VALIDATION REPORT (INTERIM)
ANCOATS MOBILITY HUB
BOWMER AND KIRKLAND NORTH WEST
VR-20376-24-270
7 AUGUST 2024



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Issued by



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Document1

Document Revisions

Rev	Date	Author	Checked	Approved

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SECTION 1 SCOPE AND INTRODUCTION

1.1 Bowmer and Kirkland (B&K), acting as Principal Contractor – is nearing completion of the construction of a new mobility hub at the location of a former light commercial premises at Poland Street, Ancoats. A Buttress Architects' drawing showing the general arrangement of the development is included in Appendix 1.

1.2 The site has been subject to phased geoenvironmental assessments undertaken by E3P on behalf of Manchester Life and supplementary investigation by IDOM, on behalf of B&K, which have identified the presence of ground contamination. The ground conditions and summary of contamination are provided in IDOM Remediation Method Statement report ref: RMS-20376-22-276Revsion B, dated May 2023, to which the reader is referred.

1.3 Typically 2 m of made ground was found across the site underlain by glacial clay deposits. Contamination was found to comprise sporadic occurrence of USEPA Priority 16 polyaromatic hydrocarbon compounds in excess of soil screening levels for a commercial land use and patches of soil containing hydrocarbon staining and odours. An initial low-moderate risk gas regime was identified and then revised to a low risk following further monitoring data. No asbestos was identified by the investigations.

1.4 The Remediation Method Statement set out the following actions to mitigate risks from ground contamination:

i. Undertake observations during groundworks to identify possible further contamination, including asbestos;

ii. Water pipes to be constructed of chemically resistant pipe materials where required by the utility provider.

iii. Removal of the requirement for passive gas protection measures and replace with the excavation of made ground from below the building footprint to remove potential ground gas sources;

iv. Assess and mitigate previous unknown contamination, if found; and,

v. Placement of clean soil cover in soft landscaping.

1.5 This report sets out the remedial actions that have been completed for Items *i-iv*, above in support of discharge of Condition 9b of the planning permission, which requires verification of the remedial actions that form the approved remediation plan. Placement of clean soil in landscaped areas is due to be undertaken during September/October 2024 and will be reported as an updated issue of this document.

1.6 This report has been prepared for Bowmer and Kirkland for the purpose set out in Section 1.5 and no duty of care to any third party is implied or offered. Third parties

making reference to this report do so at their own risk and should consult IDOM Merebrook Ltd.

SECTION 2 UNDERTAKEN GROUND REMEDIAL WORKS

2.1 REDUCED LEVEL EXCAVATION

2.1.1 B&K has confirmed a reduced level dig took place following hydrocarbon contamination delineation exercise completed in April 2023, which comprised the excavation of made ground to a depth of 2 m over an area covering the proposed mobility hub building and extending outwards by 5 m. A reduced level excavation of 1 m depth was then extended from 5 m outside the building footprint to the boundary.

2.1.2 Excavated materials are advised to have been replaced crushed/recycled aggregate.

2.1.3 B&K have provided a photographic record of the excavations and restored levels which are included in Appendix 2 and have advised that no significant unknown contamination was observed.

2.2 POTABLE WATER PIPES

2.2.1 IDOM completed a United Utilities Pipeline Works Risk Assessment for the development on behalf of B&K which assessed the requirement for a protected (Type A) barrier pipe material to be used for potable pipes. B&K has provided the product datasheet for the pipes used (Protecta Line) which is included in Appendix 3.

2.3 UNEXPECTED CONTAMINATION

2.3.1 IDOM were requested to attend site in August 2023 following discovery of hydrocarbon staining and odour encountered during the excavation of drainage infrastructure in the south-east corner of the site. Following an initial inspection of the excavation, a trial trench was extended from the eastern site boundary to identify the extent of the contamination. This identified the presence of historic coal tar type contamination which appeared to be confined to a saturated granular, at depth, emerging from the site boundary. This then thinned and dissipated after a few metres heading into the site. Given the likely age of the contamination it was considered that the extent of the contamination had been reached by this time. This was reported in IDOM letter L-20376-2.4.2-23-650-KRP which assessed the risks to the development and is reproduced in Appendix 4.

2.3.2 In view of the contamination being at depth and confined to external areas, a significant risk to human health was unlikely and the underlying clay was unaffected, which indicated no significant risk to wider groundwater. Recommendations were made to protect installation of the surface water drainage by providing an impermeable trench liner to barrier to prevent recontamination. The measures were submitted for approval by Manchester City Council.

2.3.3 Drawings of the proposed measures are contained in Appendix 4.

2.3.4 As part of the ongoing assessment of this contamination IDOM returned to site on 1 September 2023 to inspect the excavation for the cellular surface water attenuation tank located along the southern boundary and its connection point to the surface water drain in the south-east corner (SW05 location). No significant contamination was identified in the main excavation and the base of the excavation was sampled for residual contamination levels. A redundant brick manhole was encountered further east which contained an oily sludge at the base. This was dug out to expose visually clean clay at 3 m depth.

2.3.5 A file note and photographic record of the attenuation tank excavation are included in Appendix 4 along with certificate of analysis 23-54601 which includes the results of the base of dig validation samples.

2.3.6 The surface drainage trench barrier measures were installed in December 2023 which comprised a heavy-duty polythene membrane wrapping of the trench overlying a bentonite matting. Photographs of the installation are included in Appendix 5.

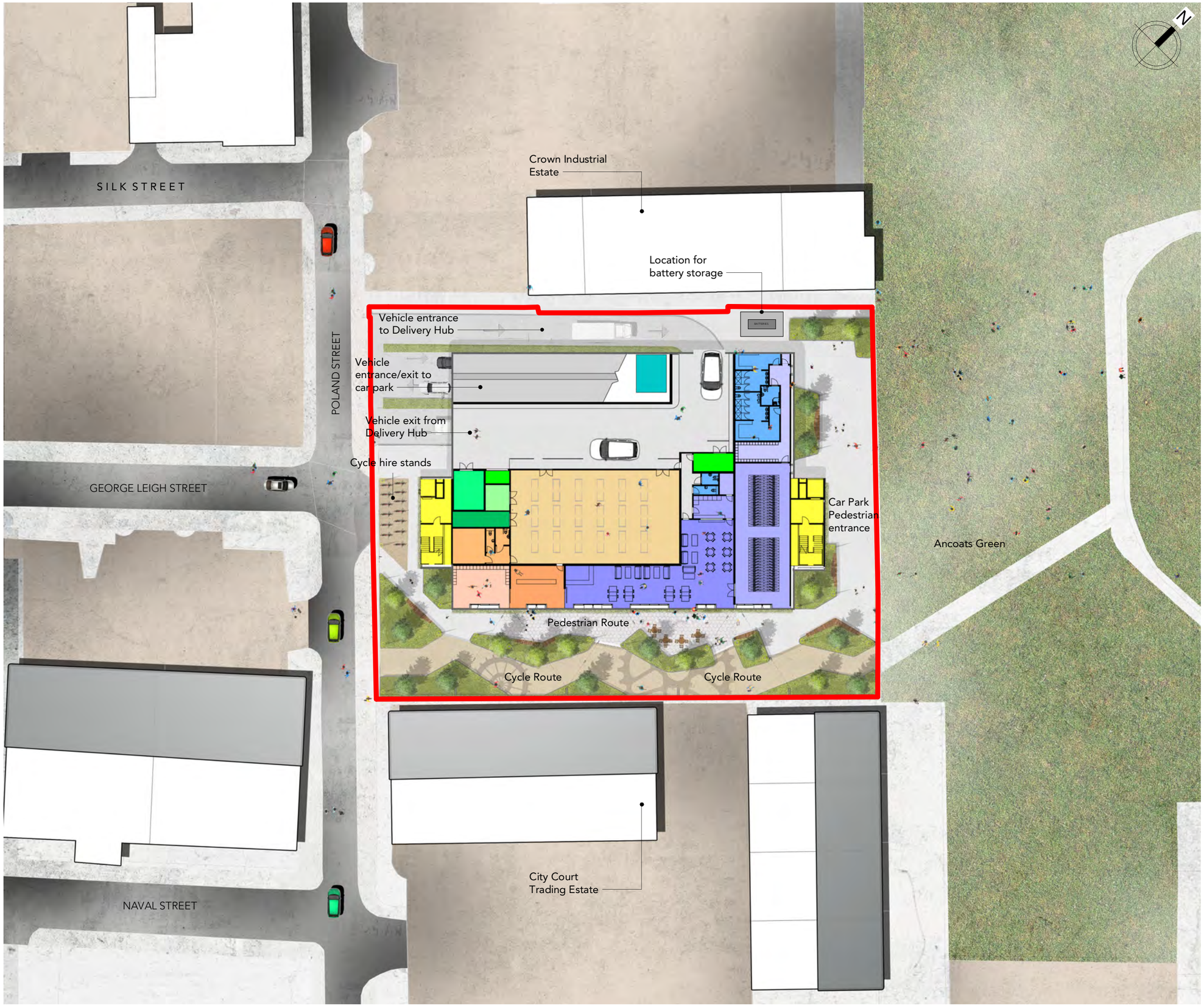
SECTION 3 CONCLUSIONS

3.1 The main remedial actions have been completed generally in accordance with the measures set out in the Remediation Method Statement and to address previously undiscovered contamination reported in supplementary letter L-20376-2.4.2-23-650-KRP.

3.2 A revision to this report will be issued on completion of the placement of soil cover to landscapes areas.

APPENDIX 1

- General Arrangement 9032-BA-XX-00-DR-A- (04)010-1-PO



Note:
Do not scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

KEY

- Stair/lift Core
- Pick Up Lockers
- Delivery Counter
- Staff Wefare
- LV Switchroom
- Bin Store
- Transformer Room
- ENW/RMU Room
- Delivery Hub Storage Area
- Delivery Hub Vehicle Access
- Cafe
- Kitchen
- Cycle Hub Cycle Storage
- Cycle Hub Lockers
- Cycle Hub Changing
- Cold Water Storage

Rev	Date	Intls	Details
P0	29/04/21	AMP	Planning

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Project Title	Ancoats Hub
Client	Manchester Life
Location	Poland Street Manchester
Drawing Title	Site GA Plan

Date	07/05/2021 15:41:59	**Scale**	As indicated
Checked	MB	**Orig Paper Size**	A3
Job No:	**9032**	**Status**	**PLANNING**

Project: Origin: Zone: Level: Type: Disc: Number: Rev:

9032-BA-XX-00-DR-A- (04)010- P0

APPENDIX 2 ▪ Photographic Record – Reduced Level Excavations



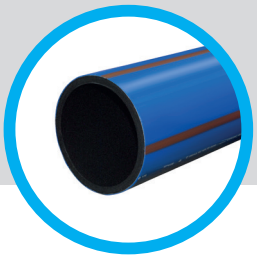


APPENDIX 3

- Water Pipe Product Datasheet

PROTECTA-LINE PIPE

PRODUCT DATA SHEET



Protecta-Line pipe is a multi-layered PE pipe with an embedded aluminium barrier layer. It is designed to safely transport drinking water in land which is contaminated or has the potential to be contaminated in the future.

RANGE / PRESSURE RATING

OD (mm)	SDR	Pressure rating	Material
25	11	12.5 bar	PE80
32			
63			
90 to 180	11	16 bar	PE100
	17	10 bar	PE100
225 to 630	11	16 bar	PE100
	17	10 bar	PE100

COLOURS

Material	Description	Colour
PE80	Black core and light blue outer with brown stripes	
PE100	Black core and dark blue outer with brown stripes	

Pipe diameter ≤ 180mm pipe has four brown stripes; > 180mm pipe has eight brown stripes.

STANDARDS / APPROVALS

- The Water Supply Regulation 31/27/30
- BS EN 12201-2
- WRAS Approved
- WIS 4-32-19

CERTIFICATION

WRAS APPROVED PRODUCT

1606501
1511343
1505514
1302025

BS EN 12201-2
KM 508224

WIS 4-32-19
KM 514626

LENGTHS

Pipes ≤ 180mm in diameter are available in coiled lengths of 25m, 50m or 100m

Pipes 63mm – 630mm in diameter are also available in straight lengths of 6 or 12m.

Other lengths may be produced at customer's request

MARKINGS

As a minimum requirement, the following information is marked indelibly and linearly at intervals along the pipe:

- Manufacturers identification: **GPS**
- System: **Protecta-Line**
- Pipe composition: **PE Pipe with AL Barrier**
- Standard and pipe type: **WIS 4-32-19 TYPE A**
- Material designation: **PE100 or PE80**
- Nominal size: **180mm (example)**
- SDR value: **SDR 17 (example)**
- Continuous pressure rating at 20°C **10 bar (example)**

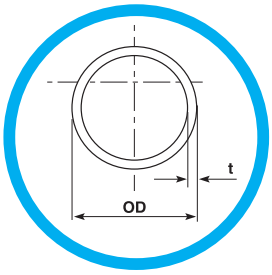
The pipes are marked with the following three times per metre:

- Application: **Water**

BATCH NUMBER FORMAT

8 Digit Code	Extruder Number 1 & 2	Shift Number 3 & 4	Week Number 5 & 6	Year 7 & 8
	01-23	01 - 14	01 - 52	01-99

PIPE DIMENSIONS



* The size is the nominal core pipe outside diameter. Other diameters, SDRs and lengths can be made subject to a minimum order value.

Size* (mm)	SDR	Min OD (mm)	Max OD (mm)	Mean Bore (mm)	Min t (mm)	Max t (mm)	Approx Weight (kg/m)
25	11	26.2	27.4	20.0	3.0	3.7	0.3
32	11	33.3	34.5	26.0	3.7	4.4	0.4
63	11	64.3	65.6	50.9	6.5	7.6	1.3
90	11	92.2	93.5	72.9	9.3	10.7	2.6
	17	92.2	93.5	78.8	6.5	7.5	1.9
110	11	112.2	113.5	89.2	11.1	12.7	3.7
	17	112.2	113.5	96.3	7.7	8.8	2.7
125	11	127.2	128.5	101.2	12.5	14.2	4.7
	17	127.2	128.5	109.6	8.5	9.8	3.4
160	11	163.2	165.1	130.4	15.8	17.9	7.6
	17	163.2	165.1	141.1	10.7	12.4	5.4
180	11	183.3	185.4	146.8	17.6	20.0	9.5
	17	183.3	185.4	158.8	11.9	13.7	6.8
225	11	227.3	229.5	182.5	21.7	24.4	14.5
	17	227.3	229.5	197.4	14.6	16.6	10.3
250	11	252.3	254.9	203.0	23.9	26.8	17.7
	17	252.3	254.9	219.6	16.0	18.3	12.4
280	11	282.3	285.1	227.4	26.6	29.8	22.0
	17	282.3	285.1	245.9	17.8	20.1	15.4
315	11	317.3	320.2	255.7	29.8	33.3	27.6
	17	317.3	320.2	276.6	19.9	22.4	19.3
355	11	357.3	360.6	288.3	33.4	37.3	34.8
	17	357.3	360.6	311.6	22.3	25.1	24.3
400	11	402.3	405.8	324.8	37.5	41.8	43.9
	17	402.3	405.8	351.3	24.9	27.9	30.4
450	11	452.3	456.1	365.4	42.1	46.8	55.3
	17	452.3	456.1	395.2	27.9	31.2	38.2
500	11	502.3	506.4	406.0	46.6	51.8	67.9
	17	502.3	506.4	439.0	30.9	34.5	46.9
560	11	562.3	566.8	454.9	52.0	57.7	84.7
	17	562.3	566.8	491.8	34.4	38.4	58.4
630	11	632.3	637.2	511.6	58.4	64.8	106.9
	17	632.3	637.2	553.2	38.6	43.0	73.6

APPENDIX 4

- South-eastern Contamination Discovery
- L-20376-2.4.2-23-650-KRP
- Trench barrier installation details
- Site record attenuation tank inspection and validation

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Bowmer and Kirkland
Via email

David Baker

25 August 2023

Subject: Ancoats Mobility Hub - Tar Contamination Assessment
Our ref: L-20376-2.4.2-23-650-KRP

Dear Mr Baker,

Further to Bowmer and Kirkland's (B&K) discovery of visibly contaminated soil during excavation for drainage installation during w/c 14 August 2023, IDOM Merebrook has undertaken site visits for the following:

- to collect soil samples of arisings for chemical analysis,
- photoionisation detector monitoring of vapours in air from soil arisings; and
- inspection of trench excavations to further identify the extent and nature of the contamination.

In accordance with Section 3.4 of the Remediation Method Statement ref. RMS-20376-22-276RevB, on encountering unexpected contamination, an assessment is required of the identified contamination and recommendations made to manage the contamination to ensure significant risks are addressed.

Since demolition of the previous light industrial units and site clearance, groundworks are understood to have been undertaken which have removed significant volumes of soil. Mainly, removal of made ground below the proposed structure to remove potential ground gas sources. B&K advise that this excavation and replacement with 6F2 type materials was undertaken to around 2 m bgl. This has extended southwards by 5 m as advised by B&K and a further 1 m depth of strip has been undertaken in proposed areas of external landscaping which will occupy mainly the southern part of the new Hub development.

Encountered Contamination

During excavation for a manhole chamber in the south-west corner, B&K reported strongly smelling soil arisings with black staining. From a visit undertaken five days later, the excavation terminated at around 2.5 m, had around 200 mm of water accumulated in the base of the excavation with sheen and iridescence on the surface and very little odour.

A further drainage excavation was dug a few metres north of this from the back (eastern) site boundary with the adjacent recreation ground and then extended under IDOM supervision westwards into the site by 5 m, as indicated on Figure 1 below.

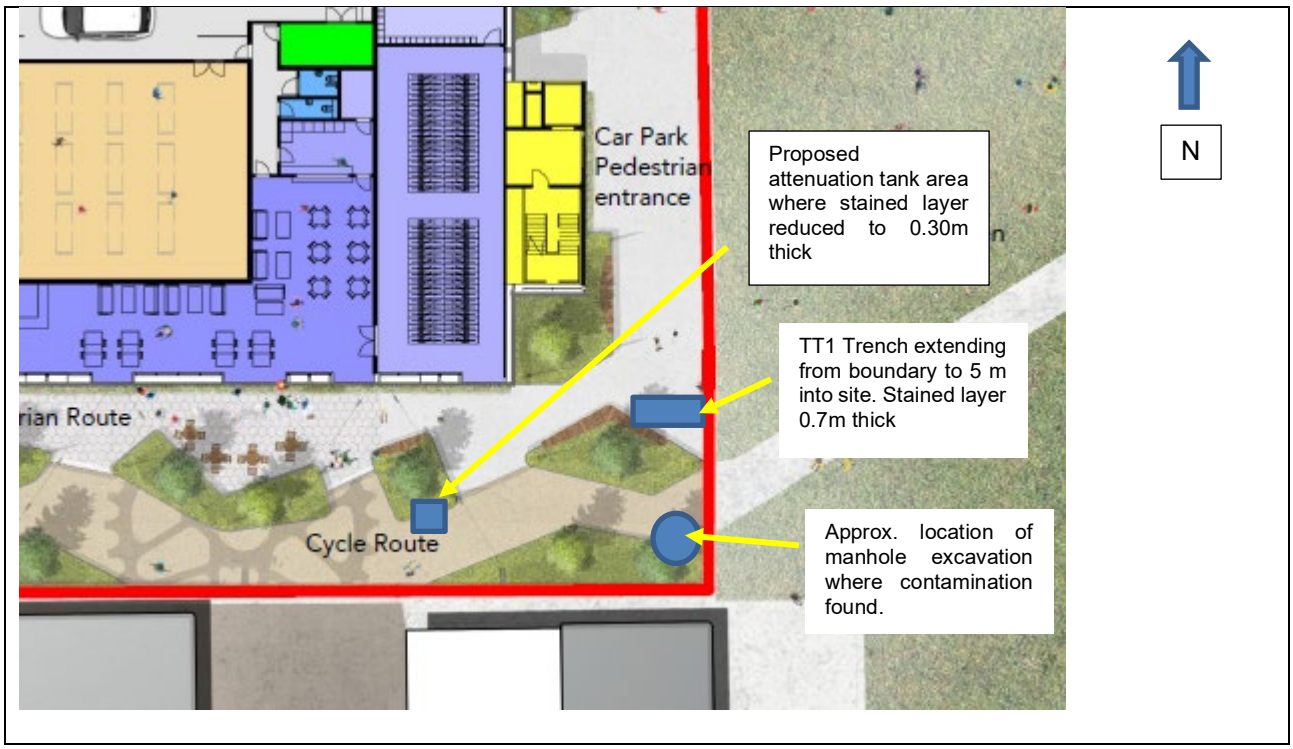
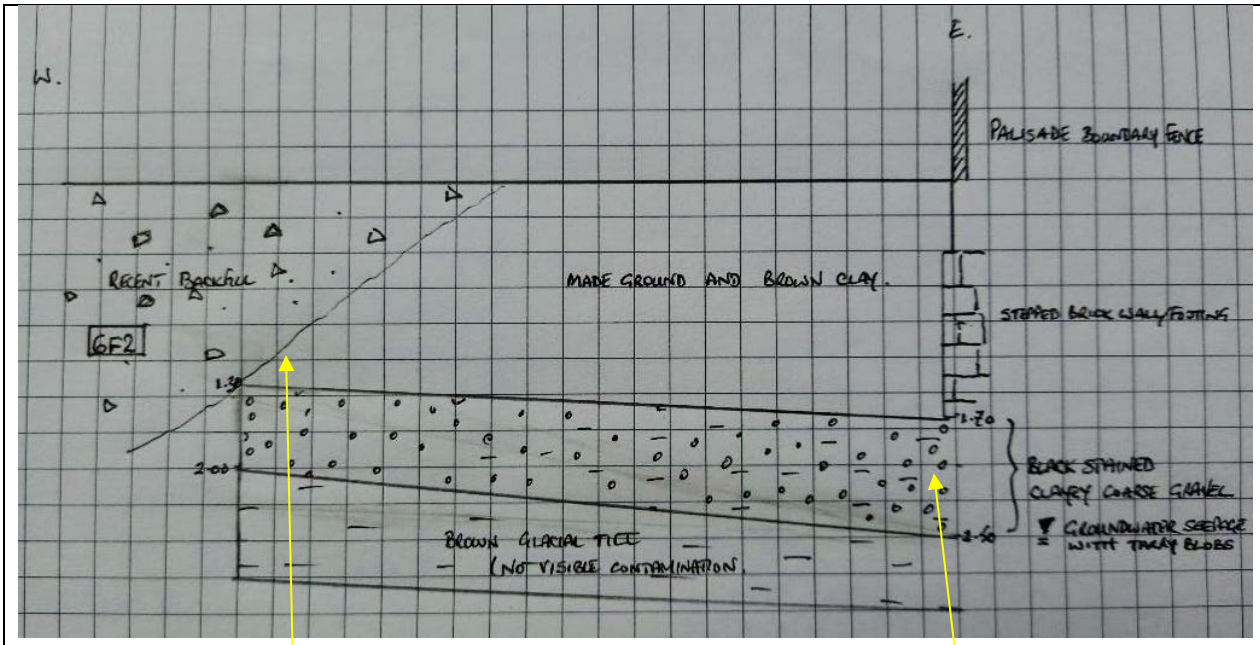


Figure 1. Excavation locations

A sketch section through the trench TT1 (shown in Figure 2 below) shows the sequence of soils from ground level to 2.50 m as mixed made ground and clay from ground level to a maximum of 1.70 m depth, below which was a 0.70 m thick layer of black stained clayey coarse gravel. At the eastern end of the trench at the site boundary, this layer was present below a vertical brick wall or footing. A slow water ingress/seepage with tarry free phase as blobs and a sheen was observed entering the trench from the boundary. Below this layer was then natural brown clay Till with no visual evidence of contamination.

The black stained layer was noted to shallow and thin into the site until an area of previous remedial excavation and backfill with 6F2 crush material was present.







Photograph of western face TT1	Photograph of stained layer below brick footing in eastern (site boundary) face TT1

Figure 2. Sketch section through TT1 and photographs of trench faces.

The stained layer smelled strongly of tar. PID monitoring shortly after excavation measured 63 ppm VOC from the arisings. However, odours from the pile had dissipated during the return visit to inspect the boundary excavation. Chemical analysis of soil samples from arisings has identified elevated levels of total petroleum hydrocarbons, USEPA 16 priority polyaromatic hydrocarbons BTEX compounds and isomers of trimethylbenzene, consistent with a tar source. Laboratory certificate of analysis 23-51173 is appended.

Risk Assessment

A layer of tarry contamination which likely dates from the 19th century has been identified from 1.30-1.70 m bgl around 0.80 m thick in a zone along the eastern boundary. Observations from TT1 indicate contamination has arisen migrating from a relatively gravelly layer which extends under the site's eastern boundary. Free phase tar is present near the boundary but the previous investigation trial pits indicate this dissipates westwards, thinning and disappearing. From a review of the pre-demolition investigation logs by E3P and post-demolition trial pit by IDOM, evidence of the tarry free phase contamination appears limited to the south-east corner of the site and none was indicated beneath the proposed building footprint, which as previously discussed has been subject to a reduced level excavation.

The contamination recently identified could pose a risk to the health of future users, where exposure via oral, dermal and inhalation pathways are active. However, in view the depth of the contamination (>1 m) and its apparent distribution within proposed external areas, exposure to future users is considered to be unlikely with the current remedial recommendations of clean cover and incorporation of hardsurfacing, likely to provide sufficient mitigation. It is also understood that installation of new attenuation tanking will also result in removal of impacted material where it has been found to thin into a 0.30 m layer, thus removing some of the source.

The identified contamination could pose a risk to groundworkers via inhalation of vapours, dermal contact and inadvertent ingestion.

Polymeric pipe materials are at risk and can be degraded by organic contamination.

The apparent confinement of the contamination above the significant thickness of glacial clay Till and minor volumes of water observed, indicate that there is unlikely to be a risk to groundwaters. No surface water receptors are identified vicinity.

Recommendations

The following are recommended actions to manage the risks identified above, *i.e*. minimise workers' exposure, protect new services and prevent recontamination of clean backfill.

- Westwards re-routing of proposed drainage infra structure installation to avoid the contaminated zone as far as possible and therefore reduce the potential for workers' exposure to contaminated soil and vapours;

- Where new infrastructure installation is required to excavate into affected soils,

    - Exclude non-essential staff from the work area.

    - Undertake machine excavation to remove affected soil from the new service trench routes and manhole ring installation excavations. Excavation operator to have closed cab and suitable RPE with an ABEK vapour filter. Arisings to be sheeted above and below or directly loaded onto lorries for disposal. Any underlying soils which have become inadvertently impacted by placement of arisings to be scraped back to clean soil.

- For all drainage excavations, extend the dig to remove a surrounding zone sufficient to install a low permeability trench liner, such as shotcrete, a chemically resistant heavy gauge membrane or a combination, to seal out vapours from the work area and prevent seepage of water or tar into the excavation and protect backfill materials.

- Excavations to be undertaken under watching brief with exposed bases and sides of the trench and attenuation tank excavations to be inspected and sampled for validation purposes.

- Use of chemically resistant drainage pipes such as vitreous clay.

- Expose the face of the contaminated section along the south-eastern boundary to the top of the glacial clay at around -2.5m and place a low permeability liner such as shotcrete or a chemically resistant heavy gauge membrane along the batter.

Waste considerations

The results of the analysis of soil arisings indicate that tarry impacted soil should be treated as hazardous for the purpose of waste disposal, due to the hydrocarbon content. The likely EWC waste code is 17 05 03. The attached results should be issued to the waste carrier and receiving facility to inform them of the nature of the material and their acceptance of the waste.

This letter should be provided to the local planning authority to confirm that the proposed remedial actions are acceptable.

Yours sincerely



Keith Paramor

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Analytical Report Number : 23-51173

Project / Site name:	Poland Street	**Samples received on:**	16/08/2023
Your job number:	20376	**Samples instructed on/ Analysis started on:**	16/08/2023
Your order number:	23 2 FDO LABS	**Analysis completed by:**	24/08/2023
Report Issue Number:	1	**Report issued on:**	24/08/2023
Samples Analysed:	2 soil samples		

Signed: JSzwagrak

Joanna Szwagrzak
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 23-51173
Project / Site name: Poland Street
Your Order No: 23 2 FDO LABS

Lab Sample Number				2782169	2782170
Sample Reference				MSP201	MSP202
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				15/08/2023	15/08/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	70
Moisture Content	%	0.01	NONE	23	13
Total mass of sample received	kg	0.001	NONE	1.1	1.2
General Inorganics					
pH - Automated	pH Units	N/A	MCERTS	8.3	9.1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.384	0.705
Organic Matter (automated)	%	0.1	MCERTS	3.7	4.4
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.1	2.5
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	2.7	3.5
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	46	110
Acenaphthylene	mg/kg	0.05	MCERTS	16	65
Acenaphthene	mg/kg	0.05	MCERTS	35	54
Fluorene	mg/kg	0.05	MCERTS	53	120
Phenanthrene	mg/kg	0.05	MCERTS	220	460
Anthracene	mg/kg	0.05	MCERTS	55	140
Fluoranthene	mg/kg	0.05	MCERTS	130	280
Pyrene	mg/kg	0.05	MCERTS	110	260
Benzo(a)anthracene	mg/kg	0.05	MCERTS	42	120
Chrysene	mg/kg	0.05	MCERTS	40	120
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	36	100
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	14	48
Benzo(a)pyrene	mg/kg	0.05	MCERTS	37	110
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	15	52
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	4.1	15
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	17	65
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	869	2120
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	17
Barium (aqua regia extractable)	mg/kg	1	MCERTS	160	150
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	27	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	230	380
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	42	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	43	39
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93	100

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

Analytical Report Number: 23-51173
Project / Site name: Poland Street
Your Order No: 23 2 FDO LABS

Lab Sample Number				2782169	2782170
Sample Reference				MSP201	MSP202
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				15/08/2023	15/08/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Monoaromatics & Oxygenates					
Benzene	µg/kg	5	MCERTS	150	370
Toluene	µg/kg	5	MCERTS	200	520
Ethylbenzene	µg/kg	5	MCERTS	330	< 5.0
p & m-xylene	µg/kg	5	MCERTS	820	< 5.0
o-xylene	µg/kg	5	MCERTS	920	1800
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0
Petroleum Hydrocarbons					
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.1	NONE	1.5	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	2.2	11
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	37	110
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	62	150
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	42	90
TPH-CWG - Aliphatic >EC35 - EC40 $_{EH_CU_1D_AL}$	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	140	360
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.1	NONE	< 0.10	0.27
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.1	NONE	< 0.10	0.35
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.1	NONE	1.7	5.4
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	9.4	47
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	180	520
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	440	1400
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	250	1100
TPH-CWG - Aromatic >EC35 - EC40 $_{EH_CU_1D_AR}$	mg/kg	10	NONE	20	94
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	880	3100
TPH Total C5 - C40 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	1000	3500
VOCs					
Chloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Chloroform	µg/kg	5	NONE	< 5.0	< 5.0
1,1,1-Trichloroethane##	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,1-Dichloropropene##	µg/kg	5	ISO 17025	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	150	370
Carbontetrachloride	µg/kg	5	NONE	< 5.0	< 5.0
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0

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

Analytical Report Number: 23-51173
Project / Site name: Poland Street
Your Order No: 23 2 FDO LABS

Lab Sample Number				2782169	2782170
Sample Reference				MSP201	MSP202
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				15/08/2023	15/08/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Cis-1,3-dichloropropene##	µg/kg	5	ISO 17025	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	200	520
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	330	< 5.0
p & m-xylene	µg/kg	5	MCERTS	820	< 5.0
Styrene	µg/kg	5	ISO 17025	140	250
Bromoform	µg/kg	5	NONE	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	920	1800
Isopropylbenzene	µg/kg	5	ISO 17025	150	120
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Bromobenzene	µg/kg	5	NONE	< 5.0	< 5.0
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	1200	1200
Tert-Butylbenzene##	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	3200	3600
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	180
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0

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

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

Analytical Report Number : 23-51173
Project / Site name: Poland Street

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2782169	MSP201	None Supplied	None Supplied	Brown clay and gravel with vegetation.
2782170	MSP202	None Supplied	None Supplied	Grey clay and gravel with stones.

Analytical Report Number : 23-51173
Project / Site name: Poland Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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 organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	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
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Analytical Report Number : 23-51173
Project / Site name: Poland Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.



NOTE:
FOR PUBLIC HIGHWAY WORKS REFER TO ARCHITECTS S278 PACK

KEY

- PROPOSED COMBINED WATER DRAIN
- PROPOSED SURFACE WATER DRAIN
- PROPOSED FOUL WATER DRAIN
- EXISTING COMBINED WATER SEWER
- PROPOSED GEOCELLULAR ATTENUATION TANK
- RWP PROPOSED RAINWATER PIPE
- CTD PROPOSED FOUL CONNECTION TO DRAIN
- PROPOSED OIL SEPERATOR
- H PROPOSED FLOW CONTROL
- PROPOSED GREASE TRAP
- PROPOSED POLYPROPYLENE INSPECTION CHAMBER
- G PROPOSED GULLY
- PROPOSED LINEAR DRAIN
- PROPOSED CATCHPIT MAMHOLE
- PROPOSED PERFORATED PIPE
- PUBLIC HIGHWAY WORKS (BY OTHERS)
- RAIN GARDENS
- RED LINE BOUNDARY
- POLLUTION CONTROL BARRIER
- IN ABEYANCE

NOTES:

1. THIS DRAWING IS PRELIMINARY AND IS SUBJECT TO CHANGE DEPENDING ON FURTHER DEVELOPMENT OF THE G.A., SITE LAYOUT, RWP AND POP-UP LAYOUT.
2. THIS DRAWING IS BASED ON PLANIT I.E. LANDSCAPE GENERAL ARRANGEMENT, DRAWING NO. 2522-PLA-00-00-DR-L-0001, REV P07 AND BUTTRESS ARCHITECTS GROUND FLOOR PLAN, DRAWING NO. 45306-BUT-ZZ-00-DR-A-2000-P02.
3. TO BE READ IN CONJUNCTION WITH ALL RELEVANT KENNEDY REDFORD DRAWINGS.
4. EXISTING SEWER LOCATIONS AND LEVELS TO BE CONFIRMED BY CONTRACTOR ON SITE, PRIOR TO WORK COMMENCING.
5. PRIVATE DRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH BUILDING REGULATIONS.
6. NO CONNECTION TO BE MADE TO THE PUBLIC SEWER UNTIL APPROVAL HAS BEEN RECEIVED FROM THE RELEVANT AUTHORITY.
7. ALL INSPECTION CHAMBER SIZES ARE 475Ø UNLESS INDICATED OTHERWISE.
8. UNLESS INDICATED OTHERWISE ALL PIPES TO BE LAID SOFFIT TO SOFFIT.
9. WHERE PROPOSED DRAINS ARE IN PROXIMITY TO PROPOSED FOUNDATIONS, THE FOUNDATIONS SHALL BE TAKEN DEEPER TO BELOW THE DRAINS OR THE DRAIN SHOULD BE PROTECTED WITH A FULL CONCRETE SURROUND.
10. PROPOSED PIPEWORK WITH LESS THAN THE FOLLOWING DEPTHS TO SOFFIT REQUIRES A CONCRETE SURROUND:
- 1.2m IN ROADS
- 0.6m UNDER FOOTPATHS AND UNDER BUILDINGS.
11. ALL PRIVATE SURFACE WATER PIPES TO BE MIN 150mmØ LAID AT A MAX 1:80 GRADIENT U.N.O.
12. ALL UNDERSLAB FOUL PIPES TO BE 100mmØ LAID AT A MAX 1:40 GRADIENT U.N.O. OTHER FOUL PIPES TO BE 100mmØ LAID AT A MAX 1:80 GRADIENT U.N.O.
13. PROPOSED DRAINAGE IS SUBJECT TO CONFIRMATION (BY CONTRACTOR) OF LEVELS OF EXISTING DRAINAGE AT PROPOSED CONNECTION POINTS.
14. ALL LINEAR DRAINS TO BE ACO MULTIDRAIN M100D OR SIMILAR APPROVED UNLESS STATED OTHERWISE.
15. CONTRACTOR TO ARRANGE ALL SEWERS AND DRAINS TO BE FLUSHED OUT BEFORE FINAL CCTV SURVEY IS CARRIED OUT ON COMPLETION OF WORKS.
16. CONTRACTOR TO APPLY FOR SEWER PERMITS AND ROAD OPENING PERMITS AS NECESSARY FROM THE APPROPRIATE AUTHORITIES, PRIOR TO COMMENCING WORKS.
17. THE CONTRACTOR SHALL ALLOW FOR ALL TRAFFIC MANAGEMENT IN CONNECTION WITH ROAD AND SEWER WORKS.
18. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND CONSTRUCTION PROCEDURES.
19. EXTENTS OF ATTENUATION TANK TO BE REFINED TO SUIT LANDSCAPE LAYOUT. PRODUCT SECTION WILL INFLUENCE THE FLEXIBILITY OF THE ARRANGEMENT.
20. ALL MANHOLE SIZES ARE 1200Ø UNLESS INDICATED OTHERWISE.

REV	DATE	DESCRIPTION	DRN	CHK	APR
C02	30.08.23	DRAINAGE AMENDED	M.M	P.V	R.B
C01	27.06.23	CONSTRUCTION ISSUE	M.M	P.V	R.B
P08	14.06.23	SURFACE WATER AND FOUL WATER REVIEWED.	M.M	P.V	R.B
P07	15.05.23	EXISTING SEWER & PROPOSED CONNECTION REVIEWED	M.M	P.V	R.B
P06	03.04.23	STAGE 4 DESIGN ISSUE	M.M	P.V	R.B
P05	24.03.23	FOUL WATER REVIEWED	M.M	P.V	R.B
P04	14.03.23	MANHOLE REF REVIEWED	M.M	P.V	R.B
P03	09.03.23	MANHOLE COVERS ADDED.	M.M	P.V	R.B
P02	24.02.23	DRAWING NO. UPDATED AS PER B&K REQUIREMENTS. DRAINAGE LAYOUT UPDATE.	M.M	P.V	R.B
P01	18.11.22	PRELIMINARY ISSUE	M.M	R.B	P.V

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CLIENT
BOWMER & KIRKLAND

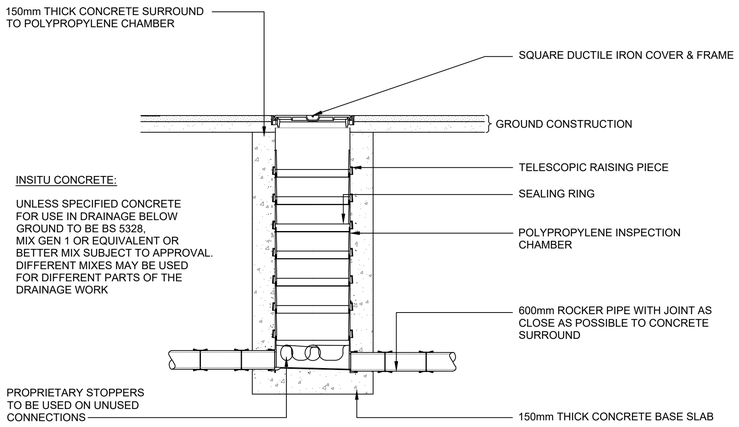
PROJECT NAME
ANCOATS MOBILITY HUB

DRAWING TITLE
DRAINAGE LAYOUT - GROUND FLOOR AND EXTERNAL

DATE	SCALE	SHEET SIZE	REV.
18.11.22	1:200	A1	C02

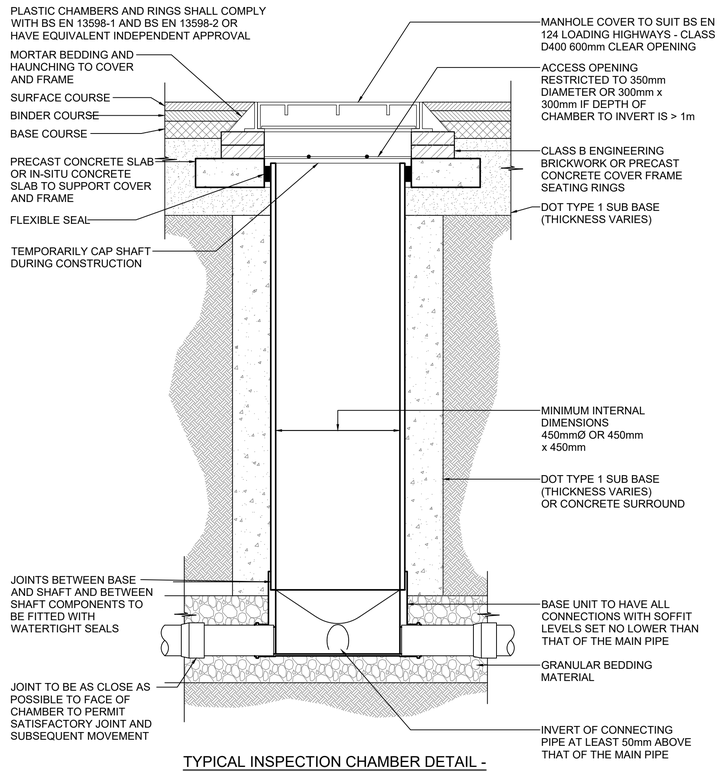
DRAWING STATUS
A - CONSTRUCTION ISSUE

DRAWING NUMBER
45306 - KRD - XX - EX - DR - C - 5201



TYPICAL PPIC DEPTHS COVER TO INVERT BETWEEN 1.2m & 3.0m

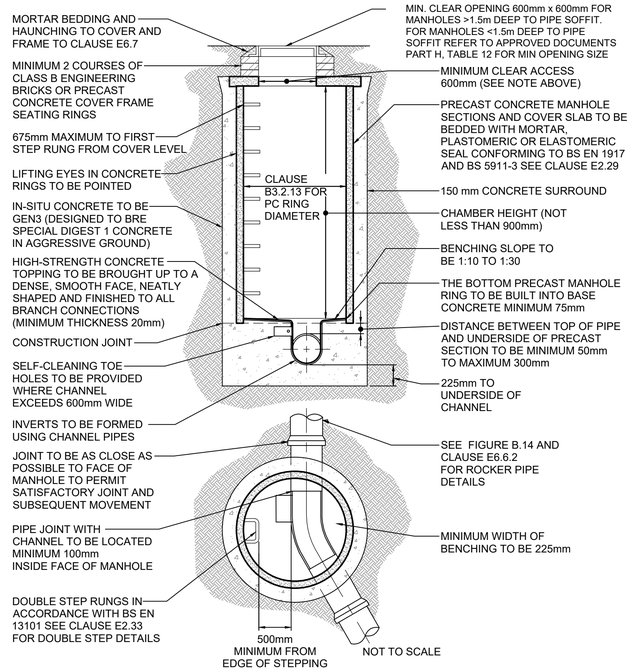
SCALE 1:20



TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (FLEXIBLE MATERIAL DETAIL)

MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE IN AREAS SUBJECT TO VEHICLE LOADING 3 M, NON-ENTRY

(NTS)



TYPICAL MANHOLE DETAIL - TYPE 2

Maximum depth from cover level to soffit of pipe 3.0 m

(NTS)

NOTES:

1. TO BE READ IN CONJUNCTION WITH ALL RELEVANT KENNEDY REDFORD DRAWINGS.
2. PROPOSED PIPEWORK WITH LESS THAN THE FOLLOWING DEPTHS TO SOFFIT REQUIRES A CONCRETE SURROUND:
   - 1.2m IN ROADS
   - 0.6m UNDER FOOTPATHS AND UNDER BUILDINGS.
3. MANHOLE COVERS AND FRAMES SHALL BE TO BS EN 124 AND SHALL BE KITEMARKED. COVERS AND FRAMES SHALL BE HEAVY DUTY D400 IN CARRIAGEWAYS AND VEHICULAR AREAS AND MEDIUM DUTY B125 IN FOOTWAYS AND SOFT LANDSCAPING. IN BLOCK/CONCRETE PAVED AREAS COVERS SHALL BE RECESSED FABRICATED STEEL. ALL RECESSED COVERS SHALL BE FACTA D IN CARRIAGEWAYS AND VEHICULAR AREAS AND FACTA B IN FOOTWAYS IN ACCORDANCE WITH THE FACTA ASSOCIATION GRADINGS.
4. COVER LEVELS ARE TO BE ADJUSTED LOCALLY TO SUIT FINISHED GROUND LEVELS.
5. WHERE POSSIBLE RECESSED COVERS IN BLOCK PAVED AREAS TO HAVE COVER & FRAME ORIENTATED 'SQUARE' WITH PAVING TO MINIMISE CUT SLABS OR BLOCKS.
6. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN124, HAVE MINIMUM 600 X 600 CLEAR OPENINGS WITH 150 DEEP FRAMES UNLESS OTHERWISE SPECIFIED.
7. PIPE CONNECTIONS NOT TO INSPECTION CHAMBERS SHALL BE VIA PREFORMED OBLIQUE JUNCTIONS SWEPT IN THE DIRECTION OF FLOW.
8. ALL BENDS IN PIPEWORK SHALL BE LONG RADIUS.
9. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.
10. RECYCLED MATERIAL MAY BE USED AS REPLACEMENT BACKFILL MATERIAL, PROVIDED IT IS SUITABLY SCREENED, GRADED AND CRUSHED, TO SHW SERIES 600.
11. SELECTED BACKFILL AS DUG MATERIAL FREE FROM VEGETABLE MATTER, RUBBISH, FROZEN SOIL & MATERIAL RETAINED O N40mm SIEVE. TO BE COMPACTED IN 100mm LAYERS BY HAND.
12. POLLUTION CONTROL BARRIERS PROPOSED IN LINE WITH IDOM'S RECOMMENDATIONS.
13. POLLUTION CONTROL BARRIERS TO BE INSTALLED TO MANUFACTURERS' SPECIFICATION AND RECOMMENDATION.

NOTE *
150mm OR 1/4 OF THE O.D. (OUTSIDE DIAMETER) WHICH EVER IS GREATER. FOR CONCRETE PIPEWORK 200mm OR 1/4 OF O.D. WHICH EVER IS GREATER.

R12:270 BACKFILLING TO PIPELINES GENERALLY:
UNLESS SPECIFIED OTHERWISE, BACKFILL FROM TOP OF SPECIFIED SURROUND OR PROTECTIVE CUSHION WITH MATERIAL EXCAVATED FROM THE TRENCH, COMPACTED IN LAYERS NOT EXCEEDING 300mm THICK. DO NOT USE HEAVY COMPACTORS BEFORE THERE IS 600mm OF MATERIAL OVER PIPES.

R12:280 BACKFILLING UNDER ROADS, PAVINGS & BUILDING FOOTPRINT:
BACKFILL FROM TOP OF SPECIFIED SURROUND OR PROTECTIVE CUSHION UP TO FORMATION LEVEL WITH GRANULAR SUB BASE MATERIAL TYPE 1 TO DOT SPECIFICATION FOR HIGHWAYS WORKS, CLAUSE 803, LAID AND COMPACTED IN 150mm LAYERS.

R12:370 CLASS S GRANULAR SURROUND
LOWER PART OF TRENCH WIDTH TO BE AS CLAUSE 667 GRANULAR MATERIAL:NATURAL

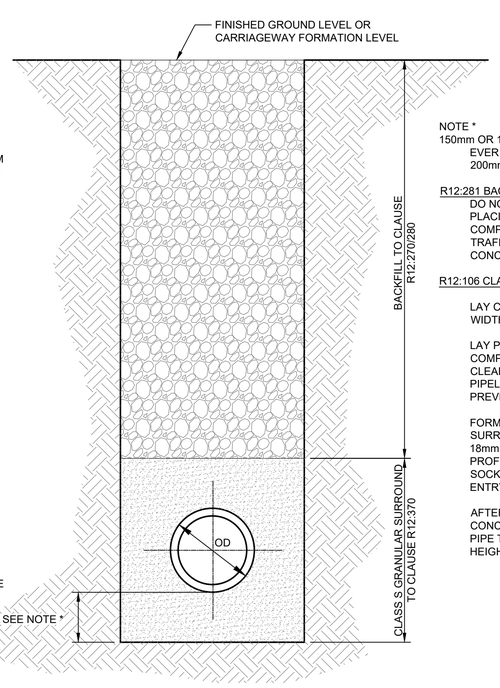
PIPE SIZES DN 100 & DN 150: SIZE 4/10.
PIPE SIZES DN 225 & DN 300: SIZE 4/10, 10/20 OR 4/20.
PIPE SIZES DN 375-500: SIZE 10/20 OR 4/20.
PIPE SIZES DN 600 AND ABOVE: SIZE 10/20, 20/40, 4/20 OR 4/40.

LAY AND COMPACT TO A THICKNESS NOT LESS THAN 50mm FOR SLEEVE JOINTED PIPES, 100mm FOR SOCKET JOINTED PIPES, OVER FULL WIDTH OF TRENCH, WHERE TRENCH BOTTOM IS UNEVEN DUE TO HARD SPOTS OR OTHER REASON, INCREASE DEPTH BY 100mm. SCOOP OUT LOCALLY AT COUPLINGS/SOCKETS AND LAY PIPES DIGGING SLIGHTLY INTO BED AND RESTING UNIFORMLY ON THEIR BARRELS. ADJUST TO LINE AND GRADIENT.

AFTER INITIAL TESTING, LAY AND COMPACT MORE GRANULAR MATERIAL IN 100MM LAYERS TO 150mm (250mm FOR ADOPTED SEWERS) ABOVE CROWN OF PIPE.

LOWER PART OF TRENCH:
WHERE BEDDING CLASS S IS SPECIFIED TRENCH WIDTH TO BE NOT MORE THAN THE FOLLOWING, REGARDLESS OF DEPTH OF COVER:

Nominal Pipe Size (DN)	100	150	225	300
Max. Trench Width (mm)	600	700	800	900



BEDDING CLASS S

SCALE 1:10

NOTE *
150mm OR 1/4 OF THE O.D. (OUTSIDE DIAMETER) WHICH EVER IS GREATER. FOR CONCRETE PIPEWORK 200mm OR 1/4 OF O.D. WHICH EVER IS GREATER.

R12:281 BACKFILLING OVER CONCRETE
DO NOT START BACKFILLING WITHIN 24 HOURS OF PLACING CONCRETE. DO NOT USE HEAVY COMPACTORS AND PREVENT IMPOSITION OF TRAFFIC LOADS WITHIN 72 HOURS OF PLACING CONCRETE.

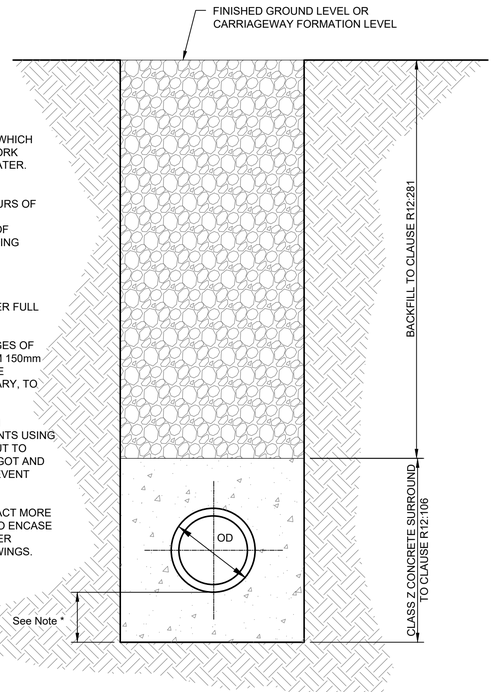
R12:106 CLASS Z CONCRETE SURROUND

LAY CONCRETE BLINDING, 25mm THICK OVER FULL WIDTH OF TRENCH AND ALLOW TO SET.

LAY PIPES ON BLINDING ON FOLDING WEDGES OF COMPRESSIBLE BOARD TO GIVE A MINIMUM 150mm CLEARANCE UNDER THE PIPE. ANCHOR THE PIPELINE OR FILL WITH WATER, IF NECESSARY, TO PREVENT FLOTATION.

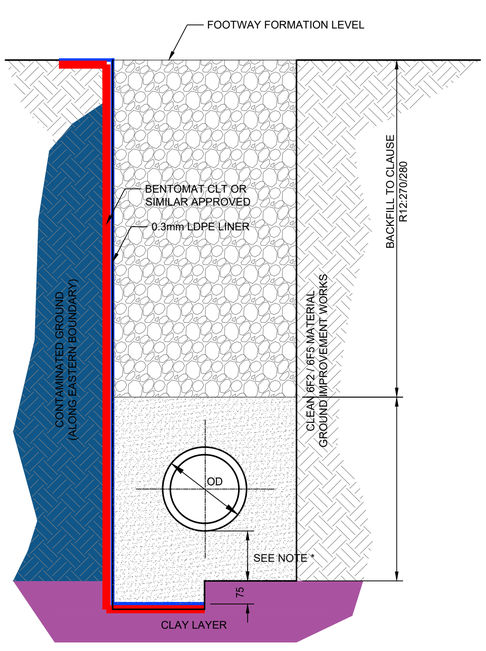
FORM VERTICAL CONSTRUCTION JOINTS IN SURROUND AT FACE OF FLEXIBLE PIPE JOINTS USING 18mm THICK COMPRESSIBLE BOARD PRECUT TO PROFILE PIPE. FILL ANY GAP BETWEEN SPIGOT AND SOCKET WITH RESILIENT MATERIAL TO PREVENT ENTRY TO CONCRETE.

AFTER INITIAL TESTING, PLACE AND COMPACT MORE CONCRETE FOR FULL WIDTH OF TRENCH TO ENCASE PIPE TO 150mm ABOVE CROWN OR TO OTHER HEIGHT AS SPECIFIED OR SHOWN ON DRAWINGS.



BEDDING CLASS Z

SCALE 1:10



POLLUTION CONTROL TRENCH LINING DETAIL

SCALE 1:10

REV	DATE	DESCRIPTION	DRN	CHK	APR
C02	30.08.23	POLLUTION CONTROL DETAIL ADDED	M.M	P.V	R.B
C01	27.06.23	CONSTRUCTION ISSUE	M.M	P.V	R.B
P03	03.04.23	STAGE 4 DESIGN ISSUE	M.M	P.V	R.B
P02	09.03.23	DRAWING NO. UPDATED AS PER B&K REQUIREMENTS. NEW DETAILS ADDED.	M.M	P.V	R.B
P01	23.11.22	STAGE 3 ISSUE	M.M	R.B	P.V

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Kennedy Redford MANAGING VISION

CLIENT: BOWMER & KIRKLAND

PROJECT NAME: ANCOATS MOBILITY HUB

DRAWING TITLE: DRAINAGE DETAILS - SHEET 1

DATE	SCALE	SHEET SIZE	REV
23.11.22	AS SHOWN	A1	C02

DRAWING STATUS: A - CONSTRUCTION ISSUE

DRAWING NUMBER: 45306 - KRD - XX - ZZ - DR - C - 5231

FILE NOTE

IDOM

PROJECT Ancoats Mobility Hub		JOB NUMBER	20376
RECORDED BY	KRP	DATE	04-09-23
REFERENCE	FN-20376-04-09-23-KRP	PAGE	1 of

☒Comments	☐Design	☐Incoming Call	☐Outgoing Call	☐Other
Desc	Desc	With	Of	Desc
SUBJECT	Attenuation tank excavation – inspection and validation			

Further to discovery of tarry contamination below ca 1.7 m in south-east corner, mitigation measures to drainage pipe trench installations discussed with B&K and their engineer. Installation of drainage runs in affected area can wait until these are agreed with the client/LPA.

In the meantime excavation of the attenuation tank/cellular SW storage along the southern boundary required to go-ahead. KRP attended site on 01-09-23 to inspect the excavation for signs of contamination and collect samples of the base for validation and from samples of made ground arisings which will go off.



Full length of tank will be is as per the hatched.

Initial excavation open upon arrival was from orange line westwards (towards Poland St). 1.2 m of recently placed crush had been removed (for re-use) revealing historic cindery made ground with oyster shells, brick, clay smoking pipe, over brown clay Till. Made ground sampled for muckaway. Trial trenches dug at locations MVAL01 and MVAL02 down to invert levels (-2.5m). Base therefore in clay which looked clean and validation samples collected from these. No significant staining or odours in base or sides. As the contamination is known to emerge from the SE corner, the absence of contamination at the validation sample locations indicated no further likelihood of contamination would be present as one progresses westwards.

As the eastern end of the tank excavation was to extend for another 10 m or so into the contaminated corner, trial pit dug at its eastern end. A black oily patch was found along part of the eastern face from around 1.7 m. This was dug through to reveal the outline of a small rectangular brick structure 1m x 0.8 m. No base, just brick sides sitting in the glacial Till – possibly a redundant manhole (see red square on plan). This had one or two bucketloads of back oily sludge at the base and was removed by 3mbgl in brown silt/clay. MVAL 03 taken at the base. Odour was of weathered diesel and oil, rather than the obvious tarry contamination found along the boundary. Therefore a separate, small source area of contamination. Nothing obvious in western face

As this was removed, it was advised that significant contamination in the attenuation tank excavation requiring RPE was no longer likely.

Samples MVAL01-03 scheduled for TPH, VOC&SVOC.

Photos saved here:

O:\Jobs 20000-20499\20376 B&K North West Projects\14.0 Poland Street Ancoats\4.0 Project Documents\4.11 Photographs\attenuation tank dig 01-09-23



Main attenuation tank excavation 01/09/23



Eastern end of attenuation tank excavation. No visible or olfactory evidence of contamination



Redundant manhole to east of attenuation tank dig (dark grey patch in photo), excavated out to clean clay at 3 m depth and sampled as VAL03.

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Analytical Report Number : 23-54601

Project / Site name:	Ancoats Mobility Hub	**Samples received on:**	04/09/2023
Your job number:	20376	**Samples instructed on/ Analysis started on:**	04/09/2023
Your order number:	23-2-FDO-LABS	**Analysis completed by:**	11/09/2023
Report Issue Number:	1	**Report issued on:**	11/09/2023
Samples Analysed:	4 soil samples		

Signed: JSzwagrak

Joanna Szwagrzak
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 23-54601
Project / Site name: Ancoats Mobility Hub
Your Order No: 23-2-FDO-LABS

Lab Sample Number				2800654	2800655	2800656	2800657
Sample Reference				MVAL01	MVAL02	MVAL03	Tank Arisings
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.30	3.00	1.20-2.00
Date Sampled				01/09/2023	01/09/2023	01/09/2023	01/09/2023
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	9.1
Moisture Content	%	0.01	NONE	20	16	13	17
Total mass of sample received	kg	0.001	NONE	0.3	1.2	0.3	1.3
General Inorganics							
pH - Automated	pH Units	N/A	MCERTS	-	-	-	8.1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.314
Organic Matter (automated)	%	0.1	MCERTS	-	-	-	5.3
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	3.1
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	0.32
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	0.28
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	0.33
Fluorene	mg/kg	0.05	MCERTS	-	-	-	0.52
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	4.4
Anthracene	mg/kg	0.05	MCERTS	-	-	-	0.97
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	4.6
Pyrene	mg/kg	0.05	MCERTS	-	-	-	5.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	2.7
Chrysene	mg/kg	0.05	MCERTS	-	-	-	2.8
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	2.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	1.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	2.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	0.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	1.6
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	-	31.6
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	29
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	240
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	-	< 1.8
Chromium (III)	mg/kg	1	NONE	-	-	-	20
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	210
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	360
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	1.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	110

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Analytical Report Number: 23-54601
Project / Site name: Ancoats Mobility Hub
Your Order No: 23-2-FDO-LABS

Lab Sample Number				2800654	2800655	2800656	2800657
Sample Reference				MVAL01	MVAL02	MVAL03	Tank Arisings
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.30	3.00	1.20-2.00
Date Sampled				01/09/2023	01/09/2023	01/09/2023	01/09/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Monoaromatics & Oxygenates							
Benzene	µg/kg	5	MCERTS	-	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	-	-	-	< 5.0
o-xylene	µg/kg	5	MCERTS	-	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	< 5.0
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.1	NONE	-	-	-	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.1	NONE	-	-	-	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.1	NONE	-	-	-	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 $_{EH_CU_1D_AL}$	mg/kg	10	NONE	-	-	-	< 10
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.1	NONE	-	-	-	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.1	NONE	-	-	-	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.1	NONE	-	-	-	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	-	-	-	1.4
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	-	-	-	4.9
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	20
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	49
TPH-CWG - Aromatic >EC35 - EC40 $_{EH_CU_1D_AR}$	mg/kg	10	NONE	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	-	-	-	75
TPH Total C5 - C40 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	-	-	-	84
VOCs							
Chloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Chloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
Bromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Chloroform	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	-
Carbontetrachloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-

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Analytical Report Number: 23-54601
Project / Site name: Ancoats Mobility Hub
Your Order No: 23-2-FDO-LABS

Lab Sample Number				2800654	2800655	2800656	2800657
Sample Reference				MVAL01	MVAL02	MVAL03	Tank Arisings
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.30	3.00	1.20-2.00
Date Sampled				01/09/2023	01/09/2023	01/09/2023	01/09/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	-
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Tetrachloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	-
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	-
Styrene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Bromoform	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	-
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Bromobenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	-

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3

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

Analytical Report Number: 23-54601
Project / Site name: Ancoats Mobility Hub
Your Order No: 23-2-FDO-LABS

Lab Sample Number				2800654	2800655	2800656	2800657
Sample Reference				MVAL01	MVAL02	MVAL03	Tank Arisings
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.30	3.00	1.20-2.00
Date Sampled				01/09/2023	01/09/2023	01/09/2023	01/09/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	0.32
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	3.6	0.4
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	1.3	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.13	0.28
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	14	0.33
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	13	0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	10	0.52
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	24	4.4
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.6	0.97
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	1.6	0.3
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	< 0.3	< 0.3	0.4	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.2	4.6
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.8	5.2
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.58	2.7
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.59	2.8
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.31	2.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.16	1.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.23	2.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.1	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.4
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.12	1.6
Miscellaneous Organics							
Presence of Petrol/Diesel	N/A	N/A	NONE	Not-detected	Not-detected	Not-detected	-

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

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Analytical Report Number : 23-54601
Project / Site name: Ancoats Mobility Hub

* 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 *
2800654	MVAL01	None Supplied	2.5	Brown clay.
2800655	MVAL02	None Supplied	2.3	Brown clay.
2800656	MVAL03	None Supplied	3	Brown clay.
2800657	Tank Arisings	None Supplied	1.20-2.00	Brown clay and sand with stones.

Analytical Report Number : 23-54601
Project / Site name: Ancoats Mobility Hub

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	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
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Product ID in soil	Determination of product ID by interpretation against standard chromatograms - Soil.	In-house method	L064-PL/UK	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

Analytical Report Number : 23-54601
Project / Site name: Ancoats Mobility Hub

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

APPENDIX 5 ▪ Drainage trench barrier photographs of installation Dec. 2023



Plate 1: HDPE liner system placement to east face of drainage trench 1



Plate 2: HDPE liner system placement to east face of drainage trench 2 with pipe bedding



Plate 3: Backfill with crush.



Plate 4: Bentomat liner underneath HDPE liner in place



Plate5: Bentomat liner and HDPE liner in place