

Our reference: 076740-CUR-00-XX-RP-GE-003-V01

13th May 2021

Mr Ian Knight
Manchester Life Development Company Limited
Unit 5, Royal Mill
17 Redhill Street
Manchester
M4 5BA

Dear Ian,

Re: Letter Report for Back of Ancoats, Plot C

1.0 Introduction

Curtins Consulting were instructed by Manchester Life Development Company Limited to undertake an additional site investigation for the proposed Ancoats Plot C, located off Jersey Street, Manchester M4 6JW. It must be noted that this ground investigation is part of a wider site, including Plots A, B and C, this letter report refers only to Plot C.

The investigation was undertaken following the E3P 2019 Ground Investigation to assess and improve the knowledge of the area with respect to the ground conditions, and to aid contamination risk assessment and foundation design.

An exploratory hole plan is included at the end of this report and shows the extent of the E3P 2019 ground investigation and Curtins 2021 supplementary intrusive investigation.

The Plot C site is currently split into two distinct parcels of land; the area to the east is vacant land which is fenced to prevent access to the public; while the area to the west is occupied by Easy Equipment catering supplier, with a warehouse on the western boundary and the remainder of the site occupied by tarmac car parking and a container. The site is bound by Jersey St to the north and the Rochdale Canal to the south.

The information provided within this report is intended to supplement the previous phase of investigation, undertaken in November 2019, the findings of which are summarised below.

2.0 Previous Reports and Summary

E3P undertook the following investigation and report for Plot C;

- 1) November 2019** – Phase 2 Geo-environmental Site Assessment, Land at Jersey Street, Ancoats, Manchester PARCEL C (Ref. 13-350-R3)

It is assumed that the above report has previously been made available for review and therefore is not included herein.



2.1 Phase 2 Intrusive Investigation (November 2019)

The E3P investigation was undertaken on the eastern area of Parcel C only, to characterise the geo-environmental and geotechnical site conditions and comprised one cable percussive borehole to a depth of 12.50m bgl, two window sample boreholes and three mechanically excavated trial pits, with selected geotechnical and environmental sampling. Groundwater and ground gas monitoring within installed window sample boreholes were completed post-investigation.

The site is underlain by superficial deposits comprising Glacial Till (diamicton) and bedrock comprising the Manchester Marls Formation. No faults were identified within Plot C.

The site has the following hydrological characteristics; Secondary Undifferentiated Aquifer (superficial deposits) overlying a Secondary B Aquifer (bedrock geology).

The 2019 E3P investigation of the eastern side of the site recorded a thickness of Made Ground between 0.80m and 2.30m bgl. Large obstructions including brick and concrete was encountered, including former brick walls. The Made Ground comprised black gravel with frequent cobbles. The gravel consisted of sandstone, ash, mudstone, concrete and brick.

The Glacial Till was identified across the entire site between 0.80m and 10.30m bgl, comprising a firm to very stiff brown slightly gravelly Clay. In TP117 an isolated area of brown clayey Silt was encountered between 2.30 and 2.80m bgl, underlain by Clay 2.80-3.00m bgl.

The bedrock was identified in the single cable percussive hole between 10.30m and 12.50m bgl, recorded as a dense brown Sandstone. This was corrected by the Curtins 2021 Ground Investigation, see *Section 3.2* for ground condition depths, as this was likely to be a dense sand layer within the Glacial Till.

No groundwater strikes were encountered during the ground investigation; however, groundwater was noted between 1.73 and 1.76m bgl during the first monitoring visit.

An organic odour was observed in the Silt recorded in TP117 at 2.30-2.80m bgl.

Environmental analysis on five Made Ground and three natural soil samples for a broad range of contaminants recorded several exceedances above Residential thresholds with respect to arsenic, cadmium and PAHs. Chrysotile asbestos fibres were also positively identified in WS112 at 1.20m bgl, although quantitative analysis confirmed <0.001% which is low risk.

Based on site observations, laboratory tests, and nature of the proposed development (high-rise apartments) provision of a structural engineer design will be required to support the structure. Considering this, shallow foundations were not considered suitable for the buildings and a driven or CFA piled foundation solution was recommended to support a pad or strip footing in order to form the building.

Ground bearing slabs are unlikely given the anticipated depths of Made Ground on site >600mm and shallow cohesive soils.

The report made the following recommendations:

- Completion of ground gas monitoring;
- Geotechnical earthworks strategy;
- Remediation and enabling works strategy; and
- Further investigation of western area of Plot C upon demolition of structures/access.



3.0 Curtins Ground Investigation (2021)

This ground investigation will assess and improve the knowledge of the ground conditions and to aid contamination assessment and foundation design in Plot C, following the ground investigation undertaken by E3P in November 2019.

Specific investigation of the historic canal channel that cuts through the centre of Plot C was also undertaken, with access agreed through the western side of the site.

3.1 Scope of Works

The site works comprised two rotary cored GeoboreS boreholes (R-C1 and R-C1A) up to 30m bgl, six window sample boreholes (WS-C1 to WS-C4, WS-C4A and WS-C4B) and four trial pits (TP-C1, TP-C2, TP-C4 and TPC5).

TP-C5 was undertaken to investigate whether or not a retaining structure exists adjacent to the old canal bridge. No structure was encountered.

The following soil and rock samples were obtained during the intrusive investigation to allow for chemical and geotechnical testing to be undertaken:

- 3 No. soil samples from Made Ground soils were scheduled for environmental chemical, detailed in *Table 3.1*, to further assess the contamination risk presented to site end users and construction workers in this area of the site;
- 6 No. 2:1 Water Soluble Sulphate;
- 6 No. pH Value;
- 2 No. Atterberg Limits;
- 2 No. Moisture Content; and
- 6 No. Point Load Tests.

The ground investigation was undertaken generally in accordance with the ICE UK Specification for Ground Investigation (2012) and with techniques outlined in Eurocodes 7 - BS EN 1997-1:2004, BS5930:2015 Code of Practice for Site Investigations.

Table 3.1 – Environmental testing suite (Soils)

Suite Ref.	Analyte	LOD
Soils Suite A	Asbestos Screen, asbestos quantification (%), pH, 2:1 Water Soluble Sulphate & Soil Organic Matter (SOM)	-
	Arsenic, Chromium, Chromium VI, Copper, Lead, Selenium, Nickel	1 mg/kg
	Zinc	5 mg/kg
	Boron (water soluble)	1 mg/kg
	Cadmium	0.5 mg/kg
	Mercury	0.17 mg/kg
	Cyanide (total)	1 mg/kg
	Phenols (screen)	0.2 mg/kg
	PAHs (USEPA 16)	0.01 to 0.08 mg/kg
	TPH (Aro/Alk Split)	0.01 to 1.0 mg/kg



One soil sample (WS-C4B) positively identified loose insulation and loose fibres of Chrysotile and Amosite asbestos; asbestos quantification analysis was therefore also undertaken on this sample.

3.2 Ground Conditions

A summary of the ground conditions encountered during the site investigation works is presented in *Table 3.2*, below, with detailed information presented in the exploratory hole logs included at the end of this report. A summary of each strata is presented below.

Table 3.2 – Summary of encountered ground conditions:

Stratum		Depth to Top of Strata m bgl (m AOD)	Thickness (m)		Description
			Min	Max	
MADE GROUND All Exploratory Holes		0.00 (51.50- 49.96)	>0.45 ¹	2.50	Concrete / Concrete and brick layer / Tarmacadam surface covering underlain by interbedded MADE GROUND: Dark brown very sandy angular to subangular fine to coarse gravel of ash, brick, clinker, glass and concrete with low cobble content and low boulder content. Cobbles are angular of brick and scrap metal. Boulders are angular to subangular of brick and scrap metal. MADE GROUND: Blue-black sandy gravelly clay. Sand is fine to coarse, Gravel is angular to subangular fine to coarse of brick, ash, concrete, porcelain, terracotta, clinker and glass. Descriptions above are based on the typical ground conditions. High variability across the site in Made Ground encountered – see Exploratory Logs for details and variations.
GLACIAL TILL	CLAY R-C1, R-C1A, TP-C1, TP-C2, WS-C1 to WS-C3	1.40 – 3.00 (49.50 – 47.80)	8.40	8.90	Soft to firm, becoming stiff brownish grey slightly sandy slightly gravelly CLAY.
	SAND R-C1, R-C1A	10.40 – 10.50 (40.50 – 40.33)	>2.10 ¹	3.50	Dense to very dense brown fine to coarse SAND
	CLAY R-C1A	14.00 (36.83)	4.50		Firm greyish brown slightly sandy gravelly CLAY to 17.0m bgl, underlain by Very stiff brown sandy CLAY.
MANCHESTER MARLS FORMATION	MUDSTONE R-C1A	18.50 (32.33 – 24.95)	7.38		Highly weathered extremely weak to weak brown thinly laminated MUDSTONE. Appears highly weathered in the upper strata (recovered as stiff brown slightly sandy clay).
	SANDSTONE R-C1A	25.88 (24.95)	>4.12		Medium strong to strong reddish brown and grey medium to coarse grained SANDSTONE to 29.60m bgl (21.23m AOD). Extremely weak reddish brown medium grained SANDSTONE from 29.60m bgl.

¹ – Base not encountered

3.3 Groundwater

Groundwater was encountered in WS-C1 to WS-C3 and TP-C1 to TP-C3 at elevations of between 47.42m to 46.96m AOD.



An iridescent sheen was observed in water in R-C1A, with a slight hydrocarbon odour observed in Made Ground at 1.50-2.10m bgl. Groundwater level could not be recorded due to water flush being used.

TP-C2 and TP-C4 also recorded iridescent sheens on the groundwater encountered at 1.40m and 2.10m bgl respectively. Strong hydrocarbon odours were observed at the base of the cohesive Made Ground soils in these trial pits.

3.4 Obstructions

Obstructions were encountered in window sample boreholes WS-C4, C4A and C4B at 0.45-0.70m due to brick foundations.

4.0 Ground Contamination Assessment

3 No. soil samples from Made Ground soils were obtained in total and were environmentally chemically analysed according to the testing Suite A outlined in *Table 1.0*. Considering the sites proposed end-use as apartments, results were compared against adopted '*Residential without Home Ground Produce*' Generic Assessment Criteria (GACs).

Soil organic matter (SOM) content has an influence on the volatilisation of organic contaminants (i.e. the higher the SOM, the lower the volatilisation rate and therefore inhalation exposure risk). Soil organic matter (SOM) values for the Made Ground soils ranged from 6.5% and 13.2% for samples from WS-C4B and WS-C2 respectively; while the sample from TP-C4 recorded an SOM of 34.9% by weight, which corresponds to the soils having a strong hydrocarbon odour and blue-black colour.

With consideration for a calculated geometric average, Made Ground features determine an SOM of 14.4%. As such, a comparison against Tier 1 thresholds for SOM of 6.0% for '*Residential without Home Grown Produce*' end use has been adopted for Made Ground soil features.

The full chemical testing results and adopted GAC's are listed in at the end of this report.

Several exceedances were noted within recovered Made Ground soil samples, as detailed in *Table 4.0* below:

Table 4.0 – Chemical testing result exceedances against Residential without Home Grown Produce 6% GACs

Determinant	Exploratory Hole ID	Depth (m bgl)	Stratum	Concentration (mg/kg)	GAC (mg/kg)
Cyanide	TP-C4	1.30	Made Ground	1320	34
Arsenic	WS-C4B TP-C4	0.60 1.30	Made Ground	42 120	40
Lead	WS-C4B TP-C4	0.60 1.30	Made Ground	2010 1110	310
Dibenzo(ah)anthracene	WS-C4B TP-C4	0.60 1.30	Made Ground	0.34	0.32

Loose insulation and loose fibres of Chrysotile and Amosite asbestos were positively identified in the Made Ground sample from WS-C4B at 0.60m bgl, recording 0.508% by weight. No asbestos containing materials (AMCs) were visually identified in the exploratory holes on site.



The results identify exceedances of cyanide, arsenic and lead, a slight exceedance of PAHs and asbestos loose insulation and fibres in Made Ground samples taken from the back-filled canal channel in the western wide of Parcel C. Based on these results it is recommended that the previous measures identified by EP3 for a clean cover system would be suitable to break the source-pathway-receptor link to the contaminants identified in Table 4.0.

4.0 Preliminary Waste Classification

An initial assessment for the waste classification of the shallow and deeper Made Ground soils encountered on site has been carried out through a comparison of the soil testing results from both the 2019 E3P and 2021 Curtins ground investigation.

This preliminary assessment for the waste classification of soil uses the Waste Soils Characterisation Assessment Tool, Cat-Waste Soil, developed by McArdle and Atkins.

The initial assessment revealed that of the 5No. Made Ground and 3No. natural soils tested from the E3P 2019 investigation and 3no Made Ground soils tested from the Curtins 2021 investigations, three Made Ground samples have indicated to be hazardous with respect to Environment Agency waste classes, using the guidance given in WM3.

These are TP116 at 0.80m (E3P), WS-C4B at 0.60m and TP-C4 at 1.30m bgl. The recorded concentration of 0.508% asbestos fibres recorded in WS-C4B is also classified as hazardous due to the elevated concentration above the 0.1% threshold level.

Where natural soils are being considered for offsite disposal as inert waste, Waste Acceptance Criteria (WAC) testing will be required with confirmation of acceptability from the receiving landfill.

As discussed, preliminary waste classification is undertaken to offer indicative advice with respect to disposal requirements. Landfill operators are not obliged to accept waste and, if they were to do so, may have specific requirements beyond those outlined above prior to acceptance. Landfill operators should be contacted to confirm the above classifications or otherwise.

5.0 Geotechnical Laboratory Analysis

A programme of geotechnical testing was scheduled by Curtins to further confirm the ground model for the site, shallow and deep ground conditions. Geotechnical soil samples for testing were prepared in accordance with BS1377: Part One:1990 and representative sub-samples were taken for testing.

5.1 Geotechnical Testing and Engineering Properties

The following section discusses the ground conditions determined from the Curtins January 2021 Ground Investigation. Where necessary, determination of characteristic parameters has been based on appropriate assessment of results derived from laboratory, published correlations and field tests, complemented with engineering judgement and consideration of the relevant limit state. The parameters are not considered to be absolute and should be referenced with the specific strata text in this section and reviewed when considering a specific area of the site.

5.1.1 Made Ground

Made ground was encountered in all exploratory hole locations however, due to the highly variable nature of made ground, no geotechnical testing was undertaken in this stratum.



5.1.2 Glacial Till

Glacial Till was recorded underlying the Made Ground. The predominantly cohesive deposits were described typically as soft to firm sandy gravelly clay, underlain by dense to very dense sand, further underlain by firm to very stiff sandy clay.

The geotechnical test results recorded within the superficial deposits are summarised in *Table 5.1.2*. As the E3P Cable Percussion boreholes had been advanced to 12.50m bgl, SPTs in R-C1 and R-C1A were started at 10.0m and 14.0m bgl.

Table 5.1.2 – Summary of Glacial Till geotechnical test results

Parameter	No. of tests	Minimum	Maximum
Moisture Content (%)	2	16	18
Liquid Limit (%)	2	41	49
Plastic Limit (%)	2	17	25
Plasticity Index (%)	2	24	
Modified Plasticity Index (%)	2	15	24
pH	1	8.42	
Water Soluble Sulphate (g/l)	1	0.05	
SPT 'N' Value	5	10	50

The average Plasticity Indices for the clay was 24% and the Atterberg Test results indicated low plasticity clays.

A total of five SPT 'N' values were recorded in the strata, ranging from between 10 and 50. The SPT 'N' results indicate variable ground condition, with an increase in strength with depth. Based on the small cohort of results, the results are not displayed graphically.

A moderately conservative characteristic unit weight of 18kN/m³ is deemed appropriate in accordance with BS8002:2015.

The results of SPT can be correlated to an Undrained Shear Strength (C_u) when undertaken within cohesive deposits. For consolidated clays, Stroud (1974) reported good correlations between N and C_u , where $C_u = f_1 \times N$ where values of f_1 are a factor of the plasticity of the clay. Based on an average plasticity Index of 19.5%, and utilising f_1 factor of 6 both undrained shear strengths were 350kPa, indicative of a very high strength clay in accordance with BS EN ISO 14688-2:2004.

The results of SPT can be correlated to a Coefficient of Consolidation (M_v) when undertaken within cohesive deposits. For consolidated clays, Stroud (1974) reported correlations between N and M_v , where $M_v = 1/(f_2 \times \text{SPT } N)$, where values of f_2 are a factor of the plasticity of the clay. Based on an average plasticity index of 19.5% and utilising f_2 factor of 0.55, M_v values were both 0.004 m²/MN. The majority of results indicate a very low compressibility clay.

The Drained and Undrained Young's Modulus, E' and E_u , can be derived through the empirical relationship with Undrained Shear Strength (C_u) described as $E_u = 330 \times C_u$ and $E' = 200 \times C_u$ in accordance with the ICE Manual of Geotechnical Engineering (2012). The results were 115.5 for E_u and 70 for E' .



5.1.3 Bedrock

The bedrock was recorded underlying the Glacial Till in R-C1A only which was extended to bedrock. The bedrock was described as highly weathered extremely weak to weak brown thinly laminated Mudstone, underlain by medium strong to strong reddish brown and grey medium to coarse grained Sandstone.

The geotechnical test results recorded within the bedrock are summarised in *Table 5.1.3a* and *Table 5.1.3b*.

Table 5.1.3a – Summary of bedrock geotechnical test results for Mudstone

Laboratory Test Results	Parameter		No. of Tests	Summary of Results
	Point Load Indices (Is50)	Axial Plane	4	Min: 0.02 Max: 0.05 Average: 0.033
		Diametral Plane	4	Min: 0.02 Max: 0.05 Average: 0.035
	pH Value		1	8.48
	Water Soluble Sulphate (mg/l)		1	<0.01

Table 5.1.3b – Summary of bedrock geotechnical test results for Sandstone

Parameter			No. of Tests	Summary of Results
Laboratory Test Results	Point Load Indices (Is50)	Axial Plane	1	1.19
		Diametral Plane	1	2.44
	pH Value		1	8.59
	Water Soluble Sulphate (mg/l)		1	<0.01

Based on the small cohort of results achieved within the Sandstone, no geotechnical analysis on has been undertaken for this rock type.

The Rock Quality Designation (RQD) recorded in the Mudstone cored samples ranged from 0 to 93% which classifies it as of very poor to excellent rock mass quality. Total Core Recovery (TCR) and Solid Core Recovery (SCR) vary between core runs, but overall show a general increase with depth. Based on the small cohort of results achieved no graphical representation of the results has been provided.

The Rock Quality Designation (RQD) recorded in the Sandstone cored samples ranged from 0 to 24% which classifies it as of very poor to poor rock mass quality. Total Core Recovery (TCR) and Solid Core Recovery (SCR) vary between core runs, but overall show a general increase with depth. Based on the small cohort of results achieved no graphical representation of the results has been provided.

UCS samples were unable to be tested due to breakage of the sample, therefore a published correlation factor of 23 has been used for Mudstone to determine an approximation of the unconfined compressive strength (UCS) of the rock. Based on this, estimated UCS values for Mudstone bedrock range between 0.46MPa and 1.15MPa for axial tests and 0.46MPa and 1.15MPa for diametral tests, indicating the rock tested has strength index of extremely weak, which is generally consistent with strength described in the field.



UCS samples were unable to be tested due to breakage of the sample, therefore a published correlation factor of 18 has been used for Sandstone to determine an approximation of the unconfined compressive strength (UCS) of the rock. Based on this, estimated UCS values for Sandstone bedrock were 21.42MPa for axial tests and 43.92MPa for diametral tests, indicating the rock tested has strength index from weak to medium strong, which is generally consistent with strength described in the field.

6.0 Geotechnical Assessment and Recommendations

The recommendations provided within this section are based on a review of the encountered ground conditions across the site.

The ground conditions at site generally comprised Made Ground of Dark brown very sandy angular to subangular fine to coarse gravel of ash, brick, clinker, glass and concrete with low cobble content and low boulder content underlain by Glacial Till. Glacial till was encountered from depths between 1.40 to 3.00m bgl overlying an extremely weak to weak brown thinly laminated Mudstone. Beneath the Mudstone weak to medium strong Sandstone was encountered and proven to a depth of 30m bgl.

6.1 Chemical Attack on Buried Concrete

The classification of the site in terms of concrete in aggressive ground is based on the guidance provided in Table C2 of the Building Research Establishment (BRE) Special Digest 1, 3rd edition of 2005. A summary of the results obtained during are summarised in *Table 6.2a*, and *Table 6.2b* details the classification.

Table 6.1a – Aggressive Chemical Environment for Concrete (ACEC) Site Classification

Stratum	Test Type	No. of Tests	Range
Made Ground	pH	3	7.2 – 9.15
	Water Soluble Sulphate (mg/l)	3	0.06 – 0.18
Glacial Till	pH	1	8.42
	Water Soluble Sulphate (mg/l)	1	0.05
Bedrock	pH	2	8.48 – 8.59
	Water Soluble Sulphate (mg/l)	2	<0.01

Table 6.1b – Aggressive Chemical Environment for Concrete (ACEC) Site Classification

Stratum	Design Sulphate Class	ACEC Class ⁽¹⁾
Made Ground	DS-1	AC-1
Glacial Till	DS-1	AC-1
Bedrock	DS-1	AC-1

(1) ACEC assessment was based on the *mobile* groundwater condition in a *brownfield* scheme area

In these conditions it is considered that deterioration of buried concrete due to sulphate or acid attack is unlikely to occur. The preliminary design of buried concrete according to Table C2 of BRE Special Digest 1:2005 should be in accordance with Class DS-1 (AC-1) conditions assuming mobile groundwater.



6.2 Foundation Assessment

It is understood the proposed development comprises several structures comprising residential high rise buildings with some commercial use to the ground floor. The loadings of the proposed structure have not been provided at the time of writing this letter report, however it is anticipated the loads will be relatively high. The loads will pre-determine the suitability of foundations adopted.

Based on the ground and groundwater conditions encountered during the E3P and Curtins ground investigations, it is considered that shallow foundations will not be possible to support the proposed development. Foundations would need to be taken down below any Made Ground and low strength superficial soils and be placed in the firm to very stiff cohesive Glacial Till deposits encountered, at depths of at least 3.00m bgl below existing ground level (approx. 46.4m AOD).

Considering the above, and subject to confirmation of building loads, piled foundations may be considered the best option to take the load of the structure to suitable bearing soils at depth. In these ground conditions, it is considered that some form of bored and in-situ cast concrete piled foundation with reinforced concrete ground beam should prove satisfactory.

It is considered likely that driven/Continuous Flight Auger (CFA) piles would be the most suitable piling technique for the site. This suggestion does not however preclude the consideration of the other pile types being used. Should driven piles be proposed then consideration will need to be made for the existing obstructions encountered on site.

It is important to note that the specific pile design will depend on a number of factors including the particular details of the piling system adopted. The advice of a specialist piling contractor should be required such that the final design of the piles can be undertaken, and the suitability of the particular piling system can be considered.

6.3 Ground Floor Slab

The suitable ground floor slab for the development is dependent on the foundation solution. It is likely that ground bearing slabs with relatively low imposed load could be founded on suitable firm to very stiff clays, subject to removal of soft spots and Made Ground. Ground floor slabs must be designed by a structural engineer.

7.0 Closure

If you have any queries with regard to this letter report please do not hesitate to contact us.

Yours sincerely,

Z Henderson
Geo-Environmental Engineer
For and on behalf of
Curtins Consulting Ltd



Author	Signature	Date
Z Henderson BSc (Hons) FGS Geo-Environmental Engineer		13/05/2021
Checked	Signature	Date
S Hyde BSc (Hons) MSc Senior Geo-Environmental Engineer		13/05/2021
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Rev	Description	Issued by	Checked	Date

Appendices

Appendix A1 – Drawings

Appendix A2 – Exploratory Hole Logs

Appendix A3 – Geo-Environmental Laboratory Testing Results

Appendix A4 – Generic Assessment Criteria (GACs)

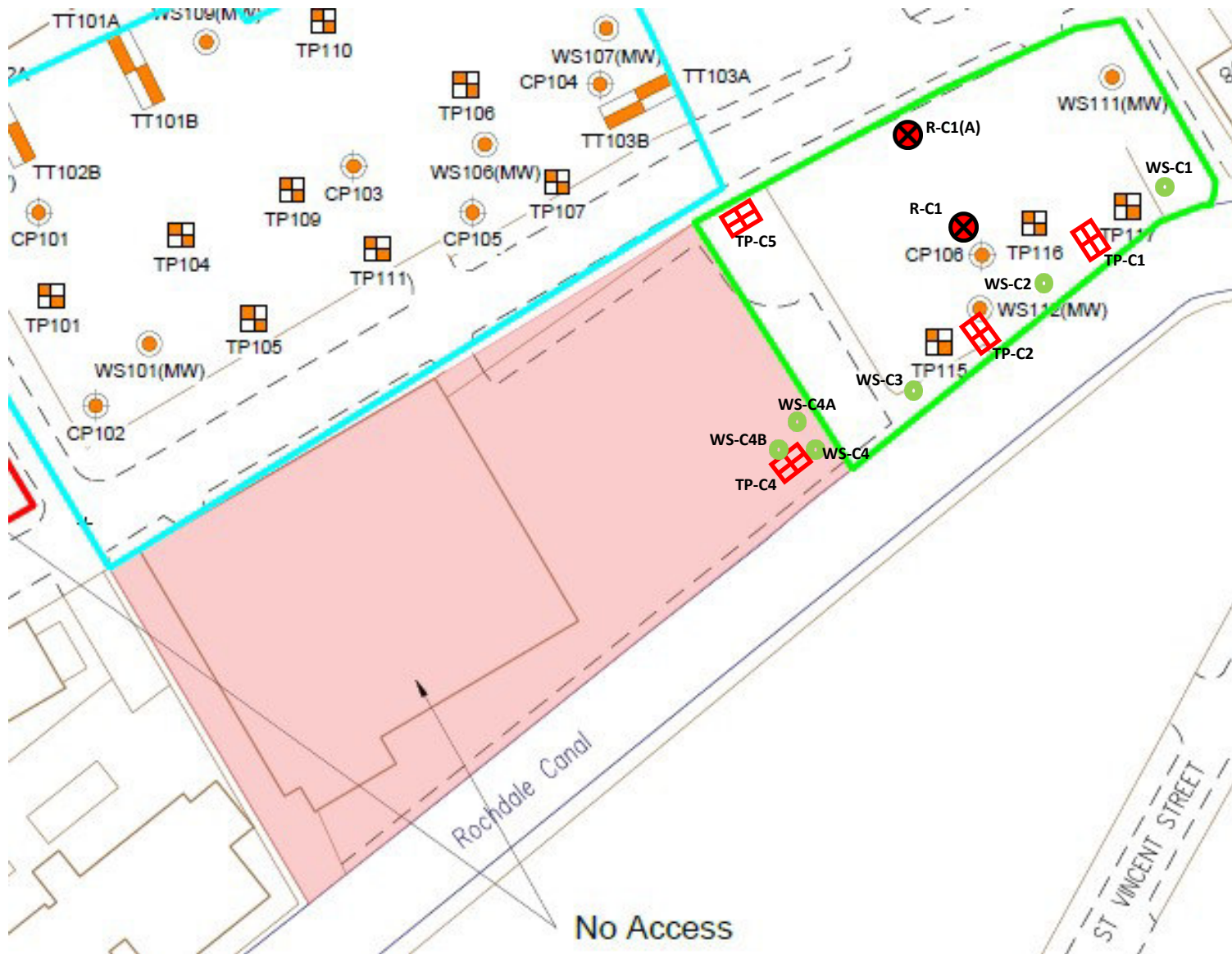
Appendix A5 – Geotechnical Laboratory Testing Results

Back of Ancoats, Plot C

Ref. 076740-CUR-00-XX-RP-GE-003-V01



Appendix A1 – Drawings



Key

E3P 2019 Investigation

Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Slit Trench Location
- No Access
- Parcel B
- Parcel C

Curtins 2021 Investigation

- Rotary Cored Boreholes
- Window Samples
- Machine Excavated Trial Pit

Scope of Works

- 2no Rotary Geobore S boreholes to max 30m bgl.
- 5no Window Sample boreholes up to 5m bgl.
- Machine excavated trial pits up to 3.5m bgl.

Back of Ancoats - Parcel C Exploratory Hole Location Plan





Appendix A2 – Exploratory Hole Logs



Borehole Log

Borehole No.

R-C1

Sheet 1 of 2

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.90

Scale
1:40

Client: Manchester Life

Dates: 18/01/2021 - 19/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	50.70		MADE GROUND: Grey and reddish brown concrete and brick layer. MADE GROUND: Dark brown mottled black sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, concrete and clinker. <i>From 0.20 to 0.40m very gravelly.</i>	1
					1.50	49.40		Soft to firm brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium of sandstone and mudstone.	2
									3
									4
									5
									6
									7
					8.00	42.90		Continued on next sheet	8

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. Terminated at 12.50m bgl due to bubbling in the Rochdale Canal adjacent.





Borehole Log

Borehole No.

R-C1

Sheet 2 of 2

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.90

Scale
1:40

Client: Manchester Life

Dates: 18/01/2021 - 19/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.00		50 (25 for 85mm/50 for 30mm)	10.40	40.50		Stiff to very stiff brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium of sandstone.	9
								Very dense brown fine to coarse SAND.	10
									11
									12
		12.50		50 (15,3/50 for 180mm)	12.50	38.40		End of borehole at 12.50 m	13
									14
									15
									16

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. Terminated at 12.50m bgl due to bubbling in the Rochdale Canal adjacent.





Borehole Log

Borehole No.

R-C1A

Sheet 1 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20	50.63		MADE GROUND: Grey and reddish brown concrete and brick layer.	1
								MADE GROUND: Dark grey slightly sandy slightly clayey angular to subangular fine to coarse gravel of ask, clinker, brick and concrete. Sand is fine to coarse.	
					1.10	49.73		MADE GROUND: Brownish grey slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone.	
					1.50	49.33		MADE GROUND: Dark grey mottled black slightly sandy slightly clayey angular to subangular fine gravel of clinker and ash. Sand is fine to coarse. Iridescent sheen on water. Slight hydrocarbon odour.	
					2.10	48.73		Soft brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to medium of sandstone.	
									2
									3
									4
									5
									6
									7
									8

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-C1A

Sheet 2 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					10.50	40.33			9
									10
								Dense brown fine to coarse SAND.	11
									12
									13
		14.00		N=10 (1,1/1,1,3,5)	14.00	36.83			14
								Firm greyish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of sandstone and chert.	15
		15.50		50 (4,7/50 for 170mm)					16
		15.50 - 15.60	D						
								Continued on next sheet	

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-C1A

Sheet 3 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		17.00		N=50 (2,7/50 for 265mm)	17.00	33.83		From 15.50 to 17.00m very stiff.	
		17.70 - 18.00	D					Very stiff brown sandy CLAY. Sand is fine to medium.	17
		18.40 - 18.50	D		18.50	32.33		From 18.20 to 18.50m no recovery.	18
								Highly weathered extremely weak brown MUDSTONE, recovered as a stiff brown slightly sandy clay.	19
								From 18.50 to 19.07m no recovery.	
								From 19.07 to 19.85m highly fractured.	
					19.85	30.98		Weathered extremely weak brown thinly laminated MUDSTONE.	20
								19.85 to 20.00m 5 degrees, planar smooth.	
								From 20.00 to 20.50m no recovery.	
								From 20.50 to 20.61m recovered as non-intact core of clayey angular coarse gravel.	
								20.61 to 21.08m 0 - 10 degrees closely spaced, planar smooth.	
								At 20.90m clayey infill.	21
								From 21.08 to 21.21m highly fractured.	
								21.21 to 22.91m 0 - 10 degrees closely spaced to medium spaced, planar smooth and 1 No. discontinuity 50 degrees, undulating smooth.	
								From 21.95 to 22.10m recovered as a clay.	22
					23.00	27.83		From 22.91 to 23.00m recovered as non-intact core of angular cobbles.	23
								Weak brown thinly laminated MUDSTONE.	
								From 23.00 to 24.35m no recovery.	
									24

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

R-C1A

Sheet 4 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					25.88	24.95		From 24.35 to 24.50m recovered as non-intact core of angular fine to coarse gravel. From 24.50 to 24.73m no recovery. 24.73 to 25.88m 10 - 15 degrees closely spaced to medium spaced, planar smooth.	25
								Medium strong to strong reddish brown and grey medium grained SANDSTONE. 25.88 to 26.36m 0 - 10 degrees closely spaced, planar rough. From 26.36 to 27.50m no recovery.	26
					27.50	23.33		Medium strong reddish brown and grey medium to coarse grained SANDSTONE. 27.50 to 27.67m 1 No. discontinuity 10 degrees, planar rough. From 27.67 to 29.60m no recovery.	28
					29.60	21.23		Extremely weak reddish brown medium grained SANDSTONE. 29.60 to 29.91m 0 - 10 degrees extremely closely spaced to closely space, planar rough with sandy infill. From 29.91 to 30.00m recovered as non-intact core of angular fine to coarse gravel and angular cobbles. End of borehole at 30.00 m	30
					30.00	20.83			31
									32

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Rotary Core Log

Borehole No.

R-C1

Sheet 1 of 2

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.90

Scale
1:40

Client: Manchester Life

Dates: 18/01/2021 - 19/01/2021

Logged By
ZH

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.20	50.70		MADE GROUND: Grey and reddish brown concrete and brick layer. MADE GROUND: Dark brown mottled black sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, concrete and clinker. <i>From 0.20 to 0.40m very gravelly.</i>	1
							1.50	49.40		Soft to firm brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium of sandstone and mudstone.	2
											3
											4
											5
											6
											7
							8.00	42.90		Continued on next sheet	8

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. Terminated at 12.50m bgl due to bubbling in the Rochdale Canal adjacent.





Rotary Core Log

Borehole No.

R-C1

Sheet 2 of 2

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.90

Scale
1:40

Client: Manchester Life

Dates: 18/01/2021 - 19/01/2021

Logged By
ZH

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							10.40	40.50		Stiff to very stiff brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium of sandstone.	9
											10
										Very dense brown fine to coarse SAND.	11
											12
							12.50	38.40		End of borehole at 12.50 m	13
											14
											15
											16

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. Terminated at 12.50m bgl due to bubbling in the Rochdale Canal adjacent.





Rotary Core Log

Borehole No.

R-C1A

Sheet 1 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.20	50.63		MADE GROUND: Grey and reddish brown concrete and brick layer.	
							1.10	49.73		MADE GROUND: Dark grey slightly sandy slightly clayey angular to subangular fine to coarse gravel of ask, clinker, brick and concrete. Sand is fine to coarse.	1
							1.50	49.33		MADE GROUND: Brownish grey slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone.	
							2.10	48.73		MADE GROUND: Dark grey mottled black slightly sandy slightly clayey angular to subangular fine gravel of clinker and ash. Sand is fine to coarse. Iridescent sheen on water. Slight hydrocarbon odour.	2
										Soft brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to medium of sandstone.	3
											4
											5
											6
											7
											8

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Rotary Core Log

Borehole No.

R-C1A

Sheet 2 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							10.50	40.33			9
											10
										Dense brown fine to coarse SAND.	11
											12
											13
							14.00	36.83			14
										Firm greyish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of sandstone and chert.	15
		15.50 - 15.60	D								16

Continued on next sheet

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Rotary Core Log

Borehole No.

R-C1A

Sheet 3 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

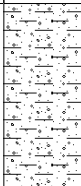
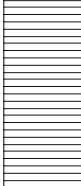
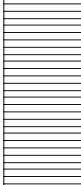
Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description						
				TCR	SCR	RQD										
		17.70 - 18.00	D				17.00	33.83		From 15.50 to 17.00m very stiff.	17					
										Very stiff brown sandy CLAY. Sand is fine to medium.						
									18.40 - 18.50	D				18.50	32.33	
		Highly weathered extremely weak brown MUDSTONE, recovered as a stiff brown slightly sandy clay. From 18.50 to 19.07m no recovery. From 19.07 to 19.85m highly fractured.														
		18.50 - 20.00	NR	62	10	10	19.85	30.98								
			>25													
			7													
			NI													
		20.00 - 21.50	6	67	49	39				From 20.50 to 20.61m recovered as non-intact core of clayey angular coarse gravel. 20.61 to 21.08m 0 - 10 degrees closely spaced, planar smooth. At 20.90m clayey infill.	20					
			>25													
3	100		94							93					From 21.08 to 21.21m highly fractured. 21.21 to 22.91m 0 - 10 degrees closely spaced to medium spaced, planar smooth and 1 No. discontinuity 50 degrees, undulating smooth.	21
NI																
21.50 - 23.00		3									From 21.95 to 22.10m recovered as a clay.				22	
23.00 - 24.50	NR					23.00	27.83		From 22.91 to 23.00m recovered as non-intact core of angular cobbles. Weak brown thinly laminated MUDSTONE. From 23.00 to 24.35m no recovery.	23						
									Continued on next sheet	24						

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Rotary Core Log

Borehole No.

R-C1A

Sheet 4 of 4

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
CP+RC

Location: Ancoats, Manchester

Level: 50.83

Scale
1:40

Client: Manchester Life

Dates: 20/01/2021 - 22/01/2021

Logged By
ZH

Well	Water Strikes	Depth (m)	Type / FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
			NI								
		24.50 - 26.00	9	85	85	78	25.88	24.95		From 24.35 to 24.50m recovered as non-intact core of angular fine to coarse gravel. From 24.50 to 24.73m no recovery. 24.73 to 25.88m 10 - 15 degrees closely spaced to medium spaced, planar smooth.	25
			6								
		26.00 - 27.50	NR	24	24	24				Medium strong to strong reddish brown and grey medium grained SANDSTONE. 25.88 to 26.36m 0 - 10 degrees closely spaced, planar rough. From 26.36 to 27.50m no recovery.	26
			>25								
		27.50 - 29.00	NR	11	11	0	27.50	23.33		Medium strong reddish brown and grey medium to coarse grained SANDSTONE. 27.50 to 27.67m 1 No. discontinuity 10 degrees, planar rough. From 27.67 to 29.60m no recovery.	28
			>25								
		29.00 - 30.00	NI	40	14	0	29.60	21.23		Extremely weak reddish brown medium grained SANDSTONE. 29.60 to 29.91m 0 - 10 degrees extremely closely spaced to closely space, planar rough with sandy infill. From 29.91 to 30.00m recovered as non-intact core of angular fine to coarse gravel and angular cobbles.	29
			NI				30.00	20.83		End of borehole at 30.00 m	30
											31
											32

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater unable to be recorded due to flush. SPT and Rotary Core details displayed on two separate logs - Borehole Log and Rotary Core Log.





Borehole Log

Borehole No.

WS-c1

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
WS

Location: Ancoats, Manchester

Level: 50.80

Scale
1:40

Client: Manchester Life

Dates: 25/01/2021 - 25/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.35			0.35	50.45		MADE GROUND: Grey and reddish brown concrete and brick layer.	
		1.00			1.00	49.80		MADE GROUND: Black slightly sandy clayey angular to subangular fine to medium gravel of ash and brick with low cobble content. Sand is fine to coarse. Cobbles are angular of brick.	
		1.20		N=2 (0,0/0,0,1,1)				MADE GROUND: Brown mottled black slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to medium of ash, clinker and brick.	1
		2.00		N=3 (0,0/0,1,1,1)					2
		3.00		N=18 (1,2/2,2,5,9)	3.00	47.80		Firm brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine of sandstone and mudstone.	3
		4.00		N=9 (0,0/0,3,3,3)	4.00	46.80		Firm to stiff brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine of sandstone and mudstone.	4
		5.00		N=27 (5,5/5,6,7,9)					5
		5.45			5.45	45.35		End of borehole at 5.45 m	6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater encountered at 3.00m bgl.





Borehole Log

Borehole No.

WS-c2

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
WS

Location: Ancoats, Manchester

Level: 50.87

Scale
1:40

Client: Manchester Life

Dates: 25/01/2021 - 25/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	50.67		MADE GROUND: Concrete.	
		1.00	ES		0.95	49.92		MADE GROUND: Black slightly sandy clayey angular to subangular fine to coarse gravel of ash and brick with low cobble content. Sand is fine to coarse. Cobbles are angular of brick.	1
		1.20		N=2 (1,1/1,0,1,0)					
		2.00		N=6 (0,0/1,1,2,2)					2
		2.50			2.50	48.37		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular fine of sandstone.	3
		3.00		N=18 (2,3/4,4,5,5)					
		4.00		N=16 (./3,3,5,5)	3.70	47.17		Stiff brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine of sandstone and mudstone.	4
		5.00		N=20 (3,3/5,5,5,5)					5
		5.45			5.45	45.42		End of borehole at 5.45 m	6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater encountered at 2.90m bgl.





Borehole Log

Borehole No.

WS-C3

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
WS

Location: Ancoats, Manchester

Level: 49.96

Scale
1:40

Client: Manchester Life

Dates: 25/01/2021 - 25/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20	49.76		MADE GROUND: Grey and reddish brown concrete and brick layer.	
		1.20		N=7 (1,1/1,2,2,2)	1.00	48.96		MADE GROUND: Black slightly sandy slightly clayey angular to subangular fine to medium gravel of ash and brick. Sand is fine to coarse.	1
		2.00		N=8 (1,1/2,2,2,2)	2.10	47.86		MADE GROUND: Brown mottled black slightly sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick. <i>From 1.20 to 2.00m no recovery.</i>	2
		3.00		N=14 (2,2/3,3,4,4)				Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to medium of sandstone.	3
		4.00		N=8 (./2,2,2,2)					4
		5.00		N=13 (2,2/2,3,4,4)					5
					5.45	44.51		End of borehole at 5.45 m	6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 1.20m. Groundwater encountered at 3.00m bgl.





Borehole Log

Borehole No.

WS-C4

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
WS

Location: Ancoats, Manchester

Level: 50.19

Scale
1:40

Client: Manchester Life

Dates: 25/01/2021 - 25/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.05	50.14		MADE GROUND: Concrete.	
					0.45	49.74		MADE GROUND: Dark brown sandy angular to subangular gravel of brick and ash with moderate cobble content. Sand is fine to coarse. Cobbles are angular of brick.	
								End of borehole at 0.45 m	
									1
									2
									3
									4
									5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 0.45m. Terminated at 0.45m bgl due to brick foundations - unable to advance past.





Borehole Log

Borehole No.

WS-C4A

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
WS

Location: Ancoats, Manchester

Level: 50.20

Scale
1:40

Client: Manchester Life

Dates: 25/01/2021 - 25/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.05	50.15		MADE GROUND: Concrete. MADE GROUND: Dark brown sandy angular to subangular gravel of brick and ash with moderate cobble content. Sand is fine to coarse. Cobbles are angular of brick.	
					0.70	49.50		End of borehole at 0.70 m	
									1
									2
									3
									4
									5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 0.70m. Terminated at 0.70m bgl due to brick foundations - unable to advance past.





Borehole Log

Borehole No.

WS-C4B

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740

Co-ords: -

Hole Type
WS

Location: Ancoats, Manchester

Level: 50.20

Scale
1:40

Client: Manchester Life

Dates: 25/01/2021 - 25/01/2021

Logged By
ZH

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	50.10		MADE GROUND: Concrete.	
		0.60	ES		0.70	49.50		MADE GROUND: Dark brown sandy angular to subangular gravel of brick and ash with moderate cobble content. Sand is fine to coarse. Cobbles are angular of brick.	
								End of borehole at 0.70 m	
									1
									2
									3
									4
									5
									6
									7
									8

Remarks

Service inspection pit hand excavated from GL to 0.70m. Terminated at 0.70m bgl due to brick foundations - unable to advance past.





Trial Pit Log

Trialpit No

TP-C1

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740Co-ords: -
Level: 50.82Date
04/02/2021

Location: Ancoats, Manchester

Dimensions
(m):

2

Depth
3.40

0.7

Scale
1:40Logged
ZH

Client: Manchester Life

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼				0.35	50.47		MADE GROUND: Grey and reddish brown concrete and brick layer.	
				0.85	49.97		MADE GROUND: Black gravelly fine to coarse sand with low cobble content. Gravel is angular to subangular fine to coarse of brick, porcelain and concrete. Cobbles are angular of brick.	1
				2.10	48.72		MADE GROUND: Dark brown mottled black slightly gravelly sandy clay with moderate cobble content. Sand is fine to coarse. Gravel is angular fine to coarse of porcelain, glass, brick and concrete. Cobbles are angular of terracotta, porcelain and brick.	2
				3.40	47.42		Firm dark grey mottled brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone.	3
							End of pit at 3.40 m	4
								5
								6
								7
								8

Remarks: Trial pit area scanned for services. Groundwater encountered at 3.40m bgl. Oily iridescent sheen noted on water.

Stability: Stable.





Trial Pit Log

Trialpit No

TP-C2

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740Co-ords: -
Level: 50.90Date
04/02/2021

Location: Ancoats, Manchester

Dimensions
(m):

2.1

Depth
3.00

0.7

Scale
1:40Logged
ZH

Client: Manchester Life

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼				0.25	50.65		MADE GROUND: Grey and reddish brown concrete and brick layer.	1
				0.70	50.20		MADE GROUND: Black very gravelly fine to coarse sand with low cobble content. Gravel is angular fine to coarse of brick and concrete. Cobbles are angular of brick.	
				1.40	49.50		MADE GROUND: Black mottled brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular fine to medium of brick, ash, porcelain and clinker. Iridescent sheen on water. Strong hydrocarbon odour.	
				3.00	47.90		Firm grey mottled brown slightly gravelly very sandy CLAY. Sand is fine to medium. Gravel is angular to subangular fine to medium of sandstone.	2
							End of pit at 3.00 m	3
								4
								5
								6
								7
								8

Remarks: Trial pit area scanned for services. Groundwater encountered at 1.40m bgl. Oily iridescent sheen noted on water.

Stability: Stable.





Trial Pit Log

Trialpit No

TP-C4

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740Co-ords: -
Level: 50.29Date
04/02/2021

Location: Ancoats, Manchester

Dimensions
(m):

2

Depth
2.10

0.7

Scale
1:40Logged
ZH

Client: Manchester Life

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	1.30	ES		0.20	50.09		MADE GROUND: Black tarmacadam.	1
				1.20	49.09		MADE GROUND: Dark brown very sandy angular to subangular fine to coarse gravel of brick, clinker, glass and concrete with low cobble content and low boulder content with occasional rootlets. Sand is fine to coarse. Cobbles are angular of brick and scrap metal. Boulders are angular to subangular of brick and scrap metal.	
							MADE GROUND: Blue-black slightly sandy slightly gravelly clay. Sand is fine to coarse, Gravel is angular to subangular fine to coarse of brick. Water at base of pit with oily iridescent sheen. Strong hydrocarbon odour.	
				2.10	48.19		End of pit at 2.10 m	2
								3
								4
								5
								6
								7
								8

Remarks: Trial pit area scanned for services. Groundwater encountered at 2.10m bgl. Oily iridescent sheen noted on water.

Stability: Stable.





Trial Pit Log

Trialpit No

TP-C5

Sheet 1 of 1

Project Name: Man Life Back of Ancoats

Project No.
076740Co-ords: -
Level: 51.50Date
05/02/2021

Location: Ancoats, Manchester

Dimensions
(m):

1.9

Depth
1.70

0.7

Scale
1:40Logged
ZH

Client: Manchester Life

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				1.70	49.80		MADE GROUND: Black slightly sandy gravelly clay with moderate cobble content. Sand is fine to coarse. Gravel is angular of brick, porcelaina and glass. Cobbles are angular of brick.	1
							End of pit at 1.70 m	2
								3
								4
								5
								6
								7
								8

Remarks: Trial pit area scanned for services in embankment to the north of site. No groundwater encountered. Wall encountered along boundary between Jersey Street and Plot C.

Stability: Stable.





Appendix A3 – Geo-Environmental Laboratory Testing Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/00805
Issue Number: 1
Date: 03 February, 2021

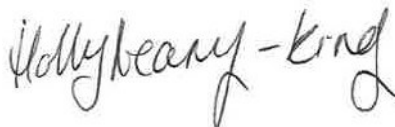
Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Siobhán Hyde/Zoe Henderson
Project Name: Ancoats Plot C
Project Ref: B076740
Order No: EBMA2675
Date Samples Received: 27/01/21
Date Instructions Received: 28/01/21
Date Analysis Completed: 03/02/21

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/00805

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00805/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	WS-C2									
Depth to Top	1.00									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	6A									
% Stones >10mm _A	2.4							% w/w	0.1	A-T-044
pH _D ^{M#}	7.89							pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.06							g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	<1							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	13.2							% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	21							mg/kg	1	A-T-024s
Boron (water soluble) _D	1.5							mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.9							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	132							mg/kg	1	A-T-024s
Chromium _D ^{M#}	24							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	152							mg/kg	1	A-T-024s
Mercury _D	<0.17							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	34							mg/kg	1	A-T-024s
Selenium _D ^{M#}	2							mg/kg	1	A-T-024s
Zinc _D ^{M#}	172							mg/kg	5	A-T-024s

Envirolab Job Number: 21/00805

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00805/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	WS-C2									
Depth to Top	1.00									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	6A									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

Envirolab Job Number: 21/00805

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00805/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	WS-C2									
Depth to Top	1.00									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	6A									
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.05							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.01							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.06							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	0.12							mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/00805

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00805/1									
Client Sample No	ES1									
Client Sample ID	WS-C2									
Depth to Top	1.00									
Depth To Bottom										
Date Sampled	25-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	6A									
TPH CWG										
Ali >C5-C6 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	1							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	2							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	6							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	5							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	23							mg/kg	1	A-T-055s
Total Aliphatics _A	38							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1							mg/kg	1	A-T-055s
Aro >C10-C12 _A	4							mg/kg	1	A-T-055s
Aro >C12-C16 _A	17							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	17							mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	18							mg/kg	1	A-T-055s
Total Aromatics _A	56							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	94							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01							mg/kg	0.01	A-T-022s

REPORT NOTES

General

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The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/00805
Project:	Ancoats Plot C	Date Received:	28/01/2021 (am)
Clients Project No:	B076740	Cool Box Temperatures (°C):	4.9

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/00929
Issue Number: 1
Date: 08 February, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Siobhán Hyde/Zoe Henderson
Project Name: Ancoats Plot C
Project Ref: B076740
Order No: EBMA2680
Date Samples Received: 01/02/21
Date Instructions Received: 01/02/21
Date Analysis Completed: 08/02/21

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/00929

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00929/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	WS-C4B									
Depth to Top	0.60									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4ABE									
% Stones >10mm _A	<0.1							% w/w	0.1	A-T-044
pH _D ^{M#}	9.15							pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.06							g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	17							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	6.5							% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	42							mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0							mg/kg	1	A-T-027s
Cadmium _D ^{M#}	3.7							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	169							mg/kg	1	A-T-024s
Chromium _D ^{M#}	266							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	2010							mg/kg	1	A-T-024s
Mercury _D	1.42							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	58							mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1							mg/kg	1	A-T-024s
Zinc _D ^{M#}	772							mg/kg	5	A-T-024s

Envirolab Job Number: 21/00929

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00929/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	WS-C4B									
Depth to Top	0.60									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4ABE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	Chrysotile & Amosite									A-T-045
Asbestos Matrix (visual) ₀	Loose Insulation & Loose fibres									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A									A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) ₀	0.508							% w/w	0.001	A-T-054

Envirolab Job Number: 21/00929

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00929/1							Units	Limit of Detection	Method ref
Client Sample No	ES1									
Client Sample ID	WS-C4B									
Depth to Top	0.60									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4ABE									
PAH-16MS										
Acenaphthene _A ^{M#}	0.72							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.14							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.90							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	3.20							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	3.15							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	3.56							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	1.46							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	1.22							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	3.14							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.34							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	6.86							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.44							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.70							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.48							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	4.51							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	6.59							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	38.4							mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/00929

Client Project Name: Ancoats Plot C

Client Project Ref: B076740

Lab Sample ID	21/00929/1									
Client Sample No	ES1									
Client Sample ID	WS-C4B									
Depth to Top	0.60									
Depth To Bottom										
Date Sampled	28-Jan-21									
Sample Type	Soil - ES									
Sample Matrix Code	4ABE									
TPH CWG										
Ali >C5-C6 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	1							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	5							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	11							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	110							mg/kg	1	A-T-055s
Total Aliphatics _A	127							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	0.02							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	2							mg/kg	1	A-T-055s
Aro >C10-C12 _A	12							mg/kg	1	A-T-055s
Aro >C12-C16 _A	56							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	206							mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	278							mg/kg	1	A-T-055s
Total Aromatics _A	555							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	682							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	0.02							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01							mg/kg	0.01	A-T-022s

REPORT NOTES

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Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/00929
Project:	Ancoats Plot C	Date Received:	01/02/2021 (am)
Clients Project No:	B076740	Cool Box Temperatures (°C):	2.4

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

FINAL ANALYTICAL TEST REPORT

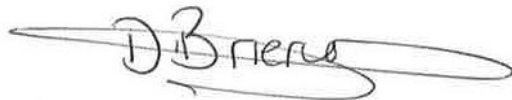
Envirolab Job Number: 21/01241
Issue Number: 1

Date: 15 February, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: Siobhán Hyde/Zoe Henderson
Project Name: Ancoats, Plot C
Project Ref: B076740
Order No: EBMA2693
Date Samples Received: 08/01/21
Date Instructions Received: 09/02/21
Date Analysis Completed: 12/02/21

Prepared by:



Danielle Brierley
Client Manager

Approved by:



Sophie France
Client Service Manager

Envirolab Job Number: 21/01241

Client Project Name: Ancoats, Plot C

Client Project Ref: B076740

Lab Sample ID	21/01241/1							Units	Limit of Detection	Method ref
Client Sample No	1									
Client Sample ID	TP-C4									
Depth to Top	1.30									
Depth To Bottom										
Date Sampled	04-Feb-21									
Sample Type	Soil - ES									
Sample Matrix Code	6AE									
% Stones >10mm _A	7.2							% w/w	0.1	A-T-044
pH _D ^{M#}	6.37							pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.18							g/l	0.01	A-T-026s
Cyanide (total) _A ^{M#}	1320							mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2							mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	34.9							% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	120							mg/kg	1	A-T-024s
Boron (water soluble) _D	1.1							mg/kg	1	A-T-027s
Cadmium _D ^{M#}	10.1							mg/kg	0.5	A-T-024s
Copper _D ^{M#}	780							mg/kg	1	A-T-024s
Chromium _D ^{M#}	164							mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1							mg/kg	1	A-T-040s
Lead _D ^{M#}	1110							mg/kg	1	A-T-024s
Mercury _D	3.75							mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	57							mg/kg	1	A-T-024s
Selenium _D ^{M#}	3							mg/kg	1	A-T-024s
Zinc _D ^{M#}	7390							mg/kg	5	A-T-024s

Envirolab Job Number: 21/01241

Client Project Name: Ancoats, Plot C

Client Project Ref: B076740

Lab Sample ID	21/01241/1							Units	Limit of Detection	Method ref
Client Sample No	1									
Client Sample ID	TP-C4									
Depth to Top	1.30									
Depth To Bottom										
Date Sampled	04-Feb-21									
Sample Type	Soil - ES									
Sample Matrix Code	6AE									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									A-T-045

Envirolab Job Number: 21/01241

Client Project Name: Ancoats, Plot C

Client Project Ref: B076740

Lab Sample ID	21/01241/1							Units	Limit of Detection	Method ref
Client Sample No	1									
Client Sample ID	TP-C4									
Depth to Top	1.30									
Depth To Bottom										
Date Sampled	04-Feb-21									
Sample Type	Soil - ES									
Sample Matrix Code	6AE									
PAH-16MS										
Acenaphthene _A ^{M#}	4.91							mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.05							mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	3.78							mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	4.86							mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	2.59							mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	2.80							mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.93							mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.96							mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	4.89							mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.26							mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	26.4							mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	4.62							mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.01							mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.29							mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	4.23							mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	21							mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	83.6							mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/01241

Client Project Name: Ancoats, Plot C

Client Project Ref: B076740

Lab Sample ID	21/01241/1									
Client Sample No	1									
Client Sample ID	TP-C4									
Depth to Top	1.30									
Depth To Bottom										
Date Sampled	04-Feb-21									
Sample Type	Soil - ES									
Sample Matrix Code	6AE									
TPH CWG										
Ali >C5-C6 _A [#]	0.06							mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	0.18							mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	55							mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	103							mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	190							mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	235							mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	2080							mg/kg	1	A-T-055s
Total Aliphatics _A	2670							mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01							mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	0.05							mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	34							mg/kg	1	A-T-055s
Aro >C10-C12 _A	69							mg/kg	1	A-T-055s
Aro >C12-C16 _A	317							mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	971							mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	1340							mg/kg	1	A-T-055s
Total Aromatics _A	2730							mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	5390							mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	0.05							mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01							mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01							mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG	Project No:	21/01241
Project:	Ancoats, Plot C	Date Received:	09/02/2021 (am)
Clients Project No:	B076740	Cool Box Temperatures (°C):	3.2

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.



Appendix A4 – Generic Assessment Criteria (GACs)

Adopted Soil Generic Assessment Criteria
Sandy loam with 6% SOM



Contaminants	Residential <u>with</u> home grown produce	Residential <u>without</u> home grown produce	Allotments	Commercial	Public open space near residential housing POS _{resi}	Public park POS _{park}
Metals						
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11,000	45	240,000	21,000	46,000
Cadmium	10⁽¹³⁾ 22	85⁽¹³⁾ 150	1.8 3.9	230 410	120 220	560 880
Chromium III	910	910	18,000	8,600	1,500	33,000
Chromium VI	6 <u>21</u>	6 <u>21</u>	1.8 <u>170</u>	33 <u>49</u>	7.7 <u>21</u>	220 <u>250</u>
Lead	<u>200</u>	<u>310</u>	<u>80</u>	<u>2,300</u>	<u>630</u>	<u>1,300</u>
Mercury (<i>elemental</i>)	1	1	26	26	16	26⁽⁸⁾ [30]
Mercury (<i>inorganic</i>)	170	240	80	3600	120	240
Nickel	130 ⁽¹⁰⁾	180 ⁽¹⁰⁾	53 ⁽¹¹⁾	980 ⁽¹⁰⁾	230	800
Vanadium	410	1200	91	9000	2000	5000
Copper	2400	7100	520	68000	12000	44000
Zinc	3700	40000	620	730000	81000	170000
Semi-Metals and non-metals						
Arsenic	32⁽¹²⁾ 37	35⁽¹²⁾ 40	43⁽¹²⁾ 49	640⁽¹²⁾ 640	79 79	170 170
Antimony		550		7500	1500	3300
Selenium	350	600	120	13000	1100	1800
Inorganic chemicals						
Cyanide	34	34	34	34	34	34
Organic contaminants						
<i>Aliphatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₆	160	160	3900	12000	600000	180000
EC ₅₋₆ - EC ₈	530	530	13000	40000	620000	320000
EC ₅₋₈ - EC ₁₀	150	150	1700	11000	13000	21000
EC ₁₀₋₁₀ - EC ₁₂	760	770	7300	47000	13000	24000
EC ₁₂₋₁₂ - EC ₁₆	4300	4400	13000	90000	13000	26000
EC ₅₋₁₆ - EC ₃₅	110000	110000	270000	1800000	250000	490000
EC ₃₅₋₃₅ - EC ₄₄	110000	110000	270000	1800000	250000	490000
<i>Aromatic risk banded hydrocarbons - TPHCWG method</i>						
EC ₅₋₅ - EC ₇	300	1400	57	86000	56000	92000
EC ₅₋₇ - EC ₈	660	3900	120	180000	56000	100000
EC ₅₋₈ - EC ₁₀	190	270	51	17000	5000	9300
EC ₁₀₋₁₀ - EC ₁₂	380	1200	74	34000	5000	10000
EC ₁₂₋₁₂ - EC ₁₆	660	2500	130	38000	5000	10000
EC ₅₋₁₆ - EC ₂₁	930	1900	260	28000	3800	7800
EC ₂₁₋₂₁ - EC ₃₅	1700	1900	1600	28000	3800	7900
EC ₃₅₋₃₅ - EC ₄₄	1700	1900	1600	28000	3800	7900
Aliph + Arom EC >44-70	1900	1900	3000	28000	3800	7900
Aromatic						
Benzene	0.33 0.87	1.0 3.3	0.07 0.18	95 98	73 140	110 230
Ethyl benzene	350	840	90	2800⁽⁸⁾ [66000]	2800⁽⁸⁾ [25000]	2800⁽⁸⁾ [27000]
Toluene	610	2700	120	4400⁽⁸⁾ [190000]	4400⁽⁸⁾ [56000]	4400⁽⁸⁾ [100000]
Xylene ⁽⁹⁾	230	290	160	2600⁽⁸⁾ [32000]	2600⁽⁸⁾ [43000]	2600⁽⁸⁾ [31000]
Phenol	420	520	280	3200⁽¹⁴⁾ (38000)	3200⁽¹⁴⁾ (10000)	3200⁽¹⁴⁾ (9300)
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	13	13	24	1100	4900	3000
Acenaphthylene	920	6000	160	100000	15000	30000
Acenaphthene	1100	6000	200	100000	15000	30000
Fluorene	860	4500	160	71000	9900	20000
Phenanthrene	440	1500	90	23000	3100	6300
Anthracene	11000	37000	2200	540000	74000	150000
Fluoranthene	890	1600	290	23000	3100	6400
Pyrene	2000	3800	620	54000	7400	15000
Benz(a)anthracene	13	15	13	180	29	62
Chrysene	27	32	19	350	57	120
Benzo(b)fluoranthene	3.7	4.0	3.9	45	7.2	16.0
Benzo(k)fluoranthene	100	110	130	1200	190	440
Benzo(a)pyrene	3.0 5.0	3.2 5.3	3.5 5.7	36 77	5.7 10	13 21
Indeno(123cd)pyrene	41	46	39	510	82	180
Dibenzo(ah)anthracene	0.3	0.32	0.43	3.6	0.58	1.4
Benzo(ghi)perylene	350	360	640	4000	640	1600
Chlorinated Aliphatic Hydrocarbons						
Vinyl chloride	0.0014	0.0015	0.0018	0.12	3.5	5.4
Trichloroethene (TCE)	0.075	0.08	0.21	5.7	120	120
1,1,1,2 Tetrachlorethane	6.4	8.2	4.4	560	1400	2100
Tetrachlorethane (PCE)	0.90	0.92	3.6	95	1400	1500
1,1,1 Trichlorethane	39	40	240	3000	140000	100000

Notes

- All values above are in mg/kg
- Numbers in bold are SGVs or GAC that are derived based on SGV report input parameters, numbers in italics are S4ULs, numbers in bold-italics are based on EIC/AGS/CL:AIRE numbers & input parameters and underlined numbers are C4SLs**
- Soil organic matter (SOM) is assumed to be 6% - DEFAULT VALUE
- Soil type is assumed to be sandy loam - DEFAULT SOIL TYPE
- For residential, the building type is conservatively assumed to be a small terrace house where the development includes bungalows change to more conservative bungalow setting in computer model
- For commercial, the building type is conservatively assumed to be a pre 1970s office building, where the proposed development comprises houses, flat with living spaces changes setting in model accordingly
- For classrooms consider increasing the dust loading factor in the 'Soil and Building Data' of the CLEA 1.04 model from 50 to 100µg m⁻³
- Based on vapour saturation limit as suggested by EA / [] model value
- Lowest of o-, m- and p-xylene
- Based on comparison of inhalation exposure with inhalation TDI
- Based on comparison of oral, dermal, and inhalation exposure with the oral TDI
- Based on a comparison of oral and dermal soil exposure with oral Index Dose only
- Averaged over and based on lifetime exposure
- Based on critical concentration for skin irritation in humans arising from contact with phenol in aqueous solution (number in brackets based on health effects following long term exposure for illustration)
- NA: Not applicable



Appendix A5 – Geotechnical Laboratory Testing Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/01532
Issue Number: 1
Date: 04 March, 2021

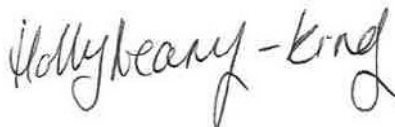
Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Siobhán Hyde/Zoe Henderson
Project Name: Ancoats, Plot C
Project Ref: B076740
Order No: EBMA2697
Date Samples Received: 01/02/21
Date Instructions Received: 17/02/21
Date Analysis Completed: 04/03/21

Prepared by:


Melanie Marshall
Laboratory Coordinator

Approved by:


Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/01532

Client Project Name: Ancoats, Plot C

Client Project Ref: B076740

Lab Sample ID	21/01532/1	21/01532/3						Units	Limit of Detection	Method ref
Client Sample No	1	3								
Client Sample ID	R-C1A	R-C1A								
Depth to Top	15.50	18.40								
Depth To Bottom	15.60	18.50								
Date Sampled	21-Jan-21	21-Jan-21								
Sample Type	Soil - D	Soil - D								
Sample Matrix Code	5A									
% Stones >10mm _A	0.5	-						% w/w	0.1	A-T-044
pH _D ^{M#}	8.42	-						pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05	-						g/l	0.01	A-T-026s
4 point Liquid & Plastic Limit by Cone Penetrometer _A [#]	Appended	Appended								Subcon IFA
Moisture Content of Soil (Oven Dried Method) _A [#]	Appended	Appended								Subcon IFA

REPORT NOTES

General

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Analytical results reflect the quality of the sample at the time of analysis only.

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG **Project No:** 21/01532
Project: Ancoats, Plot C **Date Received:** 17/02/2021 (am)
Clients Project No: B076740 **Cool Box Temperatures (°C):** 3.4

Lab Sample ID	21/01532/1
Client Sample No	1
Client Sample ID/Depth	R-C1A 15.50-15.60m
Date Sampled	21/01/21
Deviation Code	
F	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	21/01532/1
Client Sample No	1
Client Sample ID/Depth	R-C1A 15.50-15.60m
Date Sampled	21/01/21
Sulphate (water sol 2:1)	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

F.A.O.

Final Test Report - 2280419 / 1

Site: Ancoats Plot C
Job Number: 2280419
Originating Client: Envirolab Ltd
Originating Reference: 2280419
Date Sampled: 18/02/2021
Date Scheduled: 25/02/2021
Date Testing Started: 02/03/2021
Date Testing Finished: 03/03/2021

Previous Reports		Amendments	Date Issued

Amendments:

Authorised By:



Tim Robinson
Quality Supervisor

Report Issue Date: 03/03/2021

Page: 2



Final Test Report - 2280419 / 1

Site: Ancoats Plot C

Job Number: 2280419

Originating Client: Envirolab Ltd

All opinions and interpretations contained within this report are outside of our Scope of Accreditation.

This test report shall not be reproduced, except in full and only with the written permission of Ian Farmer Associates Ltd.

Samples will be retained for 28 days from date of issue of the final test report before being disposed of, unless we receive written instruction to the contrary.

Report Issue Date: 03/03/2021

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/01572
Issue Number: 1
Date: 11 March, 2021

Client: Curtins Consulting (Manchester)
Merchant Exchange
17-19 Whitworth Street
Manchester
UK
M1 5WG

Project Manager: EBMA/Siobhán Hyde/Zoe Henderson
Project Name: Ancoats, Plot C
Project Ref: B076740
Order No: EBMA2692
Date Samples Received: 09/02/21
Date Instructions Received: 17/02/21
Date Analysis Completed: 11/03/21

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Sophie France
Client Service Manager

Envirolab Job Number: 21/01572

Client Project Name: Ancoats, Plot C

Client Project Ref: B076740

Lab Sample ID	21/01572/1	21/01572/2	21/01572/3	21/01572/4	21/01572/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	R-C1A	R-C1A	R-C1A	R-C1A	R-C1A					
Depth to Top	21.21	21.65	24.88	25.54	26.00					
Depth To Bottom	21.50	21.81	25.18	25.82	26.23					
Date Sampled	21-Jan-21	21-Jan-21	21-Jan-21	21-Jan-21	21-Jan-21					
Sample Type	Solid	Solid	Solid	Solid	Solid					
Sample Matrix Code	7	7	7	7	7					
% Stones >10mm _A	<0.1	-	-	<0.1	-			% w/w	0.1	A-T-044
pH _D ^{M#}	8.48	-	-	8.59	-			pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	-	-	<0.01	-			g/l	0.01	A-T-026s
10.03a Point Load (PL) Index of a Single Specimen (Rock Sample) ISRM SM 1974-2006 _A [#]	-	Appended	-	Appended	Appended			N/A		Subcon SS
10.04 Uniaxial / Unconfined Compressive Strength (Rock Sample) ISRM SM 1974-2006 _A [#]	Appended	-	Appended	-	-			N/A		Subcon SS

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Curtins Consulting (Manchester), Merchant Exchange, 17-19 Whitworth Street , Manchester, UK, M1 5WG
Project: Ancoats, Plot C
Clients Project No: B076740

Project No: 21/01572
Date Received: 17/02/2021 (am)
Cool Box Temperatures (°C): 6.0

Lab Sample ID	21/01572/1	21/01572/4
Client Sample No		
Client Sample ID/Depth	R-C1A 21.21-21.50m	R-C1A 25.54-25.82m
Date Sampled	21/01/21	21/01/21
Deviation Code		
F	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	21/01572/1	21/01572/4
Client Sample No		
Client Sample ID/Depth	R-C1A 21.21-21.50m	R-C1A 25.54-25.82m
Date Sampled	21/01/21	21/01/21
Sulphate (water sol 2:1)	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.



STRUCTURAL SOILS LTD

TEST REPORT



1774

Report No. 784839 R1

Date 04-March-2021 Contract 21/01572

Client Envirolab Ltd
Address Units 7 & 8 Sandpits Business Park
Mottram Road
Hyde
SK14 3AR

For the Attention of Holly Neary-King

Samples submitted by client 17/02/2021
Testing Started 19/02/2021
Testing Completed 04/03/2021

Client Reference 21/01572
Client Order No.
Instruction Type Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

Non - UKAS Accredited Tests Undertaken

Point Load Index ISRM:1974-2006

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.

Test were undertaken on samples 'as received' unless otherwise stated.

Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail luke.fisher@soils.co.uk

DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.05 \text{ MN/m}^2$$
$$I_s(50) \text{ Mean Diametral tests} = \mathbf{0.04 \text{ MN/m}^2}$$

$I_a(50)$ Strength Anisotropy Index = **1.26** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

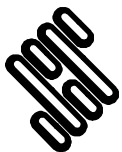
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS

The Potteries

Pottery Street

Castleford

W. Yorkshire WF10 1NJ

Compiled By

Date _____

Contract Ref:

LORNA WHITWORTH

04.03.21

Contract:

21/01572

784839



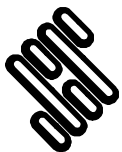
DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

$I_s(50)$ Mean Axial tests = **0.02 MN/m²**
 $I_s(50)$ Mean Diametral tests = **0.02 MN/m²**
 $I_a(50)$ Strength Anisotropy Index = **1.24** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key
Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Compiled By

Date _____

Contract Ref:

Contract:

LORNA WHITWORTH

04.03.21

21/01572

784839



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 2.44 \text{ MN/m}^2$$

$I_s(50)$ Mean Diametral tests = **1.19 MN/m²**

$I_a(50)$ Strength Anisotropy Index = **2.05** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

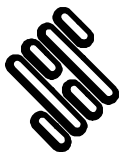
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS

The Potteries

Pottery Street

Castleford

W. Yorkshire WF10 1N.

Compiled By

Date _____

Contract Ref:

LORNA WHITWORTH

04.03.21

Contract:

21/01572

784839



TESTING VERIFICATION CERTIFICATE

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **04/03/2021 11:13:37**.

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Luke Fisher (Materials Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

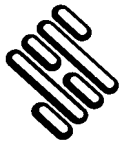
Contract:

21/01572

Job No:

784839





STRUCTURAL SOILS LTD
TEST REPORT



1774

Report No. 784839 R1

Date 05-March-2021 Contract 21/01572

Client Envirolab Ltd
Address Units 7 & 8 Sandpits Business Park
Mottram Road
Hyde
SK14 3AR

For the Attention of Holly Neary-King

Samples submitted by client 17/02/2021
Testing Started 19/02/2021
Testing Completed 05/03/2021

Client Reference 21/01572
Client Order No.
Instruction Type Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

Non - UKAS Accredited Tests Undertaken

Point Load Index ISRM:1974-2006

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.

Test were undertaken on samples 'as received' unless otherwise stated.

Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail luke.fisher@soils.co.uk

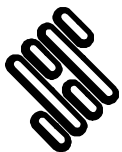
DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

$I_s(50)$ Mean Axial tests = **0.04** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.02** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.78** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key
Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Compiled By

Date _____

Contract Ref:

Contract:

LORNA WHITWORTH

05.03.21

21/01572

784839



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]
$$I_s(50) \text{ Mean Axial tests} = 0.05 \text{ MN/m}^2$$

$I_c(50)$ Mean Diametral tests = **0.04** MN/m²

$I_s(50)$ Strength Anisotropy Index = **1.26** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

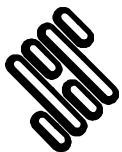
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS

The Potteries

Pottery Street

Castleford

W. Yorkshire WF10 1N.

Compiled By

Date _____

Contract Ref:

LORNA WHITWORTH

05.03.21

Contract:

21/01572

784839



DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

$I_s(50)$ Mean Axial tests = **0.03** MN/m²

$I_c(50)$ Mean Diametral tests = **0.05 MN/m²**

$I_a(50)$ Strength Anisotropy Index = **2.08** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)

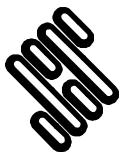
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key

Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.

Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS

The Potteries

Pottery Street

Castleford

W. Yorkshire WF10 1NJ

Compiled By

Date _____

Contract Ref:

LORNA WHITWORTH

05.03.21

Contract:

21/01572

784839



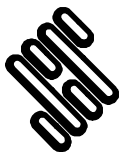
DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

$I_s(50)$ Mean Axial tests = **0.02** MN/m²
 $I_s(50)$ Mean Diametral tests = **0.02** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **1.24** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key
Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
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Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Compiled By

Date _____

Contract Ref:

Contract:

LORNA WHITWORTH

05.03.21

21/01572

784839



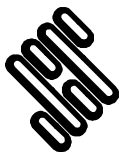
DETERMINATION OF POINT LOAD STRENGTH

In accordance with ISRM 1974-2006

[illegible]

$I_s(50)$ Mean Axial tests = **2.44** MN/m²
 $I_s(50)$ Mean Diametral tests = **1.19** MN/m²
 $I_a(50)$ Strength Anisotropy Index = **2.05** (calculated from highest and lowest diametral and axial $I_s(50)$ ratio)
Note: Size Correction Factor (F) calculated using $F = (D_e/50)^{0.45}$ (where D_e is equivalent core diameter).

Key
Type of Test column: A = Axial, D = Diametral, I = Irregular, B = Block, L = Parallel, P = Perpendicular, [NS] denotes Non-standard Test.
Point Load Index column: (✓) = included in mean calculations, (✗) = excluded from mean calculations
Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1N

Compiled By

Date _____

Contract Ref:

Contract:

LORNA WHITWORTH

05.03.21

21/01572

784839



TESTING VERIFICATION CERTIFICATE

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **05/03/2021 10:54:27**.

Testing reported after this date is not covered by this Verification Certificate.



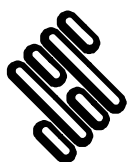
Approved Signatory
Luke Fisher (Materials Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

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