



Client:

Renaker Build Ltd.
1st Floor, NQ Building
47 Bengal Street
Ancoats
Manchester
M4 6BB

Contractor:

Verification and Validation Report

Crown Street Phase 2 Tower C5, Manchester, Soils Verification

April 2024

Site Ref: 6129/VCV V1.00 VRTD

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Verification and Validation Report

1. Introduction

This report has been produced in order to provide information to verify the efficacy of the minor remediation measures (imported landscaping soils) as detailed within the WSP Phase II environmental Assessment Report referenced 70059549-11515(3) and dated February 2020. The measures detailed in the WSP Phase II report were submitted under planning permission numbers 126668/FO/2020 for the erection of two 52-storey residential buildings (Use Class C3) each incorporating a podium accommodating residential amenity facilities and ground floor and first floor commercial units (Use Classes A1, A2, A3, or D1), private and public basement car parking, landscaping and a public park, servicing and access arrangements, highways improvements, and associated works. Outline planning permission for an educational facility (Use Class D1). The report presents the validation of soils imported to site as part of the landscaping scheme for building C5 as demarked by the blue line on the plan in Appendix A to this report. The evidence provided will demonstrate that the soft landscaping on plot C5 is suitable for the intended use.

The approximate grid reference for the centre of the site is 3838196, 397227 and the total area of the site is approximately 3050 m². The area of the site is outlined with a red line on the site plan in Appendix A1.

2. Description of the Site

2.1 Previous

The approximate grid reference for the centre of the Site is 3838196, 397227 and the total area of the application site is approximately 1.1ha. The area covered by the Phase II Ground Investigation is outlined with a red line on the Site plan in Appendix A1 and extends only to the built element of the proposal.

The site comprises a largely triangular area of land located between Silvercroft Street, Crown Street, and the Mancunian Way, located approximately 350m to the southwest of Manchester Deansgate Station in the Castlefield area of Manchester. The approximate centre of the site is located a National Grid Reference 3838196, 397227. The site was formerly used as a site compound for construction works on an adjacent development. However, previous to this, its established use was as a surface level car park. Recorded ground levels are between 32.5m and 33.3mAOD. Surfacing across the site comprised a mixture of tarmac, concrete and cobble setts and vegetation was limited to the southern boundary. The Site can be accessed from a slip road off the Mancunian Way or from Great Jackson Street, which has linkages across the City Centre.

2.2 Present Development

Two number residential tower blocks buildings, to 21 (66m) and 51 (152.4m) storeys height respectively

In summary, the development incorporates

- Erection of two 51-storey residential buildings (Use Class C3) incorporating a shared podium accommodating residential amenity facilities and ground floor commercial units (Use Class A1, A2, A3, & D1)
- Each building has separate private car and cycle parking within a three-storey basement.
- A three-storey basement public car park with access on to Silvercroft Street.
- A new public park.
- Landscaping and public realm works.
- A highways and servicing route.
- A single-form entry primary school (Use Class D1)

The three levels of basement car parking will cover the vast majority of the site area, necessitating the removal of existing soils to approximately 10-12m bgl.

3. Background Information

3.1 History of the Site

More Comprehensive information regarding the historical use of the site can be found in the Phase I report for the site undertaken by WSP and referenced 70059549-11451.

3.2 Previous Investigations

The following site investigation reports and advice notes are known to have been produced for this site and have been referenced where considered appropriate. A very brief description of the information contained within is also provided.

Author	Date	Ref	Title / description
WSP	2019	70059549-11451	Full Phase I Preliminary Contaminated Land Risk Assessment & Desk Based Study to inform intrusive works
WSP	February 2020	70059549-11515(3)	Combined Phase II Contaminated Land Risk Assessment & Remediation Plan.
GeoAssist Ltd	July 2023	6129 VCV	Validation & Remediation Report for Crown Street Phase2 for sitewide earthworks and tower C4 Landscaping

4. Remediation

4.1 Methodology

A simple and controlled civil engineering removal of made ground as part of site preparation and enabling works. The final proposed scheme for the site involved the significant removal of near surface soils over the entire area of the site and replacement at a reduced level with standard construction materials such as crushed rock sub-base and waterproof concrete slabs, or hardstanding. This has removed any made ground and hence precludes any possibility of sources of contamination impacting receptors.

The remediation methodology pursued on this site follows a relatively simple engineering approach involving the removal of significant quantity of subsoils in order to form the basement carpark levels of the site. The earthworks phase of the construction has reduced the site levels to bedrock and removed the made ground. Moreover, the final landscape plan is constructed mainly of hardstanding with newly formed planters within concrete slabs utilising imported topsoil as a growth medium.

4.2 Remediation Objectives

The objectives of the remediation is to ensure that risks from isolated occurrences of elevated levels of Lead and PAH identified in the WSP Phase II Ground Investigation in the upper made ground in localised pockets are removed and as a consequence the residual risks are reduced to an acceptable level for residential (without home Grown Produce) use following implementation of the final landscaping plan.

4.3 Verification Plan

The nature of the development has precluded the requirement for validation sampling once reduced levels were achieved, as the final scheme is constructed almost entirely of hardstanding with only very limited planting normally in raised planters or sunken beds in suspended concrete slabs. It is documented that approximately 71,625m³ of made ground, natural drift deposits and bedrock have been removed from site as part of the site preparation and earthworks.

5. Verification

5.1 Volumes of Soils Removed from Site.

Verification of the earthworks for the site was presented in the previous GeoAssist Report Referenced I section 3.0 of this report.

5.2 Volumes of Imported Soils.

The final landscaping of the scheme for building C5 (outlined in blue in appendix A1) has now been undertaken as specified. Approximately 305tons of topsoil has been imported for the Landscaping and planters within the blueline area in the vicinity of building C5.

The soils were cleared for import based on the supplier declared certification (Appendix B2). Soils as imported were then sampled and tested. The Soils as imported were found to conform with the generic assessment criteria for residential without homegrown produce land use. Photographic evidence along with a plan of the soils sampling locations are presented in appendix C1 to this report. The Soils laboratory analytical results form appendix C2, the soils risk assessment forms appendix C3 to this report and the trial pit logs form appendix C4.

5.3 Chemical & Physical Testing to Confirm Compliance with Objectives

Other than the afore mentioned soil testing certification for confirmation that the soils are low risk no additional chemical or physical test results were required to be undertaken for the earthworks phase of the planning permission.

5.4 Ongoing Monitoring

There is no ongoing monitoring programme associated with any remedial measures for this site.

6. Final Site Conditions

At present the area surrounding building C5 is nearing completion. The final development landscape plan is included within appendix A1.

Evidence provided herein demonstrates that the made ground materials have been removed and suitable growth medium has been imported for the final landscaping scheme. Insitu testing of imported soils has demonstrated that the soils are suitable for incorporation into the development and that they do not pose a risk to site end users by means of substances within. The site has been developed in accordance with the planning requirements for contaminated land.

The developer and all contractors employed by the developer were required to monitor for, and report any, evidence of contamination found during construction that had not been previously identified within the Ground Investigations. None was encountered or reported.

The evidence presented herein demonstrates that all reasonably practicable steps as set out in the Remediation Plan have been taken to ensure the site is fit for residential purposes and the risk to the occupiers from ground contamination is low to negligible in all reasonably foreseeable circumstances.



Matthew Benson BSc
Geotechnical/Environmental Engineer



Mark Richardson MSc CEng MICE
Technical Director

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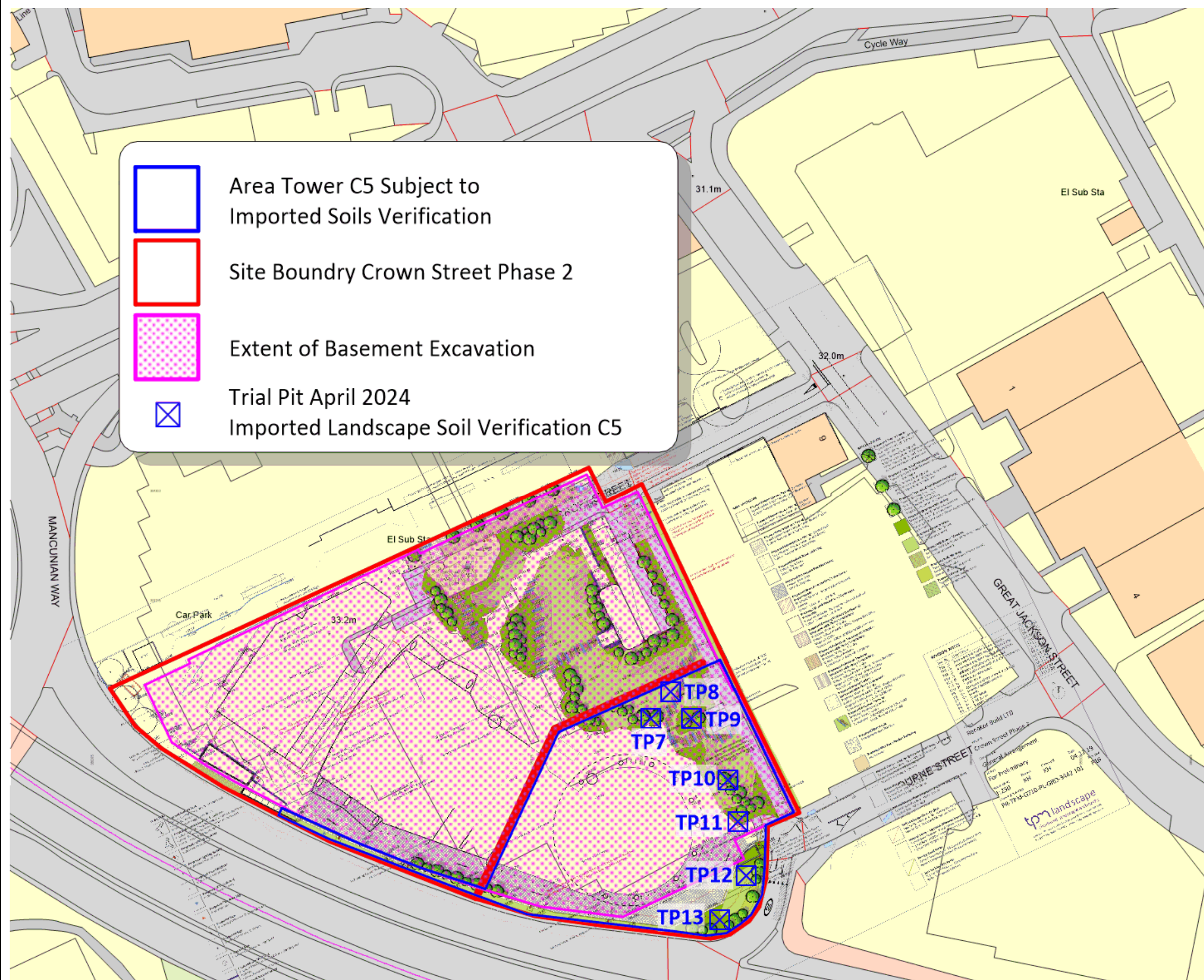
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Appendix A

A1 Site Plan

A1 Site Plan

Site Name	Crown Street Phase 2 Tower C5
Location	Manchester
GeoAssist Ref	6129VCV
Client	Renaker Build Limited
	Renaker Build Ltd. 1st Floor, NQ Building 47 Bengal Street Ancoats Manchester M4 6BB
Planning Consultant	
NGR (centre of site)	3838196,397227
Production Date	April 2024
Survey Method	
Surveyor	Others
Status	Final v1.00
Base Survey	OSGB36



Appendix B

- B1 Soil Import Notes
- B2 Supplier Declared Soils Analysis

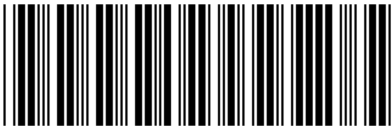
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Details			
Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19060		
Signed By:		Signed By: M smith	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 18/04/2024	Signed At: 0725
Departed On:	Departed At:	Departed On:	Departed At:

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Details			
Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19220		
Signed By:		Signed By: Rehman Afzal	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 26/03/2024	Signed At: 1016
Departed On:	Departed At:	Departed On:	Departed At:

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Details			
Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	X300RBS	Job Type	AGG
Driver:	KAMIL PASULA		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19280		
Signed By:		Signed By: Scott forseasons	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 27/03/2024	Signed At: 0936
Departed On:	Departed At:	Departed On:	Departed At:

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Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19220		
Signed By:		Signed By: R howarth	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 28/03/2024	Signed At: 0810
Departed On:	Departed At:	Departed On:	Departed At:

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Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19180		
Signed By:		Signed By: Scott oleary	
Signature:		Signature:	
			
Signed On:	Signed At:	Signed On: 27/03/2024	Signed At: 1026
Departed On:	Departed At:	Departed On:	Departed At:

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		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	18880		
Signed By:		Signed By: R howarth	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 27/03/2024	Signed At: 0758
Departed On:	Departed At:	Departed On:	Departed At:

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		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	X400RBS	Job Type	AGG
Driver:	GARY MILLER		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	18960		
Signed By:		Signed By: garymiller	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 28/03/2024	Signed At: 0815
Departed On:	Departed At:	Departed On:	Departed At:

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		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	18980		
Signed By:		Signed By: Rehman afzal	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 28/03/2024	Signed At: 1220
Departed On:	Departed At:	Departed On:	Departed At:

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Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	21380		
Signed By:		Signed By: R howarth	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 28/03/2024	Signed At: 1008
Departed On:	Departed At:	Departed On:	Departed At:

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Collect From		Deliver To	
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		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W100RBS	Job Type	AGG
Driver:	JORDAN HASLAM		
Products:	GRADE 1 TOPSOIL [BS3882]		
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Signed By:		Signed By: R howarth	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 02/04/2024	Signed At: 1007
Departed On:	Departed At:	Departed On:	Departed At:

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Details			
Collect From		Deliver To	
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		M15 4AX	
Contact		Contact	
Tel		Tel	
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Registration:	V600RBS	Job Type	AGG
Driver:	SAM BLAKE		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19460		
Signed By:		Signed By: Paul ashton	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 05/04/2024	Signed At: 0957
Departed On:	Departed At:	Departed On: 05/04/2024	Departed At: 0957

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Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
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Tel		Tel	
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Registration:	V600RBS	Job Type	AGG
Driver:	SAM BLAKE		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19400		
Signed By:		Signed By: Mark digiorgi	
Signature:		Signature: 	
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Departed On:	Departed At:	Departed On: 05/04/2024	Departed At: 1413

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		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
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Driver:	JOHN MULCROW		
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Departed On:	Departed At:	Departed On: 05/04/2024	Departed At: 0817

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		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	V700RBS	Job Type	AGG
Driver:	PETER CRAINE		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19220		
Signed By:		Signed By: Scott oleary	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 05/04/2024	Signed At: 1020
Departed On:	Departed At:	Departed On: 05/04/2024	Departed At: 1021

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Collect From		Deliver To	
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		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W600RBS	Job Type	AGG
Driver:	BILLY VICKERS		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	19760		
Signed By:		Signed By: Scottoleary	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 05/04/2024	Signed At: 1009
Departed On:	Departed At:	Departed On: 05/04/2024	Departed At: 1010

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Details			
Collect From		Deliver To	
		FOUR SEASONS LAWN AND GARDE C/O RENEKAR CROWN STREET MANCHESTER	
		M15 4AX	
Contact		Contact	
Tel		Tel	
Customer:	4 SEASONS GARDEN AND MAINTENANCE	Reference	
Registration:	W800RBS	Job Type	AGG
Driver:	GARY MILLER		
Products:	GRADE 1 TOPSOIL [BS3882]		
Weight:	18060		
Signed By:		Signed By: M Digiorgi	
Signature:		Signature: 	
Signed On:	Signed At:	Signed On: 12/04/2024	Signed At: 0827
Departed On:	Departed At:	Departed On:	Departed At:

Soil Quality & Contamination Test

14 December 2023

Cheshire Soils and Aggregates Ltd
Lydiate Lane, Thornton, Liverpool

Report by Mr Louis Turner BSc (Hons)
Supervised by Mr Joseph Turner

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5. References

1. Introduction

The following document provides details of a Soil Contamination & Quality Test carried out by Oakshire Environmental, and includes a description of the site, proposed project, sampling methodology, testing methodology and an evaluation laboratory testing.

1.1 Project Overview

Soil testing has been requested by the client, to identify the quality and contamination of sampled soil from the site and assess the suitability for re-use. Oakshire Environmental will carry out Soil Quality & Contamination Testing, including delivery and collection of a soil test kit, as described below.

1.2 Purpose of Investigation

The objectives of the Soil Quality & Contamination Testing will be to:

- Identify chemical and physical properties of sampled soil.
- Assess the risk to human health and the environment.
- Determine the suitability of sampled soil for use as a growing medium.
- Classify sampled soil according to British Standard Institute specification for topsoil (BS 3882).
- Assess the requirement for further investigations or treatment.

1.3 Scope of Work

- Brief introductory information will be noted to provide context to the report and will include an Introduction, Project Overview, Scope of Work and Limitations.
- In order to identify chemical and physical properties of sampled soil, 1 x sample will be taken by the client from soil at the site and analysed for Soil Texture, Stone Content, Loss On Ignition, pH, Carbonate, Nitrogen, Phosphorus, Potassium, Magnesium, Carbon:Nitrogen ratio, Electrical Conductivity, Exchangeable Sodium, Visual contaminants, Metals (As,Be,Cd,Cu,Pb,Hg,Ni,Se,V,Zn), Chromium (III & VI), Phenols, Polycyclic Aromatic Hydrocarbons (PAHs), BTEX & MTBE, Total Petroleum Hydrocarbons (TPHs) CWG (Aliphatic/ Aromatic), pH and Asbestos (Qualitative) in a UKAS accredited laboratory.
- Results of laboratory testing will be assessed with reference to suitable screening values, including British Standard Institute specification for topsoil (BS 3882:2015) and Generic Assessment Criteria (GAC), to determine the suitability of sampled soil for use as a growing medium and classify sampled soil according to British Standard Institute specifications.
- This information will be used to provide a clear, easy to understand and actionable summary of results, and determine the requirement for further investigations or remediation.
- Report to be carried out, by professional Environmental Consultants with BSc (Hons) in Environmental Science or above, in accordance with appropriate technical guidelines, which may include Environment Agency Land Contamination: Risk Management (LCRM) guidelines, WM3 Technical Guidance, British Standards Institute and Oakshire Environmental reporting guidelines.

1.4 Limitations

Quantum Intelligent Trading Ltd is previously and hereafter referred to as "Oakshire Environmental" or "the company". Oakshire Environmental has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant when undertaking works of this nature. This report is only valid when used in its entirety and any information or advice contained within the report should not be relied upon until considered in the context of the whole report. Oakshire Environmental disclaims any responsibility to the client, as named on the front of this report ("the client"), and others in respect of any matters outside the scope of this work. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate. This report has been prepared solely for the benefit of the client and any other party using or placing reliance upon any information contained in this report does so at their own risk. Oakshire Environmental accepts no responsibility or liability for the contents of this report being used for any purpose or project for which it was not commissioned. Oakshire Environmental accepts no liability whatsoever for any loss or damage arising from the interpretation or use of this report and in no event shall the company be liable for any punitive, exemplary or other special damages, or for any indirect, incidental or consequential damages, including with respect to the performance or non-performance of any services, whether arising under breach of contract, tort or any other legal theory, and regardless of whether the company has been advised of, knew of, or should have known of the possibility of such damages. Furthermore, Oakshire Environmental does not accept any liability for the consequences of any legislative changes or the release of subsequent guidance documentation and following delivery of the report has no obligation to advise the client or any other party of such changes or their repercussions.

This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

Oakshire Environmental cannot be held responsible for incorrect analysis of samples. The information and conclusions provided in this report are limited to, and representative of, the samples taken and cannot be extended to apply to the whole site, in addition, Oakshire Environmental cannot guarantee the accuracy of analysis for samples not taken at the source by the company or those which deviate due to exceedance of holding time or inappropriate sampling practises. The findings and/or recommendations of this report do not take into account any conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

2. Site

The following section describes the site and outlines the details of proposed project.

2.1 Site Description and Location

The site is located off Lydiate Lane, Thornton, Liverpool.

2.2 Proposed Project

Soil testing has been requested by the client, to identify the quality and contamination of sampled soil from the site and assess the suitability for re-use, in addition to, classifying soil according to British Standard Institute specifications.

3. Methodology

3.1 Sampling Methodology

One sample was taken by the client, on 29th November 2023, from stockpiled topsoil at the site and placed into sample containers. Sample containers used for analysis of volatile contaminants were filled as much as possible without air spaces as volatile compounds can be lost into these spaces.

3.2 Health & Safety

When collecting potentially contaminated soil samples it must be assumed that the soil is contaminated in order to protect the health of the assessor, Personal Protective Equipment (PPE) was used during the sampling process to mitigate this risk. Sample containers were packed with biodegradable fill for protection and placed in a sealed container for transportation to the laboratory.

3.3 Testing Methodology

UKAS accredited laboratory testing included a comprehensive suite of contaminants, including Soil Texture, Stone Content, Loss On Ignition, pH, Carbonate, Nitrogen, Phosphorus, Potassium, Magnesium, Carbon:Nitrogen ratio, Electrical Conductivity, Exchangeable Sodium, Visual contaminants, Metals (As,Be,Cd,Cu,Pb,Hg,Ni,Se,V,Zn), Chromium (III & VI), Phenols, Polycyclic Aromatic Hydrocarbons (PAHs), BTEX & MTBE, Total Petroleum Hydrocarbons (TPHs) CWG (Aliphatic/Aromatic), pH and Asbestos (Qualitative).

4. Evaluation of Results

4.1 Screening Values

Results of laboratory testing of soil samples were analysed by comparing them to industry standard screening values used for risk assessments. These are specific to the proposed land use and depend on the pathways present at a particular site. Exposure pathways considered include direct soil and indoor dust ingestion, skin contact with soils and dust, inhalation of vapours in indoor airspace, ingestion of homegrown produce, permeation into and/or corrosion of water pipes and leaching of contaminants through soil. It should be noted that not all of these pathways will be relevant at the site and the most appropriate screening values available have been used to assess the results. Screening values take a conservative approach to assessing potential risk and concentrations below these values can be considered to represent 'uncontaminated conditions' which pose 'LOW' risk based on the land use.

In addition, results of laboratory testing of soil samples were analysed by comparing them to threshold values set out in the British Standard for Topsoil (BS3882:2015 - Specification for Topsoil) guidance. These values provide maximum threshold limits and ideal ranges for soil parameters to determine its suitability for general purpose landscaping or specific purposes.

It is important to note that exceedance of a relevant screening value does not necessarily constitute evidence of either a 'significant possibility of significant harm' or the need for remediation. Rather such exceedance should usually trigger a further detailed quantitative risk assessment, where site-specific parameters are used to derive site-specific assessment criteria. Common sense tells us, and a robust risk evaluation reveals, that a gross exceedance is a good indicator that an unacceptable risk is present.

4.2 Summary of Results (Contamination)

- Heavy metal concentrations were all low
- pH was slightly acidic in sampled soil
- Phenols (total) concentrations were below the laboratory limit of detection
- Total Organic Carbon was low, suggesting the soil has a low organic matter content
 - Soils with low organic matter content will allow hydrocarbons to leach through the soil more easily as these organic contaminants would usually adsorb to organic matter particles
- Polycyclic Aromatic Hydrocarbons (PAHs) concentrations were very low
- BTEX & MTBE concentrations were below the laboratory limit of detection
- Total Petroleum Hydrocarbons (TPHs) concentrations were below the laboratory limit of detection
- No Asbestos was detected in sampled soil

4.3 Summary of Results (BS3882)

- None of the potentially phytotoxic contaminants tested were above the threshold values
- Carbonate content was low and sampled soil is considered to be non-calcareous
- Electrical conductivity value was moderate but should not present issues with deficiencies in available plant nutrients
- The Carbon:Nitrogen ratio of sampled soil exceeded the threshold for multipurpose topsoil
- Sampled soil was adequately supplied with organic matter
- pH was slightly acidic and would be suitable for use as multipurpose topsoil
- Sampled soil is deficient in Total Nitrogen
- Concentrations of Extractable Magnesium and Extractable Phosphate were within an ideal range for multipurpose topsoil
 - Sampled soil is slightly deficient in Extractable Potassium
- Sampled soil has a sandy loam texture, which should not present issues with permeability, structural degradation or compaction and is, therefore, considered to be suitable for use as multipurpose topsoil
- Sampled soil was stone free, which should not restrict the soil's suitability for use as multipurpose topsoil
- No visible contaminants, plastics or sharps were identified in sampled soil

4.4 Conclusions

Based on the results of laboratory testing, sampled soil is considered to be uncontaminated, suggesting a low risk to human health and the environment. Sampled soil is deficient in Nitrogen and slightly deficient in Extractable Potassium.

It should be noted that the potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the contaminant linkage on a receptor, if it is assumed to be present, and the probability of the contaminant linkage being present.

5. References

Environment Agency *Land contamination: risk management*. [online] Available at: <gov.uk/guidance/land-contamination-how-to-manage-the-risks>.

DEFRA. *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination*.

Nathanail, C.P.; McCaffrey, C.; Gillett, A.G.; Ogden, R.C. & Nathanail, J.F. *The LQM/CIEH S4ULs for Human Health Risk Assessment*.

USEPA. *Regional Screening Levels (RSLs)*. [online] Available at: <epa.gov/risk/regional-screening-levels-rsls>.

BSI (2015) *BS 3882:2015 - Specification for topsoil*.

Oakshire Environmental Available at: <oakshireenvironmental.co.uk>

		Sample Location			S01 (Topsoil)
		Sample Depth (m)			0.20
		Sampling Date			29/11/2023
Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Moisture Content	N	%	0.1	13.6	
Material removed	N	%	0.1	< 0.1	
Description of Inert material removed	N		0	None	
Metals					
Arsenic	M	mg/kg	0.5	11.4	
Beryllium	M	mg/kg	0.5	0.8	
Cadmium	M	mg/kg	0.2	< 0.2	
Chromium	M	mg/kg	1	23.9	
Chromium (III)	N	mg/kg	5	23.9	
Copper	M	mg/kg	4	44.0	
Lead	M	mg/kg	1	96.7	
Mercury	M	mg/kg	0.1	0.3	
Nickel	M	mg/kg	1	21.7	
Selenium	M	mg/kg	1	< 1.0	
Vanadium	M	mg/kg	0.5	29.8	
Zinc	M	mg/kg	4.5	73.8	
Inorganics					
Carbonate	N	%	0.1	0.8	
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	
Miscellaneous					
Electrical Conductivity (CaSO4 extract)	N	uS/cm	50	2160	
Carbon Nitrogen Ratio	N	ratio	0.1	28.4	
Loss on Ignition	M	%	0.01	3.09	
pH	M	pH units	0.1	6.8	
Density	N	g/ml	0	1.30	
Total Carbon	N	%	0.01	1.8	
Total Organic Carbon	N	%	0.01	1.3	
Total Nitrogen	N	%	0.01	0.06	
Extractable Potassium	N	mg/l	20	95	
Extractable Magnesium	N	mg/l	20	106	
Extractable Phosphate	N	mg/l	1	67	
Sand content	NS	%	1	72	
Silt content	NS	%	1	17	
Clay content	NS	%	1	11	
Stones > 2mm	NS	%	1	< 1	
Stones > 20mm	NS	%	1	< 1	
Stones > 50mm	NS	%	1	< 1	
Total Visible Contaminants	N	%	0.01	< 0.01	
Plastics	N	%	0.01	< 0.01	
Sharps	N	n/kg	0	0	
Phenols					
Phenol	M	mg/kg	1	< 1	
M,P-Cresol	N	mg/kg	1	< 1	
O-Cresol	N	mg/kg	1	< 1	
3,4-Dimethylphenol	N	mg/kg	1	< 1	
2,3-Dimethylphenol	M	mg/kg	1	< 1	
2,3,5-trimethylphenol	M	mg/kg	1	< 1	
Total Monohydric Phenols	N	mg/kg	5	< 5	
Polyaromatic hydrocarbons					
Naphthalene	N	mg/kg	0.1	< 0.1	
Acenaphthylene	N	mg/kg	0.1	< 0.1	
Acenaphthene	N	mg/kg	0.1	< 0.1	
Fluorene	N	mg/kg	0.1	< 0.1	
Phenanthrene	N	mg/kg	0.1	0.4	
Anthracene	N	mg/kg	0.1	0.1	
Fluoranthene	N	mg/kg	0.1	0.8	
Pyrene	N	mg/kg	0.1	0.7	
Benzo(a)anthracene	N	mg/kg	0.1	0.3	
Chrysene	N	mg/kg	0.1	0.5	

Benzo(b)fluoranthene	N	mg/kg	0.1	0.4
Benzo(k)fluoranthene	N	mg/kg	0.1	0.5
Benzo(a)pyrene	N	mg/kg	0.1	0.5
Indeno(1,2,3-cd)pyrene	N	mg/kg	0.1	0.3
Dibenzo(a,h)anthracene	N	mg/kg	0.1	0.1
Benzo[g,h,i]perylene	N	mg/kg	0.1	0.3
Total PAH(16)	N	mg/kg	0.4	5.2
BTEX				
Benzene	M	ug/kg	10	< 10.0
Toluene	M	ug/kg	10	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0
Xylenes	M	ug/kg	10	< 10.0
MTBE	N	ug/kg	10	< 10.0
TPH CWG				
>C5-C6 Aliphatic (HS_1D_MS_AL)	N	mg/kg	0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS_AL)	N	mg/kg	0.01	< 0.01
>C8-C10 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0
>C10-C12 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0
>C12-C16 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0
>C16-C21 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0
>C21-C35 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0
>C35-C40 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0
Total (>C5-C40) Aliphatic (HS_1D_MS+EH_CU_1D_AL)	N	mg/kg	1	< 1.0
>C5-C7 Aromatic (HS_1D_MS_AR)	N	mg/kg	0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS_AR)	N	mg/kg	0.01	< 0.01
>C8-C10 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0
>C10-C12 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0
>C12-C16 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0
>C16-C21 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0
>C21-C35 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0
>C35-C40 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0
Total (>C5-C40) Aromatic (HS_1D_MS+EH_CU_1D_AR)	N	mg/kg	1	< 1.0
Total (>C5-C40) Ali/Aro (HS_1D_MS+EH_CU_1D_Total)	N	mg/kg	1	< 1.0

Depth (m)	Sample Location	Description of Sample Matrix	Asbestos Identification
0.20	S01 (Topsoil)	Brown Sandy Soil,Stones,Clinker	No asbestos detected

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Acid neutralisation capacity	N	Air dried sample	06/12/2023		
Extractable cations - BS3882	N	Air dried sample	07/12/2023		ICPMS
Visible Contaminants	N		05/12/2023		
Hexavalent chromium	N	As submitted sample	05/12/2023	110	Colorimetry
pH	M	Air dried sample	08/12/2023	113	Electromeric
Electrical conductivity of soil	N	Air dried sample.	08/12/2023	114	Electromeric
Phenols in solids	M	As submitted sample	04/12/2023	121	HPLC
Loss on ignition at 450 deg C	M	Air dried sample	07/12/2023	129	Gravimetry
PAH (GC-FID)	N	As submitted sample	04/12/2023	133	GC-FID
Extr. Phos	N	Air dried sample	07/12/2023	140	ICPMS
Low range Aliphatic hydrocarbons soil	N	As submitted sample	06/12/2023	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	06/12/2023	181	GC-MS
BTEX in solids	M	As submitted sample	06/12/2023	181A	GC-MS
Total organic carbon/Total sulphur	N	Air dried sample	06/12/2023	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	04/12/2023	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	08/12/2023	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	08/12/2023	214	GC-FID
Asbestos identification	U	Air dried sample	07/12/2023	281	Microscopy
Aqua regia extractable metals	M	Air dried sample	04/12/2023	300	ICPMS

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

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

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

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



Freeland Horticulture Ltd
Rosedale Nursery
College Road
Hextable
Kent BR8 7LT

Attention: Philippa Lambourne

Our Ref: SLC-1237-SA

26 January 2024

Dear Philippa

Topsoil Analysis Report: Astley, Greater Manchester Topsoil January 2024

We have completed the analysis of the topsoil sample recently taken from the above site and it has been forwarded to an approved laboratory for analysis and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes and its compliance with the current British Standard for topsoil (BS3882).

SOIL SAMPLING & EXAMINATION

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as dark brown, slightly moist and friable with a well-developed, fine to medium granular structure. The soil contained a low fraction of small stones and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

LABORATORY ANALYSIS

The topsoil sample was submitted to a UKAS and MCERTS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- ⊕ pH & electrical conductivity values;
- ⊕ major plant nutrients (N, P, K, Mg) & organic matter content;
- ⊕ particle size distribution and stone content;
- ⊕ heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- ⊕ sulphate, sulphur, sulphide;
- ⊕ total cyanide and total (mono) phenols;
- ⊕ speciated PAHs (US EPA16)
- ⊕ banded aromatic and aliphatic petroleum hydrocarbons (C₅-C₃₅).
- ⊕ Asbestos

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

Phone: 01322 619161;

*Freeland horticulture Ltd, Registered in England: Rosedale Nursery, College Road, Hextable, Kent BR8 7LT
Company Registration No: 04015968*

COMMENTS

pH & Electrical Conductivity (salinity) Values

The sample was alkaline in nature (pH 8.3) with a pH value that would be considered suitable for general landscaping purposes.

The electrical conductivity (salinity) value using the soil:water extract was (1174 μ S/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

The electrical conductivity values by CaSO₄ extract (BS3882 requirement) fell below the maximum specified value (3300 μ S/cm) given in BS3882:2015.

Organic Matter & Nutrient Status

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or fertiliser are required, or indeed recommended, for at least the first growing season.

The C:N ratio of the sample was acceptable for general landscape purposes.

Particle Size Distribution & Stone Content

The sample contained 77% sand and fell into the sandy loam texture class. This particle size distribution is considered suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding.

The sample was Virtually free from stones of 50 mm and upwards in diameter and only contained a slight fraction of smaller stones (1.3%). As such, stones will not restrict the use of the soil for landscaping purposes.

Potential Contaminants

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil. This includes human health, environmental protection and metals considered toxic to plants. In the absence of any site-specific assessment criteria, the concentrations that affect human health have been compared with the 'residential with homegrown produce' land use in the Suitable For Use Levels presented in 'The LQM/CIEH S4UIs' for Human Health Risk Assessment (2015) and DEFRA SP1010: 'Development of Category 4 Screening Levels' for Assessment of Land Affected by Contamination – Policy Companion Document (2014).

Of the potential contaminants determined, none was found at levels that would exceed their respective guideline values.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, sandy loam. The organic matter and nutrient levels are acceptable, and no significant contamination was found with respect to the parameters determined. This soil would adhere to the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

George Longmuir MSc Soil Sci. M.I Soil Sci.

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	January 24
Our Ref	1237-SA
Date	26 January 2024

Composite sample

pH Value & Salinity

pH value (1:2.5 soil/water ext)	units
Electrical Conductivity (1:2.5 soil/water ext)	µS/cm
Electrical Conductivity (1:2.5 soil/CaSO ₄ ext)	µS/cm

8.3
1174
3159

Organic Matter & Nutrient Status

Organic Matter (LOI)	%
Organic Carbon (Derived)	%
Total Nitrogen	%
Carbon:Nitrogen Ratio	:1
Available Phosphorus	mg/l
Available Potassium	mg/l
Available Magnesium	mg/l

3.4
2.0
0.199
9.9
45.4
1026
209

Particle Size Analysis & Stones

Clay (<0.002mm)	%
Silt (0.063-0.002mm)	%
Sand (2.0-0.063mm)	%
Texture Class	UK Class

7
16
77
Sandy Loam

Stones 2-20mm	% by DW
Stones 20-50mm	% by DW
Stones >50mm	% by DW

1.2
0.5
0.0

Potential Contaminants

Total Arsenic (As)	mg/kg
Total Cadmium (Cd)	mg/kg
Total Chromium (Cr)	mg/kg
Hexavalent Chromium (Cr ^{VI})	mg/kg
Total Copper (Cu)	mg/kg
Total Lead (Pb)	mg/kg
Total Mercury (Hg)	mg/kg
Total Nickel (Ni)	mg/kg
Total Selenium (Se)	mg/kg
Total Zinc (Zn)	mg/kg
Total Beryllium (Be)	mg/kg
Total Barium (Ba)	mg/kg
Total Vanadium (V)	mg/kg
Hot Water Soluble Boron (B)	mg/kg
Total Cyanide (CN)	mg/kg
Elemental Sulphur (S)	mg/kg
Easily Liberated Sulphide (S ²⁻)	mg/kg
Water Soluble Sulphate (SO ₄ ²⁻)	mg/l
Total Phenols (ppm)	mg/kg
Asbestos Screen	-

<3
0.56
19.6
<0.2
22.5
17.5
<0.2
<10
0.14
43.4
<1
93.7
<10
1.1
<1
5.4
<1
57.6
<1
N.D.

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	January 24
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Polyaromatic Hydrocarbons

Naphthalene	mg/kg	<0.05
Acenaphthylene	mg/kg	<0.05
Acenaphthene	mg/kg	<0.05
Fluorene	mg/kg	<0.05
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.05
Fluoranthene	mg/kg	0.2
Pyrene	mg/kg	0.2
Benzo[a]anthracene	mg/kg	<0.1
Chrysene	mg/kg	0.1
Benzo[b]fluoranthene	mg/kg	<0.1
Benzo[k]fluoranthene	mg/kg	<0.1
Benzo[a]pyrene	mg/kg	<0.1
Indeno[1,2,3-cd]pyrene	mg/kg	<0.1
Dibenzo[a,h]anthracene	mg/kg	<0.1
Benzo[g,h,i]perylene	mg/kg	<0.1
Total PAHs sum US EPA 16	mg/kg	<1

Banded Petroleum Hydrocarbons

Aliphatic TPH >C ₅ -C ₈	mg/kg	<0.05
Aliphatic TPH >C ₉ -C ₁₀	mg/kg	<0.05
Aliphatic TPH >C ₁₁ -C ₁₂	mg/kg	<0.05
Aliphatic TPH >C ₁₃ -C ₁₄	mg/kg	<10
Aliphatic TPH >C ₁₅ -C ₁₆	mg/kg	<10
Aliphatic TPH >C ₁₇ -C ₂₁	mg/kg	<10
Aliphatic TPH >C ₂₂ -C ₃₅	mg/kg	52.0
Aliphatic TPH >C ₃₆ -C ₄₄	mg/kg	22.0

Aromatic TPH >C ₅ -C ₇	mg/kg	<0.05
Aromatic TPH >C ₈ -C ₉	mg/kg	<0.05
Aromatic TPH >C ₁₀ -C ₁₁	mg/kg	<0.05
Aromatic TPH >C ₁₂ -C ₁₃	mg/kg	<10
Aromatic TPH >C ₁₄ -C ₁₅	mg/kg	<10
Aromatic TPH >C ₁₆ -C ₂₁	mg/kg	<10
Aromatic TPH >C ₂₂ -C ₃₅	mg/kg	52.0
Aromatic TPH >C ₃₆ -C ₄₄	mg/kg	34.0

Total Petroleum Hydrocarbons (C ₅ -C ₄₄)	mg/kg	146
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BTEX

Benzene	mg/kg	<0.02
Toluene	mg/kg	<0.2
Ethyl Benzene	mg/kg	<0.04
m- & p- Xylene	mg/kg	<0.2
o-Xylene	mg/kg	<0.1



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Nathan Birchenall
Tarmac Topscape
Manchester Road
Congleton
Cheshire, CW12 2LU

11th March 2024
Our Ref: TOHA/24/1276/1/SS
Your Ref: PO 2002746077

Dear Sirs

Topsoil Analysis Report: Crown Farm

We have completed the analysis of the soil sample recently submitted, referenced *Crown Farm Topsoil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the topsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the topsoil has left the Tarmac Topscape site.

SAMPLE EXAMINATION

The sample was described as a very dark grey (Munsell Colour 5YR 3/1), moist, friable, very slightly calcareous SAND with a weakly developed fine to medium granular and subangular blocky structure*. The sample was stone-free and contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample. Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (% 5 sands, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Detailed Particle Size Analysis and Stone Content

The sample fell into the *sand* texture class and the particle size distribution falls outside of the specified range indicated in *Figure 1* of *BS3882:2015*.

Further detailed particle size analysis found the sample to have a relatively narrow particle size distribution with a predominance of *fine sand* (0.15-0.25mm) and *medium sand* (0.25-0.50mm). Such soils typically have good aeration and drainage properties, but can possess reduced water and nutrient retention capacities. However, in this instance the soil's organic matter content (6.2%) is likely to offset these factors and provide a suitable growing medium for general landscape applications.

The sample was stone-free and as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.5). This pH value would be considered suitable for general landscape purposes provided species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (*BS3882* requirement) fell below the maximum specified value (3300 µS/cm) given in *BS3882:2015 – Table 1*.

Organic Matter and Fertility Status

The sample was adequately supplied with organic matter and all major plant nutrients.

The C:N ratio of the sample was acceptable for general landscape purposes.

Potential Contaminants

With reference to *BS3882:2015 - Table 1*: Notes 3 and 4, there is a requirement to confirm levels of potential contaminants in relation to the topsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with homegrown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none were found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none were found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, very slightly calcareous sand with a weakly developed structure. The topsoil was stone free and contained sufficient reserves of organic matter and all major plant nutrients. Of the potential contaminants determined, none exceeded their respective guideline values.

To conclude, based on our findings, the topsoil represented by this sample would be considered suitable for general landscape purposes (trees, shrubs and amenity grass), provided plant species selected have a wide pH tolerance or are known to prefer alkaline soils and the physical condition of the soil is satisfactory.

The sample was largely compliant with the requirements of the British Standard for Topsoil (*BS3882:2015 – Specification for Topsoil – Table 1, Multipurpose Topsoil*) with the exception of the total sand content.

On this occasion, this non-compliance is considered minor when reviewed in the context of all the other results.

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. stockpiling, resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is sufficiently dry to be non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

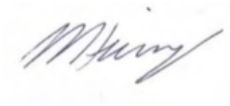
Further details on soil handling are provided in Annex A of *BS3882:2015*.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Zoe Duffin
MBiol
Graduate Soil Scientist



Matthew Heins
BSc (Hons) MSoilSci
Senior Soil Scientist

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Tarmac Topscape
Project:	Crown Farm
Job:	Topsoil Analysis - BS3882:2015
Date:	11/03/2024
Job Ref No:	TOHA/24/1276/1/SS

Sample Reference		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.05mm)	%	UKAS
Very Fine Sand (0.05-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.50mm)	%	UKAS
Coarse Sand (0.50-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.05-2.0mm)	%	UKAS
Texture Class (UK Classification)	--	UKAS
Stones (2-20mm)	% DW	GLP
Stones (20-50mm)	% DW	GLP
Stones (>50mm)	% DW	GLP

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2 CaSO ₄ extract)	uS/cm	UKAS
Exchangeable Sodium Percentage	%	UKAS
Organic Matter (LOI)	%	UKAS
Total Nitrogen (Dumas)	%	UKAS
C : N Ratio	ratio	UKAS
Extractable Phosphorus	mg/l	UKAS
Extractable Potassium	mg/l	UKAS
Extractable Magnesium	mg/l	UKAS

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total (mono) Phenols	mg/kg	MCERTS

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benzo(a)anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benzo(b)fluoranthene	mg/kg	MCERTS
Benzo(k)fluoranthene	mg/kg	MCERTS
Benzo(a)pyrene	mg/kg	MCERTS
Indeno(1,2,3-cd)pyrene	mg/kg	MCERTS
Dibenzo(a,h)anthracene	mg/kg	MCERTS
Benzo(g,h,i)perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16 - C21	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
p&m-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

Asbestos	ND/D	ISO 17025
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S = SAND

Visual Examination

The sample was described as a very dark grey (Munsell Colour 5YR 3/1), moist, friable, very slightly calcareous SAND with a weakly developed fine to medium granular and subangular blocky structure. The sample was stone-free and contained a moderate proportion of organic fines and occasional woody fragments. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Results of analysis should be read in conjunction with the report they were issued with

The contents of this certificate shall not be reproduced without the express written permission of Tim O'Hare Associates LLP.

Crown Farm Topsoil

5
6
17
28
36
6
2
89
5
0
0
0

8.5
960
2670
4.1
6.2
0.18
20
63
990
109

3
< 0.2
5
< 1.8
14
38
< 0.3
5
< 1.0
42
1
< 1.0
< 1.0

< 0.05
< 0.05
< 0.05
< 0.05
0.05
< 0.05
0.15
0.14
0.08
0.08
0.08
0.05
0.06
< 0.05
< 0.05
< 0.05
< 0.80

< 0.020
< 0.020
< 0.050
< 1.0
< 2.0
< 8.0
< 8.0
< 10
< 0.010
< 0.010
< 0.050
< 1.0
< 2.0
< 10
< 10
< 10

< 0.005
< 0.005
< 0.005
< 0.005
< 0.005
< 0.005

Not-detected

Zoe Duffin
MBiol
Graduate Soil Scientist

Appendix C

- C1 Site Photographs Insitu soils testing April 2024
- C2 Imported Soils Analytical Test Results i2
- C3 Assessment of Analytical Test Results
- C4 Trial Pit Logs April 2024



C1 Photographs

Site Name	Crown Street Phase 2 Tower C5
Location	Manchester
GeoAssist Ref	6129VCV
Client	Renaker Build Limited
	Renaker Build Ltd. 1st Floor, NQ Building 47 Bengal Street Ancoats Manchester M4 6BB
Planning Consultant	
NGR (centre of site)	3838196,397227
Production Date	April 2024
Survey Method	Photographic Record
Surveyor	Others
Status	Final v1.00
Base Survey	na

Photograph Subject

TP7	TP7	TP8	TP8
TP9	TP9	TP10	TP10
TP11	TP11	TP11	TP12
TP12	TP12	TP13	TP13



C1 Photographs

Site Name	Crown Street Phase 2 Tower C5
Location	Manchester
GeoAssist Ref	6129VCV
Client	Renaker Build Limited
	Renaker Build Ltd. 1st Floor, NQ Building 47 Bengal Street Ancoats Manchester M4 6BB
Planning Consultant	
NGR (centre of site)	3838196,397227
Production Date	April 2024
Survey Method	Photographic Record
Surveyor	Others
Status	Final v1.00
Base Survey	na

General shots of the site landscaping works being finalised



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

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

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

e: info@geoassist.co.uk

Analytical Report Number : 24-013181

Project / Site name:	Crown Street Phase 2 Tower C5, Manchester	Samples received on:	09/04/2024
Your job number:	6129 VCV	Samples instructed on/ Analysis started on:	09/04/2024
Your order number:	2240408	Analysis completed by:	16/04/2024
Report Issue Number:	1	Report issued on:	17/04/2024
Samples Analysed:	14 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Your Order No: 2240408

Lab Sample Number	165928	165929	165930	165931	165932
Sample Reference	TP7	TP7	TP8	TP8	TP9
Sample Number	C1	C2	C1	C2	C1
Depth (m)	0.20	0.50	0.20	0.50	0.20
Date Sampled	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	15	24	4	22
Total mass of sample received	kg	0.1	NONE	0.4	0.4	0.4	0.4	0.4

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.3	7.4	8.1	8.5	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.043	0.028	0.046	0.023	0.046
Sulphide	mg/kg	1	MCERTS	< 1.0	1.2	8.6	13	3.1
Total Sulphur	mg/kg	50	MCERTS	210	210	360	130	300
Total Sulphur	%	0.005	MCERTS	0.021	0.021	0.036	0.013	0.03

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.4	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.2	0.3	< 0.05	< 0.05	0.09
Anthracene	mg/kg	0.05	MCERTS	0.47	0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	3.4	0.52	0.2	0.08	0.18
Pyrene	mg/kg	0.05	MCERTS	3.3	0.53	0.18	0.07	0.16
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	0.24	0.13	0.06	0.09
Chrysene	mg/kg	0.05	MCERTS	1.5	0.34	0.13	< 0.05	0.09
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.6	0.28	0.12	< 0.05	0.12
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.49	0.16	0.06	< 0.05	0.06
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	0.22	0.13	< 0.05	0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.73	0.23	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1	0.39	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	18.1	3.26	0.95	< 0.80	0.89
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Analytical Report Number: 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Your Order No: 2240408

Lab Sample Number				165928	165929	165930	165931	165932
Sample Reference				TP7	TP7	TP8	TP8	TP9
Sample Number				C1	C2	C1	C2	C1
Depth (m)				0.20	0.50	0.20	0.50	0.20
Date Sampled				08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.1	11	9.1	5.5	4.8
Barium (aqua regia extractable)	mg/kg	1	MCERTS	72	72	43	18	35
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.51	0.52	0.31	0.12	0.29
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	< 0.2	0.9	< 0.2	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	16	12	6.2	7.9
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	28	12	4.8	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	57	66	17	15	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	19	7.6	2.7	7.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	17	10	5.9	9.7
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	64	45	18	29

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

Analytical Report Number: 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Your Order No: 2240408

Lab Sample Number	165933	165934	165935	165936	165937
Sample Reference	TP9	TP10	TP10	TP11	TP11
Sample Number	C2	C1	C2	C1	C2
Depth (m)	0.50	0.20	0.50	0.20	0.50
Date Sampled	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	20	23	22	26	5.6
Total mass of sample received	kg	0.1	NONE	0.4	0.4	0.4	0.4	0.4

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.4	8.3	8	8.2	9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.038	0.042	0.048	0.061	0.044
Sulphide	mg/kg	1	MCERTS	2.7	3.6	3.9	6	18
Total Sulphur	mg/kg	50	MCERTS	270	320	330	440	240
Total Sulphur	%	0.005	MCERTS	0.027	0.031	0.033	0.044	0.024

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	1.3	4.8	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.09	0.09	0.14	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.12	0.17	0.19	0.21	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.11	0.15	0.17	0.19	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.05	0.09	0.11	0.1	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.05	0.08	0.11	0.12	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.07	0.13	0.17	0.12	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.08	0.06	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.05	0.08	0.11	0.12	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.08	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	1.2	1.06	< 0.80
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Analytical Report Number: 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Your Order No: 2240408

Lab Sample Number				165933	165934	165935	165936	165937
Sample Reference				TP9	TP10	TP10	TP11	TP11
Sample Number				C2	C1	C2	C1	C2
Depth (m)				0.50	0.20	0.50	0.20	0.50
Date Sampled				08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.3	4.4	5.3	6.7	4.8
Barium (aqua regia extractable)	mg/kg	1	MCERTS	35	41	40	44	46
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.25	0.31	0.33	0.31	0.11
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	1.4	1	1.3	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.3
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.7	9.1	8.8	8.5	6.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13	12	12	4.3
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	13	12	15	5
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.6	7.8	8.4	7.9	2.6
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	9.2	11	11	11	7.3
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	32	33	31	32	21

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

Analytical Report Number: 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Your Order No: 2240408

Lab Sample Number	165938	165939	165940	165941
Sample Reference	TP12	TP12	TP13	TP13
Sample Number	C1	C2	C1	C2
Depth (m)	0.20	0.50	0.20	0.50
Date Sampled	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	23	22	23
Total mass of sample received	kg	0.1	NONE	0.4	0.4	0.4	0.4

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.9	7.9	8.2	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.043	0.036	0.053	0.063
Sulphide	mg/kg	1	MCERTS	1.9	2.3	3.4	2.3
Total Sulphur	mg/kg	50	MCERTS	430	390	360	370
Total Sulphur	%	0.005	MCERTS	0.043	0.039	0.036	0.037

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	1.7	2.3	1.3	3.8
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.18	0.11	0.1	0.28
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.07
Fluoranthene	mg/kg	0.05	MCERTS	0.4	0.25	0.28	0.4
Pyrene	mg/kg	0.05	MCERTS	0.37	0.23	0.27	0.36
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.24	0.15	0.16	0.19
Chrysene	mg/kg	0.05	MCERTS	0.19	0.17	0.17	0.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.29	0.23	0.2	0.24
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.13	0.12	0.09	0.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.23	0.2	0.14	0.15
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.11	0.1	0.06	0.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	0.13	0.09	0.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.29	1.69	1.56	2.19
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Analytical Report Number: 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Your Order No: 2240408

Lab Sample Number				165938	165939	165940	165941
Sample Reference				TP12	TP12	TP13	TP13
Sample Number				C1	C2	C1	C2
Depth (m)				0.20	0.50	0.20	0.50
Date Sampled				08/04/2024	08/04/2024	08/04/2024	08/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.9	5.4	4.5	5.3
Barium (aqua regia extractable)	mg/kg	1	MCERTS	61	58	52	48
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.4	0.36	0.33	0.32
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.8	1.5	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	9.3	8.9	8.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	14	34	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	17	13	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.8	9.2	8.8	8.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	13	12	11	11
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	44	46	34	35

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

Analytical Report Number : 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
165928	TP7	C1	0.2	Brown clay and sand with gravel and vegetation
165929	TP7	C2	0.5	Brown loam and clay with gravel and vegetation
165930	TP8	C1	0.2	Brown loam and clay with gravel and vegetation
165931	TP8	C2	0.5	Brown clay and sand with gravel
165932	TP9	C1	0.2	Brown loam and sand with gravel and vegetation
165933	TP9	C2	0.5	Brown loam and sand with gravel and vegetation
165934	TP10	C1	0.2	Brown loam and sand with gravel and vegetation
165935	TP10	C2	0.5	Brown loam and sand with gravel and vegetation
165936	TP11	C1	0.2	Brown loam and sand with gravel and vegetation
165937	TP11	C2	0.5	Brown sand with gravel
165938	TP12	C1	0.2	Brown loam and sand with gravel and vegetation
165939	TP12	C2	0.5	Brown loam and sand with gravel and vegetation
165940	TP13	C1	0.2	Brown loam and sand with gravel and vegetation
165941	TP13	C2	0.5	Brown loam and sand with gravel and vegetation

Analytical Report Number : 24-013181

Project / Site name: Crown Street Phase 2 Tower C5, Manchester

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil (low level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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

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

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

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

Soils Risk Assessment

Site Reference: 6129 VCV
Project Site: Crown Street Phase 2 Tower C5
Project Location: Manchester
Client: Renaker Build Limited

Principal Soil Type		Topsoil	Topsoil	Topsoil	Gravel	Topsoil	Topsoil	Topsoil	Topsoil	Topsoil	Gravel	Topsoil	Topsoil	Topsoil	Topsoil
I2 Reference	0	TP7	TP7	TP8	TP8	TP9	TP9	TP10	TP10	TP11	TP11	TP12	TP12	TP13	TP13
Customer Sample Ref:	C4SL / S4UL	C1 - 0.20	C2 - 0.50	C1 - 0.20	C2 - 0.50	C1 - 0.20	C2 - 0.50	C1 - 0.20	C2 - 0.50	C1 - 0.20	C2 - 0.50	C1 - 0.20	C2 - 0.50	C2 - 0.50	C2 - 0.50
	SOM 6% GAC	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024	08/04/2024
Determinand	LQM II														
Arsenic	37	4.6	4.3	9.8	8.5	6.5	4.3	4.7	4.6	4.3	1.5	4.4	4.4	4.4	4.4
Boron (water-soluble)	290	0.3	0.3	0.9	0.2	0.4	0.2	0.3	0.3	0.4	0.2	0.4	0.2	0.2	0.2
Cadmium	22	0.2	0.2	0.6	0.5	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.2
Chromium*	910	7.8	7.1	19	17	8.9	6.6	6.8	8.7	7.7	5.2	7.6	7.9	7.9	7.9
Chromium VI	21	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	2400	14	14	47	49	25	17	19	14	15	7.9	14	28	28	28
Cyanide(Total)	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cyanide(free)**	34	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lead	200	23	22	67	63	44	26	23	18	20	10	20	20	20	20
Mercury	1.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Nickel	130	5.4	5.3	14	13	8	5.3	6.4	6.6	5.9	2.3	5.3	5.8	5.8	5.8
pH	-	7.7	7.7	8.5	8.9	7.5	7.4	7.4	7.5	7.7	8.7	6.5	6.5	6.5	6.5
Phenols(Mono)	1100	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Selenium	250	1	1	1	1	1	1	1	1	1	1	1	1	1	1
SO4(Total)	-	0.02	0.024	0.096	0.097	0.064	0.031	0.019	0.019	0.024	0.024	0.027	0.035	0.035	0.035
Sulphide	-	1	1	8.8	5.6	1	1	1	1	1	9.7	1	1	1	1
Sulphur(Free)	-	0.025	0.027	0.053	0.06	0.049	0.028	0.027	0.024	0.028	0.022	0.027	0.026	0.026	0.026
Thiocyanate	-	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Zinc	3700	27	26	160	91	51	29	33	26	31	19	25	26	26	26
Acenaphthene	1100	0.4	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Acenaphthylene	920	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Anthracene	11000	0.47	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.07
Benzo(a)Anthracene	-	1.3	0.24	0.13	0.06	0.09	0.05	0.09	0.11	0.1	0.05	0.24	0.15	0.16	0.19
Benzo(a)Pyrene SM	5	1.3	0.22	0.13	0.05	0.1	0.05	0.08	0.11	0.12	0.05	0.23	0.2	0.14	0.15
Benzo(b)Fluoranthene	-	1.6	0.28	0.12	0.05	0.12	0.07	0.13	0.17	0.12	0.05	0.29	0.23	0.2	0.24
Benzo(ghi)Perylene	-	1	0.39	0.05	0.05	0.05	0.05	0.05	0.09	0.05	0.05	0.15	0.13	0.09	0.1
Benzo(k)Fluoranthene	-	0.49	0.16	0.06	0.05	0.06	0.05	0.05	0.08	0.06	0.05	0.13	0.12	0.09	0.1
Chrysene	-	1.5	0.34	0.13	0.05	0.09	0.05	0.08	0.11	0.12	0.05	0.19	0.17	0.17	0.2
Dibenzo(ah)Anthracene	-	0.19	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Fluoranthene	890	3.4	0.52	0.2	0.08	0.18	0.12	0.17	0.19	0.21	0.05	0.4	0.25	0.28	0.4
Fluorene	860	0.21	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Indeno(123-cd)Pyrene	-	0.73	0.23	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.11	0.1	0.06	0.1
Naphthalene	13	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	440	2.2	0.3	0.05	0.05	0.09	0.05	0.09	0.09	0.14	0.05	0.18	0.11	0.1	0.28
Pyrene	2000	3.3	0.53	0.18	0.07	0.16	0.11	0.15	0.17	0.19	0.05	0.37	0.23	0.27	0.36
PAH(total)	-	18.1	3.26	0.95	0.8	0.89	0.8	0.8	1.2	1.06	0.8	2.29	1.69	1.56	2.19

All Units mg/kg unless otherwise stated

Indicates Exceedance of Applicable Level

*Criteria Assumes Chromium III

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

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

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

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: TP7				
Consultant: 0		Project: Crown Street Phase 2 Tower C5 Location: Manchester					Sheet: 1				
Client: Renaker Build Limited		Equipment: Excavation by hand equipment					Ground Level: m.AOD Co-ordinates: Easting: (m) Northing: (m) Dates: 08/04/2024 to 08/04/2024				
Drilling Foreman: M Walton Engineer/Geologist: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to		Sample Type/No	Blow Count N/(U)	Field Records
0 Brown clayey sandy silty TOPSOIL							0.20 0.30	C1			08/04/2024: On completion of exploratory hole at 0.70m. Standing water level Nil. Exploratory hole backfilled with arisings and reinstated.
-0.5				(0.70)			0.50 0.60	C2			
0.70											
Exploratory Hole complete at 0.70m											
-1											
-1.5											
-2											
-2.5											
-3											
-3.5											
-4											
-4.5											
5											
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.									Logged: M Benson Date: 08/04/2024 Checked: M Richardson Date: 09/04/2024 Site Ref: 6129/VCV Scale 1:25		

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: TP8		
Consultant: 0		Project: Crown Street Phase 2 Tower C5 Location: Manchester					Sheet: 1		
Client: Renaker Build Limited		Equipment: Excavation by hand equipment					Ground Level: m.AOD Co-ordinates: Easting: (m) Northing: (m) Dates: 08/04/2024 to 08/04/2024		
Drilling Foreman: M Walton Engineer/Geologist: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to Sample Type/No Blow Count N/(U)		Field Records
0 Brown sandy silty TOPSOIL		(0.40)					0.20 0.30	C1	08/04/2024: On completion of exploratory hole at 0.60m. Standing water level Nil. Exploratory hole backfilled with arisings and reinstated.
Grey sandy gravel - MADE GROUND		0.40					0.50 0.60	C2	
-0.5 Exploratory Hole complete at 0.60m		0.60							
-1									
-1.5									
-2									
-2.5									
-3									
-3.5									
-4									
-4.5									
5									
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.							Logged: M Benson Date: 08/04/2024 Checked: M Richardson Date: 09/04/2024 Site Ref: 6129/VCV Scale 1:25		

GeoAssist Limited		Exploratory Hole Record Sheet						Ref: TP9			
Consultant: 0		Project: Crown Street Phase 2 Tower C5						Sheet: 1			
		Location: Manchester									
Client: Renaker Build Limited		Equipment:				Ground Level: m.AOD					
		Excavation by hand equipment				Co-ordinates: Easting: (m) Northing: (m)					
								Dates: 08/04/2024 to 08/04/2024			
Drilling Foreman: M Walton		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests			Field Records	
Engineer/Geologist: M Benson							Depth (m) from to		Sample Type/No		Blow Count N/(U)
0 Brown very sandy silty TOPSOIL						0.20	0.30	C1	08/04/2024: On completion of exploratory hole at 0.60m. Standing water level Nil. Exploratory hole backfilled with arisings and reinstated.		
-0.5						0.50	0.60	C2			
Exploratory Hole complete at 0.60m											
-1											
-1.5											
-2											
-2.5											
-3											
-3.5											
-4											
-4.5											
-5											
Remarks:								Logged: M Benson			
The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.								Date: 08/04/2024			
								Checked: M Richardson			
								Date: 09/04/2024			
								Site Ref: 6129/VCV			
								Scale 1:25			

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: TP10		
Consultant: 0		Project: Crown Street Phase 2 Tower C5 Location: Manchester					Sheet: 1		
Client: Renaker Build Limited		Equipment: Excavation by hand equipment				Ground Level: m.AOD Co-ordinates: Easting: (m) Northing: (m) Dates: 08/04/2024 to 08/04/2024			
Drilling Foreman: M Walton Engineer/Geologist: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests		Field Records
						Depth (m) from to	Sample Type/No	Blow Count N/(U)	
0 Brown very sandy silty TOPSOIL						0.20 0.30	C1		08/04/2024: On completion of exploratory hole at 0.60m. Standing water level Nil. Exploratory hole backfilled with arisings and reinstated.
-0.5						0.50 0.60	C2		
Exploratory Hole complete at 0.60m									
-1									
-1.5									
-2									
-2.5									
-3									
-3.5									
-4									
-4.5									
5									
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.								Logged: M Benson Date: 08/04/2024 Checked: M Richardson Date: 09/04/2024 Site Ref: 6129/VCV Scale 1:25	

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: TP11				
Consultant: 0		Project: Crown Street Phase 2 Tower C5 Location: Manchester					Sheet: 1				
Client: Renaker Build Limited		Equipment: Excavation by hand equipment					Ground Level: m.AOD Co-ordinates: Easting: (m) Northing: (m) Dates: 08/04/2024 to 08/04/2024				
Drilling Foreman: M Walton Engineer/Geologist: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to		Sample Type/No	Blow Count N/(U)	Field Records
0		Brown very sandy silty TOPSOIL		(0.40)			0.20	0.30	C1		08/04/2024: On completion of exploratory hole at 0.55m. Standing water level Nil. Exploratory hole backfilled with arising and reinstated.
-0.5		Grey sandy gravel - MADE GROUND with concrete at base		0.40							
				0.55			0.50	0.60	C2		
-1		Exploratory Hole complete at 0.55m									
-1.5											
-2											
-2.5											
-3											
-3.5											
-4											
-4.5											
5											
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.										Logged: M Benson Date: 08/04/2024 Checked: M Richardson Date: 09/04/2024 Site Ref: 6129/VCV Scale 1:25	

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: TP12			
Consultant: 0		Project: Crown Street Phase 2 Tower C5 Location: Manchester					Sheet: 1			
Client: Renaker Build Limited		Equipment: Excavation by hand equipment					Ground Level: m.AOD Co-ordinates: Easting: (m) Northing: (m) Dates: 08/04/2024 to 08/04/2024			
Drilling Foreman: M Walton Engineer/Geologist: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to Sample Type/No		Blow Count N/(U)	Field Records
0 Brown very sandy silty TOPSOIL							0.20 0.30	C1		08/04/2024: On completion of exploratory hole at 0.70m. Standing water level Nil. Exploratory hole backfilled with arisings and reinstated.
-0.5							0.50 0.60	C2		
-1										
-1.5		Exploratory Hole complete at 0.70m								
-2										
-2.5										
-3										
-3.5										
-4										
-4.5										
5										
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.								Logged: M Benson Date: 08/04/2024 Checked: M Richardson Date: 09/04/2024 Site Ref: 6129/VCV Scale 1:25		

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: TP13				
Consultant: 0		Project: Crown Street Phase 2 Tower C5 Location: Manchester					Sheet: 1				
Client: Renaker Build Limited		Equipment: Excavation by hand equipment					Ground Level: m.AOD Co-ordinates: Easting: (m) Northing: (m) Dates: 08/04/2024 to 08/04/2024				
Drilling Foreman: M Walton Engineer/Geologist: M Benson		STRATUM DESCRIPTION		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to		Sample Type/No	Blow Count N/(U)	Field Records
0		Brown very sandy silty TOPSOIL					0.20 0.30	C1			08/04/2024: On completion of exploratory hole at 0.60m. Standing water level Nil. Exploratory hole backfilled with arisings and reinstated.
-0.5				(0.60)			0.50 0.60	C2			
-1		Exploratory Hole complete at 0.60m		0.60							
-1.5											
-2											
-2.5											
-3											
-3.5											
-4											
-4.5											
5											
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the fieldwork operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.									Logged: M Benson Date: 08/04/2024 Checked: M Richardson Date: 09/04/2024 Site Ref: 6129/VCV Scale 1:25		