Validation Completion Report
Extra Care Building
Bowes Street, Manchester

Reference:11-813-R6-2
Date: May 2022

VALIDATION COMPLETION REPORT

Extra Care Building
Former Stagecoach Bus Depot
Land off Bowes Street
Manchester

Prepared for:
Rowlinson Construction

Report Ref: 11-813-R6-2
Date Issued: May 2022

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QUALITY ASSURANCE

PROJECT NUMBER	11-813		
VERSION	Version 1	Version 2	
REMARKS	Issue 1	Issue 2	
DATE	March 2022	May 2022	
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QUALIFICATIONS	MSci (Hons), FGS	MSci (Hons), FGS	
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QUALIFICATIONS	BSc (Hons), FGS, CEnv	BSc (Hons), FGS, CEnv	
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ISO 9001 (2015)
ISO 14001 (2015)
ISO 45001 (2018)
Cert No 18890

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1. INTRODUCTION

1.1. BACKGROUND

E3P Ltd has been commissioned by Rowlinson Construction to produce a Completion Report in relation to the validation of the landscaping and gas membrane installation for the Extra Care Building at their newly constructed site at Bowes Street in Manchester.

Manchester City Council confirmed their general acceptance of the remediation works and subsequent validation works for the proposed residential development, pending the following information:

- Validation of the 300 mm cover system; and
- Validation of the ground gas protection measures.

Interim validation letters pertaining to the above have been produced previously, however all outstanding information is included within this report.

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.2. OBJECTIVES

E3P have been instructed to develop a detailed Validation Completion Report associated with the validation of the residential development that will incorporate the following:

- Overview of the validation works undertaken on the development site within the landscaped areas;
- Chemical laboratory analysis undertaken of the imported material; and
- Overview of the validation works undertaken on the development site pertaining to the installation of gas protection measures to Characteristic 2.

1.3. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.4. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.

2. COVER SYSTEM VALIDATION

Independent validation of the Extra Care Building was undertaken on 15th July 2020 during which the depth of the cover system was measured to confirm the installation of 150 mm subsoil (imported) and 150 mm topsoil (imported) with photographs taken by way of validation.

All material used for the cover system was confirmed chemically suitable for use through chemical analysis, discussed further in Section 3.0. All validation works have been completed in strict accordance with the specification previously agreed with Manchester City Council.

Table 2.1 below shows the Cover System Validation reference and date of validation.

TABLE 2.1 SUMMARY OF GARDEN VALIDATIONS

DATE	REPORT NUMBER	PLOT NUMBER
23rd July 2020	V1	Extra Care Building

The cover system validation letter report is included in Appendix VI.

3. CHEMICAL VALIDATION

3.1. TOPSOL AND SUBSOIL

All landscaped areas require a 300 mm chemically suitable cover system comprising at least 150 mm subsoil and 150 mm topsoil.

Topsoil

There was no suitable source of topsoil available on the site prior to remediation and enabling works. As such, topsoil was imported from Freeland Horticulture, Nook Lane, Astley and chemically validated by E3P to confirm suitability for use within the upper 150 mm cover system.

Subsoil

Subsoil was imported as a horticultural sand from Tarmac Crown Farm in Northwich and chemically validated by E3P to confirm suitability for use within the cover system.

3.2. CHEMICAL VALIDATION

Six topsoil samples were submitted for chemical analysis, the results confirmed that the material is suitable for use within the 300 mm cover system within the residential development.

Laboratory certificates 20-84975 and 20-19767 provide the results for the topsoil testing, providing a validated volume of 300 m3 of topsoil.

Three samples of subsoil were analysed in accordance with the regulatory approved Remediation Strategy. Chemical analysis identified no contaminant exceedances; therefore, it has been determined that the subsoil would be suitable for utilisation within the proposed landscaping.

Laboratory certificate 19-55101 provides analysis of the imported subsoil, providing a validated volume of 600 m3 of subsoil.

All samples were analysed in accordance with the regulatory approved Remediation Strategy

Furthermore, E3P inspected the materials intended for topsoil and subsoil. Chemical analysis identified no contaminant exceedances; therefore, it has been determined that the topsoil and subsoil is suitable for utilisation within the proposed landscaping.

Sufficient samples have been obtained and analysed to meet the agreed sample frequency of 1 sample per 50 m3 topsoil and 1 sample per 200 m3 subsoil. Laboratory certificates have been attached within the cover system validation letter and are also included within Appendix IV of this report.

4. GAS MEMBRANE VALIDATION

4.1. SUMMARY OF GROUND GAS RISK ASSESSMENT

The ground gas assessment, as detailed within the Capita Geo-Environmental Report, indicated that the site is Characteristic Situation 2 – Amber 1, thus requiring mitigation measures that conform to BS8485 (2015) (A1-2019) in the construction of new homes. Due to the presence of hydrocarbon vapours within the Made Ground, all plots all required the installation of a hydrocarbon resistant membrane to be constructed in accordance with BS8485 (2015).

4.2. GAS MEMBRANE VALIDATION

The ground gas membrane was validated with the full details included within the Gas Membrane Validation Certificate included within Appendix V.

In brief, the works included the validation of the following for each plot:

- General condition of the membrane;
- Verification of the joints; and
- Verification of service entries and top hats.

Following the completion of the above, E3P can confirm that the Extra Care Building has been installed with gas protection measures in accordance with Characteristic 2 to an acceptable level of workmanship.

5. CONCLUSIONS

On completion of the validation works undertaken in relation to the installation of a chemically suitable cover system and gas protection measures, E3P can confirm that all works were undertaken in strict accordance with the agreed Remediation Strategy and therefore would deem the site suitable for use as a residential development.

E3P do not consider that any further work is necessary.

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.

8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.

10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II
GLOSSARY

TERMS

ACM	Asbestos-containing material	**MMP**	Materials management plan
ADS	Acoustic design statement	**ND**	Not detected
AST	Above-ground storage tank	**NDP**	Nuclear density probe
BGS	British Geological Survey	**NMP**	Noise management plan
BSI	British Standards Institute	**NPSE**	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	**NR**	Not recorded
CA	Coal Authority	**PAH**	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	**PCB**	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	**PI**	Plasticity index
CIRIA	Construction Industry Research Association	**PID**	Photo ionisation detector
CLEA	Contaminated land exposure assessment	**POS**	Public open space
CML	Council of Mortgage Lenders	**PPE**	Personnel protective equipment
CoC	Contaminants of concern	**ProPG**	Professional practice guidance
CSM	Conceptual site model	**QA**	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	**SGV**	Soil guideline value
DWS	Drinking water standard	**SPH**	Separate-phase hydrocarbon
EA	Environment Agency	**SPT**	Standard penetration test
EQS	Environmental quality standard	**SVOC**	Semi-volatile organic compound
FFL	Finished floor level	**TPH**	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	**TPH CWG**	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	**UKWIR**	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	**UST**	Underground storage tank
HCV	Health criteria value	**VCC**	Vibro-concrete column
ICSM	Initial conceptual site model	**VOC**	Volatile organic compound
LEL	Lower explosive limit	**VRSC**	Vibro-replacement stone columns
LMRL	Lower method reporting limit	**VSC**	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	**WHO**	World Health Organisation
MCV	Moisture condition value	**WRAP**	Waste and Resources Action Programme

MIBK	Methyl isobutyl ketone	**WTE**	Water table elevation
m	Metres	**ppm**	Parts per million
km	Kilometres	**mg/m^3**	Milligram per metre cubed
% v/v	Percent volume in air	**m bgl**	Metres below ground level
mb	Millibars (atmospheric pressure)	**m bcl**	Metre below cover level
l/hr	Litres per hour	**mAOD**	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	**kN/m^2**	Kilonewtons per metre squared
ppb	Parts per billion	**µm**	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	**SSRT**	Site Specific Remediation Target
PSD	Particle Size Distribution	**DD**	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	**Mc**	Moisture Content
ρ	Bulk Density	**GPR**	Ground Penetrating Radar
NDP	Nuclear Density Probe	**FFL**	Finished Floor Level
LEL	Lower Explosive Limit	**UKWIR**	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	**LOD**	Limit of Detection

APPENDIX III
DRAWINGS

Location Symbols

HP101 Approximate Hand Dug Pit Location

Notes:

P1	REVA	11.05.2022	EB	NS
Phase	Issue	Date	Drawn	Checked

Client: Rowlinson Construction

Job No: 11-813

Date: 11.05.2022

Drawing No: 001

Scale: NTS@ A3

Job Title: Bowes Street, Manchester

Drawing Title: Cover System Validation Location Plan

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APPENDIX IV
CHEMICAL TESTING RESULTS

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Analytical Report Number : 20-84975

Project / Site name:	Bow St	**Samples received on:**	04/02/2020
Your job number:	11813	**Samples instructed on:**	04/02/2020
Your order number:		**Analysis completed by:**	11/02/2020
Report Issue Number:	1	**Report issued on:**	11/02/2020
Samples Analysed:	3 soil samples		

Signed: Karoline Marek

Karolina Marek
Technical Reviewer (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.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 20-84975

Project / Site name: Bow St

Lab Sample Number				1432702	1432703	1432704		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				03/02/2020	03/02/2020	03/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	10	11	14		
Total mass of sample received	kg	0.001	NONE	0.48	0.54	0.54		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.8	7.9		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	400	490	540		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	63	59	120		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.032	0.029	0.061		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	31.6	29.4	60.5		
Sulphide	mg/kg	1	MCERTS	< 1.0	1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	320	340	390		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.31	0.97		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.31	0.95		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.63		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.66		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	6.66		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	6.2	6.2		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	18	16		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	16	17		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	30	29	33		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	13	13		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	55	72		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 20-84975

Project / Site name: Bow St

Lab Sample Number				1432702	1432703	1432704		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				03/02/2020	03/02/2020	03/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	9.3		
TPH (C16 - C21)	mg/kg	1	MCERTS	6.7	< 1.0	18		
TPH (C21 - C35)	mg/kg	1	MCERTS	50	< 1.0	21		
TPH (C35 - C40)	mg/kg	10	MCERTS	24	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	83	< 10	50		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-84975

Project / Site name: Bow St

* 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 *
1432702	TS101	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1432703	TS102	None Supplied	None Supplied	Brown clay and sand with gravel.
1432704	TS103	None Supplied	None Supplied	Brown clay and sand with gravel.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-84975

Project / Site name: Bow St

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 20-19767

Project / Site name:	Bowes St.	**Samples received on:**	16/07/2020
Your job number:		**Sample instructed/ Analysis started on:**	16/07/2020
Your order number:		**Analysis completed by:**	22/07/2020
Report Issue Number:	1	**Report issued on:**	22/07/2020
Samples Analysed:	3 soil samples		

Signed: Karolina Marek

Karolina Marek
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

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

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 20-19767

Project / Site name: Bowes St.

Lab Sample Number				1564595	1564596	1564597		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				15/07/2020	15/07/2020	15/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	10	13	14		
Total mass of sample received	kg	0.001	NONE	0.50	0.50	0.50		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	6.7	7.1		
Total Cyanide	mg/kg	1	MCERTS	3	1	2		
Total Sulphate as SO_4	mg/kg	50	MCERTS	1900	1800	1900		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.20	0.19	0.22		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	410	380	440		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	204	189	222		
Sulphide	mg/kg	1	MCERTS	1.1	7.3	2.9		
Total Sulphur	mg/kg	50	MCERTS	1100	1200	1200		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	0.29	0.23	0.95		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65		
Phenanthrene	mg/kg	0.05	MCERTS	2.3	1.8	5.2		
Anthracene	mg/kg	0.05	MCERTS	0.39	0.47	1.1		
Fluoranthene	mg/kg	0.05	MCERTS	3.3	4.1	7.0		
Pyrene	mg/kg	0.05	MCERTS	3.2	3.8	6.4		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.0	2.4	4.8		
Chrysene	mg/kg	0.05	MCERTS	1.4	2.0	2.8		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.9	2.4	3.7		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.94	0.95	1.5		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.7	1.8	3.5		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.71	0.85	1.4		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.37		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.83	0.94	1.5		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	19.0	21.7	40.9		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	28	29	39		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.6	0.7		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	27	29		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	66	68	75		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	470	260	350		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.7	0.8		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	22	22		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.2	2.1	2.1		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	150	170		

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Analytical Report Number: 20-19767

Project / Site name: Bowes St.

Lab Sample Number				1564595	1564596	1564597		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				15/07/2020	15/07/2020	15/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	8.3	8.9	24		
TPH (C21 - C35)	mg/kg	1	MCERTS	25	42	74		
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	36	53	99		

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Analytical Report Number : 20-19767

Project / Site name: Bowes St.

* 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 *
1564595	TS101	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1564596	TS102	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1564597	TS103	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

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Analytical Report Number : 20-19767

Project / Site name: Bowes St.

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 19-55101

Project / Site name:	Bowes Street	**Samples received on:**	16/08/2019
Your job number:		**Samples instructed on:**	16/08/2019
Your order number:		**Analysis completed by:**	23/08/2019
Report Issue Number:	1	**Report issued on:**	23/08/2019
Samples Analysed:	6 soil samples		

Signed: Karoline Marek

Karolina Marek
Technical Reviewer (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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293738	1293739	1293740	1293741	1293742
Sample Reference				TS101	TS102	TS103	SS101	SS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				15/08/2019	15/08/2019	15/08/2019	15/08/2019	15/08/2019
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	%	N/A	NONE	17	18	18	19	17
Total mass of sample received	kg	0.001	NONE	0.48	0.49	0.50	0.40	0.52
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.7	7.7	7.8	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	530	460	620	510	500
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100	120	99	120	110
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.051	0.061	0.050	0.059	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	50.9	60.9	49.7	58.5	53.2
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	350	360	380	360	380
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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	0.63	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.34	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	1.0	0.75	2.5	0.83
Anthracene	mg/kg	0.05	MCERTS	0.28	0.17	0.17	0.43	0.18
Fluoranthene	mg/kg	0.05	MCERTS	2.2	2.0	1.4	2.6	1.6
Pyrene	mg/kg	0.05	MCERTS	2.0	1.9	1.4	2.3	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.0	1.1	0.73	1.2	0.81
Chrysene	mg/kg	0.05	MCERTS	0.98	0.84	0.73	1.2	0.73
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	1.1	0.89	1.3	0.99
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.40	0.44	0.25	0.51	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.98	0.84	0.68	1.0	0.70
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.44	0.43	0.34	0.48	0.34
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	0.59	0.52	0.40	0.70	0.44
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	11.4	10.4	7.75	15.2	8.24

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293738	1293739	1293740	1293741	1293742
Sample Reference				TS101	TS102	TS103	SS101	SS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				15/08/2019	15/08/2019	15/08/2019	15/08/2019	15/08/2019
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	16	16	16	14	17
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	0.5	0.6	0.4	0.6
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	17	16	17	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	61	54	62	58	63
Lead (aqua regia extractable)	mg/kg	1	MCERTS	85	76	85	73	80
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	0.6	< 0.3	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	17	18	15	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.8	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	88	73	100	86	85

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	5.7	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	12	16	11	19	6.8
TPH (C21 - C35)	mg/kg	1	MCERTS	49	29	36	43	10
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	63	47	49	70	19

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293743				
Sample Reference				SS103				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				15/08/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	18				
Total mass of sample received	kg	0.001	NONE	0.52				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	510				
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	120				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	59.8				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	410				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.89				
Anthracene	mg/kg	0.05	MCERTS	0.22				
Fluoranthene	mg/kg	0.05	MCERTS	1.7				
Pyrene	mg/kg	0.05	MCERTS	1.6				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.79				
Chrysene	mg/kg	0.05	MCERTS	0.77				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.87				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.41				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.72				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.48				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.76				

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293743				
Sample Reference				SS103				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				15/08/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	70				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	90				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93				

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0				
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0				
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0				
TPH (C16 - C21)	mg/kg	1	MCERTS	5.8				
TPH (C21 - C35)	mg/kg	1	MCERTS	25				
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10				
TPH Total C5 - C40	mg/kg	10	MCERTS	33				

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Analytical Report Number : 19-55101

Project / Site name: Bowes Street

* 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 *
1293738	TS101	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1293739	TS102	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1293740	TS103	None Supplied	None Supplied	Brown clay and sand with gravel.
1293741	SS101	None Supplied	None Supplied	Brown clay and sand with gravel.
1293742	SS102	None Supplied	None Supplied	Brown clay and sand with gravel.
1293743	SS103	None Supplied	None Supplied	Brown loam and clay with vegetation and gravel

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-55101

Project / Site name: Bowes Street

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	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 based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report are representative of the samples submitted for analysis.

APPENDIX V
GAS MEMBRANE VALIDATION CERTIFICATE

GAS MEMBRANE VALIDATION

Site: Bowes Street	
Date: 03-05-2019	Project Number: 11-813
Project Manager: R. Horseman	E3P Engineer: J. James
Ground Gas Risk Assessment: **Hydrocarbon Resistant Membrane (VOC Blok and Visqueen GX) – Characteristic Situation 2**	

Overview:

The membrane comprised of Visqueen Ultimate VOC Blok, this was laid below the slab with welded joints, laid over Visqueen Vent Membrane & vented to external air at 3.0m centres DPC Visqueen GX with taped joints.

Visqueen Ultimate VOC Blok and Visqueen GX is resistant to Hydrocarbons, Methane, VOCs and BTEX and carbon dioxide. E3P can confirm there were no holes or rips at the time of inspection. Upon being laid the membrane is to be covered with a Celotex (closed Cell) floor insulation material which is considered to provide a high degree of protection.

All external joints were inspected and E3P can confirm that the membrane was overlapped and double taped to external and internal gas resistant DPM. The membrane was taped to the gas resistant DPM using a double-sided jointing tape. All the overlaps were then additionally taped using foil backed girth tape.

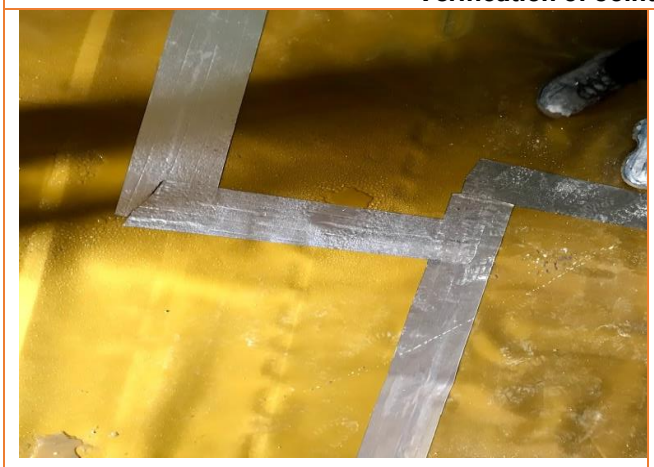
Each unit has a service duct located to the front and outer edge of the property. E3P inspected each one and can confirm that the top hats have been adequately sealed against the membrane.

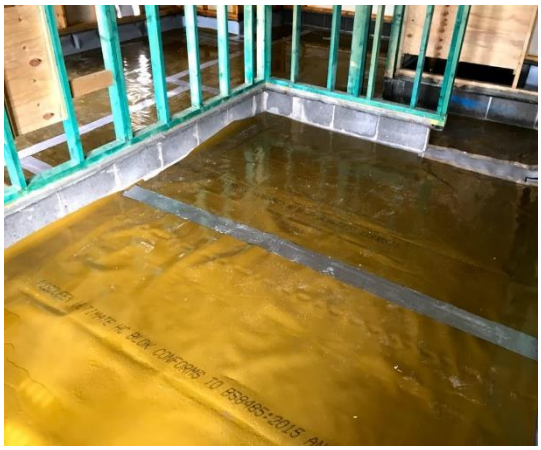
Based on the information provided within this report, the site inspections and validation checklists, E3P can confirm that the **Extra Care Building** has been installed with gas protection measures in accordance with Characteristic Situation 2 to an acceptable level of workmanship.

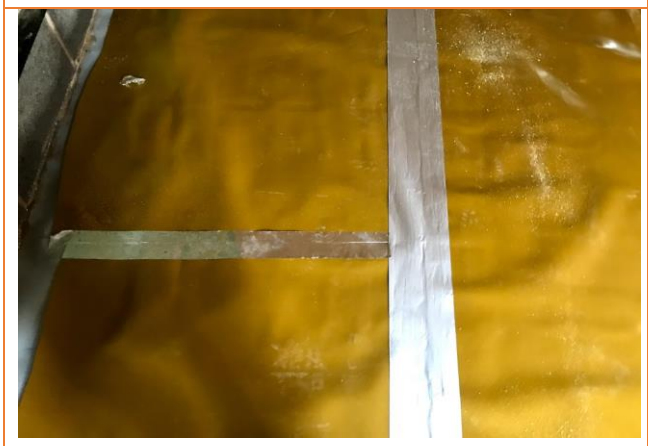
Membrane Specification: Hydrocarbon Resistant Membrane (VOC Blok and Visqueen GX)

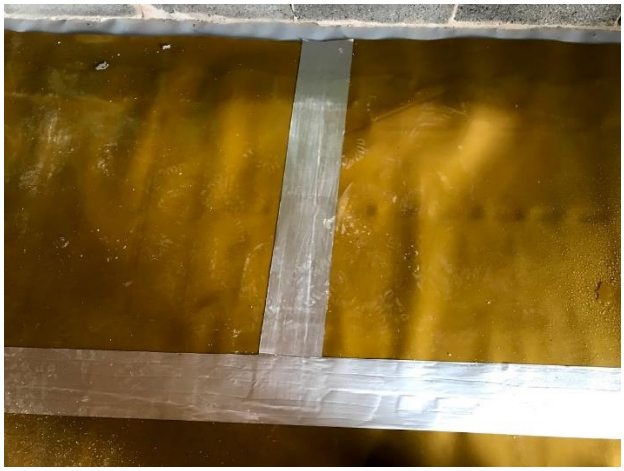
Extra Care Building	
General Condition of Membrane-Good Condition	

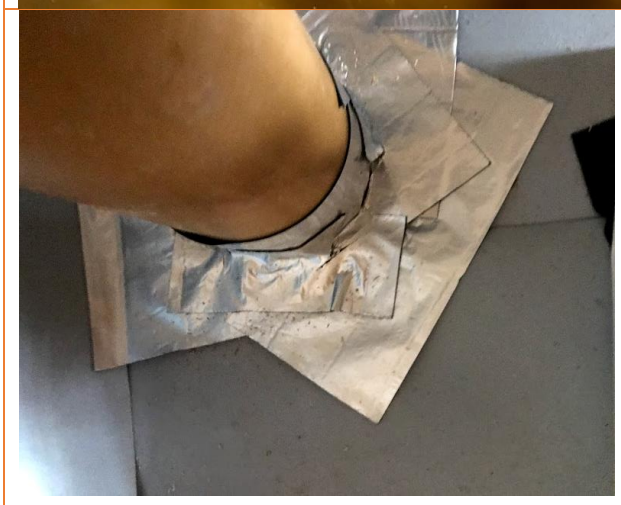
Verification of Joints and Seals









Verification of Service Penetrations	
	

e3p

Gas Protection Validation Site Record

Plot No: Extra Care

Inspection date/time:	3/5/19	Inspected by:	J JAMES	Photographed:	✓/× ✓

	✓/×	Notes/recommendations
Membrane Type Correct	✓	
Extent of Coverage Correct	✓	
Underside of Membrane	✓	
Slab / membrane condition	✓	
Laps and joints	✓	
Damp-proof course	✓	
Service entries	✓	
Folded Membrane Joint Taped & inspected	✓	

This Plot has PASSED/FAILED* inspection. (Any proposed remedial works will be noted in the "Remarks" column on this form).

An additional inspection visit IS/IS NOT* required for this Plot.

Inspection by: Jordan James Signed: [signature]

One record sheet to be completed for each plot – To be completed by E3P Professional Inspecting.

Environmental Engineering Partnership Limited trading as E3P
Registered in England No: 08725262 Registered Office: Heliport Business Park, Liverpool Road, Eccles, Salford, M30 7RU

APPENDIX VI
COVER SYSTEM
VALIDATION CERTIFICATE

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Ref: 11-813-Rev 1
Date: 10th March 2022

Steve Weir
Rowlinson Construction
London House
London Road South
Poynton
Stockport
SK12 1YP

BY Email

Dear Steve,

COVER SYSTEM VALIDATION – EXTRA CARE BUILDING

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear public open space areas of the Extra Care Building at Bowes Street, Manchester.

In total 3 No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 300 mm (150 mm topsoil and at least 150 mm subsoil).

E3P can confirm that our independent validation demonstrates that the landscaped areas have been installed with at least 300 mm of certified topsoil and subsoil in accordance with the NHBC requirements for a site of this nature.

TOPSOIL

E3P attended site on 4th February 2020 to obtain three samples of the stockpiled topsoil deposits and again on the 15th July 2020 which were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed soft landscaping areas.

Chemical analysis results are included within lab reports 20-84975 – 20-19767 (attached to this letter).

SUBSOIL

Subsoil was imported as a horticultural sand from Tarmac Crown Farm in Northwich.

Three samples of subsoil were analysed in accordance with the regulatory approved Remediation Strategy. Chemical analysis identified no contaminant exceedances; therefore, it has been determined that the subsoil would be suitable for utilisation within the proposed landscaped areas.

Laboratory certificate 19-55101 provides analysis of the imported subsoil.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

Rob Horseman
Associate Director

Site: Bowes Street

Date: 15-07-2020	Project Number: 11-813
Project Manager: R. Horseman	E3P Engineer: T. Preston
Plot Numbers Validated: Extra Care Building	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy. Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: Extra Care Building		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials

Depth of Cover System Materials

Depth of Cover System at Ground Level

Depth of Cover System in Relation to Plot

Plot No: Extra Care Building		
Depth of Strata (m bgl)	0.00.0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: Extra Care Building		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

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e: Rhorseman@e3p.co.uk

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Watford,
Herts,
WD18 8YS

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Analytical Report Number : 20-19767

Project / Site name:	Bowes St.	**Samples received on:**	16/07/2020
Your job number:		**Sample instructed/ Analysis started on:**	16/07/2020
Your order number:		**Analysis completed by:**	22/07/2020
Report Issue Number:	1	**Report issued on:**	22/07/2020
Samples Analysed:	3 soil samples		

Signed: Karolina Marek

Karolina Marek
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.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 20-19767

Project / Site name: Bowes St.

Lab Sample Number				1564595	1564596	1564597		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				15/07/2020	15/07/2020	15/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	10	13	14		
Total mass of sample received	kg	0.001	NONE	0.50	0.50	0.50		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	6.7	7.1		
Total Cyanide	mg/kg	1	MCERTS	3	1	2		
Total Sulphate as SO_4	mg/kg	50	MCERTS	1900	1800	1900		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.20	0.19	0.22		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	410	380	440		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	204	189	222		
Sulphide	mg/kg	1	MCERTS	1.1	7.3	2.9		
Total Sulphur	mg/kg	50	MCERTS	1100	1200	1200		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	0.29	0.23	0.95		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65		
Phenanthrene	mg/kg	0.05	MCERTS	2.3	1.8	5.2		
Anthracene	mg/kg	0.05	MCERTS	0.39	0.47	1.1		
Fluoranthene	mg/kg	0.05	MCERTS	3.3	4.1	7.0		
Pyrene	mg/kg	0.05	MCERTS	3.2	3.8	6.4		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.0	2.4	4.8		
Chrysene	mg/kg	0.05	MCERTS	1.4	2.0	2.8		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.9	2.4	3.7		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.94	0.95	1.5		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.7	1.8	3.5		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.71	0.85	1.4		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.37		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.83	0.94	1.5		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	19.0	21.7	40.9		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	28	29	39		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.6	0.7		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	27	29		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	66	68	75		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	470	260	350		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.7	0.8		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	22	22		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.2	2.1	2.1		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	150	170		

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 20-19767

Project / Site name: Bowes St.

Lab Sample Number				1564595	1564596	1564597		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				15/07/2020	15/07/2020	15/07/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	8.3	8.9	24		
TPH (C21 - C35)	mg/kg	1	MCERTS	25	42	74		
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	36	53	99		

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Analytical Report Number : 20-19767

Project / Site name: Bowes St.

* 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 *
1564595	TS101	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1564596	TS102	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
1564597	TS103	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 20-19767

Project / Site name: Bowes St.

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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The results included within the report relate only to the sample(s) submitted for testing.

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Analytical Report Number : 20-84975

Project / Site name:	Bow St	**Samples received on:**	04/02/2020
Your job number:	11813	**Samples instructed on:**	04/02/2020
Your order number:		**Analysis completed by:**	11/02/2020
Report Issue Number:	1	**Report issued on:**	11/02/2020
Samples Analysed:	3 soil samples		

Signed: Karoline Marek

Karolina Marek
Technical Reviewer (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

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

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Analytical Report Number: 20-84975

Project / Site name: Bow St

Lab Sample Number				1432702	1432703	1432704		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				03/02/2020	03/02/2020	03/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	10	11	14		
Total mass of sample received	kg	0.001	NONE	0.48	0.54	0.54		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.8	7.9		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	400	490	540		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	63	59	120		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.032	0.029	0.061		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	31.6	29.4	60.5		
Sulphide	mg/kg	1	MCERTS	< 1.0	1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	320	340	390		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.31	0.97		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.31	0.95		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.65		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.63		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.66		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	6.66		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	6.2	6.2		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	18	16		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	16	17		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	30	29	33		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	13	13		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	55	72		

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Analytical Report Number: 20-84975

Project / Site name: Bow St

Lab Sample Number				1432702	1432703	1432704		
Sample Reference				TS101	TS102	TS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				03/02/2020	03/02/2020	03/02/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	9.3		
TPH (C16 - C21)	mg/kg	1	MCERTS	6.7	< 1.0	18		
TPH (C21 - C35)	mg/kg	1	MCERTS	50	< 1.0	21		
TPH (C35 - C40)	mg/kg	10	MCERTS	24	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	83	< 10	50		

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Analytical Report Number : 20-84975

Project / Site name: Bow St

* 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 *
1432702	TS101	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1432703	TS102	None Supplied	None Supplied	Brown clay and sand with gravel.
1432704	TS103	None Supplied	None Supplied	Brown clay and sand with gravel.

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Analytical Report Number : 20-84975

Project / Site name: Bow St

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 19-55101

Project / Site name:	Bowes Street	**Samples received on:**	16/08/2019
Your job number:		**Samples instructed on:**	16/08/2019
Your order number:		**Analysis completed by:**	23/08/2019
Report Issue Number:	1	**Report issued on:**	23/08/2019
Samples Analysed:	6 soil samples		

Signed: Karoline Marek

Karolina Marek
Technical Reviewer (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

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

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293738	1293739	1293740	1293741	1293742
Sample Reference				TS101	TS102	TS103	SS101	SS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				15/08/2019	15/08/2019	15/08/2019	15/08/2019	15/08/2019
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	%	N/A	NONE	17	18	18	19	17
Total mass of sample received	kg	0.001	NONE	0.48	0.49	0.50	0.40	0.52
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.7	7.7	7.8	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	530	460	620	510	500
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100	120	99	120	110
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.051	0.061	0.050	0.059	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	50.9	60.9	49.7	58.5	53.2
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	350	360	380	360	380
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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	0.63	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.34	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	1.0	0.75	2.5	0.83
Anthracene	mg/kg	0.05	MCERTS	0.28	0.17	0.17	0.43	0.18
Fluoranthene	mg/kg	0.05	MCERTS	2.2	2.0	1.4	2.6	1.6
Pyrene	mg/kg	0.05	MCERTS	2.0	1.9	1.4	2.3	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.0	1.1	0.73	1.2	0.81
Chrysene	mg/kg	0.05	MCERTS	0.98	0.84	0.73	1.2	0.73
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	1.1	0.89	1.3	0.99
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.40	0.44	0.25	0.51	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.98	0.84	0.68	1.0	0.70
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.44	0.43	0.34	0.48	0.34
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	0.59	0.52	0.40	0.70	0.44
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	11.4	10.4	7.75	15.2	8.24

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293738	1293739	1293740	1293741	1293742
Sample Reference				TS101	TS102	TS103	SS101	SS102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				15/08/2019	15/08/2019	15/08/2019	15/08/2019	15/08/2019
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	16	16	16	14	17
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	0.5	0.6	0.4	0.6
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	17	16	17	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	61	54	62	58	63
Lead (aqua regia extractable)	mg/kg	1	MCERTS	85	76	85	73	80
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	0.6	< 0.3	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	17	18	15	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.8	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	88	73	100	86	85

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	5.7	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	12	16	11	19	6.8
TPH (C21 - C35)	mg/kg	1	MCERTS	49	29	36	43	10
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	63	47	49	70	19

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293743				
Sample Reference				SS103				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				15/08/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	18				
Total mass of sample received	kg	0.001	NONE	0.52				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	510				
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	120				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	59.8				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	410				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.89				
Anthracene	mg/kg	0.05	MCERTS	0.22				
Fluoranthene	mg/kg	0.05	MCERTS	1.7				
Pyrene	mg/kg	0.05	MCERTS	1.6				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.79				
Chrysene	mg/kg	0.05	MCERTS	0.77				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.87				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.41				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.72				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.48				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.76				

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Analytical Report Number: 19-55101

Project / Site name: Bowes Street

Lab Sample Number				1293743				
Sample Reference				SS103				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				15/08/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	70				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	90				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93				

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0				
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0				
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0				
TPH (C16 - C21)	mg/kg	1	MCERTS	5.8				
TPH (C21 - C35)	mg/kg	1	MCERTS	25				
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10				
TPH Total C5 - C40	mg/kg	10	MCERTS	33				

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Analytical Report Number : 19-55101

Project / Site name: Bowes Street

* 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 *
1293738	TS101	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1293739	TS102	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
1293740	TS103	None Supplied	None Supplied	Brown clay and sand with gravel.
1293741	SS101	None Supplied	None Supplied	Brown clay and sand with gravel.
1293742	SS102	None Supplied	None Supplied	Brown clay and sand with gravel.
1293743	SS103	None Supplied	None Supplied	Brown loam and clay with vegetation and gravel

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Analytical Report Number : 19-55101

Project / Site name: Bowes Street

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	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 based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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