.00	1.50	0.50	2.00
Date of Sampling			22/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022	23/07/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Aliphatics								
>C ₅ to C ₆ [HS_MS_1D_AL]	(mg/kg)	u	0.08	0.10	0.07	0.08	< 0.04	< 0.05
>C ₆ to C ₈ [HS_MS_1D_AL]	(mg/kg)	u	0.11	0.18	0.14	0.11	< 0.04	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.05	< 0.04	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AL]	(mg/kg)	u	< 10	14	< 10	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AL]	(mg/kg)	u	13	39	< 10	< 10	< 10	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AL]	(mg/kg)	u	22	38	< 10	< 10	17	16
>C ₂₁ to C ₃₅ [EH_CU_1D_AL]	(mg/kg)	u	150	61	34	18	110	130
Aromatics								
>C ₅ to C ₇ [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.05	< 0.04	< 0.05
>C ₇ to C ₈ [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.05	< 0.04	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.04	< 0.04	< 0.05	< 0.04	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AR]	(mg/kg)	u	< 10	69	< 10	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AR]	(mg/kg)	u	< 10	220	14	< 10	17	21
>C ₁₆ to C ₂₁ [EH_CU_1D_AR]	(mg/kg)	u	67	780	71	42	84	91
>C ₂₁ to C ₃₅ [EH_CU_1D_AR]	(mg/kg)	u	310	1400	210	100	370	470
Total								
>C ₅ to C ₄₀ [EH_CU+HS_1D_Total]	(mg/kg)	u	770	2900	410	190	800	1000

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Mar

Analytical Test Results - TPH CWG

NC Reference			253271	253272	253273
Client Sample ID			TP06	TP07	TP07
Client Sample Location			-	-	-
Client Sample Type			-	-	-
Client Sample Number			-	-	-
Depth - Top (m)			3.00	0.50	1.30
Depth - Bottom (m)			3.00	0.50	1.30
Date of Sampling			23/07/2022	23/07/2022	23/07/2022
Time of Sampling			-	-	-
Sample Matrix			Sand	Sand	Sand
Determinant	Units	Accreditation			
Aliphatics					
>C ₅ to C ₆ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	0.07	0.11
>C ₆ to C ₈ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	< 0.05	0.16
>C ₈ to C ₁₀ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	< 0.05	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AL]	(mg/kg)	u	12	< 10	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AL]	(mg/kg)	u	21	13	16
>C ₂₁ to C ₃₅ [EH_CU_1D_AL]	(mg/kg)	u	170	100	110
Aromatics					
>C ₅ to C ₇ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.05	< 0.05
>C ₇ to C ₈ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.05	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.05	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AR]	(mg/kg)	u	22	< 10	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AR]	(mg/kg)	u	90	36	36
>C ₂₁ to C ₃₅ [EH_CU_1D_AR]	(mg/kg)	u	420	200	210
Total					
>C ₅ to C ₄₀ [EH_CU+HS_1D_Total]	(mg/kg)	u	1000	520	550

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253259
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Client Sample ID	TP01
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	0.5
Depth - Bottom (m)	0.5
Date of Sampling	22/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark brown gravelly silty sand with occasional brick fragments slag
Sample Matrix	Sand
Moisture Content (%)	19
Stone content (%)	38

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	5.1	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.3	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	595	500	-	-
PAH	mg/kg	u	87	100	-	-
pH	units	MCERTS	8.9	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.51	0.50	2	25
Barium	mg/kg	u	0.07	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.12	0.5	10	70
Copper	mg/kg	u	0.08	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.06	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.09	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	270	800	15000	25000
Fluoride	mg/kg	u	6	10	150	500
Sulphate (as SO ₄)	mg/kg	u	100	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1000	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	32.0	500	800	1000

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253261
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Client Sample ID	TP01
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	2
Depth - Bottom (m)	2
Date of Sampling	22/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark orangish brown gravelly silty sand with occasional brick fragments slag
Sample Matrix	Sand
Moisture Content (%)	13
Stone content (%)	5.6

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	1.9	3.0	5.0	6.0
Loss on Ignition	%	UKAS	2.1	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	136	500	-	-
PAH	mg/kg	u	8.8	100	-	-
pH	units	MCERTS	8.4	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.15	0.50	2	25
Barium	mg/kg	u	0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.05	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.08	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	280	800	15000	25000
Fluoride	mg/kg	u	4	10	150	500
Sulphate (as SO ₄)	mg/kg	u	41	1000	20000	50000
Total Dissolved Solids	mg/kg	u	940	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	28.0	500	800	1000

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253262
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Client Sample ID	TP03
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	0.5
Depth - Bottom (m)	0.5
Date of Sampling	22/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag
Sample Matrix	Sand
Moisture Content (%)	8.4
Stone content (%)	55

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	3.6	3.0	5.0	6.0
Loss on Ignition	%	UKAS	3.5	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	0.03	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	1070	500	-	-
PAH	mg/kg	u	73	100	-	-
pH	units	MCERTS	10.5	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.06	0.50	2	25
Barium	mg/kg	u	0.13	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.04	0.5	10	70
Copper	mg/kg	u	0.06	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.04	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.06	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	12	800	15000	25000
Fluoride	mg/kg	u	5	10	150	500
Sulphate (as SO ₄)	mg/kg	u	400	1000	20000	50000
Total Dissolved Solids	mg/kg	u	720	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	38.0	500	800	1000

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253265
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Client Sample ID	TP04
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	1
Depth - Bottom (m)	1
Date of Sampling	22/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag
Sample Matrix	Sand
Moisture Content (%)	12
Stone content (%)	30

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	4.6	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.3	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	0.06	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	986	500	-	-
PAH	mg/kg	u	50	100	-	-
pH	units	MCERTS	10.3	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.11	0.50	2	25
Barium	mg/kg	u	0.23	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.03	0.5	10	70
Copper	mg/kg	u	0.04	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.12	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.37	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	10	800	15000	25000
Fluoride	mg/kg	u	5	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1700	1000	20000	50000
Total Dissolved Solids	mg/kg	u	2100	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	37.0	500	800	1000

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253267
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Client Sample ID	TP02
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	1
Depth - Bottom (m)	1
Date of Sampling	23/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark brown gravelly silty sand with occasional brick fragments
Sample Matrix	Sand
Moisture Content (%)	11
Stone content (%)	29

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	2.9	3.0	5.0	6.0
Loss on Ignition	%	UKAS	2.6	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	366	500	-	-
PAH	mg/kg	u	110	100	-	-
pH	units	MCERTS	8.7	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.16	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.02	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.15	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	200	800	15000	25000
Fluoride	mg/kg	u	5	10	150	500
Sulphate (as SO ₄)	mg/kg	u	38	1000	20000	50000
Total Dissolved Solids	mg/kg	u	790	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	25.0	500	800	1000

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Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253269
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Client Sample ID	TP06
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	0.5
Depth - Bottom (m)	0.5
Date of Sampling	23/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark brown gravelly silty sand with occasional brick fragments slag
Sample Matrix	Sand
Moisture Content (%)	9.6
Stone content (%)	22

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	4.1	3.0	5.0	6.0
Loss on Ignition	%	UKAS	3.0	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	0.03	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	1100	500	-	-
PAH	mg/kg	u	210	100	-	-
pH	units	MCERTS	9.8	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.21	0.50	2	25
Barium	mg/kg	u	0.07	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.05	0.5	10	70
Copper	mg/kg	u	0.05	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.11	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.36	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	19	800	15000	25000
Fluoride	mg/kg	u	6	10	150	500
Sulphate (as SO ₄)	mg/kg	u	1700	1000	20000	50000
Total Dissolved Solids	mg/kg	u	2100	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	39.0	500	800	1000

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253271
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Client Sample ID	TP06
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	3
Depth - Bottom (m)	3
Date of Sampling	23/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark brown gravelly silty sand with occasional brick fragments
Sample Matrix	Sand
Moisture Content (%)	10
Stone content (%)	34

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	2.9	3.0	5.0	6.0
Loss on Ignition	%	UKAS	3.3	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	0.05	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	1090	500	-	-
PAH	mg/kg	u	69	100	-	-
pH	units	MCERTS	11.8	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.40	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.11	0.5	10	70
Copper	mg/kg	u	0.67	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.10	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.10	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	42	800	15000	25000
Fluoride	mg/kg	u	< 1	10	150	500
Sulphate (as SO ₄)	mg/kg	u	510	1000	20000	50000
Total Dissolved Solids	mg/kg	u	4500	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	63.0	500	800	1000

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Project Reference - P10056 New Victoria Office Block, Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253273
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Client Sample ID	TP07
Client Sample Location	-
Client Sample Type	-
Client Sample Number	-
Depth - Top (m)	1.3
Depth - Bottom (m)	1.3
Date of Sampling	23/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag
Sample Matrix	Sand
Moisture Content (%)	12
Stone content (%)	51

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	16.0	3.0	5.0	6.0
Loss on Ignition	%	UKAS	11	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	0.31	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH ₁ ID ₁ Total]	mg/kg	MCERTS	706	500	-	-
PAH	mg/kg	u	17	100	-	-
pH	units	MCERTS	9.4	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.22	0.50	2	25
Barium	mg/kg	u	0.22	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.05	0.5	10	70
Copper	mg/kg	u	0.05	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.17	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	0.07	0.5	10.0	50
Antimony	mg/kg	u	2.20	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	180	800	15000	25000
Fluoride	mg/kg	u	17	10	150	500
Sulphate (as SO ₄)	mg/kg	u	480	1000	20000	50000
Total Dissolved Solids	mg/kg	u	1200	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	41.0	500	800	1000

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Project Reference - P10056 New Victoria Office Block, Manchester

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
253259	TP01	-	-	-	Made Ground- dark brown gravelly silty sand with occasional brick fragments slag	19	38	53
253260	TP01	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	16	13	42
253261	TP01	-	-	-	Made Ground- dark orangish brown gravelly silty sand with occasional brick fragments slag	13	5.6	64
253262	TP03	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	8.4	55	38
253263	TP03	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	7.2	52	26
253264	TP04	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	8.4	50	34
253265	TP04	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	12	30	39
253266	TP02	-	-	-	Made Ground- dark brown gravelly silty sand with occasional brick fragments slag	8.3	26	61
253267	TP02	-	-	-	Made Ground- dark brown gravelly silty sand with occasional brick fragments	11	29	42
253268	TP02	-	-	-	Orangish brown gravelly sand	9.7	3.6	59
253269	TP06	-	-	-	Made Ground- dark brown gravelly silty sand with occasional brick fragments slag	9.6	22	51
253270	TP06	-	-	-	Made Ground- dark brown gravelly silty sand with occasional brick fragments	8.9	45	34
253271	TP06	-	-	-	Made Ground- dark brown gravelly silty sand with occasional brick fragments	10	34	38
253272	TP07	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	9.4	56	48
253273	TP07	-	-	-	Made Ground- dark greyish brown gravelly silty sand with occasional brick fragments slag	12	51	40

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Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
253259	TP01	-	-	-	
253260	TP01	-	-	-	
253261	TP01	-	-	-	
253262	TP03	-	-	-	
253263	TP03	-	-	-	
253264	TP04	-	-	-	
253265	TP04	-	-	-	
253266	TP02	-	-	-	
253267	TP02	-	-	-	
253268	TP02	-	-	-	
253269	TP06	-	-	-	
253270	TP06	-	-	-	
253271	TP06	-	-	-	
253272	TP07	-	-	-	
253273	TP07	-	-	-	

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Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
BTEXS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of BTEX in soils via Headspace-GC-MS
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP - Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
TDSL	MS - CL - pH & Conductivity in Water	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
ENLEACHP	BS EN 12457-2	As Received	-	Leaching in accordance with BSEN 12457-2 (10:1 Ratio)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 Loi	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1:2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.

L22/03919/GRM - 22-28325

Project Reference - P10056 New Victoria Office Block, Manchester

HWOL TPH Acronym Index

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



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DE14 2WH

Analytical Test Report: L22/03999/GRM - 22-28428

Your Project Reference: **P10056 New Victoria Office Block Manchester**

Your Order Number: P10056 Samples Received / Instructed: 01/08/2022 / 01/08/2022

Report Issue Number: 1 Sample Tested: 01/08 to 11/08/2022

Samples Analysed: 10 soil samples Report issued: 11/08/2022

Signed

James Gane
Analytical Services Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and these results are not covered by our accreditation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

WAC Testing

Samples were leached in accordance with BS EN 12457-2: 2002.

Euate Results are reported as L/S 10. These results have been calculated in accordance with BS EN 12457-2:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 10/12/2020

Owned by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

L:\DATA\REPORTS\GRM495\L22-03999-GRM - 22-28428.XLSM\Sample Deviations

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block

Manchester

Analytical Test Results - Soil

NC Reference			253944	253945	253946	253947	253948	253949
Client Sample ID			Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Client Sample Location			TP08	TP08	TP08	TP09	TP09	TP09
Client Sample Type			ES D	ES D	ES D	ES D	ES D	ES D
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			1.00	1.60	2.50	0.50	2.00	2.80
Depth - Bottom (m)			1.00	1.60	2.50	0.50	2.00	2.80
Date of Sampling			27/07/2022	27/07/2022	27/07/2022	27/07/2022	27/07/2022	27/07/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Arsenic	(mg/kg)	MCERTS	< 10	28	18	15	49	71
Cadmium	(mg/kg)	MCERTS	1.6	1.5	1.1	1.4	1.5	1.3
Chromium (Total)	(mg/kg)	UKAS	15	500	82	25	17	12
Copper	(mg/kg)	MCERTS	66	120	87	150	5700	9100
Lead	(mg/kg)	MCERTS	130	760	1300	440	2100	2800
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5	4.8	6.3
Nickel	(mg/kg)	MCERTS	17	100	36	29	27	21
Selenium	(mg/kg)	u	< 8.0	9.2	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	80	180	180	110	470	710
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	1.9	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	10.7	8.9	9.3	8.7	8.6	8.5
Sulphate (Water soluble)	(mg/l)	u	200	50	140	21	43	24
Acenaphthene	(mg/kg)	MCERTS	0.44	< 0.20	0.20	7.4	0.55	< 0.02
Acenaphthylene	(mg/kg)	UKAS	0.27	< 0.20	0.11	< 2.00	< 0.20	0.08
Anthracene	(mg/kg)	UKAS	0.95	0.41	0.43	12	1.3	0.19
Benzo (a) anthracene	(mg/kg)	MCERTS	2.1	1.2	0.98	17	2.8	0.53
Benzo (a) pyrene	(mg/kg)	MCERTS	2.2	0.97	1.0	14	2.7	0.65
Benzo (b) fluoranthene	(mg/kg)	MCERTS	2.2	1.2	1.2	15	3.1	1.1
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	1.2	0.57	0.63	7.0	1.7	0.65
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.76	0.49	0.43	5.7	1.1	0.31
Chrysene	(mg/kg)	MCERTS	2.3	1.1	1.1	20	3.3	0.69
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.28	< 0.20	0.15	< 2.00	0.38	0.16
Fluoranthene	(mg/kg)	MCERTS	4.7	2.4	2.0	49	6.8	0.77
Fluorene	(mg/kg)	MCERTS	0.56	< 0.20	0.23	4.4	0.37	0.03
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	1.1	0.57	0.60	6.9	1.6	0.62
Naphthalene	(mg/kg)	MCERTS	0.59	< 0.20	0.33	7.1	0.27	0.06
Phenanthrene	(mg/kg)	MCERTS	4.2	1.6	1.8	66	6.5	0.43
Pyrene	(mg/kg)	MCERTS	4.9	1.9	2.0	46	6.7	0.82
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	29	13	13	280	39	7.1
SOM (via TOC)	(%)	UKAS	1.9	9.6	4.8	8.5	7.7	4.8
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block
Manchester

Analytical Test Results - Soil

NC Reference			253950	253951	253952	253953
Client Sample ID			Test 7	Test 8	Test 9	Test 10
Client Sample Location			TP05	TP05	TP10	TP10
Client Sample Type			ES D	ES D	ES D	ES D
Client Sample Number			-	-	-	-
Depth - Top (m)			0.70	1.30	0.50	1.90
Depth - Bottom (m)			0.70	1.30	0.50	1.90
Date of Sampling			27/07/2022	27/07/2022	27/07/2022	27/07/2022
Time of Sampling			-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand
Determinant	Units	Accreditation				
Arsenic	(mg/kg)	MCERTS	22	34	< 10	23
Cadmium	(mg/kg)	MCERTS	1.3	1.4	1.2	1.8
Chromium (Total)	(mg/kg)	UKAS	31	25	14	22
Copper	(mg/kg)	MCERTS	210	110	64	100
Lead	(mg/kg)	MCERTS	330	320	280	390
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	24	27	18	34
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0
Zinc	(mg/kg)	MCERTS	160	170	120	180
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	1.7	< 1.0	< 1.0	1.6
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	9.2	9.0	11.5	10.6
Sulphate (Water soluble)	(mg/l)	u	82	52	390	330
Acenaphthene	(mg/kg)	MCERTS	4.9	2.8	2.2	0.69
Acenaphthylene	(mg/kg)	UKAS	0.83	< 2.00	1.4	0.18
Anthracene	(mg/kg)	UKAS	11	5.0	5.2	1.3
Benzo (a) anthracene	(mg/kg)	MCERTS	21	12	8.0	2.6
Benzo (a) pyrene	(mg/kg)	MCERTS	22	14	7.2	2.8
Benzo (b) fluoranthene	(mg/kg)	MCERTS	23	13	7.7	3.0
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	12	8.6	3.6	1.6
Benzo (k) fluoranthene	(mg/kg)	MCERTS	8.8	5.1	2.8	1.1
Chrysene	(mg/kg)	MCERTS	21	14	8.7	2.9
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	2.7	< 2.00	0.86	0.36
Fluoranthene	(mg/kg)	MCERTS	52	32	20	5.8
Fluorene	(mg/kg)	MCERTS	4.6	2.3	3.9	0.69
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	12	7.6	3.6	1.5
Naphthalene	(mg/kg)	MCERTS	2.0	< 2.00	5.4	1.1
Phenanthrene	(mg/kg)	MCERTS	42	24	24	5.2
Pyrene	(mg/kg)	MCERTS	46	29	20	5.6
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	290	180	120	36
SOM (via TOC)	(%)	UKAS	5.1	5.8	4.2	7.8
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Analytical Test Results - TPH CWG

NC Reference			253944	253945	253946	253947	253948	253949
Client Sample ID			Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
Client Sample Location			TP08	TP08	TP08	TP09	TP09	TP09
Client Sample Type			ES D	ES D	ES D	ES D	ES D	ES D
Client Sample Number			-	-	-	-	-	-
Depth - Top (m)			1.00	1.60	2.50	0.50	2.00	2.80
Depth - Bottom (m)			1.00	1.60	2.50	0.50	2.00	2.80
Date of Sampling			27/07/2022	27/07/2022	27/07/2022	27/07/2022	27/07/2022	27/07/2022
Time of Sampling			-	-	-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand	Sand	Sand
Determinant	Units	Accreditation						
Aliphatics								
>C ₅ to C ₆ [HS_MS_1D_AL]	(mg/kg)	u	0.07	0.06	0.10	< 0.05	< 0.04	0.16
>C ₆ to C ₈ [HS_MS_1D_AL]	(mg/kg)	u	0.08	< 0.04	0.14	< 0.05	< 0.04	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AL]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10	< 10	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AL]	(mg/kg)	u	< 10	15	< 10	13	14	< 10
>C ₂₁ to C ₃₅ [EH_CU_1D_AL]	(mg/kg)	u	51	100	60	42	48	39
Aromatics								
>C ₅ to C ₇ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₇ to C ₈ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AR]	(mg/kg)	u	< 0.05	< 0.04	< 0.05	< 0.05	< 0.04	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	33	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	110	< 10	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AR]	(mg/kg)	u	18	15	17	430	36	16
>C ₂₁ to C ₃₅ [EH_CU_1D_AR]	(mg/kg)	u	96	120	94	710	110	65
Total								
>C ₅ to C ₄₀ [EH_CU+HS_1D_Total]	(mg/kg)	u	240	370	260	1500	260	160

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Mar

Analytical Test Results - TPH CWG

NC Reference			253950	253951	253952	253953
Client Sample ID			Test 7	Test 8	Test 9	Test 10
Client Sample Location			TP05	TP05	TP10	TP10
Client Sample Type			ES D	ES D	ES D	ES D
Client Sample Number			-	-	-	-
Depth - Top (m)			0.70	1.30	0.50	1.90
Depth - Bottom (m)			0.70	1.30	0.50	1.90
Date of Sampling			27/07/2022	27/07/2022	27/07/2022	27/07/2022
Time of Sampling			-	-	-	-
Sample Matrix			Sand	Sand	Sand	Sand
Determinant	Units	Accreditation				
Aliphatics						
>C ₅ to C ₆ [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.05	< 0.05	< 0.05
>C ₆ to C ₈ [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.05	< 0.05	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AL]	(mg/kg)	u	< 0.04	< 0.05	< 0.05	< 0.05
>C ₁₀ to C ₁₂ [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AL]	(mg/kg)	u	14	13	20	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AL]	(mg/kg)	u	21	18	42	11
>C ₂₁ to C ₃₅ [EH_CU_1D_AL]	(mg/kg)	u	77	76	130	55
Aromatics						
>C ₅ to C ₇ [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.05	< 0.05	< 0.05
>C ₇ to C ₈ [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.05	< 0.05	< 0.05
>C ₈ to C ₁₀ [HS_MS_1D_AR]	(mg/kg)	u	< 0.04	< 0.05	< 0.05	0.13
>C ₁₀ to C ₁₂ [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10	< 10
>C ₁₂ to C ₁₆ [EH_CU_1D_AR]	(mg/kg)	u	30	27	14	< 10
>C ₁₆ to C ₂₁ [EH_CU_1D_AR]	(mg/kg)	u	230	160	50	26
>C ₂₁ to C ₃₅ [EH_CU_1D_AR]	(mg/kg)	u	650	470	200	120
Total						
>C ₅ to C ₄₀ [EH_CU+HS_1D_Total]	(mg/kg)	u	1200	930	580	290

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253945
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Client Sample ID	Test 1
Client Sample Location	TP08
Client Sample Type	ES D
Client Sample Number	-
Depth - Top (m)	1.6
Depth - Bottom (m)	1.6
Date of Sampling	27/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark brown very gravelly silty sand with occasional brick fragments concrete
Sample Matrix	Sand
Moisture Content (%)	11
Stone content (%)	31

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	5.6	3.0	5.0	6.0
Loss on Ignition	%	UKAS	5.3	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_1D_Total]	mg/kg	MCERTS	477	500	-	-
PAH	mg/kg	u	14	100	-	-
pH	units	MCERTS	8.9	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.10	0.50	2	25
Barium	mg/kg	u	0.36	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.24	0.5	10	70
Copper	mg/kg	u	0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.06	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.20	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	9	800	15000	25000
Fluoride	mg/kg	u	4	10	150	500
Sulphate (as SO ₄)	mg/kg	u	62	1000	20000	50000
Total Dissolved Solids	mg/kg	u	440	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	23.0	500	800	1000

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253949
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Client Sample ID	Test 6
Client Sample Location	TP09
Client Sample Type	ES D
Client Sample Number	-
Depth - Top (m)	2.8
Depth - Bottom (m)	2.8
Date of Sampling	27/07/2022
Time of Sampling	-
Sample Description	Dark brown very gravelly silty sand
Sample Matrix	Sand
Moisture Content (%)	20
Stone content (%)	6

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	2.8	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.8	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_1D_Total]	mg/kg	MCERTS	204	500	-	-
PAH	mg/kg	u	7.3	100	-	-
pH	units	MCERTS	8.5	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.16	0.50	2	25
Barium	mg/kg	u	0.34	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.05	0.5	10	70
Copper	mg/kg	u	2.20	2.0	50	100
Mercury	mg/kg	u	0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	0.42	0.5	10.0	50
Antimony	mg/kg	u	0.13	0.06	0.7	5
Selenium	mg/kg	u	0.05	0.1	0.5	7
Zinc	mg/kg	u	0.10	4	50	200
Chloride	mg/kg	u	19	800	15000	25000
Fluoride	mg/kg	u	6	10	150	500
Sulphate (as SO ₄)	mg/kg	u	41	1000	20000	50000
Total Dissolved Solids	mg/kg	u	640	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	40.0	500	800	1000

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253950
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Client Sample ID	Test 7
Client Sample Location	TP05
Client Sample Type	ES D
Client Sample Number	-
Depth - Top (m)	0.7
Depth - Bottom (m)	0.7
Date of Sampling	27/07/2022
Time of Sampling	-
Sample Description	Made Ground- dark brown very gravelly silty sand with rare brick fragments
Sample Matrix	Sand
Moisture Content (%)	7.3
Stone content (%)	47

	Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	3.0	3.0	5.0	6.0
Loss on Ignition	%	UKAS	3.8	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_1D_Total]	mg/kg	MCERTS	1400	500	-	-
PAH	mg/kg	u	290	100	-	-
pH	units	MCERTS	9.2	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.15	0.50	2	25
Barium	mg/kg	u	0.10	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.09	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.07	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	0.04	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	980	800	15000	25000
Fluoride	mg/kg	u	4	10	150	500
Sulphate (as SO ₄)	mg/kg	u	120	1000	20000	50000
Total Dissolved Solids	mg/kg	u	2100	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	34.0	500	800	1000

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Certificate Of Analysis - WAC Suite

NC Reference	253952
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Client Sample ID	Test 9
Client Sample Location	TP10
Client Sample Type	ES D
Client Sample Number	-
Depth - Top (m)	0.5
Depth - Bottom (m)	0.5
Date of Sampling	27/07/2022
Time of Sampling	-
Sample Description	Dark brown very gravelly silty sand
Sample Matrix	Sand
Moisture Content (%)	4.3
Stone content (%)	65

Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
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Solid Analysis

Total Organic Carbon	%	MCERTS	2.4	3.0	5.0	6.0
Loss on Ignition	%	UKAS	4.3	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.30	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C ₁₀ to C ₄₀) [EH_1D_Total]	mg/kg	MCERTS	855	500	-	-
PAH	mg/kg	u	130	100	-	-
pH	units	MCERTS	11.5	-	> 6	-

Eluate Analysis

Arsenic	mg/kg	u	0.06	0.50	2	25
Barium	mg/kg	u	0.26	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	0.03	0.5	10	70
Copper	mg/kg	u	0.17	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.05	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	0.09	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	7600	800	15000	25000
Fluoride	mg/kg	u	3	10	150	500
Sulphate (as SO ₄)	mg/kg	u	570	1000	20000	50000
Total Dissolved Solids	mg/kg	u	14000	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	52.0	500	800	1000

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
253944	Test 1	TP08	ES D	-	Greyish brown very gravelly silty sand	6.2	35	25
253945	Test 2	TP08	ES D	-	Made Ground- dark brown very gravelly silty sand with occasional brick fragments concrete	11	31	43
253946	Test 3	TP09	ES D	-	Made Ground- dark brown very gravelly silty sand with occasional brick fragments concrete	7.5	57	37
253947	Test 4	TP09	ES D	-	Dark brown very gravelly silty sand with rare brick fragments	10	49	22
253948	Test 5	TP09	ES D	-	Dark brown very gravelly silty sand with rare brick fragments	15	33	53
253949	Test 6	TP05	ES D	-	Dark brown very gravelly silty sand	20	6.0	61
253950	Test 7	TP05	ES D	-	Made Ground- dark brown very gravelly silty sand with rare brick fragments	7.3	47	42
253951	Test 8	TP10	ES D	-	Dark brown very gravelly silty sand with rare brick fragments	8.2	43	54
253952	Test 9	TP10	ES D	-	Dark brown very gravelly silty sand	4.3	65	36
253953	Test 10	TP10	ES D	-	Made Ground- dark brown very gravelly silty sand with occasional brick fragments bituminous material	12	27	40

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Sample Comments

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
253944	Test 1	TP08	ES D	-	
253945	Test 2	TP08	ES D	-	
253946	Test 3	TP08	ES D	-	
253947	Test 4	TP09	ES D	-	
253948	Test 5	TP09	ES D	-	
253949	Test 6	TP09	ES D	-	VPH - Sample taken from container with headspace.
253950	Test 7	TP05	ES D	-	VPH - Sample taken from container with headspace.
253951	Test 8	TP05	ES D	-	
253952	Test 9	TP10	ES D	-	VPH - Sample taken from container with headspace.
253953	Test 10	TP10	ES D	-	

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
BTEXS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of BTEX in soils via Headspace-GC-MS
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP - Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
TDSL	MS - CL - pH & Conductivity in Water	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
ENLEACHP	BS EN 12457-2	As Received	-	Leaching in accordance with BSEN 12457-2 (10:1 Ratio)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
1377LOI	BS1377 Lol	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Analysis Methodologies

Sample condition for analysis				
Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Date of sampling to receipt insufficient to allow analysis to be completed without deviation, Please note this is only a deviation if 'X' is also recorded against the sample

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
253944	Test 1	TP08	ES D	-	MS - CL - VPH	RX
253944	Test 1	TP08	ES D	-	MS - CL - pH in Soils	RX
253945	Test 2	TP08	ES D	-	MS - CL - VOC and MBTEX	R
253945	Test 2	TP08	ES D	-	MS - CL - VPH	RX
253945	Test 2	TP08	ES D	-	MS - CL - pH in Soils	RX
253945	Test 2	TP08	ES D	-	MS - CL - pH in Soils (WAC)	RX
253946	Test 3	TP08	ES D	-	MS - CL - VPH	RX
253946	Test 3	TP08	ES D	-	MS - CL - pH in Soils	RX
253947	Test 4	TP09	ES D	-	MS - CL - VPH	RX
253947	Test 4	TP09	ES D	-	MS - CL - pH in Soils	RX
253948	Test 5	TP09	ES D	-	MS - CL - VPH	RX
253948	Test 5	TP09	ES D	-	MS - CL - pH in Soils	RX
253949	Test 6	TP09	ES D	-	MS - CL - VOC and MBTEX	R
253949	Test 6	TP09	ES D	-	MS - CL - VPH	RX
253949	Test 6	TP09	ES D	-	MS - CL - pH in Soils	RX
253949	Test 6	TP09	ES D	-	MS - CL - pH in Soils (WAC)	RX
253950	Test 7	TP05	ES D	-	MS - CL - VOC and MBTEX	R
253950	Test 7	TP05	ES D	-	MS - CL - VPH	RX
253950	Test 7	TP05	ES D	-	MS - CL - pH in Soils	RX
253950	Test 7	TP05	ES D	-	MS - CL - pH in Soils (WAC)	RX
253951	Test 8	TP05	ES D	-	MS - CL - VPH	RX
253951	Test 8	TP05	ES D	-	MS - CL - pH in Soils	RX
253952	Test 9	TP10	ES D	-	MS - CL - VOC and MBTEX	R
253952	Test 9	TP10	ES D	-	MS - CL - VPH	RX
253952	Test 9	TP10	ES D	-	MS - CL - pH in Soils	RX
253952	Test 9	TP10	ES D	-	MS - CL - pH in Soils (WAC)	RX
253953	Test 10	TP10	ES D	-	MS - CL - VPH	RX
253953	Test 10	TP10	ES D	-	MS - CL - pH in Soils	RX

L22/03999/GRM - 22-28428

Project Reference - P10056 New Victoria Office Block Manchester

HWOL TPH Acronym Index

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



A P P E N D I X J

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Date: 27th July 2022

Lab Ref: 66006

Order Ref: Project P10056

Site: New Victoria Office Block, Manchester.

Originator: Robert Crossland.

Samples: 21No borehole core samples, nominally 85mmØ, were sampled and delivered, by the client, to Kiwa CMT on 25th July 2022. Each of the samples were labelled, individually, with BH and depth range.

Requirements: To assess the individual samples for Point Load Index (15No) and UCS (6No) at the locations, and depths, delivered and requested by the client. Due to specimen suitability a total of 16No Point Load tests and 5No UCS tests were carried out.

Results: Tabulated values are included overleaf, detailing test results and sample location.

Kiwa CMT

G.Peach AMICT
Department Manager
Building Products

Test Results

Ref	Depth (m)	Test Type	I _s (MPa)	I _{s(50)} (MPa)	UCS (N/mm ²)
ROC1	3.98-4.05	PL	<0.020	<0.023	-
ROC1	5.07-5.19	PL	0.394	0.486	-
ROC1	6.33-6.46	PL	0.008	0.010	-
ROC1	7.70-7.95	PL*	<0.018	<0.022	-
ROC1	9.04-9.19	PL	0.068	0.078	-
ROC1	10.56-10.65	PL	<0.018	<0.022	-
ROC1	13.35-13.64	UCS	-	-	16.8
ROC1	15.73-15.83	PL	0.160	0.201	-
ROC1	16.92-17.13	PL	0.458	0.546	-
ROC1	18.13-18.39	UCS	-	-	16.0
ROC1	18.40-18.64	PL	0.240	0.269	-
ROC1	19.73-20.17	UCS	-	-	31.2
ROC1	21.67-21.84	PL	0.285	0.359	-
ROC1	22.70-22.81	PL	0.231	0.286	-
ROC1	22.96-23.14	UCS	-	-	13.3
ROC1	24.06-24.39	PL	0.585	0.711	-
ROC1	26.02-26.16	PL	0.394	0.468	-
ROC1	27.11-27.23	PL	0.836	0.973	-
ROC1	27.72-28.00	UCS	-	-	33.0
ROC1	28.12-28.28	PL	0.486	0.584	-
ROC1	30.06-30.16	PL	0.672	0.807	-

Kiwa CMT



G. Peach AMICT
Department Manager
Building Products

Comments:

$I_{s(50)}$ is the corrected Point Load strength when converted to a value of I_s that would have been measured by a diametral test with a $\varnothing$ of 50mm. All Point Load tests undertaken Axially.

Point load samples, highlighted in **BOLD**, failed under preloading of the samples (<0.1 kN) which is why a < X MPa has been reported – rather than a definitive point of failure as determined on the remaining samples.

The UCS results have taken into account the length to diameter ratio (2:1) in the calculation of compressive strength.

(*) Sample referenced RH01 7.70-7.95 was fractured on receipt and, as such, unsuitable for a UCS determination but was subjected to a Point Load determination in order to generate a test result at this depth/location.

Samples tested on the 26th July 2022.

Kiwa CMT

A handwritten signature in black ink, appearing to read "G. Peach".

G. Peach AMICT
Department Manager
Building Products

Kiwa CMT



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Date: 8th August 2022

Lab Ref: 66017

Order Ref: Project P10056

Site: New Victoria Office Block, Manchester.

Originator: Robert Crossland.

Samples: 43No borehole core samples, nominally 85mmØ, were sampled and delivered, by the client, to Kiwa CMT on 1st August 2022. Each of the samples were labelled, individually, with BH (RC02 and RC03) and depth range.

Requirements: To assess the individual samples for Point Load Index (30No) and UCS (13No) at the locations, and depths, delivered and requested by the client.

Results: Tabulated values are included overleaf, detailing test results and sample location.

Kiwa CMT

G. Peach AMICT
Department Manager
Building Products

Test Results – RC02

Ref	Depth (m)	Test Type	I _s (MPa)	I _{s(50)} (MPa)	UCS (N/mm ²)
RC02	5.20 – 5.34	PL1	0.165	0.197	-
RC02	6.61 – 6.71	PL2	0.151	0.179	-
RC02	7.18 – 7.37	UCS1	-	-	3.1
RC02	8.12 – 8.24	PL3	0.312	0.377	-
RC02	9.60 – 9.70	PL4	0.064	0.079	-
RC02	11.01 – 11.40	UCS2	-	-	7.6
RC02	11.60 – 11.76	PL5	0.241	0.296	-
RC02	13.01 – 13.12	PL6	0.435	0.536	-
RC02	14.12 – 14.38	UCS3	-	-	10.4
RC02	14.38 – 14.55	PL7	0.336	0.408	-
RC02	16.04 – 16.27	PL8	0.299	0.363	-
RC02	17.16 – 17.30	UCS4	-	-	10.6
RC02	17.87 – 17.95	PL9	>0.018	>0.021	-
RC02	19.35 – 19.45	PL10	>0.015	>0.019	-
RC02	20.02 – 20.28	UCS5	-	-	13.6
RC02	20.28 – 20.45	PL11	0.345	0.417	-
RC02	22.16 – 22.33	PL12	0.410	0.487	-
RC02	23.09 – 23.36	PL13	1.190	1.416	-
RC02	24.66 – 25.10	UCS6	-	-	37.9
RC02	25.11 – 25.35	PL14	0.578	0.691	-
RC02	26.70 – 26.87	PL15	0.686	0.820	-
RC02	28.00 – 28.21	PL16	0.632	0.751	-
RC02	29.20 – 29.32	PL17	0.614	0.744	-
RC02	29.41 – 29.81	UCS7	-	-	33.6

Kiwa CMT



G. Peach AMICT
Department Manager
Building Products

Test Results – RC03

Ref	Depth (m)	Test Type	I _s (MPa)	I _{s(50)} (MPa)	UCS (N/mm ²)
RC03	8.24 – 8.46	UCS1	-	-	5.8
RC03	8.46 – 8.60	PL1	0.204	0.247	-
RC03	9.88 – 10.02	PL2	0.136	0.165	-
RC03	10.97 – 11.10	PL3	0.221	0.250	-
RC03	13.00 – 13.12	PL4	0.551	0.661	-
RC03	13.50 – 13.73	UCS2	-	-	9.4
RC03	14.08 – 14.25	PL5	0.235	0.281	-
RC03	16.13 – 16.25	PL6	0.182	0.222	-
RC03	17.26 – 17.51	UCS3	-	-	14.0
RC03	18.33 – 18.46	PL7	0.211	0.254	-
RC03	20.08 – 20.37	PL8	0.218	0.265	-
RC03	21.72 – 21.85	PL9	0.374	0.453	-
RC03	23.13 – 23.44	UCS4	-	-	32.2
RC03	23.73 – 23.87	PL10	0.456	0.559	-
RC03	25.04 – 25.42	PL11	0.409	0.486	-
RC03	26.27 – 26.58	UCS5	-	-	21.0
RC03	27.47 – 27.59	PL12	0.299	0.364	-
RC03	28.50 – 28.93	PL13	0.361	0.431	-
RC03	29.08 – 29.82	UCS6	-	-	22.2

Kiwa CMT



G. Peach AMICT
 Department Manager
 Building Products

Comments:

$I_{s(50)}$ is the corrected Point Load strength when converted to a value of I_s that would have been measured by a diametral test with a $\varnothing$ of 50mm. All Point Load tests undertaken Axially.

Point load samples, highlighted in **BOLD**, failed under preloading of the samples (<0.1 kN) which is why a < X MPa has been reported – rather than a definitive point of failure as determined on the remaining samples.

The UCS results have taken into account the length to diameter ratio (2:1) in the calculation of compressive strength.

Samples tested for UCS on the 1st August 2022. Samples tested for Point Load on the 8th August 2022.

Kiwa CMT

A handwritten signature in black ink, appearing to read "G. Peach".

G.Peach AMICT
Department Manager
Building Products



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	GRM TIER 1 ASSESSMENT CRITERIA		
LAND USE	Commercial Industrial		
CONTAMINANT	1%	2.50%	6%
^a Arsenic	640	640	640
^a Cadmium	410	410	410
^b Chromium III	8600	8600	8600
^a Chromium VI	49	49	49
^a Lead	2330	2330	2330
^{b/c} Mercury	1100	1100	1100
^b Selenium	12000	12000	12000
^b Nickel	980	980	980
^b Phenols	760	1500	3200
^b Copper	68000	68000	68000
^b Zinc	730000	730000	730000
^d Cyanide	280	280	280
^b Benzene	27	47	90
^b Toluene	56000	110000	180000
^b Ethylbenzene	5700	13000	27000
^b <i>o</i> - xylene	6600	15000	33000
^b <i>m</i> - xylene	6200	14000	31000
^b <i>p</i> - xylene	5900	14000	30000
Non Genotoxic PAHs			
^b Acenaphthene	84000	97000	100000
^b Acenaphthylene	83000	97000	100000
^b Anthracene	520000	540000	540000
^b Fluoranthene	23000	23000	23000
^b Fluorene	63000	68400	70800
^b Naphthalene	190	460	1100
^b Phenanthrene	22000	22000	23000
^b Pyrene	54000	54000	54000
Genotoxic PAHs			
^{a/e} Benzo(a)pyrene	76	76	76
ALIPHATIC HYDROCARBONS			
^b C5-C6	3200	5900	12000
^b C6-C8	7800	17000	40000
^b C8-C10	2000	4800	11000
^b C10-C12	9700	23000	47000
^b C12-C16	59000	82000	90000
^b C16-35	1600000	1700000	1800000
AROMATIC HYDROCARBONS			
^b C5-7 (benzene)	26000	46000	86000
^b C7-8 (toluene)	56000	110000	180000
^b C8-C10	3500	8100	17000
^b C10-C12	16000	28000	34000
^b C12-C16	36000	37000	38000
^b C16-C21	28000	28000	28000
^b C21-C35			

Notes

- a C4SL - SP1010 (2014) - Benzene and Benzo(a)pyrene values for 1% and 2.5% SOM have been calculated using default C4SL parameters in CLEA v1.07
- b LQM/CIEH S4UL values (2015).
- c S4UL for inorganic Hg used.
- d Atkins ATRISKsoil Value
- e Benzo(a)pyrene is a surrogate marker for the 8 genotoxic PAHs (Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(ah)anthracene, Ideno(1,2,3-cd)pyrene)

GRM TAC 11-2016

Contaminant Thresholds for Subsurface Water Pipes

Contaminant	Thresholds (mg/kg)
Corrosion	
Wrapped Steel	pH<7 Cond >400µS/cm
Wrapped Ductile Iron	pH<5 Cond >400µS/cm, he not neutral
Copper	pH<5 >8 and Eh +ve
Toxic Substances	
Chromium (total) (Cr)	Applies to above pipe materials
Organic Contaminants	
VOC's	0.5 PE/0.125 PVC
BTEX & MTBE	0.1 PE/0.03 PVC
SVOC	2 PE/1.4 PVC
Phenols	2 PE/0.4 PVC
Cresols & Chlorinated Phenols	2 PE/0.04 PVC
Mineral Oil C11-C20	10 PE
Mineral Oil C21 - C40	500
Ether/Ketone/Amines, Nitrobenzene/Aldehydes	0.5 PE/0.02-1 PVC

Notes.

It is not recommended that water pipes should be laid in sites where these substances are identified or suspected
Local Utility Companies should be consulted prior to pipe specifications being finalised.

Ref: Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. UKWIR Ref. No. 10/WM/03/21. 2010.



A P P E N D I X L

Land Appraisal | Environmental | Geotechnical | Design | Mining | Inspections

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Waste Classification Report

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

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



ON9EE-BF1BQ-AT212

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

Job name

P10056 - New Victoria Office Block

Description/Comments

Assessment based upon chemical data obtained from ground investigation.

Project

P10056

Site

Manchester

Classified by

Name:

Charlotte Mortimer

Company:

GRM Development Solutions Ltd

Date:

19 Aug 2022 11:10 GMT

Telephone:

01283 551 249

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

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Most recent 3 year Refresher

Date

19 Sep 2017

07 Dec 2021

Next 3 year Refresher due by Dec 2024

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01	0.5	Hazardous	HP 7	3
2	TP01[2]	1	Hazardous	HP 7	6
3	TP01[3]	2	Non Hazardous		9
4	TP02	0.5	Hazardous	HP 7, HP 11	11
5	TP02[2]	1	Non Hazardous		14
6	TP02[3]	1.5	Non Hazardous		16
7	TP03	0.5	Non Hazardous		18
8	TP03[2]	1	Hazardous	HP 7, HP 11	20
9	TP04	0.5	Non Hazardous		23
10	TP05	0.7	Hazardous	HP 7, HP 11	25
11	TP05[2]	1.3	Non Hazardous		28
12	TP04[2]	1	Non Hazardous		30
13	TP06	0.5	Non Hazardous		32
14	TP06[2]	1	Hazardous	HP 8	34
15	TP06[3]	3	Hazardous	HP 8	36
16	TP07	0.5	Non Hazardous		38
17	TP07[2]	1.3	Hazardous	HP 7	40
18	TP08	1	Non Hazardous		43
19	TP08[2]	1.6	Non Hazardous		45
20	TP08[3]	2.5	Hazardous	HP 7	47
21	TP09	0.5	Hazardous	HP 7, HP 11	50
22	TP09[2]	2	Hazardous	HP 7, HP 14	53
23	TP09[3]	2.8	Hazardous	HP 7, HP 14	56
24	TP10	0.5	Hazardous	HP 8	59
25	TP10[2]	1.9	Non Hazardous		61