Providing Ground Solutions

McAleer & Rushe

276 Bath Road, West Drayton

Remediation Verification Report

September, 2018

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1. INTRODUCTION

Card Geotechnics Limited (CGL) was commissioned by McAleer & Rushe Limited to produce a Verification Report for the remediation measures installed as part of the hotel development at 276 Bath Road, West Drayton, UB7 0DQ. The remedial measures were designed to address residual contamination risks associated with the site and comprised materials management, including re-use of site-won soils, installation of a vapour membrane within the hotel complex and placement of suitable capping layers to facilitate the development.

A Materials Management Plan (MMP) was prepared for the scheme to reuse soils on the site of origin, in accordance with the CL:AIRE Definition of Waste: Code of Practice (DoWCoP)[1,2].

CGL produced a Soil Vapour Assessment and Remediation Strategy[3] (SVARS) in 2016 for the site, which provided details on the scope of remediation works necessary to render the site suitable for the proposed hotel development. The SVARS was agreed with London Borough of Hillingdon (LBH) prior to the commencement of works.

This report presents a summary of previous works undertaken at the site, the completed construction-phase works, the results of chemical samples taken during construction, inspections by CGL and information provided by the contractor.

The purpose of this report is to provide evidence that the remediation and verification works have been completed in accordance with the requirements of the SVARS and pursuant to Condition 24 of the LBH Planning Permission for the development (35293/APP/2009/1938) which relates to verification reporting and Condition 21 of permission of 35293/APP/2015/3693 which relates to land contamination.

[1] CL:AIRE. (2011) The Definition of Waste: Development Industry Code of Practice. Version 2.
[2] CGL. (2018). *276 Bath Road. Materials Management Plan – Revision 2.*
[3] CGL (2016). *276 Bath Road, West Drayton, Soil Vapour Assessment and Remediation Strategy.* Reference CG/18411D.

2. SITE CONTEXT

2.1 Site Location and Description

The site covers approximately 2 hectares, is roughly rectangular in shape and is located approximately 150m north of Heathrow Airport and is bordered by a commercial estate to the west, comprising *Heathrow Boulevard* and *Orbit Developments Southern Limited*. *Airport Gate Business Centre* borders the site to the east, with Bath Road carriageway immediately to the south and a ground level car park off Bath Road to the north.

The site was previously occupied by a Technicolor film processing facility from the 1930s until 2009, after which it was demolished in 2009/2010. Prior to the commencement of the hotel construction works, the site comprised vacant land with a stockpile of crushed aggregate located within the northeast of the site. During operation by Technicolor the site is understood to have been subject to widespread usage of associated chemicals and fuels, including chlorinated solvents, with storage reported to have been in above ground vessels only.

2.2 The Development

The development comprises the construction of a 623 bedroom multi-storey hotel with associated areas of soft landscaping, car parking and related civil infrastructure. The hotel structure and hard surfaced car parking cover the majority the site with discrete areas of soft landscaping, predominantly around the periphery of the site and in beds close to the car parking. Development plans are provided in Appendix A.

2.3 Summary of Previous Investigation

The site has been subject to a number of phases of previous ground investigation between 2007 and the present[4,5,6,7,8,9,10,11,12,13,14,15]. The ground conditions encountered during the various phases of investigation are consistent with the published geological records[16]. A summary of the ground conditions encountered during the most recent CGL investigations is presented in Table 1 below.

Table 1. Summary of Ground Conditions

Stratum	Level to top of stratum (mbgl)	Typical thickness (m)
Loose to medium dense multi- coloured (grey, brown and orange) slightly silty slightly sandy gravel with occasional cobbles. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse of concrete and brick, with infrequent cobbles of subangular concrete. [MADE GROUND]	0	0.3 to 1.6
Firm to stiff orange to brown slightly gravelly clayey SILT. Gravel is angular to subrounded fine of flint. [LANGLEY SILT MEMBER]	0.3 to 0.8	0.4 to 0.6
Dense orange brown occasionally pinkish grey or black clayey SAND and GRAVEL becoming very sandy GRAVEL at depth. Sand is medium to coarse. Gravel is subangular to rounded fine to coarse of flint. Occasional cobbles of flint. Less clay with depth. [TAPLOW GRAVEL FORMATION]	0.8 to 1.6	4.1 to 4.9
Weathered firm to stiff brown CLAY. [WEATHERED LONDON CLAY FORMATION]	5.0 to 6.0	0.4 to 1.0
Stiff to very stiff grey slightly fissured CLAY with rare siltstone beds. [LONDON CLAY FORMATION]	5.4 to 6.8	Proven to 30m bgl

The works have incorporated ground investigations, generic and detailed risk assessment, soil and groundwater remediation, monitoring and vapour assessments. Works to date are summarised below with further details provided within the CGL SVARS[3].

[4] Environ (August 2007.) *Phase I Environmental Review: Technicolor, Bath Road.* 61C11857, Issue 03.
[5] Environ (March 2008). *Phase II Environmental Site Assessment: Technicolor, Bath Road, West Drayton.* 61C11857, Issue 04.
[6] Environ (November 2009). *Refined Groundwater Quantitative Risk Assessment: Technicolor, Bath Road, West Drayton.* UK11-14942.
[7] Environ (September 2009). *Demolition Phase Watching Brief: Technicolor, West Drayton.* AM/JG/VB/uk61c11857_35.
[8] Environ (January 2010). Remediation Strategy: Technicolor, West Drayton. UK11-14942.
[9] Regenesis (April 2010). *Contract Completion Report: Former Technicolor Site, Bath Road, West Drayton.* #7GL09328.RRS.
[10] Environ (May 2014). *Post Remediation Targeted Investigation of Residual Hotspots: 276 Bath Road, West Drayton*. UK11-14942.
[11] Environ (December 2014). *Residual Soil Source Remediation: 276 Bath Road, West Drayton.* UK11-14942.
[12] CGL (October 2015). *276 Bath Road, Heathrow: Geotechnical and Geoenvironmental Interpretative Report Rev2.*
[13] CGL (October 2015) 276 Bath Road, Heathrow: Additional trial pitting and waste characterisation.
[14] Capita (September 2015). *Volatile Vapour Detailed Quantitative Risk Assessment and Remediation Strategy: 276 Bath Road, West Drayton.* CS070779-PE-15-126-R.
[15] CGL (March 2016). *Soil Vapour Risk Assessment: 276 Bath Road.* CG/18411C.
[16] BGS (1991) Solid and Drift Geology: Sheet 269 Windsor 1:50,000.

Environ undertook a series of ground investigations and watching briefs between 2008 and 2009. These investigations identified substantially elevated concentrations of chlorinated solvents in the shallow soils and groundwater. The Taplow Gravel Formation was noted to have been heavily impacted.

Environ concluded that the in-situ concentrations of contaminants on site did not pose a risk to controlled waters. The site was to undergo cut and fill earthworks during development and it was noted that when material is lain down for fill (primarily under the car park in the northern section of the site), the levels will increase. This fill process has increased the depth at which the groundwater is encountered in that area. Furthermore, the layer of hardstanding constructed across the car park area will drastically reduce surface water infiltration and, therefore, reduce potential leaching of material from the unsaturated zone into the groundwater table.

Following agreement with Environ[8], Regenesis Remediation Services[9] undertook remediation of three identified chlorinated solvent hotspots[8] on site, which included chemical injection of 3D Microemulsion (3DMe). Ongoing groundwater monitoring noted a general decrease in contaminant concentrations, however, volatile organic compound (VOC) impacted soil hotspot areas were highlighted during the monitoring. The hotspot areas were believed to have represented residual contamination within the unsaturated soil zone. Further investigation works were undertaken in the hotspot areas and additional groundwater monitoring rounds were carried out. The results indicated active reductive dechlorination of chlorinated solvents occurring on site and it was considered that groundwater on-site was considered to have been remediated to a suitable standard that it would no longer pose an unacceptable risk to controlled waters receptors. A verification report providing this conclusion was submitted to the Local Authority in December 2014[9] and a Decision Notice for Condition's 23 and 29 of the original 2010 Planning Permission, confirming 'no further action' in relation to these works, was issued by LBH on 25 April 2016.

A detailed vapour quantitative risk assessment was undertaken by Capita in 2015[14] which concluded that a potentially significant risk to hotel occupants existed from the inhalation of vapours in indoor air. This was followed by trial pitting by CGL to classify the material in the vicinity of the former hotspots for waste disposal purposes.

Further vapour risk assessment was completed by CGL in 2016 to evaluate the potential for the development to proceed without the requirement for a sub-slab ventilation system. CGL concluded that the presence of a 300mm thick concrete slab with VOC membrane "*wrapped continuously around foundations and sealed to the inside face of the concrete*" would significantly reduce the predicted indoor air concentrations. Based on this, it was deemed that the membrane, in conjunction with the

concrete slab, without sub-floor ventilation, would mitigate potential risks to acceptable levels in terms of indoor air inhalation. Consequently, the use of sub-floor ventilation was eliminated from the design so long as the membrane and slab were properly installed, and integrity tested[3].

A final phase of intrusive investigation and vapour risk assessment was undertaken by CGL in 2016 which confirmed that potentially unacceptable risks from soil vapours will not be realised as long as the outlined mitigation measures are adopted and the recommendations of the CGL risk assessment followed.

3. REMEDIATION REQUIREMENTS AND VERIFICATION

3.1 General

The CGL SVARS[3] was produced for the site in 2016 with the following remedial measures recommended to mitigate against potentially unacceptable risks:

- Provision of an engineered capping layer to mitigate the potential risks to human health*;
- Provision of ground vapour protection measures for buildings and structures;
- Appropriate materials for underground water supply pipes;
- Material (waste) management (including provision of a Material Management Plan); and,
- Discovery strategy/watching brief where unexpected contaminants are discovered during groundworks.

*It should be noted that further to submission of the soil vapour assessment and remediation strategy, the remediation strategy was subsequently updated with regards to the capping layer requirements. This is discussed further in Section 3.4 of this report.

3.2 Verification Requirements

The 2016 SVARS[3] stated that validation inspections and sampling were to be carried out to confirm the remediation measures have been undertaken in accordance with the agreed protocol. A copy of the Verification Plan is included as Appendix B.

3.3 Verification Overview

During the construction-phase of works, CGL visited site on a number of occasions between 5th January and 8th March 2017 and on 20th September 2018 to validate the works. Information with respect to the works completed has also been supplied by McAleer and Rushe. The following section presents a summary of the works completed in accordance with the recommendations of the CGL SVARS[3].

3.4 Revision of Capping Layer Requirements

The SVARS[3] recommended that 150mm of topsoil is placed over 450mm of subsoil (including a geotextile) in areas of soft landscaping. The presence of buildings, roads and hard standing are considered to mitigate the potential risks to human health and therefore no further capping is required in these areas. Following review of the landscape design and a value engineering exercise, it was recommended that the capping thickness be reduced to 150mm of clean imported topsoil in grassed

areas and 450mm topsoil in areas of planting with a geotextile separator underlying all imported soils. These recommendations have been provided to the Environmental Protection team at Hillingdon Borough Council and a response is awaited (Appendix C).

The change to the soft landscaping thickness was recommended following review of the proposed landscape design which identified that the areas of proposed soft landscaping were minimal, on the periphery of the site and within discrete pockets within the car parking area. In addition, it was noted that, residual underlying ground conditions generally indicate relatively low concentrations of contaminants, that the imported clean capping soils will be underlain by a geotextile separator and that the landscaped areas will only be accessed intermittently, for maintenance purposes and occasionally by guests of the hotel development as they access the car park.

3.4.1 Pre-import Test Data

Prior to the import of approximately 670m^3 of multi-purpose topsoil to site for the soft landscaping, the results of two samples was provided, copy of laboratory certificate is in Appendix D. The results have been compared to the capping import criteria detailed within the CGL SVARS[3]. When compared, no exceedances of the import criteria are recorded and the topsoil is considered suitable for use on-site.

3.4.2 Capping Depth Checks and Laboratory Testing

CGL attended site on 20th September 2018 to verify the placement of the capping layer, undertake depth checks and obtain laboratory samples of completed areas of soft landscaping. It is noted that not all areas of soft landscaping had been completed at the time of the visit. A summary of the capping depth checks is presented in Table 2.

Table 2. Summary of Capping Thickness

Summary of capping layer thickness/sampling							
Sample location.	*Topsoil*		*Subsoil*		*Total (mm).*	*Geotextile present?*	*PASS/FAIL?*
	Thickness (mm).	*Sample Ref*	*Thickness (mm).*	*Sample Ref*			
TP1	200	TS-1	0	-	200	Yes	Pass
TP2	190	-	0	-	190	No	Fail
TP3	480	-	0	-	480	Yes	Pass
TP4	130	-	0	-	130	No	Fail
TP5	300	TS-3	0	-	300	Yes	Pass
TP6	190	TS-6	0	-	190	No	Fail

During the verification visit, it was noted that there was insufficient thickness of capping soils in one location along with the absence of the geotextile separator layer in three locations. The client has confirmed that the capping defects in these locations have subsequently been rectified and that the further areas of soft landscaping are to be completed during the week commencing 1st October 2018.

During the verification visit three topsoil samples were obtained, for subsequent laboratory analysis, to meet the minimum testing frequency of one sample per 250m^3 per material type, in accordance with the verification plan (Appendix B). The topsoil sample results were subsequently assessed and found to meet the criteria in the capping import specification presented in the CGL SVARS[3]. A capping inspection plan is provided as Figure 2 and the topsoil sample results and a photographic record are included in Appendix E.

3.5 Vapour Protection Measures

Given the presence of volatile petroleum hydrocarbons and chlorinated solvents in the soils beneath the site, the Capita[14] report and CGL SVARS[3,15] specified the need for vapour protection measures beneath the proposed hotel development.

Cordex's Puraflex VOC resistant membrane was specified for the building and installed by UK membranes. The vapour membrane installation was inspected by CGL on a phased basis on 12 occasions between 5th January and 8th March 2017. The membrane was generally noted to be in good condition, although a number of minor defects were recorded throughout the visits, which were either repaired whilst CGL was present on site or were fixed at a later date and repair photographs provided by the client. The seal between the membrane and inside face of the concrete has not been inspected by CGL. The vapour membrane was independently integrity tested and verified by MEC Environmental (MEC).

CGLs site visit records are included in Appendix F, along with the vapour membrane specification, MEC validation report and membrane performance certificate.

3.6 Water Supply Pipes

The Client has confirmed that Puriton water barrier pipes have been used across the site. A copy of the Puriton technical specification are included in Appendix G.

3.7 Materials Management

3.7.1 Materials Management Plan

Excess arisings have been generated at the site from the excavation of foundations and general site re-profiling. The MMP estimated that arisings comprised approximately 12,000m^3 of Taplow Gravel. CGL produced a Materials Management Plan (MMP)[2] in 2018 for the site which covered the re-use of 3,010m^3 of natural soils for general site re-profiling, 790m^3 for re-use around foundations and a further 170m^3 of hazardous material for re-use as backfill around a drainage attenuation tank in the north eastern section of the site (Appendix I). Excess soils (8,058m^3) from the southern portion of the site and 6,701m^3 of material from beneath the area of car parking in the northern section have been disposed off-site via the appropriate waste stream and under suitable Duty of Care documentation.

3.7.2 Duty of Care

Volumes from the material movement tracker provided by the client confirmed that 12,705m^3 of excess materials have been disposed of off-site including concrete, bituminous waste, inert and non-hazardous soils. Classification testing has been undertaken on stockpiled soils and the results are presented in Appendix H.

A material disposal summary is presented in Table 3 below.

Table 3. Summary of Material Disposal

Waste Stream	*Haulier*	*Reuse, Recycle or Dispose*	*Receiving Facility*	*European Waste Code*	*Volume (m³)*	*TOTAL (m³)*
Bituminous mixtures	O.Malley Haulage Limited	Recycle	Harper Lane Quarry	17 03 02	68	**68**
Concrete	O.Malley Haulage Limited	Recycle	Harper Lane Quarry	17 01 01	1,921	**1,938**
			Day Group Limited		17	
Inert	O.Malley Haulage Limited	Recycle	Harper Lane Quarry	17 01 07	385	**437.5**
			Airlinks Golf Club		17.5	
			Day Group Limited		35	
Soils	O.Malley Haulage Limited	Disposal	Sipson Lane	17 05 04	1,800	**10,244.5**
			Rushford Landfill		5,340	
	West London Grab Services Limited	Recycle	Hollybush Lane Aggregate Recycling Facility		900	
	HWS Waste Limited	Reuse	Hollybush Lane Aggregate Recycling Facility		70	
	Mitchellson Plant Hire Limited		Sipson Lane		752.5	
			Airlinks Golf Club		1,246	
	Mick George Limited		Queen Mary Reservoir Recycling Facility		85	
	Foley Haulage Limited		Harper Lane Quarry		51	
Other waste	O.Malley Haulage Limited	Disposal	Harper Lane Quarry	-	17	**17**

Material has been recycled, reused and disposed of to a number of facilities, as shown in Table 3 above. The haulier licences and receiving facility permits are provided in Appendix H, along with a selection of waste transfer tickets.

3.8 Watching Brief and Discovery Strategy

A watching brief and discovery strategy was maintained by the client during the earthworks and construction phase of the development.

During the earthworks, an area of potentially hazardous material was identified along the eastern boundary of the site, in the vicinity of a former diesel tank. CGL attended site on 11th November 2017 and 11th January 2017 to chase out visual and olfactory indicators of contamination, excavate impacted soils and take validation samples. The site visit records and laboratory analysis is presented in Appendix I. The impacted material was stockpiled and further laboratory analysis was undertaken to assess its suitability for re-use. Laboratory testing on the material confirmed elevated concentrations of heavy metals, including cyanide and asbestos. Assessment of the results confirmed that the material was suitable for use as backfill around an attenuation tank in the north eastern section of the site, which was to be located above the water table and under an area of hardstanding. A material re-use letter was produced by CGL and is also included in Appendix I.

It is understood that no further unexpected contamination was encountered during the works. An email from the client confirming that no unexpected contamination was encountered is presented as Appendix I.

4. CONCLUSIONS

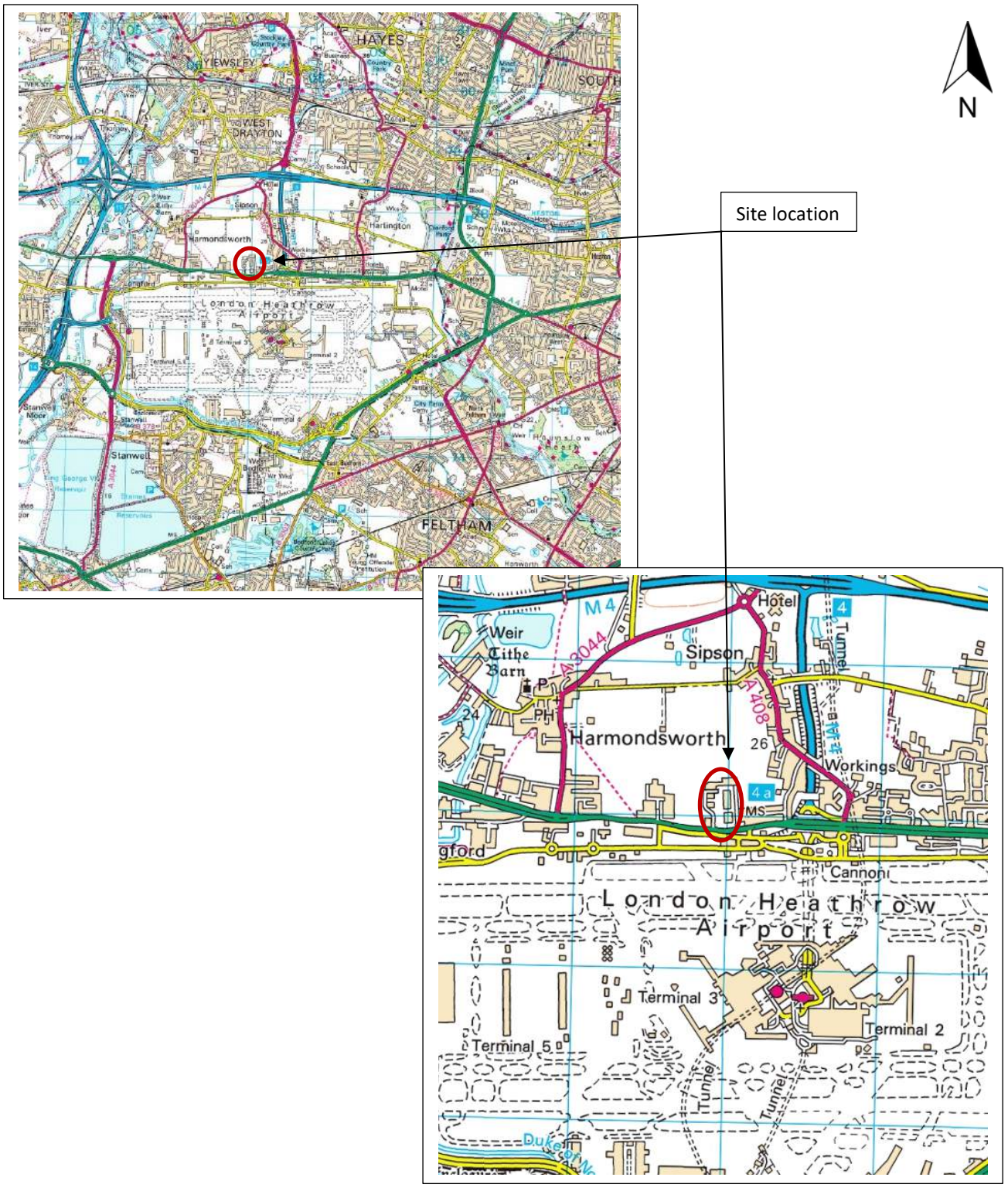
Following completion of the CGL SVARS[3] including the Verification Plan (Appendix B), and updated capping layer requirements (Appendix E), the following remedial actions are considered to have been undertaken in accordance with the agreed remediation strategy for the hotel development at the Bath Road site:

- Capping layers within areas of soft landscaping, with the exception of confirmation from the Local Authority regarding a reduced capping layer thickness;
- Installation of a VOC resistant membrane including installation inspection records from CGL and an independent integrity testing report;
- Installation of appropriate barrier pipes for water supplies to the development;
- Material management/disposal including appropriate reuse of site won soils in accordance with an MMP and off-site disposal of excess materials in accordance with Duty of Care documentation; and
- Provision of a watching brief for areas of unexpected / unidentified contamination and subsequent assessment and re-use, where suitable.

On the above basis it is considered the remedial works completed for the 276 Bath Road hotel development have met the requirements of the remedial strategy and are suitable for the development.

This report should be provided to the LBH planning team for discharge of the contamination related conditions pursuant to the development.

FIGURES

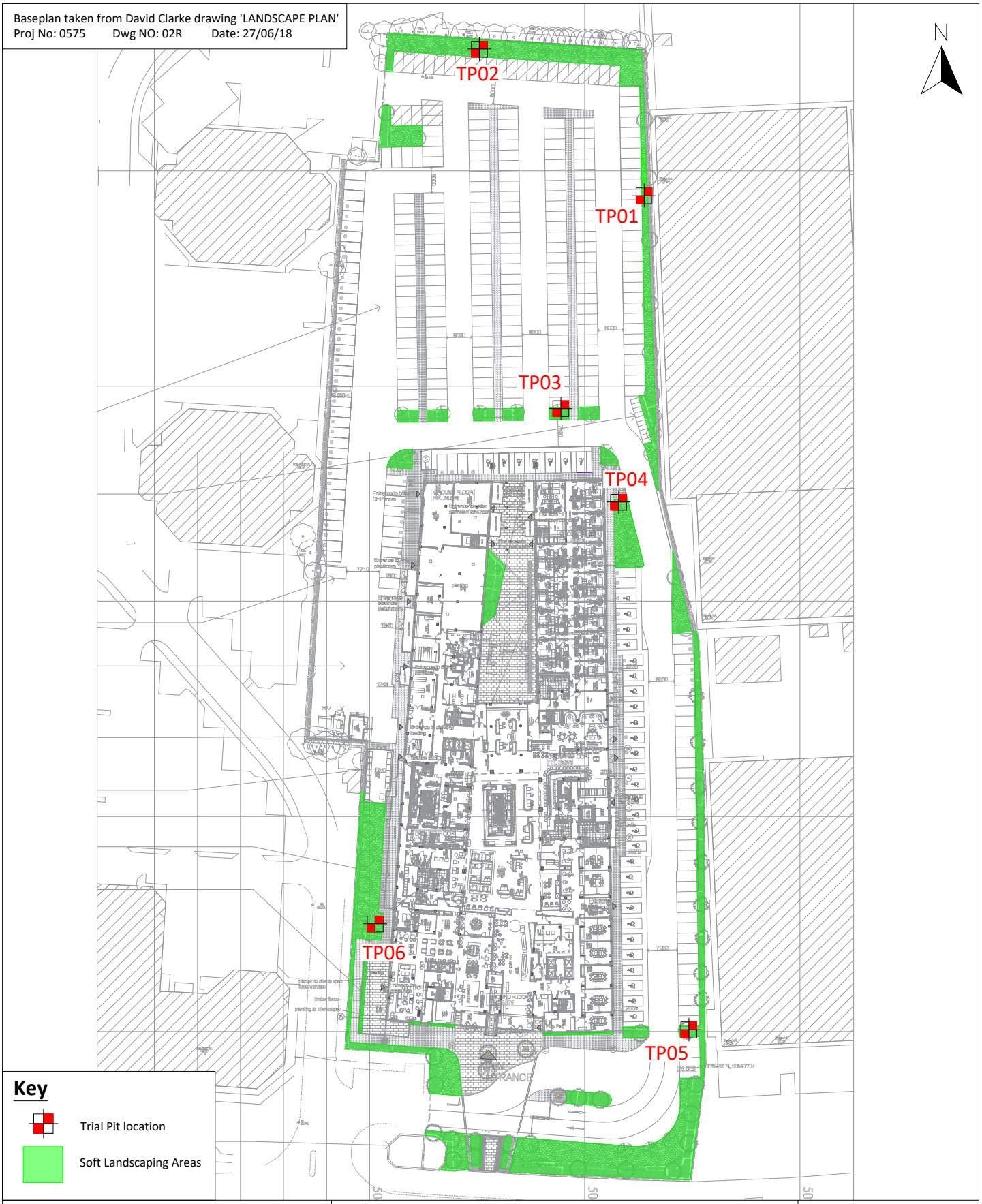


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Client	Project	Job No
McAleer & Rushe	**276 Bath Road, West Drayton**	**CG/18411E**
CGL	Title: **Site Location Plan**	**Figure 1**

Baseplan taken from David Clarke drawing 'LANDSCAPE PLAN'
Proj No: 0575 Dwg NO: 02R Date: 27/06/18



Client	Project	Job No
McAleer & Rushe	276 Bath Road, West Drayton	CG/18411E

CGL

Title

Figure 2 - Capping Inspection Plan

Drawn by	TSB
Checked by	XXX
Approved by	XXX

CG/18411E-001

APPENDIX A

Development Plans



01 202 GROUND FLOOR PLAN

1:250

GEA	5153 sqm
No. of rooms	75

NOTES:

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NOTE -

THE LANDSCAPING SHOWN IS INDICATIVE ONLY. PLEASE REFER TO BEA LANDSCAPING DRAWINGS FOR DETAILS

KEY:

Ac	Accessible bedroom
Ac(H)	Accessible bedroom with tracked hoist
Ad	Adaptable bedroom capable of being fitted out to accessible standards in the future
B	Standard room with bath
S	Standard room with shower
F	Family room

REV	DATE	NOTE	DRAW	CHCK
*	04 / 09 /09	First Issue	JH	AL

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Canmoor

TITLE
BATH ROAD, HEATHROW
TECHNICOLOR SITE

DRAWING
GROUND FLOOR PLAN

CLIENT
CANMOOR

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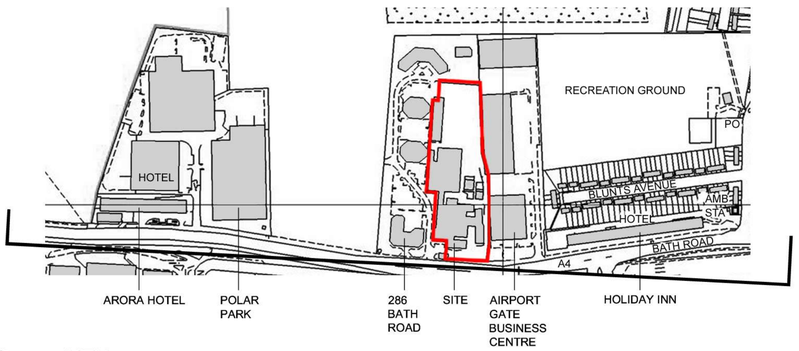
LEVELS SHOWN INDICATIVE



ARORA HOTEL | POLAR PARK | 286 BATH ROAD | PROPOSED HOTEL | AIRPORT GATE BUSINESS CENTRE | HOLIDAY INN

01/208 BATH ROAD ELEVATION

1:500



02/208 KEY

NTS

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	STATUS: PLANNING	CHECKED: AC

DRAWING NUMBER
2747-PL-208

APPENDIX B

Verification Plan

Reference	Principal requirements	Design or construction related	Site visit required by qualified geoenvironmental engineer	Supporting documentation
1.0 General principles	The site risk mitigation requirements are as follows: • Provision of an engineered capping layer to mitigate the potential risks to human health. • Ground vapour protection measures for buildings and structures. • Discovery strategy/watching brief where unexpected contaminants are discovered during groundworks. Amendments will be made to accord with any differing conditions encountered during the progress of the works.	Design & construction	**YES** • As detailed below	Details of construction programme to be provided by client/contractor.
2.0 Compliance with leglisation	The construction activities on the site will be undertaken in accordance with all current health and safety and environmental legislation.	Construction	-	-
3.0 Health and Safety requirements	This verification plan does not specifically cover health and safety requirements. This will be addressed in the Contractor's Health and Safety Plan.	Design & Construction	-	-
4.0 Capping layer	Where buildings, roads, hard standing are proposed, these are considered to mitigate the potential risks to human health and therefore no further capping will be required. However, in soft landscaping areas the capping be a minimum thickness of 0.6m and will comprise: • Topsoil and turf – 0.15m. • Sub-soil – minimum 0.45m. • Geotextile placed at the base of the capping layer (comprising Terram® 1000 or similar a non-woven geotextile with a pore size of 0.15mm and a nominal thickness of 0.8mm). The depth of the capping layer will need to be increased for trees/large shrubs. Where import of soils is required the soil will be imported from a known and reputable source. Concentrations must be below the Maximum Permissible Concentrations detailed in Appendix G, which are provided for a commercial end use. The pre-delivery chemical test results will be reviewed by the geoenvironmental consultant prior to the material being brought onto site.	Construction	**YES** • Yes, to obtain verification samples of capping layer soils (subsoil and topsoil) and confirm capping layer thickness	Source certificates and pre-delivery test data (to be provided by Contractor) Site visit reports including photographs Chemical test results

Reference	Principal requirements	Design or construction related	Site visit required by qualified geoenvironmental engineer	Supporting documentation
	Materials should be tested at a frequency of 1 sample per 250m^3 of imported soil for soft landscaping. A minimum of three samples per material type (i.e. topsoil and sub-soil) should be collected.			
5.0 Stockpiled aggregate	Prior to reuse, the stockpiled aggregate in the north east of the site should be subject to validation testing to confirm its chemical suitability for use. Concentrations must be below the Maximum Permissible Concentrations detailed in Appendix G, which are provided for a commercial end use. Materials should be tested at a frequency of 1 sample per 500m^3 of the stockpiled aggregate. A minimum of three samples per material type should be collected.	Construction	**YES** • Yes, to obtain verification samples of stockpiled aggregate	Site visit reports including photographs Chemical test results
6.0 Vapour protection measures	The design should be in accordance with CIRIA Guidance and British Standard BS8485:2015 and approved by the Local Authority. The measures will be installed by a competent individual with an appropriate NVQ Diploma with appropriate verification, as recommended in CIRIA Report C735. Puraflex's hydrocarbon resistant membrane has been specified for use within the development to mitigate potential risks from soil vapour. The client should engage with the manufacturer in order to ensure the design is fit for purpose and does not invalidate warranties. The design should be in accordance with CIRIA Guidance and British Standard BS8485:2015 and approved by the Local Authority. The membrane should be installed by a competent individual with an appropriate NVQ Diploma. The vapour protection measures should be subject to independent verification/integrity testing, as recommended in CIRIA Report C735.	Design and construction	**NO but integrity testing/inspection required by third party specialist** • To inspect the installed and completed vapour protection measures	Integrity testing/verification reports including photographs, provenance data for materials/membrane etc to be provided
7.0. Unexpected contamination (Watching brief/discovery strategy)	A watching brief/discovery strategy is to be put into place whereby should unexpected areas of contamination be encountered during construction works the geoenvironmental consultant is to be informed to conduct a site visit, take additional samples and assess the risk. The regulators will also be notified. Full details presented in report.	Construction	**Yes** • As required	Site visit reports including photographs Chemical test results Revised risk assessment

APPENDIX C

Regulatory Correspondence (Awaited)

APPENDIX D

Pre-Import Capping Data

Results - Soil

Project: Springbridge Yard - MP

Client: Springbridge Direct Ltd			**Chemtest Job No.:**		18-04424
Quotation No.: Q18-12109			**Chemtest Sample ID.:**		579441
			Client Sample ID.:		Sample 1
			Sample Type:		SOIL
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected
Moisture	N	2030	%	0.020	16
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Stones
Soil Texture	N	2040		N/A	Sand
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.3
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50
Arsenic	U	2450	mg/kg	1.0	15
Cadmium	U	2450	mg/kg	0.10	0.11
Chromium	U	2450	mg/kg	1.0	13
Copper	U	2450	mg/kg	0.50	6.9
Mercury	U	2450	mg/kg	0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	8.6
Lead	U	2450	mg/kg	0.50	13
Selenium	U	2450	mg/kg	0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	39
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] 8.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] 54
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] 62
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] 1.2
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] 5.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] 61
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] 5.8
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] 73
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] 130
Naphthalene	N	2700	mg/kg	0.010	[A] < 0.010
Acenaphthylene	N	2700	mg/kg	0.010	[A] < 0.010
Acenaphthene	N	2700	mg/kg	0.010	[A] < 0.010

Chemtest
The right chemistry to deliver results

Results - Soil

Project: Springbridge Yard - MP

Client: Springbridge Direct Ltd			**Chemtest Job No.:**		18-04424
Quotation No.: Q18-12109			**Chemtest Sample ID.:**		579441
			Client Sample ID.:		Sample 1
			Sample Type:		SOIL
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Fluorene	N	2700	mg/kg	0.010	[A] < 0.010
Phenanthrene	N	2700	mg/kg	0.010	[A] < 0.010
Anthracene	N	2700	mg/kg	0.010	[A] < 0.010
Fluoranthene	N	2700	mg/kg	0.010	[A] < 0.010
Pyrene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[a]anthracene	N	2700	mg/kg	0.010	[A] < 0.010
Chrysene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	[A] < 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	[A] < 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	[A] < 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	[A] < 0.20
Benzene	U	2760	µg/kg	1.0	[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0
Total Phenols	U	2920	mg/kg	0.30	3.4

Chemtest
The right chemistry to deliver results

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 18-04424
Chemtest Sample ID.: 579441
Client Sample Ref.: Springbridge Yard
Client Sample ID.: Sample 1

Date Sampled: 22/02/2018

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					**Acid**	**Low F**	**Calc.**
Clay content	%		6.0				
Silt content	%		10.0				
Sand content	%		84				
Soil texture class			Sand	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	5.1	YES	NO	YES	NO
Clay 20-35%		5.0-20					
Stone Content	**% m/m**						
>2mm		0-30	6.9	YES			
>20mm		0-10	< 0.020	YES			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	[A] 7.9	YES	NO	YES	YES
Carbonate (Calcareous only)	%		< 0.10				NO
Electrical Conductivity	µS/cm	If >3300 do ESP	[A] 2500	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.26	YES	YES		YES
Extractable phosphorus	mg/l	16-140	48	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	1300	YES	YES		YES
Extractable magnesium	mg/l	51-600	140	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	6.3/1	YES	YES	YES	YES
Exchangeable sodium	**%**	<15	5.3				
Available Calcium	mg/l		1100				
Available Sodium	mg/l		130				
Phytotoxic Contaminants (by soil pH)		**< 6.0** / **6.0-7.0** / **> 7.0**					
Zinc (Nitric Acid extract)	mg/kg	<200 / <200 / <300	33	YES			
Copper (Nitric Acid extract)	mg/kg	<100 / <135 / <200	7.6	YES			
Nickel (Nitric Acid extract)	mg/kg	<60 / <75 / <110	6.9	YES			
Visible Contaminants	**% mm**						
>2mm		<0.5	0.000	YES			
….. of which plastics		<0.25	0.000	YES			
….. man-made sharps		zero in 1kg	0.000	YES			

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd			**Chemtest Job No.:**		18-16016
Quotation No.: Q18-12109			**Chemtest Sample ID.:**		634319
			Client Sample ID.:		Sample 1
			Sample Type:		SOIL
			Asbestos Lab:		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected
Moisture	N	2030	%	0.020	16
Soil Colour	N	2040		N/A	Brown
Other Material	N	2040		N/A	Roots
Soil Texture	N	2040		N/A	Sand
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.7
Cyanide (Total)	U	2300	mg/kg	0.50	[A] 1.6
Arsenic	U	2450	mg/kg	1.0	27
Cadmium	U	2450	mg/kg	0.10	0.15
Chromium	U	2450	mg/kg	1.0	21
Copper	U	2450	mg/kg	0.50	14
Mercury	U	2450	mg/kg	0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	18
Lead	U	2450	mg/kg	0.50	26
Selenium	U	2450	mg/kg	0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	54
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] 19
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] 24
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] 4.8
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] 60
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] 110
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	[A] 140
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] 140
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] 240
Naphthalene	N	2700	mg/kg	0.010	[A] < 0.010
Acenaphthylene	N	2700	mg/kg	0.010	[A] < 0.010
Acenaphthene	N	2700	mg/kg	0.010	[A] < 0.010

Results - Soil

Project: Springbridge Yard

Client: Springbridge Direct Ltd				**Chemtest Job No.:**	18-16016
Quotation No.: Q18-12109				**Chemtest Sample ID.:**	634319
				Client Sample ID.:	Sample 1
				Sample Type:	SOIL
				Asbestos Lab:	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Fluorene	N	2700	mg/kg	0.010	[A] < 0.010
Phenanthrene	N	2700	mg/kg	0.010	[A] < 0.010
Anthracene	N	2700	mg/kg	0.010	[A] < 0.010
Fluoranthene	N	2700	mg/kg	0.010	[A] 0.85
Pyrene	N	2700	mg/kg	0.010	[A] 0.70
Benzo[a]anthracene	N	2700	mg/kg	0.010	[A] < 0.010
Chrysene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	[A] < 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	[A] < 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	[A] < 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	[A] < 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	[A] 1.6
Benzene	U	2760	µg/kg	1.0	[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0
Total Phenols	U	2920	mg/kg	0.30	< 0.30

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 18-16016
Chemtest Sample ID.: 634319
Client Sample Ref.:
Client Sample ID.: Sample 1
Top Depth (m):
Bottom Depth (m):
Date Sampled:
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)
Texture						
Clay content	%				9.7	
Silt content	%				11	
Sand content	%				79	
Soil texture class		See Attached Chart			Sandy Loam	YES
Mass Loss on Ignition						
Clay 5-20%		3.0-20			6.9	YES
Clay 20-35%		5.0-20				
Stone Content	**% m/m**					
>2mm		0-30			26	YES
>20mm		0-10			< 0.020	YES
>50mm		0			< 0.020	YES
Soil pH value		5.5-8.5			[A] 8.3	Yes
Carbonate (Calcareous only)	%				4.0	
Electrical Conductivity	µS/cm	If >3300 do ESP			[A] 2800	YES
Available Nutrient Content						
Nitrogen %		>0.15			0.52	YES
Extractable phosphorus	mg/l	16-140			60	YES
Extractable potassium	mg/l	121-1500			850	YES
Extractable magnesium	mg/l	51-600			140	YES
Carbon : Nitrogen Ratio		<20:1			7.8/1	YES
Exchangeable sodium	**%**	<15			6.4	
Available Calcium	mg/l				2700	
Available Sodium	mg/l				270	
Phytotoxic Contaminants (by soil pH)		**< 6.0**	**6.0-7.0**	**> 7.0**		
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	50	YES
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	14	YES
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	15	YES
Visible Contaminants	**% mm**					
>2mm		<0.5			0.000	YES
….. of which plastics		<0.25			0.000	YES
….. man-made sharps		zero in 1kg			0.000	YES

APPENDIX E

Capping Chemical Laboratory Results and Photographic Record

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Watford,
Herts,
WD18 8YS

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Analytical Report Number : 18-11316

Project / Site name:	Bath Road, Heathrow	**Samples received on:**	21/09/2018
Your job number:	CG-18411E	**Samples instructed on:**	21/09/2018
Your order number:	POP001469	**Analysis completed by:**	27/09/2018
Report Issue Number:	1	**Report issued on:**	27/09/2018
Samples Analysed:	3 soil samples		

Signed:

Jordan Hill
Reporting Manager
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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-11316

Project / Site name: Bath Road, Heathrow
Your Order No: POP001469

Lab Sample Number				1051062	1051063	1051064		
Sample Reference				TP1	TP5	TP6		
Sample Number				TS-1	TS-3	TS-4		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				20/09/2018	20/09/2018	20/09/2018		
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	14	11	12		
Total mass of sample received	kg	0.001	NONE	0.41	0.41	0.40		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.2	8.2		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	4		
Total Sulphate as SO_4	mg/kg	50	MCERTS	1900	1800	2000		
Organic Matter	%	0.1	MCERTS	7.7	8.2	6.8		
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	0.94	0.32	0.27		
Anthracene	mg/kg	0.05	MCERTS	0.26	0.09	0.07		
Fluoranthene	mg/kg	0.05	MCERTS	2.4	1.0	0.81		
Pyrene	mg/kg	0.05	MCERTS	2.0	0.91	0.74		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.53	0.39		
Chrysene	mg/kg	0.05	MCERTS	1.1	0.57	0.43		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	0.92	0.60		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.70	0.41	0.35		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.2	0.65	0.47		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.70	0.47	0.30		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.91	0.58	0.38		
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05		
Total PAH								
Total WAC-17 PAHs	mg/kg	0.85	NONE	13	6.5	4.8		

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

Analytical Report Number: 18-11316

Project / Site name: Bath Road, Heathrow
Your Order No: POP001469

Lab Sample Number				1051062	1051063	1051064		
Sample Reference				TP1	TP5	TP6		
Sample Number				TS-1	TS-3	TS-4		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				20/09/2018	20/09/2018	20/09/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.6	1.1	1.6		
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	9.9	14		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	89	81	99		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.56	0.50	0.54		
Boron (water soluble)	mg/kg	0.2	MCERTS	3.6	3.7	3.3		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (III)	mg/kg	1	NONE	18	17	20		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	18	20		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39	35	33		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140	69	91		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	12	15		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	29	35		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	91	92		
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	12	< 10	11		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	53	25	53		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	64	25	64		

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

Analytical Report Number : 18-11316

Project / Site name: Bath Road, Heathrow

* 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 *
1051062	TP1	TS-1	None Supplied	Brown loam and clay with gravel and vegetation.
1051063	TP5	TS-3	None Supplied	Brown loam and clay with gravel and vegetation.
1051064	TP6	TS-4	None Supplied	Brown loam and clay with gravel and vegetation.

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

Analytical Report Number : 18-11316

Project / Site name: Bath Road, Heathrow

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
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	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 WAC-17 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. MCERTS accredited except Coronene.	L064-PL	D	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	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.

PHOTO SHEET

Date	Job No	Made by	Checked by	Sheet No
September 2018	CG/18411E	HJG	RNS	01



TP1 – 200mm of topsoil.



TP1 – Geotextile separator.



TP2 – 190mm of topsoil.



TP2 – formation soils below the topsoil.



TP3 location.



TP3 – 480mm topsoil and geotextile.

Notes

PHOTO SHEET

Date	Job No	Made by	Checked by	Sheet No
September 2018	CG/18411E	HJG	RNS	02



TP4 location.



TP4 – 130mm topsoil.



TP5 – 300mm of topsoil.



TP6 location.



TP6 – 190mm of topsoil.

Blank.

Notes

APPENDIX F

Vapour Membrane Records

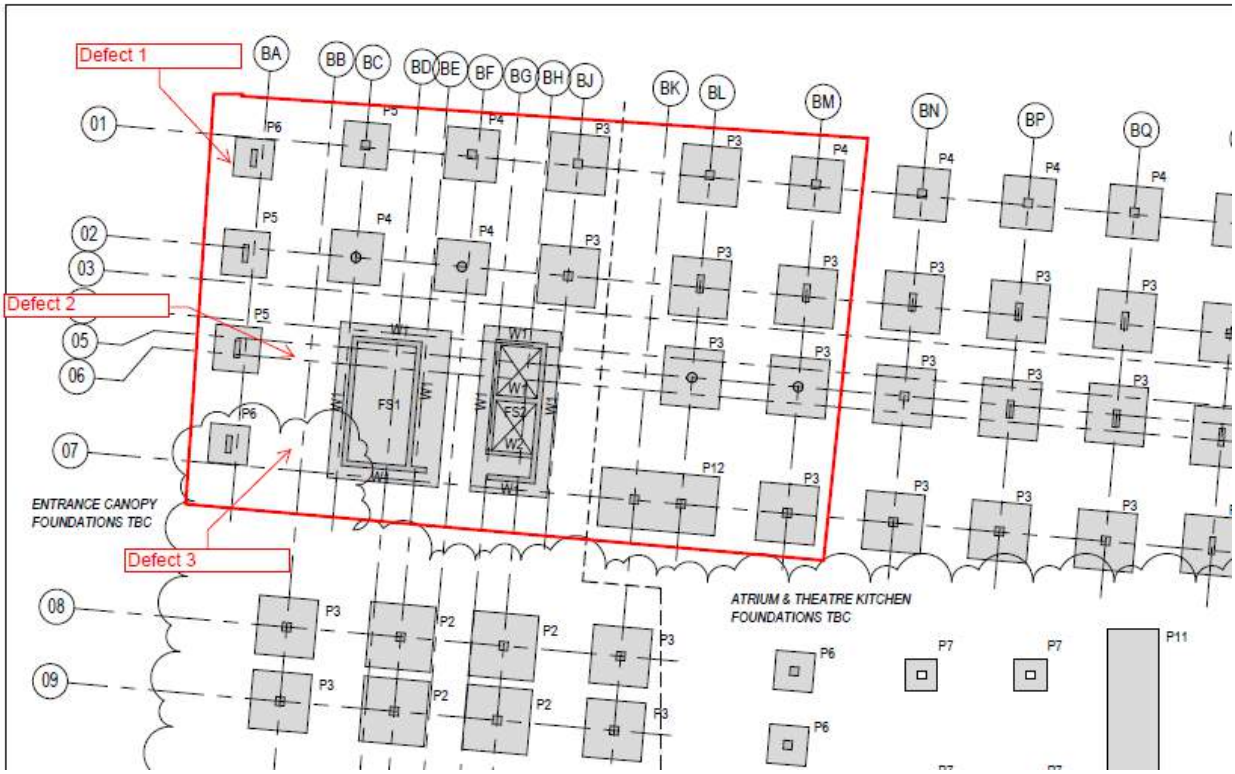
Record of Site Visit No. 001

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	
Weather:	Cold, dry, icy ground		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site	8.10am		
Visitors			

HJG inspect gas membrane in plots BA – BM, 1-7.

The membrane was generally in good condition, with x3 defects noted, two of which were holes in the membrane (post installation) and the third where the lapping had come unstuck around the foundation (BA 01).

UK membranes to arrange a separate independent inspection on 5/1/17, where the defects are to be repaired. The PC is to send through photos of the repaired defects to CGL.



	
View east.	View north.
	
Puraflex membrane.	Typical seal around foundation.
	
Service entry point.	Defect 1.
	
Defect 2	Defect 3

	
Repaired defect (photo provided by the client).	Repaired defect (photo provided by the client).
	Blank.
Repaired defect (photo provided by the client).	

Record of Site Visit

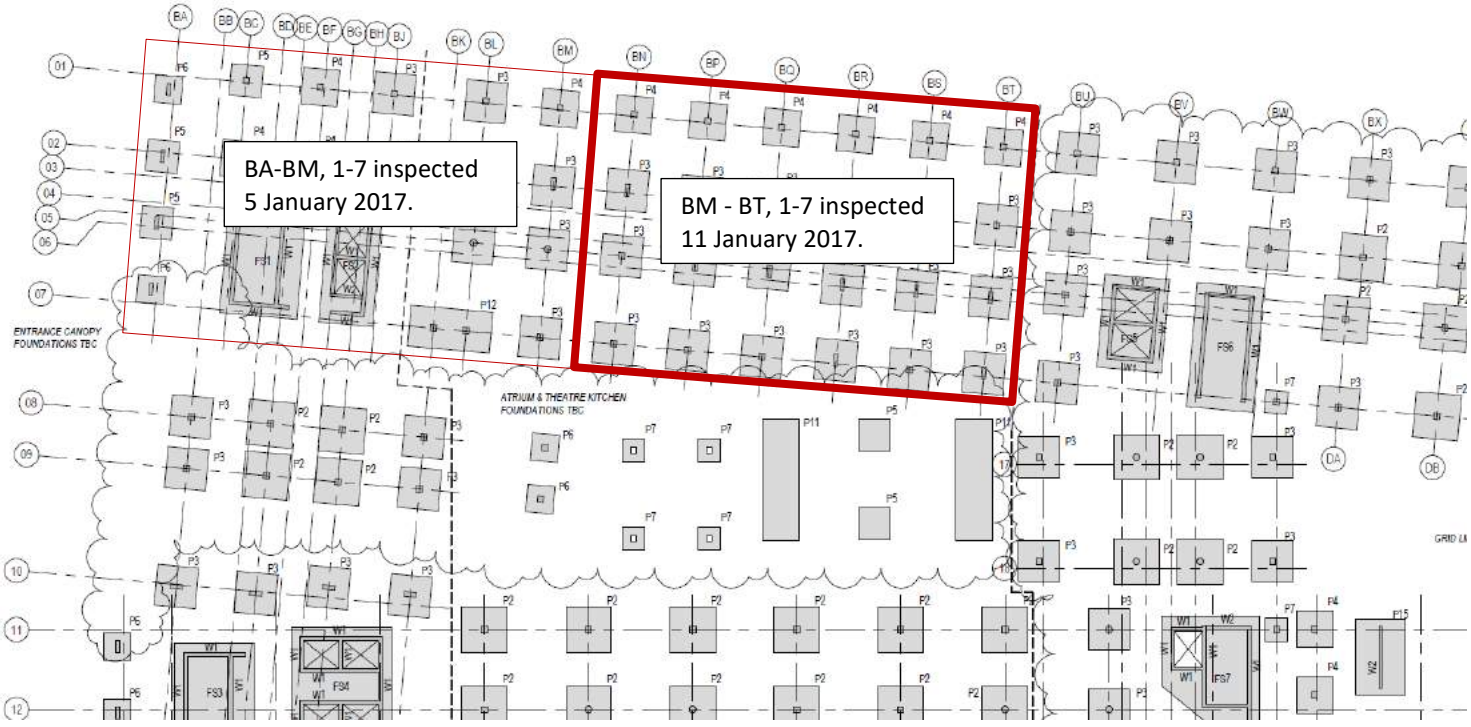
Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	11 January 2017
Weather:	Mild		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG inspect gas membrane in plots BM – BT, 1-7.

Up on arrival to site, insulation was being installed over the southern portion of the membrane, which had to be lifted during inspection. The membrane was generally in good condition, with x3 post installation defects noted (slices in the membrane) which were repaired during the inspection by UK Membranes.

McAleer & Rushe request that CGL attends site on 13 January 2017 to inspect the next section of membrane.

HJG also requested by the PC to take waste classification samples from the southern end of the attenuation tank excavation. X3 samples taken (Attn ES1 – ES3). Testing pending client confirmation.



	
View west.	View north.
	
View south.	Typical foundation and service seal.
	
Typical service seal.	Typical service seal.
	
Defect 1.	Defect 2.

	
Defect 3.	Repaired defect 1.
	
Repaired defect 2.	Repaired defect 3.

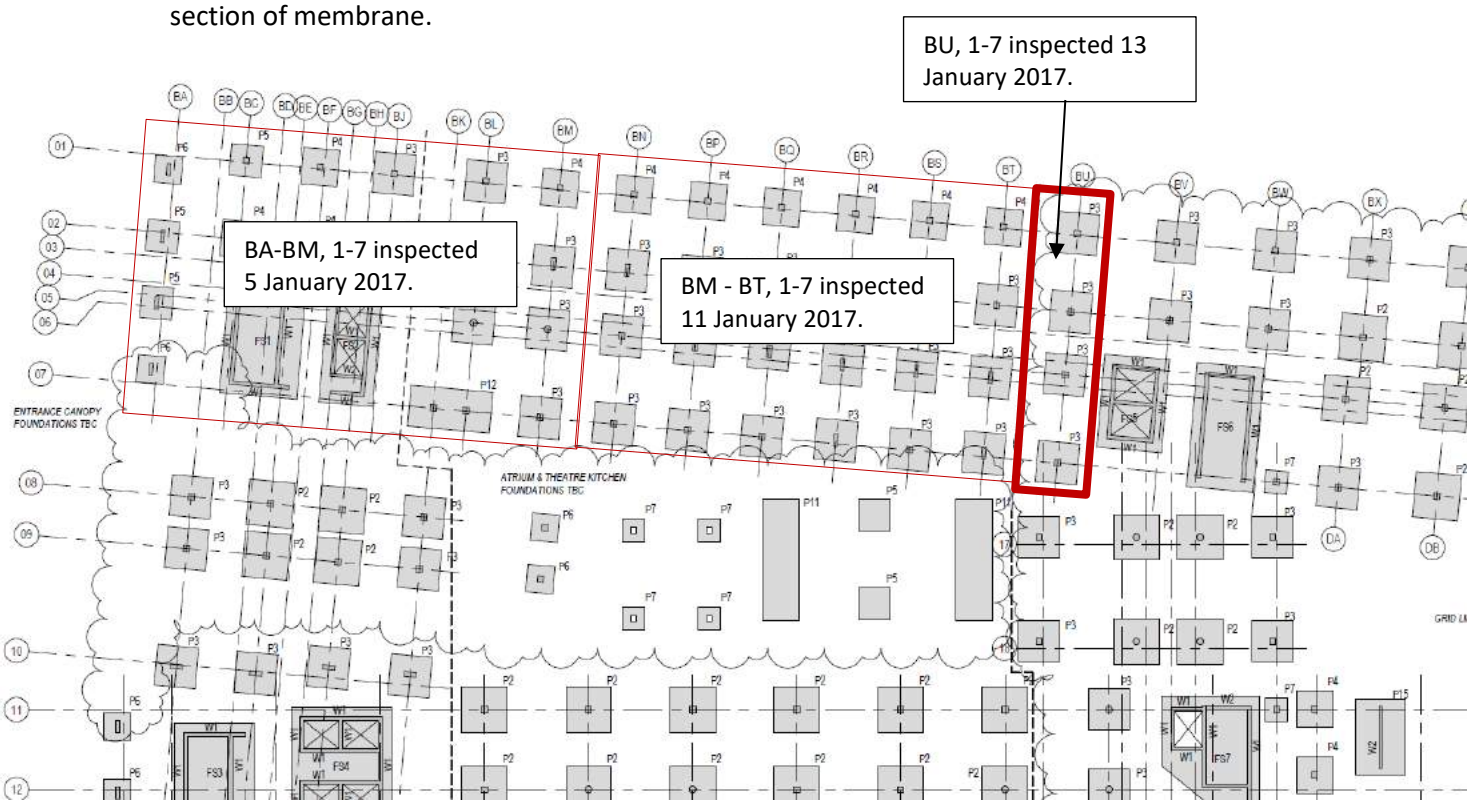
Record of Site Visit No. 001

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	13 January 2017
Weather:	Cold, snow showers, wet		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG inspect gas membrane in plots BU, 1-7.

Up on arrival to site, insulation had been laid across the area of the membrane to be inspected, which had to be lifted during inspection. The membrane was noted to be in good condition with no defects noted.

McAleer & Rushe request that CGL attends site on either 17 or 18 January 2017 to inspect the next section of membrane.



HJG also took additional validation samples from the area of hydrocarbon impacted soil within the east of the site. Samples VES13 to VES61 were taken from the sides and base of the northern portion of the excavated area.

Additional waste classification samples (Attn ES4 to Attn ES6) were also taken from the area of the proposed attenuation tank in the west of the site.

Whilst on site, the PC also requested that HJG excavated a couple of trial pits (CPTP1 and CPTP2) beneath the former car park area in the northwest of the site to confirm the extent of the contamination. Due to space restrictions from stored materials across the area, two shallow pits were excavated and samples of impacted and clean natural soils were taken.

HJG spoke to Steve Morris whilst on site re the sampling that had been undertaken. Steve Morris confirmed that for ease, all samples should be placed on a 5-day turnaround. HJG to follow this up in an email to Steve and to include costs.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>View northwest.</td><td>View east.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Membrane under the insulation.</td><td>Service entry.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Foundation seal.</td><td>Foundation seal.</td></tr>
</table>

Record of Site Visit No. 001

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	23 January 2017
Weather:	Mild		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

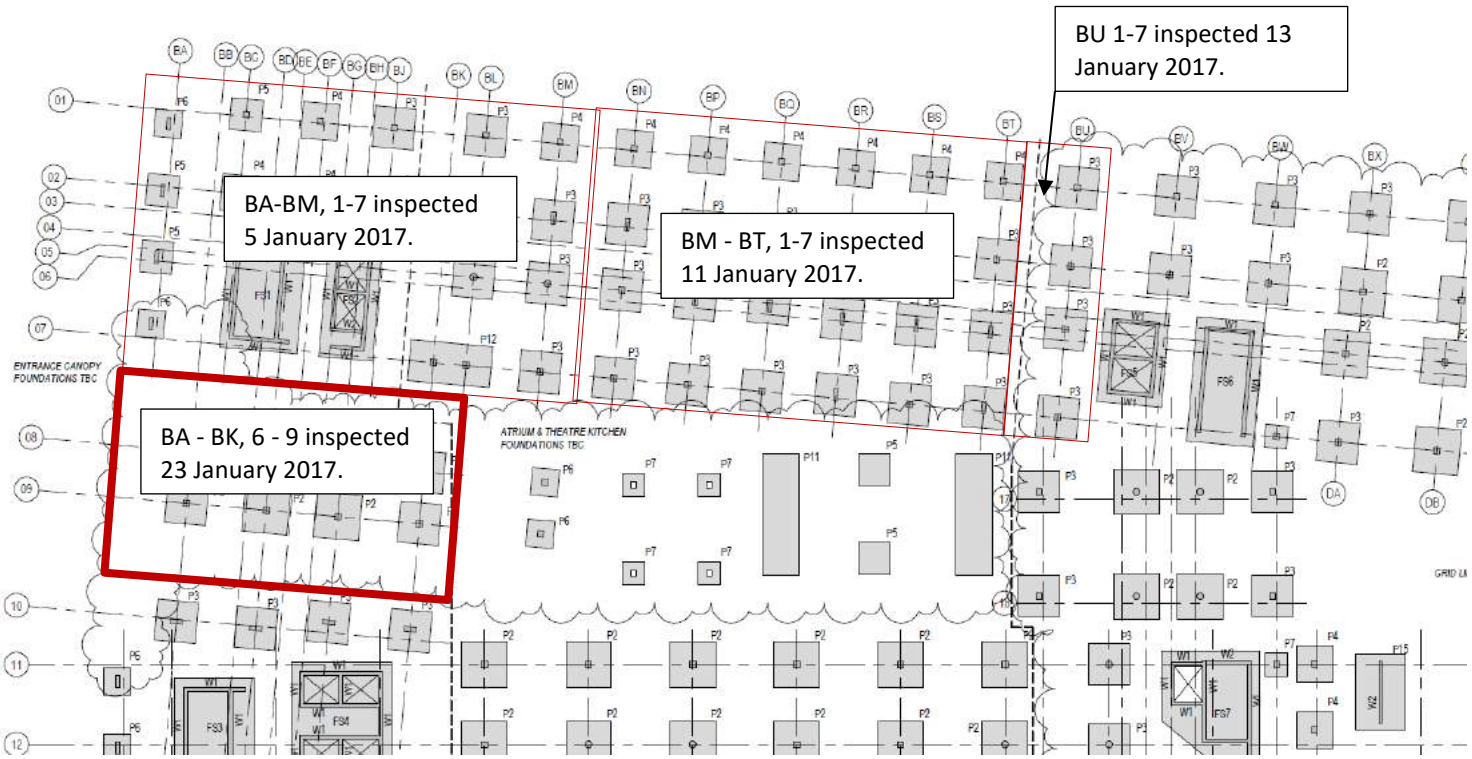
HJG inspect gas membrane in plots BA- BK, 7 – 9.

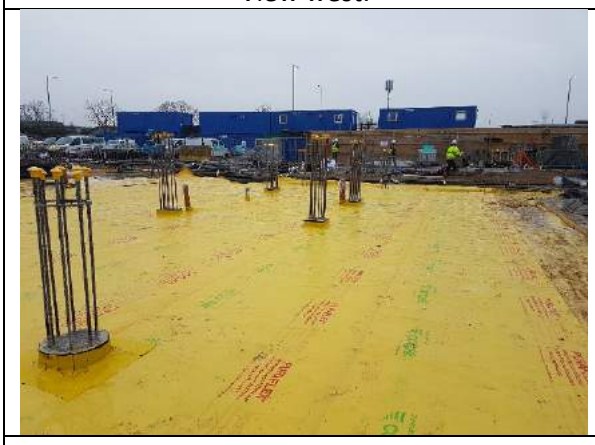
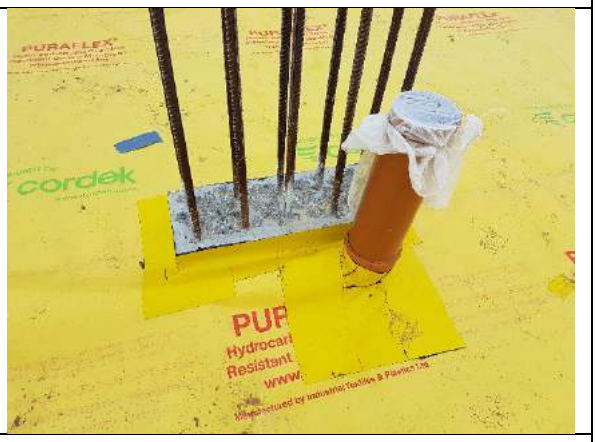
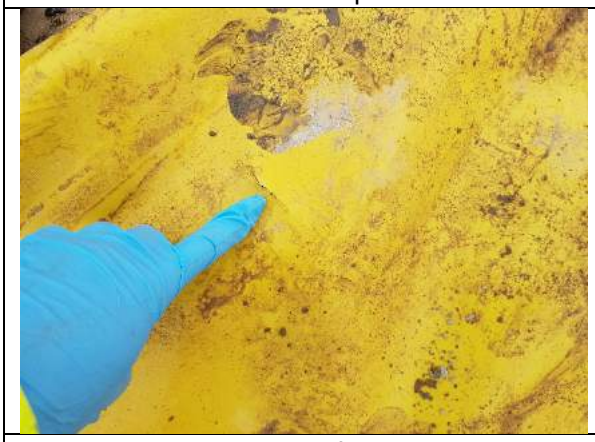
Up on arrival to site, the membrane was being installed over area BA-BK, 7-9.

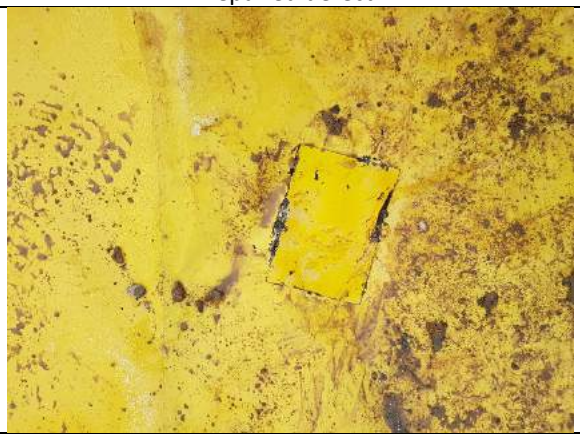
The membrane over BA- BK, 7 – 10 was generally in good condition, with x2 post installation defects noted (slice and hole in the membrane) which were repaired during the inspection by UK Membranes.

Upon re-inspection of the membrane over BA-BJ, 7, a number of post installation defects were noted, which had occurred following CGLs previous inspection of this area. This portion of the membrane was noted to be extremely muddy from site workers walking across the membrane. A total of 12 defects were identified which mainly comprised tears/holes with one large tear noted in the vicinity of BC, 7. The repairs were fixed by UK membranes during the inspection.

McAleer & Rushe request that CGL attends site on 24 January 2017 to inspect the next section of membrane.



	
View west.	View north.
	
View south.	View north along seal with other section of membrane.
	
Seal around pile.	Foundation and service entry seal.
	
Typical defect.	Typical defect.

	
Typical defect.	Typical defect.
	
Repaired defect.	Repaired defect.
	
Repaired defect.	Repaired defect.
	Blank.
Defects repaired whilst CGL on site.	

Record of Site Visit No. 001

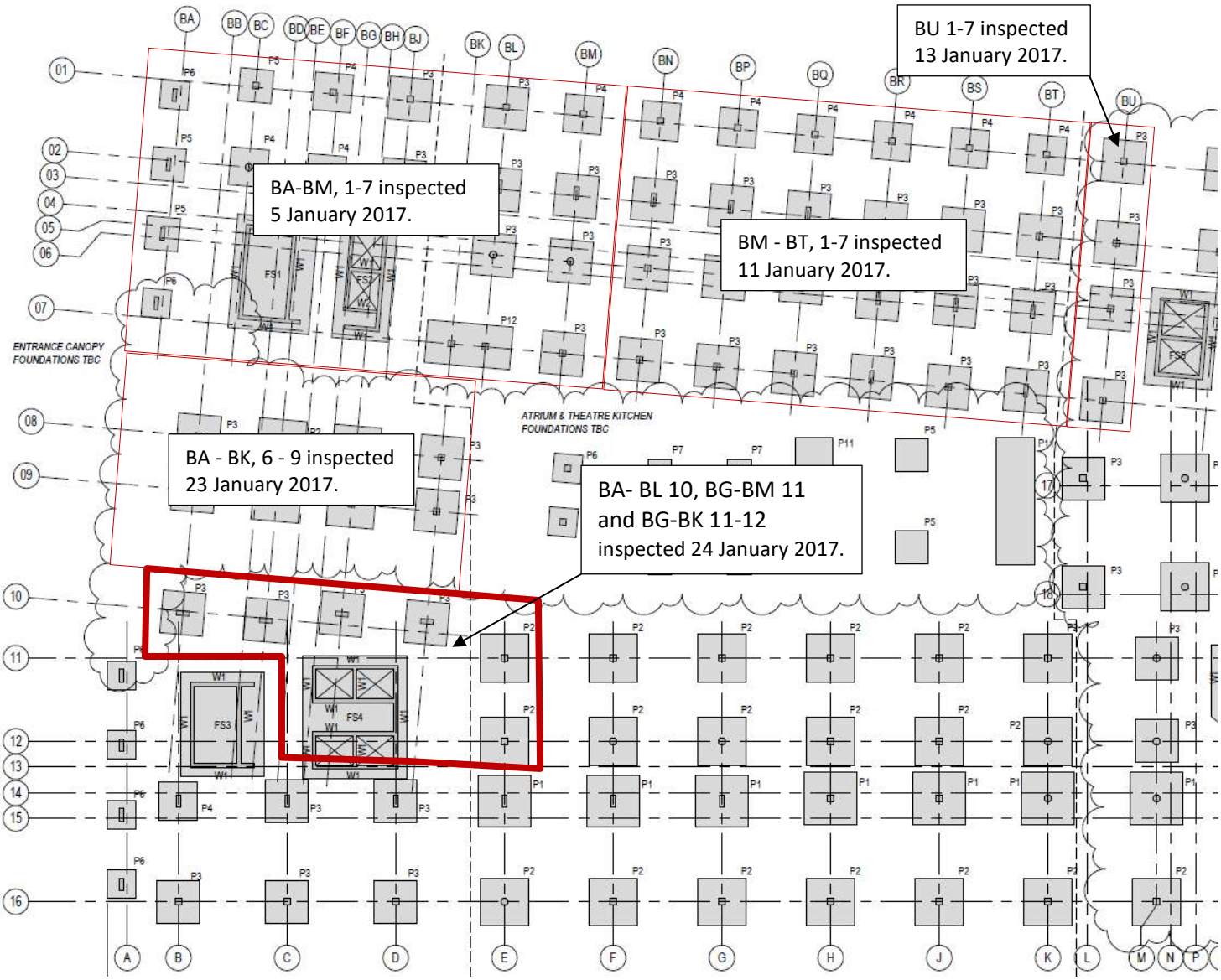
Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	24 January 2017
Weather:	Mild		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG inspect gas membrane in plots BA- BL 10, BG-BM 11 and BG-BK 11-12. Prior to the site visit, insulation had been laid over BA-BK 10 which has to be lifted prior to inspection.

Up on arrival to site, the membrane over parts of BA-BG 11-16 and BG-BM 12 to16 was still being installed and therefore not inspected (anticipated to be inspected 24/1/17).

The membrane over BA- BL 10, BG-BM 11 and BG-BK 11-12 was generally in good condition, with x11 post installation defects noted (slices and holes in the membrane) and two installation defects which were repaired during the inspection by UK Membranes. The defects were primarily located around BG-BK 11-12.

McAleer & Rushe request that CGL attends site on 25 January 2017 to inspect the next section of membrane.


BU 1-7 inspected
13 January 2017.
BA-BM, 1-7 inspected
5 January 2017.
BM - BT, 1-7 inspected
11 January 2017.
BA - BK, 6 - 9 inspected
23 January 2017.
BA- BL 10, BG-BM 11
and BG-BK 11-12
inspected 24 January 2017.
ENTRANCE CANOPY
FOUNDATIONS TBC
ATRIUM & THEATRE KITCHEN
FOUNDATIONS TBC

	
View northwest.	View northeast.
	
Unfinished membrane.	Finished membrane.
	
Seal around foundations.	Seal around foundations.
	
Foundation and service entry seal.	Typical defects.

	
Typical defect.	Typical defects.
	
Repaired defects.	Repaired defects.
	
Repaired defect.	Repaired defect.
	
Repaired defects.	Repaired defect.

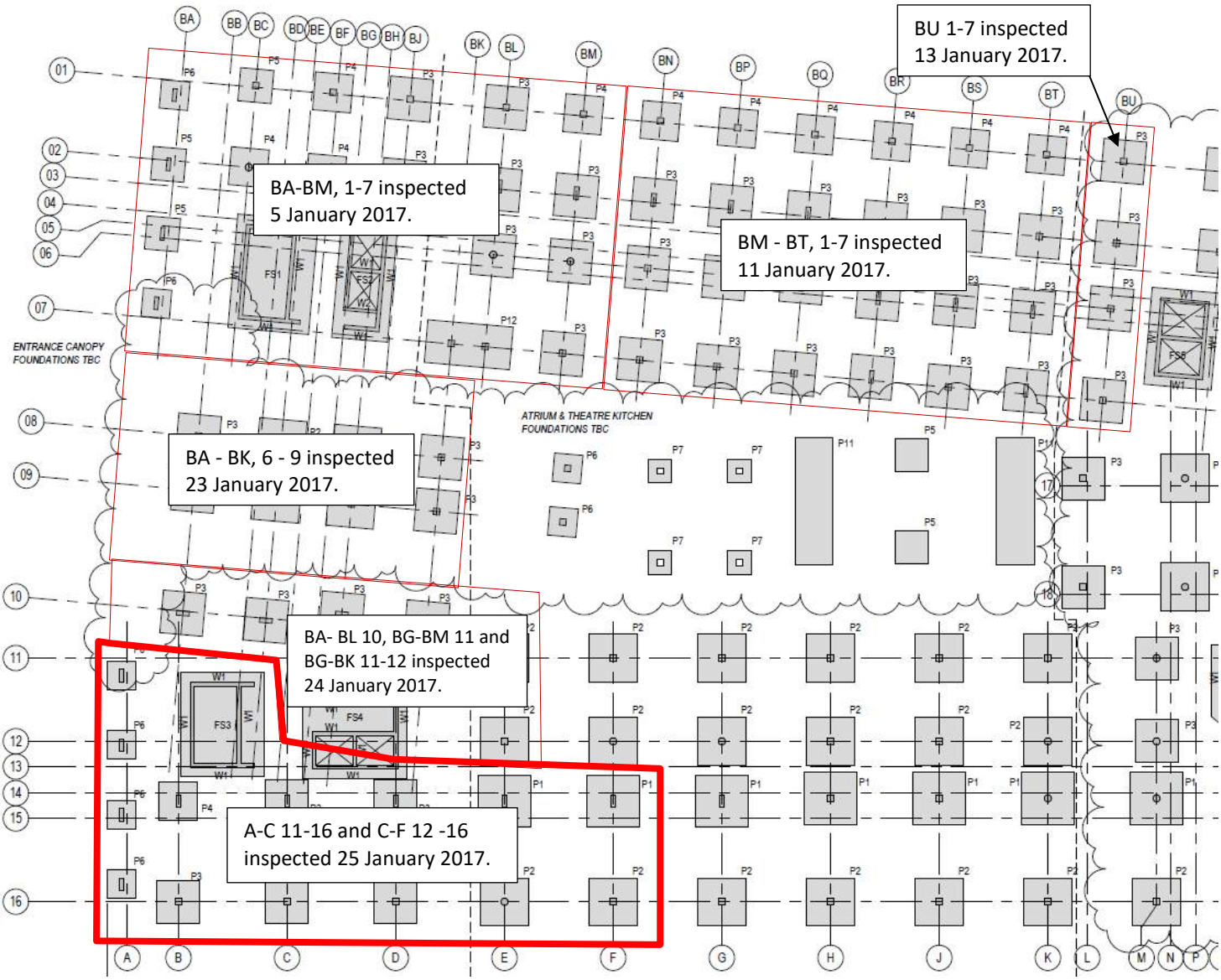
Record of Site Visit No. 001

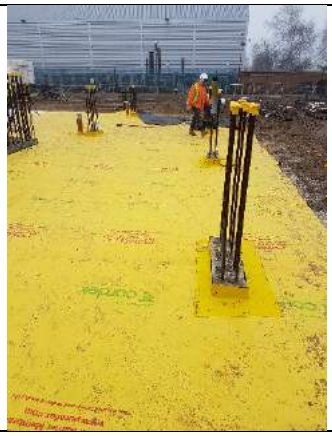
Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	25 January 2017
Weather:	Mild, foggy		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG inspect gas membrane in area A-C 11-16 and C-F 12 -16. Prior to the site visit, insulation had started to be laid over A-E 11-15 which was lifted during the inspection.

The membrane over A-C 10-16 and C-F 12 -16 was generally in good condition, with x1 post installation defect noted (two holes in the membrane). The defects were repaired by UK Membranes and photographic evidence send to CGL by the Principal Contractor.

McAleer & Rushe request that CGL attends site on 26 January 2017 to inspect the next section of membrane.


BU 1-7 inspected
13 January 2017.
BA-BM, 1-7 inspected
5 January 2017.
BM - BT, 1-7 inspected
11 January 2017.
BA - BK, 6 - 9 inspected
23 January 2017.
BA- BL 10, BG-BM 11 and
BG-BK 11-12 inspected
24 January 2017.
A-C 11-16 and C-F 12 -16
inspected 25 January 2017.
ENTRANCE CANOPY
FOUNDATIONS TBC
ATRIUM & THEATRE KITCHEN
FOUNDATIONS TBC

	
View east.	View north.
	
View south.	Membrane under the insulation.
	
Typical service entry seal.	Foundation seal.

	
Lift pit.	Typical defect.
	
Lift pit.	Typical defect.
	
Repaired defect.	Repaired defect.
	
Repaired defect.	Repaired defect.

	
Repaired defect.	Repaired defect.

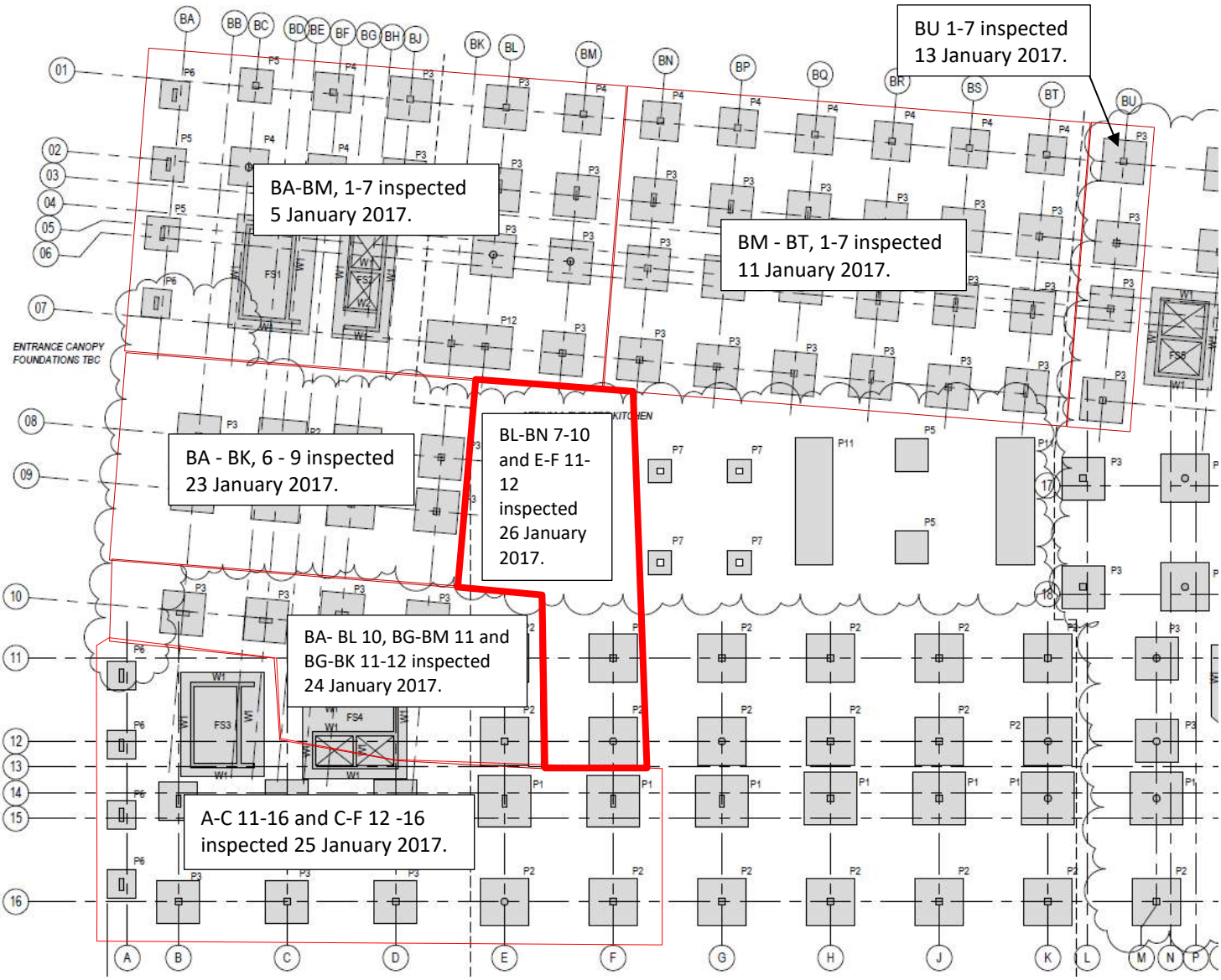
Record of Site Visit No. 001

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	26 January 2017
Weather:	Cold, foggy		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG inspect gas membrane in area BL-BN 7-10 and E-F 11-12. Prior to the inspection, a number of defects along BL-BN 7 had been identified by the Principal Contractor and had been repaired by UK Membranes.

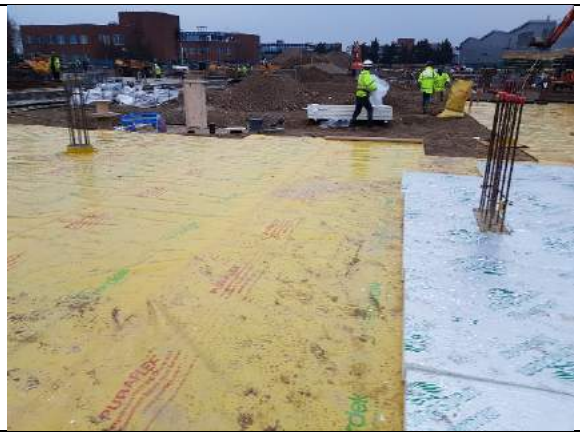
The membrane was generally in good condition, with x3 post installation defects noted (two holes and a repair that had not been sealed properly). The defects were repaired by UK Membranes during the inspection.

McAleer & Rushe request that CGL attends site on 27 January 2017 to inspect the next section of membrane.


BU 1-7 inspected 13 January 2017.
BA-BM, 1-7 inspected 5 January 2017.
BM - BT, 1-7 inspected 11 January 2017.
BA - BK, 6 - 9 inspected 23 January 2017.
BL-BN 7-10 and E-F 11-12 inspected 26 January 2017.
BA- BL 10, BG-BM 11 and BG-BK 11-12 inspected 24 January 2017.
A-C 11-16 and C-F 12 -16 inspected 25 January 2017.
ENTRANCE CANOPY FOUNDATIONS TBC



View northwest.



View north.



Seal around pile.



Foundation and service entry seal.



Service entry seals.



View southeast.



Typical defect.



Repaired defect.

	
Repaired defect that has become unstuck.	Repaired defects.

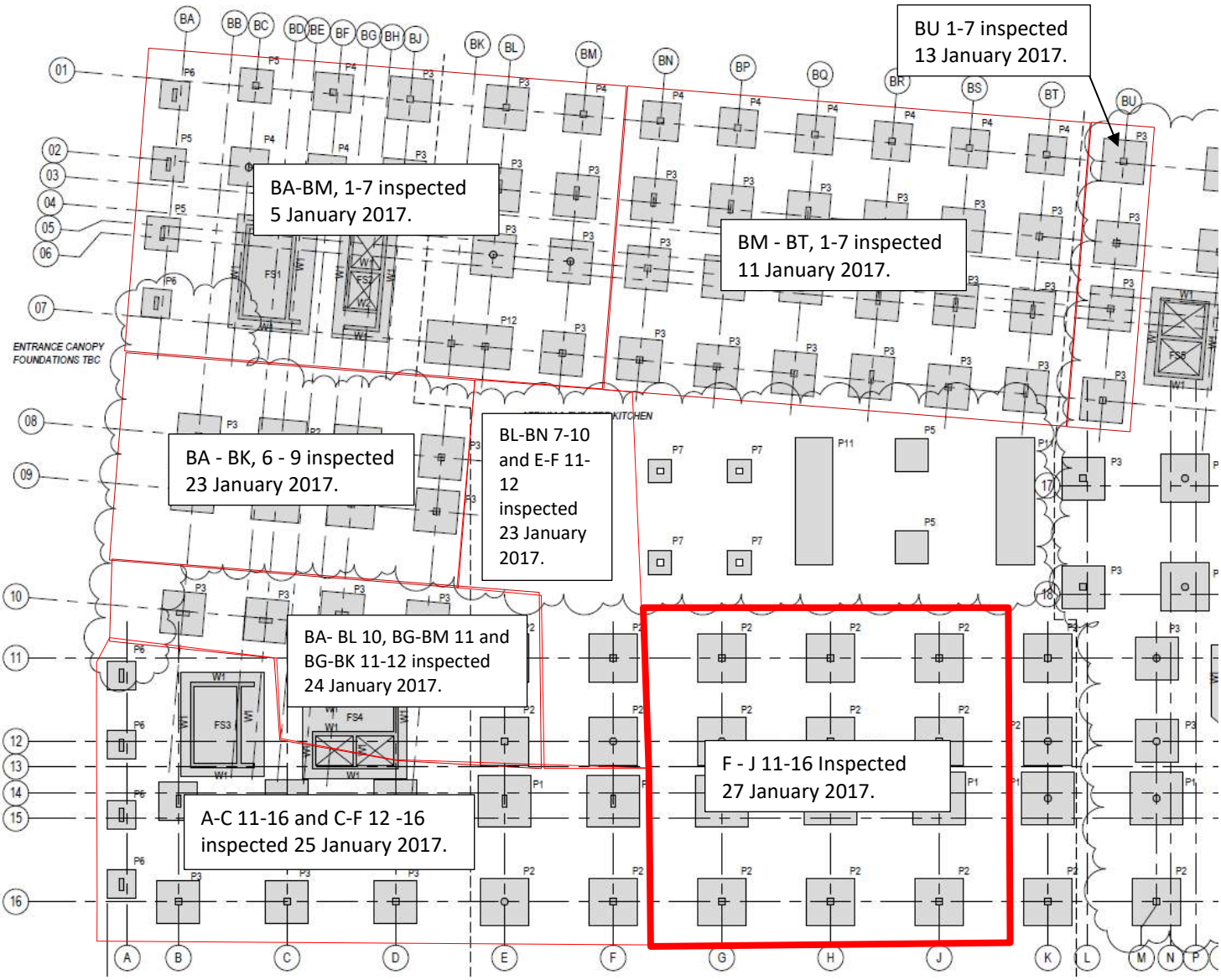
Record of Site Visit No. 001

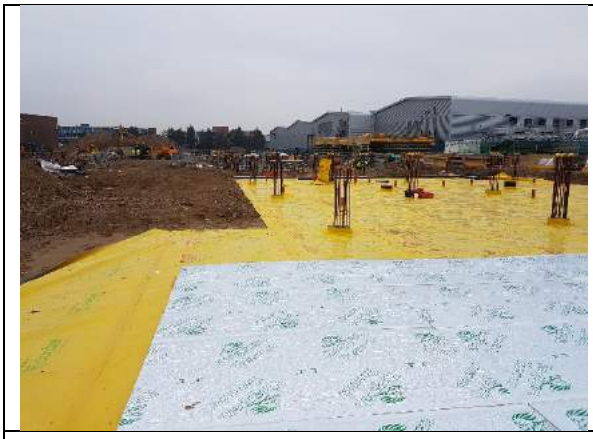
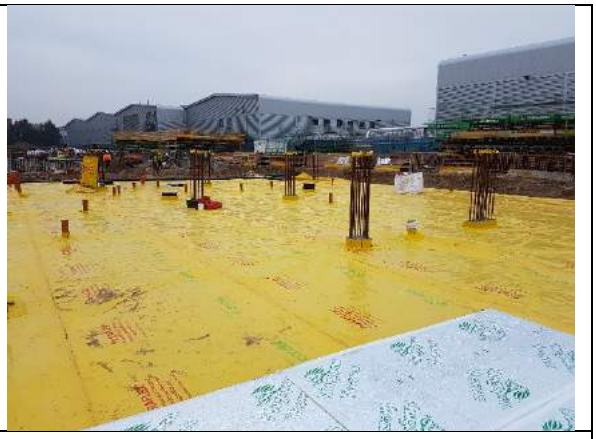
Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	27/01/17
Weather:	Cold, foggy		
Site visit by	HJG	**Project Manager**	JAS
On site	-		
Off site	-		
Visitors	-		

HJG inspect gas membrane in area F-J 11 - 16. Prior to the inspection, a number of defects along F-J 11 had been identified by the Principal Contractor and had been repaired by UK Membranes.

The membrane was generally in good condition, with x2 post installation defects noted (one hole and a repair that had not been sealed properly). The defects were repaired by UK Membranes during the inspection.

McAleer & Rushe request that CGL attends site on 1st February 2017 (to be confirmed) to inspect the next section of membrane.


BU 1-7 inspected 13 January 2017.
BA-BM, 1-7 inspected 5 January 2017.
BM - BT, 1-7 inspected 11 January 2017.
BA - BK, 6 - 9 inspected 23 January 2017.
BL-BN 7-10 and E-F 11-12 inspected 23 January 2017.
BA- BL 10, BG-BM 11 and BG-BK 11-12 inspected 24 January 2017.
F - J 11-16 Inspected 27 January 2017.
A-C 11-16 and C-F 12 -16 inspected 25 January 2017.
ENTRANCE CANOPY FOUNDATIONS TBC

	
View north.	View northeast.
	
View east.	View west.
	
Foundation seal.	Service entry seal.
	Blank.
Service entry seal.	

Record of Site Visit No. 001

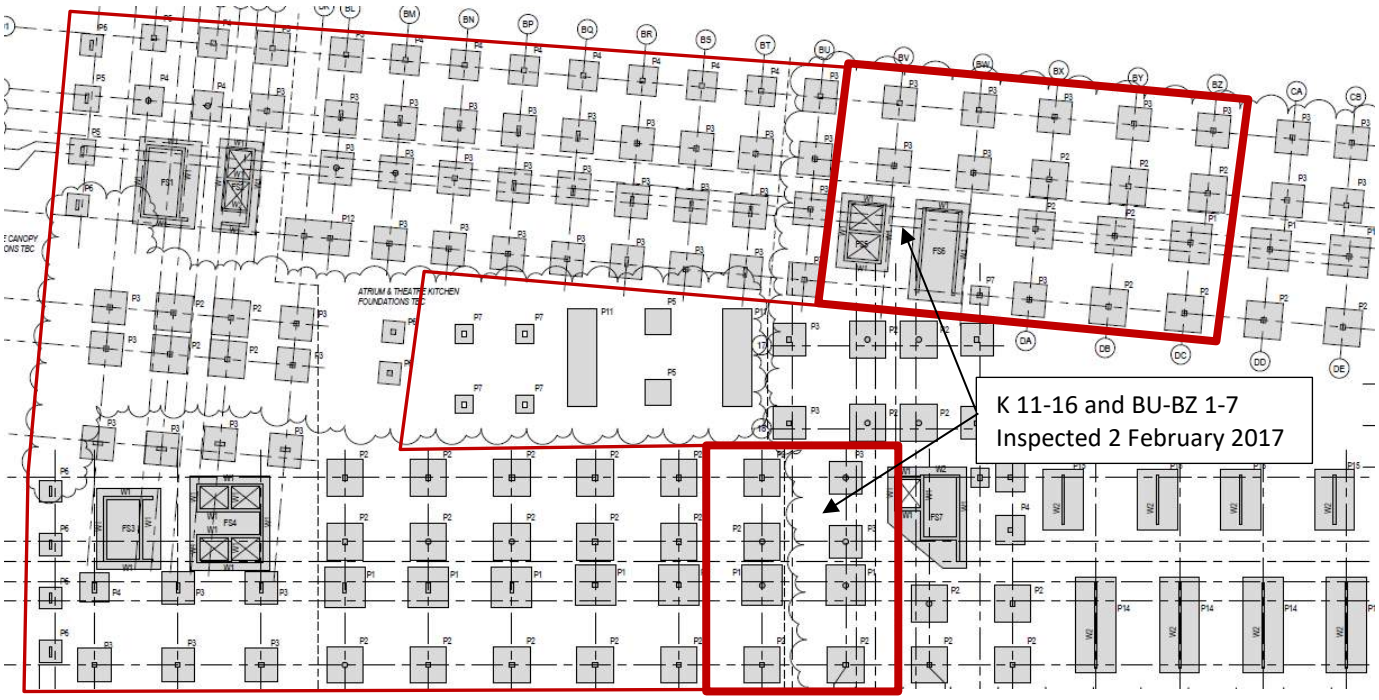
Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	2 February 2017
Weather:	Mild, overcast		
Site visit by	HJG	**Project Manager**	
On site			
Off site			
Visitors			

HJG inspect gas membrane in area K 11-16 and BU-BZ 1-7.

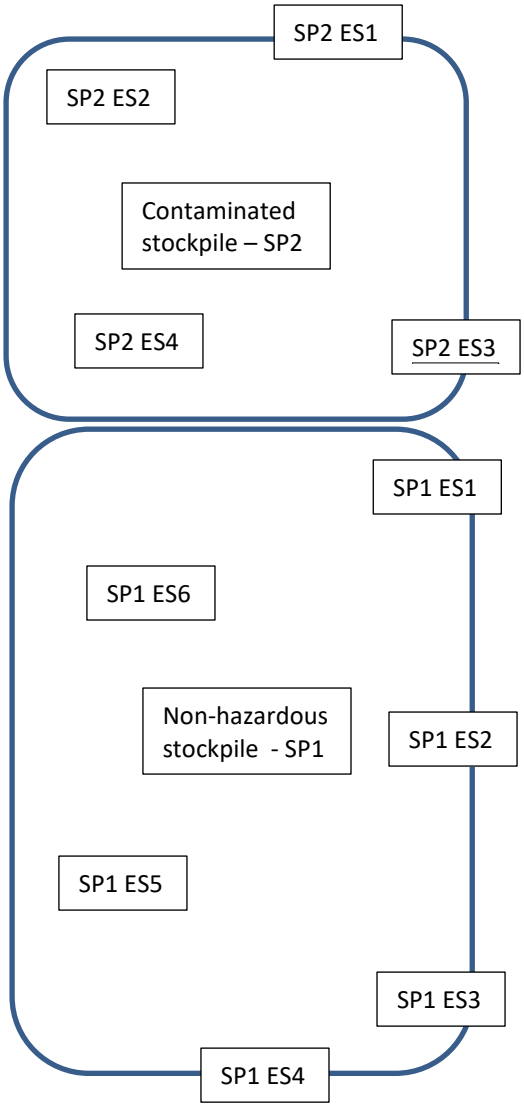
The membrane was generally in good condition although it was noted to be muddy and pooled with water in both areas. x2 post installation defects noted (two slices in the membrane) were noted in K 11-16 and two areas containing small holes and unstuck seal around a foundation pad was noted over BU-BZ 1-7. The defects were repaired by UK Membranes during the inspection.
During the inspection, insulation materials were noted over BU-BZ 1-7 and therefore these areas were not inspected.

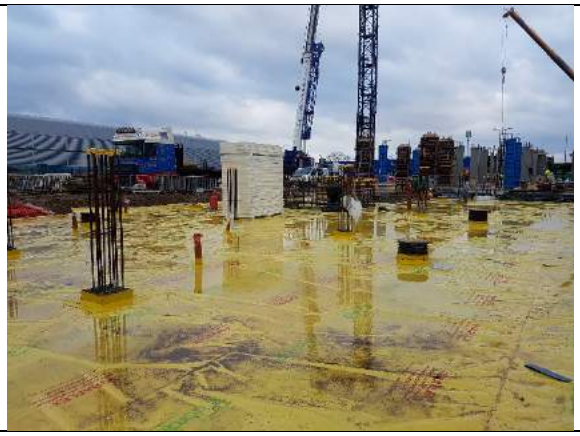
HJG also took asbestos quantification samples from the stockpile of non-hazardous material (SP1 ES1 to ES6) and the contaminated stockpile (SP2 ES1 to ES4). A fragment of [potential] ACM was noted and sampled (ES5) from the non-hazardous stockpile.

Gas membrane plan



Stockpile sampling plan



	
View west.	Typical service entry seal.
	
Typical foundation seal.	Typical foundation seal.
	
View northwest.	View north.
	
View northeast.	View southeast.



Typical foundation and service entry seal.



Typical defects.



Typical defect. Typical defect.





Typical defects.



Repaired defect.



Repaired defects.



Repaired defect.

Record of Site Visit No. 011

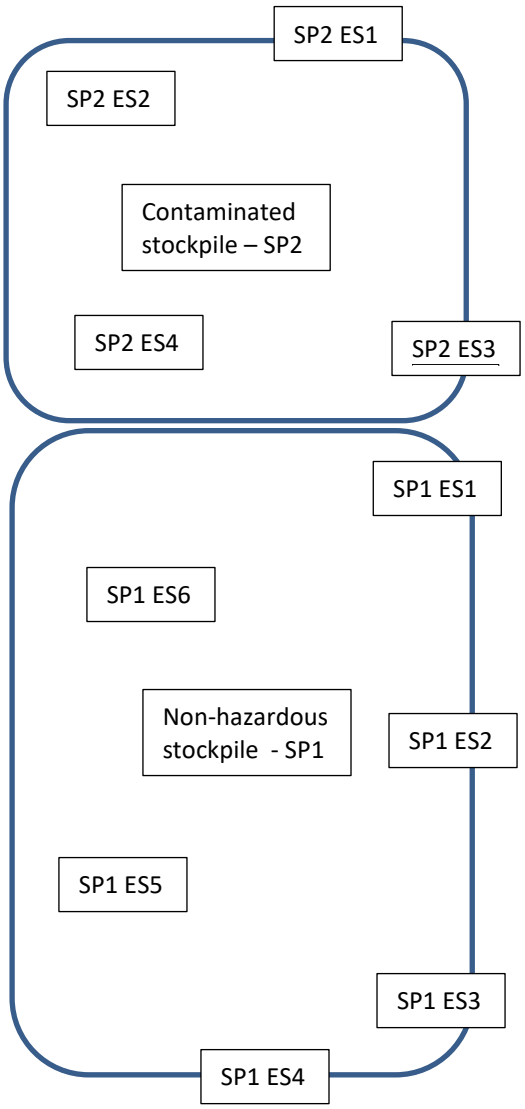
Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	17/02/17
Weather:	Mild, overcast		
Site visit by	NDH	**Project Manager** JAS	
On site	10:00		
Off site	13:00		
Visitors	-		

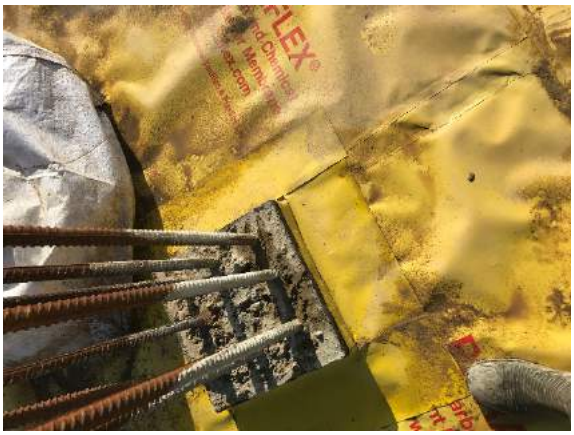
NDH inspect gas membrane in area TV11-16

The membrane was generally in good condition although it was noted to be muddy and pooled with water in both areas. One area had been repaired prior to visit.

NDH also took samples from the area the attenuation tank will be placed.

Stockpile sampling plan



	
View west.	View northeast.
	
Foundation seal.	Service entry seals.
	Blank.
Sand blinding layer to the north.	

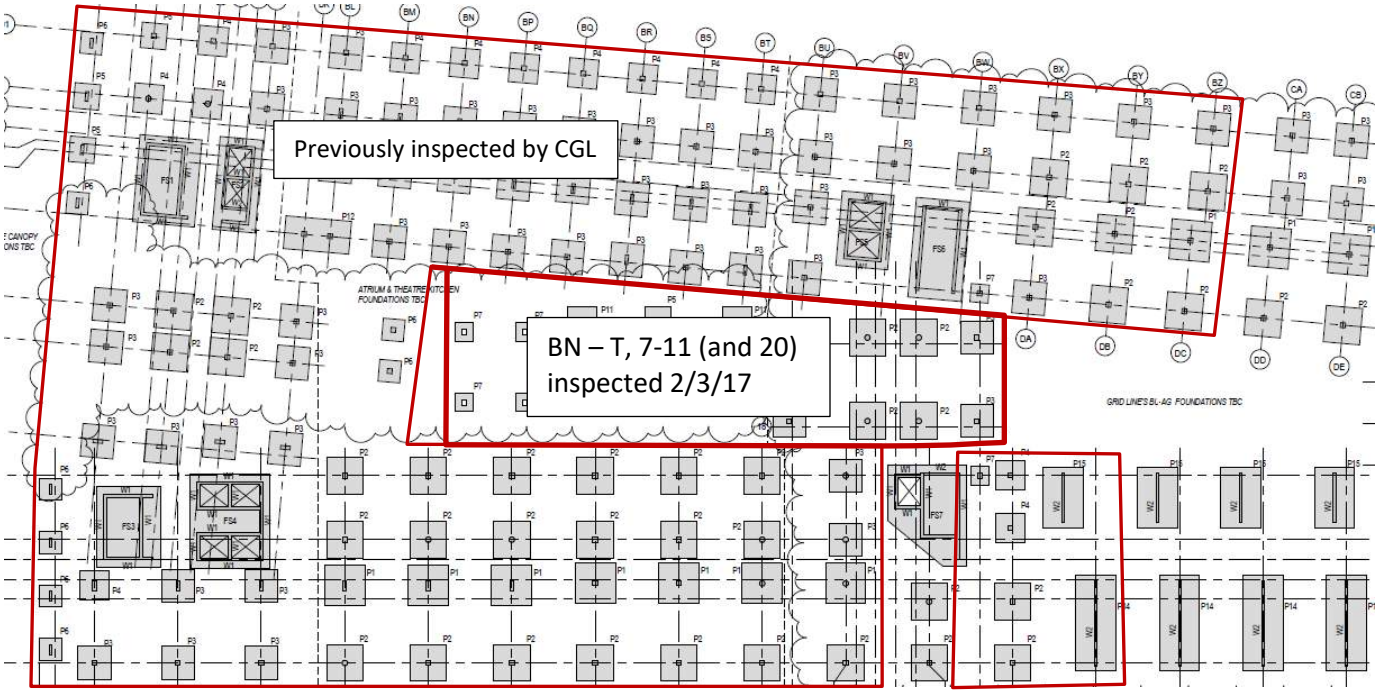
Record of Site Visit No. 001

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	02/03/17
Weather:	Breezy, overcast		
Site visit by	HJG	**Project Manager**	JAS
On site	-		
Off site	-		
Visitors	-		

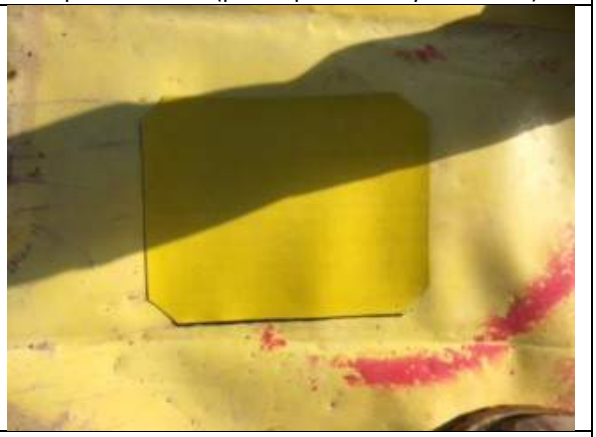
HJG inspect gas membrane in area BN – T, 7-11 (and 20). Prior to the inspection, a number of defects along BN 20 had been identified and marked out by the Principal Contractor.

The membrane was generally in good condition, although particularly covered in mud/construction debris along the western edge of the section. Areas of the membrane were also noted to be covered in pooled water following periods of heavy rainfall. The southern portion of the section was also covered with insulation that had to be lifted during the inspection. A total of 14 post installation defects was noted during the inspection. The Principal Contractor is to repair the defects and send validation photos to CGL.

McAleer & Rushe request that CGL attends site on 7th or 8th March 2017 (to be confirmed) to inspect the final section of membrane.



	
View northeast.	View northwest.
	
View south.	Typical foundation seal.
	
Typical service entry seal.	Typical defect.

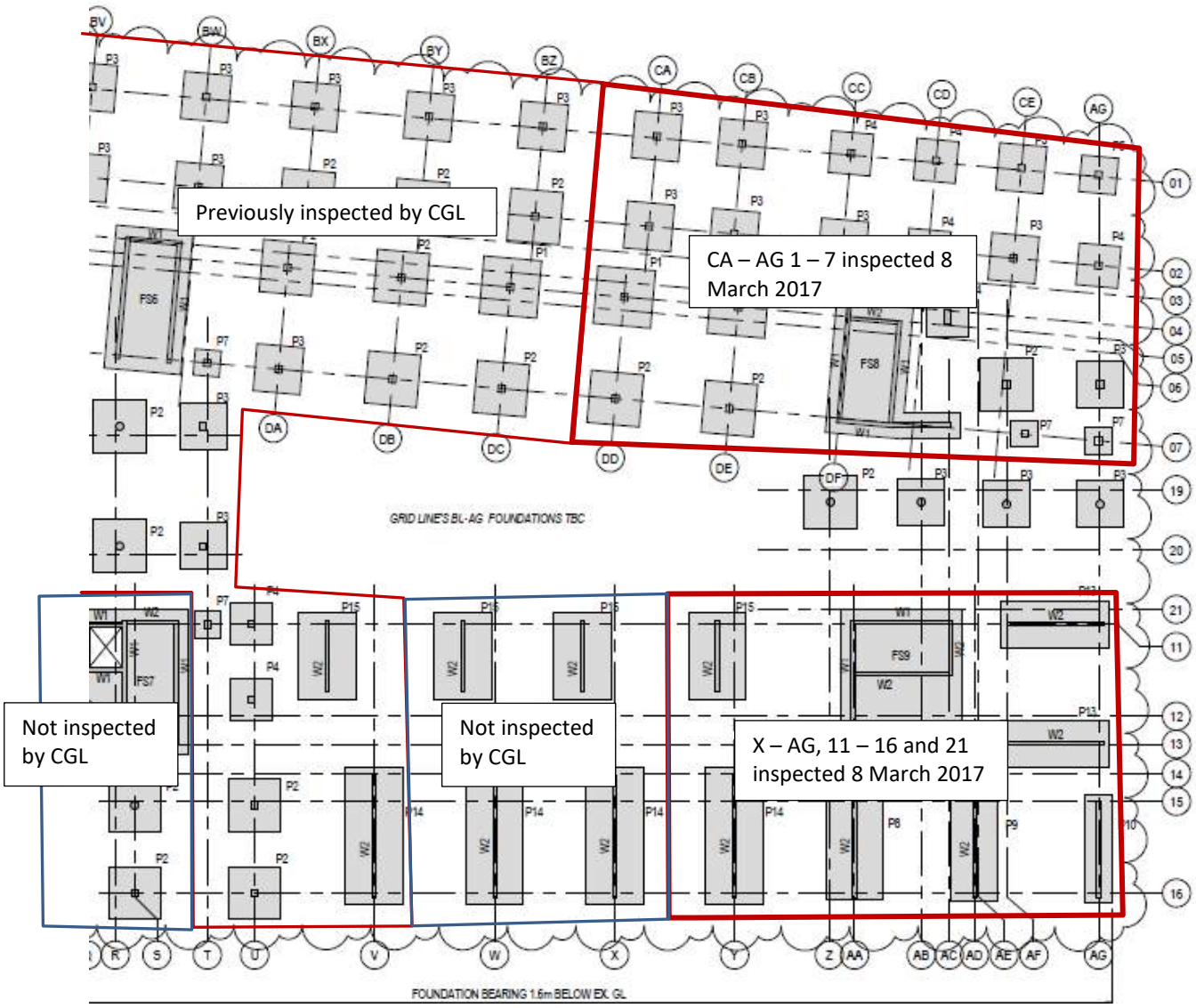
	
Typical defect.	Typical defect.
	
Typical defect.	Typical defect.
	
Repaired defect (photo provided by the client).	Repaired defect (photo provided by the client).
	
Repaired defect (photo provided by the client).	Repaired defect (photo provided by the client).

Record of Site Visit No. 001

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	8 March 2017
Weather:	Overcast		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG inspect gas membrane in area X – AG, 11 – 16 and 21 in the east, and CA – AG 1 – 7 in the west of the site.

The membrane was generally in fair condition with areas covered in pooled water following periods of heavy rainfall. The eastern portion of the membrane (X – AG, 11 – 16 and 21) was covered with insulation that had to be lifted during the inspection. A total of 27 post installation defects were noted during the inspection, primarily located around DF – DG 4 – 7 and AA – AC 11 – 13 and 21. The Principal Contractor repaired the majority of the defects (except 1 and 2) whilst CGL was in attendance. Photos of repaired defects 1 and 2 are to be sent to CGL by the PC.


Previously inspected by CGL
CA – AG 1 – 7 inspected 8 March 2017
GRID LINE'S BL-AG FOUNDATIONS TBC
Not inspected by CGL
Not inspected by CGL
X – AG, 11 – 16 and 21 inspected 8 March 2017
FOUNDATION BEARING 1.6m BELOW EX. GL

	
View northwest.	View northeast.
	
Typical service entry seal.	Typical service entry and foundation seal.
	
Membrane beneath the insulation.	Membrane beneath the insulation.
	
Defect 4.	Defect 8.

	
Defects 13, 14 and 15.	Defect 27.
	
Repaired defect 4.	Repaired defect 8.
	
Repaired defects 13 and 14.	Repaired defect 15.
	Blank.
Repaired defect 27.	

Gas Membrane Installation Validation Report McAleer and Rushe Holiday Inn Heathrow London

MEC Environmental Ltd

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Email: mick@mecenvironmental.co.uk www.mecenvironmental.co.uk

1. INTRODUCTION

1.1 Purpose

UK Membranes are installing a gas protection membrane to the aforementioned site. MEC Environmental Ltd (MEC) has been appointed by UK Membranes to carry out independent validation of the installation of the membrane on the site.

1.2 Limitations

(MEC) has prepared this report in accordance with the instructions of UK Membranes ("the Client") under the terms of its appointment for the gas membrane validation/inspections and report.

This report is limited to the verification that the gas membrane measures are correctly installed. MEC Environmental Ltd have not carried out any design work in respect of the gas protection measures prescribed for this site and therefore no professional liability is extended in respect of the gas protection design.

This report has been prepared in accordance with the best available practise and the relevant guidance documents listed below of which the author of the report was a contributor and member of the steering committees:

Chartered Institute of Environmental Health (2008). "The local authority guide to ground gas".

Mallett H, Wilson S, Corban M (2014) "Good practice on the testing and verification of protection systems for buildings against hazardous ground gases". CIRIA Report C735

This report and its contents should not be used for any purpose other than that for which it was prepared and provided. Should the Client require to pass copies of the report to other parties for information, the whole of the report should be so copied, but no professional liability or warranty shall be extended to other parties by MEC in this connection without the explicit written agreement thereto by MEC.

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1.3 Method

The Validation Consultant visually inspected 100% of the surface area of the gas membrane to identify any holes, areas of bridging and defects in the gas membrane and ancillary products.

The Validation Consultant then integrity tested where possible (air lance) approx. 50% of all joints and seams of the gas membrane, , pipe penetrations and corner details.

1.4 Equipment

Electronic Tablet (Ipad), Tape Measure, Air lancing Equipment and PPE

1.5 Identification

All seams and non-seam areas of the gas membrane were inspected as per 1.3 by the Validation Consultant for identification of defects, protruding and penetrating objects, lack of subgrade support, overheating, holes, blisters, undispersed raw materials, scratches and gouges, and any sign of contamination by foreign matter.

Any portion of the gas membrane exhibiting a flaw, or failing a visual inspection/testing was repaired. Several procedures exist for the repair of these areas. The final decision as to the appropriate repair procedure was agreed upon between the Validation Consultant and the Installer at the time of the repair and is noted in the survey sheets.

Each repair was visually inspected/tested, repairs passing the inspection/testing were considered acceptable. The Validation Consultant carried out all visual inspections/testing of repairs and recorded the type and result of the repairs on the survey report, prior to taking sample photos which are presented in section 1.8

1.6 Validators Experience

(See Appendix 1)

1.7 Survey Sheets

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Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked: 50% Pour One Gridlines BA-BN 1-7**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 05/01/2017	**Visit No: 1**
Inspection by: Keith Barsby	**Weather at time of inspection: 5^0 C Dry**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane 2) Puraflex self-adhesive gas membrane (SAGM)
4	Membrane condition	The membrane was installed to a good standard. 2no holes found by during our inspection inspection repaired by the installer, approx. 50% of area had been covered by with insulation at the time of our inspection and therefore could not be inspected. No further remedial action required at time of our inspection.
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☒ Air Lance (ASTM D4437) | ☐ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No Joints made using hand held hot air tool to a good standard. The areas not covered by insulation were tested and were all carried out to a good standard
8	Detailing Work	Detailing work to pipes and columns made using (SAGM), which was warmed prior to placing. 26no pipe penetrations 23no columns
9	External wall airbricks	Not applicable

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Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked: 50% of pour 1 Gridlines BN-BT 1-7**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 11/01/2017	**Visit No: 2**
Inspection by: Ashley Ready	**Weather at time of inspection: 10^0 C Fine**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised hard core and sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane chemical resistant barrier membrane 2) Puraflex self-adhesive gas membrane (SAGM)
4	Membrane condition	The membrane was installed to a good standard. 4no holes repaired by the installer as part of their CQA prior to our inspection using (SAGM) 4no holes identified caused by follow on trades repaired using (SAGM) whilst the surveyor was in attendance. No further remedial action required at time of our inspection.
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☒ Air Lance (ASTM D4437) | ☐ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No All welds completed to a good standard, small area could not be tested due to insulation already in place No remedial action required at the time of our inspection
8	Detailing Work	Pipe penetrations and pipes sealed using 150mm-150mm of (SAGM) that was warmed prior to placing All completed to a good standard with no remedial action required at the time of our inspection.
9	External wall airbricks	Not applicable

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Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked: Gridlines BM-F 7-16 Approx 20% of floor area**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 24/01/2017	**Visit No: 3**
Inspection by: Keith Barsby	**Weather at time of inspection: 3^0 C Misty**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane chemical resistant barrier membrane 2) Puraflex self-adhesive gas membrane (SAGM)
4	Membrane condition	The membrane was installed to a good standard. Due to insulation being installed prior to inspection only approximately 60% of area could be viewed. No remedial action required to the area inspected at time of our inspection.
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☐ Air Lance (ASTM D4437) | ☒ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No Joints made using hand held hot air tool to a good standard No remedial action required at the time of our inspection, probe test to visible joints only
8	Detailing Work	19no pile caps sealed using (SAGM), which was applied to primed surface. 20no pipe penetrations sealed using warmed (SAGM) prior to placing All completed to a good standard with no remedial action required at the time of our inspection.
9	External wall airbricks	Not applicable

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Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked Approximately 12.5% of floor area. Gridlines K to W 11 to 16**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 15/02/2017	**Visit No: 4**
Inspection by: Keith Barsby	**Weather at time of inspection: 9^0 C Damp**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised compacted sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane chemical resistant barrier membrane 2) Puraflex self-adhesive gas membrane (SAGM) 3) Primer
4	Membrane condition	The membrane was installed to a good standard. 7no hole identified during inspection by MEC Environmental Ltd, repair made by the installer whilst the surveyor was in attendance. No further remedial action required to the area inspected at time of our inspection.
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☒ Air Lance (ASTM D4437) | ☐ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No Joints made using hand held hot air tool to a good standard No remedial action required at the time of our inspection
8	Detailing Work	18no pipe penetrations and 14no pile caps sealed using warmed (SAGM) The pile caps had been primed prior to the sealing of the (SAGM). 4no pile caps needed re-sealing as identified during inspection by MEC Environmental Ltd. All repairs to a satisfactory standard

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9	External wall airbricks	Not applicable

Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked Pour 6 Gridlines G-T 7-11** **2no piles from pour 5 gridlines X 16-21**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 28/02/2017	**Visit No: 5**
Inspection by: Ashley Ready	**Weather at time of inspection: 9^0 C Fine**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised compacted hard-core and sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane chemical resistant barrier membrane 2) Puraflex self-adhesive gas membrane (SAGM)
4	Membrane condition	In excess of 10no holes identified mainly to perimeter area's caused by follow on trades, Installer to repaired using (SAGM). No further remedial work required at time of inspection
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☒ Air Lance (ASTM D4437) | ☐ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No All welds completed at the time of our inspection. 1no un-welded area identified – once identified the installer welded the area whilst the surveyor was in attendance. No further remedial action required at the time of our inspection
8	Detailing Work	Pipe penetrations and piles to be sealed using 150mm-150mm of (SAGM) that must be warmed prior to placing
9	External wall airbricks	Not applicable

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Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked Pour 7 Gridlines Y-AG 11-16 Zone 12**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 07/03/2017	**Visit No: 6**
Inspection by: Ashley Ready	**Weather at time of inspection: 8^0 C Fine**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised compacted hard-core and sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane chemical resistant barrier membrane 2) Puraflex self-adhesive gas membrane (SAGM) 3) Bitumen Primer
4	Membrane condition	The membrane was installed to a good standard. In excess of 20no defects repaired as part of installers CQA prior to inspection using (SAGM) 2no holes identified repaired using (SAGM) whilst the surveyor was in attendance 1no un-sealed patch, repaired /heated by the installer whilst the surveyor was in attendance. No further remedial action required at the time of our inspection.
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☒ Air Lance (ASTM D4437) | ☐ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No 1no un-welded area identified – once identified the installer welded the area whilst the surveyor was in attendance. All other welds completed to a good standard. No further remedial action required at the time of our inspection

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8	Detailing Work	Pipe penetrations sealed with 150mm-150mm of warmed (SAGM) Piles primed with bitumen, sealed using 150mm-150mm of warmed (SAGM) All completed to a good standard with no remedial action required at the time of our inspection.
9	External wall airbricks	Not applicable

Verification of gas protection measures

Site name: Holiday Inn, Heathrow, London	**Units/ plots checked Pour 8 Gridlines AG-B2 1-7 Final pour.**
Installers Name: UK Membranes	**Type of development: Commercial**
Date: 08/03/2017	**Visit No: 7**
Inspection by: Ashley Ready	**Weather at time of inspection: 12^0 C Fine**

Item no.	Item	Comments
1	Underside of membrane	Not inspected by MEC Environmental Ltd, contractor advised compacted hard-core and sand blinding
2	Sub-floor void	Not inspected by MEC Environmental Ltd, contractor advised not applicable.
3	Materials	1) Puraflex Hydro Carbon gas membrane chemical resistant barrier membrane 2) Puraflex self-adhesive gas membrane (SAGM) 3) Bitumen Primer
4	Membrane condition	The membrane was installed to a good standard. 9no defects repaired as part of installers CQA prior to inspection using (SAGM) No further remedial action required at the time of our inspection
5	Type of Joint	Tape Joint ☐ | Auto Weld ☐ | Hand Weld ☒ | Extrusion Weld ☐
6	Jointing Testing	☒ Air Lance (ASTM D4437) | ☐ Probe Test (ASTM D4437)
7	Laps, welds and joints seals	Did all welds, laps and seals pass testing | ☒ Yes | ☐ No All welds completed to a good standard. No further remedial action required at the time of our inspection

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8	Detailing Work	Pipe penetrations sealed with 150mm-150mm of warmed (SAGM) Piles primed with bitumen, sealed using 150mm-150mm of warmed (SAGM) 1no un-sealed pipe, repaired by the installer using (SAGM) 1no un-sealed pipe identified on another pour section repaired by the installer. Both repaired whilst the surveyor was in attendance All completed to a good standard with no further remedial action required at the time of our inspection.
9	External wall airbricks	Not applicable

Photograph



05/01/17



05/01/17

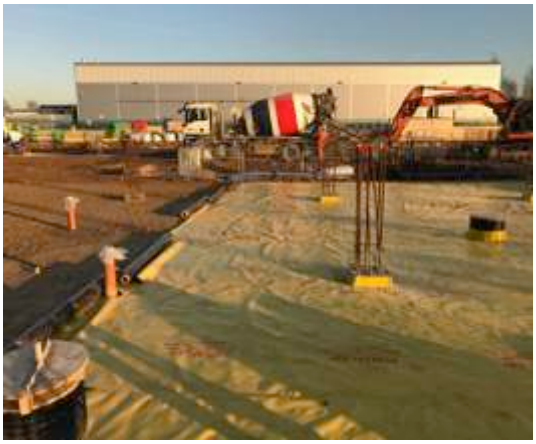


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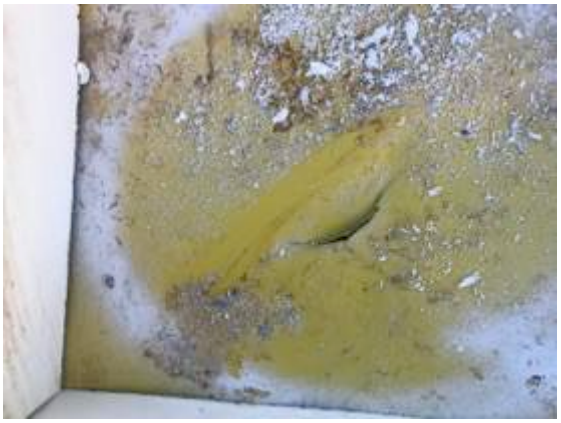
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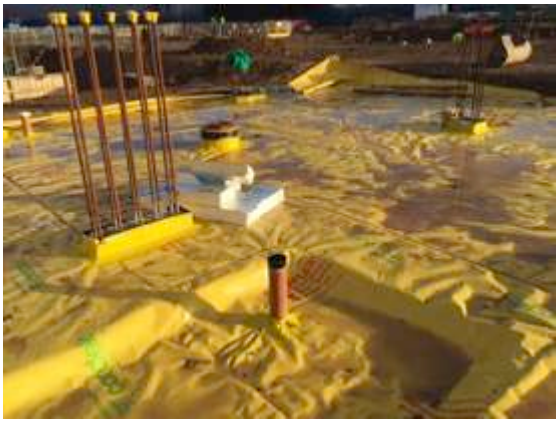
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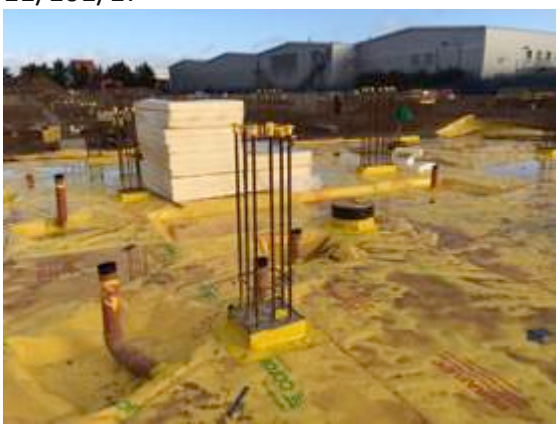
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11/01/17

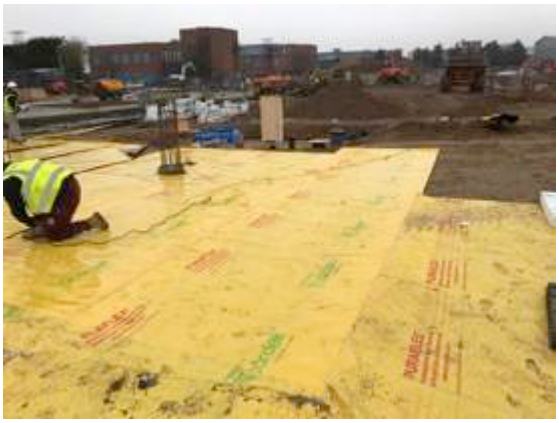


11/01/17

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11/01/17


24/01/17


24/01/17


24/01/17



24/01/17


24/10/17

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24/01/17



24/01/17



15/02/17



15/02/17

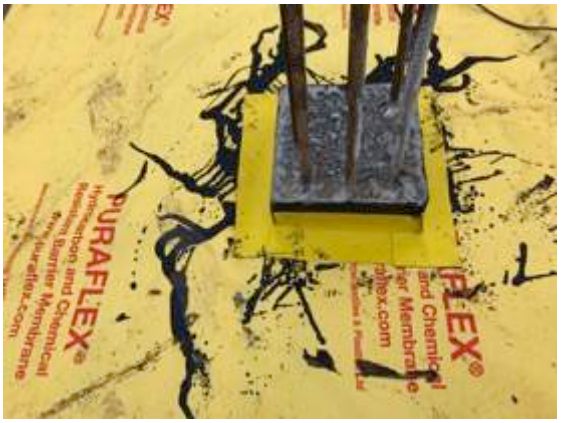


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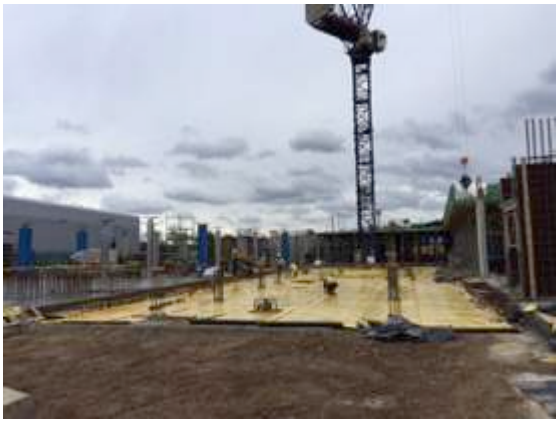


15/02/17

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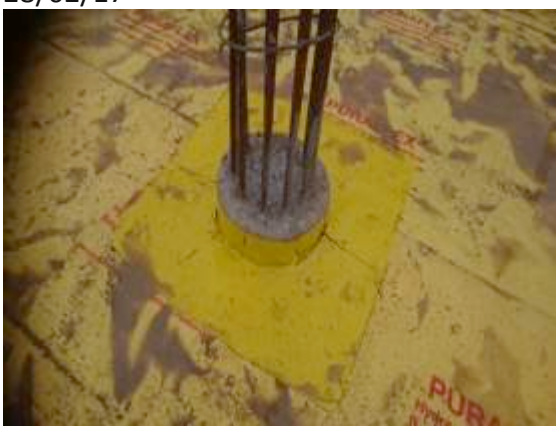
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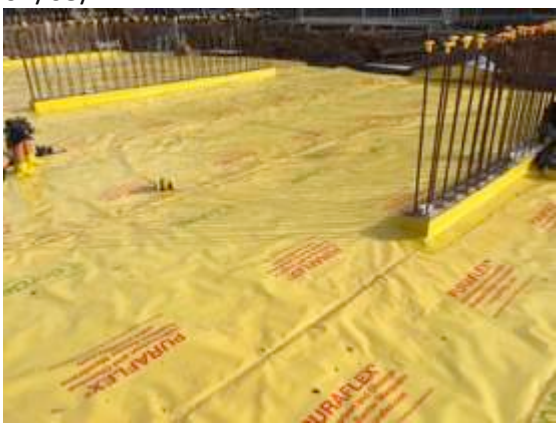


07/03/17



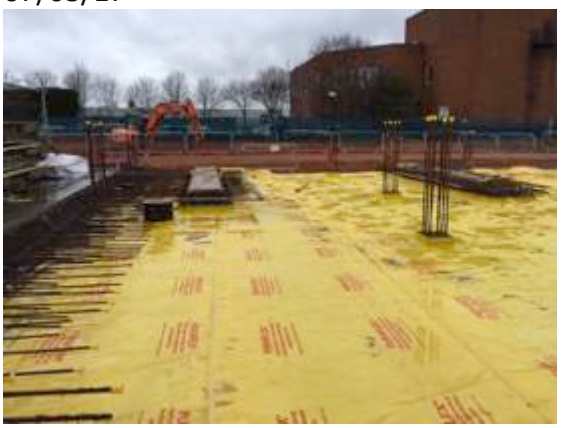
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07/03/17



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08/03/17



08/03/17



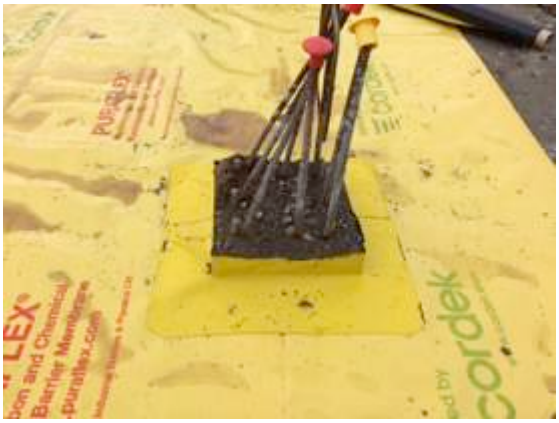
08/3/17



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08/03/17



08/3/17

The installers all hold the NVQ Level 2 “Gas membrane Installations” qualification and as such are classed as a qualified and experienced installer. MEC Environmental have checked the CSCS Trade Cards of the installers, which confirms the holder has attained the qualification.

The frequency and number of independent visits and inspection regime employed is broadly line with Annex 1 of CIRIA C735.

Signed: Date: 08/03/2017
Director
MEC Environmental Ltd

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Appendix 1

Consultants Gas Protection Specific Experience:

Michael Corban

10 years Building Surveyor (Blackburn Borough Council)

2 years Surveyor (Environmental Protection Group)

4 years Geo-engineering Technical Manager (APG Ltd)

2 years Geo-engineering Technical Manager (Geosolutions Ltd)

8 Years Technical Director (MEC Environmental Ltd)

Member of Technical Committee Published Guidance and Papers

1) Ciria 665 **"Assessing risks posed by hazardous ground gases"** (Steering Group Member Non-Funder)

2) ***Ciria C716*** **"Remediating and Mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination"** (Steering Group Member Non-Funder)

Author of Published Guidance and Papers

1) Chartered Institute of Environmental Health Card G & Wilson S **"Local Authority Ground Gas Handbook"** (Text Contributor and Peer Review Committee)

2) Corban M & Wilson S 2012 "**Gas membranes and the requirements of CIRIA C665/British Standard BS8485" (**co-author)

3) Corban M & Wilson S 2012 **"Gas Membrane Tracer Gas Testing Trial" (**co-author)

4) Mallet H, Taffel-Andureau L, Wilson S & Corban M ***Ciria 735*** "**Good Practice on the testing and verification of protection systems for buildings against hazardous ground gases"** (co-author)

5) Consultant to Construction Skills CITB - co author of the **Cskills NVQ Level 2 syllabus for "Gas membrane Installation and Integrity Testing apprenticeship and Up-skilling Courses"**

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Gas Protection Specific Qualifications

1) The Welding Institutes **"Geomembrane Welding Training and Inspection Course"**

2) BGA & Construction skills **"Quality Controls of Inspection and Validations of Gas Membrane Installations"**

3) Radon Council (Approved Designer)

4) Co-Author of the syllabus and Instructor of the BGA & Construction Skills Training Course **"Quality Controls of Inspection and Validations of Gas Membrane Installations"**

5) Construction Skills CITB "**Cskills "Gas membrane Installation Up-skilling Course"**

Associations

British Geomembrane Association (BGA)

Construction Related Qualifications

- ONC Building Construction (Blackburn College 1989-91)
- HNC Building Construction (Blackburn College 1991-93)

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Puraflex VOC Membrane Declaration of Performance

CE

Reference: M-DOP01	
1. Unique identification code of the product-type:	Puraflex VOC Membrane
2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4) of the CPR:	Type T in accordance with EN 13967 – Flexible sheets for waterproofing – damp proof sheet.
3. Intended use or uses of the construction product, in accordance with the harmonised technical specification, as foreseen by the manufacturer:	Plastic or rubber sheets with or without a reinforcing grid, intended for use as a damp-proof membrane on or beneath floors/ground slabs not subject to hydrostatic pressure, to prevent moisture in the ground passing through to the internal environment.
4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):	Cordek Ltd, Spring Copse Business Park, Slinfold, West Sussex. RH13 0SZ
5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):	Not Applicable
6. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:	System 3
7. In case of the declaration of performance of the construction product covered by a harmonised standard: - name and number of notified body:	Information available upon request

Declared Performance:

Essential Characteristics	Performance	Harmonised Standard
Reaction to Fire	F	EN 13967
Water Tightness	758 kpa	
Resistance to Impact	N1470	
Resistance to Static Loading	>20kg	
Durability (Heat Ageing)	Pass	
Durability (Chemicals)	Pass	

The performance of the product identified in points 1 and 2 is in conformity with the declared performance.
This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed on behalf of the manufacturer:

Name	Alastair Seaton	Position	Technical Director	Date of Issue	October 2015

DISCLAIMER: Information contained within this 'Declaration of Performance' is for guidance only, and it is intended for experienced construction industry workers. It contains summaries of aspects of the subject matter and does not provide comprehensive statements of construction industry practice. As conditions of usage and installation are beyond our control we do not warrant performance obtained. Please contact us if you have any doubt as to the suitability of application. The information provided within this document is based on data and knowledge correct at the time of printing.

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cordek

Puraflex VOC Membrane Data Sheet



The Cordek Puraflex VOC membrane is a high performance hydrocarbon and chemical resistant barrier with exceptional resistance to a wide range of pollutants including hydrocarbons, industrial chemicals, toxic waste, natural and radioactive gases. The Cordek Puraflex VOC membrane is generally used within construction applications, predominantly within the foundation design. It also acts as a high performance DPM.

Key Features

- High performance membrane comprising of protective polymeric layers on both sides of a chemical resistant inner core, for protection of buildings against hydrocarbons, VOCs and ground gases
- Provides additional damp proofing protection to the structure
- Robust membrane construction with excellent resistance to both puncturing and tearing
- Extensively tested with a depth of performance data supported by the Cordek Puraflex Permeation Modeller.

Installation

In order to provide a robust installation, it is recommended that the Cordek Puraflex VOC membrane is jointed using conventional thermal (hot air/wedge) welding equipment to provide adequate protection against VOC, chemical, ground gas and moisture ingress.

All laps and junctions within the membrane should be overlapped by a minimum of 150mm. Any penetrations within the membrane should be effectively sealed using the appropriate accessories and recommended details.

The membrane should be installed upon a suitably prepared level surface consisting of either Cordek's ventilation product Ventform, a well compacted sand layer or concrete blinding of a minimum 50mm depth. Surfaces should be swept clean and free from any sharp edges or protrusions.

For further information on the installation of the Cordek Puraflex VOC membrane please refer to the separate installation guide, available from Cordek's technical team upon request.

For further information on the full range of VOC & Ground Gas Protection, please contact the Cordek technical team on 01403 799600, techsupport@cordek.com or consult our website at www.cordek.com.

Protection & Repair

All welded and non-welded areas of the Cordek Puraflex VOC membrane should be inspected for defects, holes, blisters, un-dispersed raw materials, and any sign of contamination by foreign matter prior to covering. The surface of the membrane should be clean at the time of inspection and free from debris.

Following installation of the membrane, the installer and specifier should assess the requirement for additional protection prior to the positioning of reinforcement and pouring of concrete upon it. If additional protection is required, then the Cordek Correx protection system should be used directly above the membrane.

If the membrane is damaged, it should be repaired by means of patching. Pinholes and small holes can also be repaired via patching. The patch should be made of the same barrier membrane and should extend at least 150mm outside the damaged area in order to ensure that the damaged area is covered completely. The patch should be prepared and welded using a hot air gun with a fishtail nozzle. The two surfaces to be welded are heated with the hot air gun until melting occurs on both surfaces. Pressure is then applied to the patch by means of a hand roller until the weld cools.

Storage & Handling

Care should be taken when moving, transporting or handling to avoid physical damage, puncturing or tearing which may affect the performance of the membrane.

The membrane should be stored under cover to protect from puncture, dirt, grease, moisture, sunlight and excessive heat. Damaged material shall be quarantined and stored separately for repair or replacement. The rolls shall be stored on a prepared smooth dry surface (or fully boarded wooden pallets; note that slatted pallets with sharp corners will damage the rolls) and stacked no more than two rolls high. The bottom rolls need to be chocked to prevent them from rolling.

Storage between 5 to 30°C at 40 to 65% humidity under non-condensing conditions is recommended.

Product Data

Physical Properties:

Performance		Standard	Units	Values MD	Values XD	Min	Max
Physical Properties							
Mass		EN 1849-2	gsm	440		435	455
Thickness		EN 1849-2	µm	440		425	490
Tensile Strength at break		ISO R 527-3	N/mm	53	48	45 I 40	60 I 55
Elongation at break			%	920	780	850I700	995I950
Tear Strength – trouser		ISO 34 method B	N	57	60	50 I 50	65 I 70
Tear Strength		ASTM D1004	N	45	45	40 I 55	40 I 55
Puncture Resistance	Resistance	EN ISO 12236	N	1470		1200	1500
	Movement		mm	100		90	120
Burst Strength (Mullen)		ASTM 3786	kPa	145		125	160
Hydrostatic Resistance		ASTM D751-A	kPa	758		745	780
Low Temperature Resistance		EN 495-5		Pass		-	-
Seam Test	Peel	ASTM D6392	N	NA	167	-	-
Roll Size	18 rolls/pallet		m	2.1 x 50		-	-
Roll Weight	20cm dia		kg	47			
Durability Properties							
Temperature Range			°C	-40 to +70		-	
Flame Retardant		BS EN ISO 11925-2		Class F		-	
UV Resistance			kLy	150		-	
Co-efficient of Linear Thermal Expansion (CLTE)		ASTM D696	m/m/ °C	1.26E-04		BICS BS-G428/a	
Dimensional Stability		ASTM D1204-08	%			BICS BS-G428/a	
Resistance to Oxidation	Max Tensile Str.	EN 14575	%	-3.2	-3.2	BICS BS-E928-10	
Retained strength after ageing	Elongation		%	-2.2	-1.3	BICS BS-E928-10	
Oxidative Induction Time		ASTM D3895	min	58		BICS BS-E928-08	
Root Penetration		prCEN/TS 14416	-	Pass		TSUS 90-09-0319	
Micro-organisms		EN 12225	-	Pass		TSUS 09/0640	
Weathering		EN 12224	-	Not Applicable		Covered installation	
Env. Stress Cracking		ASTM D 5397-99	-	Not Applicable		BICS E928-09	

Chemical Resistance:

Group	Challenge Chemical 100% concentration	CAS	State	Permeation Rate [1] 20 °C at 100 mg/kg mg/m²/year	Chemical Resistance [2] ASTM D5322 / EN 14414 Performance after Chemical Attack				
					Attack on exposed surfaces	Weight %	Thick-ness %	Tensile Strength MD %	Tensile Strength XD %
OTHER CHEMICALS									
Carboxylic Carbocyclic Acids	Butyl benzl phthalate (BBP)	85-68-7	Liquid	5.80E-03	NT	NT	NT	NT	NT
	Di-n-octyl phthalate	117-84-0	Liquid	3.11E-03	NT	NT	NT	NT	NT
	Diethyl phthalate	84-66-2	Liquid	9.28E-01	NT	NT	NT	NT	NT
	Dimethyl phthalate	131-11-3	Liquid	8.30E-01	None	-0.9	-0.2	-20.0	+1.8
	Dibutyl phthalate	84-74-2	Liquid	2.54E-01	None	+0.9	-0.2	-16.9	-22.6
	Dioctyl phthalate	117-81-7	Liquid	1.06E-02	NT	NT	NT	NT	NT
Heterocyclics	Carbazole SVOC	86-74-8	Solid	1.58E-01	NA	NA	NA	NA	NA
	1,4-Dioxane	123-91-1	Liquid	9.45E+02	NT	NT	NT	NT	NT
	Tetrahydrofuran (THF)	109-99-9	Liquid	2.07E+03	NT	NT	NT	NT	NT
Inorganics	Carbon Disulphide	75-15-0	Liquid	5.45E-06	NT	NT	NT	NT	NT
Organics	2-Methoxy-2-methylpropane (MTBE)	1634-04-4	Liquid	1.45E+00	None	+1.2	-0.2	+7.7	+17.9
	2-Methylphenol	95-48-7	Solid	8.82E+02	NA	NA	NA	NA	NA
	4-Methylphenol (Cresol)	106-44-5	Solid	8.82E+02	NA	NA	NA	NA	NA
	Pentachlorophenol	87-86-5	Solid	1.70E+00	NA	NA	NA	NA	NA

Glossary

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
PAH	Polycyclic Aromatic Hydrocarbons
SVOC	Semi Volatile Organic Compound
THM	Trihalomethanes
VOC	Volatile Organic Compound
NA	Not Applicable
NT	Not Tested

[1] Puraflex Permeation Modeller

100mg/kg contaminant at 20°C with No Soil Moisture Partition Coefficient applied.

Permeation Rates are influenced by site-specific variables including contaminant soil concentration, soil temperature, moisture etc. Soil moisture partition coefficients will have a significant effect on the effective concentration levels at the face of any geosynthetic membrane.

Please refer to Puraflex Permeation Modeller software to calculate Permeation Rates for appropriate soil moisture content and other site-specific variables.

[2] Chemical Resistance – ASTM D5322 / EN 14414 Method of Test

Chemical Resistance immersion test method are not applicable for Solids or Gaseous chemicals.

Performance data after Chemical Attack is the variation in Weight & Thickness and Retained Residual Strength & Elongation after immersion in challenge chemical at 50°C for 56 days, measured against control specimen.

Test procedure is equivalent to ASTM D5322 within EPA method 9090 and ASTM D5747.

Though these immersion tests are designed for mono-polymer homogeneous geosynthetic membranes, test results for Puraflex are included for completeness.

Group		Challenge Chemical 100% concentration		CAS	State	Permeation Rate [1] 20 °C at 100 mg/kg mg/m²/year	Chemical Resistance [2] ASTM D5322 / EN 14414 Performance after Chemical Attack				
							Attack on exposed surfaces	Weight %	Thick-ness %	Tensile Strength MD %	Tensile Strength XD %
		HYDROCARBONS									
	Aliphatics	1,2-Dichloropropane		78-87-5	Liquid	3.54E-01	NT	NT	NT	NT	NT
		Cyclohexane		110-82-7	Liquid	5.52E-06	None	-2.1	-0.2	-8.2	+4.2
		Diesel Fuel (DIN 14214)		68334-	Liquid	8.57E-04	None	+3.1	+2.0	-15.9	+7.7
		Hexane		30-5	Liquid	1.56E-06	None	-1.1	-1.7	-5.6	+6.0
		Hexachlorobuta-1,3-diene		110-54-3	Liquid	1.51E-01	NT	NT	NT	NT	NT
		Hexachloroethane		87-68-3	Gaseous	1.18E-05	NA	NA	NA	NA	NA
		Jet Fuel (Jet A1)		67-72-1	Liquid	1.34E-03	None	+0.5	0	+0.5	+7.1
		Petrol / Gasoline (unleaded)		91770-15-9	Liquid	2.38E-03	None	-0.2	-1.5	+11.8	+16.7
		White Mineral Oil		86290-81-5 8042-47-5	Liquid	1.34E-03	None	+1.2	0	-4.1	-3.0
Total Petroleum Hydrocarbons (TPHs) With aliphatic and aromatic hydrocarbons and halogen derivatives, the surface may show signs of swelling at high concentration. However the original properties of the protective outer polymer layer are usually restored upon evaporation of the liquid concerned without affecting the integrity of the chemical resistant core.	Aromatics	1,1-Biphenyl		92-52-4	Solid	7.99E-05	NA	NA	NA	NA	NA
		1,2,4-Trimethylbenzene	VOC	95-63-6	Liquid	3.25E-05	None	+1.7	-0.5	-1.5	+14.9
		1,3,5-Trimethylbenzene	VOC	108-67-8	Liquid	3.25E-05	None	+1.0	-1.0	-6.7	-1.2
		1-Methynaphthalene		90-12-0	Liquid	1.51E-02	None	+1.6	-0.2	-9.2	-6.5
		2-Chloronaphthalene		91-58-7	Solid	1.22E-02	NA	NA	NA	NA	NA
		2-Methynaphthalene		91-57-6	Solid	3.35E-03	NA	NA	NA	NA	NA
		2,4-Dimethylphenol		105-67-9	Liquid	1.52E+02	NT	NT	NT	NT	NT
		Acenaphthene	PAH	83-32-9	Solid	1.10E-02	NA	NA	NA	NA	NA
		Anthracene	PAH	120-12-7	Solid	1.54E-03	NA	NA	NA	NA	NA
		Benzene	BTEX	71-43-2	Liquid	3.52E-04	None	-0.3	-1.7	-1.5	-3.6
		Benzo(a)anthracene	PAH	56-55-3	Solid	7.24E-05	NA	NA	NA	NA	NA
		Benzo(a)pyrene	PAH	50-32-8	Solid	7.24E-05	NA	NA	NA	NA	NA
		Benzo(b)fluoroanthene	PAH	205-99-2	Solid	7.24E-05	NA	NA	NA	NA	NA
		Benzo(ghi)perylene	PAH	191-24-2	Solid	7.24E-05	NA	NA	NA	NA	NA
		Benzo(k)fluoroanthene	PAH	207-08-9	Solid	7.24E-05	NA	NA	NA	NA	NA
		n-Butylbenzene	VOC	104-51-8	Liquid	2.51E-05	NT	NT	NT	NT	NT
		sec Butylbenzene	VOC	135-98-8	Liquid	1.26E-03	None	-0.4	+0.2	+8.2	+33.3
		tert Butylbenzene	VOC	98-06-6	Liquid	3.47E-04	None	-0.5	-0.7	+7.2	+22.6
		Chrysene	PAH	218-01-9	Solid	3.57E-04	NA	NA	NA	NA	NA
		Dibenzo(a,h)anthracene	PAH	53-70-3	Solid	7.24E-05	NA	NA	NA	NA	NA
		Ethylbenzene	BTEX	100-41-4	Liquid	1.18E-04	None	-0.7	-0.7	-1.0	+13.1
		Fluoranthene	PAH	206-44-0	Solid	6.67E-04	NA	NA	NA	NA	NA
		Fluorene	PAH	86-73-7	Solid	3.23E-06	NA	NA	NA	NA	NA
		Hexachlorocyclohexane (HCH)		58-89-9	Solid	4.79E-05	NA	NA	NA	NA	NA
		Idendo(1,2,3-cd)pyrene	PAH	193-39-5	Solid	7.24E-05	NA	NA	NA	NA	NA
		Isopropyl benzene (Cumene)	VOC	98-82-8	Liquid	5.64E-05	None	-0.1	-0.2	-3.1	-8.3
		Naphthalene	PAH	91-20-3	Solid	7.76E-01	NA	NA	NA	NA	NA
		Pentachlorobenzene	SVOC	608-93-5	Solid	2.68E-06	NA	NA	NA	NA	NA
		Propylbenzene		103-65-1	Liquid	2.11E-03	None	+1.4	+1.2	+24.6	+31.0
		Pyrene	PAH	129-00-0	Solid	1.40E-07	NA	NA	NA	NA	NA
		Styrene	VOC	100-42-5	Liquid	3.98E-02	None	+0.3	-0.5	-0.5	+14.9
		Toluene (Methylbenzene)	BTEX	108-88-3	Liquid	1.14E-03	None	+1.1	-0.5	-7.2	-4.2
		Xylene	BTEX	1330-20-7	Liquid	6.09E-03	None	-0.3	+0.2	+2.6	+3.6

Group	Challenge Chemical 100% concentration		CAS	State	Permeation Rate [1] 20 °C at 100 mg/kg mg/m²/year	Chemical Resistance [2] ASTM D5322 / EN 14414 Performance after Chemical Attack				
						Attack on exposed surfaces	Weight %	Thick-ness %	Tensile Strength MD %	Tensile Strength XD %
HYDROCARBONS										
Halogenated Hydrocarbons	1,1-Dichloroethene	VOC	75-35-4	Liquid	1.17E+00	None	+2.6	+1.5	+31.8	+52.4
	1,1,2-Trichloroethane	VOC	79-00-5	Liquid	3.02E+02	None	0.0	+0.7	+17.4	+41.1
	1,1,2,2-Tetrachloroethane	VOC	79-34-5	Liquid	1.01E+01	None	+2.2	+0.5	-11.8	+14.3
	1,2-Dibromoethane	VOC	106-93-4	Liquid	1.04E+03	None	+2.7	-1.0	+13.8	+1.2
	1,2-Dichloroethane	VOC	107-06-2	Liquid	5.30E+00	None	+2.0	-0.5	-19.0	-2.4
	1,2,4-Trichlorobenzene	SVOC	120-82-1	Liquid	6.82E-03	None	+3.1	-0.2	-2.1	+16.1
	1,2,4,5-Tetrachlorobenzene	SVOC	95-94-3	Solid	3.00E-03	NA	NA	NA	NA	NA
	Bromobenzene	VOC	108-86-1	Liquid	3.90E-01	None	+2.4	+0.2	+33.3	+33.3
	Bromodichloromethane	THM	75-27-4	Liquid	1.42E+01	NT	NT	NT	NT	NT
	Bromoform	THM	75-25-2	Liquid	6.35E+01	Swelling	+3.9	+0.5	+17.4	+41.1
	Carbon Tetrachloride	VOC	56-23-5	Liquid	3.19E-05	NT	NT	NT	NT	NT
	Chlorobenzene	VOC	108-90-7	Liquid	3.82E-03	None	-1.2	-1.2	-1.0	+37.5
	Chloroethane	VOC	75-00-3	Gaseous	3.80E-01	NA	NA	NA	NA	NA
	Chlorotoluene		95-49-8	Liquid	7.19E-03	None	+0.3	-0.5	+2.1	+1.2
	Dichlorodiphenyltrichloroethane	DDT	50-29-3	Solid	1.84E-03	NA	NA	NA	NA	NA
	Dichloromethane	VOC	75-09-2	Liquid	1.87E+03	None	+0.8	-1.2	-7.2	-9.5
	Dieldrin		60-57-1	Solid	2.17E-03	NA	NA	NA	NA	NA
	Polychlorinated Biphenyl (PCB)		1336-36-3	Liquid	1.77E-05	NT	NT	NT	NT	NT
	Tetrachloroethene		127-18-4	Liquid	1.95E-04	None	-0.8	-3.7	3.1	+3.6
	Trichloroethene	VOC	79-01-06	Liquid	9.25E+00	None	-0.3	-2.0	+9.2	-3.6
	Trichloromethane(Chloroform)	THM	67-66-3	Liquid	2.58E+01	None	+0.7	-0.7	-7.2	-23.8
	Vinyl Chloride	VOC	75-01-4	Gaseous	1.67E-01	NA	NA	NA	NA	NA
Turpenes	Isopropyltoluene		99-87-6	Liquid	1.55E-03	None	+1.1	+0.7	-15.4	-25.0

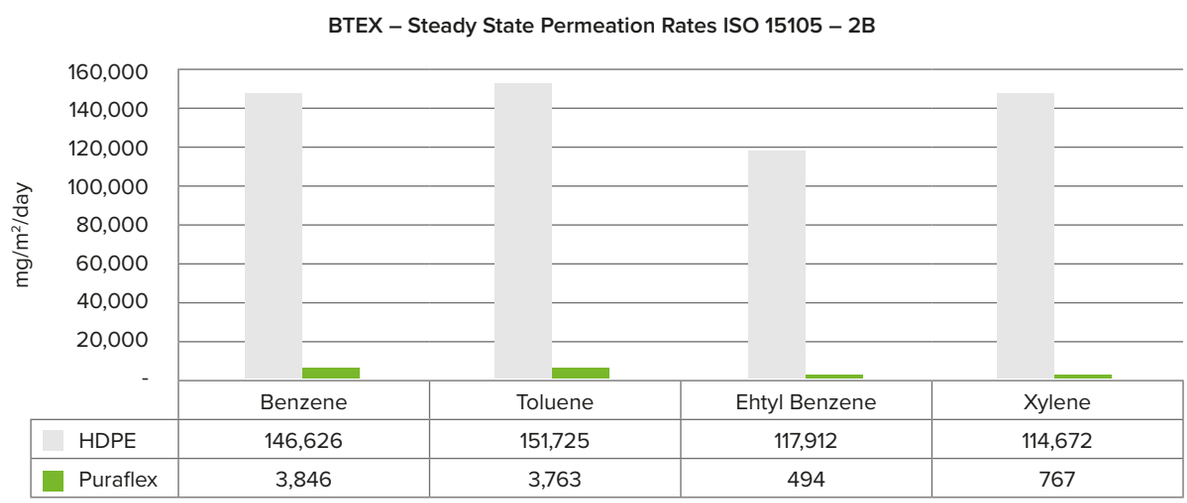
Permeation Data:

Group	Challenge Chemical 100% concentration		CAS	State	Permeation Rate	Unit		
PERFORMANCE TESTING PERMEATION DATA								
Liquids	Benzene	ISO 15105-2B	71-43-2	Liquid	3846	mg/m²/day		
	Ethyl Benzene	ISO 15105-2B	100-41-4	Liquid	494	mg/m²/day		
	Toluene	ISO 15105-2B	108-88-3	Liquid	3763	mg/m²/day		
	Xylene	ISO 15105-2B	1330-20-7	Liquid	767	mg/m²/day		
	Acetone	ISO 15105-2B	67-64-1	Liquid	<0.0001	mg/m²/day		
Gases	Methane	ISO 15105-1A	74-82-8	Gaseous	0.120	cm³/m².day.bar	23°C	0% RH
	Carbon Dioxide	ASTM D1434	124-38-9	Gaseous	1.958	cm³/m².day.atm	25°C	94.9% RH
	Oxygen	ASTM D1434	7782-44-7	Gaseous	1.460	cm³/m².day.atm	25°C	96.2% RH

Durability Testing:

Durability Testing Chemical Resistance Data						
EN 14414 Chemical Resistance Retained Strength after Chemical Attack - Immersion Test	EN 14414-A (Acids)	Tensile Strength	MPa MD | XD	25.2	20.8	Pass
		Elongation	% MD | XD	+18.0	+9.5	Pass
	EN 14414-B (Alkalies)	Tensile Strength	MPa MD | XD	24.4	22.0	Pass
		Elongation	% MD | XD	+17.6	+13.3	Pass
	EN 14414-C (Organic Solvents)	Tensile Strength	MPa MD | XD	26.9	23.6	Pass
		Elongation	% MD | XD	+24.1	+17.6	Pass
	EN 14414-D (Synthetic Leachate)	Tensile Strength	MPa MD | XD	18.2	19.3	Pass
		Elongation	% MD | XD	+9.9	-2.6	Pass
EN 14415 Chemical Resistance Retained Strength after Chemical Attack - Immersion Test	EN 14415-A (Hot Water)	Tensile Strength	MPa MD | XD	26.1	22.8	Pass
		Elongation	% MD | XD	-0.3	-2.5	Pass
	EN 14415-B (Alkalines)	Tensile Strength	MPa MD | XD	27.7	25.5	Pass
		Elongation	% MD | XD	+3.6	-1.3	Pass
	EN 14415-C (Organic Alcohols)	Tensile Strength	MPa MD | XD	24.9	25.2	Pass
		Elongation	% MD | XD	-2.6	+2.7	Pass
Resistance to Acids Retained Strength - Immersion Test	EN 14030	Tensile Strength	MPa MD | XD	26.5	25.0	Pass
		Elongation	% MD | XD	+7.0	+11.2	Pass
Resistance to Alkalis Retained Strength - Immersion Test	EN 14030	Tensile Strength	MPa MD | XD	24.3	24.7	Pass
		Elongation	% MD | XD	-1.6	+10.2	Pass

Comparative Performance Against HDPE Membranes:



	Benzene	Toluene	Ehtyl Benzene	Xylene
HDPE	146,626	151,725	117,912	114,672
Puraflex	3,846	3,763	494	767

Puraflex significantly outperforms HDPE

Issued: 02/2018

DISCLAIMER: Information contained within this 'Technical Data Sheet' is for guidance only, and it is intended for experienced construction industry workers. It contains summaries of aspects of the subject matter and does not provide comprehensive statements of construction industry practice. As conditions of usage and installation are beyond our control we do not warrant performance obtained. Please contact us if you have any doubt as to the suitability of application. The information provided within this document is based on data and knowledge correct at the time of printing.

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APPENDIX G

Water Supply Pipe Email and Puriton Technical Specification

RADIUS Systems

Puriton® barrier pipe and fittings system

Protecting drinking water through contaminated land



March 2018

Puriton® by Radius Systems
Barrier pipe and fittings system



The barrier pipe system of choice for the safe distribution of drinking water through contaminated land.

Contaminated soils are commonly found in brownfield sites. These are sites which were previously used for instance, for industrial or commercial purposes, but have subsequently fallen into disuse. The regeneration and development of these types of sites into housing, warehouses or factories is encouraged by governments to protect the green belt, minimise urban sprawl and make better use of disused land.

Depending on the level or type of soil contaminant found in brownfield sites, the water undertaker may specify the use of a barrier pipe system to ensure the drinking water is protected from the permeation of soil contaminants through the wall of the pipeline.

Puriton®, a cutting-edge barrier pipe system developed by Radius Systems, is specifically designed and approved to provide the level of protection required to safeguard potable water against contaminants commonly found in brownfield sites. A multi-layer composite structure barrier pipe, Puriton® combines the benefits of polyethylene (PE) with the exceptional barrier properties of aluminium (Al), making it the barrier pipe system of choice to safeguard potable water.

- No need to post-wrap the joints
- Protects drinking water
- Corrosion resistant system
- Lightweight and easy to install
- End load resistant - no need for thrust blocks

Lightweight, flexible and corrosion resistant, the Puriton® system is easy to install, without the need to post-wrap the finished joints. The pipe can be joined using our comprehensive range of Puriton® fittings, specifically developed to give you the assurance of a safe and durable solution that protects your drinking water supply.



Puriton®- a 'Type A' barrier pipe

Radius Systems' Puriton® pipe is a multi-layer composite structure 'Type A' pipe, as defined in the newly published British Standard BS 8588 (*'Polyethylene pressure pipe with an aluminium layer and associated fittings for potable water supply in contaminated land').*

'Type A' Puriton® pipes are multi-layer pipes, where the black PE core is designed to accommodate the internal pressure and where the aluminium layer and the outer PE layer are respectively, the barrier and protection layers. Both outer layers do not contribute to the pipe's overall pressure rating.

Puriton® - a tried and tested barrier pipe system

The introduction of BS 8588 outlines the material and mechanical performance requirements for barrier pipe systems. Importantly, it also specifies their capability to protect the water quality when installed as part of a potable water supply system in contaminated ground. One of the key performance tests required by BS 8588 is the pipe system's resistance to the permeation of soil contaminants. Radius Systems' products evaluated in accordance with the permeation requirements, have been successfully tested without the need for external protective wrapping of the joint.



Benefits of the Puriton® system

- Multi-layer pipe construction PE-Al-PE
- Brown stripes denote a multi-layer pipe
- Full barrier pipe system
- Combines the flexibility of polyethylene with the barrier properties of aluminium
- Safeguards drinking water quality
- Easy to handle, flexible and lightweight
- End load resistant system
- Installation cost savings - no requirement for thrust blocks
- No requirement to post-wrap the joints
- Suitable for most common installation techniques
- Suitable for new and replacement drinking water supply systems

Product approval

- Polyethylene pipe material approved for use in drinking water supply for pipe diameters 90 to 180 mm
- WRAS approved material PE80 for pipe 25 to 63 mm
- WRAS approved product for Redman™ fittings 63 to 180 mm
- WRAS approved product for plastic mechanical fittings 25 to 63 mm
- BS EN 12201-3 (KM 597648) - Puriton® electrofusion fittings 90 to 180 mm
- KIWA UK Approved Product in compliance with UK Water Supply Regulations
  - 63 to 180 mm x 25 mm outlet tapping tees
  - 63 to 180 mm x 32 mm outlet tapping tees

- BS 8588:2017 (KM 672956) - 25 to 180 mm pipe
- WIS 4-32-19* (KM 592372) - 25 to 180 mm pipe

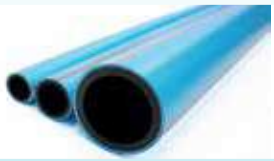
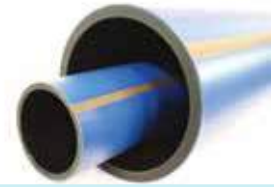
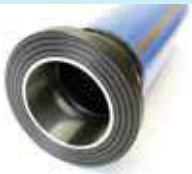
Jointing methods

- BS 8588 (KM 672956) and WIS 4-32-19* (KM 592372)
  - Puriton® plastic mechanical fittings
  - Redman™ fittings
  - Puriton® electrofusion fittings
  - Puriton® gunmetal tapping tees
  - Butt-fusion in accordance with WIS 4-32-08 with maximum aluminium removal according to Radius Systems' installation guidance

KM 592372
KM 597648
KM 672956

* BS 8588:2017 supersedes WIS 4-32-19

Puriton® product range at a glance

Description	Diameter	Pressure rating	Material(s)	Jointing
Service pipe				
	• 25 to 63 mm SDR11	• 12.5 bar	• PE80 • Aluminium	• Puriton® mechanical fittings • Redman™ fittings (63 mm) • Tapping tees (63 mm) • Spigot fittings (63 mm)
Mains pipe				
	• 90 to 180 mm SDR11 • 90 to 180 mm SDR17	• 16 bar • 10 bar	• PE100 • Aluminium	• Electrofusion fittings • Redman™ fittings • Spigot fittings • Tapping tees • Butt-fusion technique
Mechanical fittings				
	• 25 to 63 mm	• 12.5 bar	• Polypropylene	• Puriton® service pipe
Electrofusion fittings				
	• 90 to 180 mm	• 16 bar	• Polyethylene	• Puriton® mains pipe
Redman™ fittings				
	• 63 mm SDR11 • 90 - 110 mm SDR11 • 90 - 180 mm SDR17	• 12.5 bar • 16 bar • 10 bar	• Steel insert • Steel and copper outer shell	• Puriton® service pipe (63 mm) • Puriton® mains pipe
Tapping tees				
	• 63 to 180 mm x 25 mm • 63 to 180 mm x 32 mm	• 12.5 bar • 12.5 bar	• Gunmetal body • Polypropylene outlet	• Puriton® service pipe (63 mm) • Puriton® mains pipe
Spigot fittings				
	• 63 mm SDR11 • 90 to 180 mm SDR11 • 90 to 180 mm SDR17	• 12.5 bar • 16 bar • 10 bar	• Polyethylene with stainless steel insert	• Puriton® service pipe (63 mm) • Puriton® mains pipe

Puriton® service pipe

BS 8588 (WIS 4-32-19*) 'Type A' pipe

Available in diameters 25 to 63 mm, our Puriton® service pipe is manufactured from a black PE80 core, an aluminium barrier layer and a light blue PE80 outer layer with brown stripes.



Our Puriton® service pipes are available in coils and also in straight lengths for the 63 mm pipe. They are quick and easy to join without the need for surface preparation, using our range of cutting edge mechanical fittings and Redman™ fittings for our 63 mm pipe.

Pipe dimensions

Nominal diameter mm	Materials	SDR	Pressure rating bar	Core pipe external diameter mm	Core pipe wall thickness mm	Internal diameter mm	Overall external diameter mm	Pipe weight kg/m	Pipe length m	Product code
25	PE80/Al	11	12.5	25.0 - 25.3	2.3 - 2.7	19.6 - 20.7	27.0 - 27.6	0.3	50	XQ2528
32	PE80/Al	11	12.5	32.0 - 32.3	3.0 - 3.4	25.2 - 26.3	34.0 - 34.6	0.5	50	XQ2535
63	PE80/Al	11	12.5	63.0 - 63.4	5.8 - 6.5	50.0 - 51.8	64.8 - 65.8	1.5	6 25 50 100	XQ2568 XQ2570 XQ2571 XQ2572



Pipe coil dimensions

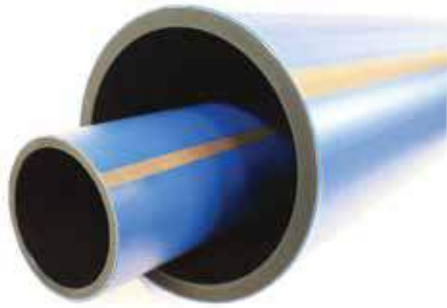
Nominal diameter mm	SDR	Pressure rating bar	Coil inner diameter mm	Coil outer diameter mm	Coil width mm	Coil length m	Coil weight kg
25	11	12.5	800	930	175	50	14.5
32	11	12.5	800	930	175	50	22.0
63	11	12.5	1275 1275 1275	1510 1815 1815	221 208 310	25 50 100	36.3 72.5 145.0

Pipe weights are for lifting and handling purposes. They are calculated on a per metre length and are based on a maximum diameter and pipe wall thickness.

* BS 8588:2017 supersedes WIS 4-32-19

Puriton® mains pipe

BS 8588 (WIS 4-32-19*) 'Type A' pipe



Available in diameters 90 to 180 mm, our Puriton® mains pipe is manufactured from a black PE100 core, an aluminium barrier layer and a dark blue PE100 outer layer with brown stripes. Our Puriton® mains pipes are joined using our range of state of the art Redman™ fittings, Radius Systems' electrofusion fittings and the butt-fusion jointing technique detailed within this brochure.

Pipe dimensions

Nominal diameter mm	Materials	SDR	Pressure rating bar	Core pipe external diameter mm	Core pipe wall thickness mm	Internal diameter mm	Overall external diameter mm	Pipe weight kg/m	Pipe length m	Product code
90	PE100/Al	11	16	90.0 - 90.6	8.2 - 9.2	71.6 - 74.2	92.2 - 93.8	2.8	6 12 50 100	XQ0125 XQ0126 XQ0128 XQ0129
90	PE100/Al	17	10	90.0 - 90.6	5.4 - 6.1	77.8 - 79.8	92.2 - 93.8	2.1	6 12 50 100	XQ0143 XQ0145 XQ0146 XQ0147
110	PE100/Al	11	16	110.0 - 110.7	10.0 - 11.1	87.8 - 90.7	112.2 - 113.9	3.9	6 12 50 100	XQ0233 XQ0235 XQ0236 XQ0237
110	PE100/Al	17	10	110.0 - 110.7	6.6 - 7.4	95.2 - 97.5	112.2 - 113.9	2.9	6 12 50 100	XQ0251 XQ0253 XQ0254 XQ0255
125	PE100/Al	11	16	125.0 - 125.8	11.4 - 12.7	99.6 - 103.0	127.2 - 129.0	5.0	6 12 50 100	XQ0287 XQ0289 XQ0290 XQ0291
125	PE100/Al	17	10	125.0 - 125.8	7.4 - 8.3	108.4 - 111.0	127.2 - 129.0	3.6	6 12 50 100	XQ0305 XQ0307 XQ0308 XQ0309
160	PE100/Al	11	16	160.0 - 161.0	14.6 - 16.2	127.6 - 131.8	162.2 - 164.2	8.0	6 12 50 100	XQ0458 XQ0460 XQ0461 XQ0462
160	PE100/Al	17	10	160.0 - 161.0	9.5 - 10.6	138.8 - 142.0	162.2 - 164.2	5.7	6 12 50 100	XQ0476 XQ0478 XQ0479 XQ0480
180	PE100/Al	11	16	180.0 - 181.1	16.4 - 18.2	143.6 - 148.3	182.2 - 184.3	9.9	6 12 50 100	XQ0530 XQ0532 XQ0534 XQ0535
180	PE100/Al	17	10	180.0 - 181.1	10.7 - 11.9	156.2 - 159.7	182.2 - 184.3	7.1	6 12 50 100	XQ0550 XQ0552 XQ0554 XQ0555

Pipe weights are for lifting and handling purposes. They are calculated on a per metre length and are based on a maximum diameter and pipe wall thickness.

* BS 8588:2017 supersedes WIS 4-32-19

Puriton® mains pipe

BS 8588 (WIS 4-32-19*) 'Type A' pipe

Pipe coil dimensions

Nominal diameter mm	SDR	Pressure rating bar	Coil inner diameter mm	Coil outer diameter mm	Coil width mm	Coil length m	Coil weight kg
90	11	16	1800	2220	320	50	137.9
	11	16	1800	2440	410	100	275.7
90	17	10	2500	2930	320	50	102.7
	17	10	2500	3000	410	100	205.4
110	11	16	2500	3000	400	50	197.1
	11	16	2500	3200	500	100	394.1
110	17	10	2500	3000	400	50	145.7
	17	10	2500	3200	500	100	291.4
125	11	16	2500	3000	450	50	251.0
	11	16	2500	3200	600	100	502.0
125	17	10	2500	3000	450	50	181.6
	17	10	2500	3200	600	100	363.1
160	11	16	3000	3590	530	50	397.6
	11	16	3000	3850	700	100	795.2
160	17	10	3000	3590	530	50	284.4
	17	10	3000	3850	700	100	568.8
180	11	16	3000	3800	630	50	496.3
	11	16	3000	4000	800	100	992.6
180	17	10	3000	3800	630	50	353.0
	17	10	3000	4000	800	100	706.0

To ensure that the barrier properties of the Puriton® system are maintained, Puriton® fittings must be used with Puriton® pipe. The use of non Puriton® fittings may compromise the barrier properties of the system.

* BS 8588:2017 supersedes WIS 4-32-19

Puriton® fittings



Mechanical fittings

Quick and easy to install, our range of Puriton® mechanical fittings for service pipes are manufactured from polypropylene and supplied with integral inserts, grip rings and O-ring seals for maximum contamination protection. The system is easy to construct with no requirement for pipe surface preparation and no need to post-wrap the joint after installation.



Couplers

Diameter mm	Pack quantity	Product code
25	1	XR5244
32	1	XR5245
63	1	XR5251



Equal tees

Diameter mm	Pack quantity	Product code
25	1	XR5247
32	1	XR5248
63	1	XR5253



90° elbows

Diameter mm	Pack quantity	Product code
25	1	XR5249
32	1	XR5250
63	1	XR5252



Reducers

Diameter mm	Pack quantity	Product code
32 x 25	1	XR5246
63 x 25	1	XR5257
63 x 32	1	XR5254



Male adaptors

Diameter mm	Pack quantity	Product code
25 x ¾”	1	XR5235
32 x ¾”	1	XR5236
32 x 1”	1	XR5237
63 x 1½”	1	XR5258
63 x 2”	1	XR5259



Female adaptors

Diameter mm	Pack quantity	Product code
25 x ¾”	1	XR5240
32 x ¾”	1	XR5241
32 x 1”	1	XR5242
63 x 2”	1	XR5260



C ring wrenches

Pipe diameter	Pack quantity	Product code
25-32 mm	1	XR4998
63 mm	1	XR4999

Redman™ fittings

Simple and quick to install with little pipe preparation, the Redman™ joint is made by pressurising the outer shell of the fitting using a dedicated hydraulic pump. Once made, our Redman™ fittings provide a 'fit and forget' end-load-bearing joint.

Available in diameters 63 mm to 180 mm, the fittings are supplied ready to install with the appropriate number of outer shells and inserts, offering full corrosion resistance and barrier protection against contamination to your potable water system.





Couplers

Diameter mm	Pipe SDR	Pack quantity	Product code
63	11	1	RE0001
90	11	1	RE0002
90	17	1	RE0009
110	11	1	RE0003
110	17	1	RE0010
125	17	1	RE0005
160	17	1	RE0007
180	17	1	RE0047



Repair couplers

Diameter mm	Pipe SDR	Pack quantity	Product code
63	11	1	RE0065
90	11	1	RE0064
90	17	1	RE0067
110	11	1	RE0066
110	17	1	RE0069
125	17	1	RE0071
160	17	1	RE0078
180	17	1	RE0080



45° elbows

Diameter mm	Pipe SDR	Pack quantity	Product code
63	11	1	RE0032
90	11	1	RE0033
90	17	1	RE0034
110	11	1	RE0035
110	17	1	RE0036
125	17	1	RE0038
160	17	1	RE0040
180	17	1	RE0045



90° elbows

Diameter mm	Pipe SDR	Pack quantity	Product code
63	11	1	RE0011
90	11	1	RE0012
90	17	1	RE0013
110	11	1	RE0014
110	17	1	RE0015
125	17	1	RE0017
160	17	1	RE0019
180	17	1	RE0021

Note: the Redman™ fittings' inserts are not interchangeable between pipe SDRs.

Redman™ fittings

Flange adaptors



Diameter mm	Pipe SDR	Pack quantity	Product code
63 x DN50	11	1	RE0073
63 x DN80	11	1	RE0083
90 x DN80	11	1	RE0074
90 x DN80	17	1	RE0075
110 x DN100	11	1	RE0076
110 x DN100	17	1	RE0077
125 x DN100	17	1	RE0079
160 x DN150	17	1	RE0081
180 x DN150	17	1	RE0089

Flange drilling BS 4504 NP16. Supplied with galvanised iron backing ring. Nuts, bolts, washers and gaskets not supplied.

Adaptors



Diameter mm	Pipe SDR	Pack quantity	Product code
63 x 1½" BSPF/2" BSPM	11	1	RE0123

Note: the Redman™ fittings' inserts are not interchangeable between pipe SDRs.

Tooling

Hydraulic pump



Description	Pack quantity	Product code
Redman hydraulic pump	1	XR0211

For calibration and servicing of the Redman™ hydraulic pump, contact Fluidlink:

t: +44(0)1249 818555
w: www.fluidlink.co.uk.

Hydraulic oil



Description	Pack quantity	Product code
Biodegradable hydraulic oil for Redman pump - 5 litres	1	XR0212

Electrofusion Fittings

Available in diameters 90mm to 180mm, our range of Puriton® electrofusion fittings are manufactured from high strength black PE100 and are suitable for Puriton® pipe in SDR17 and SDR11. The fittings are welded in a single fusion operation using a 40V electrofusion control unit, and when correctly installed in accordance with Radius Systems' guidance, there is no requirement to post-wrap the joint.

For guidance on the correct preparation of Puriton® pipe for electrofusion jointing, please refer to the jointing guidance within the brochure or visit our website: www.radius-systems.com.





Couplers

Diameter mm	Pack quantity	Product code 4.0 mm pin
90	1	WA0210
110	1	WA0211
125	1	WA0212
160	1	WA0214
180	1	WA0215



Equal tees

Diameter mm	Pack quantity	Product code 4.0 mm pin
90	1	WA2210
110	1	WA2211
125	1	WA2212
160	1	WA2214
180	1	WA2215



45° elbows

Diameter mm	Pack quantity	Product code 4.0 mm pin
90	1	WA3318
110	1	WA3319
125	1	WA3320
160	1	WA3322
180	1	WA3323



90° elbows

Diameter mm	Pack quantity	Product code 4.0 mm pin
90	1	WA3347
110	1	WA3348
125	1	WA3349
160	1	WA3351
180	1	WA3352



Reducers

Diameter mm	Pack quantity	Product code 4.0 mm pin
110 x 90	1	WA4286
125 x 90	1	WA4289
125 x 110	1	WA4291
160 x 110	1	WA4294
180 x 125	1	WA4297

Service pipe off-take connections

Radius Systems offer a dedicated range of gunmetal tapping tees, which are suitable for Puriton® pipe in both SDR11 and SDR17. A 25 or 32mm mechanical outlet is fitted to enable the Puriton® service pipe connection. The tapping tees incorporate a unique sleeve, which, as part of the tapping operation, is 'swaged' into the pipe wall, sealing the aluminium barrier layer from contact with the water supply.



Tapping tees

Diameter mm	Pack quantity	Product code
63 x 25	1	XR5111
90 x 25	1	XR5112
110 x 25	1	XR5113
125 x 25	1	XR5114
160 x 25	1	XR5115
180 x 25	1	XR5116
63 x 32	1	XR5117
90 x 32	1	XR5118
110 x 32	1	XR5119
125 x 32	1	XR5120
160 x 32	1	XR5121
180 x 32	1	XR5122

Maximum operating pressure 12.5 bar



Ferrule adaptors

Diameter mm	Pack quantity	Product code
25 x ¾"	1	XR5055

Spigot fittings

Our Puriton® flange adaptors have been specifically designed with a unique stainless steel insert, which is fitted during the manufacturing process to provide effective barrier properties to the polyethylene stub flange.



Flange adaptors

Diameter mm	SDR	Pack quantity	Product code
63 x DN80	11	1	XR0290
90 x DN80	11	1	XR0291
90 x DN80	17	1	XR0300
110 x DN100	11	1	XR0310
110 x DN100	17	1	XR0303
125 x DN100	11	1	XR0311
125 x DN100	17	1	XR0301
160 x DN150	11	1	XR0312
160 x DN150	17	1	XR0304
180 x DN150	11	1	XR0313
180 x DN150	17	1	XR0302

Flange drilling BS 4504 NP16. Supplied with Rilsan coated backing ring. Nuts, bolts and gaskets are not supplied.

Tooling



Tapping tee T key

Description	Pack quantity	Product code
3/8" T key	1	XR0215

To ensure that the barrier properties of the Puriton® system are maintained, Puriton® fittings must be used with Puriton® pipe. The use of non Puriton® fittings may compromise the barrier properties of the system.

Jointing guidance

The Puriton® pipe system has been developed for ease of jointing with a range of fittings specifically designed to suit the pipe type. Minimal pipe surface preparation is required when using our mechanical or Redman™ fittings. However, pipe surface preparation is mandatory when joining Puriton® pipe using the electrofusion or butt-fusion techniques.

To ensure that the barrier properties of the Puriton® system are maintained, only Puriton® fittings must be used with Puriton® pipe. The use of non Puriton® fittings may compromise the barrier properties of the system.

Pipe jointing methods and pipe surface preparation requirements

Pipe diameter (mm)		25	32	63	90	110	125	160	180
Mechanical compression fittings		●	●	●					
Redman™ hydraulic fittings	SDR11			●	●	●			
	SDR17				●	●	●	●	●
Electrofusion					●	●	●	●	●
Butt-fusion					●	●	●	●	●
Gunmetal tapping tee				●	●	●	●	●	●

● No pipe surface preparation required. Ensure the pipe outer surface is clean and free from damage

● Pipe surface preparation mandatory

When joining Puriton® pipe in diameters 90 to 180 mm using the electrofusion or butt-fusion jointing techniques, the preparation of the pipe surface is mandatory. Dedicated equipment has been designed to locally remove the outer polyethylene and aluminium barrier layers. This equipment is available for sale or hire from the suppliers below:

- Caldervale Technology www.caldertech.co.uk
- PSS Hire www.psshire.com
- Hy-Ram www.hyram.com
- MCA-Fusion Hire www.mcafusionhire.co.uk



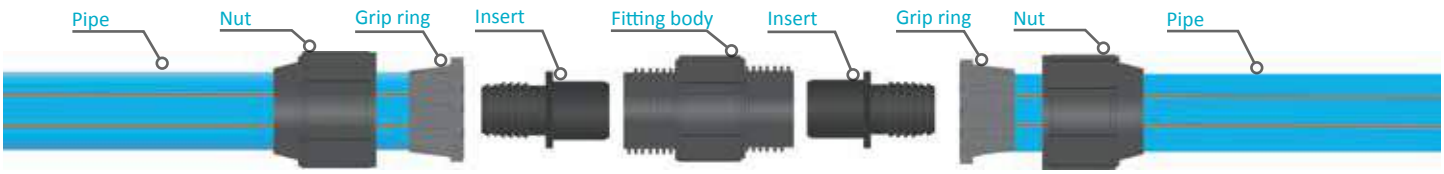
Rotary pipe surface preparation tools

Jointing overview



Minimum recommended personal protection equipment

Mechanical fitting - coupler jointing overview





Ensure the pipe is cut square and damage free. Re-round if necessary. Slide the nut and grip ring on the pipe.



Using a rubber mallet, gently tap the insert fully into the pipe end.



Push the pipe with the insert fully into the body of the fitting.



Slide the grip ring so it is flush with the pipe insert.



Hand tighten the nut onto the body of the fitting.



Repeat steps 1 to 5 for the second pipe to be joined.



Using C ring wrenches fully tighten the nuts onto the body of the fitting.



The joint is complete. Carry out a water industry approved joint pressure test to check for leak-tightness. There is no requirement to wrap the finished joint.

Redman™ fittings - coupler jointing overview





Ensure the pipe is cut square and damage free. Re-round if necessary. Slide the outer shell over the pipe and push the insert into the pipe end.



Fit the second pipe onto the insert. Ensure that both pipes are pushed up to the insert stop.



Slide the outer shell over both pipes, ensuring it is centralised over the two pipes.



Using the Redman™ pump, pressurise the fitting following Radius Systems' pressurisation procedure on our website: www.radius-systems.com.

Operate the pump at a safe distance away from the joint, using the full length of the hose. Do not touch the fitting or the pipe during the pressurisation and de-pressurisation processes.

Electrofusion fittings - coupler jointing overview

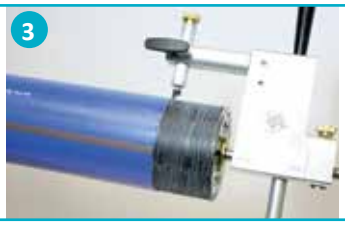
Pipe preparation is mandatory before carrying out an electrofusion joint. **A 2-pass pipe surface preparation process is required** for jointing Puriton® pipes. Please visit our website for the complete jointing guidance at www.radius-systems.com.



Ensure the pipe surface is clean and free from damage. Re-round if necessary. Measure and mark the fitting insertion depth on the pipe.



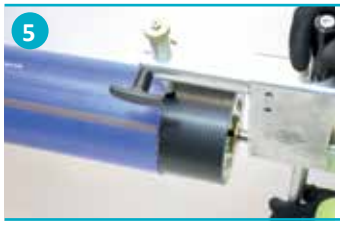
First pass
Select the correct size tooling and cutting blade and carry out the first pass of the pipe surface preparation.



Rotate the tool anti-clockwise, to remove the outer PE and aluminium layers up to the fitting insertion depth mark.



Second pass
Select the standard pipe preparation blade to carry out the second pass of the pipe surface preparation.



Rotate the tool continuously in an anti-clockwise direction. This will remove a continuous layer of polyethylene swarf.



Place the fitting on the pipe end as shown. Keep the fitting in its packaging to the point of inserting the second pipe, to avoid contamination.



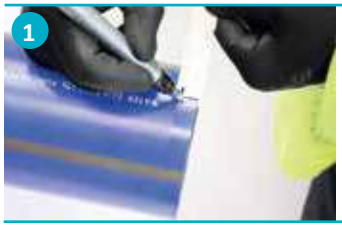
Repeat the pipe surface preparation for the second pipe to be joined and fully insert into the fitting.



Fit alignment clamps and follow industry best practice to fuse the fitting. There is no requirement to wrap the finished joint.

Butt-fusion jointing overview

Pipe preparation is mandatory before carrying out an electrofusion joint. **A 2-pass pipe surface preparation process is required** for jointing Puriton® pipes. Please visit our website for the complete jointing guidance at www.radius-systems.com.



Ensure the pipe surface is clean and free from damage. Re-round if necessary. Mark the minimum pipe preparation distance using the Puriton® butt-fusion gauge.



First pass
Select the correct size tooling and cutting blade and carry out the first pass of the pipe surface preparation.



Rotate the tool anti-clockwise, to remove the outer PE and aluminium layers up to the fitting insertion depth mark.



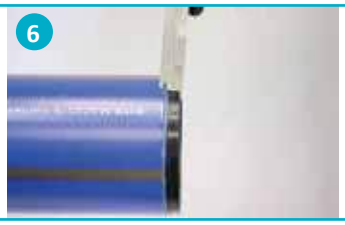
Second pass
Select the standard pipe preparation blade to carry out the second pass of the pipe surface preparation.

(Cont...)

Butt-fusion jointing overview (...Cont.)



Rotate the tool continuously in an anti-clockwise direction. This will remove a continuous layer of polyethylene swarf.



Check the correct pipe surface distance using the Puriton® butt-fusion gauge. Prepare the second pipe following steps 1 to 5.



Follow the water industry standard butt-fusion procedure. Program the butt-fusion unit with the correct pipe parameters.



Finished joint. Remove the external bead and perform a bend back test to assess the joint quality. There is no requirement to wrap the finished joint.

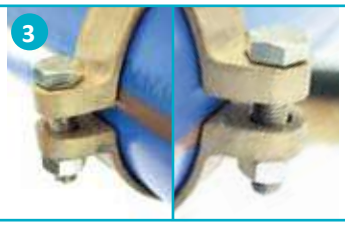
Tapping tee jointing overview



Ensure the pipe surface is clean and free from damage. Place the O-ring seal into the recess of the tapping tee base and place the fitting onto the main.



Equally tighten the nuts on both sides of the tapping tee.



Ensure the distances between the 'lugs' are identical and parallel on both sides.



Carry out the service pipe connection to the tapping tee outlet following the jointing overview in this brochure.

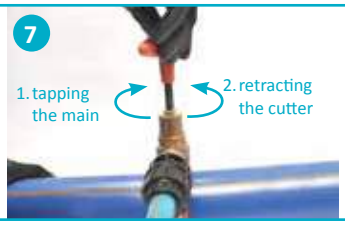


Using C ring wrenches fully tighten the nuts onto the tapping tee outlet.

Carry out a water industry approved joint pressure test to check for leak-tightness.



Using a 3/8" T key, remove the tapping tee dust cap and seal.



1. Tapping the main
Use a hexagonal 3/8" T key and turn in a clockwise direction. The cutter must come to a definite stop.
2. Retracting the cutter
Turn the T key in an anti-clockwise direction. The cutter will come to a definite stop at the top of the tapping tee stack.



Replace the dust cap and tighten. The connection is complete. Visually check for leak-tightness. There is no requirement to wrap the finished joint.

Coil banding & coil dispensing



Minimum personal protection equipment (PPE)

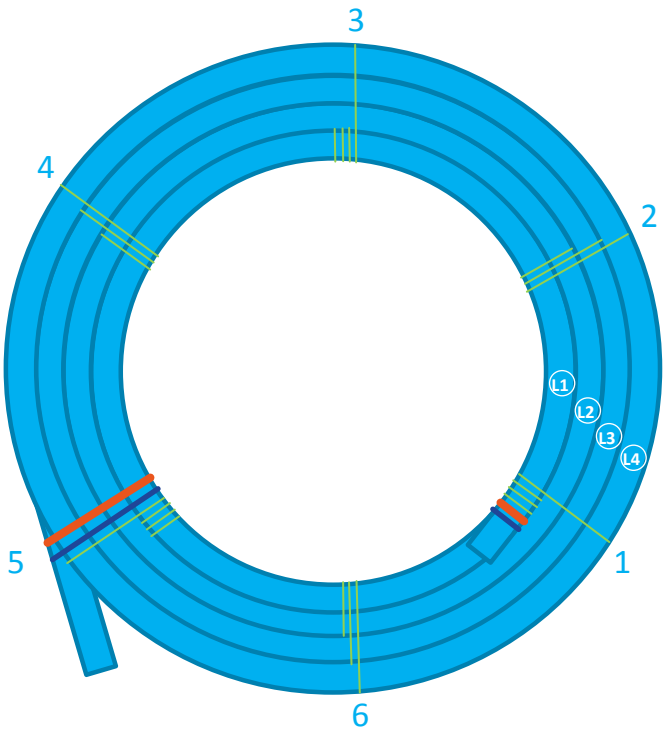
When pipes are packaged into coils, Radius Systems use restraining straps around the pipe to retain the pipe's coil shape. Coils contain a considerable amount of stored energy, which could potentially cause injury to personnel, if the coils are not handled and dispensed correctly. To allow the safe handling and dispensing of coils, Radius Systems use specialist straps, fitted at different positions around the pipe's turns and layers that form the coil. When the coil is ready to be dispensed, the straps are removed in sequence, ensuring that the energy contained in the coil is release in a controlled and safe manner. (See diagrams below).

To ensure a safe working environment during the installation of pipe coils, these should only be dispensed from specially designed coil dispensers, supplied by a reputable manufacturer.

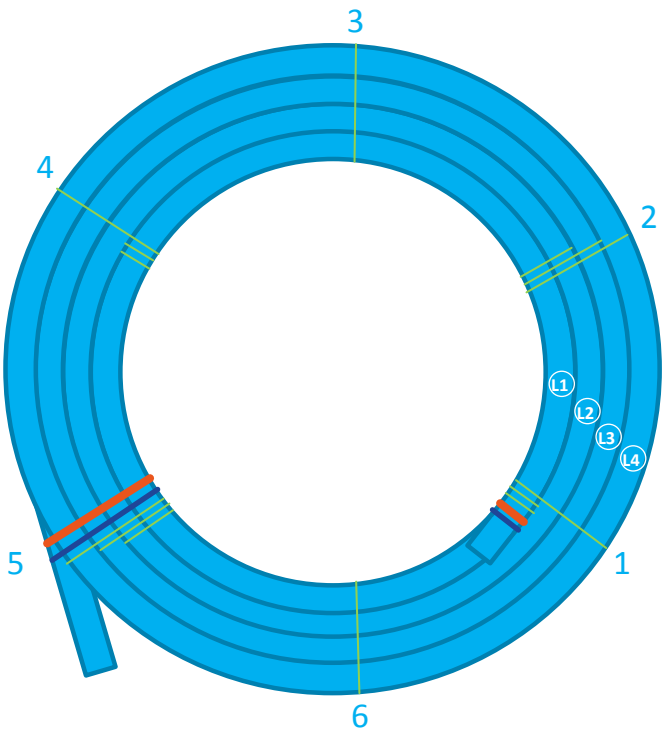
Radius Systems recommend that personnel involved in the handing and dispensing of pipe coils are adequately trained for this operation. Courses in the safe and correct handling and dispensing of pipe coils are available from industry bodies.

- Always wear the minimum PPE
- Restrict the work area to essential personnel only
- Always dispense coils from a coil dispenser
- Only use a suitable round-nosed cutting tool to cut the strap to prevent the pipe from being damaged
- Never cut all of the restraining straps at once
- Only cut the required number of straps to allow the required pipe length to be dispensed
- Take care when cutting the straps to release the pipe
- Always ensure the tail ends of the coil are released in a restrained and controlled manner
- Ensure the tail ends of a part used coil are secured before transporting it from the site
- Do not transport coiled pipes containing water

● For coils with inner diameter ≥ 2.5 m



● For coils with inner diameter ≤ 1.8 m

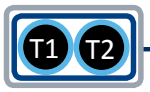
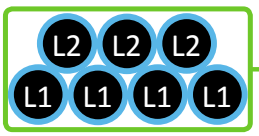
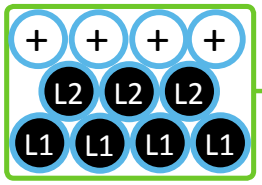
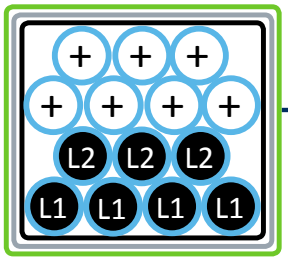


Welded polyester strap
Anti-vandal steel band
Coil length & caution tape

Illustrations showing the banding positions on a 4 layer coil

Banding position for coils

Coils consist of a minimum of 2 layers and the number of layers and turns in a coil will depend on its length and may exceed the ones shown below. If the coil consists of only 2 layers, the 'final layer' banding sequence is applied to layer 2.

	• Coil internal diameter ≥ 2.5 m	• Coil internal diameter ≤ 1.8 m
• Layer 1 (L1)		
	Anti-vandal steel band and length & caution tape are applied around turns T1 & T2 of L1 Position 1	Anti-vandal steel band and length & caution tape are applied around turns T1 & T2 of layer 1 (L1) Position 1
	Polyester strap around turns T1 & T2 of L1 Positions 1, 3 & 5	Not applicable
	Polyester strap around turns T1, T2 & T3 of L1 Positions 1, 3 & 5	Polyester strap Around turns T1, T2 & T3 of L1 Positions 1 & 4
	Additional turns on L1 follow the same banding sequence as above	Additional turns on L1 follow the same banding sequence as above
• Additional layers		
	Once layer 2 (L2) is completed Polyester straps are applied around L1 and L2 Positions 2, 4 & 6	Once layer 2 (L2) is completed Polyester straps are applied around L1 and L2 Positions 2 & 5
	Additional layers follow the same banding sequence as above	Additional layers follow the same banding sequence as above
• Final layer		
	Anti-vandal steel band and coil length & caution tape are applied to the coil end. Polyester straps are applied at all positions.	Anti-vandal steel band and coil length & caution tape are applied to the coil end. Polyester straps are applied at all positions.



Why are there 2 different polyethylene pipe materials used within the range of Puriton® pipes?

- To maintain the current industry convention that PE80 materials are used for small diameter service pipes and PE100 materials are used for mains pipes:
- Puriton® pipes in diameters 25, 32 and 63 mm are manufactured from a PE80 black inner core and a PE80 light blue outer
- Puriton® pipes in diameters 90 to 180 mm are manufactured from a PE100 black inner core and a PE100 dark blue outer.

When referring to barrier pipe systems, what does the term 'Type A' refer to?

The term 'Type A' is defined within BS 8588 and refers to pipes 'where one or more of the polymer layers form a core pipe which is designed to bear the stress associated with the hydrostatic pressure'. The aluminium provides protection against contamination and the outer polyethylene layer protects the aluminium.

Are the dimensions of Puriton® pipes the same as those of conventional SDR11 and SDR17 pipes?

The Puriton® pipe being a 'Type A' pipe, its overall wall thickness exceeds the requirements of BS EN 12201 for SDR11 and SDR17 pipes.

The dimensions of the black core pipe meet the requirements of BS EN 12201-2, to which the aluminium and outer protective polyethylene layers are added, increasing the wall thickness and the outer diameter over conventional polyethylene pipes to BS EN 12201.

What are the pressure ratings of Puriton® pipes?

Puriton® pipe maximum operating pressures:

- PE80 SDR11 service pipe 25 to 63 mm: 12.5 bar
- PE100 SDR11 mains pipe 90 to 180 mm: 16 bar
- PE100 SDR17 mains pipe 90 to 180 mm: 10 bar

What are the recommended jointing techniques for Puriton® 'Type A' service pipes?

- For ease of installation, Radius Systems offer a range of mechanical fittings in diameters 25, 32 and 63 mm. In addition, for 63 mm diameter pipe our Redman™ hydraulic compression fittings range can be used.
- Do not undertake electrofusion jointing on Puriton® service pipes in 25, 32 and 63 mm, as this is not an approved jointing procedure.
- For 'Type B' legacy Puriton® service pipes jointing guidance, please contact Radius Systems.

What are the recommended jointing techniques for Puriton® 'Type A' mains pipes?

For Puriton® pipes in diameters 90, 110, 125, 160 and 180 mm the following jointing techniques are recommended:

- Redman™ hydraulic compression fittings.
- Butt-fusion jointing
  To maintain the barrier properties of the system this method of jointing must be undertaken in accordance with the Radius Systems' jointing procedure.
- Electrofusion jointing
  To maintain the barrier properties of the system only the Radius Systems' electrofusion fittings identified within the Puriton® product range are recommended.
  The jointing method must be undertaken in accordance with the Radius Systems' jointing procedure.
- Electrofusion jointing must not be undertaken on Puriton® 'Type B' PE80 legacy pipe systems (90 and 110 mm pipe). For guidance on jointing legacy pipes, please contact Radius Systems.
- When making either a butt-fusion or an electrofusion joint onto Puriton® pipe, both the outer polyethylene and aluminium layers must be locally removed using the tooling recommended by Radius Systems. Care must be taken to ensure that additional external material is not removed.

Where can I find detailed jointing instructions for the system?

Jointing instructions in PDF format and videos are available to download from the Radius Systems' website: www.radius-systems.com.
The jointing instructions for the mechanical fittings, Redman™ fittings and the tapping tees are also included in the fittings' packaging.

How do I connect 90 mm Puriton® pipe to 63 mm Puriton® pipe?

63 mm and 90 mm Puriton® pipes are joined together using 63 x DN80 and 90 x DN80 Redman™ flange adaptors.

When I have made a joint or connection onto Puriton® pipe using Puriton® fittings and following Radius Systems' Puriton®jointing guidance, do I need to wrap the joint with an additional aluminium or protective barrier tape?

Once the joint is made, there is no requirement to wrap the Puriton® joint with additional aluminium or protective barrier tape.

Radius Systems have evaluated their Puriton® jointing system without the use of additional aluminium or protective barrier tape.

Can I use fittings from other manufacturers with Puriton® pipe?

Radius Systems only recommend the use of Puriton® fittings with Puriton® pipe, to ensure that the barrier properties of the Puriton® system are maintained. The use of non Puriton® fittings may compromise the barrier properties of the system.

What are the recommended installation techniques for Puriton® pipe?

Puriton® pipe is typically installed using the open-cut technique. However, alternative techniques like 'slip lining' and 'horizontal directional drilling' can be used. Particular care must be taken to ensure that the outer polyethylene layer is not damaged to an extent that the aluminium barrier is exposed. This will compromise the barrier properties of the pipe.

When installing a Puriton® pipe, what should I do if the outer polyethylene layer becomes damaged and the aluminium layer is exposed?

To maintain the integrity of the aluminium layer and the barrier properties of the system, we recommend that the damaged pipe is removed and replaced with undamaged pipe.

Do I need to use a PTFE thread tape for the male threaded connection when using mechanical fittings and the Redman™ 63 x 1½" BSPF/2" BSPM fitting?

To ensure that the system is leak-tight, only WRAS approved PTFE thread tape should be used.

Who can I contact if I have additional product or technical queries on the Puriton® system?

If you have additional questions relating to our Puriton® pipe, please contact Radius Systems' Sales or Technical Support teams:

Sales:
t: +44 (0)1773 811112
e: sales@radius-systems.com

Technical support:
t: +44 (0)1773 811112
e: techsupport@radius-systems.com

Radius Systems

Radius Systems are a market leader in the innovation and manufacture of plastic pipe systems for the utilities and construction industries. With extensive research and development at the heart of our products and systems, we take care of the entire pipe life cycle - from design and manufacture through to installation, repair and rehabilitation. We strive to improve industry practices, with good health and safety policies at the forefront of our philosophy of 'getting it right first time'. Our continuous customer inspired research and development, combined with successful customer partnerships represent our total dedication to the plastic piping industry.

- **Manufacturing facilities**
  With 2 production sites in the UK, we have complete control over quality and the ability to meet the expectations of our customers.
- **Innovative approach**
  We are leaders in our field with a history of research and new product development. Practicality, durability and adaptability are all high on our agenda to meet our clients' needs.
- **Flexible product and service provision**
  Our comprehensive range of services is designed to fit the variable demands of our clients' developments in pipes, fittings, training and support services.
- **Reliability and safety**
  With over 50 years experience of design and manufacture, our clients know that they can count on us to meet not just their product and service needs, but also their delivery and safety requirements.
- **Outstanding customer service**
  We have a dedicated Customer Services team to answer queries from our customers in the UK and overseas. Our service is not just about the delivery of products - contact our team if you have a product or installation enquiry or a post-delivery query.

RADIUS Systems

For more information please visit our website:
www.radius-systems.com or contact us:

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t: +44 (0)1773 811112
e: sales@radius-systems.com

Northern Ireland and Republic of Ireland sales
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e: info@radius-systems.com

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As part of the Radius Systems program of continuous improvement, we reserve the right to amend the content of this publication without notice. The information supplied in this document is correct at the time of publication.

Puriton_brochure-Mar_2018.indd

Civils & Drainage Supplies Ltd
19 James Street
Righead Industrial Estate
Bellshill
ML4 3LU
T: 01698 844057
VAT Reg No: 866 1546 03

Invoice

SAS Utilities Limited
UNIT 2 DOLPHIN COURT
TREVOL BUSINESS PARK
TORPOINT
CORNWALL
PL11 2TB
VAT Reg No:

64863

30/06/2017

P170662

SAS01

Quantity	Details	Unit Price	Net Amt	VAT %	VAT
20.00	125MM X 6MT PURITON PIPE XQ0305	[redacted]	[redacted]	[redacted]	[redacted]
6.00	90MM X 50MT PURITON SDR 17 XQ0146				

Total Net Amount [redacted]

Carriage Net [redacted]

Total VAT Amount [redacted]

Invoice Total [redacted]

Civils & Drainage Supplies Ltd
19 James Street
Righead Industrial Estate
Bellshill
ML4 3LU
T: 01698 844057
VAT Reg No: 866 1546 03

Invoice

SAS Utilities Limited
UNIT 2 DOLPHIN COURT
TREVOL BUSINESS PARK
TORPOINT
CORNWALL
PL11 2TB
VAT Reg No:

65390

20/07/2017

P170738

SAS01

Quantity	Details	Unit Price	Net Amt	VAT %	VAT
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2.00	90MM X 50MT PURITON SDR 17 XQ0146				

direct 31330

heathrow

Total Net Amount	[redacted]
Carriage Net	[redacted]
Total VAT Amount	[redacted]
Invoice Total	[redacted]

APPENDIX H

Materials Management Documentation

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Registration number	CBDU87105
Business name	MICK GEORGE LTD
Company number	02417831 (http://business.data.gov.uk/id/company/02417831)
Registered as	Carrier, Broker, Dealer - Upper Tier
Applicant type	Company
Registration date:	16/02/2016
Expiry date:	28/02/2019

Business address

Address	Mick George Ltd, 6 Lancaster Way, Huntingdon, Pe29 6xu
Postcode	Pe29 6xu (http://data.ordnancesurvey.co.uk/id/postcodeunit/PE296XU)

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Bath Road.

Environment Agency

CERTIFICATE OF REGISTRATION UNDER THE WASTE (ENGLAND AND WALES) REGULATIONS 2011

Regulation Authority			
Name:	Environment Agency		
Address	National Customer Contact Centre 99 Parkway Avenue Sheffield S9 4WF		
Tel:	03708 506 506	Fax:	0114 2626697

The Environment Agency certify that the following information is entered in the register which they maintain under regulation 28 of the Waste (England and Wales) Regulations 2011:-

Name(s) of registered carrier:	FOLEY HAULAGE LTD
Registered as an:	Upper Tier Carrier Dealer
Registration number:	CB/EE5881YE
Business name (if any):	
Address of principal place of business:	60 HANWORTH ROAD, FELTHAM, MIDDLESEX, TW13 5AY
Tel: 0208 7512969	Fax: 0208 890 3693
Date of registration:	04/03/2014
Date of expiry of registration (unless revoked):	03/03/2017

Signature of authorised officer of the regulation authority:

Date: 04/03/2014

311010

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Registration CBDU200204 – HWS Waste Ltd

Registration number	CBDU200204
Business name	HWS Waste Ltd
Company number	07789815 (http://business.data.gov.uk/id/company/07789815)
Registered as	Carrier, Broker, Dealer - Upper Tier
Applicant type	Company
Registration date:	18/09/2017
Expiry date:	12/10/2020

Business address

Address	114, BLENHEIM ROAD, NORTHOLT, UB5 4TT
Postcode	UB5 4TT (http://data.ordnancesurvey.co.uk/id/postcodeunit/UB54TT)

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Certificate of Registration under the Waste (England and Wales) Regulations 2011

Regulation authority

Name	Environment Agency
Address	• National Customer Service Centre • 99 Parkway Avenue • Sheffield • S9 4WF
Telephone number	03708 506506

The Environment Agency certify that the following information is entered in the register which they maintain under regulation 28 of the Waste (England and Wales) Regulations 2011.

Carriers details

Name of registered carrier	O'MALLEY HAULAGE LIMITED
Registered as	an upper tier waste carrier, broker and dealer
Registration number	CBDU86635
Address of place of business	O'MALLEY HAULAGE LIMITED O'MALLEY HAULAGE LTD OXHEY LANE WATFORD WD19 5RF
Telephone number	01923252177
Date of registration	Thursday 4th February 2016
Expiry date of registration (unless revoked)	Monday 20th May 2019

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/ Search waste carriers, brokers and dealers (/public-register/view/search-waste-carriers-brokers)
/ Result from Waste Carriers and Brokers Public Register for England

Registration CBDU40750 – West London Grab Services Ltd

Registration number	CBDU40750
Business name	West London Grab Services Ltd
Company number	09443322 (http://business.data.gov.uk/id/company/09443322)
Registered as	Carrier Dealer - Upper Tier
Applicant type	Company
Registration date:	08/04/2015
Expiry date:	22/10/2018

Business address

Address	5 MOAT PLACE, OXFORD ROAD, UXBRIDGE, UB9 4DW
Postcode	UB9 4DW (http://data.ordnancesurvey.co.uk/id/postcodeunit/UB94DW)

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Registration CBDU61307 – MITCHELLSON PLANT HIRE LTD

Registration number	CBDU61307
Business name	MITCHELLSON PLANT HIRE LTD
Company number	02072365 (http://business.data.gov.uk/id/company/02072365)
Registered as	Carrier Dealer - Upper Tier
Applicant type	Company
Registration date:	11/08/2015
Expiry date:	24/02/2019

Business address

Address	Mitchellson Plant Hire Ltd UNIT 16, Unit 16 Arlesey Business Park, Mill Lane, Arlesey, Bedfordshire, SG15 6RF
Postcode	SG15 6RF (http://data.ordnancesurvey.co.uk/id/postcodeunit/SG156RF)

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Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Oakland Golf and Leisure Limited

Airlinks Golf Club
Southhall Lane
Hounslow
London
TW5 9PE

Permit number

EPR/NB3539AY

Airlinks Golf Club
Permit Number EPR/NB3539AY

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows.

This environmental permit is for use of waste in construction as a recovery activity to undertake landscaping, remodelling and installation of a surface water harvesting system at Airlinks Golf Club. The landscaping and remodelling will include mounding, raising and bunding to profile the ground of the tees, greens, pathways, bunkers and the addition of netting.

This environmental permit allows the operator to store and subsequently use waste in the construction of the Airlinks Golf Club. This environmental permit is for the recovery of waste only and does not apply to any activities involving disposal. Permitted wastes do not include hazardous wastes. The total quantity of waste that can be stored and subsequently used at the site under this permit shall not exceed 871,076 tonnes. The permit does not permit the burning of any wastes, either in the open, inside buildings or in any form of incinerator.

Groundwater and sub surface gas emissions from the site will be monitored and control levels set as part of this permit to ensure ongoing protection of the environment and human health.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status Log of the permit		
Detail	**Date**	**Comments**
Application EPR/NB3539AY/A001	Duly made 05/08/2013	Application for a deposit for recovery activity permit.
Additional information received	Schedule 5 Notice 02/10/2013	Response to a request for additional information on gas monitoring, groundwater monitoring and waste acceptance limits.
Additional information received	Schedule 5 Notice 16/10/2013	Response to a request for further details on waste acceptance.
Additional information received	24/10/2013	Confirmation of topsoil tonnages to be accepted on site and identity of perimeter boreholes.

Status Log of the permit		
Detail	**Date**	**Comments**
Permit determined	08/11/2013	Permit issued to Oakland Golf and Leisure Ltd.

End of Introductory Note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/NB3539AY

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Oakland Golf and Leisure Limited ("the operator"),

whose registered office is

37 Warren Street
London
W1T 6AD

company registration number **07006297**

to operate waste operations at

Airlinks Golf Club
Southhall Lane
Hounslow
London
TW5 9PE

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Tracey E Pollard	**08/11/2013**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the requirements of an approved competence scheme.

1.2 Avoidance, recovery and disposal of wastes produced by the activities

1.2.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.2.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the

techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

(b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan , and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.2 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.1 and S2.2

(b) it conforms to the description in the documentation supplied by the producer and holder.

2.3.3 No waste shall be accepted for disposal at the site.

2.4. Pre-operational conditions

2.4.1. The activities shall not be brought into operation until the measures specified in schedule1 table S1.3A have been completed.

3 Emissions and monitoring

3.1 Emissions of substances not controlled by emission limits

3.1.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.1.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2 Odour

3.2.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.3 Noise and vibration

3.3.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.3.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.4 Monitoring

3.4.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring and any other actions for:

(a) Groundwater specified in table S3.1; and

(b) Sub-surface gas specified in table S3.2.

3.4.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.4.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.4.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

3.4.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1 and S3.2 unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater;

(iii) the results of groundwater monitoring; and

(iv) the results of sub-surface gas monitoring.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.2 ; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit; or

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "without delay", in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 activities	
Description of activities	**Limits of activities**
R13: Storage of wastes pending any of the operations numbered R3 and R5 **R3**: Recycling/reclamation of organic substances which are not used as solvents **R5:** Recycling or reclamation of other inorganic materials	Secure storage and use of wastes listed in table S2.1 and S2.2 for the purposes of construction work as detailed in the approved waste recovery plan. The activities shall not be carried out other than in accordance with the approved waste recovery plan. On completion of the construction work a survey of final waste levels relative to Ordnance Datum shall be submitted to the Environment Agency within one month. Deposit of inert waste listed Table S2.1 will be in accordance with the operators waste acceptance criteria for inert waste detailed in the approved waste recovery plan. Deposit of non-inert waste listed Table S2.2 will be in accordance with the operators waste acceptance criteria for non- inert waste detailed in the approved waste recovery plan and Information Submission for Section 5 Notice document reference 36578/001/10021.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Application response to Part B4 of the application form, Table 3a – technical standards.	05/08/2013
Application	Approved waste recovery plan documents as detailed in the approval letter dated 01 August 2013, in response to question 1c of Part B4 of the application form – Deposit for recovery purposes. Section 9 of the waste recovery plan is excluded from the operating techniques. Approved wastes contaminants thresholds have been accepted in accordance to Information submission for Section 5 Notice document reference: 36578/001/10012 and Information submission for Section 5 Notice document reference: 36578/001/10021	05/08/2013
Application	H1 Risk Assessment document Ref: 36578/002/9859	05/08/2013
Application	Soil Management Strategy document Ref: 36578/002/9860 dated August 2013.	05/08/2013
Response to Schedule 5 Notice dated 02/10/2013	Information submission for Section 5 Notice document reference: 36578/001/10012. Maximum recorded values identified in the Operational Maintenance Plan (OMP) reference: BMW2047E/03V2 cannot be represented as trigger levels. Groundwater trigger levels are to be approved in accordance to pre-operational condition No.3 in Schedule 1 Table S1.3A.	07/10/2013

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Response to Schedule 5 Notice dated 16/10/2013	Information submission for Section 5 Notice document reference: 36578/001/10021	22/10/2013
Additional information	Response email to confirm topsoil tonnages and identity of perimeter boreholes.	24/10/2013

Table S1.3A Pre-operational measures	
Reference	**Pre-operational measures**
PO1	Prior to any waste deposit, the Operator shall submit to the Environment Agency for its agreement in writing, action limits for methane and carbon dioxide in peripheral boreholes BH6, BH8, BH9, BH12, BH18, BHA and BHD.
PO2	Prior to any waste deposit, the Operator shall submit to the Environment Agency for its agreement in writing, action limits for ammoniacal nitrogen and boron to be applied to boreholes BH6, BH8, BH9, BH12, BH18, BHA and BHD.
PO3	The Operator shall submit to the Environment Agency, for its agreement in writing a Groundwater Management Plan which will include proposed groundwater trigger levels.
PO4	Prior to any waste deposit, the Operator shall submit to the Environment Agency, for its agreement in writing, an action plan which will be implemented in the event of an exceedence of any of the action limits proposed under pre-operational condition 1, 2 and 3.

Schedule 2 - List of permitted wastes

Table S2.1 Inert Waste types

Maximum Quantities

The total quantity of waste accepted at the site shall not exceed 756,688 tonnes.

Exclusions

Wastes having any of the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders or loose fibres
- Hazardous wastes
- Wastes in liquid form

Waste Code	Description
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 01	**concrete, bricks, tiles and ceramics**
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 05	**soil (including excavated soil from contaminated sites) stones and dredging spoil**
17 05 04	soil and stones including chalk other than those mentioned 17 05 03
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
20 02	**garden and park wastes (including cemetery waste)**
20 02 02	soil and stones

Table S2.2Non - Inert Waste types

Maximum Quantities

The total quantity of waste accepted at the site shall be less than 114,388 tonnes.

Exclusions

Wastes having any of the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders or loose fibres
- Hazardous wastes
- Wastes in liquid form

Waste Code	Description
01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINEARALS**
01 01	**waste from mineral excavation**
01 01 02	waste from non-metalliferous excavation
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
10	**WASTES FROM THERMAL PROCESSES**
10 12	**waste from manufacture of ceramic goods, bricks, tiles and construction products**
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF SITE WASTE WATER TREATMENT PLANTS AND PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION/INDUSTRIAL WASTE**
19 13	**wastes from soil and groundwater**
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01

Schedule 3 – Emissions and monitoring

Table S3.1 Trigger levels for emissions into groundwater and monitoring requirements

Monitoring point reference	Parameter	Limit (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
BH6, BH8, BH9, BH12, BH18, BHA and BHD.	Ammoniacal nitrogen Boron	No limit[1]	Spot Sample	Quarterly	TGN02: Monitoring landfill leachate, groundwater and surface water.

Note 1: Groundwater monitoring action limits and trigger levels as agreed by PO2, PO3 and PO4.

Table S3.2 Subsurface gas in external monitoring boreholes – limits and monitoring requirements

Monitoring point Ref. /description	Parameter	Limit (including units)	Monitoring frequency	Monitoring standard or method
BH6, BH8, BH9, BH12, BH18, BHA and BHD.	Methane Carbon Dioxide	No limit [1] No limit [1]	Monthly	TGN03: Guidance on the management of landfill gas.

Note 1: Sub-surface gas action limits as agreed in PO1and PO4.

Schedule 4 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data

Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Groundwater Parameters as required by condition 3.4.1	As agreed in writing with the Environment Agency.	Quarterly unless otherwise agreed in writing with the Environment Agency	08/11/2013
Subsurface gas Parameters as required by condition 3.4.1	As agreed in writing with the Environment Agency.	Quarterly unless otherwise agreed in writing with the Environment Agency	08/11/2013

Table S4.2 Reporting forms

Media/parameter	Reporting Format	Date of Form
Groundwater	Reporting format to be agreed in writing with the Environment Agency	N/A
Sub-surface gas	Reporting format to be agreed in writing with the Environment Agency	N/A

Schedule 5 - Notification

This page outlines the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

"accident" means an accident that may result in pollution.

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"authorised officer" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"building" means a construction that has the objective of providing sheltering cover and minimising emissions of noise, particulate matter, odour and litter.

"construction work" means the carrying out of any building, civil engineering or engineering work and includes the building, alteration, conversion, repair, upkeep or other maintenance of a structure and the preparation of a site for an intended structure. It includes drainage works. This does not include land restoration or reclamation.

"emissions to land" includes emissions to groundwater.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit**.**.

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"pollution" means emissions as a result of human activity which may—

(a) be harmful to human health or the quality of the environment,

(b) cause offence to a human sense,

(c) result in damage to material property, or

(d) impair or interfere with amenities and other legitimate uses of the environment.

"hazardous waste" has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 No.894, the Hazardous Waste (Wales) Regulations 2005 No. 1806 (W.138), the List of Wastes (England) Regulations 2005 No.895 and the List of Wastes (Wales) Regulations 2005 No. 1820 (W.148).

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"*R*" means a recovery operation provided for in Annex IIB to Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on Waste.

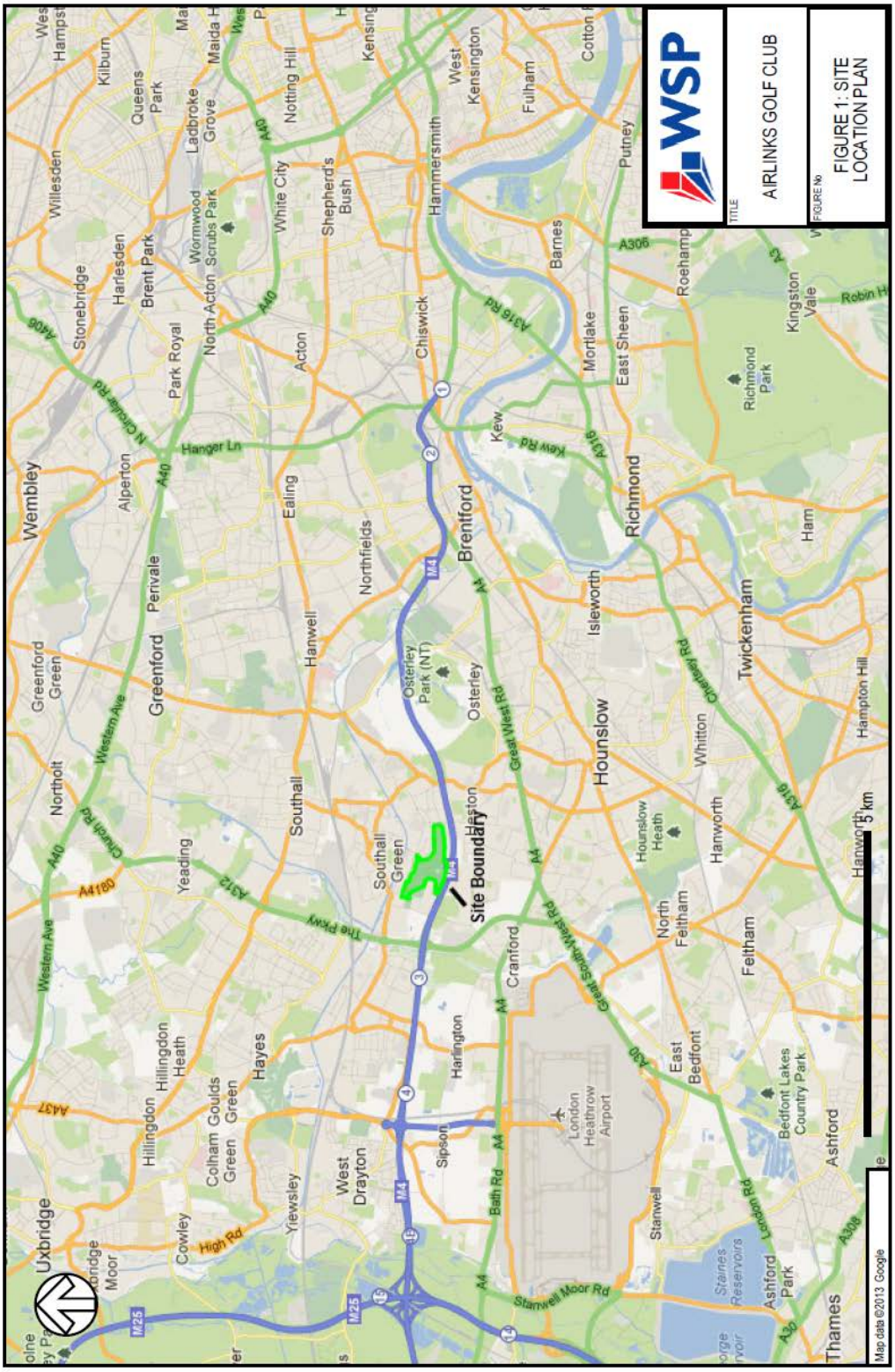
"secure storage" means storage where waste cannot escape and members of the public do not have access to it.

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"Waste Framework Directive" or "WFD" means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.

"year" means calendar year ending 31 December.

Schedule 7 - Site plan





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END OF PERMIT

Guy's Copy.

creating a better place

Environment Agency

RECEIVED
3 - FEB 2012

Company Secretary
Brett Aggregates Limited
150 Aldersgate Street
London
EC1A 4AB

Our ref: EPR/EB3732RR/A001

Date: 31 January 2012

Dear Sir or Madam,

Your new environmental permit

Permit reference: EPR/EB3732RR/A001
Waste returns reference: EAWML 103836
Operator: Brett Aggregates Limited
Facility: Queen Mary Reservoir Recycling Facility, Ashford Road, Laleham, Staines, Middlesex, TW18 1QF

Our determination of your application for a permit is complete and we're satisfied that you can carry out your activities in accordance with the enclosed permit, without harm to the environment or human health. I enclose your new permit. Please keep it in a safe place.

This letter contains web links to other documents. If you aren't able to access these phone our Customer Contact Centre for help.

You need to read our document 'How to comply with your environmental permit'. This will help you understand what you need to do to meet the conditions of your permit. You can find this on our guidance web page at http://www.environment-agency.gov.uk/business/topics/permitting/32320.aspx

Please look at the table below and note any of the things that apply to your permit.

If...	then..
you plan to keep your records at a site other than where the activity takes place	you need to let us know within 20 working days of receiving this letter.
your permit includes pre-operational or improvement conditions	check the deadlines for completing measures and make sure you carry them out by the times stated
you are carrying out a waste operation or activity and need to submit quarterly waste returns on waste movements	you can get the forms you need from our website http://www.environment-agency.gov.uk/business/topics/waste/32176.aspx
Note: This does not apply to permits that only have stand alone water discharge or groundwater activities.	When you complete your return use the waste returns reference above.
your permit includes an installation	we enclose a legal notice and information about reporting to the Pollution Inventory.
you need to submit other returns	send these to your area office. Speak to your area officer to check local arrangements.

INVESTOR IN PEOPLE

There is an annual subsistence charge for your permit unless:

- your permit is only for discharges of sewage effluent where the maximum daily volume of discharge permitted is five cubic metres or less (this does not apply to non trade effluent or any other type of discharge);
- or your permit is only for mobile plant, instead we will charge for each deployment.

The annual charge is due on demand in the year that we issue the permit and then on 1 April each year. The charge starts from the date we authorise the permit, unless there's a condition relating to a standalone water discharge which states a later start date. In that case we will charge for the discharge from the start date. If you need to know more about the subsistence charge please look at the charging guidance on our website at http://www.environment-agency.gov.uk/business/regulation/31857.aspx

If you have any questions about this permit please phone our Customer Contact Centre on 03708 506 506. They will put you in touch with a local area officer.

Yours faithfully

Beata Czech
Permitting Officer

Permit

The Environmental Permitting (England & Wales) Regulations 2010

Brett Aggregates Limited

Queen Mary Reservoir Recycling Facility
Ashford Road
Laleham
Staines
Middlesex
TW18 1QF

Permit number

EPR/EB3732RR

Copies to:

Rob Pinnock
Damian McCloan
SHE Dept - Scanned

Original : Lesley Bond - pre safe.

Sent 3/2/12
LOM

Permit

Permit number
EPR/EB3732RR

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Brett Aggregates Limited ("the operator"),

whose registered office is

150 Aldersgate Street
London
EC1A 4AB

company registration number **00316788**

to operate waste operations described in standard rules **SR2010No12** at

Queen Mary Reservoir Recycling Facility
Ashford Road
Laleham
Staines
Middlesex
TW18 1QF

to the extent authorised by and subject to the conditions of this permit.

Under regulation 27(2) of the Regulations, standard rules **SR2010No12** are conditions of this permit.

Name	Date
Alan Whitley	31st January 2012

Authorised on behalf of the Environment Agency

Schedule 1 - Site plan

This is the plan referred to in the standard rules SR2010No12



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6/16

Standard rules

Chapter 4, The Environmental Permitting (England and Wales) Regulations 2010

Environment Agency

Standard rules SR2010No12 Treatment of waste to produce soil, soil substitutes and aggregate

Introductory note

This introductory note does not form part of these standard rules.

When referred to in an environmental permit, these standard rules will allow the operator to store waste at a specified location and treat it to produce soil, soil substitutes and aggregate. Permitted wastes do not include hazardous wastes. The total quantity of waste that can be stored and subsequently treated at the site under these standard rules shall be no more than 75,000 tonnes per year. These standard rules do not permit the burning of any wastes, either in the open, inside buildings or in any form of incinerator.

The permitted activities shall not be carried out within 500 metres of a European Site[1], Ramsar site or a Site of Special Scientific Interest (SSSI) nor within a specified Air Quality Management Area (AQMA)[2]. The permitted activities shall not be within:

- 10 metres of any watercourse;
- 50 metres from any spring or well, or from any borehole not used to supply water for domestic or food production purposes; and
- 250 metres from any well, spring or from any borehole used to supply water for domestic or food production purposes.

These standard rules do not allow any point source emission into surface waters or groundwater. However, under the emissions of substances not controlled by emission limits rule:

- Liquids may be discharged into a foul sewer subject to a consent issued by the local water company.
- Liquids may be taken off-site in a tanker for disposal or recovery.
- Clean surface water from roofs, or from areas of the site that are not being used in connection with storing and treating waste, may be discharged directly to surface waters, or to groundwater by seepage through the soil via a soakaway.

End of introductory note

[1] A candidate or Special Area of Conservation (cSAC or SAC) and proposed or Special Protection Area (pSPA or SPA) in England and Wales.

[2] An Air Quality Management Area within the meaning of the Environment Act 1995 which has been designated due to concerns about particulate matter in the form of PM10.

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Rules

1 – Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with rule 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in these standard rules shall have convenient access to a copy of them kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the requirements of an approved competence scheme.

2 – Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the operations specified in table 2.1 below ("the activities").

Table 2.1 Activities

Description of activities	Limits of activities
R13: Storage of wastes pending the operations numbered R3 and R5. R3: recycling or reclamation of organic substances which are not used as solvents. R5: Recycling or reclamation of other inorganic materials.	Treatment of wastes listed in table 2.3 consisting only of sorting, separation, screening, crushing and blending of waste for recovery as a soil, soil substitute or aggregate. Secure storage of wastes listed in table 2.3 pending treatment. Storage of wastes listed in table 3.1 shall not exceed 10,000 tonnes in total at any one time. All other wastes stored shall not exceed 40,000 tonnes in total at any one time. No more than 75,000 tonnes of waste shall be treated per year.

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan attached to the permit.

2.2.2 The activities shall not be carried out within:

(a) 500 metres of a European Site or Site of Special Scientific Interest (SSSI);

(b) 10 metres of any watercourse;

(c) 50 metres of any spring or well, or any borehole not used to supply water for domestic or food production purposes;

(d) 250 metres of any well, spring or borehole used to supply water for domestic or food production purposes; and / or

(e) a specified AQMA.

2.3 Waste acceptance

2.3.1 Waste shall only be accepted if:

(a) it is of a type listed in table 2.3 of these standard rules;

(b) it conforms to the description in the documentation supplied by the producer and holder;

(c) its chemical, physical and biological characteristics make it suitable for its intended treatment;

(d) any excavated soil from potentially contaminated sites has been shown by prior chemical analysis and assessment to be suitable for the intended use without significant risk of pollution; and

(e) it is visually inspected on arrival and before it enters the treatment process to ensure that it complies with these standard rules.

2.3.2. Any waste that does not comply with 2.3.1 shall be rejected and shall be;

(a) removed from the site; or

(b) moved to a designated quarantine area pending removal.

2.3.3 Records demonstrating compliance with rule 2.3 (including analysis and assessment of any excavated soil from potentially contaminated sites) shall be maintained.

Table 2.3 Waste types

Exclusions

Wastes having any of the following characteristics shall not be accepted:

- **Consisting solely or mainly of dusts, powders or loose fibres**
- **Hazardous wastes**
- **Wastes in liquid form**

Waste Code	Description
01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
02 02	**waste from preparation and processing of meat, fish and other foods of animal origin**
02 02 02	shellfish shells from which the soft tissue or flesh has been removed only

03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD
03 01	wastes from wood processing and the production of panels and furniture
03 01 01	waste bark and cork
03 03	wastes from pulp, paper and cardboard production and processing
03 03 01	waste bark and wood
10	WASTES FROM THERMAL PROCESSES
10 01	waste from power stations and other combustion plants
10 01 01	bottom ash and slag only
10 01 02	pulverised fuel ash only
10 01 05	gypsum (solid) only
10 01 07	gypsum (sludge) only
10 01 15	bottom ash and slag only from co-incineration other than those mentioned in 10 01 14
10 11	wastes from manufacture of glass and glass products
10 11 12	clean glass other than those mentioned in 10 11 11
10 12	wastes from manufacture of ceramic goods, brick, stiles and construction products
10 12 08	waste ceramics, bricks, tiles and construction products(after thermal processing)
10 13	wastes from manufacture of cement, lime and plaster products and articles and products made from them
10 13 14	waste concrete only
15	WASTE PACKAGING
15 01	packaging
15 01 07	clean glass only
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 01	concrete, bricks, tiles and ceramics
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	wood, glass and plastic
17 02 02	clean glass only
17 03	bituminous mixtures, coal tar and tarred products
17 03 02	road base and road planings (other than those containing coal tar) only
17 05	soil (including excavated soil from contaminated sites) stones and dredging spoil
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 08	track ballast other than those mentioned in 17 05 07
17 08	gypsum based construction material
17 08 02	gypsum only other than that mentioned in 17 08 01
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF SITE WASTE WATER TREATMENT PLANTS AND PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND INDUSTRIAL WASTE
19 05	wastes from aerobic treatment of solid waste
19 05 03	compost from source segregated biodegradable waste only
19 08	wastes from waste water treatment plants not otherwise specified
19 08 02	washed sewage grit (waste from desanding) free from sewage contamination only
19 08 99	stone filter media if free from sewage contamination only
19 09	wastes from the preparation of water intended for human consumption or water for industrial use
19 09 02	sludges from water clarification

19 12	**wastes from the mechanical treatment of wastes**
19 12 05	clean glass only
19 12 09	minerals (for example sand, stones)
19 12 12	treated bottom ash including IBA and slag other than that containing dangerous substances only
19 13	**wastes from soil and groundwater remediation**
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
20 01	**separately collected fractions**
20 01 02	clean glass only
20 02	**garden and park wastes**
20 02 02	soil and stones

3 – Emissions and monitoring

3.1 Emissions of substances not controlled by emission limits

3.1.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this rule if appropriate measures, including, but not limited to, those specified in Table 3.1 below and in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

Table 3.1 Appropriate measures for emissions not controlled by emission limits

When located within groundwater Source Protection Zones 1 or 2 the specified wastes below shall be stored and treated on an impermeable surface with a sealed drainage system.

When located outside groundwater Source Protection Zones 1 or 2 all permitted wastes shall be stored and treated on hard-standing or on an impermeable surface with sealed drainage system.

Waste Code	Description
03 01 01	waste bark and cork
03 03 01	waste bark and wood
10 01 01	bottom ash and slag only
10 01 05	gypsum (solid) only
10 01 07	gypsum (sludge) only
10 01 15	bottom ash and slag only from co-incineration other than those mentioned in 10 01 14
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 08 02	gypsum only other than that mentioned in 17 08 01
19 05 03	compost from source segregated biodegradable waste only
19 09 02	sludges from water clarification
19 12 12	treated bottom ash including IBA and slag other than that containing dangerous substances only
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03

3.1.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.1.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container

3.2 Odour

3.2.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable, to minimise, the odour.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.3 Noise and vibration

3.3.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan, to prevent or where that is not practicable, to minimise, the noise and vibration.

3.3.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 – Information

4.1 Records

4.1.1 All records required to be made by these standard rules shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible or are capable of retrieval; and

(d) be retained, unless otherwise agreed by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by these standard rules, unless otherwise agreed in writing by the Environment Agency

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by these standard rules to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in these standard rules; or

(c) any significant adverse environmental effects.

4.3.2 Written confirmation of actual or potential pollution incidents and breaches of emission limits shall be submitted within 24 hours.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters except where such disclosure is prohibited by Stock Exchange rules:

a) Where the operator is a registered company:

- any change in the operator's trading name, registered name or registered office address; and
- any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

b) Where the operator is a corporate body other than a registered company:

- any change in the operator's name or address; and
- any steps taken with a view to the dissolution of the operator.

c) In any other case:

- the death of any of the named operators (where the operator consists of more than one named individual);
- any change in the operator's name(s) or address(es); and
- any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case them being in a partnership, dissolving the partnership.

4.4 Interpretation

4.4.1 In these standard rules the expressions listed below shall have the meaning given.

4.4.2 In these standard rules references to reports and notifications mean written reports and notifications, except when reference is being made to notification being made "without delay", in which case it may be provided by telephone.

"accident" means an accident that may result in pollution.

"AQMA" means an air quality management area within the meaning of the Environment Act 1995 which has been designated due to concerns about particulate matter in the form of PM10.

"authorised officer" means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in Section 108(4) of that Act.

"dangerous substances" means any substance that has been or will be classified as dangerous in Directive 67/548/EEC and its subsequent amendments.

"domestic purposes" has the same meaning as in section 218 of the Water Industry Act 1991.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from emission points specified in these standard rules or from other localised or diffuse sources, which are not controlled by an emission limit.

"European Site" means Special Area of Conservation or candidate Special Area of Conservation or Special Protection Area or proposed Special Protection Area in England and Wales, within the meaning of Council Directives 79/409/EEC on the conservation of wild birds and 92/43/EEC on the conservation of natural habitats and of wild flora and fauna and the Conservation (Natural Habitats &c) Regulations 1994. Internationally designated Ramsar sites are dealt with in the same way as European sites as a matter of government policy and for the purpose of these rules will be considered as a European Site.

"food production purposes" means the manufacturing, processing, preserving or marketing purposes with respect to food or drink for which water supplied to food production premises may be used, and for the purposes of this definition "food production purposes" means premises used for the purposes of a business of preparing food or drink for consumption otherwise than on the premises.

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"impermeable surface" means a surface or pavement constructed and maintained to a standard sufficient to prevent the transmission of liquids beyond the pavement surface, and should be read in conjunction with the term "sealed drainage system" (below).

"hardstanding" is a compacted solid surface capable of withstanding the operation and the loading / unloading of wastes.

"IBA" means incinerator bottom ash derived from the incineration or pyrolosis of waste.

"pollution" means emissions as a result of human activity which may –

(a) be harmful to human health or the quality of the environment,
(b) cause offence to a human sense,
(c) result in damage to material property, or
(d) impair or interfere with amenities and other legitimate uses of the environment.

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"R" means a recovery operation provided for in Annex IIB to Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on Waste.

"sealed drainage system" in relation to an impermeable surface, means a drainage system with impermeable components which does not leak and which will ensure that:

(a) no liquid will run off the surface otherwise than via the system;
(b) except where they may lawfully be discharged to foul sewer, all liquids entering the system are collected in a sealed sump.

"secure storage" means storage where waste cannot escape and members of the public do not have access to it.

"SSSI" means Site of Special Scientific Interest within the meaning of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000).

"waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"year" means calendar year commencing on 1st January.

End of standard rules

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Permit with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Day Group Limited

Brentford Aggregate Materials Recycling Facility
Transport Avenue
Brentford
Middlesex
TW8 9HF

Permit number

EPR/BB3232RX

Brentford Aggregate Materials Recycling Facility

Permit number EPR/BB3232RX

Introductory note

This introductory note does not form a part of the permit

The main features of the permit are as follows. The facility is to be used for the recycling and reclamation, of wastes for the purpose of manufacturing high grade recycled aggregates.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Application EPR/BB3232RX/A001	Duly made 19/04/12	Application for material recycling facility
Additional information received	09/05/12	Amendment to Operating Techniques Document to include maintenance of site interceptors – Section 4.1.2
Permit determined	31/05/12	Permit issued to Day Group Limited

End of introductory note

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/BB3232RX

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Day Group Limited ("the operator"),

whose registered office is

Day Group House
Transport Avenue
Brentford
Middlesex
TW8 9HF

company registration number 00432417

to operate waste operations at

Brentford Aggregate Materials Recycling Facility
Transport Avenue
Brentford
Middlesex
TW8 9HF

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Clare Palmer Clark	**31/05/2012**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Avoidance, recovery and disposal of wastes produced by the activities

1.2.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.2.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

(b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.2 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.1 and

(b) it conforms to the description in the documentation supplied by the producer and holder.

3 Emissions and monitoring

3.1 Emissions of substances not controlled by emission limits

3.1.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.1.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.1.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.2 Odour

3.2.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan;

(b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.3 Noise and vibration

3.3.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.3.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit; or

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

4.3.4 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “without delay”, in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities	
Description of activities for waste operations	**Limits of activities**
D15: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced) **R13**: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced) **D9**: Physico-chemical treatment not specified elsewhere in Annex IIA which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D8 and D10 to D12 **R5:** Recycling/reclamation of other inorganic materials **R4**: Recycling/reclamation of metals and metal compounds **R3**: Recycling/reclamation of organic substances which are not used as solvents	Treatment consisting only of sorting, separation, screening, baling, shredding, crushing, blending or compaction of waste into different components for disposal (no more than 50 tonnes per day) or recovery. Only inert waste shall be stored and treated on hard standing, all other wastes shall be stored and treated on an impermeable surface with a sealed drainage system.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	Summary of Management System – DAY. B2.03	12/03/12
Application	Amended Operating Techniques – DAY. B4.10	09/05/12

Schedule 2 - Waste types, raw materials and fuels

Table 2.1 Permitted waste types and quantities.

Maximum Quantities

The total quantity of waste accepted at the site shall be less than 775,000 tonnes a year.

Exclusions

Wastes having the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders or loose fibres;
- Wastes that are in a form which is either sludge or liquid.

Waste code	Description
01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, PHYSICAL AND CHEMICAL TREATMENT OF MINERALS
01 01	wastes from mineral extraction
01 01 01	wastes from mineral metalliferous excavation
01 01 02	wastes from mineral non-metalliferous excavation
01 04	wastes from physical and chemical processing of non-metalliferous minerals
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
01 04 12	tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07 and 01 04 11
01 04 13	wastes from stone cutting and sawing other than those mentioned in 01 04 07
10	WASTES FROM THERMAL PROCESSES
10 09	wastes from casting of ferrous pieces
10 09 03	furnace slag
10 09 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05
10 09 08	casting cores and moulds which have undergone pouring other than those mentioned in 01 09 07
10 10	wastes from casting of non-ferrous pieces
10 10 03	furnace slag
10 10 06	casting cores and moulds which have not undergone pouring, other than those mentioned in 10 10 05
10 10 08	casting cores and moulds which have undergone pouring, other than those mentioned in 10 10 07
10 12	wastes from manufacture of ceramic goods, bricks, tiles and construction products
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 12 12	wastes from glazing other than those mentioned in 10 12 11
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them
10 13 14	waste concrete and concrete sludge

15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01	packaging (including separately collected municipal packaging waste)
15 01 01	paper and cardboard packaging
15 01 07	glass packaging
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 01	concrete, bricks, tiles and ceramics
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02	wood, glass and plastic
17 02 01	wood
17 02 02	glass
17 03	bituminous mixtures, coal tar and tarred products
17 03 02	bituminous mixtures other than those mentioned in 17 03 01
17 04	metals (including their alloys)
17 04 01	copper, bronze, brass
17 04 02	aluminium
17 04 03	lead
17 04 04	zinc
17 04 05	iron and steel
17 04 06	tin
17 04 07	mixed metals
17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 08	track ballast other than those mentioned in 17 05 07
17 09	other construction and demolition wastes
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 01	wastes from incineration or pyrolysis of waste

19 01 02	ferrous materials removed from bottom ash
19 01 12	bottom ash and slag other than those mentioned in 19 01 11
19 01 19	sands from fluidised beds
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
19 12 03	non-ferrous metal
19 12 05	glass
19 12 09	mineral (for example sand, stones)
19 13	wastes from soil and groundwater remediation
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
20 01	separately collected fractions (except 15 01)
20 01 02	glass

Schedule 3 – Emissions and monitoring

There are no emission limits or associated monitoring requirements.

Schedule 4 - Reporting

There is no reporting under this schedule.

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	
(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	
(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

"accident" means an accident that may result in pollution.

"Annex I" means Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"Annex II" means Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"*application"* means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"*authorised officer"* means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"*D*" means a disposal operation provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit**.**.

"emissions to land" includes emissions to groundwater.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"*MCERTS"* means the Environment Agency's Monitoring Certification Scheme.

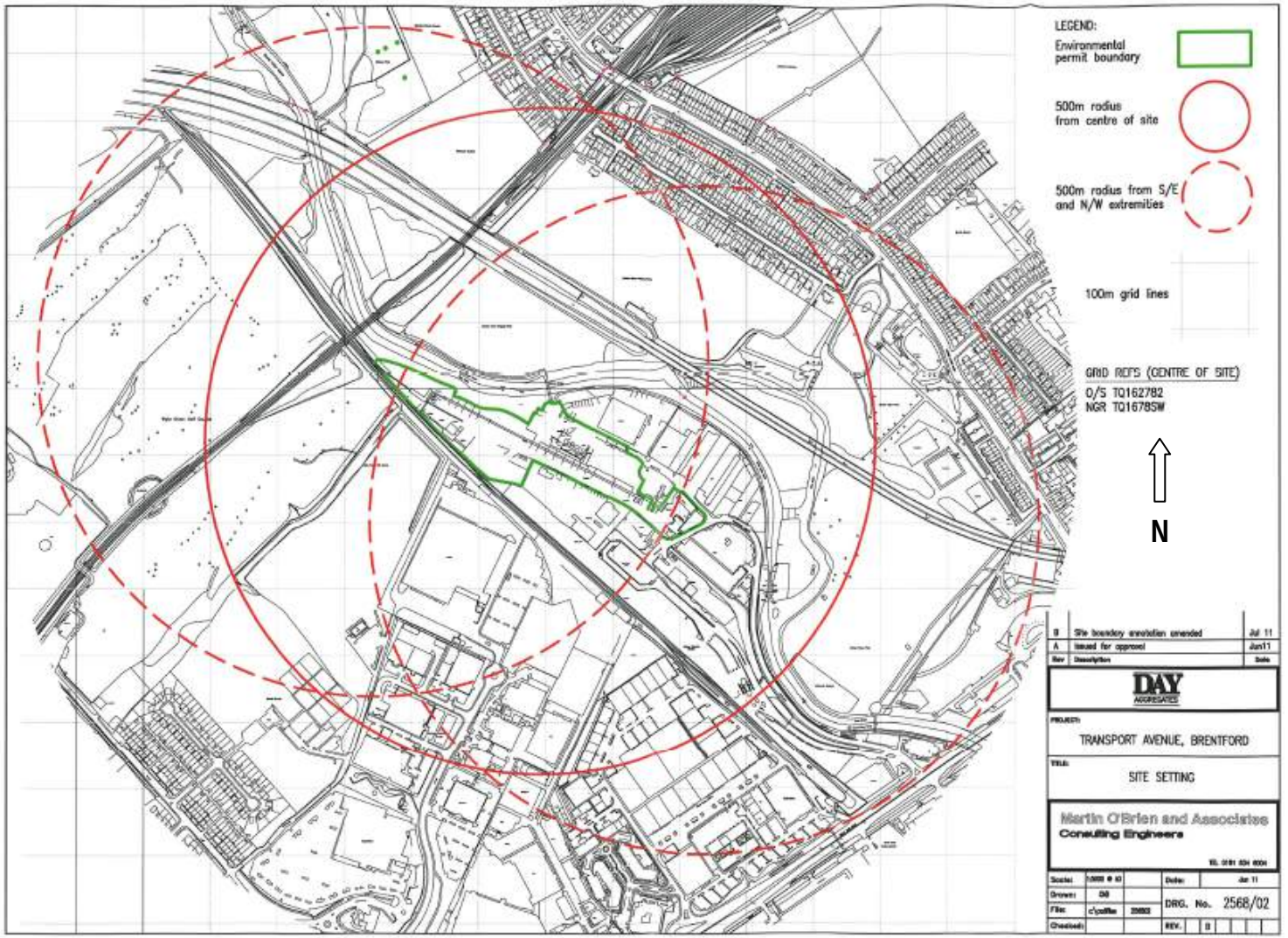
"*quarter"* means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"*R*" means a recovery operation provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

"*Waste code"* means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"year" means calendar year ending 31 December.

Schedule 7 - Site plan



END OF PERMIT

Notice of variation and consolidation
Environmental Permitting (England and Wales) Regulations 2010

Permit number
EPR/BT7183IA

The Environment Agency in exercise of its powers under regulations 18 and 20 of the Environmental Permitting (England and Wales) Regulations 2010 varies and consolidates the environmental permits issued to

Henry Streeter (Sand and Ballast) Limited ("the operator")

whose registered office is

14-16 Station Road West
Oxted
Surrey
RH8 9EP

company registration number 543481

to operate a regulated facility at

Sipson Lane Combined Inert Landfill
Sipson Lane
Off Sipson Road
Sipson
West Drayton
Middlesex UB7 0JG

to the extent set out in the schedules.

The notice shall take effect from 29/03/2011

Name	Date
Jane McNamara	**29/03/2011**

Authorised on behalf of the Environment Agency

MICK GEORGE ®

Ticket no: 087297

Non-Hazardous Soils Waste Transfer Note

WAF 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: Environment Agency

Date 16.5.17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: McALEER & RUSHE CON NEW PREMIER INN BATH RD, HEATHROW

Driver's name: J. McGOVERN

Driver's signature: J McGovern

Vehicle registration: KR14XZN

	Vehicle type	Customers signature	Print name
1	1X8W		A.S
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site

DISPOSAL SECTION

Site name: RUSHTON

Operator: Mick George Limited, Kettering, Northamptonshire, NN14 1RS

Licence no. Permit number EPR/DB3005HY

Issued by: E.A

Site address

Print name

Signature

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 097493

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

Issued by: Environment Agency

SIC for the process giving rise to the waste: 47.00/1

Date 16/5/17

Time

DUTY OF CARE SECTION

Customer's name: MGL 163

Collect address: 276 Bath Rd Heathrow

Driver's name: Lee Pocock

Driver's signature:

Vehicle registration: KN15 FMP

	Vehicle type	Customers signature	Print name
1	1 x 8		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
~~Kettering~~
Northamptonshire
NN14 1RS
Permit number EPR/DB3005HY

DISPOSAL SECTION

Operator: MGH

Licence no.: EPR/DB3005HY

Issued by: EA

Site name: Rushton

Site address: Kettering

Print name: G McBEAN

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled th duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (Engla

MICK GEORGE ®

Ticket no: 097492

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: Environment Agency

Date 16/5/17

Time

WAF 6157

DUTY OF CARE SECTION

Customer's name: MGC 1631

Collect address: 276 Bath RD Heathrow

Driver's name: LEE Pocock

Driver's signature:

Vehicle registration: KU15 FML

	Vehicle type	Customers signature	Print name
1	1 x 8		
2			
3			
4			
5			
6			
7		Mick George Limited Rushton Soil & Aggregates Facility Rushton Landfill Site Oakley Road Rushton Kettering Northamptonshire NN14 1RS Permit number EPR/DB3005HY	
8			

WASTE DESCRIPTION Non-Hazardous Sub-Soil

EWC CODE 170504

DISPOSAL SECTION

Operator: MGH

Licence no.: EPR/DB3005HY

Issued by: EA

Site name: Rushton

Site address: Kettering

Print name: C McBurn

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 2. 093987

Non-Hazardous Soils Waste Transfer Note

WAF. 6157.

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/1

Issued by: Environment Agency

Date 16.05.17.

Time

DUTY OF CARE SECTION

Customer's name: MGL. 1631.

Collect address: PREMIER INN. HEATHROW.

Driver's name: B. MOORE.

Driver's signature:

Vehicle registration: AE11 ESF.

	Vehicle type	Customer's signature	Print name
1	1 x 8w.		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Mick George Limited ~~Soil & Aggregates Facility~~

~~Oakley Road~~ Rushton ~~Kettering~~ Northamptonshire ~~NN14 1RS~~

Operator: MGL

Licence no.:

Issued by: EA Permit number EPR/DB3005HY

Site name: MGL.

Site address: RUSHTON.

Print name:

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: (1) 093986

Non-Hazardous Soils Waste Transfer Note 31820

WAF. 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: Environment Agency

Date 16.05.17.

Time

DUTY OF CARE SECTION

Customer's name: MGL. 1631.

Collect address: PREMIER INN. HEATROW.

Driver's name: B. MOORE.

Driver's signature:

Vehicle registration: AE11 ESF.

	Vehicle type	Customer's signature	Print name
1	1 x 8w.		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Mick George Limited ... Aggregates Facility

Operator: Oakley Road Rushton MGL. Kettering

Licence no.: Northamptonshire NN14 1RS

Issued by: Permit number EPR/DE3[illegible]HY

Site name: MGL.

Site address: RUSHTON.

Print name:

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 093944

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

Issued by: Environment Agency

SIC for the process giving rise to the waste: 42.11/01

Date 16/5/2017

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: 216 Bath Rd Harmondsworth

Driver's name: [illegible]

Driver's signature:

Vehicle registration: [illegible]

	Vehicle type	Customers signature	Print name
1	1x8w		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MGL

Licence no.: CPA 7MOOSHY

Issued by: EC

Site name: Mick George Limited Rushton Soil & Aggregates Facility / Rushton Landfill Site

Site address: Oakley Road, Rushton, Kettering, Northamptonshire, NN14 1RS

Permit number: EPR/DB3005HY

Print name: [illegible]

Signature: [illegible]

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 093943

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 47.11/01

Issued by: **Environment Agency**

Date 16/8/2017

Time

DUTY OF CARE SECTION

Customer's name: MGR 1631

Collect address: 27 Town Rd Thrapston

Driver's name: Thomas

Driver's signature:

Vehicle registration: MW 15 FMO

	Vehicle type	Customers signature	Print name
1	4x2		
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

WASTE DESCRIPTION: Non-Hazardous Sub-Soil

EWC CODE: 170504

DISPOSAL SECTION

Operator: MSH

Licence no.: CBM Moorby

Issued by:

Site name:

Site address: Rushton

Print name: G McGinn

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 095130

Non-Hazardous Soils Waste Transfer Note

WAF 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41 · 10/

Issued by: Environment Agency

Date 16-05-17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: M^c Aleer + Rushe Contracts, 276 Bath Rd, London Heathrow

Driver's name: M Frampton

Driver's signature: M

Vehicle registration: KR14 XZM

	Vehicle type	Customers signature	Print name
1	1x8W		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub Soil

32-000

EWC CODE

170504

Mick George Limited
Rushton Soil & Aggregates Facility
Pardlow Quill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/CB3005HY

DISPOSAL SECTION

Operator: MG

Licence no.: CB 3005 HY

Issued by: EA

Site name: MG

Site address: Rushton

Print name: A McBLAIN

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 095129

Non-Hazardous Soils Waste Transfer Note

WAF - 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 4 1 . 2 0 /

Issued by: Environment Agency

Date 16-05-17

Time

DUTY OF CARE SECTION

Customer's name: MGC 1631

Collect address: McAleer + Rushe Contracts
276 Bath Rd
London Heathrow

Driver's name: M Frampton

Driver's signature: MF

Vehicle registration: KR14 XZM

	Vehicle type	Customers signature	Print name
1	1X 8W		
2			
3			
4			
5			
6			
7			
8			31-8W

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MG

Licence no.: DB3005 HY

Issued by: EA

Site name: MG

Site address: Rushton Landfill Site
Oxendon Road
Rushton
Kettering
Northamptonshire
NN14 1RE

Permit number: EPR/BB3805IY

Print name

Signature

Mick George Limited
Rushton Skil & Aggregates Facility

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 097213

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.18/

Issued by: Environment Agency

Date 16/05/17

Time

DUTY OF CARE SECTION

Customer's name: MG1631

Collect address: 276 BATH RD HEATHROW

Driver's name: LEON HUNTT

Driver's signature:

Vehicle registration: FC63 UDK

	Vehicle type	Customers signature	Print name
1	8W		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

Mick George Limited
Rushton Soil & Aggregates Facility

DISPOSAL SECTION

Operator: Rushton Kettering Northamptonshire NN14 1RS

Licence no.: ~~Permit number~~ EPR/DB3005HY

Issued by:

Site name:

Site address: Rushton

Print name:

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 095087

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/1

Issued by: Environment Agency

Date 16/3/17

Time

DUTY OF CARE SECTION

Customer's name: MGI 1631

Collect address: BATH RD HEATHROW

Driver's name: A. Doswell

Driver's signature: AJ

Vehicle registration: KM13 CJM

	Vehicle type	Customer's signature	Print name
1	1x8w		
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MGI

Licence no.: DB3005HY

Issued by:

Site name: MGI

Site address: RUSHTON

Print name: G McBAIN

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 095086

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: Environment Agency

Date 16/5/17

Time

DUTY OF CARE SECTION

Customer's name: MGI 1631

Collect address: BATH RD HEATHROW

Driver's name: A. Doswell

Driver's signature: A.D

Vehicle registration: KM13 LSY

	Vehicle type	Customers signature	Print name
1	1x8w		
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
~~Rushton Soil & Aggregates Facility~~
Rushton Landfill Site
~~Oakley Road~~
Rushton
Kettering
Northamptonshire
NN14 1RS
~~Permit number~~
EPR/DB3005HY

WASTE DESCRIPTION: Non-Hazardous Sub-Soil

EWC CODE: 170504

DISPOSAL SECTION

Operator: MGI

Licence no.: DB3005HY

Issued by:

Site name: MGI

Site address: RUSHTON

Print name: G McBAIN

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 079352

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 41.1

Issued by: **Environment Agency**

Date: 16.05.17

Time:

DUTY OF CARE SECTION

Customer's name: MGL1631

Collect address: London Heathrow

Driver's name: ZIELINSKI

Driver's signature: Zeliński

Vehicle registration: P864 VNG

	Vehicle type	Customers signature	Print name
1	1x8w		P.S
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MGL

Licence no.:

Issued by:

Site name: Rushton

Site address: Rushton

Print name: ACI

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 079351

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.1 / 43.1

Issued by: Environment Agency

Date: 16.05.17

Time:

DUTY OF CARE SECTION

Customer's name: MGL1631

Collect address: London HEATHROW

Driver's name: ZIELINSKI

Driver's signature:

Vehicle registration: FJ64 VNC

	Vehicle type	Customers signature	Print name
1	1x 8w.		
2			
3			
4			
5			
6			
7	WAF 6157		
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

WASTE DESCRIPTION: Non-Hazardous Sub-Soil

EWC CODE: 170504

DISPOSAL SECTION

Operator: MGH

Licence no.:

Issued by:

Site name: Rushton

Site address: Rushton

Print name: G McBEAN

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 095166

Non-Hazardous Soils Waste Transfer Note

(2)

WAF 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 41 . 10 /

Issued by: **Environment Agency**

Date 16/5/17

Time

DUTY OF CARE SECTION

Customer's name: MGC 1631

Collect address: McAleer & Rushe Heathrow

Driver's name: S. Hands

Driver's signature:

Vehicle registration: KTIS VSY

	Vehicle type	Customers signature	Print name
1	1x8w		WATSON
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1BS
Permit number
EPR/DB3005HY

3/780

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MGH

Licence no.:

Issued by:

Site name: Rushton

Site address:

Print name: C McBean

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

(1)

Ticket no: 095165

Non-Hazardous Soils Waste Transfer Note

WAF 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 41 · 10 /

Issued by: **Environment Agency**

Date 16/5/17

Time

DUTY OF CARE SECTION

Customer's name: MGC 1631

Collect address: McALEER & RUSHE HEATHROW

Driver's name: S. HANDS

Driver's signature:

Vehicle registration: KT15 VSY

	Vehicle type	Customers signature	Print name
1	1x8w		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

31920.

DISPOSAL SECTION

Operator: MGN

Licence no.:

Issued by:

Mick George Limited Rushton Landfill Gates Facility
Rushton Landfill
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number EPR/BP3005HY

Site name: RUSHTON

Site address:

Print name:

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 099380

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: Environment Agency

Date 16-5-17

Time

DUTY OF CARE SECTION

Customer's name: Mac 1631

Collect address: HOUNSLOW

Driver's name: P. MEADOWS

Driver's signature:

Vehicle registration: KU15 GNN

	Vehicle type	Customers signature	Print name
1	18w		
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

WMP 6157

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/[illegible]/SHY

DISPOSAL SECTION

Operator: M-G-H

Licence no.: 3005 HY

Issued by: e/A

Site name: RUSHTON

Site address: OAKLEY RD
RUSHTON

Print name: C McCLAW

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 099379

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: Environment Agency

Date 16-5-17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: HORTHROW

Driver's name: P. MADDOWS

Driver's signature:

Vehicle registration: KU15 GNN

	Vehicle type	Customers signature	Print name
1	1x8w		
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
~~Rushton Landfill Site~~
Oakley Road
~~Rushton~~
Kettering
Northamptonshire
NN14 1RS
~~Permit number~~
~~EPR/DB3005HY~~

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504 WAP 6157

DISPOSAL SECTION

Operator: MGH

Licence no.: 3005HY

Issued by: O/A

Site name: RUSHTON

Site address: OAKLEY RD
RUSHTON

Print name: GMSCW

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE

Ticket no: 043238

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 41 . 10 /

Issued by: **Environment Agency**

Date 16 05 17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: Heathrow

Driver's name: A Roberts

Driver's signature:

Vehicle registration: KU15FUW

	Vehicle type	Customers signature	Print name
1	1x Tw		
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

WASTE DESCRIPTION Non-Hazardous Soil

EWC CODE 170504

DISPOSAL SECTION

Operator: MGH

Licence no.:

Issued by:

Site name:

Site address: Rushton

Print name: G McBean

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 093700

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41 · 101

Issued by: Environment Agency

Date 16/5/17

Time

DUTY OF CARE SECTION

Customer's name: MOL 1631

Collect address: Bath road Heathrow

Driver's name: Alan Taylor

Driver's signature: A Taylor

Vehicle registration: FJ16VZY

	Vehicle type	Customer's signature	Print name
1	1X8W		
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
[illegible]

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator

Licence no.

Issued by

Site name: Rushton

Site address

Print name: C McEachen

Signature

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE

Ticket no: 043237

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 41.10/

Issued by: **Environment Agency**

Date 16 05 17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: Heathrow

Driver's name: A Roberts

Driver's signature:

Vehicle registration: KM15 FMV

	Vehicle type	Customers signature	Print name
1	1x8w		A Roberts
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
~~Rushton Landfill Site~~
Oakley Road
~~Rushton~~
Kettering
~~Northamptonshire~~
NN14 1RS
~~Permit number~~
EPR/DB3005HY

WASTE DESCRIPTION

Non-Hazardous Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MGH

Licence no.:

Issued by:

Site name:

Site address: Rushton

Print name: G McBain

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

MICK GEORGE ®

Ticket no: 093699

32-000

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: **CB/BN5911QW**

SIC for the process giving rise to the waste: 41 · 10 /

Issued by: **Environment Agency**

Date 16/5/17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: Bath road Heathrow

Driver's name: Alan Taylor

Driver's signature: A Taylor

Vehicle registration: FJ16UZY

	Vehicle type	Customers signature	Print name
1	1X8W		A S
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator

Licence no.

Issued by

Site name: Rushton

Site address

Print name: G McBain

Signature

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions

VAT GB 550 6329 53
Mick George Ltd

MICK GEORGE ®

Ticket no: (2) 080547

Non-Hazardous Soils Waste Transfer Note

WAF 6157

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41 · 10 /

Issued by: Environment Agency

Date 16-5-17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: BATH RD
London Heathrow

Driver's name: V ELMORE

Driver's signature: [signature]

Vehicle registration: FJ16 VZO

	Vehicle type	Customers signature	Print name
1	1X8W	[signature]	WATSON
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

DISPOSAL SECTION

Operator: MGH

Licence no.:

Issued by:

Site name: Rushton

Site address:

Print name: G McBLAIN

Signature: [signature]

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies : White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 080546 (1)

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

WAC 6157

Carrier licence: CB/BN5911QW

Issued by: Environment Agency

SIC for the process giving rise to the waste: [ ][ ].[ ][ ]/[ ]

Date 16-5-17

Time

DUTY OF CARE SECTION

Customer's name: MGL 1631

Collect address: BATH RD LONDON HEATHROW

Driver's name: V ESMORE

Driver's signature: [signature]

Vehicle registration: FJ16 VZO

	Vehicle type	Customers signature	Print name
1	1X8 W	[signature]	[signature]
2			
3			
4			
5			
6			
7			
8			

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

DISPOSAL SECTION

Operator: MGH

Licence no.:

Issued by:

Site name: Rushton

Site address:

Print name: G MCBEAN

Signature: [signature]

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

MICK GEORGE ®

Ticket no: 074539

Non-Hazardous Soils Waste Transfer Note

sales@mickgeorge.co.uk
www.mickgeorge.co.uk

T 01480 498 099
F 01480 498 077

Second Drove
Meadow Lane
St Ives
Huntingdon
Cambridgeshire PE27 4YQ

Carrier licence: CB/BN5911QW

SIC for the process giving rise to the waste: 41.10/

Issued by: 6157 Environment Agency

Date 16.5.17

Time

DUTY OF CARE SECTION

Customer's name: MGM 1631

Collect address: 276 Bath Rd Heathrow

Driver's name: Ian

Driver's signature:

Vehicle registration: MR14 XYN

	Vehicle type	Customers signature	Print name
1	1X8W		P.S
2			
3			
4			
5			
6			
7			
8			

Mick George Limited
Rushton Soil & Aggregates Facility
Rushton Landfill Site
Oakley Road
Rushton
Kettering
Northamptonshire
NN14 1RS
Permit number
EPR/DB3005HY

WASTE DESCRIPTION

Non-Hazardous Sub-Soil

EWC CODE

170504

DISPOSAL SECTION

Operator: MGM

Licence no.: CP3536XG

Issued by: EA

Site name: MGM

Site address: Rostron

Print name: G McGraw

Signature:

By signing this Duty of Care Waste Transfer Note the producer/holder of the waste confirms that they have fulfilled their duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

Copies: White → Office Pink → Customer Yellow → Site Green → Remains in book

TERMS & CONDITIONS OF SALE

Subject to Mick George Limited standard terms and conditions (available on request)

VAT GB 550 6329 53
Mick George Ltd
Registered no 2417831 (England)

O'MALLEY HAULAGE LTD.

The Brickfields, Oxhey Lane, Watford WD19 5RF
Telephone: 01923 252177 Fax: 01923 510282

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990
Weights and Measures Act, 1985, Schedule 4, Paragraph 7
Waste Carrier No. CB/QP3679BF

384636

PRODUCER **i.e. Company Loading**
FULL NAME:
GOLDMAX

ADDRESS OF TRANSACTION POINT:
BATH RD
HEATHROW

NAME & ADDRESS OF BROKER WHO ARRANGED THIS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER:
25-11-16

HAULIER

Waste Carrier No. if not O'MALLEY LTD:.....

VEHICLE REG.No: EU 66 WTE ..... **Time on Site**.....

DRIVER: BRIAN ..... **Time off Site:**.....

DESCRIPTION OF MATERIAL

1 x LOAD
TREE WASTE
AWAY

✓	EWC		Tonnes	KG
	17.05.04 Inert	GROSS		
	17.09.04 Mixed Construction	TARE		
✓	Other GREEN WASTE	NETT		

Sic Code
4312

Quantity of Material:..... ***M³ or***..... ***Tonnes***

DISPOSAL FACILITY

1 SITE OPERATOR:
GLYNNS

2 ADDRESS:
NEASDEN

3 SITE LICENCE No:

4 ISSUED BY:

DISPOSAL SIGNATURE: ..... ***PRINT NAME:*** JOANNA

PRODUCER SIGNATURE: ..... ***PRINT NAME:*** .....

N.B. To Customers, Authorised Agents, Representativesor Responsible Persons signing this Conveyance Note. This is in your interest. Please read this Conveyance Note carefully and inspect the material, agreeing quantity, quality and that everything is to your satisfaction before finally signing this receipt note. We regret we cannot under any circumstances entertain any claim concerning quantity, quality or anything else once the vehicle has left the site, and a clear signature has been given. Customers are also reminded that ordering vehicles of the public road is done entirely at their own risk. We cannot accept responsibility for damage caused by our vehicles whilst delivering to your site.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England and Wales) Regulations 2011

I, the driver agree to fulfil the terms of this Transfer Note.

SIGNED.....

White Copy **- Producer** ***Blue Copy*** **- Office** ***Pink Copy*** **- File** ***Yellow Copy*** **- Disposer**

O'MALLEY HAULAGE LTD.

The Brickfields, Oxhey Lane, Watford WD19 5RF
Telephone: 01923 252177 Fax: 01923 510282

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990
Weights and Measures Act, 1985, Schedule 4, Paragraph 7
Waste Carrier No. CBDU86635 393821

PRODUCER i.e. Company Loading
FULL NAME: Goldcrox

ADDRESS OF TRANSACTION POINT: 6 Bath Rd [redacted] Heathrow

NAME & ADDRESS OF BROKER WHO ARRANGED THIS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER: 25/11/16

HAULIER

Waste Carrier No. if not O'MALLEY LTD:

VEHICLE REG.No: EU16 OHF Time on Site 9.0

DRIVER: Mick Time off Site:

DESCRIPTION OF MATERIAL	✓	EWC		Tonnes	KG
1 Ld of concrete away		17.05.04 Inert	GROSS		
		17.09.04 Mixed Construction	TARE		
		Other	NETT		

Sic Code 4312

Quantity of Material ..... M³ or ..... Tonnes

DISPOSAL FACILITY

1 SITE OPERATOR: Tarmac

2 ADDRESS: Harper Lane

3 SITE LICENCE No:

4 ISSUED BY:

DISPOSAL SIGNATURE: PRINT NAME:

PRODUCER SIGNATURE: PRINT NAME: JOHN CUTA.

N.B. To Customers, Authorised Agents, Representativesor Responsible Persons signing this Conveyance Note. This is in your interest. Please read this Conveyance Note carefully and inspect the material, agreeing quantity, quality and that everything is to your satisfaction before finally signing this receipt note. We regret we cannot under any circumstances entertain any claim concerning quantity, quality or anything else once the vehicle has left the site, and a clear signature has been given. Customers are also reminded that ordering vehicles of the public road is done entirely at their own risk. We cannot accept responsibility for damage caused by our vehicles whilst delivering to your site.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England and Wales) Regulations 2011

I, the driver agree to fulfil the terms of this Transfer Note.

SIGNED

White Copy - Producer *Blue Copy - Office* *Pink Copy - File* *Yellow Copy - Disposer*

O'MALLEY HAULAGE LTD.

The Brickfields, Oxhey Lane, Watford WD19 5RF
Telephone: 01923 252177 Fax: 01923 510282

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990
Weights and Measures Act, 1985, Schedule 4, Paragraph 7
Waste Carrier No. CB/QP3679BF

384637

ODUCER i.e. Company Loading
LL NAME:
GOLDMAX

ADDRESS OF TRANSACTION POINT:
BATH RD
HEATHROW

ME & ADDRESS OF BROKER WHO ARRANGED IS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER:
25-11-16

ULIER
ste Carrier No. if not O'MALLEY LTD:

HICLE REG.No: EU 06 WXE **Time on Site**

IVER: BRIAN **Time off Site:**

DESCRIPTION OF MATERIAL	✓	EWC		Tonnes	KG
X LOAD FOR CRGIE AWAY		17.05.04 Inert	GROSS		
		17.09.04 Mixed Construction	TARE		
	✓	Other CRGIE	NETT		

Sic Code 4312

Quantity of Material: ..... *M³ or* ..... *Tonnes*

SPOSAL FACILITY
SITE OPERATOR: TARMAC
2 ADDRESS: HARPER LANE
SITE LICENCE No:
4 ISSUED BY: RADLETT

SPOSAL SIGNATURE: ..... ***PRINT NAME:*** .....

ODUCER SIGNATURE: ..... ***PRINT NAME:*** X JOHN CUTA.

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firm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England and Wales) Regulations 2011

e driver agree to fulfil the terms of this Transfer Note.

GNED .....

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O'MALLEY HAULAGE LTD.

The Brickfields, Oxhey Lane, Watford WD19 5RF
Telephone: 01923 252177 Fax: 01923 510282

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990
Weights and Measures Act, 1985, Schedule 4, Paragraph 7
Waste Carrier No. CBDU86635

393822

PRODUCER **i.e. Company Loading**
FULL NAME: Goddaux

ADDRESS OF TRANSACTION POINT: Bath Rd Heathrow [redacted]

NAME & ADDRESS OF BROKER WHO ARRANGED THIS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER: 25/11/16

HAULIER

Waste Carrier No. if not O'MALLEY LTD:

VEHICLE REG.No: GU16 GHF **Time on Site**

DRIVER: Mick **Time off Site:**

DESCRIPTION OF MATERIAL	✓	EWC		Tonnes	KG
1 Ld of concrete away		17.05.04 Inert	GROSS		
		17.09.04 Mixed Construction	TARE		
		Other	NETT		

Sic Code 4312

Quantity of Material: ..... ***M³ or*** ..... ***Tonnes***

DISPOSAL FACILITY
1 SITE OPERATOR: Tarmac **2 ADDRESS:** Harper lane

3 SITE LICENCE No: **4 ISSUED BY:**

DISPOSAL SIGNATURE: ***PRINT NAME:***

PRODUCER SIGNATURE: ***PRINT NAME:*** JOHN GOTH

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I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England and Wales) Regulations 2011

I, the driver agree to fulfil the terms of this Transfer Note.

SIGNED.....

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O'MALLEY HAULAGE LTD.

The Brickfields, Oxhey Lane, Watford WD19 5RF
Telephone: 01923 252177 Fax: 01923 510282

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990
Weights and Measures Act, 1985, Schedule 4, Paragraph 7
Waste Carrier No. CB/QP3679BF

384638

PRODUCER i.e. Company Loading
FULL NAME: GOLD MAX

ADDRESS OF TRANSACTION POINT: BATH RD HEATHROW

NAME & ADDRESS OF BROKER WHO ARRANGED THIS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER: 25-11-16

HAULIER

Waste Carrier No. if not O'MALLEY LTD:

VEHICLE REG.No: EU 66 WXE Time on Site:

DRIVER: BRIAN Time off Site:

DESCRIPTION OF MATERIAL

1 x LOAD C/C AWAY

Sic Code 4312

✓	EWC		Tonnes	KG
	17.05.04 Inert	GROSS		
	17.09.04 Mixed Construction	TARE		
✓	Other C/CRETE	NETT		

Quantity of Material: M³ or Tonnes

DISPOSAL FACILITY

1 SITE OPERATOR: TARMAC

2 ADDRESS: HARPER LANE

3 SITE LICENCE No:

4 ISSUED BY: RADLETT

DISPOSAL SIGNATURE: PRINT NAME:

PRODUCER SIGNATURE: PRINT NAME: MANI GUPTA

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the driver agree to fulfil the terms of this Transfer Note.

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O'MALLEY HAULAGE LTD.

The Brickfields, Oxhey Lane, Watford WD19 5RF
Telephone: 01923 252177 Fax: 01923 510282

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990
Weights and Measures Act, 1985, Schedule 4, Paragraph 7
Waste Carrier No. CBDU86635

393823

PRODUCER **i.e. Company Loading**
FULL NAME:

Goldmex

ADDRESS OF TRANSACTION POINT:

Bath Rd [redacted] Heathrow

NAME & ADDRESS OF BROKER WHO ARRANGED THIS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER:

25/1/16

HAULIER

Waste Carrier No. if not O'MALLEY LTD:

VEHICLE REG.No: CJ16 OMF **Time on Site**

DRIVER: Mick **Time off Site:**

DESCRIPTION OF MATERIAL

1 Ld of concrete away

Sic Code
4312

✓	EWC		Tonnes	KG
	17.05.04 Inert	GROSS		
	17.09.04 Mixed Construction	TARE		
	Other	NETT		

Quantity of Material: ..... ***M³ or*** ..... ***Tonnes***

DISPOSAL FACILITY

1 SITE OPERATOR: Tarmac **2 ADDRESS:** Harper Lane

3 SITE LICENCE No: **4 ISSUED BY:**

DISPOSAL SIGNATURE: ***PRINT NAME:***

PRODUCER SIGNATURE: ***PRINT NAME:*** IOAN CUTH

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the driver agree to fulfil the terms of this Transfer Note.

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Ryan Grimes
Card Geotechnics Ltd
4 Godalming Business Centre
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t: 01483 310600
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e: RyanG@cgl-uk.com

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

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

Analytical Report Number : 16-35007

Replaces Analytical Report Number : 16-35007, issue no. 1

Project / Site name:	Bath Road	**Samples received on:**	08/12/2016
Your job number:	CG18411D	**Samples instructed on:**	08/12/2016
Your order number:	3868	**Analysis completed by:**	16/12/2016
Report Issue Number:	2	**Report issued on:**	16/12/2016
Samples Analysed:	8 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 16-35007

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				670714	670715	670716	670717	670718
Sample Reference				A2.2	A3.2	A6.2	C2.2	C4.2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	0.30	0.30	0.30
Date Sampled				06/12/2016	06/12/2016	06/12/2016	06/12/2016	06/12/2016
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	9.3	4.5	7.3	9.1	9.0
Total mass of sample received	kg	0.001	NONE	0.39	0.46	0.45	0.44	0.41
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	Chrysotile	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	< 0.001	0.003
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	< 0.001	0.003
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.9	8.2	9.2	10.9	9.8
Total Cyanide	mg/kg	1	MCERTS	6	3	4	< 1	7
Total Sulphate as SO_4	mg/kg	50	MCERTS	3500	310	2000	9500	4000
Organic Matter	%	0.1	MCERTS	0.6	< 0.1	0.6	1.0	0.6
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	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.27	0.23	1.6	2.3	1.6
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.33	0.56	0.37
Fluoranthene	mg/kg	0.1	MCERTS	0.84	0.45	2.4	4.0	4.0
Pyrene	mg/kg	0.1	MCERTS	0.96	0.41	2.2	3.3	3.5
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.63	0.20	1.3	1.9	2.4
Chrysene	mg/kg	0.05	MCERTS	0.76	0.22	1.3	1.5	2.0
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.59	0.20	1.5	1.9	2.7
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.47	0.20	0.61	1.0	1.5
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.45	0.20	1.1	1.7	2.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.26	< 0.10	0.56	0.77	1.3
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.15	0.18	0.35
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.37	< 0.05	0.61	0.90	1.4
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	5.6	2.1	14	20	23
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	1.9	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	18	10	6.5	7.8
Barium (aqua regia extractable)	mg/kg	1	MCERTS	180	35	64	82	86
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.69	0.44	0.47	0.20	0.55
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	0.3	1.0	2.8	2.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	0.3	0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	25	23	24	29	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	23	24	29	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	16	25	39	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	47	9.6	18	23	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	22	19	15	17
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	38	24	25	26	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	85	23	43	79	68

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

Analytical Report Number: 16-35007

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				670714	670715	670716	670717	670718
Sample Reference				A2.2	A3.2	A6.2	C2.2	C4.2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	0.30	0.30	0.30
Date Sampled				06/12/2016	06/12/2016	06/12/2016	06/12/2016	06/12/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.3	< 1.0	2.5	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.1	2.1	9.3	2.6	7.1
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	13	< 8.0	27	26	18
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	36	< 8.0	200	160	64
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	54	< 10	240	190	90
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.6	< 1.0	1.5
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	2.9	8.5	4.2	7.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	11	< 10	38	37	29
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	30	< 10	120	200	74
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	41	16	170	240	110

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Analytical Report Number: 16-35007

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				670719	670720	670721		
Sample Reference				B2.2	B3.2	B6.2		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30	0.30	0.30		
Date Sampled				06/12/2016	06/12/2016	06/12/2016		
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	13	10	9.9		
Total mass of sample received	kg	0.001	NONE	0.34	0.42	0.37		
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile		
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	< 0.001		
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	< 0.001		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	9.7	9.4		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	2300	2900	5500		
Organic Matter	%	0.1	MCERTS	2.8	1.4	1.4		
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	0.1	MCERTS	< 0.10	< 0.10	0.16		
Acenaphthene	mg/kg	0.1	MCERTS	0.26	< 0.10	0.26		
Fluorene	mg/kg	0.1	MCERTS	0.29	< 0.10	0.33		
Phenanthrene	mg/kg	0.1	MCERTS	3.6	2.0	5.6		
Anthracene	mg/kg	0.1	MCERTS	2.3	0.44	1.5		
Fluoranthene	mg/kg	0.1	MCERTS	8.6	5.8	11		
Pyrene	mg/kg	0.1	MCERTS	7.0	4.9	9.0		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	4.2	3.1	4.9		
Chrysene	mg/kg	0.05	MCERTS	4.1	2.7	5.1		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	6.4	4.3	6.0		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	3.6	1.6	3.9		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	4.5	3.1	5.5		
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	2.9	2.3	3.4		
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	0.41	0.49	0.69		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.2	2.6	4.0		
Coronene	mg/kg	0.05	NONE	1.4	0.31	0.48		
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	53	34	61		
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	4.1	1.9	< 1.0		
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	4.9	6.2		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	160	97	130		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.57	0.33	0.39		
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	2.2	1.1		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	0.5	0.3		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (III)	mg/kg	1	NONE	30	23	20		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	23	21		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	31	31		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	49	170		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	12	18		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.1	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	25	29		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	71	84		

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Analytical Report Number: 16-35007

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				670719	670720	670721		
Sample Reference				B2.2	B3.2	B6.2		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30	0.30	0.30		
Date Sampled				06/12/2016	06/12/2016	06/12/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	2.2	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.2	< 2.0	3.1		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	25	< 8.0	12		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	240	68	88		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	270	76	100		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.6	1.5		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	9.3	5.5	11		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	81	32	60		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	340	140	180		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	430	170	260		

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Analytical Report Number: 16-35007
Project / Site name: Bath Road
Your Order No: 3868

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
670714	A2.2	0.30	166	Bitumen	**Chrysotile**	< 0.001	**< 0.001**
670717	C2.2	0.30	115	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
670718	C4.2	0.30	122	Insulation Lagging & Loose Fibres	**Chrysotile & Amosite**	0.003	**0.003**
670719	B2.2	0.30	89	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
670720	B3.2	0.30	102	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
670721	B6.2	0.30	92	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

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Analytical Report Number : 16-35007

Project / Site name: Bath Road

* 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 *
670714	A2.2	None Supplied	0.30	Brown loam and clay with gravel.
670715	A3.2	None Supplied	0.30	Brown loam and clay with gravel.
670716	A6.2	None Supplied	0.30	Brown loam and clay with gravel.
670717	C2.2	None Supplied	0.30	Brown loam and sand with gravel and brick.
670718	C4.2	None Supplied	0.30	Brown loam and sand with gravel.
670719	B2.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670720	B3.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670721	B6.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 16-35007

Project / Site name: Bath Road

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

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
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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 3, 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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	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 WAC-17 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	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	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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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
A2.2		S	16-35007	670714	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
A2.2		S	16-35007	670714	b	TPHCWG (Soil)	L076-PL	b
A3.2		S	16-35007	670715	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
A3.2		S	16-35007	670715	b	TPHCWG (Soil)	L076-PL	b
A6.2		S	16-35007	670716	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
A6.2		S	16-35007	670716	b	TPHCWG (Soil)	L076-PL	b
B2.2		S	16-35007	670719	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
B2.2		S	16-35007	670719	b	TPHCWG (Soil)	L076-PL	b
B3.2		S	16-35007	670720	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
B3.2		S	16-35007	670720	b	TPHCWG (Soil)	L076-PL	b
B6.2		S	16-35007	670721	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
B6.2		S	16-35007	670721	b	TPHCWG (Soil)	L076-PL	b
C2.2		S	16-35007	670717	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
C2.2		S	16-35007	670717	b	TPHCWG (Soil)	L076-PL	b
C4.2		S	16-35007	670718	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
C4.2		S	16-35007	670718	b	TPHCWG (Soil)	L076-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 16-35008

Project / Site name:	Bath Road	**Samples received on:**	08/12/2016
Your job number:	CG18411D	**Samples instructed on:**	08/12/2016
Your order number:	3868	**Analysis completed by:**	15/12/2016
Report Issue Number:	1	**Report issued on:**	15/12/2016
Samples Analysed:	8 10:1 WAC Samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
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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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client: CARDGEO		
Location	**Bath Road**						
Lab Reference (Sample Number)	670722 / 670723				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A1.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	2.8				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	9.0				--	>6	--
Acid Neutralisation Capacity (mol / kg)	59				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:01 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0079			0.0637	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0021			0.017	0.5	10	70
Copper *	0.011			0.089	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0026			0.0213	0.5	10	30
Nickel *	0.0006			0.0048	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.0052			0.042	0.06	0.7	5
Selenium *	0.0057			0.046	0.1	0.5	7
Zinc *	0.0026			0.021	4	50	200
Chloride *	1.8			14	800	4000	25000
Fluoride	0.47			3.8	10	150	500
Sulphate *	18			150	1000	20000	50000
TDS	59			480	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.32			43.1	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.43						
Dry Matter (%)	90						
Moisture (%)	10						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

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** = MCERTS accrediited

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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670724 / 670725				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A4.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.4				3%	5%	6%
Loss on Ignition (%) **	2.6				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	0.018				1	--	--
Mineral Oil (mg/kg)	77				500	--	--
Total PAH (WAC-17) (mg/kg)	13				100	--	--
pH (units)**	8.7				--	>6	--
Acid Neutralisation Capacity (mol / kg)	13				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0016			0.0130	0.5	2	25
Barium *	0.0076			0.0635	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0015			0.013	0.5	10	70
Copper *	0.017			0.14	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0027			0.0227	0.5	10	30
Nickel *	0.0031			0.026	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.011			0.091	0.06	0.7	5
Selenium *	0.0077			0.065	0.1	0.5	7
Zinc *	0.0037			0.031	4	50	200
Chloride *	2.4			20	800	4000	25000
Fluoride	0.83			7.0	10	150	500
Sulphate *	55			460	1000	20000	50000
TDS	100			870	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.20			52.0	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.44						
Dry Matter (%)	91						
Moisture (%)	8.6						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670726 / 670727				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A5.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	2.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	0.023				1	--	--
Mineral Oil (mg/kg)	41				500	--	--
Total PAH (WAC-17) (mg/kg)	18				100	--	--
pH (units)**	9.1				--	>6	--
Acid Neutralisation Capacity (mol / kg)	16				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:01 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0051			0.0430	0.5	2	25
Barium *	0.0081			0.0688	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0011			0.0089	0.5	10	70
Copper *	0.013			0.11	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0018			0.0148	0.5	10	30
Nickel *	0.0017			0.014	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.0082			0.070	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0022			0.019	4	50	200
Chloride *	1.8			15	800	4000	25000
Fluoride	0.18			1.5	10	150	500
Sulphate *	35			300	1000	20000	50000
TDS	85			720	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	4.70			39.8	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.46						
Dry Matter (%)	93						
Moisture (%)	6.9						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670728 / 670729				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A7.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	2.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	0.028				1	--	--
Mineral Oil (mg/kg)	82				500	--	--
Total PAH (WAC-17) (mg/kg)	11				100	--	--
pH (units)**	8.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	15				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:01 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0077			0.0631	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0018			0.015	0.5	10	70
Copper *	0.011			0.091	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0065			0.0527	0.5	10	30
Nickel *	0.0013			0.011	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.0037			0.030	0.06	0.7	5
Selenium *	0.0058			0.047	0.1	0.5	7
Zinc *	0.0037			0.031	4	50	200
Chloride *	1.9			16	800	4000	25000
Fluoride	0.43			3.5	10	150	500
Sulphate *	32			260	1000	20000	50000
TDS	71			580	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.66			46.3	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.44						
Dry Matter (%)	93						
Moisture (%)	6.8						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670730 / 670731				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	B1.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.8				3%	5%	6%
Loss on Ignition (%) **	3.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	0.024				1	--	--
Mineral Oil (mg/kg)	100				500	--	--
Total PAH (WAC-17) (mg/kg)	21				100	--	--
pH (units)**	9.0				--	>6	--
Acid Neutralisation Capacity (mol / kg)	54				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0122			0.0963	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0018			0.014	0.5	10	70
Copper *	0.012			0.095	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0015			0.0117	0.5	10	30
Nickel *	0.0005			0.0040	0.4	10	40
Lead *	0.0022			0.017	0.5	10	50
Antimony *	0.013			0.11	0.06	0.7	5
Selenium *	0.0059			0.046	0.1	0.5	7
Zinc *	0.0042			0.033	4	50	200
Chloride *	6.1			48	800	4000	25000
Fluoride	0.19			1.5	10	150	500
Sulphate *	29			230	1000	20000	50000
TDS	84			670	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.93			54.9	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.37						
Dry Matter (%)	88						
Moisture (%)	12						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670732 / 670733				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	B4.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	1.3				3%	5%	6%
Loss on Ignition (%) **	5.2				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	0.028				1	--	--
Mineral Oil (mg/kg)	110				500	--	--
Total PAH (WAC-17) (mg/kg)	24				100	--	--
pH (units)**	8.3				--	>6	--
Acid Neutralisation Capacity (mol / kg)	19				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0135			0.0958	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0018			0.013	0.5	10	70
Copper *	0.012			0.082	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0005			< 0.0040	0.5	10	30
Nickel *	0.0006			0.0043	0.4	10	40
Lead *	0.0033			0.024	0.5	10	50
Antimony *	0.0071			0.051	0.06	0.7	5
Selenium *	0.0059			0.042	0.1	0.5	7
Zinc *	0.011			0.079	4	50	200
Chloride *	4.1			29	800	4000	25000
Fluoride	0.15			1.1	10	150	500
Sulphate *	22			160	1000	20000	50000
TDS	81			570	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	8.10			57.7	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.36						
Dry Matter (%)	88						
Moisture (%)	12						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670734 / 670735				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	B5.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.9				3%	5%	6%
Loss on Ignition (%) **	5.0				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	0.029				1	--	--
Mineral Oil (mg/kg)	81				500	--	--
Total PAH (WAC-17) (mg/kg)	13				100	--	--
pH (units)**	7.9				--	>6	--
Acid Neutralisation Capacity (mol / kg)	10				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0119			0.0919	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0013			0.0098	0.5	10	70
Copper *	0.012			0.096	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0010			0.0079	0.5	10	30
Nickel *	0.0004			0.0033	0.4	10	40
Lead *	0.0018			0.014	0.5	10	50
Antimony *	0.014			0.11	0.06	0.7	5
Selenium *	0.0058			0.045	0.1	0.5	7
Zinc *	0.0039			0.030	4	50	200
Chloride *	3.1			24	800	4000	25000
Fluoride	0.17			1.3	10	150	500
Sulphate *	31			240	1000	20000	50000
TDS	82			630	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	7.70			59.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.46						
Dry Matter (%)	87						
Moisture (%)	13						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Waste Acceptance Criteria Analytical Results

Report No:	**16-35008**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	670736 / 670737				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	06/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	B2.2						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	1.6				3%	5%	6%
Loss on Ignition (%) **	5.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	300				500	--	--
Total PAH (WAC-17) (mg/kg)	54				100	--	--
pH (units)**	7.9				--	>6	--
Acid Neutralisation Capacity (mol / kg)	15				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0013			< 0.0110	0.5	2	25
Barium *	0.0136			0.0995	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0017			0.012	0.5	10	70
Copper *	0.014			0.10	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0007			0.0051	0.5	10	30
Nickel *	0.0006			0.0044	0.4	10	40
Lead *	0.0021			0.016	0.5	10	50
Antimony *	0.012			0.088	0.06	0.7	5
Selenium *	0.0084			0.062	0.1	0.5	7
Zinc *	0.0036			0.027	4	50	200
Chloride *	6.3			46	800	4000	25000
Fluoride	0.21			1.5	10	150	500
Sulphate *	32			240	1000	20000	50000
TDS	97			710	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	8.76			64.2	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.34						
Dry Matter (%)	87						
Moisture (%)	13						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Analytical Report Number : 16-35008

Project / Site name: Bath Road

* 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 *
670722	A1.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670724	A4.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670726	A5.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670728	A7.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670730	B1.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670732	B4.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670734	B5.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
670736	B2.2	None Supplied	0.30	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 16-35008

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 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	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.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

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Analytical Report Number : 16-35008

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
A1.2		S	16-35008	670722	b	BTEX in soil (Monoaromatics)	L073B-PL	b
A1.2		S	16-35008	670722	b	Total BTEX in soil (Poland)	L073-PL	b
A4.2		S	16-35008	670724	b	BTEX in soil (Monoaromatics)	L073B-PL	b
A4.2		S	16-35008	670724	b	Total BTEX in soil (Poland)	L073-PL	b
A5.2		S	16-35008	670726	b	BTEX in soil (Monoaromatics)	L073B-PL	b
A5.2		S	16-35008	670726	b	Total BTEX in soil (Poland)	L073-PL	b
A7.2		S	16-35008	670728	b	BTEX in soil (Monoaromatics)	L073B-PL	b
A7.2		S	16-35008	670728	b	Total BTEX in soil (Poland)	L073-PL	b
B1.2		S	16-35008	670730	b	BTEX in soil (Monoaromatics)	L073B-PL	b
B1.2		S	16-35008	670730	b	Total BTEX in soil (Poland)	L073-PL	b
B2.2		S	16-35008	670736	b	BTEX in soil (Monoaromatics)	L073B-PL	b
B2.2		S	16-35008	670736	b	Total BTEX in soil (Poland)	L073-PL	b
B4.2		S	16-35008	670732	b	BTEX in soil (Monoaromatics)	L073B-PL	b
B4.2		S	16-35008	670732	b	Total BTEX in soil (Poland)	L073-PL	b
B5.2		S	16-35008	670734	b	BTEX in soil (Monoaromatics)	L073B-PL	b
B5.2		S	16-35008	670734	b	Total BTEX in soil (Poland)	L073-PL	b

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Analytical Report Number : 16-36164

Project / Site name:	Bath Road	**Samples received on:**	20/12/2016
Your job number:	CG18411D	**Samples instructed on:**	21/12/2016
Your order number:	3868	**Analysis completed by:**	30/12/2016
Report Issue Number:	1	**Report issued on:**	30/12/2016
Samples Analysed:	7 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
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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Analytical Report Number: 16-36164

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				678227	678228	678229	678230	678231
Sample Reference				1A	2B	3F	5C	6D
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.45	0.00	0.30	0.45
Date Sampled				19/12/2016	19/12/2016	19/12/2016	19/12/2016	19/12/2016
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	17	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.3	15	8.7	11	12
Total mass of sample received	kg	0.001	NONE	0.15	0.17	0.78	0.45	0.16
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Amosite- Loose Fibres	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected
General Inorganics								
pH - Manual	pH Units	N/A	MCERTS	-	-	-	-	-
pH - Automated	pH Units	N/A	MCERTS	I/S	8.9	10.1	11.0	9.4
Total Cyanide	mg/kg	1	MCERTS	1	< 1	1	1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	1400	700	1800	2500	1200
Organic Matter	%	0.1	MCERTS	< 0.1	0.2	0.3	0.4	0.7
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	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.50	< 0.10	0.30	0.38	0.22
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	0.97	< 0.10	0.60	0.87	0.54
Pyrene	mg/kg	0.1	MCERTS	0.92	< 0.10	0.58	0.86	0.49
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.41	< 0.10	0.24	0.56	0.29
Chrysene	mg/kg	0.05	MCERTS	0.49	< 0.05	0.32	0.43	0.29
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.37	< 0.10	0.24	0.44	0.33
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.29	< 0.10	0.22	0.34	0.21
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.27	< 0.10	0.21	0.27	0.20
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	4.2	< 1.6	2.7	4.3	2.6
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.3	2.5	1.1	1.7	1.6
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	12	8.9	8.9	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	76	100	63	85	73
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65	0.62	0.47	0.49	0.56
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	1.2	2.6	2.1	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	20	24	19	26	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	24	19	26	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	29	19	27	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	41	18	23	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.5	0.4	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	17	17	18	17
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	38	33	27	32	31
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	81	41	54	52

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

Analytical Report Number: 16-36164

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				678227	678228	678229	678230	678231
Sample Reference				1A	2B	3F	5C	6D
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.45	0.00	0.30	0.45
Date Sampled				19/12/2016	19/12/2016	19/12/2016	19/12/2016	19/12/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.1	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.3	< 2.0	2.1	2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	21	< 8.0	13	25	14
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	34	< 10	22	35	18
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	12	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	15	14	22	< 10	16

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Analytical Report Number: 16-36164

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				678232	678605			
Sample Reference				7E	4D			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.00	0.45			
Date Sampled				19/12/2016	19/12/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	9.4	5.6			
Total mass of sample received	kg	0.001	NONE	1.1	0.13			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile- Loose Fibres	-			
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected			
General Inorganics								
pH - Manual	pH Units	N/A	MCERTS	-	8.4			
pH - Automated	pH Units	N/A	MCERTS	10.3	-			
Total Cyanide	mg/kg	1	MCERTS	2	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	1800	750			
Organic Matter	%	0.1	MCERTS	0.5	0.1			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Phenanthrene	mg/kg	0.1	MCERTS	0.70	< 0.10			
Anthracene	mg/kg	0.1	MCERTS	0.13	< 0.10			
Fluoranthene	mg/kg	0.1	MCERTS	1.6	< 0.10			
Pyrene	mg/kg	0.1	MCERTS	1.5	< 0.10			
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.84	< 0.10			
Chrysene	mg/kg	0.05	MCERTS	0.81	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.93	< 0.10			
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.51	< 0.10			
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.65	< 0.10			
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.30	< 0.10			
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.43	< 0.05			
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05			
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	8.4	< 1.6			
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.6	9.1			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	79	43			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47	0.50			
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	0.5			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2			
Chromium (III)	mg/kg	1	NONE	26	21			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	21			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	15			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	17			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	17			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	27			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	45			

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Analytical Report Number: 16-36164

Project / Site name: Bath Road
Your Order No: 3868

Lab Sample Number				678232	678605			
Sample Reference				7E	4D			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.00	0.45			
Date Sampled				19/12/2016	19/12/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	2.3	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	22	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	32	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.2	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.5	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	16	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	30	< 10			

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Analytical Report Number : 16-36164

Project / Site name: Bath Road

* 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 *
678227	1A	None Supplied	0.30	Brown clay and sand with gravel.
678228	2B	None Supplied	0.45	Brown clay and sand with gravel.
678229	3F	None Supplied	0.00	Brown clay with stones.
678230	5C	None Supplied	0.30	Brown clay and sand with rubble.
678231	6D	None Supplied	0.45	Brown clay and sand with gravel.
678232	7E	None Supplied	0.00	Brown clay and sand with gravel.
678605	4D	None Supplied	0.45	Light brown clay and sand with gravel.

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Analytical Report Number : 16-36164

Project / Site name: Bath Road

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

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
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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 3, 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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-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 WAC-17 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	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	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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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
3F		S	16-36164	678229	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
3F		S	16-36164	678229	b	Monohydric phenols in soil	L080-PL	b
3F		S	16-36164	678229	b	Speciated WAC-17 PAHs in soil	L064-PL	b
3F		S	16-36164	678229	b	TPHCWG (Soil)	L076-PL	b
5C		S	16-36164	678230	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
5C		S	16-36164	678230	b	TPHCWG (Soil)	L076-PL	b
7E		S	16-36164	678232	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
7E		S	16-36164	678232	b	Monohydric phenols in soil	L080-PL	b
7E		S	16-36164	678232	b	Speciated WAC-17 PAHs in soil	L064-PL	b
7E		S	16-36164	678232	b	TPHCWG (Soil)	L076-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 17-41291

Replaces Analytical Report Number : 17-41291, issue no. 1

Project / Site name:	Bath Road, Heathrow	**Samples received on:**	28/02/2017
Your job number:	CG-18411D	**Samples instructed on:**	28/02/2017
Your order number:	4097	**Analysis completed by:**	15/03/2017
Report Issue Number:	2	**Report issued on:**	15/03/2017
Samples Analysed:	19 soil samples		

Signed:

Rexona Rahman
Reporting Manager
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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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709739	709740	709741	709742	709743
Sample Reference				A101	A102	A103	A104	A105
Sample Number				1	2	3	4	5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
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	7.2	13	11	11	12
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	-	Chrysotile	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.001	< 0.001	-	< 0.001	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	0.001	< 0.001	-	< 0.001	< 0.001
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.6	9.8	8.9	10.0	9.6
Total Cyanide	mg/kg	1	MCERTS	3	2	2	2	4
Total Sulphate as SO_4	mg/kg	50	MCERTS	6400	2500	1000	4600	3200
Organic Matter	%	0.1	MCERTS	0.7	0.5	0.3	0.9	0.5
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	0.29	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.59	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.68	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.37	0.21	< 0.10	4.0	0.42
Anthracene	mg/kg	0.1	MCERTS	0.15	< 0.10	< 0.10	0.96	0.15
Fluoranthene	mg/kg	0.1	MCERTS	1.6	0.73	< 0.10	4.2	1.2
Pyrene	mg/kg	0.1	MCERTS	1.8	0.78	< 0.10	3.7	1.4
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.4	0.57	< 0.10	2.7	0.86
Chrysene	mg/kg	0.05	MCERTS	0.98	0.41	< 0.05	1.9	0.56
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.7	0.59	< 0.10	2.3	0.80
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.75	0.26	< 0.10	1.5	0.51
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.3	0.40	< 0.10	1.9	0.65
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.86	0.28	< 0.10	1.2	0.44
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.25	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.95	0.33	< 0.05	1.2	0.50
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	12	4.6	< 1.6	27	7.4
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	4.1	2.5	1.3	5.4	2.5
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	13	13	16	15
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	77	62	110	89
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46	0.54	0.63	0.44	0.56
Boron (water soluble)	mg/kg	0.2	MCERTS	2.1	2.1	1.1	2.9	2.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	26	21	28	23	22
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	21	28	23	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	21	23	23	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	31	15	46	26
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	17	30	16	19
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	34	36	34	31	35
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86	73	53	76	73

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

Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709739	709740	709741	709742	709743
Sample Reference				A101	A102	A103	A104	A105
Sample Number				1	2	3	4	5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.2	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	9.7	3.7	< 2.0	4.2	7.1
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	21	8.1	< 8.0	16	17
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	46	32	< 8.0	75	42
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	76	45	< 10	96	66
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.7	< 2.0	3.8	3.4
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	19	13	< 10	22	16
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	70	56	20	110	39
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	90	73	26	140	58

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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709744	709745	709746	709747	709748
Sample Reference				A106	A107	A108	A109	A110
Sample Number				6	7	8	9	10
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
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	11	13	14	10	10
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.5	9.8	8.9	9.1	9.5
Total Cyanide	mg/kg	1	MCERTS	3	4	< 1	5	9
Total Sulphate as SO_4	mg/kg	50	MCERTS	4900	2700	1200	1700	2800
Organic Matter	%	0.1	MCERTS	0.7	1.1	0.7	0.6	0.7
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	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.49	0.31	< 0.10	0.29	0.45
Anthracene	mg/kg	0.1	MCERTS	0.11	< 0.10	< 0.10	< 0.10	0.13
Fluoranthene	mg/kg	0.1	MCERTS	1.1	1.0	0.46	0.94	1.1
Pyrene	mg/kg	0.1	MCERTS	1.2	0.98	0.47	0.93	1.2
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.80	0.70	0.37	0.63	0.81
Chrysene	mg/kg	0.05	MCERTS	0.54	0.46	0.28	0.42	0.55
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.65	0.74	0.35	0.55	0.74
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.45	0.26	0.25	0.40	0.51
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.58	0.53	0.28	0.44	0.68
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.30	0.29	< 0.10	0.28	0.37
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.36	0.29	< 0.05	0.26	0.45
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	6.6	5.6	2.5	5.1	7.0
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.0	2.0	1.3	2.4	2.5
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	7.6	9.6	7.3	8.3
Barium (aqua regia extractable)	mg/kg	1	MCERTS	99	82	76	79	88
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.57	0.53	0.66	0.65	0.63
Boron (water soluble)	mg/kg	0.2	MCERTS	2.5	1.9	1.0	2.5	4.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	26	22	23	28	25
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	22	23	28	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	19	19	45	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	20	21	25	32
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	19	16	18	24	20
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	37	34	36	35	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	91	61	52	70	75

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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709744	709745	709746	709747	709748
Sample Reference				A106	A107	A108	A109	A110
Sample Number				6	7	8	9	10
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.0	1.6
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.0	< 2.0	< 2.0	16	4.7
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	12	< 8.0	< 8.0	31	12
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	47	18	< 8.0	180	40
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	63	26	< 10	230	58
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	3.1	< 2.0	< 2.0	4.7	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	15	< 10	< 10	18	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	49	25	< 10	71	31
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	68	35	11	94	42

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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709749	709750	709751	709752	709753
Sample Reference				A111	A112	A113	A114	A115
Sample Number				11	12	13	14	15
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
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	12	10	10	12	14
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	0.023	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	0.023	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.0	9.4	9.1	8.3	9.7
Total Cyanide	mg/kg	1	MCERTS	2	5	23	2	2800
Total Sulphate as SO_4	mg/kg	50	MCERTS	2500	1600	1000	2000	2000
Organic Matter	%	0.1	MCERTS	0.6	0.8	0.8	0.5	0.7
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	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.92	< 0.10	1.0	< 0.10	0.51
Anthracene	mg/kg	0.1	MCERTS	0.29	< 0.10	0.17	< 0.10	0.15
Fluoranthene	mg/kg	0.1	MCERTS	2.1	0.55	2.0	< 0.10	0.98
Pyrene	mg/kg	0.1	MCERTS	2.2	0.58	1.3	< 0.10	0.85
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.5	0.31	1.5	< 0.10	0.48
Chrysene	mg/kg	0.05	MCERTS	1.0	0.34	1.1	< 0.05	0.48
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.6	0.36	1.1	< 0.10	0.42
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.62	0.26	0.85	< 0.10	0.32
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.3	0.28	0.80	< 0.10	0.36
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.66	< 0.10	0.41	< 0.10	0.21
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.70	< 0.05	0.40	< 0.05	0.28
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	13	2.7	11	< 1.6	5.0
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.0	1.7	2.3	2.3	2.1
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.2	9.3	12	12	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	75	79	61	79	95
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.61	0.55	0.54	0.71	0.58
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	1.8	3.6	2.6	1.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	23	22	22	26	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	22	22	26	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	17	22	26	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	21	24	25	27
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	19	18	16	22	17
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	35	32	32	38	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	54	58	56	65

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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709749	709750	709751	709752	709753
Sample Reference				A111	A112	A113	A114	A115
Sample Number				11	12	13	14	15
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.3	< 2.0	< 2.0	< 2.0	4.1
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	8.5
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	23	< 8.0	< 8.0	< 8.0	27
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	34	< 10	< 10	< 10	40
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	15	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	32	< 10	< 10	< 10	11
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	49	< 10	10	< 10	21

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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709754	709755	709756	709757	
Sample Reference				A116	AT101	AT102	AT103	
Sample Number				16	17	18	19	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	
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	42	
Moisture Content	%	N/A	NONE	4.4	15	13	4.6	
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.3	7.8	7.5	7.4	
Total Cyanide	mg/kg	1	MCERTS	3	< 1	< 1	7	
Total Sulphate as SO_4	mg/kg	50	MCERTS	2100	650	480	310	
Organic Matter	%	0.1	MCERTS	0.5	0.4	0.3	< 0.1	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluoranthene	mg/kg	0.1	MCERTS	0.39	< 0.10	< 0.10	< 0.10	
Pyrene	mg/kg	0.1	MCERTS	0.45	< 0.10	< 0.10	< 0.10	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.29	< 0.10	< 0.10	< 0.10	
Chrysene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	< 1.6	< 1.6	< 1.6	< 1.6	
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.7	< 1.0	1.2	< 1.0	
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.6	16	11	5.2	
Barium (aqua regia extractable)	mg/kg	1	MCERTS	52	75	80	24	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.93	1.3	0.27	
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	1.3	0.5	0.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	
Chromium (III)	mg/kg	1	NONE	18	32	32	12	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	32	32	12	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	18	20	9.3	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	12	12	6.4	
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	15	28	45	12	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25	45	48	20	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	49	53	21	

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Analytical Report Number: 17-41291

Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Lab Sample Number				709754	709755	709756	709757	
Sample Reference				A116	AT101	AT102	AT103	
Sample Number				16	17	18	19	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				24/02/2017	24/02/2017	24/02/2017	24/02/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	

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Analytical Report Number: 17-41291
Project / Site name: Bath Road, Heathrow
Your Order No: 4097

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
709739	A101		210	Loose Fibres & Insulation Lagging	**Chrysotile**	0.001	**0.001**
709740	A102		169	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
709742	A104		193	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
709743	A105		164	Loose Fibres & Bitumen	**Chrysotile & Amosite**	< 0.001	**< 0.001**
709749	A111		125	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
709750	A112		139	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
709751	A113		129	Insulation Lagging	**Chrysotile**	0.023	**0.023**

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

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Analytical Report Number : 17-41291

Project / Site name: Bath Road, Heathrow

* 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 *
709739	A101	1	None Supplied	Brown clay and loam with gravel.
709740	A102	2	None Supplied	Brown clay and loam with gravel.
709741	A103	3	None Supplied	Brown clay and loam with gravel.
709742	A104	4	None Supplied	Brown loam and sand with gravel.
709743	A105	5	None Supplied	Brown clay and loam with gravel.
709744	A106	6	None Supplied	Brown clay and loam with gravel.
709745	A107	7	None Supplied	Brown clay and loam with gravel.
709746	A108	8	None Supplied	Brown clay and loam with gravel.
709747	A109	9	None Supplied	Brown clay and loam with gravel.
709748	A110	10	None Supplied	Brown clay and loam with gravel.
709749	A111	11	None Supplied	Brown clay and loam with gravel.
709750	A112	12	None Supplied	Brown clay and loam with gravel.
709751	A113	13	None Supplied	Brown clay and loam with gravel.
709752	A114	14	None Supplied	Brown clay and loam with gravel.
709753	A115	15	None Supplied	Brown clay and loam with gravel.
709754	A116	16	None Supplied	Brown clay and loam with gravel.
709755	AT101	17	None Supplied	Brown loam with gravel.
709756	AT102	18	None Supplied	Brown clay and sand with gravel.
709757	AT103	19	None Supplied	Brown loam and sand with gravel and stones.

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Analytical Report Number : 17-41291

Project / Site name: Bath Road, Heathrow

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

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
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	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 WAC-17 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	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	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 : 17-42432

Project / Site name:	Bath Road, Heathrow	**Samples received on:**	28/02/2017
Your job number:	CG-18411D	**Samples instructed on:**	10/03/2017
Your order number:	4097	**Analysis completed by:**	21/03/2017
Report Issue Number:	1	**Report issued on:**	21/03/2017
Samples Analysed:	9 10:1 WAC sample		

Signed:

Dr Irma Doyle
Senior Account Manager
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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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client:	**CARDGEO**	
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716502 / 716503				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	24/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A103 3						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	< 0.1				3%	5%	6%
Loss on Ignition (%) **	3.2				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	1.8				100	--	--
pH (units)**	9.5				--	>6	--
Acid Neutralisation Capacity (mol / kg)	3.3				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0071			0.0640	0.5	2	25
Barium *	0.0118			0.106	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0043			0.038	0.5	10	70
Copper *	0.0066			0.060	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	< 0.0004			< 0.0040	0.5	10	30
Nickel *	0.0022			0.020	0.4	10	40
Lead *	0.0030			0.028	0.5	10	50
Antimony *	0.0069			0.062	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0064			0.058	4	50	200
Chloride *	0.60			5.4	800	4000	25000
Fluoride	0.30			2.7	10	150	500
Sulphate *	20			180	1000	20000	50000
TDS	70			630	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	3.56			32.2	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	89						
Moisture (%)	11						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client: CARDGEO		
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716504 / 716505				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A106 6						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	3.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	98				500	--	--
Total PAH (WAC-17) (mg/kg)	6.0				100	--	--
pH (units)**	9.3				--	>6	--
Acid Neutralisation Capacity (mol / kg)	1.5				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0090			0.0807	0.5	2	25
Barium *	0.0055			0.0493	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0032			0.029	0.5	10	70
Copper *	0.0093			0.084	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0143			0.129	0.5	10	30
Nickel *	0.0012			0.011	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.011			0.095	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0035			0.031	4	50	200
Chloride *	1.4			12	800	4000	25000
Fluoride	0.29			2.6	10	150	500
Sulphate *	40			360	1000	20000	50000
TDS	110			980	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	4.24			38.3	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	89						
Moisture (%)	11						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client: CARDGEO		
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716506 / 716507				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A107 7						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.4				3%	5%	6%
Loss on Ignition (%) **	3.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	29				500	--	--
Total PAH (WAC-17) (mg/kg)	4.4				100	--	--
pH (units)**	9.2				--	>6	--
Acid Neutralisation Capacity (mol / kg)	3.0				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0103			0.0887	0.5	2	25
Barium *	0.0087			0.0754	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0030			0.026	0.5	10	70
Copper *	0.0072			0.063	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0075			0.0651	0.5	10	30
Nickel *	0.0012			0.011	0.4	10	40
Lead *	0.0012			0.011	0.5	10	50
Antimony *	0.0094			0.081	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0037			0.032	4	50	200
Chloride *	0.82			7.1	800	4000	25000
Fluoride	0.32			2.8	10	150	500
Sulphate *	32			270	1000	20000	50000
TDS	88			760	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	3.88			33.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	87						
Moisture (%)	13						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client: CARDGEO		
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716508 / 716509				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A108 8						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	3.4				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	4.0				100	--	--
pH (units)**	9.3				--	>6	--
Acid Neutralisation Capacity (mol / kg)	5.3				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0053			0.0334	0.5	2	25
Barium *	0.0193			0.121	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0051			0.032	0.5	10	70
Copper *	0.0049			0.031	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0016			0.0102	0.5	10	30
Nickel *	0.0034			0.022	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0010			0.0066	4	50	200
Chloride *	3.6			22	800	4000	25000
Fluoride	0.46			2.9	10	150	500
Sulphate *	8.9			56	1000	20000	50000
TDS	52			330	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	4.73			29.7	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	86						
Moisture (%)	14						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client:	**CARDGEO**	
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716510 / 716511				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A109 9						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	2.8				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	210				500	--	--
Total PAH (WAC-17) (mg/kg)	5.7				100	--	--
pH (units)**	8.5				--	>6	--
Acid Neutralisation Capacity (mol / kg)	2.9				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0034			0.0292	0.5	2	25
Barium *	0.0121			0.103	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0034			0.029	0.5	10	70
Copper *	0.0057			0.049	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0153			0.130	0.5	10	30
Nickel *	0.0024			0.020	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.012			0.098	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0049			0.041	4	50	200
Chloride *	0.99			8.4	800	4000	25000
Fluoride	0.80			6.8	10	150	500
Sulphate *	40			340	1000	20000	50000
TDS	98			830	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	3.10			26.3	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	90						
Moisture (%)	10						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client:	**CARDGEO**	
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716512 / 716513				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	24/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A110 10						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	3.0				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	86				500	--	--
Total PAH (WAC-17) (mg/kg)	7.2				100	--	--
pH (units)**	8.9				--	>6	--
Acid Neutralisation Capacity (mol / kg)	2.6				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0106			0.0896	0.5	2	25
Barium *	0.0210			0.178	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0054			0.045	0.5	10	70
Copper *	0.015			0.13	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0135			0.114	0.5	10	30
Nickel *	0.0046			0.039	0.4	10	40
Lead *	0.0068			0.058	0.5	10	50
Antimony *	0.0099			0.084	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0093			0.079	4	50	200
Chloride *	0.97			8.2	800	4000	25000
Fluoride	0.44			3.7	10	150	500
Sulphate *	43			370	1000	20000	50000
TDS	110			910	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.54			55.4	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	90						
Moisture (%)	10						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client:	**CARDGEO**	
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716514 / 716515				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	27/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A114 14						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.2				3%	5%	6%
Loss on Ignition (%) **	3.3				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	7.6				--	>6	--
Acid Neutralisation Capacity (mol / kg)	1.5				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0122			0.104	0.5	2	25
Barium *	0.0130			0.111	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0039			0.034	0.5	10	70
Copper *	0.013			0.11	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0022			0.0184	0.5	10	30
Nickel *	0.0045			0.038	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.028			0.24	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0019			0.016	4	50	200
Chloride *	1.2			9.9	800	4000	25000
Fluoride	0.85			7.2	10	150	500
Sulphate *	72			610	1000	20000	50000
TDS	120			1000	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	4.88			41.6	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	88						
Moisture (%)	12						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client:	**CARDGEO**	
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716516 / 716517				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	27/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A115 15						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.4				3%	5%	6%
Loss on Ignition (%) **	3.3				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	31				500	--	--
Total PAH (WAC-17) (mg/kg)	5.2				100	--	--
pH (units)**	9.3				--	>6	--
Acid Neutralisation Capacity (mol / kg)	8.0				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0084			0.0576	0.5	2	25
Barium *	0.0033			0.0228	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0026			0.018	0.5	10	70
Copper *	0.0044			0.030	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0113			0.0774	0.5	10	30
Nickel *	0.0011			0.0074	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	0.0062			0.043	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0058			0.040	4	50	200
Chloride *	1.3			8.9	800	4000	25000
Fluoride	0.51			3.5	10	150	500
Sulphate *	27			190	1000	20000	50000
TDS	73			500	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.04			34.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	86						
Moisture (%)	14						

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Waste Acceptance Criteria Analytical Results

Report No:	**17-42432**						
					Client:	**CARDGEO**	
Location	**Bath Road, Heathrow**						
Lab Reference (Sample Number)	716518 / 716519				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	27/02/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	A116 16						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	0.1				3%	5%	6%
Loss on Ignition (%) **	2.6				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	24				500	--	--
Total PAH (WAC-17) (mg/kg)	2.0				100	--	--
pH (units)**	8.1				--	>6	--
Acid Neutralisation Capacity (mol / kg)	3.1				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0033			0.0313	0.5	2	25
Barium *	0.0122			0.115	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0043			0.041	0.5	10	70
Copper *	0.0072			0.068	2	50	100
Mercury *	0.0013			0.0124	0.01	0.2	2
Molybdenum *	0.0059			0.0559	0.5	10	30
Nickel *	0.0027			0.025	0.4	10	40
Lead *	0.0017			0.016	0.5	10	50
Antimony *	0.0055			0.051	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0078			0.073	4	50	200
Chloride *	0.69			6.5	800	4000	25000
Fluoride	0.41			3.8	10	150	500
Sulphate *	26			250	1000	20000	50000
TDS	67			630	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	3.59			33.8	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	96						
Moisture (%)	4.4						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and I2 cannot be held responsible for any discrepencies with current legislation

*= UKAS accredited (liquid eluate analysis only)
** = MCERTS accrediited

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Analytical Report Number : 17-42432

Project / Site name: Bath Road, Heathrow

* 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 *
716502	A103	3	None Supplied	Brown clay and loam with gravel.
716504	A106	6	None Supplied	Brown clay and loam with gravel.
716506	A107	7	None Supplied	Brown clay and loam with gravel.
716508	A108	8	None Supplied	Brown clay and loam with gravel.
716510	A109	9	None Supplied	Brown clay and loam with gravel.
716512	A110	10	None Supplied	Brown clay and loam with gravel.
716514	A114	14	None Supplied	Brown clay and loam with gravel.
716516	A115	15	None Supplied	Brown clay and loam with gravel.
716518	A116	16	None Supplied	Brown clay and loam with gravel.

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Analytical Report Number : 17-42432

Project / Site name: Bath Road, Heathrow

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	NONE
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 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 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	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.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

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Analytical Report Number : 17-42432

Project / Site name: Bath Road, Heathrow

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
A103	3	S	17-42432	716502	c	BTEX in soil (Monoaromatics)	L073B-PL	c
A103	3	S	17-42432	716502	c	Organic matter in soil	L023-PL	c
A103	3	S	17-42432	716502	c	Total BTEX in soil (Poland)	L073-PL	c
A106	6	S	17-42432	716504	c	BTEX in soil (Monoaromatics)	L073B-PL	c
A106	6	S	17-42432	716504	c	Organic matter in soil	L023-PL	c
A106	6	S	17-42432	716504	c	Total BTEX in soil (Poland)	L073-PL	c
A107	7	S	17-42432	716506	c	BTEX in soil (Monoaromatics)	L073B-PL	c
A107	7	S	17-42432	716506	c	Organic matter in soil	L023-PL	c
A107	7	S	17-42432	716506	c	Total BTEX in soil (Poland)	L073-PL	c
A108	8	S	17-42432	716508	c	BTEX in soil (Monoaromatics)	L073B-PL	c
A108	8	S	17-42432	716508	c	Organic matter in soil	L023-PL	c
A108	8	S	17-42432	716508	c	Total BTEX in soil (Poland)	L073-PL	c
A109	9	S	17-42432	716510	c	BTEX in soil (Monoaromatics)	L073B-PL	c
A109	9	S	17-42432	716510	c	Organic matter in soil	L023-PL	c
A109	9	S	17-42432	716510	c	Total BTEX in soil (Poland)	L073-PL	c
A110	10	S	17-42432	716512	c	BTEX in soil (Monoaromatics)	L073B-PL	c
A110	10	S	17-42432	716512	c	Organic matter in soil	L023-PL	c
A110	10	S	17-42432	716512	c	Total BTEX in soil (Poland)	L073-PL	c

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Analytical Report Number : 17-43473

Project / Site name:	Bath Road	**Samples received on:**	21/03/2017
Your job number:	CG-18411D	**Samples instructed on:**	22/03/2017
Your order number:		**Analysis completed by:**	31/03/2017
Report Issue Number:	1	**Report issued on:**	31/03/2017
Samples Analysed:	6 soil samples		

Signed:

Rexona Rahman
Reporting Manager
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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 17-43473

Project / Site name: Bath Road

Lab Sample Number				722342	722343	722344	722345	722346
Sample Reference				B101	B102	B103	B104	B105
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				21/03/2017	21/03/2017	21/03/2017	21/03/2017	21/03/2017
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	11	9.2	13	12	12
Total mass of sample received	kg	0.001	NONE	2.0	1.9	1.8	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	-	Chrysotile	Chrysotile, Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	-	< 0.001	0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	-	< 0.001	0.001
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.0	8.8	8.3	8.4	9.2
Total Cyanide	mg/kg	1	MCERTS	25	25	< 1	51	1
Total Sulphate as SO_4	mg/kg	50	MCERTS	4100	1200	560	880	2300
Organic Matter	%	0.1	MCERTS	0.5	0.3	0.7	0.8	0.6
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	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.31
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.27
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.29
Phenanthrene	mg/kg	0.1	MCERTS	0.57	0.33	0.52	0.35	4.9
Anthracene	mg/kg	0.1	MCERTS	0.17	< 0.10	< 0.10	< 0.10	1.4
Fluoranthene	mg/kg	0.1	MCERTS	1.6	0.89	1.6	0.64	9.7
Pyrene	mg/kg	0.1	MCERTS	1.8	0.90	1.6	0.62	8.9
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.91	0.50	0.78	0.31	4.4
Chrysene	mg/kg	0.05	MCERTS	0.83	0.50	0.77	0.35	3.8
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.0	0.62	0.95	0.35	4.7
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.51	0.30	0.48	0.22	2.1
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.94	0.53	0.82	0.34	4.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.49	0.32	0.45	0.20	2.0
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.54
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.58	0.35	0.52	0.22	2.4
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	0.61
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	9.4	5.2	8.4	3.6	50
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.0	1.4	1.8	1.2	3.5
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	14	17	17	19
Barium (aqua regia extractable)	mg/kg	1	MCERTS	110	72	92	96	100
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.73	0.90	0.81	0.83	0.87
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	1.9	1.4	2.6	1.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	27	26	27	25	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	26	27	25	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	37	23	45	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	37	32	27	42
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	22	26	22	25	23
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	39	38	42	42	43
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	92	75	63	79	120

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Analytical Report Number: 17-43473

Project / Site name: Bath Road

Lab Sample Number				722342	722343	722344	722345	722346
Sample Reference				B101	B102	B103	B104	B105
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				21/03/2017	21/03/2017	21/03/2017	21/03/2017	21/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.2	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.0	4.0	< 2.0	< 2.0	9.9
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	9.7	11	< 8.0	< 8.0	23
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	29	45	< 8.0	< 8.0	38
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	45	61	< 10	< 10	71
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	1.2	< 1.0	< 1.0	< 1.0	3.1
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	4.2	2.1	2.9	< 2.0	19
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	20	13	14	< 10	67
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	53	43	30	< 10	110
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	77	58	47	< 10	200

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Analytical Report Number: 17-43473

Project / Site name: Bath Road

Lab Sample Number				722347				
Sample Reference				B106				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/03/2017				
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	8.8				
Total mass of sample received	kg	0.001	NONE	2.0				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-				
Asbestos Quantification Total	%	0.001	ISO 17025	-				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.7				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	2300				
Organic Matter	%	0.1	MCERTS	0.7				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10				
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10				
Fluorene	mg/kg	0.1	MCERTS	< 0.10				
Phenanthrene	mg/kg	0.1	MCERTS	0.98				
Anthracene	mg/kg	0.1	MCERTS	0.34				
Fluoranthene	mg/kg	0.1	MCERTS	2.0				
Pyrene	mg/kg	0.1	MCERTS	2.1				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.0				
Chrysene	mg/kg	0.05	MCERTS	0.98				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.2				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.65				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.1				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.58				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	0.13				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.72				
Coronene	mg/kg	0.05	NONE	< 0.05				
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	12				
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.7				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.4				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	110				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	23				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	59				
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				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	95				

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

Analytical Report Number: 17-43473

Project / Site name: Bath Road

Lab Sample Number				722347				
Sample Reference				B106				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				21/03/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.4				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	16				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	28				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	53				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	99				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.7				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	14				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	37				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	58				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	110				

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Analytical Report Number: 17-43473
Project / Site name: Bath Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
722342	B101		138	Loose fibres	**Chrysotile**	< 0.001	**< 0.001**
722343	B102		130	Loose fibres	**Chrysotile**	< 0.001	**< 0.001**
722345	B104		130	Loose fibres	**Chrysotile**	< 0.001	**< 0.001**
722346	B105		132	Loose fibrous debris, Loose fibres	**Chrysotile, Amosite**	0.001	**0.001**

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

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Analytical Report Number : 17-43473

Project / Site name: Bath Road

* 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 *
722342	B101	None Supplied	None Supplied	Brown clay and sand with gravel.
722343	B102	None Supplied	None Supplied	Brown clay and sand with gravel.
722344	B103	None Supplied	None Supplied	Brown clay and sand with gravel.
722345	B104	None Supplied	None Supplied	Brown clay and sand with gravel.
722346	B105	None Supplied	None Supplied	Brown clay and sand with gravel.
722347	B106	None Supplied	None Supplied	Brown clay and sand with gravel.

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Analytical Report Number : 17-43473

Project / Site name: Bath Road

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

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
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	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 WAC-17 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	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

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Analytical Report Number : 17-43473

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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 : 17-43475

Project / Site name:	Bath Road	**Samples received on:**	22/03/2017
Your job number:	CG-18411D	**Samples instructed on:**	22/03/2017
Your order number:		**Analysis completed by:**	29/03/2017
Report Issue Number:	1	**Report issued on:**	29/03/2017
Samples Analysed:	6 soil samples		

Signed:

Rexona Rahman
Reporting Manager
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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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 17-43475

Project / Site name: Bath Road

Lab Sample Number				722354	722355	722356	722357	722358
Sample Reference				Attn 3	Attn 3	Attn 3	Attn 3	Attn 3
Sample Number				ES1	ES3	ES5	ES7	ES9
Depth (m)				0.30	0.50	0.40	0.40	0.50
Date Sampled				21/03/2017	21/03/2017	21/03/2017	21/03/2017	21/03/2017
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	9.1	8.9	8.3	11	11
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	Chrysotile	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	0.013	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	0.013	-	< 0.001
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.8	7.6	7.9	10.3	9.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	1	1
Total Sulphate as SO_4	mg/kg	50	MCERTS	3000	2400	2200	2300	2600
Organic Matter	%	0.1	MCERTS	3.2	4.8	7.1	3.0	2.4
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	0.34	0.24	0.25
Acenaphthylene	mg/kg	0.1	MCERTS	0.15	< 0.10	0.46	0.33	0.60
Acenaphthene	mg/kg	0.1	MCERTS	0.68	0.20	1.7	0.86	1.8
Fluorene	mg/kg	0.1	MCERTS	0.59	0.22	1.4	0.59	0.93
Phenanthrene	mg/kg	0.1	MCERTS	6.7	0.90	10	4.8	6.6
Anthracene	mg/kg	0.1	MCERTS	1.8	0.19	3.5	1.5	2.4
Fluoranthene	mg/kg	0.1	MCERTS	12	0.98	28	7.3	15
Pyrene	mg/kg	0.1	MCERTS	10	1.1	28	6.6	12
Benzo(a)anthracene	mg/kg	0.1	MCERTS	4.3	0.81	15	2.7	5.2
Chrysene	mg/kg	0.05	MCERTS	4.1	0.83	9.9	2.7	4.5
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	6.0	0.64	16	3.1	5.6
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	2.2	0.43	9.9	2.0	1.9
Benzo(a)pyrene	mg/kg	0.1	MCERTS	4.7	0.61	13	2.9	4.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	2.4	0.32	7.3	1.5	2.0
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	0.66	< 0.10	2.1	0.41	0.61
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.7	0.51	8.1	1.7	2.1
Coronene	mg/kg	0.05	NONE	0.36	< 0.05	1.1	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	59	7.7	160	39	65
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.1	1.0	7.7	1.1	1.7
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	24	24	22	21	14
Barium (aqua regia extractable)	mg/kg	1	MCERTS	750	550	330	300	1000
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.9	1.1	1.2	0.86	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	2.2	1.2	1.7	2.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.7	< 0.2	0.4	0.4
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	29	24	17	20	28
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	24	18	20	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	65	51	63	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	1100	93	420	820	1800
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.4	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	27	27	23	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	2.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	51	29	43	44	56
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	380	160	120	190	680

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Analytical Report Number: 17-43475

Project / Site name: Bath Road

Lab Sample Number				722354	722355	722356	722357	722358
Sample Reference				Attn 3	Attn 3	Attn 3	Attn 3	Attn 3
Sample Number				ES1	ES3	ES5	ES7	ES9
Depth (m)				0.30	0.50	0.40	0.40	0.50
Date Sampled				21/03/2017	21/03/2017	21/03/2017	21/03/2017	21/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	9.3	4.8	1.3	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	20	19	5.7	2.9
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	23	32	27	9.3
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	38	72	100	280	61
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	42	120	160	310	73
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.5	4.9	2.3	1.2
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	9.9	19	35	19	20
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	76	37	230	92	110
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	260	90	640	670	330
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	340	150	900	780	460

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Analytical Report Number: 17-43475

Project / Site name: Bath Road

Lab Sample Number				722359				
Sample Reference				Attn 3				
Sample Number				ES11				
Depth (m)				0.30				
Date Sampled				21/03/2017				
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	11				
Total mass of sample received	kg	0.001	NONE	2.0				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-				
Asbestos Quantification Total	%	0.001	ISO 17025	-				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.2				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	1200				
Organic Matter	%	0.1	MCERTS	4.1				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10				
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10				
Fluorene	mg/kg	0.1	MCERTS	< 0.10				
Phenanthrene	mg/kg	0.1	MCERTS	0.46				
Anthracene	mg/kg	0.1	MCERTS	0.16				
Fluoranthene	mg/kg	0.1	MCERTS	0.57				
Pyrene	mg/kg	0.1	MCERTS	0.58				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.34				
Chrysene	mg/kg	0.05	MCERTS	0.26				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.37				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.21				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.36				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.19				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.28				
Coronene	mg/kg	0.05	NONE	< 0.05				
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	3.8				
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	260				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.4				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	19				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	74				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	840				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	53				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	80				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130				

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Analytical Report Number: 17-43475

Project / Site name: Bath Road

Lab Sample Number				722359				
Sample Reference				Attn 3				
Sample Number				ES11				
Depth (m)				0.30				
Date Sampled				21/03/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.7				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	9.5				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	91				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	110				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.8				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	29				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	400				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	430				

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Analytical Report Number: 17-43475
Project / Site name: Bath Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
722354	Attn 3	0.30	143	Loose Fibrous Debris	**Chrysotile**	< 0.001	**< 0.001**
722356	Attn 3	0.40	149	Loose Fibrous Debris	**Chrysotile**	0.013	**0.013**
722358	Attn 3	0.50	145	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

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Analytical Report Number : 17-43475

Project / Site name: Bath Road

* 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 *
722354	Attn 3	ES1	0.30	Brown loam and clay with gravel and brick.
722355	Attn 3	ES3	0.50	Brown clay and sand with gravel.
722356	Attn 3	ES5	0.40	Brown clay and sand with gravel.
722357	Attn 3	ES7	0.40	Brown loam and clay with gravel and brick.
722358	Attn 3	ES9	0.50	Brown loam and clay with gravel and brick.
722359	Attn 3	ES11	0.30	Brown loam and clay with gravel.

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Analytical Report Number : 17-43475

Project / Site name: Bath Road

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

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
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	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 WAC-17 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	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

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Analytical Report Number : 17-43475

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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 : 17-43477

Project / Site name:	Bath Road	**Samples received on:**	21/03/2017
Your job number:	CG-18411D	**Samples instructed on:**	22/03/2017
Your order number:		**Analysis completed by:**	29/03/2017
Report Issue Number:	1	**Report issued on:**	29/03/2017
Samples Analysed:	6 10:1 WAC samples		

Signed:

Emma Winter
Assistant Reporting Manager
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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Waste Acceptance Criteria Analytical Results

Report No:	**17-43477**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	722367 / 722368				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	21/03/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Attn 3 ES1						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	1.8				3%	5%	6%
Loss on Ignition (%) **	9.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	82				500	--	--
Total PAH (WAC-17) (mg/kg)	50				100	--	--
pH (units)**	8.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	14				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0180			0.161	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0008			0.0069	0.5	10	70
Copper *	< 0.0007			< 0.0070	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0023			0.0208	0.5	10	30
Nickel *	< 0.0003			< 0.0030	0.4	10	40
Lead *	0.015			0.13	0.5	10	50
Antimony *	0.0033			0.030	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0010			0.0090	4	50	200
Chloride *	1.6			15	800	4000	25000
Fluoride	0.41			3.6	10	150	500
Sulphate *	29			260	1000	20000	50000
TDS	95			850	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.73			51.3	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	91						
Moisture (%)	9.1						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation ** = MCERTS accrediited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Waste Acceptance Criteria Analytical Results

Report No:	**17-43477**						
					Client:	**CARDGEO**	
Location	**Bath Road**						
Lab Reference (Sample Number)	722369 / 722370				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	21/03/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Attn 3 ES3						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	2.8				3%	5%	6%
Loss on Ignition (%) **	26				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	91				500	--	--
Total PAH (WAC-17) (mg/kg)	7.6				100	--	--
pH (units)**	7.7				--	>6	--
Acid Neutralisation Capacity (mol / kg)	0.73				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0034			0.0290	0.5	2	25
Barium *	0.0243			0.205	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	< 0.0004			< 0.0040	0.5	10	70
Copper *	0.0026			0.022	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0070			0.0589	0.5	10	30
Nickel *	0.0019			0.016	0.4	10	40
Lead *	0.0011			< 0.010	0.5	10	50
Antimony *	0.0045			0.038	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	< 0.0004			< 0.0040	4	50	200
Chloride *	0.98			8.3	800	4000	25000
Fluoride	1.3			11	10	150	500
Sulphate *	19			160	1000	20000	50000
TDS	88			740	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	8.16			68.8	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	91						
Moisture (%)	8.9						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
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** = MCERTS accrediited

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Waste Acceptance Criteria Analytical Results

Report No:	**17-43477**						
					Client: CARDGEO		
Location	**Bath Road**						
Lab Reference (Sample Number)	722371 / 722372				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	21/03/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Attn 3 ES5						
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	4.1				3%	5%	6%
Loss on Ignition (%) **	22				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	87				500	--	--
Total PAH (WAC-17) (mg/kg)	140				100	--	--
pH (units)**	8.2				--	>6	--
Acid Neutralisation Capacity (mol / kg)	2.9				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0150			0.127	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	< 0.0004			< 0.0040	0.5	10	70
Copper *	0.0008			< 0.0070	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0036			0.0300	0.5	10	30
Nickel *	0.0023			0.020	0.4	10	40
Lead *	0.0081			0.068	0.5	10	50
Antimony *	0.011			0.094	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0012			0.0097	4	50	200
Chloride *	1.2			10	800	4000	25000
Fluoride	0.63			5.3	10	150	500
Sulphate *	40			340	1000	20000	50000
TDS	110			930	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.72			56.7	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	92						
Moisture (%)	8.3						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
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Waste Acceptance Criteria Analytical Results

Report No:	**17-43477**						
					Client: CARDGEO		
Location	**Bath Road**						
Lab Reference (Sample Number)	722373 / 722374				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	21/03/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Attn 3 ES7						
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	1.8				3%	5%	6%
Loss on Ignition (%) **	4.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	990				500	--	--
Total PAH (WAC-17) (mg/kg)	33				100	--	--
pH (units)**	8.5				--	>6	--
Acid Neutralisation Capacity (mol / kg)	7.0				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0018			0.0163	0.5	2	25
Barium *	0.0154			0.140	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0018			0.016	0.5	10	70
Copper *	0.0080			0.073	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0051			0.0467	0.5	10	30
Nickel *	0.0013			0.012	0.4	10	40
Lead *	0.0049			0.045	0.5	10	50
Antimony *	0.0040			0.037	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0005			0.0049	4	50	200
Chloride *	1.7			15	800	4000	25000
Fluoride	0.30			2.7	10	150	500
Sulphate *	34			310	1000	20000	50000
TDS	120			1100	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.90			54.0	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	89						
Moisture (%)	11						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
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Waste Acceptance Criteria Analytical Results

Report No:	**17-43477**						
					Client: CARDGEO		
Location	**Bath Road**						
Lab Reference (Sample Number)	722375 / 722376				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	21/03/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Attn 3 ES9						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	1.4				3%	5%	6%
Loss on Ignition (%) **	5.7				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	93				500	--	--
Total PAH (WAC-17) (mg/kg)	61				100	--	--
pH (units)**	8.3				--	>6	--
Acid Neutralisation Capacity (mol / kg)	7.4				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0011			< 0.0110	0.5	2	25
Barium *	0.0163			0.137	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0043			0.036	0.5	10	70
Copper *	0.0035			0.030	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0023			0.0194	0.5	10	30
Nickel *	0.0011			0.0090	0.4	10	40
Lead *	0.048			0.40	0.5	10	50
Antimony *	0.0022			0.018	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0078			0.066	4	50	200
Chloride *	0.97			8.1	800	4000	25000
Fluoride	0.27			2.3	10	150	500
Sulphate *	19			160	1000	20000	50000
TDS	78			660	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	7.11			59.8	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	89						
Moisture (%)	11						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation
** = MCERTS accrediited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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

i2 Analytical
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Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	**17-43477**						
					Client: CARDGEO		
Location	**Bath Road**						
Lab Reference (Sample Number)	722377 / 722378				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	21/03/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Attn 3 ES11						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	2.4				3%	5%	6%
Loss on Ignition (%) **	6.8				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	320				500	--	--
Total PAH (WAC-17) (mg/kg)	5.5				100	--	--
pH (units)**	8.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	7.7				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:01	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0027			0.0204	0.5	2	25
Barium *	0.0219			0.164	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0051			0.038	0.5	10	70
Copper *	0.0068			0.051	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0103			0.0765	0.5	10	30
Nickel *	0.0013			0.0099	0.4	10	40
Lead *	0.064			0.47	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.014			0.11	4	50	200
Chloride *	1.2			8.6	800	4000	25000
Fluoride	0.23			1.7	10	150	500
Sulphate *	17			130	1000	20000	50000
TDS	74			550	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.99			44.6	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	2.0						
Dry Matter (%)	89						
Moisture (%)	11						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation
** = MCERTS accrediited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Analytical Report Number : 17-43477

Project / Site name: Bath Road

* 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 *
722367	Attn 3	ES1	0.30	Brown loam and clay with gravel and brick.
722369	Attn 3	ES3	0.50	Brown clay and sand with gravel.
722371	Attn 3	ES5	0.40	Brown clay and sand with gravel.
722373	Attn 3	ES7	0.40	Brown loam and clay with gravel and brick.
722375	Attn 3	ES9	0.50	Brown loam and clay with gravel and brick.
722377	Attn 3	ES11	0.30	Brown loam and clay with gravel.

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Analytical Report Number : 17-43477

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	NONE
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 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 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	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.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS

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Analytical Report Number : 17-43477

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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.

Certificate of Analysis

Certificate Number 17-93186

07-Mar-17

Client Card Geotechnics Ltd
Windsor House
Cornwall Road
Harrogate
HG1 2PW

Our Reference 17-93186

Client Reference CG/18411E

Order No (not supplied)

Contract Title Bath Road

Description 16 Soil samples.

Date Received 02-Mar-17

Date Started 02-Mar-17

Date Completed 07-Mar-17

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Rob Brown
Business Manager

UKAS TESTING
2139

Summary of Asbestos Analysis
Soil Samples

Our Ref 17-93186
Client Ref CG/18411E
Contract Title Bath Road

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1136504	A101 1	SOIL	Chrysotile	bundle of Chrysotile fibres + Chrysotile within bitumen material	Colin Patrick
1136505	A102 2	SOIL	NAD	none	Colin Patrick
1136506	A103 3	SOIL	NAD	none	Colin Patrick
1136507	A104 4	SOIL	NAD	none	Colin Patrick
1136508	A105 5	SOIL	Amosite	bundle of Amosite fibres	Colin Patrick
1136509	A106 6	SOIL	NAD	none	Colin Patrick
1136510	A107 7	SOIL	NAD	none	Colin Patrick
1136511	A108 8	SOIL	Chrysotile	bundle of Chrysotile fibres	Colin Patrick
1136512	A109 9	SOIL	NAD	none	Colin Patrick
1136513	A110 10	SOIL	NAD	none	Colin Patrick
1136514	A111 11	SOIL	NAD	none	Colin Patrick
1136515	A112 12	SOIL	NAD	none	Colin Patrick
1136516	A113 13	SOIL	NAD	none	Colin Patrick
1136517	A114 14	SOIL	NAD	none	Colin Patrick
1136518	A115 15	SOIL	NAD	none	Colin Patrick
1136519	A116 16	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 17-93186
Client Ref CG/18411E
Contract Bath Road

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1136504	A101 SOIL		PT 500ml		
1136505	A102 SOIL		PT 500ml		
1136506	A103 SOIL		PT 500ml		
1136507	A104 SOIL		PT 500ml		
1136508	A105 SOIL		PT 500ml		
1136509	A106 SOIL		PT 500ml		
1136510	A107 SOIL		PT 500ml		
1136511	A108 SOIL		PT 500ml		
1136512	A109 SOIL		PT 500ml		
1136513	A110 SOIL		PT 500ml		
1136514	A111 SOIL		PT 500ml		
1136515	A112 SOIL		PT 500ml		
1136516	A113 SOIL		PT 500ml		
1136517	A114 SOIL		PT 500ml		
1136518	A115 SOIL		PT 500ml		
1136519	A116 SOIL		PT 500ml		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

APPENDIX I

Unexpected Contamination

Helen Gardiner

From: Steve Morris <steve.morris@mcaleer-rushe.co.uk>
Sent: 17 September 2018 16:46
To: Robin Slade
Cc: Mark Elliott; Emma Wright; Mark Anderson; Richard Ball; Helen Gardiner; Liam McFadden; Dermot McLaughlin; gavin.kelly@caldwellconsulting.net
Subject: RE: 16-308 BRH Planning

Follow Up Flag: Follow up
Flag Status: Flagged

Robin

Please find link below containing the following

- Waste spreadsheet for all muck away from the project including some sample WTN's
- Waste licences
- Supplier/source of capping soils - Sirom ltd, Merton dell farm, Monkton lane, Marlow, SL7 3RE. Volume 670m3
- No further contamination other than what was photographed by yourselves
- As constructed landscape and drainage drawings

https://www.dropbox.com/sh/msnwhjzcck29iqv/AADfu5397ynI4zBxI4ljtVUba?dl=0

I will forward details on the water pipe separately.

Can you give me a time frame for submission to planning as we are 3 weeks away from PC.

Steve

From: Robin Slade <RobinS@cgl-uk.com>
Sent: 01 August 2018 13:35
To: Steve Morris <steve.morris@mcaleer-rushe.co.uk>
Cc: Jacinta Gillespie <jacinta.gillespie@mcaleer-rushe.co.uk>; Mark Elliott <mark.elliott@mcaleer-rushe.co.uk>; Emma Wright <emma@whiteink.co.uk>; Mark Anderson <mark@whiteink.co.uk>; Richard Ball <RichardB@cgl-uk.com>; Helen Gardiner <HelenG@cgl-uk.com>
Subject: RE: 16-308 BRH Planning

This Email has been sent by an External Source. **DO NOT** open attachments or click on links unless you recognize the sender and believe the content to be safe.

Steve,

Yes, the separator is part of the capping remedial strategy in areas of landscaping and is required beneath the topsoil (or subsoil, if used).

To complete the verification report, we'll require:

- Copies of waste tickets / carrier licences for the muck away from site (from Mick George etc);
- Supplier / source of capping soils (topsoil) and volume to be imported;
- Photos / site records of unexpected contamination observations recorded when CGL were not on site or confirmation, in writing, that no further unexpected contamination was encountered, other than where CGL was informed;

Record of Site Visit No. 001

Site: Bath Road	**Job No.**	CG/18411D
Client: McAleer & Rushe	**Date**	18/11/2016
Weather: Cold and sunny		
Site visit by - RPG	**Project Manager - RJB**	
On site – 07:55am		
Off site – 12:30pm		
Visitors		

RPG arrived on site at 07:55am. RPG then went to the pit containing the contaminated material to examine the material and take photographs of the pit, as well as the rest of the site.

At 09.00am plant was used to further excavate the pit to the north. This process was carried out by removing the uncontaminated Made Ground to approximately 1.5m depth. At 11.00am plant was used to begin excavating the contaminated material from approximately 1.5m depth to approximately 2.0m depth.

Five samples were taken from the contaminated material, two from approximately 1.5m and three from approximately 2.0m.

Further photographs were taken at 12.15pm of the pit and material excavated from the pit.

RPG left site at 12.30pm.

Photographic record of site visit

Previously excavated pit found fenced off upon arrival.

Previously excavated contaminated material.



Bottom of pit upon arrival to site.



Old pipe observed in eastern wall of previously excavated pit where contaminated material was found.



Removal of uncontaminated material for excavation expansion.



Contaminated material removed from pit was moved via dumper and placed on impermeable concrete surface.



Pit extension overview. Photograph taken after excavation for the day had been completed.

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Godalming
Surrey
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Herts,
WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 16-33395

Project / Site name:	Bath Road	**Samples received on:**	18/11/2016
Your job number:	CG18411D	**Samples instructed on:**	18/11/2016
Your order number:		**Analysis completed by:**	29/11/2016
Report Issue Number:	1	**Report issued on:**	29/11/2016
Samples Analysed:	3 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Dr Irma Doyle
Senior Account Manager
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.

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

Analytical Report Number: 16-33395

Project / Site name: Bath Road

Lab Sample Number				661403	661404	661405		
Sample Reference				P1	P1	P1		
Sample Number				ES2	ES4	ES5		
Depth (m)				1.50	2.00	2.00		
Date Sampled				18/11/2016	18/11/2016	18/11/2016		
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	17	10	11		
Total mass of sample received	kg	0.001	NONE	1.6	2.0	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.7	8.5	-		
Total Cyanide	mg/kg	1	MCERTS	1	< 1	-		
Total Sulphate as SO_4	mg/kg	50	MCERTS	1100	910	-		
Organic Matter	%	0.1	MCERTS	1.5	1.4	-		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.25	0.34	-		
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Phenanthrene	mg/kg	0.1	MCERTS	0.22	0.40	-		
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Fluoranthene	mg/kg	0.1	MCERTS	0.26	0.58	-		
Pyrene	mg/kg	0.1	MCERTS	0.43	0.72	-		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.23	0.38	-		
Chrysene	mg/kg	0.05	MCERTS	0.37	0.49	-		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.24	0.50	-		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.16	0.20	-		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.20	0.32	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	-		
Total PAH								
Total WAC-17 PAHs	mg/kg	1.6	NONE	2.4	3.9	-		

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

Analytical Report Number: 16-33395

Project / Site name: Bath Road

Lab Sample Number				661403	661404	661405		
Sample Reference				P1	P1	P1		
Sample Number				ES2	ES4	ES5		
Depth (m)				1.50	2.00	2.00		
Date Sampled				18/11/2016	18/11/2016	18/11/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.6	2.3	-		
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.1	8.8	-		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	79	91	-		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.82	0.89	-		
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	1.0	-		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	-		
Chromium (III)	mg/kg	1	NONE	28	30	-		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	30	-		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	27	-		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	30	19	-		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	24	-		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	48	-		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	64	-		
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.5	6.8	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	41	40	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	140	110	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	650	530	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	830	690	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.0	4.0	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	40	37	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	190	150	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	930	640	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	1200	830	-		

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Analytical Report Number: 16-33395

Project / Site name: Bath Road

Lab Sample Number				661403	661404	661405		
Sample Reference				P1	P1	P1		
Sample Number				ES2	ES4	ES5		
Depth (m)				1.50	2.00	2.00		
Date Sampled				18/11/2016	18/11/2016	18/11/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0		
Chloroethane	µg/kg	1	NONE	-	-	< 1.0		
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0		
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0		
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0		
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0		
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0		
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0		
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0		
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0		
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0		
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0		
Benzene	µg/kg	1	MCERTS	-	-	< 1.0		
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0		
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0		
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0		
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0		
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0		
Toluene	µg/kg	1	MCERTS	-	-	< 1.0		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0		
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0		
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0		
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0		
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0		
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0		
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0		
Styrene	µg/kg	1	MCERTS	-	-	< 1.0		
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0		
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0		
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0		
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0		
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0		
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0		
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0		
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0		
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0		
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0		
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0		
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0		

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Analytical Report Number : 16-33395

Project / Site name: Bath Road

* 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 *
661403	P1	ES2	1.50	Brown sandy clay with gravel and oil / petroleum.
661404	P1	ES4	2.00	Brown sandy clay with gravel.
661405	P1	ES5	2.00	Brown sandy clay with gravel and oil / petroleum.

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Analytical Report Number : 16-33395

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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 3, 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
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	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 WAC-17 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	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.	L019-UK/PL	D	NONE
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	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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Record of Site Visit

Site:	Bath Road	**Job No.**	CG/18411D
Client:	McAleer and Rushe	**Date**	9th January 2017
Weather:	Breezy and wet		
Site visit by	HJG	**Project Manager**	JAS
On site			
Off site			
Visitors			

HJG on-site to further chase out any visual or olfactory evidence of contamination in the location of a former below ground tank diesel tank in vicinity of K to N 16 along the eastern boundary of the site.

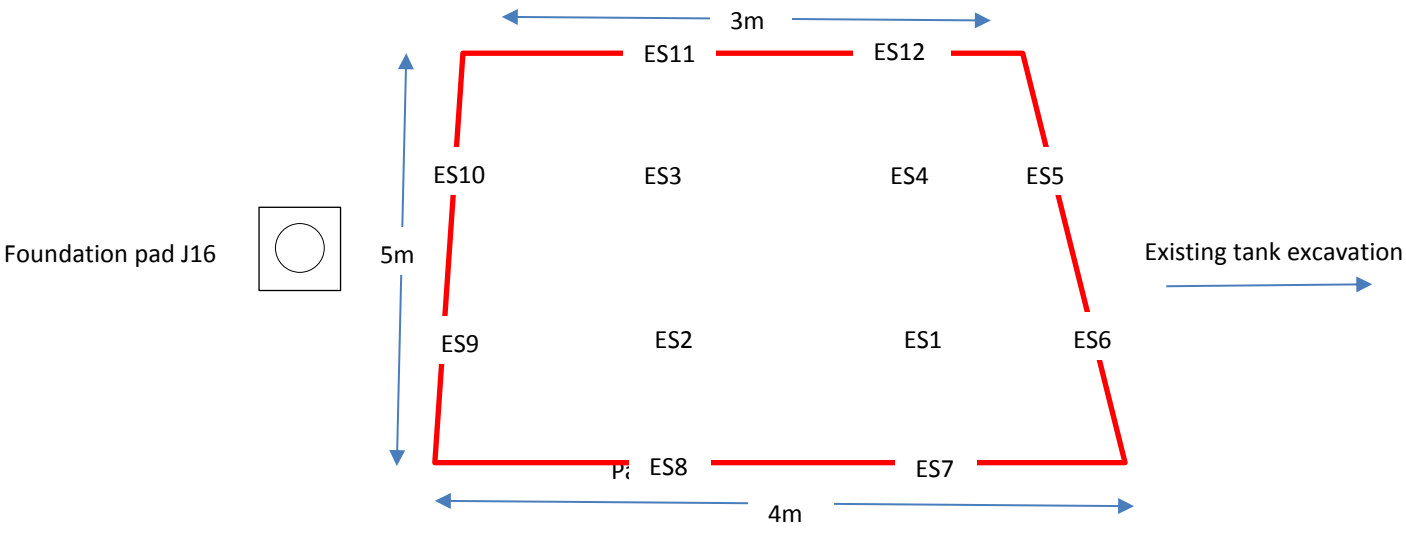
HJG visit follows a phase of initial excavation undertaken by RPG on 18 November 2016.

Visual evidence of contamination was noted along the southern boundary of the existing excavation. The chasing out of contamination was constrained laterally by the presence of foundation pads to the north (R to S 16) and west (K to N 15and 15) and to the east by storage of materials.

The existing excavation was extended further to the south by approximately 5m, before foundation pad J16 was encountered, and to a maximum depth of approximately 2.50m bgl. Small localised pockets of black staining (with a very mild hydrocarbon odour) were generally noted throughout the excavation to a depth of 2m bgl, until a tract of impacted gravel approximately 1m wide was encountered along the eastern portion of the pit and running in a north south direction. It is possible that a service run/pipe may have once been located in this area, although this has not been confirmed by the Principal Contractor. This impacted tract was chased out and removed as far as possible. Four samples (ES1 to ES4) were taken from the base of the excavation and a further eight samples (ES5 to ES12) were taken from the sides. Due to the on –site constraints, it is considered likely that visual and olfactory evidence of contamination still remains on site, the horizontal and vertical extent unknown, however risks are considered to be low given vapour membrane and floor slab to prevent contaminant migration.

Excavated soils were segregated and paced on appropriate stockpiles. It is understood that the impacted material was placed on a separate stockpile which had been placed on an impermeable liner.

The excavation area is shown on Figure 1 and the sampling location plan below. A photographic record is presented as Figure 2.



During the visit, UK Membranes were installing the vapour membrane over the southwestern portion of the site. HJG informed by the Principal contractor that the membrane would be ready for inspection on the afternoon of 10 January 2016.

I2 delivered the sample containers ~3pm.

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Analytical Report Number : 17-37330

Project / Site name:	Bath Road	**Samples received on:**	13/01/2017
Your job number:	CG-18411D	**Samples instructed on:**	13/01/2017
Your order number:		**Analysis completed by:**	19/01/2017
Report Issue Number:	1	**Report issued on:**	19/01/2017
Samples Analysed:	4 soil samples		

Signed: CCStone

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Dr Irma Doyle
Senior Account Manager
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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Analytical Report Number: 17-37330

Project / Site name: Bath Road

Lab Sample Number				685756	685757	685758	685759	
Sample Reference				VES13	VES14	VES15a	VES16	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				1.50	1.50	1.50	1.50	
Date Sampled				13/01/2017	13/01/2017	13/01/2017	13/01/2017	
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	%	N/A	NONE	5.8	6.7	9.5	6.5	
Total mass of sample received	kg	0.001	NONE	0.91	1.9	1.5	1.3	
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	9.5	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	19	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	23	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	21	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	44	< 10	

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Analytical Report Number : 17-37330

Project / Site name: Bath Road

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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 *
685756	VES13	None Supplied	1.50	Brown sand with gravel.
685757	VES14	None Supplied	1.50	Brown sand with gravel.
685758	VES15a	None Supplied	1.50	Brown sand with gravel.
685759	VES16	None Supplied	1.50	Brown sand with gravel.

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Analytical Report Number : 17-37330

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	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.	L019-UK/PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	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 : 17-37354

Project / Site name:	Bath Road	**Samples received on:**	16/01/2017
Your job number:	CG-18411D	**Samples instructed on:**	16/01/2017
Your order number:		**Analysis completed by:**	23/01/2017
Report Issue Number:	1	**Report issued on:**	23/01/2017
Samples Analysed:	2 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Dr Irma Doyle
Senior Account Manager
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.

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

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Analytical Report Number: 17-37354

Project / Site name: Bath Road

Lab Sample Number				685938	685939			
Sample Reference				ES4	ES9			
Sample Number				None Supplied	None Supplied			
Depth (m)				2.50	1.80			
Date Sampled				09/01/2017	09/01/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	5.8	6.6			
Total mass of sample received	kg	0.001	NONE	1.5	1.6			

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

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

Analytical Report Number : 17-37354

Project / Site name: Bath Road

* 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 *
685938	ES4	None Supplied	2.50	Brown clay and sand with gravel.
685939	ES9	None Supplied	1.80	Brown gravelly sand.

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Analytical Report Number : 17-37354

Project / Site name: Bath Road

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	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.	L019-UK/PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	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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26 May, 2017

Mr Steve Morris
Contracts Manager
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Sipson
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Our ref: CG/18411E

Please reply to: Tom Fairweather/Robin Slade

Dear Steve

276 Bath Road –Stockpile Re-use Summary

As requested, please find below our summary report confirming the recent assessment of soils data from 'Stockpile 3' at 276 Bath Road, West Drayton. As per your email instruction of 08 May 2017, CGL was commissioned to sample and arrange subsequent analysis of material within the approximately 170m^3 Stockpile 3, located in the north-western section of the site, adjacent to the boundary fence, in order to assess the potential options for material reuse. Subsequent to the sampling it was identified that the preferred option for reuse would be as backfill around the attenuation tank in the north-eastern section of the site.

Stockpile sampling

A CGL engineer attended site on 11 May 2017 in order to sample Stockpile 3. Based on previous sampling from trial holes of the material, which was subsequently placed in Stockpile 3, the material had been provisionally classified as 'hazardous waste' and, therefore, segregated from other stockpiled materials and stored on plastic sheeting. The stockpile is understood to comprise approximately 170m^3 of material and is roughly semi-cylindrical in shape.

Whilst on site, the CGL engineer divided the stockpile into three zones for sampling purposes and three incremental samples were then taken from across each zone. Two of the samples were obtained from the sides and one from the top of the stockpile. The three incremental samples per zone were then combined to create a composite sample, representative of the individual zone. The three composite samples were then sub sampled and scheduled for both total soils and leachate testing at I2 Analytical, for a comprehensive suite of chemical determinants. A sample location plan is presented as Figure 1.

Laboratory testing

The three samples were scheduled for a range of contaminants including:

- Heavy metals / metalloids including; arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium and zinc;
- pH, total organic content and sulfate as SO4;
- Benzene, toluene, ethylbenzene, xylenes (BTEX compounds);
- Total petroleum hydrocarbons (TPH);

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- Polycyclic aromatic hydrocarbons (PAH);
- Total monohydric phenols;
- Semi volatile and volatile organic compounds (SVOC/VOC);
- Total cyanide; and
- Asbestos screening with identification.

The laboratory results are presented as Appendix A.

Contamination assessment

As mentioned previously it is proposed that the material associated with Stockpile 3 will be used as fill around a below ground attenuation tank, in the north-eastern section of the site. The location and design of the attenuation tank are shown in Appendix B. It is understood that the material will be infilled to within 0.5m of ground level before being capped with hardstanding, consisting of tarmac or brick paving.

Human health assessment

The results of the laboratory testing have been compared against generic assessment criteria (GAC) derived for a "Commercial" land-use category. A "Commercial" land-use category was adopted for the site within the previous Environ[1] and CGL[2] conceptual site models. The material was screened against criteria derived for 1% Soil Organic Matter (SOM). The results of the assessment are presented in Table A, Appendix C.

A single exceedance of cyanide (64mg/kg) against the screening value (34mg/kg) was noted within Sample 3A. In addition to the exceedance of cyanide the presence of asbestos (recorded as 'Chrysotile - loose fibrous debris') was confirmed across all samples.

Controlled waters assessment

The samples were also scheduled for leachate testing. The leachate samples were screened against freshwater Environmental Quality Standards (EQS) and Drinking Water Values (DWV). The results of the assessment are presented in Table B, Appendix C.

An exceedance of copper (1.39µg/l) was noted against the EQS value (1µg/l) in Sample 3B, whilst cyanide (8.6 µg/l and 81µg/l) was noted to exceed against the EQS value (1µg/l) in samples 3B and 3C, respectively. Furthermore, lead (1.3µg/l to 2.2µg/l) marginally exceeded the EQS value (1.2µg/l) across all samples.

An exceedance of cyanide (81µg/l) was note against the DWV (50µg/l) in sample 3B.

The laboratory reporting limit for chromium (hexavalent) and mercury exceeded the EQS, along with the laboratory reporting limit for phenol exceeding the DWV. These contaminants are not considered to pose an unacceptable risk to controlled waters as they are not representative of measured concentrations.

Discussion and conclusion

Elevated concentrations of cyanide were noted within the soil, this was noted to be leachable as elevated concentrations were encountered within the leachate test results. Free cyanide, the more harmful component

[1] Environ (March 2008) Phase II Environmental Site Assessment: Technicolor, Bath Road, West Drayton. 1C11857, Issue 04.
[2] CGL (November 2016) Soil and Vapour Assessment and Remediation Strategy: 276 Bath Road, West Drayton.

of total cyanide, is highly volatile and, therefore, the concentrations encountered within the soil will likely decrease over time and are not considered to present a human health risk when placed at >0.5m beneath hard standing around the attenuation tank. Elevated concentrations of copper and lead were noted within the leachate test results. These results are considered to pose a *potential* risk to controlled waters. In addition, the presence of asbestos within the material presents a *potential* risk to human health in its current setting. The asbestos findings are consistent with those observed within general fill materials across the site (i.e low quantities

It is proposed to place the fill material above the groundwater table around the attenuation tank and for the material to be covered with approximately 0.5m of fill and hardstanding. The use of hardstanding around the attenuation tank, and more locally the hotel and carpark will reduce surface water infiltration and, therefore, reduce the likelihood of leachate generation from the placed soils. Additionally, the nearest surface water body is a tributary of the Duke of Northumberland's River, approximately 1.7km west of the site. Given the distance to this surface water feature, the placement of the fill above the groundwater table, and the reduction in infiltration and leaching as a result of the hardstanding, the fill material is not considered to pose an unacceptable risk to surface waters.

The presence of hardstanding will also mitigate against the potential subsequent release of asbestos fibres, though it is noted that the fill material will need to be managed appropriately, during backfilling operations, to minimise potential fibre release (i.e. dust suppression will need to be considered). This is in line with current materials management on site.

Based on the above assessment, it is considered that the material, in its proposed future use (i.e. backfill to the attenuation tank at >0.5m below final finish level and beneath hard standing), does not represent an unacceptable risk to human health or controlled waters. As such, the material is suitable to be placed in its intended location.

Reuse of the material as backfill to the attenuation tank will need to be captured as a revision of the current Materials Management Plan[3] (MMP) for the Bath Road site. This letter report will be referenced in support of this update to the MMP.

We trust the above provides you with the necessary information to support the proposed materials reuse.

Yours sincerely,



Robin Slade, Associate Director
Card Geotechnics Limited

Figures & Appendices

Figure 1 – Sample location plan – Stockpile 3
Appendix A – Attenuation tank drawings
Appendix B – Chemical laboratory results
Appendix C – Chemical data assessment

[3] CGL (February 2017) Materials Management Plan: 276 Bath Road