BROWNFIELD SOLUTIONS LTD

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

DOMIS CONSTRUCTION LTD

Back Turner Street, Manchester

Geo-Environmental Assessment Report

BM/C3967/7815 Rev C

October 2021

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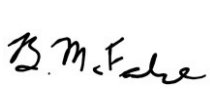
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EXECUTIVE SUMMARY	
Location	The site is centred on National Grid Reference 384297, 398667 and is situated off Back Turner Street, Manchester approximately 320m north of the city centre.
Site History	The earliest maps dated 1848/1851 indicate the site to be occupied by a row of small buildings, possibly residential. By 1891 these had been demolished and replaced with four larger buildings which became merged by 1953. By 1992 the south-eastern building had been demolished.
Geology	The superficial geology is indicated to comprise superficial Glacial Till deposits, underlain by solid geology of the Chester Pebble Beds Formation sandstone.
Hydrogeology and Hydrology	The superficial deposits in this area are classified by the Environment Agency as a Secondary Aquifer – Undifferentiated Layers and the bedrock is classified as a Principal Aquifer. The site does not lie within 500m of a Source Protection Zone, groundwater abstraction well or potable abstraction well. The nearest named watercourse to the site is the River Irk, which lies at 355m north-west of the site and there are no surface water abstraction licences within 2km.
Mining	The site lies within a Coal Mining Reporting Area and a Surface Coal Resource Area. Based on a search carried out with the Coal Authority, the site does not lie within an influencing distance of historic mining activities and coal mining is not considered a significant risk at the site.
Environmental	The presence of made ground is considered a potentially contaminating on-site source as well as a potential ground gas source, both of which are considered risks to the site and/or controlled waters worthy of further investigation.
Ground Conditions	Ground conditions encountered at the site generally comprised made ground to a depth between 0.25m and 1.10m bgl in Block A (north of site), proven to 0.65m and 1.20m in Block B (centre), and 3.20m bgl and 3.40m bgl in Block C (south of the site) underlain by gravelly sandy clay (glacial till) to a depth between 11.10m bgl and 13.60m bgl where weathered sandstone bedrock was encountered. The sandstone became more competent with depth.
Foundations and Floor Slabs	The recommended foundation type is CFA piles founded in competent sandstone bedrock with a minimum RQD of 25%. Suspended ground floor slabs are recommended though ground bearing floor slabs may also be suitable subject to specific construction criteria. There are known basements associated with the existing building in Block B, which is also to be retained under proposed development plans, with a single storey extension. A raft foundation has been recommended as the most suitable foundation solution for Block B.
Soil Contamination	Concentrations of contaminants including heavy metals and PAHs in excess of the applicable screening criteria for residential end use were identified within the made ground. The localised presence of asbestos fibre has been identified within the made ground, but not at concentrations considered a risk to end-users or construction workers. The risk to site end-users, construction workers and controlled waters from contamination in the made ground is considered low. An area of localised VOC impacted made ground was encountered associated with S02 within Block B. Although there are no relevant screening criteria for p-isopropyltoluene given its volatile properties it is considered to pose a risk to the end-user and mitigation is therefore required.
Ground Gases	General made ground (on-site) was identified as a potential source of ground gases. The risks were deemed to be moderate to low. The results from ten rounds of ground gas monitoring and subsequent Gas Risk Assessment revealed the site to be representative of Characteristic Situation 1 and no gas protection measures are required.
Further Work	• Demolition asbestos survey. • Design of remedial strategy. • Detailed foundation design. • Confirmation of Remedial Strategy with Local Authority.

PROJECT QUALITY CONTROL DATA SHEET

Site Name:	Back Turner Street, Manchester		
Report Name:	Geo-Environmental Assessment Report		
Report Number:	BM/C3967/7815 Rev C		
Date:	22 October 2021		
Status:	Final for Comment		
Revision:	Original	19 September 2018	Original SI.
	A	19 February 2021	Basement Trial Pits.
	B	05 July 2021	Additional Rotary Borehole.
	C	October 2021	Update for Basement Boreholes.

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CONTENTS

1.0 INTRODUCTION 1

1.1 Objectives 1
1.2 Proposed Development 1
1.3 Limitations 1

2.0 THE SITE 2

2.1 Location & Access 2
2.2 Site Description 2

3.0 ENVIRONMENTAL SETTING 3

3.1 Geological Search 3
3.2 Hydrogeology 3
3.3 Hydrology 4
3.4 Historical Setting 4
3.5 Environmental Searches 5
3.6 Radon 6
3.7 Coal Authority Search 7
3.8 UXO Risk 8

4.0 DESK STUDY SUMMARY AND RISK ASSESSMENT 9

4.1 Introduction 9
4.2 Potential Contaminative Sources 9
4.3 Pathways 10
4.4 Receptors 10
4.5 Preliminary Conceptual Site Model 10
4.6 Ground Gas Risk Assessment 12

5.0 METHOD OF INVESTIGATION 13

5.1 Objectives 13
5.2 Site Works 13
5.3 Sampling 14
5.4 In-Situ Testing 14
5.5 Laboratory Testing 14
5.6 Monitoring 15

6.0 GROUND CONDITIONS 17

6.1 Made Ground 17
6.2 Natural Ground 18
6.3 Bedrock 18
6.4 Groundwater 19
6.5 Observations 19

7.0 TEST RESULTS 20

7.1 Chemical Test Results - Soils 20
7.2 Geotechnical Testing 22
7.3 Aggressive Ground Conditions 24
7.4 Gas Monitoring Results 25

8.0 GEOTECHNICAL ASSESSMENT 27

8.1 General 27
8.2 Soil and Bedrock Parameters 27

8.3 Block A and C Foundations 29
8.4 Block B Foundations 31
8.5 Building Near Trees 32
8.6 Floor Slabs 32
8.7 Construction 33
8.8 Soakaways 33

9.0 ENVIRONMENTAL ASSESSMENT 34

9.1 General 34
9.2 Contamination 34
9.3 Qualitative Risk Assessment 37
9.4 Remedial Measures 39
9.5 Asbestos 39
9.6 Health and Safety Issues 40

10.0 WASTE SOIL CLASSIFICATION & ASSESSMENT 41

10.1 Overview 41
10.2 Waste Classification Procedure 41
10.3 Waste Classification and Waste Acceptance Criteria (WAC) 43
10.4 Options Assessment 44
10.5 Re-use of Soils 45

11.0 CONCLUSIONS 48

11.1 Summary 48
11.2 Further Work 48

12.0 REFERENCES 50

DRAWINGS

Drawing Number	Rev	Title
05593_MP_02_2200	J	General Arrangement – Ground Floor
C3967/01	-	Site Location Plan
C3967/02	C	Exploratory Hole Location Plan

APPENDICES

APPENDIX A BSL Guidance and Methodology
APPENDIX B Historical Maps
APPENDIX C GroundSure Report
APPENDIX D Coal Authority Report
APPENDIX E Exploratory Hole Logs
APPENDIX F Chemical Testing Results
APPENDIX G Geotechnical Testing Results
APPENDIX H Ground Gas Monitoring Results
APPENDIX I Waste Classification Report
APPENDIX J Limitations

GEO-ENVIRONMENTAL ASSESSMENT REPORT
FOR A SITE OFF
BACK TURNER STREET, MANCHESTER

1.0 INTRODUCTION

1.1 Objectives

1.1.1 This report describes a Geo-Environmental Assessment carried out by Brownfield Solutions Limited (BSL) for Domis Construction Limited on a site off Back Turner Street, Manchester.

1.1.2 The objectives of the assessment were to determine the site's environmental setting and likely site conditions, highlighting potential areas of concern that may govern the site's redevelopment in addition to collecting subsurface information for geotechnical design.

1.1.3 An initial intrusive investigation was undertaken to confirm the findings of the preliminary CSM and risk assessment and meet any objectives that had not been satisfied. The initial investigation was undertaken using combined percussive/rotary cored boreholes.

1.1.4 The report has been completed in general accordance with CLR11 "Model Procedures for the Management of Land Contamination", BS 5930:2015 and BS 10175:2011+A1:2017.

1.2 Proposed Development

1.2.1 The proposed development is a commercial office / retail end-use comprising three adjoining buildings, Blocks A to C. This comprises the erection of a part 17 storey (Block A – north), part 6 storey building (Block C – south) and the conversion with single-storey rooftop extension of the existing building (Block B – centre) with associated landscaping as shown on the Ground Floor General Arrangement Plan drawing ref. 05593_MP_02_2200_J as provided to BSL by the client. It should be noted that no soft landscaping is proposed.

1.3 Limitations

1.3.1 This Geo-Environmental Assessment has been carried out based on information obtained from a number of areas, BSL have assumed that this information is correct.

1.3.2 At the time of the investigation many areas were inaccessible due to the existing building and other physical and operational restrictions. There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by this assessment and therefore not been taken into account by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

1.3.3 This report has been prepared for the sole use of the client. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report they rely on it at their own risk and BSL do not owe them any Duty of Care.

2.0 THE SITE

2.1 Location & Access

2.1.1 The site covers an area of approximately 0.06 hectares and is situated approximately 320m north of Manchester City Centre.

2.1.2 The site is centred on National Grid Reference 384297, 398667 as shown on the Site Location Plan C3967/01.

2.1.3 Access to the site is gained off High Street, Soap Street, or Back Turner Street bordering the southern portion of the site.

2.2 Site Description

2.2.1 A site walkover was undertaken on 26th June 2018 and the pertinent features are detailed below.

2.2.2 The site is elongate in shape and has a gentle slope from the south east down to the north west. The site sits in a commercial/retail area of Manchester and is surrounded by a mixture of shops and restaurants.

2.2.3 The site is bordered by back Turner Street to the south and Soap Street to the north. High Street borders the site to the east with Shudehill bordering the site to the west.

2.2.4 The site comprised two distinct areas of development; with buildings occupying the northern and central areas, whilst a car park was present in the south.

2.2.5 The northern part of the site is occupied by single story commercial units some of which were disused at the time of the walkover. These also appear to have a basement.

2.2.6 The middle of the site is occupied by a disused building of between four and five storeys in height which is in a very poor state of repair with collapsed ceilings and stair wells in places. The building has a basement with limited access.

2.2.7 The southern part of the site has no buildings present and is used as a rough surfaced car park bordered by concrete bollards and posts. It is apparent that the site had a building present previously and that it also very likely contained a basement which has now been backfilled to pavement level.

2.2.8 Since the date of the first investigation, the building in the north of the site has been demolished. The only structure remaining is one in the centre of the site, referred to as Block B.

3.0 ENVIRONMENTAL SETTING

3.1 Geological Search

3.1.1 The following publications of the British Geological Survey (BGS) were examined in respect of the geology underlying the site:

- 1:50,000 Scale Geological Map Sheet 85, Manchester. Solid & Drift Edition (2011).
- 1:50,000 scale Geological Map Sheet 85, Manchester. Solid Edition (2010)
- Geology of Britain Interactive Online Viewer.

Made Ground

3.1.2 The Groundsure report and geological maps do not identify any record of artificial or made ground beneath the site. However, the historical maps show that the land has been developed several times in the past, so it is assumed that there is made ground present.

Superficial Deposits

3.1.3 The site is indicated to be underlain by glacial till. This stratum typically comprises firm to stiff sandy clay, with occasional sand lenses gravels, cobbles and occasional boulders.

Solid Geology

3.1.4 The solid geology underlying the site is indicated to comprise the Chester Pebble Beds Formation. The BGS describes this unit as typically comprising red-brown and pinkish red medium-grained sandstone, with moderately cemented quartzite pebbles towards the base. According to the BGS map, this unit is gently dipping towards the south-west.

3.1.5 The normal Ardwick Fault is indicated to be present adjacent to the south-western boundary of the site, with the strata being downthrown to the east.

3.2 Hydrogeology

3.2.1 The Superficial Till deposits in this area are classified by the Environment Agency as a Secondary Aquifer (Undifferentiated Layers). This is assigned where it is not possible to attribute either a category A or B to the rock type. Generally, this type of aquifer was formerly identified as a minor aquifer.

3.2.2 The bedrock is classified by the Environment Agency as a Principal Aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning that they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

3.2.3 There are no groundwater abstraction licences within 0.5km of the study site. The nearest active licence is located 578m to the west and pertains to abstraction from a borehole in Chapel Street, Salford by British Telecommunications PLC, for the purpose of general cooling.

3.2.4 The soils underlying the site are indicated to be of High Leaching Potential (HU); which is a worst-case designation in urban areas or restored mineral workings in the absence of site-specific information.

3.2.5 The site does not lie in, or within 500 metres of, a Source Protection Zone.

3.2.6 There are no active potable water abstraction licences within 2km of the site. The nearest historical licence is located 685m to the north west, with the borehole's water being used for drinking, cooking, sanitary and washing purposes.

3.3 Hydrology

3.3.1 The River Irk is indicated to be present 353m to the west of the study site and confluences with the River Irwell approximately 470m to north-west.

3.3.2 There are twenty Ordnance Survey MasterMap Water Network entries within 500m of the site. The nearest two are located 293m to the west and are listed as an inland river not influenced by normal tidal action, within the Mersey catchment area. The average width of the watercourse's section is listed as being 2.0m. Evidence obtained during the site walkover indicates that this watercourse is a decorative water feature within a public open space and appears to be isolated.

3.3.3 The nearest available River Quality data to the site is for the River Irk, which was classified Biological Grade E and Chemical Quality Grade D in 2009, at a monitoring point 524m to the north-west.

3.3.4 There are no surface water abstraction licences within 2km of the site.

3.3.5 Information obtained from the Environment Agency (EA) Risk of Flooding from Rivers and the Sea (RoFRaS) database indicates the risk of flooding across the site is very low (less than 1 in 1000 chance of flooding in any given year). The site is not indicated to lie within an EA designated floodplain.

3.4 Historical Setting

3.4.1 Information has been obtained from historical Ordnance Survey Maps with the pertinent issues that may have affected the site, or its environs summarised below.

3.4.2 The following plans produced by the Ordnance Survey were examined.

Scale	Date
1:500	1891
1:1056/1250	1851 1953 1954 1963 1985 1990 1992 1995
1:2500	1893 1908 1922 1933 1957 1958 1965 1970 1971
1:10000/10560	1848 1894 1896 1906 1923 1934 1938 1956 1972 1981 1985 1991 1994 2002 2010 2014

The Site

3.4.3 The earliest available mapping of 1848 and 1851 indicates the site to be occupied by back-to-back residential terraced properties fronting onto Back Turner Street to the west and Back Thomas Street to the east.

3.4.4 By 1891 it appears that the terraced buildings on-site have been **demolished** and is now entirely occupied by four large adjoining buildings; two located in the north of the site, one in the centre and one in the south-east.

3.4.5 The mapping of 1948-53 shows that by 1948 the four adjoining buildings have been merged into two; with only the one in the south-east of the site remaining unaffected.

3.4.6 Between 1990 and 1992 the building in the south-eastern area of the site has been demolished. The site takes its current form.

Surrounding Area

3.4.7 The earliest maps available of 1848/1851 show the site to be surrounded by terraced buildings. Two **smithies** can be seen approximately 50m to the east, and 50m to the south-east of the site respectively. Several pubs and hotels are also shown within 100m of the site. Smithfield Market is present around 150m to the north-east.

3.4.8 By 1891 many of the terraces south-east of the site have been demolished to make way for the High Street. The smithies are no longer shown on the map. A **tramway** has been constructed along Nicholas Croft 20m west of the site. A large wholesale fish market is present 50m to the north-east.

3.4.9 The map of 1894 shows **Victoria Railway Station** present 500m to the north-west of the site.

3.4.10 The map of 1908 shows a **printing works** approximately 150m to the north-west. These printing works had expanded northward by 1922.

3.4.11 By 1933 the printing works had expanded again, to the south.

3.4.12 The map of 1953 shows the printing works to have been renamed Kemsley House, which in turn is later renamed Thomson House by 1963. An **electricity sub-station** is present within the boundary of Kemsley House. A ruin is visible around 75m north-east of the site. The tramway no longer appears on the map.

3.4.13 The map of 1985 shows many buildings to have demolished and replaced with the Arndale centre and associated multi-storey car park 50m to the south-west. Another multi-storey car park is visible around 120m to the south. Smithfield Market to the east has also been converted to a car park by this time.

3.4.14 By 1990 the wholesale fish market has been replaced with a garden centre.

3.4.15 The map of 1992 shows a new **tramway** to have opened along part of the old tram route 20m to the west of the site. Thomson House is now labelled as a **works**.

3.4.16 There are no significant further changes indicated on the subsequent mapping.

3.4.17 The Historical Maps are presented in Appendix B.

3.5 Environmental Searches

3.5.1 An Environmental Search has been conducted through Groundsure, which utilises British Geological Survey and Environment Agency databases. The full report can be found in Appendix C, although a summary of the more relevant findings is presented below.

Entry	0 – 249m	250 – 500m	Details
Authorised industrial processes (IPC/IPPC/LAPPC)	0	0	
Pollution Incidents	0	1	Incident date 2002, 409m S of the site. Pollutant is unidentified and had a Category 3 (Minor) Impact of Land.
Landfill and Waste treatment	0	1	A historic waste transfer site located 491m to the north-east, although the licence was surrendered in 2010.
Discharge consent	0	14	Closest discharge consent is 362m NW of the site, for Sewage Discharges – Sewer Storm Overflow into the River Irk in 1995.
Control of Major Accident Hazard (COMAH) sites	0	0	
Consents issued under planning (Hazardous substances) Act 1990	0	0	
Radioactive substances	0	1	354m NE, Category 3 or 4 Radioactive Substances Authorisation for Brooke Edgley Specialist Technical Services Ltd for Disposal of radioactive waste between 2000 and 2015. Status: Revoked/Cancelled.
Fuel Station entries	0	2	Two obsolete fuel stations at 463m NE and 487m E respectively.
Other Current industrial land uses	30	N/A	Including: Electricity sub-stations at 45m NE, 107m NE, 135m NW, 188m SW, 204m NE, and 238m N. Tram/ Light Railway 80m NW.

3.6 Radon

3.6.1 Map 4 'Northern Welsh Marches and Liverpool' of the Indicative Atlas of Radon in Great Britain was inspected, which defines areas which require radon protective measures. The Manchester study site is not in an area requiring Radon precautions in foundations in accordance with BRE Report 211 'Radon – Guidance on protective measures for new dwellings' 2015 Edition.

3.6.2 The commissioned Groundsure report confirms that the site is not in a Radon Affected Area, as less than 1% of properties are above the action level.

3.6.3 The radon data within the Groundsure report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supersede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in the Groundsure report is considered definitive.

3.7 Coal Authority Search

3.7.1 The site lies in an area where the Law Society and Coal Authority recommends a mining search be undertaken as the site could be affected by past or current mining.

3.7.2 Therefore a search was carried out with the Coal Authority, which is presented in Appendix D, the main findings of which are presented below.

Past Mining

3.7.3 The property is not within a surface area that could be affected by recorded past underground mining.

Present Mining

3.7.4 The site is not within the zone of influence of any present underground coal workings.

Future Mining

3.7.5 The property is not in an area where the Coal Authority are determining whether to grant a licence to remove coal by underground workings.

3.7.6 The property is not in an area likely to be affected at the surface by any planned underground workings.

3.7.7 Reserves of coal exist in the local area that may be worked in the future.

3.7.8 No notice of the risk of land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine Entries

3.7.9 There are no records of any mine entries on or within 20m of site boundary.

Coal Mining Geology

3.7.10 The Authority is not aware of any damage arising to geological faults or lines of weakness that have been affected by coal mining.

Opencast Coal Mining

3.7.11 The property is not in an area affected by past or present coal mining extracted by opencast methods. The property is also not in an area affected by a proposed opencast coal mine.

Subsidence

3.7.12 The Coal Authority has not received a damage notice or claim for the subject property or within 50m since 31 October 1994.

Mine Gas

3.7.13 There is no record of mine gas emission requiring action by the Coal Authority within the boundary of the property.

Withdrawal of Support

3.7.14 The property is not in an area which notice of entitlement to withdraw support has been published.

3.8 UXO Risk

3.8.1 In accordance with CIRIA Report C681, BSL have reviewed non-specialist UXO data for the site using the Zetica Bomb Risk Map. There is no indication of former military use from the desk study. The map indicates the site to be in an area where the bomb risk is moderate. A ruin can be seen 75m north-east of the site on the map of 1953, this is likely due to wartime bombing.

3.8.2 BSL has reviewed an Explosive Ordnance Desk Top Study for the site prepared by EOD Contacts Limited and dated 19 February 2018, which was prepared for and provided by the client. On the basis of the information available to them, EOD Contacts limited concluded that there was a low risk of UXO being located within the site boundaries and that no further risk mitigation measures were required.

4.0 DESK STUDY SUMMARY AND RISK ASSESSMENT

4.1 Introduction

4.1.1 The risk posed by any contaminants in soil or groundwater will depend on the nature and level of the source, the probability of exposure occurring, the potential pollution pathway and the likely effects on the receptors.

4.1.2 A contaminant is defined as a substance that has the potential to cause harm, a risk is considered to exist if such a substance is present at sufficient concentrations to cause harm and if a pathway is present a receptor could be exposed to the contaminant.

4.1.3 The following sections discuss the identified potential on-site and off-site sources, and any pollution that could impact receptors associated with the proposed development. Pollution linkages are assessed which may represent a risk to human health and/or controlled water receptors from the information gained from the desk study searches. The assessment has been carried out on a qualitative basis and aims to produce a complete and comprehensive Preliminary Conceptual Site Model.

4.1.4 Three potential impacts exist for any given site and all three need to be considered in the qualitative risk assessment, these are:

- On- site impacts.
- The site impacting its surroundings.
- Off-site sources impacting the subject site.

4.2 Potential Contaminative Sources

<u>On-Site</u>

4.2.1 From the information obtained during the desk study, the following potential on-site source of contamination has been identified which may affect the redevelopment of the site for mixed residential and commercial end-use:

- General made ground associated with former development and demolition.

<u>Off-Site</u>

4.2.2 From the information obtained during the desk study a number of historic land uses have been identified in the surrounding area, which may affect the redevelopment of the site for mixed residential and commercial end use:

- Smithies at 50m E & 50m NE (pre-1891).
- Tramway at 20m W (1891 – 1953; since 1992).
- Printing Works at 150m NW (1908 – 1995).
- Electricity Sub-station at 150m NW (since 1953).

Associated Contaminants

4.2.3 The contaminants commonly associated with the potential sources of contamination identified include:

- Made ground – heavy metals, PAHs, asbestos, hydrocarbons, ground gas.
- Printing works – heavy metals, acids, asbestos, dye, solvents, hydrocarbons.
- Iron and metal works – metal dust, silica dust, mineral acids, asbestos, ash.
- Railway Industry – hydrocarbons, PCBs, PAHs, metal fines, ash and fill.
- Electricity Sub-stations – PCBs.

4.3 Pathways

4.3.1 A pathway is defined as a medium by which a contaminant comes into contact with, or otherwise impacts a receptor. Due to the site's proposed end use being mixed residential and commercial potential pollution pathways for contaminant migration at the site will exist.

4.3.2 At this stage the potential contaminants identified above are considered to present potential risks to site end users and controlled waters through the following pathways:

- Ingestion or inhalation of contaminated soils;
- Dermal contact with contamination;
- Inhalation of gases or vapours in both indoor and outdoor air;
- Direct contact by buried structures such as services pipes;
- Leaching of mobile contamination into groundwater;
- Migration of perched groundwater in any permeable soils or along existing or proposed service runs;
- Saturated zone flow through the Secondary Aquifer (Undifferentiated Layers) and Principal Aquifer underlying the site.

4.4 Receptors

4.4.1 Receptors generally fall into the categories of human health or controlled waters. The identified receptors are listed below:

- Site end-users.
- Secondary Aquifer (Undifferentiated Layers) within the superficial till.
- Principal Aquifer within the Chester Pebble Beds Formation.
- Unnamed surface water/river located 293m to the west.

4.4.2 Contaminants within the soil and groundwater could potentially attack the clean potable water supply pipe, the contaminants should be assessed to determine the correct pipe material and level of precautions.

4.5 Preliminary Conceptual Site Model

4.5.1 The information obtained in the previous sections has been used to compile a Preliminary CSM. The identified potential contaminants and receptors have been assessed in the table below as to whether a plausible source-pathway-receptor pollutant linkage for the proposed

end use of the site exists. The risk classification has been estimated in accordance with information in Appendix A.

Human Health

4.5.2 The Preliminary CSM for human health is presented in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Made Ground Heavy metals, PAHs, asbestos, hydrocarbons	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Made Ground Ground gas	Migration and build-up of asphyxiant or explosive ground gases in confined spaces/void	End-users, Property	Low Likelihood	Severe	Moderate
OFF-SITE					
Smithy metal dust, silica dust, mineral acids, asbestos, ash	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Tram/Railway hydrocarbons, PCBs, PAHs, metal fines, ash and fill	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Printing Works heavy metals, acids, asbestos, dye, solvents, hydrocarbons	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Electricity Sub-station PCBs	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low

Human Health Justification

4.5.3 Made ground is anticipated to be present underlying the site associated with former developments and demolition. However, gross contamination is not anticipated associated with the on-site sources.

4.5.4 Post-development, the entirety of the site is anticipated to be covered in hardstanding, thereby breaking the pathway for inhalation, ingestion or direct contact with any potentially contaminated soils. Significant volatile contamination is unlikely based on the sources identified, and no areas of soft landscaping are currently being proposed for the study site. Therefore, the risk to end-users are generally considered to be low from all on-site and off-site sources.

4.5.5 The made ground on-site is considered to be a potential source of ground gas. Anecdotal evidence suggests that thick deposits of made ground may be present in the southern area of the study site associated with the demolition of a previous brick structure into its basement. At this stage the risk is considered to be moderate.

Controlled Waters

4.5.6 The Preliminary CSM for controlled waters is presented in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Made ground heavy metals, PAHs, asbestos, hydrocarbons	Surface run-off and / or migration through groundwater or granular soils	Controlled waters (surface waters)	Unlikely	Medium	Low
		Secondary Aquifer - Undifferentiated Layers (superficial deposits)	Unlikely	Medium	Low
		Aquifer (bedrock)	Unlikely	Medium	Low

Controlled Waters Justification

4.5.7 The site is underlain by a Secondary Aquifer (Undifferentiated Layers) within the superficial deposits, overlying a Principal Aquifer within the bedrock. The site does not lie within a Source Protection Zone and there are no groundwater abstraction licences within 500m of the site. The sensitivity of the groundwater is considered to be low. Post-development the majority of the site will be covered with hardstanding, thus significantly reducing the leaching potential of any residual made ground soils. The risk to the aquifers is therefore considered to be low.

4.5.8 The nearest identified surface water feature is an unnamed river located 293m to the north-west. Given the distance, presence of hard and soft surfacing and drains between the site and this surface water feature, overland flow is unlikely to be a pathway. Likewise, due to the distance, there is significant potential for attenuation, dispersal and degradation of any mobile contamination. The risk to surface waters is considered to be low.

4.6 Ground Gas Risk Assessment

4.6.1 A potential on-site gas source has been identified associated with the general made ground and the preliminary CSM considers it to be a moderate risk to site end-users and structures. The sensitivity of the development is currently considered to be moderate (after Wilson et al, 2005).

4.6.2 In accordance with CIRIA C665 as set out in Appendix A of this report, the recommended gas monitoring should comprise 9 visits over a 6-month period, subject to the results of the initial monitoring visits.

5.0 METHOD OF INVESTIGATION

5.1 Objectives

5.1.1 The aim of the fieldwork was to:

- Investigate ground conditions on the site;
- Assess the potential contamination on the site and obtain samples for contamination screening;
- Assess the potential impact of any contamination on controlled waters;
- Assess the need for detailed investigation;
- Obtain geotechnical information on the ground conditions at the site for preliminary foundation design and preliminary pavement design purposes;
- Install standpipes to allow future monitoring;
- Give an assessment of the geo-environmental risks associated with redevelopment of the site.

5.2 Site Works

5.2.1 Two combined percussive/rotary core boreholes (BH01 and BH02) were drilled to depths of 24.00m bgl using a tracked drilling rig between 6th August and 10th August 2018.

5.2.2 Subsequently, hand pitting was undertaken in the basement of the most northern building and at the surface to the north of the above mentioned boreholes. In total, seven pits were proposed within TP01-TP04 and TP06-TP07 undertaken to depths between 0.40m bgl and 1.20m bgl. TP05 within the basement was noted to be inaccessible due to a collapsed roof. TP01 to TP04 were undertaken to understand the existing foundations in place, whilst TP06 and TP07 were undertaken for waste classification purposes associated with demolition rubble in this location and were all undertaken between 10th and 11th August 2020.

5.2.3 A third round of works was conducted on 27th January 2021 and 1st February 2021 which comprised hand pits within the basement of Block B in the centre of the site. In total ten pits (BB-TP01 to BB-TP07, S01 to S03) were excavated to depths between 0.65m bgl and 1.20m bgl to confirm foundation and slab build up within Block B which is to be retained as part of the development.

5.2.4 A third combined dynamic sampling / rotary core borehole (BH03) was drilled to a depth of 25.50m bgl using a tracked machine between 12th and 13th April 2021.

5.2.5 A fourth round of works was conducted between 13th September 2021 and 16th September 2021, which comprised of three window sample boreholes to depths of between 7.00m bgl and 7.87m bgl within the basement of Block B.

5.2.6 The approximate locations of the exploratory holes are indicated on the Exploratory Hole Location Plan, Drawing No C3967/02 Rev C. The exploratory hole logs are presented in Appendix E.

5.2.7 The exploratory holes were positioned to establish general ground conditions within the accessible southern (car park) area of the study site. These boreholes were logged by an experienced geo-environmental engineer in general accordance with BS 5930 'Code of Practice for Site Investigations' 2015, BS EN 14688-1:2002 'Geotechnical Investigation and

Testing – Identification and classification of soil' and BS EN ISO 14689:2002 "Geotechnical investigation and testing – Identification and classification of rock".

5.3 Sampling

5.3.1 During the drilling of the exploratory holes, representative samples were taken at regular intervals to assist in the identification of the soils and to allow subsequent laboratory testing.

5.3.2 A summary of the samples taken is presented in the table below:

Type	Number				
	2018	2020	JAN 2021	APR 2021	SEP 2021
Environmental	5	15	16	4	-
Small Disturbed	12	-	-	7	21
U100	4	-	-	1	16
Rock Core (Sub-Sample)	12	-	-	7	-

5.3.3 The type of sample is dependent upon the stratum and the purpose of analysis in accordance with current environmental and geotechnical guidance.

5.3.4 Disturbed samples of soil for chemical testing were placed in plastic tubs and amber jars as required by the UKAS accredited laboratory and transported under secure refrigerated conditions.

5.3.5 The distribution of samples taken across the site is recorded on the exploratory logs.

5.4 In-Situ Testing

5.4.1 Standard Penetration Tests (SPTs) were carried out within the boreholes at regular intervals. The results of the individual seating blows (first 150mm penetration) and the calculated N-values are recorded on the exploratory hole logs.

5.4.2 All SPTs presented are uncorrected; density and strength descriptors are reported in accordance with the guidance stated in BS 5930:2015, incorporating requirements of BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003.

5.5 Laboratory Testing

5.5.1 As part of the initial assessment for potential contamination of the site, selected samples were taken for the purpose of chemical contamination testing.

5.5.2 The potential contaminative processes on site were identified to be made ground and various off-site historic industrial activities; therefore, the following suites of determinands were chosen to screen for potential impacts.

5.5.3 The following soil samples were analysed at an UKAS approved laboratory:

Determinand	2018	2020	JAN 2021	APR 2021
Arsenic, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, zinc, speciated PAHs, total	4	3	6	2

phenol, free cyanide, water soluble sulphate, soil organic matter and pH.				
TPH CWG	2	2	2	-
Asbestos Screen and Identification	4	3	6	2
Asbestos Quantitative Analysis	1	-	1	-
Volatile Organic compounds (VOCs)	-	-	1	-
Semi-Volatile Organic compounds (SVOCs)	-	-	1	-
Total Organic Carbon (TOC)	-	-	-	2
Waste Acceptance Criteria (WAC)	1	1	-	1

5.5.4 The Chemical Laboratory Testing Results are presented in Appendix F.

5.5.5 Representative disturbed samples were obtained for all soil types encountered and bedrock samples were cored in 1.50m runs. Selected samples were scheduled for testing at an approved laboratory in accordance with BS 1377 'Method of Test for Soils for Civil Engineering Purposes' 1990. The following tests were scheduled:

BS Test Number	Description	No of Samples
Part 2:	Natural Moisture Content	12
Part 2:	Plasticity Index Analysis	18
Part 3:	pH Value	10
Part 3:	Water Soluble Sulphate Content	10
Part 5:	One-Dimensional Consolidation	9
Part 7:	Determination of Undrained Shear Strength in Triaxial Compression	11
-	Point Load Strength Index of Rock	16
-	Uniaxial Compressive Strength of Rock Materials	4

5.5.6 The Geotechnical Laboratory Testing Results are presented in Appendix G.

5.6 Monitoring

5.6.1 Gas and water monitoring standpipes were installed in each of the boreholes and proposed gas monitoring visits will be undertaken. All gas monitoring will be undertaken using GA 2000/5000 infrared gas meter with integral electronic flow analyser.

5.6.2 Measurements of the percentage volume in air (%v/v) of oxygen (O_2), carbon dioxide (CO_2) and methane (CH_4) will be recorded in addition to the percentage Lower Explosive Limit (%LEL) of methane and the atmospheric pressure. Flow measurements on each standpipe (l/hr) will also be taken. (Note: 100% LEL equates to 5% by volume).

5.6.3 The standpipes installed consist of high-density polyethylene (HDPE) pipe. A bentonite seal was made around the plain pipe and a clean gravel pack was placed around the slotted pipe. A summary of the installation construction is presented in the table below:

Location	Depth(s) (m bgl)	Response Zone(s) (m bgl)	Targeted Strata	Reason
BH01	16.00	4.00 – 16.00	Glacial Till & Sandstone	Ground Gas / Groundwater

BH02	4.00	1.00 – 4.00	Made Ground & Glacial Till	Ground Gas
BH03	3.00 / 16.00	1.00 – 3.00 / 9.00 – 16.00	Made Ground / Glacial Till & Sandstone	Ground Gas / Groundwater

5.6.4 The results monitor peak and steady state conditions. Peak results are those that occur on opening the valve on the borehole tap. Steady state conditions are those that occur a period of time afterwards when the initial (accumulated) gases have been purged from the borehole.

5.6.5 Final gas monitoring results are presented in Appendix H of this report.

6.0 GROUND CONDITIONS

6.1 Made Ground

Block A

6.1.1 Made ground was encountered in all exploratory hole locations within Block A and was between 0.25m (TP01 and TP03) and 1.10m (TP04) in thickness. Generally concrete was encountered at the surface up to 0.05m in thickness, underlain by a thickness of made ground comprising ashy gravelly sand with brick cobbles and fragments, concrete and mudstone or a firm slightly gravelly slightly sandy clay with brick cobbles and fragments, concrete and mudstone.

6.1.2 Within BH03, made ground representing demolition rubble was encountered down to 3.30m bgl. This comprised sands and gravels with a medium cobble content. The gravels comprised brick, concrete, glass, metal, plastic, wood and wires. Cobbles of brick and concrete were encountered throughout. The made ground became slightly clayey between 2.80m and 3.30m bgl.

Block B

6.1.3 Made ground was encountered in all exploratory hole locations within Block B and was proven to between 0.416m (S03) and 0.85m (Block B TP06) in thickness. Generally concrete was encountered at the surface up to 0.10m in thickness, underlain by a thickness of made ground comprising sandy gravel with brick cobbles and fragments or a gravelly sand with fragments of brick and concrete. A second concrete basement floor slab was encountered in BHB1 and BHB3 from 0.30m to 0.45m bgl. An odour was noted within the made ground clay encountered in S02 between 0.25m and 0.80m bgl. Concrete was encountered in Block B TP04 between 0.18m and 0.65m bgl.

Block C

6.1.4 Made ground was encountered in all of the exploratory hole locations in Block C and was encountered to depths between 3.20m (BH02) and 3.40m in thickness (BH01). Made ground in TP06 and TP07 was proven to 1.00m bgl.

6.1.5 The made ground generally comprised compacted gravel surfacing of limestone and sandstone to depths of between 0.20m and 0.25m bgl. The surfacing was underlain by loose to medium dense reddish brown slightly sandy gravel or very gravelly sand with frequent brick cobbles and localised ash. The gravel was generally subangular to subrounded of mixed lithologies including brick, quartzite, mudstone and sandstone, with localised fragments of plastic, timber, cables, textiles and glass i.e. demolition rubble. The cobbles were generally angular of brick, whilst a metal bar was encountered within BH02 at 0.40m bgl.

6.1.6 A 100mm thick vinyl-coated floor covering was recovered from the exploratory holes at a depth of between 2.40m (BH01) and 2.60m bgl (BH02). This was directly underlain by a 500mm thick heterogenous mixture of brick fragments, rotten timber fragments and ash, which was interpreted on-site as being the remains of a basement structure.

6.1.7 Underlying the floor slab structure in borehole BH01, a layer of made ground comprising sandy gravel with brick cobbles was encountered extending to a depth of 3.40m bgl.

6.2 Natural Ground

Block A

6.2.1 Natural ground comprising a very stiff slightly sandy clay was encountered at the base of all pits in Block A. Natural ground was encountered at depths from 0.25m (TP01 and TP03) and 1.10m bgl in TP04.

The deeper natural deposits encountered in BH03 also comprised a stiff slightly gravelly slightly sandy clay to a maximum depth of 8.80m bgl. Orange sand was encountered from 8.80m to 9.10m bgl. A very dense slightly clayey very sandy gravel was encountered from 9.10m to 10.00m bgl. A gravelly sand was encountered from 10.00 to 14.50m bgl.

Block B

6.2.2 The natural strata underlying the made ground within the basement comprised firm to stiff brown slightly gravelly clay. The gravel was angular to rounded fine to coarse of mudstone. Corresponding SPT N-values within this cohesive unit ranged between 7 and 43, with refusals (N-values >50) being encountered at 6.90m, 7.60m and 7.70m bgl in BHB1, BHB2 and BHB3, respectively. This natural clay stratum is interpreted as being representative of the superficial Glacial Till indicated to be present on-site through BGS Mapping. The clay underlying block B was proven to a maximum depth of 7.87m bgl.

Block C

6.2.3 The natural strata underlying the made ground initially comprised stiff brown gravelly and sandy clay to depths of between 11.10m and 11.80m bgl. Corresponding SPT N-values within this cohesive unit initially ranged between 19 and 44, with refusals (N-values >50) being encountered below 9.00m (BH02) and 10.50m bgl (BH01). This natural clay stratum is interpreted as being representative of the superficial Glacial Till indicated to be present on-site through the BGS mapping.

6.2.4 Underlying the natural clay, red coarse-grained sand was encountered and has been interpreted as being the weathered margin of sandstone bedrock.

6.3 Bedrock

6.3.1 Rotary core drilling was undertaken from the base of the three boreholes (BH01, BH02 and BH03) from 14.50m bgl, to a depth of between 24.00m (BH01 & BH02) and 25.50m bgl (BH03) bgl.

6.3.2 Weak thinly bedded red coarse-grained sandstone was generally recovered and was interpreted as being representative of the Chester Pebble Beds Formation. The bedrock was observed to be very weak from its initial encounter (recovered as sand) and became weak, thinly bedded and distinctly weathered from depths of 14.05m bgl (BH01), 15.60m bgl (BH02) and 14.50m bgl (BH03).

6.3.3 One distinct joint set was identified within the sandstone; being horizontal to sub-horizontal (generally 0 – 5°), medium spaced and planar, with no infilling.

6.3.4 Values of Total Core Recovery (TCR) ranged between 57% and 100% and values of Solid Core Recovery (SCR) ranged between 20% and 100%. Both TCR and SCR were observed to increase with depth and were consistently 100% below a depth of 19.50m bgl in BH01 and BH02. This trend was not seen in BH03 with TCR and SCR found to be both 20% between 22.50m and 24.00m bgl.

6.3.5 The Rock Quality Designation (RQD) of the sandstone bedrock was determined to be between 0% and 80% and was observed to generally increase with depth. The RQD in BH01 and BH02 was consistently greater than 25% below a depth of 19.50m bgl and greater than 50% below a depth of 21.00m bgl. The RQD between 21.00m and 24.00m in BH03 was 0%.

6.4 Groundwater

6.4.1 Groundwater was encountered at depths of between 15.50m and 17.10m bgl across the three boreholes, as summarised in the table below:

Location	Depth of Groundwater Strike (m bgl)	Remarks
BH01	16.30	Rising to 15.10m bgl after twenty minutes.
BH02	17.10	Rising to 15.90m after twenty minutes.
BH03	15.50	-
BHB1	-	
BHB2	-	
BHB3	-	

6.5 Observations

6.5.1 During the works undertaken by BSL observations for both visual and olfactory evidence of contamination were made.

6.5.2 Localised deposits of ash were encountered within the made ground in BH01 and BH02 to depths of between 2.40m and 2.60m bgl, and within the shallow made ground in Block A and Block B.

6.5.3 Black staining with a strong sweet volatile odour was noted in made ground in S02 between 0.25m and 0.80m bgl.

7.0 TEST RESULTS

7.1 Chemical Test Results - Soils

7.1.1 The samples were tested for an assessment of the chemical contamination and results were examined with reference to a selection of guidance documents as detailed in Appendix A.

7.1.2 The apparent exceedance of the relevant Tier 1 generic screening value for a residential end use without plant uptake is taken as indicating further detailed assessment or remedial action is required.

7.1.3 A summary of the chemical testing is presented below:

Metals

7.1.4 For heavy metal determinands, concentrations exceeding the GAC were identified at the locations presented in the table below:

Location	Depth (m bgl)	Metal	Concentration (mg/kg)	GAC (mg/kg)
BH01	0.50	Lead	770	330
		Mercury	1.7	1.2
BH01	1.50	Lead	1300	330
BH02	1.50	Lead	380	330
BH02	1.50	Mercury	1.3	1.2
TP04	0.20 - 0.40	Lead	430	330
		Mercury	3.3	1.2
TP06	0.10 - 0.30	Lead	1100	330
TP07	0.50 - 0.70	Lead	100	330
Block B TP03	0.20 - 0.65	Lead	590	51
Block B TP05	0.16 - 0.32	Arsenic	44	40
		Lead	1200	330

Polycyclic Aromatic Hydrocarbons (PAHs)

7.1.5 BSL consider the main risk drivers for PAHs to be benzo(a)pyrene (B(a)P) and naphthalene. This is due to B(a)P being one of the most toxic of the PAHs, and naphthalene the most volatile and soluble. Category 4 Screening Levels (C4SLs) indicate B(a)P as a surrogate marker for carcinogenic PAHs, if it falls within appropriate limits, since the risk from other non-carcinogenic PAHs are considered negligible. Given the difference in chemical properties between the two, naphthalene will be treated separately using the LQM S4ULs.

PAHs and B(a)P as a Surrogate Marker

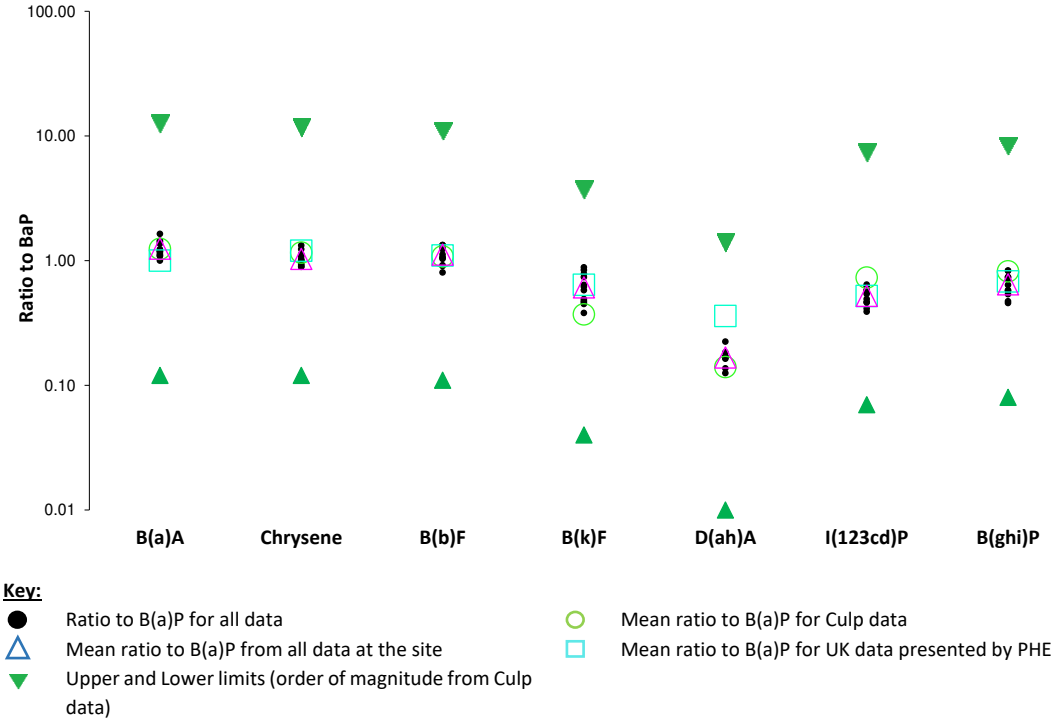
7.1.6 In line with CL:AIRE and Public Heath England (PHE) guidance, benzo(a)pyrene is considered to be one of the most potent PAHs, and it would be appropriate to assume the cancer risk in a mixture is proportional to the concentration of a surrogate marker PAH (benzo(a)pyrene) in the mixture. The ratio of PAHs within the mixture can be assessed to ensure that the profile is similar to that seen for the test material (coal tar mixtures) in the toxicological study by Culp et al. The International Programme on Chemical Safety (IPCS) considered that the PAH profile of the soil sample may deviate from the average profile by about an order of magnitude (up or down).

7.1.7 A more recent study by Bull et al (2013) which analysed PAH concentrations in soil samples from 274 sites, showed that the levels of PAH relative to B(a)P showed little variability and

were similar to that recorded for the coal tar mix used in the Culp et al study. Given this, it was concluded that benzo(a)pyrene is a suitable surrogate marker to represent mixtures of PAH in soil.

7.1.8 In order to risk assess the PAH mixture in the site soil samples using human health guideline values, notably C4SLs, the PAH profile in the soil samples, the ratio of the seven genotoxic PAHs shown below, relative to B(a)P, should be calculated to ensure it is similar to the test material used in the Culp study (PHE 2010). To be considered sufficiently similar, the ratio relative to B(a)P should fit within the upper and lower limits (representing an order of magnitude above and below the mean ratio to B(a)P of test material used in the Culp et al study). In such cases B(a)P is considered an adequate surrogate marker and the Low Levels of Toxicological concern (LLTC) for B(a)P may be used in the risk assessment.

7.1.9 The graph below summarises the site data with respect to how the ratios of carcinogenic PAHs relate to B(a)P, within the confidence limits provided in the PHE documents.



7.1.10 All the data points that could be used to calculate ratios fall inside the upper or lower limits (order of magnitude above or below that of the study material). Based on this distribution of data it is considered that B(a)P can be used as a surrogate marker for carcinogenic PAHs and the C4SL criteria is suitable for this dataset.

7.1.11 Based on the above, elevated PAHs were recorded in one location to date. The location(s) and elevated species of PAH's are shown in the table below:

Location	Depth (m bgl)	Determinand	Concentration (mg/kg)	GAC (mg/kg)
Block B TP03	0.20 – 0.65	Benzo(a)pyrene	46.0	5.3

Total Petroleum Hydrocarbons (TPH CWG)

7.1.12 No petroleum hydrocarbons have been identified above the adopted screening criteria.

BTEX and MTBE

7.1.13 No BTEX or MTBE compounds have been identified above the adopted screening criteria.

Volatile Organic Compounds (VOCs)

7.1.14 No VOCs have been identified above the adopted screening criteria. A sample was taken from S02 where a strong odour was encountered and was tested for VOCs. All of the determinands were noted to be below the limit of detection with the exception of p-isopropyltoluene which was recorded at 25,000ug/kg.

Semi - Volatile Organic Compounds (SVOCs)

7.1.15 No SVOCs have been identified above the adopted screening criteria.

Asbestos

7.1.16 Asbestos was detected in one of the samples submitted from borehole BH01 at a depth of 0.50m bgl and within a sample from Block B TP03 at 0.20m to 0.65m bgl, asbestos was not detected in the remaining eleven samples submitted for analysis.

7.1.17 Additional analysis on the samples from borehole BH01 (0.50m) and Block B TP03 (0.20-0.65m) determined the asbestos detected to comprise loose fibre of chrysotile at a concentration less than 0.001%, which is the laboratory detection limit for the quantification analysis method.

7.2 Geotechnical Testing

7.2.1 Plasticity index analysis was carried out on eight samples of the clay soils and the results ranged between 15% and 30%, indicating the clays to be of low to intermediate plasticity, as summarised below:

Location	Depth (m)	Plasticity Index %	Passing .425mm %	Modified Volume Change Potential
BH01	3.50	20	100	(20%) Medium
	5.00	21	100	(21%) Medium
	7.00	20	95	(19%) Low
	9.30	17	96	(16.3%) Low
BH02	3.50	18	93	(16.7%) Low
	5.00	22	100	(22%) Medium
	6.00	23	100	(23%) Medium
	8.00	15	96	(14.4%) Low
BH03	4.00	24	100	(24%) Medium
	5.00	27	95	(25.7%) Medium
	6.00	20	93	(21.4%) Medium
	7.50	22	95	(20.9%) Medium
BHB1	0.50	27	97	(26.2%) Medium
	1.00	29	94	(27.3%) Medium
BHB2	0.45	28	95	(26.6%) Medium
	2.00	30	98	(29.4%) Medium
BHB3	1.00	28	98	(27.4%) Medium
	3.00	27	96	(25.9%) Medium

7.2.2 After modification of particle size in accordance with NHBC Chapter 4.2 the modified plasticity indices are in the range 14% to 29.4% indicating the soils to be of low to medium volume change potential.

7.2.3 The moisture contents of the samples ranged between 13% and 22%.

7.2.4 Undrained shear strength testing in triaxial compression was carried out on four undisturbed clay samples recovered from the boreholes. The results are summarised in the table below:

Sample Location	Depth (m bgl)	Shear Strength Cu (kPa)	Mode of Failure	Undrained Shear Strength to EC7	Young's Modulus (E_u50) (MPa)
BH01	5.50 – 6.00	117	Compound	High	-
	8.00 – 8.50	100	Plastic	High	-
BH02	4.00 – 4.50	38	Brittle	Low	-
	4.50 – 5.00	84	Brittle	High	-
BH03	6.00 – 6.45	70	Compound	Medium	-
BHB1	1.50 – 2.10	171	Plastic	Very High	4.1
BHB2	1.50 – 2.00	283	Plastic	Very High	8.6
BHB2	2.50 – 3.00	143	Plastic	High	3.5
BHB3	0.50 – 0.80	256	Plastic	Very High	5.3
BHB3	3.50 – 4.00	87	Plastic	High	2.6
BHB3	5.10 – 6.00	151	Plastic	Very High	5.1

7.2.5 Unconsolidated undrained triaxial compression testing determined the undrained shear strength of the glacial till soils to generally be between 70kPa and 283kPa with a bulk density between 2100kg/m^3 and 2230kg/m^3. The test result of 38kPa recorded within the sample from BH02 at 4.00 – 4.50 m bgl is considered anomalous and potentially indicative of pre-shearing of the soil. The results of the shear strength testing are generally consistent with a normally consolidated to slightly over-consolidated clay.

7.2.6 One-dimensional oedometer compression tests were carried out on nine undisturbed samples as summarised in the table below.

Location	Depth (m)	Mv Range (m^2/MN)	Mv at Approx. OB* Pressure (m^2/MN)	Cv Range (m^2/yr)	Compressibility
BH01	5.50 – 6.00	0.027 – 0.120	0.10	2.60 – 17	Medium
BH02	4.50 – 5.00	0.023 – 0.120	0.12	13 – 43	Medium
BH03	6.00 – 6.45	0.015 – 0.33	0.33	0.84 – 2.60	High
BHB1	0.50 – 1.00	0.11 – 0.21	0.21	2.26 – 2.74	Medium
BHB2	1.00 – 1.50	0.10 – 0.67	0.30	1.51 – 2.37	High
BHB2	5.50 – 6.00	0.02 – 0.33	0.33	2.70 – 3.47	High
BHB2	7.10 – 7.60	0.02 – 0.13	0.13	1.72 – 4.27	Medium
BHB3	2.50 – 3.00	0.05 – 0.27	0.27	3.11 – 3.73	Medium
BHB3	7.10 – 7.60	0.03 – 0.44	0.40	1.60 – 3.59	High

*OB – Overburden Pressure

7.2.7 One-dimensional consolidation testing determined the mean coefficient of volume compressibility (m_v) of the samples tested to be 0.140m^2/MN and the mean coefficient of

consolidation (C_v) of the samples tested to be 6.94m^2/yr, which is consistent with expectations for a slightly overconsolidated glacial till.

7.2.8 Based on the results of the consolidation testing and using Casagrande's method, the preconsolidation pressure of the soil samples submitted for testing was found to be between 110kPa and 160kPa, which corresponds to an overconsolidation ratio (OCR) between 1.12 and 1.36 indicating the natural glacial till soils to be slightly overconsolidated.

7.2.9 Sixteen point load tests (PLTs) were carried out on rock sub-samples taken from the rotary core in axial and diametral orientation. The results are summarised in the table below:

Location	Depth (m bgl	Strata Type	Point Load Strength Index I_{s50} (MPa)
BH01	16.00	Sandstone	0.11
	17.00	Sandstone	0.17
	18.00	Sandstone	0.17
	19.00	Sandstone	0.31
	20.00	Sandstone	0.81
BH02	16.00	Sandstone	0.21
	17.00	Sandstone	0.23
	18.00	Sandstone	0.06
	19.00	Sandstone	0.53
	21.00	Sandstone	0.50
BH03	16.00	Sandstone	0.13
	17.61	Sandstone	0.06
	18.50	Sandstone	0.04
	23.93	Sandstone	0.48
	25.06	Sandstone	0.04
	25.20	Sandstone	0.17

7.2.10 Four unconfined compressive strength (UCS) tests were carried out on rock samples and the results are summarised in the table below:

Location	Sample Depth (m bgl)	Strata Type	Moisture Content (%)	Bulk Density (Mg/m^3)	UCS (MPa)	Mode of Failure
BH01	18.5	Sandstone	8.4	2.32	12.6	Multi-shear & axial cleavage
	22.0	Sandstone	7.9	2.91	19.7	Multi-shear & axial cleavage
BH02	19.5	Sandstone	8.3	2.30	16.1	Multi-shear & axial cleavage
	22.5	Sandstone	10.2	2.34	22.2	Multi-shear & axial cleavage

7.3 Aggressive Ground Conditions

7.3.1 Water soluble sulphate testing was undertaken on ten samples of the granular made ground and underlying natural cohesive strata. The results revealed water soluble sulphate (SO_4) contents of between 21.9mg/l and 3470mg/l. Associated pH values were obtained which ranged between 7.7 and 10.1 indicating slightly alkaline conditions. These results are summarised in Appendix G.

7.4 Gas Monitoring Results

7.4.1 Twelve ground gas monitoring visits have been carried out between the dates of 31st August 2018 to 13th September 2018, 23rd November 2020 to 11th December 2020 and 26th April 2021. The results are summarised in the table below:

	CH_4 (%)		CO_2 (%)		O_2 (%)		CO (ppm)		H_2S (ppm)		Flow (l/h)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
P	0.1	0.1	0.1	6.3	16.6	22.0	0.0	0.0	0.0	0.0	0.1	0.6
S	0.1	0.1	0.1	6.2	15.7	22.3					0.1	0.6

Notes: P = Peak, S = Steady, CH_4 = Methane; CO_2= Carbon dioxide; O_2= Oxygen; CO= Carbon Monoxide; H_2S= Hydrogen Sulphide; TVOC (PID)= Total Volatile Organic Compounds (as measured with Photo Ionisation Detector); ppm= Parts Per Million.

7.4.2 Both peak and steady state methane was encountered 0.1%v/v during the monitoring period.

7.4.3 Peak carbon dioxide concentrations ranged between 0.1%v/v and 6.3%v/v and only exceeded 5.0%v/v once on three occasions when there was a period of falling pressure. Steady state concentrations ranged between 0.1%v/v and 6.2%v/v. Carbon dioxide concentrations were consistently highest in BH01.

7.4.4 Peak oxygen concentrations ranged between 16.6%v/v and 22.0%v/v, steady state conditions ranged between 15.7%v/v and 22.3%v/v. Depleted oxygen concentrations were present in BH01 on the tenth visit under a period of falling pressure.

7.4.5 Carbon monoxide and hydrogen sulphide was not detected during any gas monitoring visit.

7.4.6 Positive flow rates between 0.1l/hr and 0.6l/hr were recorded during the monitoring period. The flows were consistently low positive values for both BH01 and BH02 with 0.2 l/h being the highest value recorded. The shallow install in BH03 (3.00m) recorded a flow of 0.6l/hr.

7.4.7 The weather conditions during the monitoring period ranged from precipitation to clear and sunny conditions. No evidence of frost was observed on the ground and none of the areas surrounding the boreholes appeared to be saturated.

7.4.8 The temperatures recorded during the monitoring period ranged between 3° and 16°Celsius.

7.4.9 No groundwater was encountered in BH01 on the first three visits. On the following visits groundwater was encountered between 15.49m and 15.66m bgl. Groundwater was encountered in BH02 on all visits between 2.75m and 3.63m bgl. Groundwater levels during site works ranged from 16.30m bgl and 17.10m bgl. Groundwater was recorded within the response zones in BH01 and BH02 in the majority of monitoring visits. No groundwater was encountered in either of the two standpipes installed in BH03. The depths and locations are shown in the table below:

Location and Response Zone	During Site Works	31/08/18	13/09/18	23/11/20	27/11/20	02/12/20	03/12/20	04/12/20	07/12/20	09/12/20	11/12/20
BH01 4.00-16.00	16.30	NGW	NGW	NGW	NGW	15.54	15.49	15.52	15.56	15.66	15.66

Location and Response Zone	During Site Works	31/08/18	13/09/18	23/11/20	27/11/20	02/12/20	03/12/20	04/12/20	07/12/20	09/12/20	11/12/20
BH02 1.00 – 4.30	17.10	3.40	2.87	3.55	3.63	2.75	2.77	2.76	2.77	2.76	2.75

8.0 GEOTECHNICAL ASSESSMENT

8.1 General

8.1.1 The proposed development is a commercial office / retail end-use comprising three adjoining buildings, Blocks A to C. This will comprise erection of a part 17 storey (Block A – north), part 6 storey building (Block C – south) and the conversion with single -storey rooftop extension of the existing building (Block B – centre) with associated hard landscaping as shown on the Ground Floor General Arrangement Plan drawing ref. 05593_MP_02_2200_J as provided to BSL by the client. It should be noted that no soft landscaping is proposed. There are known basements associated with the previous development at the site in Block B.

8.1.2 Made ground was encountered within all the exploratory holes across the site and was observed from ground level to depths between 3.20m and 3.40m. The strata generally comprised hardstanding concrete over sandy gravels with frequent brick and concrete cobbles, and occasional clay, sand and ash.

8.1.3 The natural strata underlying the made ground was comprised of glacial till grading from slightly gravelly sandy clay to slightly sandy gravelly clay to a depth between 8.80m bgl and 11.80m bgl.

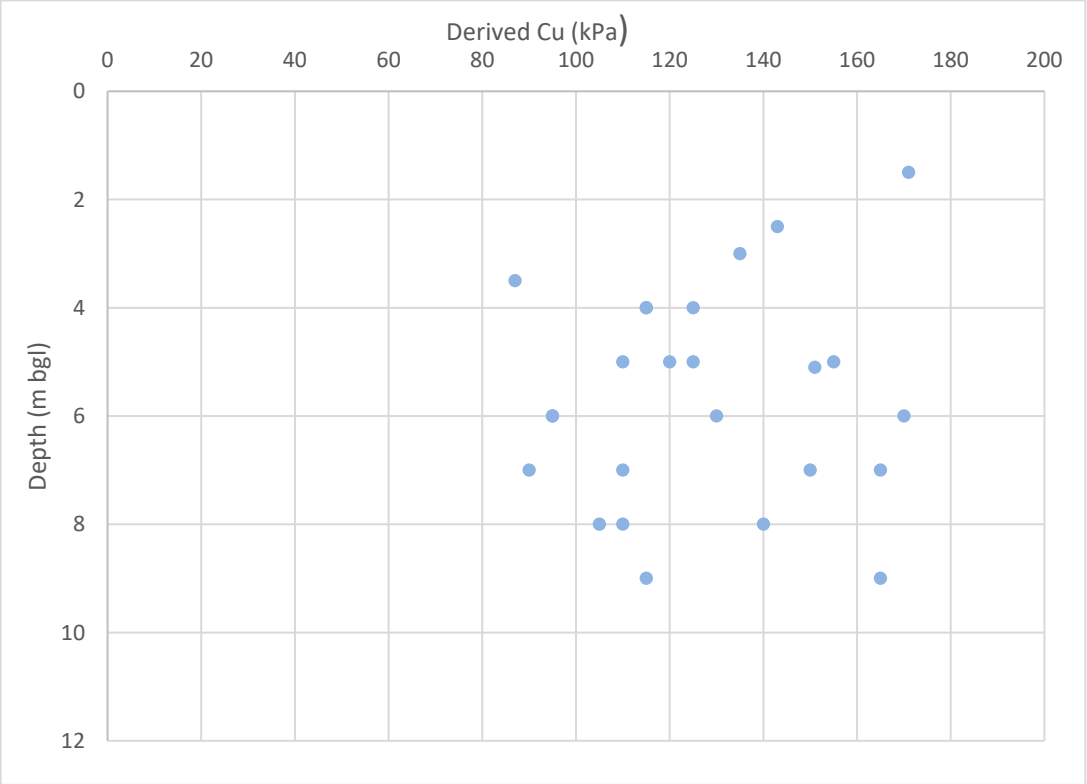
8.1.4 Underlying the glacial till at a depth of 11.80m bgl in borehole BH01, a layer of dense gravelly sand was encountered extending to a depth of 13.60m. In BH03, gravelly sand was encountered between 10.00m and 14.50m bgl.

8.1.5 The solid geology of the Chester Formation was encountered at depths from 11.10m to 14.50m bgl, proven to a maximum depth of 25.50m bgl. Weathered bedrock comprising red coarse-grained sandstone was encountered at depths of 11.10m bgl and 14.50m bgl, this became less weathered with depth.

8.1.6 Groundwater was encountered at depths of between 15.50m and 17.10m bgl.

8.2 Soil and Bedrock Parameters

8.2.1 The test results have been evaluated to derive geotechnical soil parameters for the site. A depth vs Cu graph is provided below to provide a profile of the ground conditions underlying the site. Derived shear strength values are based on SPT N values and the correlation of Stroud (1975) based on ‘average’ plasticity, adopting an f1 value of 6.



8.2.2 The Cu values were generally observed to increase with depth, with some variability between borehole locations. A characteristic undrained shear strength value (C_u) of 108kPa for these natural glacial till soils has been derived. Stroud proposed that C_u=f1xN, where N is the characteristic N value of the soil identified above and f1 is a factor dependent on the "average" Plasticity Index of the soil; for a low to intermediate plasticity clay such as those encountered at the site, an f1 value of 6 is considered appropriate.

8.2.3 Based on laboratory testing, the undrained shear strength of the glacial till soils was determined to be between 70kPa and 283kPa, excluding one test result considered an anomaly. These accord with the values generated by the in-situ SPT testing. It is considered appropriate to exclude the anomalous test result as the foundation design outlined below does not rely solely on the potentially pre-sheared soils for support, but rather an average strength across the entire soil layer.

8.2.4 Based on a correlation developed by Broch and Franklin (1972), who proposed that UCS=24($I_{s(50)}$), the results of the point load testing completed correlate to a UCS of between 1.0MPa and 19.4MPa. Compressive strength testing of bedrock core samples determined the UCS to be between 12.6MPa and 22.2MPa. It should be noted that point load testing was generally completed on core samples collected from a shallower depth than the compressive strength testing samples, where the bedrock was observed to be weaker and more strongly weathered; therefore, lower UCS values are expected for the point load correlation. In general, there is a good correlation between the compressive strength testing and point load testing results.

8.2.5 Characterisation of the geotechnical parameters above has been undertaken to obtain a characteristic value, which is a cautious estimate of the value affecting the occurrence of the limit state. A characteristic C_u value of 84kPa for the glacial till soils encountered was

selected based on the information outlined above. A characteristic UCS value of 12.6MPa was selected for the sandstone bedrock on the basis of the compressive strength testing results.

8.3 Block A and C Foundations

8.3.1 Due to the thickness of the made ground encountered across the site and expected loads for the proposed multi-storey structure, the most suitable foundation type for the proposed development is considered to be pile foundations. Selection of a pile type and detailed design of pile foundation is typically completed by specialist piling contractors; the following general information is provided for guidance only. Based on the information from the site investigation, the most suitable foundation type is considered to be continuous flight auger (CFA) or displacement piles end-bearing in the sandstone bedrock.

8.3.2 Bored piles are also considered suitable; however, they would likely need to be cased due to the potential for sand and gravel bands within the glacial till that could result in caving of the walls of the bored shaft and/or seepage from perched groundwater layers.

8.3.3 Driven piles including small displacement, large displacement, and driven cast-in-place while considered technically and economically feasible are not recommended for this site as noise from their installation may impact surrounding businesses and ground vibrations caused by piling operations may cause damage to nearby structures. Augered displacement piles may be suitable as these have the advantage of minimising the generation of waste soils.

8.3.4 Design guidance for piled foundations socketed in bedrock is provided in BS 8004:2015 – Code of practice for foundations. The information provided below should be used for preliminary design purposes only and must be verified through static pile load testing.

8.3.5 Trial piles are recommended to verify design assumptions including confirmation that a reasonable socket length into bedrock can be achieved using a CFA piling rig. Load testing can also be completed on trial piles to confirm a final design and verify that the design resistance can be achieved.

8.3.6 For CFA piles socketed in bedrock, the ultimate shaft resistance for the portion of the pile embedded in the bedrock may be determined through the following equation:

$$q_s = k_1 p_{ref} \left(\frac{q_u}{p_{ref}} \right)^{k_2}$$

In this equation, q_s is the ultimate shaft resistance in kN/m^2, q_u is the UCS value of the bedrock, p_{ref} is a reference pressure of 100kPa and k_1 and k_2 are coefficients selected from the range presented in BS 8004 as 1.0 and 0.6 respectively.

8.3.7 The ultimate shaft resistance for the portion of CFA piles embedded in soil may be determined through the following equation:

$$q_s = \alpha C_u$$

In this equation, q_s is the ultimate shaft resistance in kN/m^2, α is an empirical coefficient conservatively assumed as 0.5 for preliminary design purposes, and C_u is the undrained shear strength of the soil.

8.3.8 For design of CFA piles, the frictional contribution of the made ground should be omitted due to the variability and generally loose nature unless a significant resistance can be proven through plate load testing. Additionally, the design should be based on the final ground level, if any excavation is proposed, rather than the current ground elevations

8.3.9 For CFA piles founded in competent bedrock, the ultimate base resistance may be determined through the following equation:

$$q_b = k_3 p_{ref} \left(\frac{q_u}{p_{ref}} \right)^{k_4}$$

In this equation, q_b is the ultimate base resistance in kN/m^2, q_u is the UCS value of the bedrock, p_{ref} is a reference pressure of 100kPa and k_3 and k_4 are coefficients identified in BS 8004 as 15 and 0.5 respectively. The design base resistance may be limited by the compressive strength of the concrete used to construct the pile or the structural capacity of the pile itself.

8.3.10 Following guidance provided in Rowe (2001), the ultimate bedrock shaft and base resistances should be reduced by a suitable factor to account for discontinuities in the rock mass. Adopting a characteristic RQD of 25% or less, consistent with that observed for the upper portion of the sandstone bedrock in which with piles are anticipated to be founded, BSL recommends a reduction factor of 0.45 for the ultimate shaft resistance and 0.15 for the ultimate base resistance. These reduction factors are also intended to account for variation in surface roughness of the pile socket in bedrock.

8.3.11 Based on the design guidance outlined above and the results of the site investigation, estimated factored resistances for single vertical CFA piles founded in sandstone bedrock with a minimum RQD value of 25% have been determined for a variety of different pile sizes assuming the ground elevations will remain the same as they are now; these are presented in the table below for guidance.

Pile Diameter (m)	Allowable Axial Load (kN)	
	BH01 & BH02 Block C	BH03 Block A
0.3	1006	1400
0.4	1373	2000
0.5	1756	2600
0.6	2155	3300
0.7	2569	4000
0.8	3000	4800

8.3.12 The preliminary factored resistances for design presented above are based on a conservative stratigraphic model. Based on the results of the investigation, competent bedrock with a minimum RQD of 25% capable of supporting the design base resistance was encountered at a depth of 19.50m bgl in borehole BH01 and 18.00m bgl in borehole BH02. The RQD in BH03 was noted to be lower than that of BH01 and BH02 with an RQD above 25% at 16.50m bgl, and falling below this until it improved to 24% at 24.00m bgl, therefore a pile length of 24.00m has been utilised to determine the allowable axial load.

8.3.13 The piles should be designed to resist uplift forces, including ground heave. In these cases, only the shaft resistance of the pile should be considered for preliminary design purposes

along with the buoyant self-weight of the pile. To confirm a final pile design, a trial pile test is recommended.

8.3.14 If any increase to existing ground elevations are proposed (i.e. fill placement) or if any dewatering operations are proposed in the vicinity of the site, the piles should be designed to resist potential downdrag forces (negative skin friction) based on the results of the consolidation testing presented in the previous section.

8.3.15 All piling design and installation works should be completed by a suitably qualified specialist contractor, ideally with experience completing piles in the local subsurface conditions. Detailed pile installation records should be kept.

8.4 Block B Foundations

8.4.1 The proposed development of Block B will comprise the conversion with single storey rooftop extension of the existing five storey building.

8.4.2 Due to the anticipated increased loads, and the development limitations presented by the existing building layout and known basement, a raft foundation solution could be adopted which would spread the loads of the proposed structures evenly across a large surface area.

8.4.3 The design and analysis of the raft should be undertaken by a suitably qualified competent engineer. As an approximate guide (adopting the simple equations for a mat foundation within Braja M. Das 8th Edition) based on a suitably reinforced concrete raft found at circa 0.50m below existing ground level due to the variations across the site, approximately 15m in width by 17m in length, preliminary calculations indicate an allowable bearing capacity of 220kN/m^2 should be adopted for the design of the raft in order to limit settlements within tolerable limits of less than 50mm.

8.4.4 The raft will need to be sufficiently reinforced and stiffened to withstand the applied load and bending moments without causing cracking or significant distortion. The foundation geometry and superstructure factors should also be considered in the design. For preliminary design, it is recommended that the slab be designed based on an indicative k_{762} of 21 MN/m$_2$/m, which is based on assumption of the CBR value of the materials at depth and use of the formula, $k_{762} = 14.558 \times (CBR)_{0.577}$ in MN/m$_3$ (from transposition of the formula within DMRB IAN 73/06 rev 1 for conversion of k to CBR).

8.4.5 Prior to the placement of the founding materials and the construction of the ground bearing floor slab, the sub-formation and formation will need to be inspected and checked by a suitably competent engineer to ensure the ground conditions are as expected. In accordance with The Concrete Society Technical Report 34, this shall include the measurement of modulus of sub-grade reaction (k) determined by static plate load testing to confirm the ground conditions at time of construction are consistent with the design parameters derived from this ground investigation. Should the field parameters differ from the design values, then the engineer should be consulted for advice.

8.4.6 If the ground conditions encountered during the construction phase differ significantly to the conditions encountered during construction, work should cease and BSL contacted for further advice.

8.4.7 During the construction phase supervision should be on a continuous basis to check the design assumptions are correct and construction conforms to design. Supervision should include inspections, Control Ground Investigations and monitoring.

8.5 Building Near Trees

8.5.1 Due to the location of the site and its surrounding land use, BSL has assumed that there are no trees within an influencing distance of the site and no evidence of current or former trees was observed during the site investigation.

8.5.2 The clay soils encountered at the site are considered to be of a low to medium volume change potential and designs should take suitable precautions to protect against ground heave and the influence of trees if the inclusion of trees is proposed as part of the design of the new development or if evidence of current or former trees is uncovered during construction.

8.6 Floor Slabs

8.6.1 Due to the recommended foundation type, a suspended ground floor slab is recommended.

8.6.2 Ground bearing floor slabs may also be used, although these would need to be suitably designed to tie in with piles and ring beams, providing the following criteria are satisfied:

- Any fill is suitable, well-compacted granular material placed in an appropriate thickness and in accordance with a suitable specification.
- It is demonstrated that desiccation in cohesive soils is not present.
- Any compressible or unsuitable materials are excavated and either improved or removed and replaced with suitable materials.
- The slab is adequately reinforced.
- Regular construction joints and ties should be provided to allow for differential settlement.

8.6.3 The final floor slab design should be of sufficient thickness and sufficiently reinforced to accept the envisaged applied loads, without unacceptable total or differential movement.

8.6.4 Prior to the placement of the founding materials and the construction of a ground bearing floor slab, the sub-formation and formation will need to be inspected and checked by a geotechnical engineer to ensure the ground conditions are as expected. If soft spots are identified at the formation level they should be reported to the Geotechnical Engineer immediately and remedial actions agreed.

8.6.5 Ground floor slabs should also be designed to incorporate any required ground gas protections measures.

8.6.6 The test results have been evaluated to derive geotechnical soil parameters for the site. Depth vis Cu and Depth vs SPT graphs are provided below to provide a profile of the ground conditions underlying the site.

8.7 Construction

8.7.1 Instability of excavations through natural soils is not anticipated provided they are not exposed to adverse weather conditions for any substantial period of time. Instability of the made ground should be allowed for. All excavations should be carried out in accordance with CIRIA Report 97 'Trenching Practice'.

8.7.2 Excavation depths should generally be readily achieved using conventional plant (JCB or similar) although high specification plant (tracked 360° or similar) is recommended to maintain the build programme. Breaking equipment will also be required locally to penetrate the existing backfilled basement structure and potentially old foundations associated with former construction.

8.7.3 Characteristic values have been derived for soluble sulphate and pH in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005 and are presented below:

Soluble Sulphate Characteristic Value (mg/kg)	pH Characteristic Value
1500	8.2

8.7.4 Based on the potential for perched groundwater within the made ground or seams of sand and gravel within the glacial till, groundwater is assumed to be mobile.

8.7.5 The results of laboratory pH and sulphate content indicate that ACEC Class AC-2 and sulphate class DS-2 conditions prevail in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005. The specific concrete mixes (the Design Concrete Class) to be used on site will be determined by the site specific concrete requirements in terms of the durability and structural performance. These are assessed in terms of the Structural Performance Level (SPL) and any need for Additional Protective Measures (APM) detailed in Part D of BRE Special Digest 1 with further guidance in Pt E and F.

8.8 Soakaways

8.8.1 The use of soakaways within the natural ground is not considered feasible or recommended at the site due to the presence of relatively impermeable strata underlying the site and the presence of variable and potentially contaminated made ground near the surface.

9.0 ENVIRONMENTAL ASSESSMENT

9.1 General

9.1.1 The chemical results have not identified any significant volatile contaminants within the soil. Therefore, protected water pipes are unlikely to be required. Confirmation should be sought with the local Water Company prior to any irrevocable action being taken and a site specific UKWIR water pipe risk assessment may be required.

9.2 Contamination

Soils

9.2.1 On the basis of the testing undertaken to date, it would appear that there is localised PAH contamination in the near surface made ground in the investigated southern area of the study site. Significant elevations of PAH species were identified within the sample from BH02 at 0.3m bgl and corresponded with ashy made ground.

9.2.2 Three made ground samples (from BH01 and BH02) also recorded elevated concentrations of lead which were in exceedance of the adopted GAC values for the proposed mixed residential and commercial development. One further samples (from BH02) recorded elevated concentrations of mercury. These samples generally contained ash, which is considered to be the likely source of the elevated lead, mercury and PAH concentrations.

9.2.3 Asbestos was identified in one sample of made ground screened (BH01 at 0.5m bgl). Subsequent quantification analysis on this sample has recorded an asbestos gravimetric and PCOM total of <0.001% mass (trace).

Permanent Ground Gases

9.2.4 In order to assess the ground gas situation and the requirement for ground gas precautionary measures at the site, guidance was taken from CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings' and BS8485:2015+A1:2019 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

9.2.5 As the proposed end-use a high rise development potentially including apartments, townhouses and/or retail space CIRIA C665 dictates that the gas monitoring results should be assessed in accordance with Situation A, the Wilson and Card methodology.

9.2.6 Six visits were undertaking during falling pressure events, therefore it is considered that the data includes worst case conditions and the data set is considered suitable for assessment.

9.2.7 In accordance with CIRIA C665, the Wilson and Card methodology uses the concept of a Gas Screening Value (GSV) which is based on measured data using the following equation: (max gas concentration / 100) x maximum flow.

9.2.8 A maximum positive flow of 0.6l/hr has been used to derive the GSVs. The GSV's for the site are presented below.

Gas	Calculated GSV (l/h)	Typical Max Threshold Concentration Exceeded	Classification
Methane	0.0006	No	CS-1
Carbon Dioxide	0.0378	Yes	CS-1

9.2.9 The GSV for both methane and carbon dioxide places the site the site into Characteristic Situation 1 (CS1) where no protection measures are required, however the typical threshold concentration for carbon dioxide in BH01 was exceeded on just one occasion, where guidance states consideration should be given to placing the site in CS2 when this threshold is exceeded.

9.2.10 On review of the exploratory hole logs, the response zone of BH01 is within natural strata, whilst the response zone for BH02 is largely within the made ground (no thicker than 3.50m where encountered). The only degradable matter within the made ground is noted to be rare timber fragments, no other significant degradable or putrescible organic matter was observed.

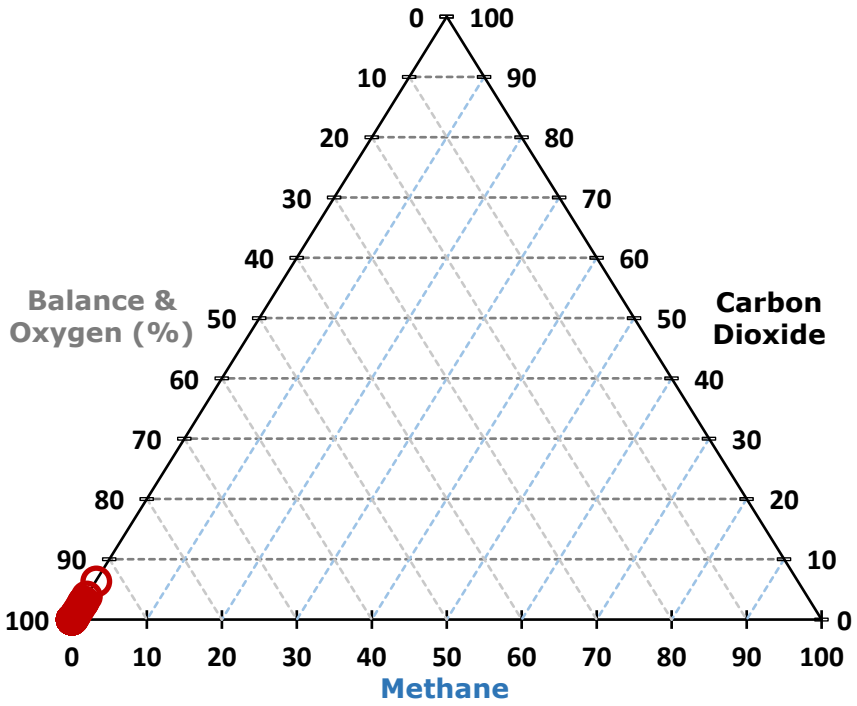
9.2.11 The only gas concentration recorded above the 5.0% threshold is associated with BH01, therefore the source is likely to be within the natural deposits. No significant gas concentrations were recorded in BH02 with the response zone within the made ground containing potentially degradable timbers. There are no nearby landfills or backfilled ponds, and the site is not in an area where mining gas risks are considered to be a potential issue. In addition, no organic material is noted within the natural strata.

9.2.12 Based on the exploratory hole logs, the natural superficial geology is largely cohesive, and there appears to be no significant reservoir for ground gas accumulation and storage. The recorded low peak flows support that no significant build-up of ground gas is currently taking place, nor is gas generation at a continuous or significant enough rate to provide steady gas flows.

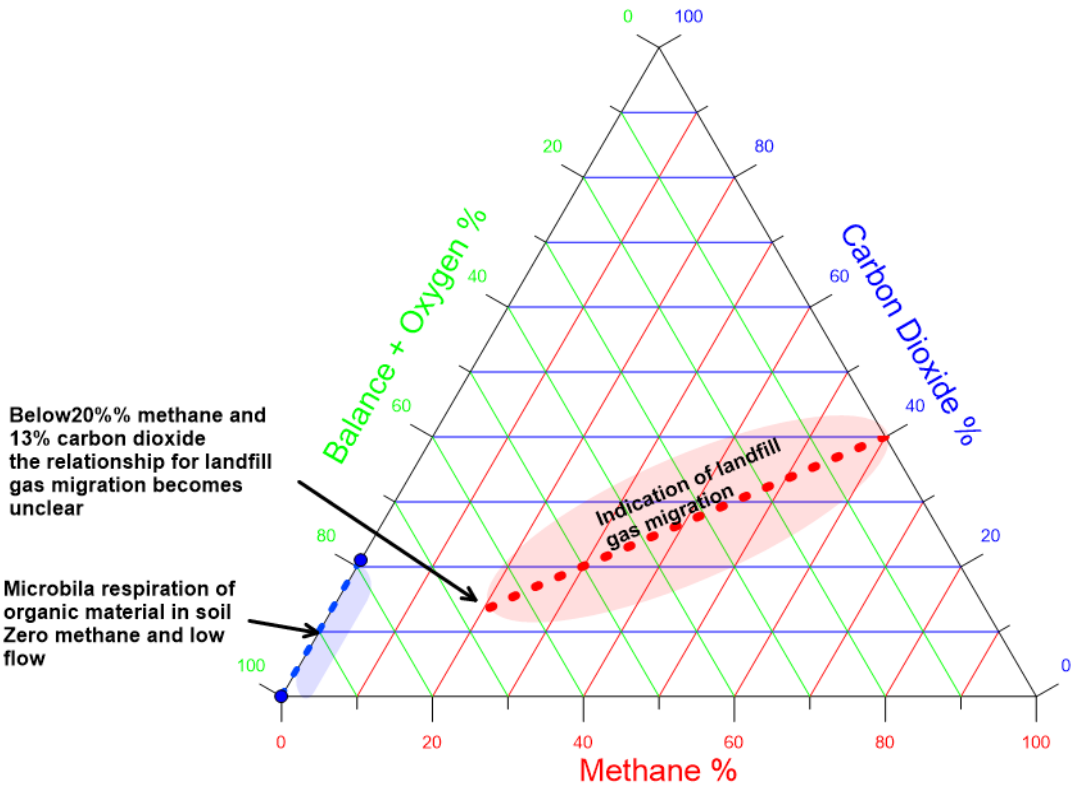
9.2.13 The flux in groundwater levels does not appear to be a driving mechanism for the production of ground gas and to an extent, falls in barometric pressure also do not appear to significantly drive an increase in either flows or gas production. There is only a single occasion where falling pressure corresponds with increased carbon dioxide within the well installation. Corresponding oxygen levels are only slightly depleted when this occurs (still >17.0%).

9.2.14 From the evidence above it would appear that the carbon dioxide concentrations are naturally occurring.

9.2.15 To add further support, guidance states that where results plot in the zone typical for microbial respiration there is no need to increase the characteristic situation. In order to increase confidence in this assessment and adopting a lines of evidence approach, reference has been made to the recent 2018 paper by Wilson et al (Ambisence and EPG Ltd) “Using ternary plots for interpretation of ground gas monitoring results”. The data has been presented on the ternary plot displayed below, which aims to determine the likely source of the ground gas.



9.2.16 The dataset falls within the zone attributed to microbial respiration of organic material in soils, and the hypothesis is supported by the low gas flow rates and very low methane concentrations which characterise the gas monitoring data as shown below (extract from Wilson et al 2018).



9.2.17 The rates of gas generation via microbial respiration are typically very low and subsequently high flow rates would not be expected from this source.

9.2.18 Based on this rationale, in this instance the classification of CS2 is not considered to be applicable and the site is considered to be characteristic of a CS1 site.

9.2.19 Furthermore, the structure is likely to have an inherent level of ground gas protection, with floor slabs likely to comprise a significant thickness of reinforced concrete which would further resist ground gas ingress. Whilst piles are being utilised at the site, it is not considered that these would create a significant pathway for ground gas migration based on the latest industry research (Piled foundations and pathways for ground gas migration in the UK, Wilson And Mortimer, 2017).

9.2.20 Whilst an area of localised VOC contamination (p-isopropyltoluene) was recorded in a hand pit undertaken in the basement of Block B in the centre of the site, which presents an indoor pathway inhalation risk, It is recommended that the hotspot should be removed and the base and sides validated, therefore protection measures for this are not considered a requirement.

9.3 Qualitative Risk Assessment

9.3.1 The risk assessment methodology used in this instance is based on **Source – Pathway – Receptor** (SPR) philosophy. The **source** is the presence of contamination, or substance/event likely to cause harm. The **receptor** is the target that may be detrimentally affected by the source. The **pathway** is the means of the contamination to move from the source to the receptor. Where any of these three factors are removed there is deemed to be no risk.

9.3.2 The CSMs have been revised based on the findings of the site investigation and laboratory testing results.

Human Health

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Made Ground heavy metals, PAHs, asbestos, hydrocarbons	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Made Ground VOCs	Inhalation of vapours.	End-users	Low Likelihood	Severe	Moderate
Made Ground ground gas	Inhalation of vapours.	End-users	Unlikely	Severe	Moderate/Low
OFF-SITE					
Smithy metal dust, silica dust, mineral acids, asbestos	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Tram/Railway hydrocarbons, PCBs, PAHs, metal fines, ash and fill	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Printing Works heavy metals, acids, asbestos, dye, solvents, hydrocarbons	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low
Electricity Sub-station PCBs	Ingestion, direct contact, inhalation of dusts and vapours.	End-users	Unlikely	Medium	Low

Human Health Justification

9.3.3 It is considered that the pollution linkage pathway for direct contact, ingestion and inhalation of dusts and vapours will be best broken by the presence of a cover system. The proposed hardstanding across the development will be a form of remediation and will break the pollution pathway; therefore, the risk from the made ground present on site is considered low as it is unlikely the contamination will move from source to receptor.

9.3.4 Chrysotile asbestos fibres were recorded in two samples of the made ground below the limit of detection (<0.001%) therefore generally indicative of trace levels. The samples are within the area of the proposed building footprint, and the building will break the pathway to site end-users post-development. The affected made ground may be wider spread, however due to the very low quantities recorded and the current presence of overlying gravel surfacing and proposed hardstanding covering post-development, the risk is considered to be low.

9.3.5 An elevated concentration of p-isopropyltoluene was recorded within a sample taken from Block B TP03 in the centre of the site. Given the determinant is a volatile this is considered to pose a moderate risk to end-users.

9.3.6 The risk associated with the identified on-site and off-site sources of ground gas are considered to be moderate to low at this stage and no gas protection measures are required.

Controlled Waters

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Made ground heavy metals, PAHs, asbestos, hydrocarbons	Surface run-off and / or migration through groundwater or granular soils	Controlled waters (surface waters)	Unlikely	Medium	Low
		Secondary Aquifer Undifferentiated Layers (superficial deposits)	Unlikely	Medium	Low
		Aquifer (bedrock)	Unlikely	Medium	Low

Controlled Waters Justification

9.3.7 It is considered unlikely potential contaminants will enter controlled surface waters due to the distance to the nearest watercourses and the relatively impermeable soil strata encountered.

9.3.8 The likelihood of contaminants reaching the Secondary Aquifer in the superficial deposits is classed as unlikely, due to the future construction of hardstanding across the site, which will

inhibit the migration of any contaminants. As well as the relatively impermeable nature of the natural soils encountered and depth to the groundwater table.

9.3.9 The risk of contaminants reaching the Principal Aquifer in the bedrock is considered low due to the amount of clay present in the natural glacial till soils, which will inhibit contaminant migration through the superficial deposits.

9.4 Remedial Measures

9.4.1 Localised heavy metal and PAH concentrations in excess of the assessment criteria for residential end use without plant uptake as well as trace levels of chrysotile asbestos have been identified in the shallow made ground. Based on the current development proposals and if undisturbed, these are not considered to pose a significant risk to site end-users and therefore no specific remedial measures are considered necessary. Where these materials are excavated, measures should be put in place to prevent a potential pathway from being introduced and to prevent cross contamination with clean materials.

9.4.2 An area of localised VOC contamination (p-isopropyltoluene) was recorded in a hand pit undertaken in the basement of Block B in the centre of the site. It is recommended that the hotspot should be removed and the base and sides validated.

9.4.3 Gas monitoring and assessment reveals no gas protection measures are required.

9.4.4 A watching brief should be maintained during construction for any evidence of contamination. If any evidence of contamination is encountered, work should cease and BSL should be consulted for advice.

9.5 Asbestos

9.5.1 The investigation of asbestos issues within structures was beyond the scope of this report. However, guidance from UK Government indicates that asbestos should be assumed to be present in buildings unless proven otherwise.

9.5.2 Any asbestos within structures will require removal prior to re-development. This will need to be done by a suitably qualified experienced and licensed contractor, who ensures that adequate PPE is provided to operatives, and that all the relevant legislation is adhered to.

9.5.3 In addition, the presence of asbestos within the ground will require, a safe system of work to be set up on site to deal with the asbestos risk from the made ground. This may include but be not limited to:

- The use of qualified personnel where required.
- Careful segregation of stockpiles on site.
- Defining transport routes.
- Cleaning down of machinery in designated areas.
- Decontamination unit for ground workers.
- Damping down of soils to prevent dust migration.

9.5.4 Asbestos fibres have been identified in two samples at the site with quantification analysis identifying this to be trace amounts. At these concentrations the liberation of fibres is considered to be unlikely and no specific precautionary measures with regards to asbestos

are likely to be required at the site. The level of precautions required are at the discretion of the principal contactor on site however good site practices including minimising the generation of dusts should be adhered to and sufficient to mitigate against the risk from asbestos. In addition. site personnel should have the risk communicated at the induction stage. It is recommended that the asbestos in construction materials assessment tool is used at the site to inform asbestos licensing and control measures.

9.5.5 Excavations in soils containing asbestos should comply with the CL:AIRE publication 'Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials' (CARSOIL) and CAR 2012. All such works will need to be agreed with the regulatory bodies (HSE and/or LA).

9.5.6 Additional guidance is provided within the BSL methodology Guidance Note in Appendix A.

9.6 Health and Safety Issues

9.6.1 During the construction phases of the site development it will be necessary to protect the health and safety of site personnel. The risk to construction and ground workers is assessed in the table below based on the results of the laboratory testing:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Made Ground heavy metals, PAHs, asbestos, hydrocarbons	Ingestion, direct contact, inhalation of dusts and vapours.	Construction Workers	Likely	Minor	Low

Discussion

9.6.2 General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

10.0 WASTE SOIL CLASSIFICATION & ASSESSMENT

10.1 Overview

BSL have undertaken a preliminary assessment of potential excavation waste to arise from the site during redevelopment to:

- Classify the excavation waste to arise as either hazardous or non-hazardous.
- Identify the most sustainable options for the wastes to arise in accordance with the waste hierarchy.
- Provide a written description of the waste required as part of the Duty of Care.
- Provide details of "hazardous properties" to complete hazardous waste consignment note (where applicable).
- Be able to provide a basic classification report to a landfill operator (where waste is destined for landfill disposal).

10.2 Waste Classification Procedure

10.2.1 As described in the 'Waste Duty of Care Code of Practice (2016)' any substance or object that the holder discards, intends to discard or is required to discard is a waste. It is the responsibility of the waste producer to classify this waste. The classification process is described in the 'Guidance on the classification and assessment of waste' WM3 and aims to determine whether the waste is Hazardous or Non-Hazardous to human health and the environment.

10.2.2 Hazardous wastes are signified by entries where the code is followed by an asterisk, where some wastes are deemed hazardous without further assessment, which are termed "Absolute Entries" e.g. most waste oils. Alternatively, waste entries are termed "Mirror" entries that require further assessment of hazardous properties, in order to determine whether they are hazardous waste or not (e.g. soil and stones). The EWC codes relevant to excavation wastes are:

- 17 05 03* - soil and stones containing dangerous substances.
- 17 05 04 – soil and stones other than those mentioned in 17 05 03.

10.2.3 The Landfill Directive (Directive 1999/31/EC on the landfilling of waste, Decision 2003/33/EC and Landfill Regulations 2005) led to the establishment of a methodology for classifying wastes.

10.2.4 Wastes first need to be classified based on their total concentrations and classified as either hazardous or non-hazardous waste. WAC testing is only required if the end disposal route is a landfill and WAC analysis must not be used for waste classification.

10.2.5 Wastes can only be accepted at a landfill if they meet the relevant Waste Acceptance Criteria (WAC) for that type of landfill. A waste must comply with the WAC limits for the relevant landfill, otherwise the soil will need to be pre-treated. There are three different WAC criteria, these are:

- Inert waste.

- Stable Non-Reactive Hazardous Waste (SNRHW).
- Hazardous waste.

10.2.6 There are no standard set of WAC limits for non-hazardous landfill sites and each non-hazardous landfill will have its own set of criteria under which it is licenced to accept non-hazardous waste. These will need to be determined through the selected waste receiver prior to disposal.

10.2.7 A non-hazardous waste should not be compared with WAC limits for hazardous or SNRHW waste sites and the WAC test should only be used to determine if the waste is suitable for disposal at an inert waste landfill site. Likewise, wastes classified as hazardous based on their total concentrations should not be compared with WAC limits for inert waste landfill sites, as these will not be accepted.

10.2.8 Details of how material should be classified for waste disposal are presented in the BSL Methodology and Guidance in Appendix A and are summarised in the table below:

	PRIOR TO LEAVING SITE			
Classification based on Total Concentrations[1]	**Non-Hazardous Waste**		**Hazardous Waste**	
	IF SOILS CANNOT BE RE-USED ELSEWHERE AND MUST GO TO LANDFILL			
WAC testing	Below inert WAC limit values	Above inert WAC limit values	Below hazardous WAC limit values[4]	> WAC limit values
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill[2]	HAZARDOUS landfill	PRE-TREATMENT[3]

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).
2 Individual sites may have certain limit values pre-determined in their licence.
3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.
4 Possibility that wastes could be classified as stable Nonreactive HAZARDOUS waste in non-hazardous Landfill (e.g. soils containing low concentrations of asbestos, gypsum or sulphate bearing soils).

10.2.9 Waste classified as non-hazardous can be accepted into a non-hazardous landfill without having to pass any numerical WAC.

10.2.10 Soils above hazardous WAC limit values require pre-treatment prior to disposal. The effective pre-treatment, typically involving separation, sorting and screening, can offer cost savings through reducing the hazardous nature and volumes of soil. Costs for disposal of non-hazardous/hazardous soils are significant compared to the disposal of inert material.

Inert Waste

10.2.11 The possibility of automatic inert classification of the naturally occurring "clean" soils should be explored in accordance with Section 4.3 of the EA guidance document. The Council Decision includes a list of wastes in Section 2.1.1 of the document that are assumed to be inert and therefore acceptable at a landfill for inert waste without testing. This is the case if:

- They are single stream waste of a single waste type (although different waste types from the list may be accepted together if they are from a single source); and
- There is no suspicion of material or substances such as metals, asbestos, plastics, chemicals, etc to an extent which increases the risk associated with the waste sufficiently to justify contamination and they do not contain other classes of landfill.

10.3 Waste Classification and Waste Acceptance Criteria (WAC)

10.3.1 We have reviewed the testing results and assessed them through a waste classification database which allows users to code and classify waste as defined in the EWC (European Waste Catalogue) based on EC Regulation 1272/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (CLP) and latest Environment Agency guidance (WM3 "Guidance on the classification and assessment of waste -Technical Guidance").

10.3.2 Thirteen samples were tested to assess whether they contained any contaminants in the hazardous range when screened against assessment criteria within WM3 using the HazWasteOnline tool.

10.3.3 The Waste Classification Report is presented in Appendix I. The results of the waste assessment based on total concentrations are presented in the table below. Waste Acceptance Criteria (WAC) testing was outside the scope of this investigation and should be undertaken once materials are stockpiled onsite for removal.

Location	Depth (m)	Stratum	Waste Classification	WAC	Landfill	Comments
BH01	0.50	MADE GROUND	Non-hazardous		-	-
BH01	1.50	MADE GROUND	Non-hazardous		-	-
BH02	0.30	MADE GROUND	Non-hazardous		-	-
BH02	1.00	MADE GROUND	-	Exceeds Inert WAC	NON-HAZARDOUS landfill	Based on Antimony
BH02	1.50	MADE GROUND	Non-hazardous		-	-
TP04	0.20-0.40	MADE GROUND	Non-hazardous		-	-
TP06	0.10-0.30	MADE GROUND	Non-hazardous	Exceeds Inert WAC	NON-HAZARDOUS landfill	Based on TOC, Sulphate, TDS
TP07	0.50-0.70	MADE GROUND	Non-hazardous		-	-
Block B TP02	0.18-0.30	MADE GROUND	Non-hazardous		-	-
Block B TP03	0.20-0.65	MADE GROUND	Non-hazardous		-	-
Block B TP05	0.16-0.32	MADE GROUND	Non-hazardous		-	-
Block B TP06	0.16-0.32	MADE GROUND	Non-hazardous	Exceeds Inert WAC	NON-HAZARDOUS landfill	Based on Sulphate
Block B TP07	0.15-0.50	MADE GROUND	Non-hazardous		-	-
S02	0.50	MADE GROUND	Non-hazardous	Inert	INERT LANDFILL	-

10.3.4 Based on the waste classification database assessment, the majority of the made ground soils have been classified as **non-hazardous.**

10.3.5 Note that further testing of the soils (WAC testing) may be required on the actual arisings in order to satisfactorily categorise the soil for its suitability for disposal to landfill.

Waste Containing Asbestos

10.3.6 Should soils contain asbestos, the concentration and type of asbestos identified, in addition to the chemical composition (i.e. hazardous or non-hazardous detailed above), will determine which waste code is applicable to the soils and which landfill will accept it.

Waste	Conc. by Weight (%)	EWC 2002 Catalogue Entry Code	Waste Disposal Route
Non-hazardous containing asbestos fibres	<0.001 - <0.1%	17 05 04 (soil and stones other than those mentioned in 17 05 03*)	Non-hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a stable non-reactive hazardous landfill site.
Hazardous containing asbestos fibres	<0.001 - <0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a hazardous landfill site.
Non-hazardous soils containing asbestos fibres	>0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill authorised to receive asbestos, or in a stable non-reactive hazardous waste cell at a non-hazardous landfill authorised to receive asbestos.
Non-hazardous Soils containing ACM (Mechanically separable)	>0.1%	17 06 05 (construction material containing asbestos) 17 05 04 (soil and stones other than those mentioned in 17 05 03*)	ACMs disposed of at a hazardous landfill authorised to receive asbestos, or in a stable non-reactive hazardous waste cell at a non-hazardous landfill authorised to receive asbestos. Soils should be disposed of at a non-hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a stable non-reactive hazardous landfill site.
Hazardous soils containing ACM	>0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a hazardous landfill site.

10.3.7 The concentrations of fibres in the samples tested outside the existing building footprint ranged from trace to 0.002% which indicate the soils will potentially be accepted as stable non-reactive hazardous waste.

Location	Depth (m)	ACM	Conc. by Weight (%)	Waste Disposal Route
Block B TP03	0.20-0.65	Free fibres	<0.001	SNR Hazardous
BH01	0.50	Free fibres	<0.001	SNR Hazardous

10.3.8 A watching brief should be maintained for evidence of Asbestos Containing Materials (ACMs), any ACMs observed should be handpicked and disposed of in accordance with current asbestos disposal regulations.

10.4 Options Assessment

10.4.1 Following the classification of waste materials, the options available for the waste can be considered in the context of the waste hierarchy as below:

- Onsite re-use (with or without prior treatment) under suitable exceptions/permits.
- Offsite processing for recycling or recovery e.g. screening.
- Offsite disposal (with or without prior treatment) i.e. landfill.

10.4.2 Where feasible, efforts should be made to retain soils for onsite re-use to minimise costs and maximise the sustainability of projects.

10.4.3 Based on the above, the possible options for the generation of waste soils at the site are described in the table below:

Waste Generation Source	Comments
Crush	The crushed concrete is site derived from structures which had not been used for potentially contaminative activities. These should be subject to an asbestos survey and removal of asbestos as required, prior to demolition and crushing of structures. Assuming the above criteria are met, with materials containing no asbestos or ACM, crushed concrete is considered to be inert without testing. Where samples of crushed concrete have been subject to totals testing this is likely to hazardous due to pH, and where subject to WAC testing, the sulphate and TDS limits are breached, this is to be expected due to the presence of concrete.
Made Ground from site levelling/foundations excavations/services excavations	Samples of made ground from across the site have been classified as non-hazardous for off-site disposal purposes, although should be suitable for re-use on site if required under suitable exemptions/permits.
Natural ground from site levelling/foundations excavations/services excavations	The Till may be considered suitable for re-use onsite as fill where the criteria of the WFD exception for re-use of naturally occurring soils can be met. Naturally occurring clean materials could also be exported to another site under the direct transfer scenario of the DoWCoP. Classified as non-hazardous and below inert WAC testing criteria for off-site disposal purposes.
VOC hotspot removal	Samples from the made ground in Block B TP03 are recorded as inert.

General

10.4.4 If any gross hydrocarbon contaminated material is encountered during the construction phase, it is possible that this may be classified as hazardous and testing should be undertaken at that time.

10.4.5 Where it is necessary to dispose material off site it is recommended that materials are segregated and sufficient time is allowed to further classify the actual soil arisings that constitute the waste, including discussion with landfill sites and waste transfer stations to find the best disposal route. It is illegal to dilute and mix soils without a suitable permit.

10.4.6 As a significant proportion of the soils likely to be generated on site are clean it is recommended that where possible that the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route.

10.5 Re-use of Soils

10.5.1 It has been suggested some of the material excavated from the southern part of the site is to fill northern part of the site. If the reuse of soils is proposed on the site this should be

done in accordance with the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE CoP). Further guidance is provided on this in Appendix A and below. Any re-use scheme should be designed to minimise disposal costs.

10.5.2 By definition in law, any material excavated from the ground becomes waste at the moment of excavation. If that soil (now a "waste") is then placed on another part of the development site (or used on another development site) without an appropriate materials management plan, permit or exemption being in place, by law this material is defined as "illegally deposited waste".

10.5.3 Landfill tax rules allow HM Revenue & Customs (HMRC) to recover landfill tax on illegally deposited waste on construction sites. This could lead to excessive costs without the correct documentation in place. In addition, a person who makes, knowingly causes or knowingly facilitates a disposal to be made at an unauthorised site is also liable to pay Landfill Tax.

10.5.4 In order to comply with UK legislation and avoid excessive costs, if the re-use of soils is proposed on site, this should be done in accordance with the relevant exemptions or permits in place.

Soils Re-use Under DoWCoP

10.5.5 One of the main industry mechanisms for allowing the re-use of soils in construction is the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE DoWCoP) also known as a Materials Management Plan (MMP). Further guidance is provided in the BSL Methodology and Guidance in Appendix A.

10.5.6 To implement the DoWCoP (for Route A), there is a requirement to notify the Environment Agency and Local Authority of the intention to use the code of practice in principal, after which there is a 21-day notice period for their response.

10.5.7 In order to re-use soils under the DoWCoP, there are four key criteria that need to be met:

- The aims and objectives of the project meet the requirements of the Waste Framework Directive (does not harm human health or the environment).
- The soils can be demonstrated to be suitable for use (backed up by chemical/geotechnical testing and assessment).
- There is certainty of use (planning consents are in place alongside materials tracking, which should be in place as part of good site practice in any case).
- Quantity (the quantity of materials used should be known).

10.5.8 Information on existing site levels, proposed levels, volumes generated (e.g. foundation / drainage excavation arisings) would need to be known in order to complete the MMP.

10.5.9 If the DoWCoP is the chosen route, the MMP should be in place and declared by a Qualified Persons (QP) before works commence, otherwise excavated soils could constitute an illegal deposit of waste and enforcement action could be taken by the EA and HMRC. The declared MMP should be amended as new import sources are added.

10.5.10 Once the project is complete, a verification report detailing soils re-use/import will need to be produced and submitted to CL:AIRE, which may be subject to a random audit process. Sites found to be non-complaint with the CoP can be referred to the EA for further investigation.

10.5.11 Regardless of implementing re-use under the code of practice or not, all sites should have some form of materials tracking in place in compliance with current legislation. Any re-use scheme should also be designed to minimise disposal costs.

10.5.12 Re-use of soils containing asbestos should comply with the CL:AIRE publication 'Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials' (CAR-SOIL™) and CAR 2012.

10.5.13 In terms of the re-use of brick/concrete crush materials, the DoWCoP does cover aggregates, but only on the site of origin, and the EA WRAP aggregate Quality Protocol might best apply to ensure quality standards, which are discussed further below.

Soils Re-use under Exemptions and Permits

10.5.14 Other potentially suitable options to allow the re-use and/or import of soils and aggregates on site are provided in the table below:

Re-use Mechanism	Description
U1 Exemption	Can be applied to re-use/import of soils and stones, but only up to 1000 tonnes or for brick and concrete up to 5000 tonnes. This is usually an efficient way to re-use small volumes of waste materials. However, only one U1 can be filled in per site in any 3-year period. Quick and free via online registration.
WRAP Quality Protocols	Describes how processed demolition arisings can be removed from regulatory waste regime. Requires a demonstration of appropriateness by: • Factory Production Control Manual. • Facility Permit (or Exemption). • Grading Analysis.
Waste Framework Directive (WFD) exclusion	In regard to "clean" naturally occurring soils only that are to be re-used on their site of origin, these are covered by a Waste Framework Directive (WFD) exclusion which is an EA regulatory position statement. So long as the project can prove the four criteria listed above for the DoWCoP, then permits or the DoWCoP are not required. However, many projects still use the CoP to ensure compliance.
T5 Screening and blending of waste	The T5 exemption allows you to temporarily treat waste on a small scale to produce aggregate or soil at a particular location, such as a construction or demolition site. The limit is 5,000 tonnes. This applies to: • Screening soil on a demolition site to remove wood and rubble. • Blending soil and compost that has been produced under an exemption on a construction site to produce better soil for landscaping on that site (e.g. peaty deposits). • Crushing waste (except bricks, tiles and concrete) before screening or blending • Grading waste concrete after it has been crushed to produce a certain type of aggregate.
T7 Exemption	The T7 allows treatment of waste bricks, tiles and concrete by crushing, grinding or reducing in size. This needs to be registered with the Local Authority.
Other Permitting Routes	Other options include use under an Environmental Permit (Standard or Bespoke Rules), however these may be a time consuming and costly route, where use of the other above options (if applicable) are likely to be more feasible in construction.

11.0 CONCLUSIONS

11.1 Summary

Environmental

11.1.1 Concentrations of contaminants including heavy metals and PAHs in excess of the applicable screening criteria were identified within the made ground. The localised presence of asbestos fibres has been identified within the made ground, but not at concentrations considered a risk to end-users or construction workers.

11.1.2 An isolated area of elevated p-isopropyltoluene was recorded within the basement of Block B which is considered to pose a moderate risk to end-users and removal of the hotspot is recommended.

11.1.3 The risk to site end-users and controlled waters from contamination in the made ground is considered low due to the relatively impermeable nature of the underlying natural soils that will mitigate the potential for contaminant migration as well as the proposed development area being substantially covered in hardstanding, which will create a barrier that breaks the pathway between the source and receptor. The risk to construction workers is also considered low as the pathway between source and receptor can be broken through the use of suitable protective clothing.

11.1.4 General made ground (on-site) was identified as a potential source of ground gases. The risks were deemed to be moderate to low. Gas monitoring revealed that gas protection measures are not required.

11.1.5 Based on the testing performed, there are samples of the made ground that are considered non-hazardous waste if it to be removed from site. If the end disposal route of the made ground is landfill, the material would be classified as stable non-reactive waste in a hazardous landfill.

Geotechnical

11.1.6 Based on the expected structural loads, the recommended foundation type is CFA piles founded in competent sandstone bedrock with a minimum RQD of 25%, at an anticipated depth of 18m to 19m below existing ground level. The RQD within BH03 was noted to be lower than that of BH01 and BH02 but was noted to improve in quality from 24.00m bgl. Detailed foundation design should be completed by a suitably qualified specialist.

11.1.7 Suspended ground floor slabs are recommended for the proposed structure. Ground bearing floor slabs may also be suitable subject to meeting specific criteria with regards to construction of the slab.

11.1.8 There are known basements associated with the existing building in Block B, which is also to be retained under proposed development plans, with a single storey extension. A raft foundation has been recommended as the most suitable foundation solution for Block B.

11.1.9 Soakaways are not considered feasible due to the presence of relatively impermeable strata underlying the site as well as the contaminants within the made ground.

11.2 Further Work

11.2.1 The following further work is considered necessary to progress the site to construction phase:

- Demolition asbestos survey.
- Design of remedial strategy.
- Detailed foundation design.
- Confirmation of Remedial Strategy with the Local Authority.

12.0 REFERENCES

1. British Standards Institution. Investigation of Potentially Contaminated sites - code of practice. BS 10175:2011 (2nd Ed).
2. British Standards Institution 'Code of Practice for Site Investigations' BS 5930:2015
3. British Standards Institution "Geotechnical investigation and testing – Identification and classification of soil" BS EN ISO 14688:2002.
4. British Standards Institution "Geotechnical investigation and testing – Identification and classification of rock" BS EN ISO 14689:2002.
5. BRE Report BR211 'Radon – Guidance on protective measures for new buildings' 2015 Edition.
6. BRE Special Digest 1: "Concrete in Aggressive Ground" 3rd Ed 2005.
7. CIRIA 149 "Protecting development from methane" 1995.
8. CIRIA 150 "Methane Investigation Strategies" 1995.
9. CIRIA 151 "Interpreting measurements of gas in the ground" 1995.
10. CIRIA 152 "Risk assessment for methane and other gases from the ground" 1995.
11. CIRIA 552 "Contaminated Land Risk Assessment – A guide to good practice" 2001.
12. CIRIA C665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" 2007.
13. Wilson & Card "Proposed method classifying gassing sites" Ground Engineering 1999.
14. Card & Steve Wilson in "A pragmatic approach to ground gas risk assessment for the 21st Century" - CIRIA/Environmental Protection UK Ground gas seminar 2011
15. BS 8576:2013 'Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)'
16. BS 8485:2015 'Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings'
17. The Hazardous Waste (England) Regulations 2005.
18. Environment Agency Hazardous Waste: "Guidance on the classification and assessment of waste" WM3 ver 1 May 2015.
19. The National Planning Policy Framework (NPPF) March 2012
20. DETR. Circular 02/2000 Contaminated Land.
21. Environment Agency, 2009 'Using Soil Guideline Values'.
22. Environment Agency, 2009 'Updated Technical Background to the CLEA model'.
23. Environment Agency, 2009 'Human health toxicological assessment of contaminants in soil'.
24. Department of the Environment, 1994, CLR Report No 1 'A framework for assessing the impact of contaminated land on groundwater and surface water'.
25. Department of the Environment, 1994, CLR Report No 2 'Guidance on Preliminary Site Inspection of Contaminated Land'.
26. Department of the Environment, 1994, CLR Report No 3 'Documentary research on Industrial Sites'.

27. Department of the Environment, 1994, CLR Report No 4 'Sampling Strategies for Contaminated Land'.

28. DEFRA and the Environment Agency, 2002-2004, CLR10 'Soil Guideline Value Reports for Individual Soil Contaminants'.

29. DEFRA and the Environment Agency, 2004, CLR Report No 11 'Model Procedures for the Management of Contaminated Land'.

30. Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R. C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.

31. CL:AIRE, 2014 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination'.

32. Water Framework Directive.

33. Environmental Quality Standards.

34. UK Drinking Water Standards: Water Supply (Water Quality) Regulations 1989 (SI 1989/1147) and Water Supply (Water Quality) Regulations

35. UKWIR Report 10/WM/03/21 2010 "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites"

36. Health & Safety Executive, 1991. 'Protection of Workers & the General Public during the Development of Contaminated Land'.

37. Environment Agency & NHBC, 2000. R&D Publication 66. Guidance for the Safe Development of Housing on Land Affected by Contamination.

38. Environment Agency "Guidance on the classification and assessment of waste (1st edition 2015) Technical Guidance WM3"

39. Department of the Environment, 1992. Waste Management Paper No. 27. Landfill Gas: A Technical Memorandum Providing Guidance on the Monitoring and Control of Landfill Gas.

40. NHBC Standards 2006

41. CL:AIRE "The Definition of Waste: Development Industry Code of Practice" Version 2 March 2011.

42. CIRIA "Asbestos in soil and made ground: a guide to understanding and managing risks" C733 2014

43. Control of Asbestos Regulations (CAR) 2012

44. Harris, M R, Herbert, S. M, Smith, M A 'Remedial Treatment for Contaminated Land' (twelve volumes), special publications 101-112, CIRIA 1996.

45. BRE Digest 365 "Soakaway Design" 2007.

DRAWINGS

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All Contractors must visit the site and are responsible for taking and checking all dimensions relative to their work, Jon Matthews Architects are to be advised of any variation between drawings and site conditions.

Electronic data/ drawings issued as 'read only' and should not be interrogated for measurement. All dimensions and levels should be read only from those values stated/ noted, on this drawings

⚠ CONSTRUCTION - It is considered that the proposed works are within the scope of a competent Contractor and as such no unusual hazards have been identified, refer to relevant Key/ Schedule/ Designers Risk Assessment

Key Plan:

Planning Application Boundary

Legal / Ownership Boundary

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General Notes:

To be read in conjunction with all Design Consultant's drawings and reports:
- Structures
- MEP
- Fire Engineering
- Acoustics
- Landscapes

This documentation contains information that is in abeyance and subject to further information from Design Consultants and the client which may affect and/or change the design, specification and areas.

All glazing modules to Block A (Tower) in abeyance subject to Sub-Contractor design.

MEP / Plant is indicative and subject to final MEP design.

Refer to 04_3000 series for facade material scoping

Area in abeyance

Revs	Dates:	Details:
J	18/12/20	Stage 4 Issue
H	16/12/20	Issued for Contract
G	03/12/20	Issued for Stage 4 structural coordination
F	20/11/20	Interim Stage 4 Issue for Coordination
E	23/10/20	Stage 3 - Final Issue
D	04/09/20	Stage 3 Issue - Updated Column Location
C	28/08/20	Stage 3 Issue - Updated Drainage Points
B	24/08/20	Stage 3 Issue
A	18/03/20	Issued as part of Planning Application.

Jon Matthews Architects
22 City Tower, Piccadilly Plaza, New York St, Manchester, M1 4BT

Project:
Back Turner Street
Manchester

Title:
General Arrangement Plan
Proposed Ground Floor Level

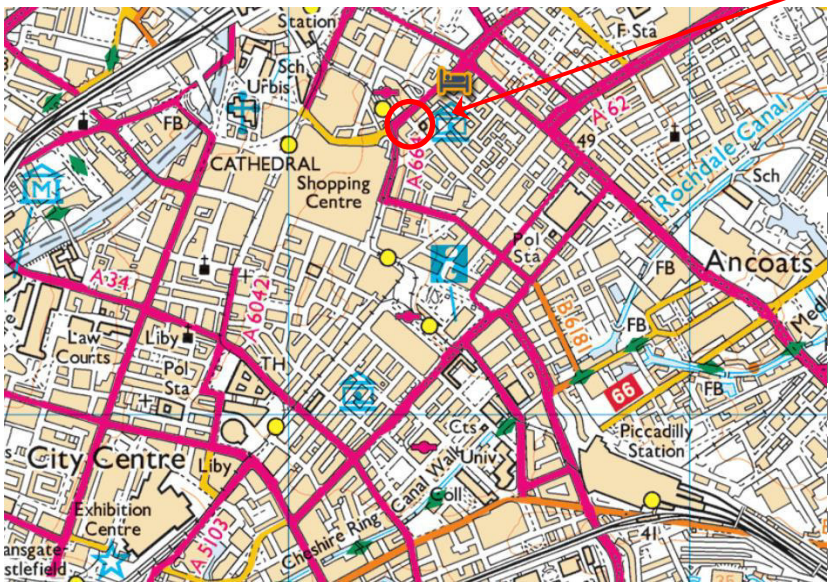
Scale:	Origin Date:	Drawn:	Checked:
1:100 @ A1	06/03/20	JTB	JC

Status:
Stage 4

Project:	Drawing No:	Revs:
05593	MP_02_2200	J



SITE



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DOMIS CONSTRUCTION LTD

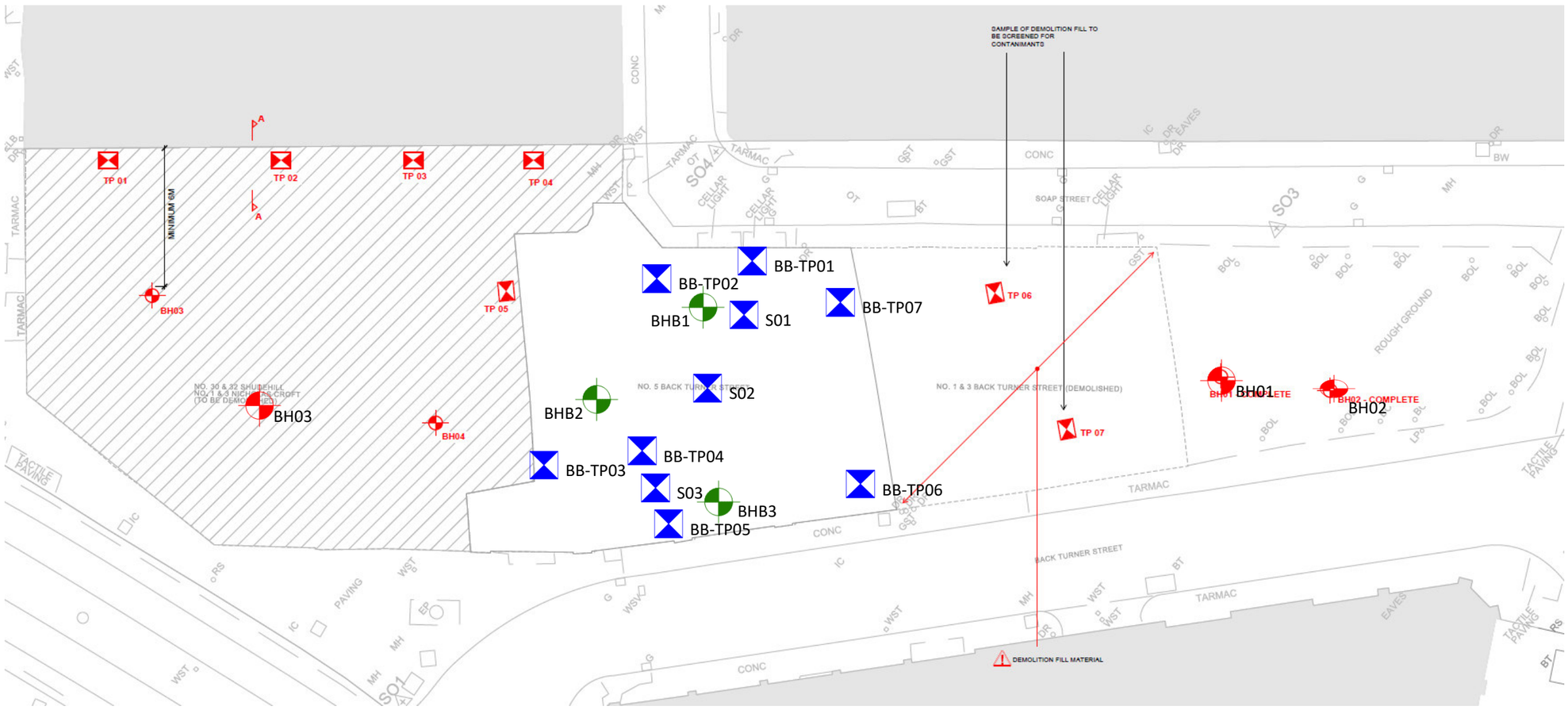
Back Turner Street, Manchester

Site Location Plan

Drawing Number C3967/01

Scale: NTS

Drawn By: BM	Checked By: JMJ



KEY

- BHXX ROTARY BOREHOLE
- HPXX HAND EXCAVATED TRIAL PIT
- BB-TPXX HAND EXCAVATED TRIAL PIT (BLOCK B) – VISIT 1
- SXX HAND EXCAVATED TRIAL PIT (BLOCK B) – VISIT 2
- BHBX WINDOW SAMPLE BOREHOLE

REV	DATE	DESCRIPTION	BY	CKD

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CLIENT
DOMIS CONSTRUCTION LTD

PROJECT TITLE
BACK TURNER STREET, MANCHESTER

DRAWING TITLE
EXPLORATORY HOLE LOCATION PLAN

DRAWING No.	REVISION	SCALE	DATE
C3967/02	C	NTS	21/10/21

DRAWN BY	CHECKED BY
NS	AJS

APPENDIX A
BSL Methodology and Guidance

BSL Methodology and Guidance – Geo-Environmental Assessment Reports

This Appendix provides information on the approaches, methods and guidance used by Brownfield Solutions Ltd in the preparation of this report.

The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential soils and groundwater contamination). The term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). It should be noted that this is an integrated investigation and these two main aspects are related, unless otherwise specified within the report.

Desk Studies are written in broad agreement with BS 10175:2011+A2:2017. The first stage of a two-staged investigation and assessment of a site is the Preliminary Investigation (BS 10175:2011+A2:2017), often referred to as a Phase 1 Desk Study Assessment, comprising a desk study and walk-over survey, which culminates in the Preliminary Risk Assessment. A preliminary conceptual site model (CSM) is developed. From this are identified any geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them.

From the geo-environmental perspective, the hazard Identification process uses professional judgement to evaluate all the hazards in terms of possible contaminant linkages (of source-pathway-receptor). Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment.

The second stage is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The Ground Investigation comprises field work and laboratory testing based on the findings of the Preliminary Risk Assessment, to reduce uncertainty in the geotechnical and geo-environmental hazard identification. This may include the exploratory, main and supplementary Investigations described in BS 10175:2011+A2:2017.

Legislative Background

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act;
- The Contaminated Land (England) Regulations 2000;
- The DETR circular 02/2000 Environmental Protection Act 1990: Part IIA Contaminated Land.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

1) Significant harm is being caused or there is a significant possibility of such harm being caused;
2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

- **Source** - substances that are potential contaminants or pollutants that may cause harm;
- **Pathway** - a potential route by which contaminants can move from the source to the receptor;
- **Receptor** - a receptor that may be harmed, for example the water environment, humans and water.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused. The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the SPR approach is 'suitable for use' criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents
This report has been prepared in accordance with the list of guidance below however the list is not exhaustive:

- DETR Circular 02/2000, Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990.
- CLR11 – Model Procedures.
- Brownfields – Managing the development of previously developed land – A client's guide, CIRIA 2002.
- DEFRA and Environment Agency publications CLR7 – 10, supported by the TOX guides and SGV guides, dated March 2002.
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002.
- Contamination and Environmental Matters - Their implications for Property Professionals (2nd Edition RICS Nov 2003).
- BS 10175:2011+A2:2017.

Relevant Legislative Documents
The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012).
- The Environment Protection Act (1990).
- The Water Resources Act (1991).
- The Environment Act (1995).
- The Contaminated Land (England) Act (2000).
- The Pollution Prevention and Control (England and Wales) Regulations (2000).
- The Landfill Regulations (England and Wales) Regulations (2002).
- The Landfill (England and Wales) (Amendment) Regulations (2004).
- Contaminated Land (England) Regulations (2012).
- Health and Safety at Work Act.

Contaminated Land Risk Assessment

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:

Hazard Identification → Hazard Assessment → Risk Estimation → Risk Evaluation

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process. Under CLR11, three tiers of risk assessment exist - Preliminary, Generic Quantitative and Detailed Quantitative.

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552:

- **High likelihood**: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution;

- **Likely**: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;

- **Low likelihood**: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term;

- **Unlikely**: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.

The severity is also classified using a system based on CIRIA C552. The terms and definitions are:

- **Severe**: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse;

- **Medium**: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve;

- **Mild**: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment;
  Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

- **Minor**: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low
	No Linkage	No risk			

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

- **Very high**: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required;

- **High**: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term;

- **Moderate**: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term;

- **Low**: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild;

- **Very Low**: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Some linkages may be identified which constitutes a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible for some reason. These are labelled 'no linkage' in the summary table and no further action is required.

Ground Gas Guidance

Redevelopment on brownfield sites is an ever increasing occurrence, including those sites where a potential ground gas issue is present.

BS8485:2015+A1:2019 and CIRIA C665 is the current guidance which gives up-to-date advice on all aspects of ground gas. It outlines good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to gas contaminated land. Two semi-quantitative methods are set out for the assessment of risk:

1 For low rise housing with a ventilated under floor void at minimum 150 mm (Boyle and Witherington);
2 For all other development types (Wilson and Card).

Both methods use the concept of Gas Screening Values (GSVs) to identify levels of risk. The mitigation and management of potentially unacceptable risk is described with reference to both passive and active systems of gas. Source removal is also discussed as an option.

CIRIA C665 and the advice it contains has been prepared to be generally consistent with CLR11 *Model Procedures for the management of land contamination* (Defra and Environment Agency, 2004a). The aim of CIRIA C665 is a consistent approach to decision making, particularly relating to the scope of protective design measures on a site specific basis.

Legislative Framework
CIRIA C665 provides technical guidance however also recognises the context into which the guidance has to be employed. Government policy is based upon a "suitable for use approach", which is relevant to both the current and proposed future use of land. When considering the current use of land, Part IIA of the Environment Protection Act 1990 provides the regulatory regime. The presence of hazardous ground gases could provide the "source" in a "pollutant linkage" which could lead the regulator to determine that considerable harm or there is a significant possibility of such harm being caused. Under such circumstances, the regulator would determine the land to be "contaminated land" under the provisions of the Act, setting out the process of remediation as described in the DETR Circular 02/2000 *Statutory guidance on contaminated land* (DETR, 2000a).

Frequency and Duration of Monitoring
The monitoring period for a specific site covers the "worst case" scenario. A "worst case" scenario will occur during falling atmospheric pressure and, in particular, weather conditions such as rainfall, frost and dry weather.

The benefits of the additional information and whether it is likely to change the scope of gas protection should be considered, as are the consequences of failing to characterise adequately pollutant linkages. Investigations concerned with soil gas are required to provide monitoring data sufficient to allow prediction of worst case conditions enabling the confident assessment of risk and subsequent design of appropriate gas protection schemes. Monitoring programmes should not be an academic exercise in data collection.

Below are matrices that will aid in determining an appropriate number of gas monitoring visits and the length of monitoring period.

Typical/idealised periods of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (Flats)	2 months	3 months	6 months	12 months	24 months
	High (Residential with Gardens)	3 months	6 months	6 months	12 months	24 months

Typical/idealised frequency of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4	6	6	12	12
	Moderate (Flats)	6	6	9	12	24
	High (Residential with Gardens)	6	9	12	24	24

Note

1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).
2 There is no industry consent over "high", "medium" or "low" generation potential of source.
3 At least two sets of readings should be at low and falling atmospheric pressure (but not restricted to periods below <1000 mb) known as worst case conditions. Historical data can be used as part of the data set (Table 5.5b).

It is recommended that newly installed monitoring wells are left for 24 hours to allow the soil gas to reach equilibrium. It should be recognised, however, that some soil gas regimes could take considerably longer (up to seven days). Interpretation of any initial readings should take this equilibrium process into account.

Contaminated Land Screening Values

In assessing the potential for contamination Brownfield Solutions Limited (BSL) follows UK guidance and current best practice.

General
The current recommended method for assessing contamination is on the basis of:

Source-Pathway-Receptor

Where any one of these "pollution linkages" is absent there is deemed to be no risk.

Fundamentally receptors can be considered as humans and controlled waters (surface and ground waters).

The purpose of using Tier 1 screening levels is to have a simple means of assessing the potential contamination of a site and to inform decisions on whether further investigation is warranted or whether an option to undertake clean up based on the data to hand is cost effective.

Human Health
Current UK guidance is provided by DEFRA and the Environment Agency (EA). Publications forming part of the guidance include; CLEA Model, toxicological reports and soil guideline values (SGV), collectively referred to as the CLEA Guidance. The CLEA Guidance has included a number of publications which have provided initial screening values for soil contamination based on standard land uses and soil assumptions.

CLEA guidance has gone through a number of revisions, all of the original SGV's that were published have been withdrawn and publication of new SGV's commenced in 2009.

For determinands where no SGVs are available, S4UL values have been published using the CLEA 1.06 Model. These are the third set of generic assessment criteria generated by CIEH, and replace the previous two sets of GACs. The revised S4UL values are based on greater knowledge of relevant toxicology and further consideration of exposure frequencies.

No SGV or S4UL is available for lead as this is derived based on blood lead levels. C4SL values for six determinands including lead was published by DEFRA/CL:AIRE in December 2014 and they represent a low risk as opposed to minimal risk. The C4SL values are based on a sandy loam with 6% Soil Organic Matter. These screening values were published by DEFRA for Part 2A use, although with the dual purpose for use under planning. However these have not been officially accepted by Local Government for use under planning. S4ULs remain the first reference due to the broader range of end uses and soil organic content.

The preference from the EA is that site specific screening levels are used wherever possible. Due to numerous factors it is not always possible to utilise site specific values. In these instances the following data sources are used in the order of preference given below:

- CIEH S4UL values (derived by CIEH/LQM)
- DEFRA/CL:AIRE C4SL's
- CL:AIRE GAC values
- Current UK SGV's
- Guidance from other European countries
- Guidance from the outside Europe

Controlled Waters
The European Water Framework Directive (WFD) became UK law in December 2003. It was created to ensure that European countries manage their rivers, groundwater and lakes so that they stay healthy for people and for wildlife.

This is achieved by the use of chemical standards for surface waters and groundwater. These values describe concentrations of chemicals that are not expected to cause harm to environmental organisms or human health, provided they are not exceeded. The same chemical may have several standards for different environmental regimes, and for different protection objectives.

Statutory Standards are set in legislation and if exceeded, this constitutes non-compliance with statutory obligations. European Directives are implemented in England and Wales by corresponding statutory instruments (i.e. regulations). The statutory instruments can be the exact same standards as they appear in the Directive or be more stringent.

A number of non-statutory standards also exist, these are set by various organisations (including the EA) for chemicals that are considered to be of concern, but are not covered by any specific legislation.

The chemical standards used in the UK to control impaction of contamination on controlled waters are Environmental Quality Standards (EQS). The EQS's cover a large number of compounds.

Where certain compounds are not covered by the EQS these are commonly compared to the UK Drinking Water Standards (DWS).

Further Assessment

When screening values are exceeded then further consideration is required. This could include the use of simple measures to break the pollution pathway and mitigate the risk, further more detailed investigation, including the deriving of site specific values to better define the risk and to design appropriate remedial measures.

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			Proposed End Use														
Source	Contaminant	Unit	Residential with Homegrown Produce			Residential without Homegrown Produce			Commercial			Public Open Space (POS) resi			Public Open Space (POS) park		
		SOM (%)	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6
LQM S4UL	Arsenic	mg/kg	37	37	37	40	40	40	640	640	640	79	79	79	170	170	170
LQM S4UL	Cadmium	mg/kg	11	11	11	85	85	85	190	190	190	120	120	120	532	532	532
LQM S4UL	Chromium (III)	mg/kg	910	910	910	910	910	910	8600	8600	8600	1500	1500	1500	33000	33000	33000
LQM S4UL	Chromium (VI)	mg/kg	6	6	6	6	6	6	33	33	33	7.7	7.7	7.7	220	220	220
LQM S4UL	Copper	mg/kg	2400	2400	2400	7100	7100	7100	68000	68000	68000	12000	12000	12000	44000	44000	44000
C4SL	Lead	mg/kg	200	200	200	330	330	330	2300	2300	2300	760	760	760	1400	1400	1400
LQM S4UL	Mercury, Elemental	mg/kg	1.2	1.2	1.2	1.2	1.2	1.2	58	58	58	16	16	16	30	30	30
LQM S4UL	Nickel	mg/kg	180	180	180	180	180	180	980	980	980	230	230	230	3400	3400	3400
LQM S4UL	Selenium	mg/kg	250	250	250	430	430	430	12000	12000	12000	1100	1100	1100	1800	1800	1800
LQM S4UL	Zinc	mg/kg	3700	3700	3700	40000	40000	40000	730000	730000	730000	81000	81000	81000	170000	170000	170000
LQM S4UL	Phenol (total)	mg/kg	280	550	1100	750	1300	2300	760	1500	3200	760	1500	3200	760	1500	3200
LQM S4UL	Acenaphthene	mg/kg	210	510	1100	3000	4700	6000	84000	97000	100000	15000	15000	15000	29000	30000	30000
LQM S4UL	Acenaphthylene	mg/kg	170	420	920	2900	4600	6000	83000	97000	100000	15000	15000	15000	29000	30000	30000
LQM S4UL	Anthracene	mg/kg	2400	5400	11000	31000	35000	37000	520000	540000	540000	74000	74000	74000	150000	150000	150000
LQM S4UL	Benz(a)anthracene	mg/kg	7.2	11	13	11	14	15	170	170	180	29	29	29	49	56	62
LQM S4UL	Benzo(a)pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2	35	35	36	5.7	5.7	5.7	11	12	13
LQM S4UL	Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	3.9	4	4	44	44	45	7.1	7.2	7.2	13	15	16
LQM S4UL	Benzo(ghi)perylene	mg/kg	320	340	350	360	360	360	3900	4000	4000	640	640	640	1400	1500	1600
LQM S4UL	Benzo(k)fluoranthene	mg/kg	77	93	100	110	110	110	1200	1200	1200	190	190	190	370	410	440
LQM S4UL	Chrysene	mg/kg	15	22	27	30	31	32	350	350	350	57	57	57	93	110	120
LQM S4UL	Dibenz(a,h)anthracene	mg/kg	0.24	0.28	0.30	0.31	0.32	0.32	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4
LQM S4UL	Fluoranthene	mg/kg	280	560	890	1500	1600	1600	23000	23000	23000	3100	3100	3100	6300	6300	6400
LQM S4UL	Fluorene	mg/kg	170	400	860	2800	3800	4500	63000	68000	71000	9900	9900	9900	20000	20000	20000
LQM S4UL	Indeno(1,2,3,cd)pyrene	mg/kg	27	36	41	45	46	46	500	510	510	82	82	82	150	170	180
LQM S4UL	Naphthalene	mg/kg	2.3	5.6	13	2.3	5.6	13	190	460	1100	4900	4900	4900	1200	1900	3000
LQM S4UL	Phenanthrene	mg/kg	95	220	440	1300	1500	1500	22000	22000	23000	3100	3100	3100	6200	62000	6300
LQM S4UL	Pyrene	mg/kg	620	1200	2000	3700	3800	3800	54000	54000	54000	7400	7400	7400	15000	15000	15000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 5 - 6	mg/kg	42	78	160	42	78	160	3200	5900	12000	570000	590000	600000	95000	130000	180000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 6 - 8	mg/kg	100	230	530	100	230	530	7800	17000	40000	600000	610000	620000	150000	220000	320000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 8 - 10	mg/kg	27	65	150	27	65	150	2000	4800	11000	13000	13000	13000	14000	18000	21000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 10 - 12	mg/kg	130	330	760	130	330	770	9700	23000	47000	13000	13000	13000	21000	23000	24000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 12 - 16	mg/kg	1100	2400	4300	1100	2400	4400	59000	82000	90000	13000	13000	13000	25000	25000	26000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 16 - 35	mg/kg	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 35 - 44	mg/kg	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 5 - 7	mg/kg	70	140	300	370	690	1400	26000	46000	86000	56000	56000	56000	76000	84000	92000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 7 - 8	mg/kg	130	290	660	860	1800	3900	56000	110000	180000	56000	56000	56000	87000	95000	100000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 8 - 10	mg/kg	34	83	190	47	110	270	3500	8100	17000	5000	5000	5000	7200	8500	9300
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 10 - 12	mg/kg	74	180	380	250	590	1200	16000	28000	34000	5000	5000	5000	9200	9700	10000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 12 -16	mg/kg	140	330	660	1800	2300	2500	36000	37000	38000	5100	5100	5000	10000	10000	10000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 16 - 21	mg/kg	260	540	930	1900	1900	1900	28000	28000	28000	3800	3800	3800	7600	7700	7800
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 21 - 35	mg/kg	1100	1500	1700	1900	1900	1900	28000	28000	28000	3800	3800	3800	7800	7800	7900
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 35 - 44	mg/kg	1100	1500	1700	1900	1900	1900	28200	28200	28200	3800	3800	3800	7800	7800	7900
LQM S4UL	Benzene	mg/kg	0.087	0.17	0.37	0.38	0.7	1.4	27	47	90	72	72	73	90	100	110
LQM S4UL	Toluene	mg/kg	130	290	660	880	1900	3900	56000	110000	180000	56000	56000	56000	87000	95000	100000
LQM S4UL	Ethyl Benzene	mg/kg	47	110	260	83	190	440	5700	13000	27000	24000	24000	25000	17000	22000	27000
LQM S4UL	Xylene - o	mg/kg	60	140	330	88	210	480	6600	15000	33000	41000	42000	43000	17000	24000	33000
LQM S4UL	Xylene - m	mg/kg	59	140	320	82	190	450	6200	14000	31000	41000	42000	43000	17000	24000	32000
LQM S4UL	Xylene - p	mg/kg	56	130	310	79	180	430	5900	14000	30000	41000	42000	43000	17000	23000	31000
CL:AIRE 2010	MTBE (methyl tert-butyl ether)	mg/kg	49	84	160	49	84	160	7900	13000	24000	49	84	160	49	84	160
LQM S4UL	Chloroethene (Vinyl Chloride)	mg/kg	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4
LQM S4UL	1,2-Dichloroethane (1,2-DCA)	mg/kg	0.0071	0.011	0.019	0.0092	0.013	0.023	0.67	0.97	1.7	29	29	29	21	24	28
LQM S4UL	1,1,1-Trichloroethane	mg/kg	8.8	1.8	39	9	18	40	660	1300	3000	14000	14000	14000	57000	76000	100000
LQM S4UL	1,1,2,2-Tetrachloroethane	mg/kg	1.6	3.4	7.5	3.9	8	17	270	550	11000	1400	1400	1400	1800	2100	2300
LQM S4UL	1,1,1,2-Tetrachloroethane	mg/kg	1.2	2.8	6.4	1.5	3.5	8.2	0.79	1.9	4.4	1400	1400	1400	1500	1800	2100
LQM S4UL	Tetrachloroethene (PCE)	mg/kg	0.18	0.39	0.9	0.18	0.4	0.92	19	42	95	1400	1400	1400	810	1100	1500
LQM S4UL	Tetrachloromethane (carbon tetrachloride)	mg/kg	0.026	0.056	0.13	0.026	0.056	0.13	2.9	6.3	14	890	920	950	190	270	400

			Proposed End Use														
			Residential with Homegrown Produce			Residential without Homegrown Produce			Commercial			Public Open Space (POS) resi			Public Open Space (POS) park		
Source	Contaminant	Unit															
		SOM (%)	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6
LQM S4UL	Trichloroethene **(TCE)**	mg/kg	0.016	0.034	0.075	0.017	0.036	0.08	1.2	2.6	5.7	120	120	120	70	91	120
LQM S4UL	Trichloromethane (chloroform)	mg/kg	0.91	1.7	3.4	1.2	2.1	4.2	99	170	350	2500	2500	2500	2600	2800	3100
LQM S4UL	Chlorobenzene	mg/kg	0.45	1	2.4	0.46	1	2.4	56	130	290	11000	13000	14000	1300	2000	2900
LQM S4UL	1, 2 Dichlorobenzene	mg/kg	23	55	130	24	57	130	2000	4800	11000	90000	95000	98000	24000	26000	51000
LQM S4UL	1, 3 Dichlorobenzene	mg/kg	0.4	1	2.3	0.44	1.1	2.5	30	73	170	300	300	300	390	440	470
LQM S4UL	1, 4 Dichlorobenzene	mg/kg	61	150	350	61	150	340	4400	10000	25000	17000	17000	17000	26000	36000	36000
LQM S4UL	1, 2, 3 Trichlorobenzene	mg/kg	1.5	3.6	8.6	1.5	3.7	8.8	102	250	590	1800	1800	1800	770	1100	1600
LQM S4UL	1, 2, 4 Trichlorobenzene	mg/kg	2.6	6.4	15	2.6	6.4	15	220	530	1300	15000	17000	19000	1700	2600	4000
LQM S4UL	1, 2, 3, 4 Trichlorobenzene	mg/kg	0.33	0.81	1.9	0.33	0.81	1.9	23	55	130	1700	1700	1800	280	580	860
LQM S4UL	1, 2, 3, 4 Tetrachlorobenzene	mg/kg	15	36	78	24	56	120	1700	3080	4400	830	830	830	1500	1600	1600
LQM S4UL	1, 2, 3, 5 Tetrachlorobenzene	mg/kg	0.66	1.6	3.7	0.75	1.9	4.3	49	120	240	78	79	79	110	120	130
LQM S4UL	1, 2, 4, 5 Tetrachlorobenzene	mg/kg	0.33	0.77	1.6	0.73	1.7	3.5	42	72	96	13	13	13	25	26	26
LQM S4UL	Pentachlorobenzene	mg/kg	5.8	12	22	19	30	38	640	770	830	100	100	100	190	190	190
LQM S4UL	Hexachlorobenze	mg/kg	1.8	3.3	4.9	4.1	5.7	6.7	110	120	120	16	16	16	30	30	30

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See LQM/CIEH S4ULs for Human Health Risk Assessment document for notes regarding derivation.

Re-Use Of Waste - Guidance Note

Definition of Waste
The Environment Agency considers waste to be *"...any material that is discarded, or intended to be discarded..."* This includes any soil from trenches, footing, site strip etc. It is no longer required in its original location, therefore it is considered to be waste.

CL:AIRE: Code of Practice
Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. This can be implemented under the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE DoWCoP), also commonly referred to as a "Materials Management Plan".

The developer/contractor is advised to complete all works under the DoWCoP.

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment.
- Material capable of being used in another place on the same site following ex-situ treatment on site.
- Material capable of being used in another development site without treatment (Direct Transfer).
- Material capable of being used in another development site following ex-situ treatment on another site eg Hub site.

The Code of Practice requires 4 No. Factors to be addressed:

1. Protection of human health and protection of the environment.
2. Suitability of use, without further treatment.
3. Certainty of use.
4. Quantity of material.

In order to satisfy these requirements the following are required:

i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
v) Volume calculations.
vi) Planning permission for the development.
vii) Contractual details to be clear, regarding who steps in is a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or remedial strategy on the site.
Soils which require treatment on site (eg bioremediation, stabilisation) will require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use.
Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

Waste Classification For Soils

Introduction

Waste producers have a duty of care to classify the waste they are producing:

- before it is collected, disposed of or recovered.
- to identify the controls that apply to the movement of the waste.
- to complete waste documents and records.
- to identify suitably authorised waste management options.
- to prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site will also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal

In July 2005 the United Kingdom implemented the European Directive 1999/31/EC (The Landfill Directive), this introduced the current regime for waste and waste disposal to landfill. The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets his permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).

If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed or the operator may refuse to accept the waste.

Key Points

- Not all waste can be landfilled
- Landfills are classified according to whether they can accept **hazardous**, **non-hazardous** or **inert** wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue (EWC 2002) and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not i.e the hazard assessment. The most common EWC waste codes related to soil are:

17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (eg asbestos, oil,) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on specific "hazardous properties" which include hazards such as carcinogenicity, flammability and toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations**.

Waste Definitions

Inert	• Will not undergo any significant physical, chemical or biological transformations. • Will not dissolve. • Will not burn. • Will not physically or chemically react. • Will not biodegrade. • Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. • Has insignificant total leachability and pollutant content. • Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above) Is not hazardous (see below)
Hazardous	Soil has hazardous properties as defined in WM3 (Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance)
Stable Non-reactive hazardous waste#	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents either: in the waste alone (for example, by biodegradation), under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints) or by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that is stable and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. If the waste has any disposal route other than a landfill site (e.g. recycling facility, incineration etc) the **WAC is not relevant.** Furthermore the WAC limits **cannot be used to make an assessment of whether a waste is hazardous**. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.

Classification based on Total Concentrations[1]	Non-Hazardous Waste		Hazardous Waste	
WAC testing	Below inert WAC limit values:	Above inert WAC limit values:	Below hazardous WAC limit values	Above hazardous WAC limit values
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill[2]	HAZARDOUS landfill	PRE-TREATMENT[3]

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).
2 Individual sites may have certain limit values pre-determined in their licence.
3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.

Hydrocarbons in Soils

WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However hydrocarbons in soils are a mixture rather than a pure product and are therefore not absolute entries.

Known Oils

The simplest scenario is where the identity of the contaminating oil is known or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils, the laboratory needs

to provide an interpretation of the chromatograph to determine if it is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils

Where hydrocarbons are contaminating soils it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

> For contaminated land specific consideration must be given to the following before proceeding;
>
> - The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in WM3 example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
> - The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of **marker compounds** is optional; however it is recommended that where possible the marker compounds should be used. WM3 states:

> If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:
>
> - The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
> - This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D of WM3, and
> - The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the subsequent Council Decisions.
2. Environment Agency Environmental Permitting Regulations: "Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land" 2009.
3. Environment Agency "Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria" Nov 2010.
4. Environment Agency "Guidance on the classification and assessment of waste (Technical Guidance WM3)".
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).
6. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives
7. 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament
8. Environmental Permitting Guidance The Landfill Directive For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1
9. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

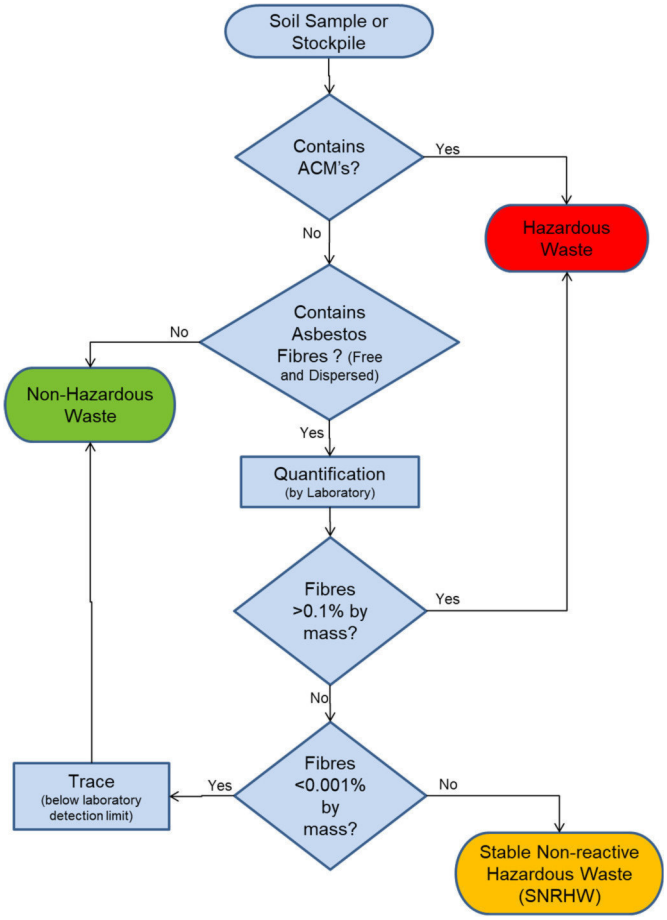
Additional Asbestos Guidance Notes

Disposal

The 1st Edition of WM3 "Guidance on the classification and assessment of waste", details the way in which Asbestos is assessed within soils.

The assessment of asbestos containing waste is dependent on whether the asbestos is present as:

- Fibres that are free and dispersed, or
- Identifiable pieces of asbestos containing materials (ACM's)



Identifiable pieces of asbestos are any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye. The result is that commonly soils with visible ACM's are sorted and the ACM's removed by hand picking and separate disposal.

Asbestos concentrations below 0.001% by mass are below standard laboratory detection limits and are not currently regarded as containing asbestos for the purposes of disposal and may be disposed of to an inert landfill site[1]. These levels are often termed "trace" by laboratories.

Asbestos concentrations between 0.001% and 0.1% are stable non-reactive hazardous waste (SNRHW)[1]. Waste transfer stations where soil recycling takes place may be able to take SNRHW, but are unlikely to take soils containing asbestos above trace concentrations.

The following codes should be assigned to the asbestos waste as appropriate:

17 06	**Insulation materials and asbestos-containing construction materials**
17 06 01	Insulation materials containing asbestos
17 06 03	Other insulation materials consisting of or containing hazardous substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05	Construction material containing asbestos

WM3 indicates that 17 06 05 would normally be used in preference to 17 06 01 for the asbestos in asbestos contaminated soil and stones.

Construction materials containing asbestos and "*other suitable materials*" may be landfilled at landfills for non-hazardous waste in accordance with the Landfill Directive without testing.

This means that wastes that are only hazardous because of their asbestos content can be disposed of at landfills for non-hazardous waste in separate landfill cells that only accept asbestos wastes and other suitable materials. The Landfill Directive requires that stable non-reactive hazardous waste shall not be deposited with biodegradable waste (for example organic material, household waste, paper etc..) and must meet the waste acceptance criteria set out in accordance with Annex II.

Construction

Health and Safety Executive (HSE) guidance on asbestos is not directly related to soil and much of the guidance focuses on the removal of asbestos from buildings. The overarching legislation is the Control of Asbestos Regulation (CAR 2012). However where work involves (or is likely to involve) contact with asbestos then CAR 2012 requires a risk assessment including whether or not the work is licensed or notifiable non-licensed work and may require an Asbestos Management Plan. Work becomes notifiable if it is considered that the control limit could be exceeded.

Brownfield sites frequently have soils that contain asbestos and the presence of asbestos needs to be considered within the context of construction, particularly in relation to groundworks. The exposure of soils and the use of excavators and plant to move soil around increases the possibility of fibres becoming airborne. However it is good site practice to not generate dusts and to employ dust suppression on all sites regardless of the presence of asbestos.

The legal control limit for asbestos is 0.1f/ml over a continuous four hour period. The control limit is not a '*safe*' level and exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

Clearly the higher the concentrations in the soil the greater potential there is for fibres to be released, however IOM publication TM/88/14 "the release of dispersed asbestos fibres from soil" 1988 concludes that:

- Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1f/ml in dust clouds where the respirable dust concentrations are less than 5mg/m^3.
- An action limit is recommended of no higher than 0.001% asbestos in soils above which steps should be taken to minimise exposure to airborne fibres (eg by wetting).
- The addition of relatively small quantities (10%) of water can reduce the airborne fibre concentrations by an order of magnitude.

Where asbestos has been identified at concentrations above 0.001% as free and dispersed fibres in the soil precautions need to be adopted. Concentrations below this are considered to be normal background, although good site practice dictates that the generation of dusts should be avoided and therefore any fugitive fibre release from minor concentrations should be kept to a practical minimum.

End Use

The use of materials containing asbestos and material containing asbestos is prohibited under EU legislation. There is currently a Joint Industry Working Group (JIWG) tasked with producing a Code of Practice for Asbestos in Soil, Made Ground and Construction & Demolition Material that will clarify in due course the position of the various government agencies.

Asbestos containing materials can remain in situ under a suitable cover system which may be hardsurfacing or soft landscaping (with or without hard dig layers and markers).

There is a risk that future maintenance may compromise such systems and details of the presence of asbestos should be kept in the Health and Safety File.

Preliminary publications from JIWG (April 2015) provide guides for decision making in relation to construction. These are at a "Beta" test stage and further publications will be provided in due course.

The re-use of waste soils should be undertaken in accordance with the CL:AIRE Code of Practice and is subject to suitable risk assessments demonstrating low risk . There is nothing that specifically excludes the re-use of soils containing asbestos as fill to raise levels. However the movement of materials increases the risk of fibres becoming airborne and suitable precautions will be required.

The re-use of soils containing asbestos at concentrations above hazardous waste levels is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be feasible where there is a long program for implementation.

Asbestos in Soil as Free Fibres

Concentration (by weight)	Waste Disposal				Construction Issues	End Use	
	Recycle	Inert	SNR Hazardous	Hazardous		Suitable for re-use on site	Precautions
Not detected	√	√			No precautions necessary, however on a brownfield site asbestos not previously identified may be found during works and a statement within the contractors method statement for how they will deal with this unforeseen asbestos would be good practice to ensure compliance with CAR2012.	Yes	None
Trace (<0.001%)		√ [2]			Precautions are unlikely to be required, however a detailed method statement may be required to ensure compliance with CAR2012. Basic asbestos management good practice will be required. Typically precautions would include: • Ensuring soils do not dry out to become dusty. • Site personnel have the risk communicated at induction stage.	Yes Soils can be re-used under CL:AIRE CoP with the correct precautions in place.	Generally clean cover or hardstanding cover required.
0.001% – 0.099%			√		Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: • Site personnel have the risk communicated at induction stage. • Ensuring personnel have suitable training. • Task monitoring to inform PPE requirements. • Ensuring soils do not dry out to become dusty and that misting is available during groundworks. • Separate stockpiling. • Clean haulage routes.	Possibly Soils may be able to be re-used under CL:AIRE CoP, subject to a satisfactory Risk Assessment and regulatory agreement with the correct precautions in place.	Clean cover or hardstanding cover required.
0.1+%				√	Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: • Site personnel have the risk communicated at induction stage. • Ensuring personnel have suitable training. • Task monitoring to inform PPE requirements. • Site wide and or perimeter monitoring. • Ensuring soils do not dry out to become dusty and that misting is available during groundworks. • Separate stockpiling. • Clean haulage routes. • Decontamination unit	Unlikely [3] Re-use of soils containing asbestos within an earthworks scheme will involve significant engineering and the risk for generating dusts will be significantly increased with repeated handling and compaction.	Clean cover and a hard dig layer. A plan should be in place for future excavations as part of the Health and Safety File.

2 The standard laboratory detection limit is normally 0.001%. Below 0.001% is trace and currently regarded as not containing asbestos for the purposes of disposal off site. However the waste producer has a duty to fully classify the waste and the presence of trace asbestos should be declared. Consequently it is unlikely that a waste treatment site will take this soil and an inert landfill may make a commercial decision to only take it under some circumstances.

3 The re-use of soils containing asbestos at concentrations above hazardous waste is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be warranted where there a long program for implementation.

APPENDIX B
Historical Maps



Site Details:

Back Turner ,Manchester ,M4 1EZ

Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: 1056 Scale Town Plan

Map date: **1850-1851**

Scale: 1:1,056

Printed at: 1:1,056

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Site Details:

Back Turner ,Manchester ,M4 1EZ

Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series Town Plan

Map date: **1891**

Scale: 1:500

Printed at: 1:1,000

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Surveyed 1891
Revised N/A
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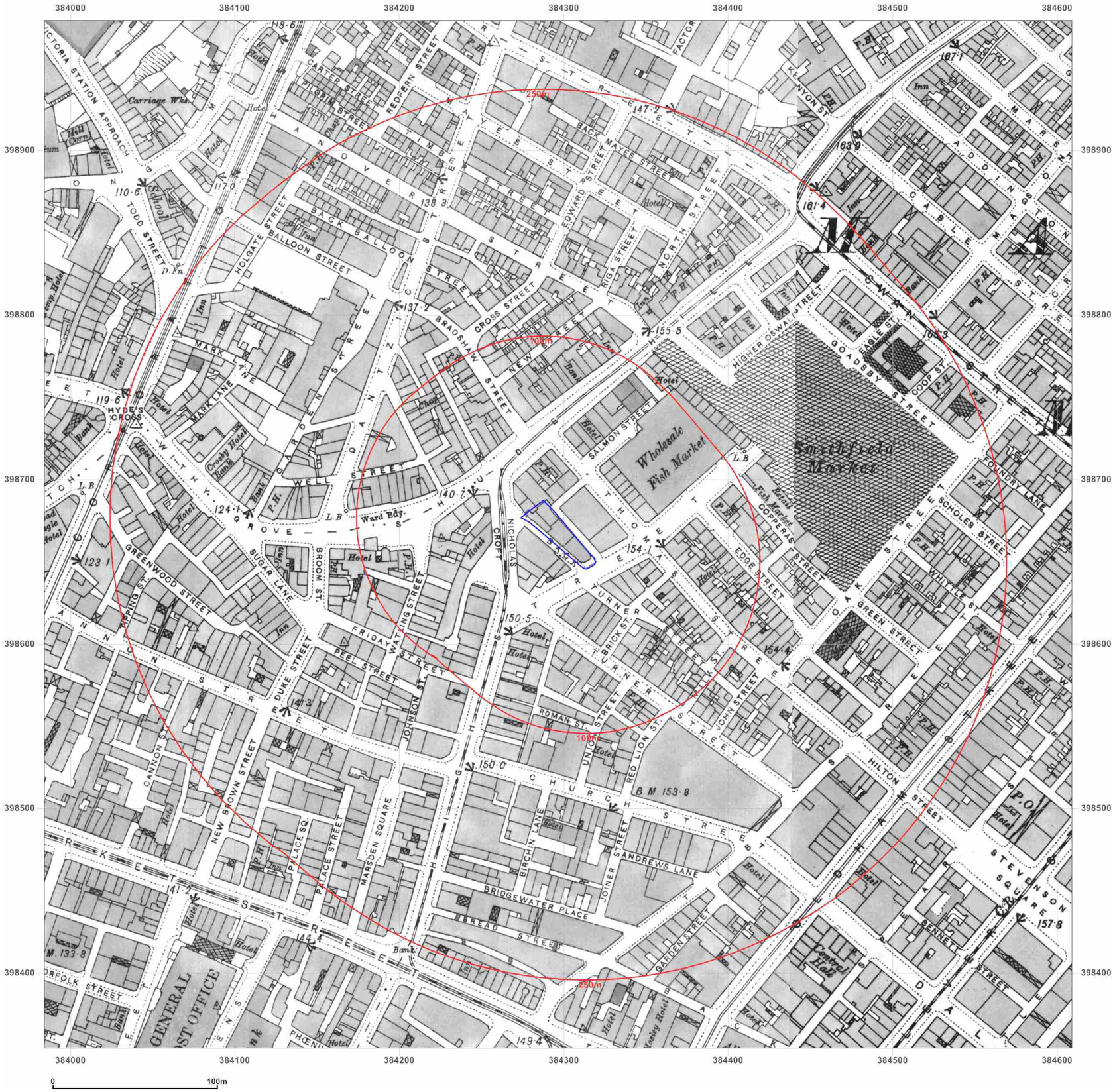
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Site Details:

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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1892-1893**

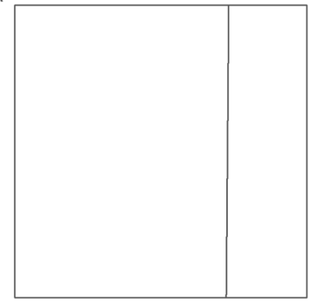
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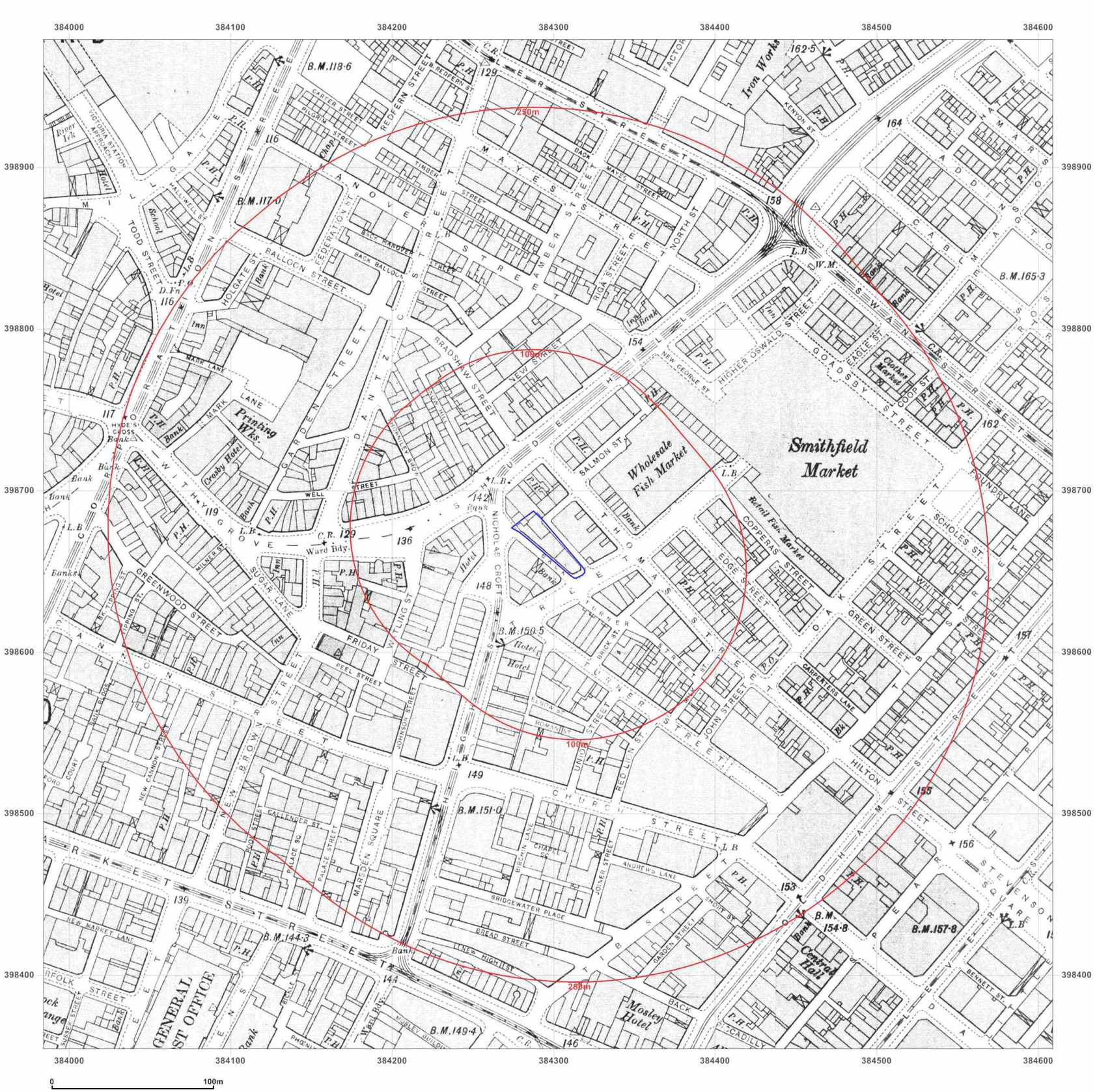
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Site Details:

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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1908**

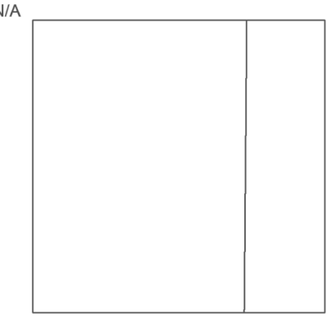
Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1891
Revised 1905
Edition 1908
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1905
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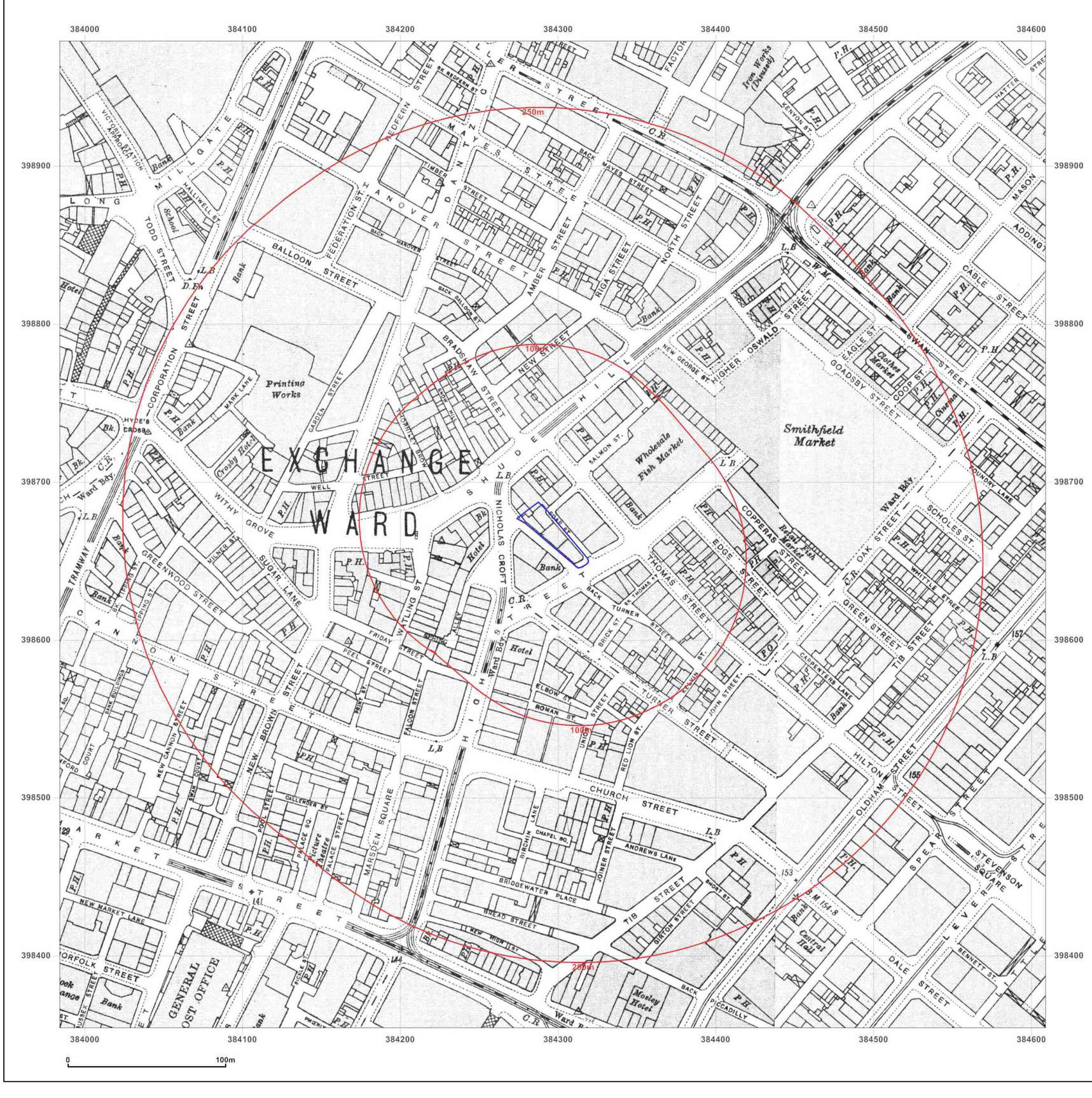
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1922**

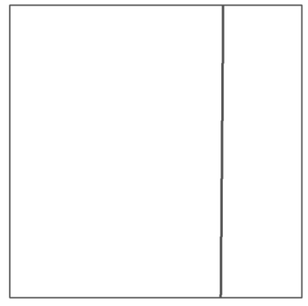
Scale: 1:2,500

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Surveyed 1922
Revised 1916
Edition 1922
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Levelled 1915

Surveyed 1922
Revised 1916
Edition 1922
Copyright N/A
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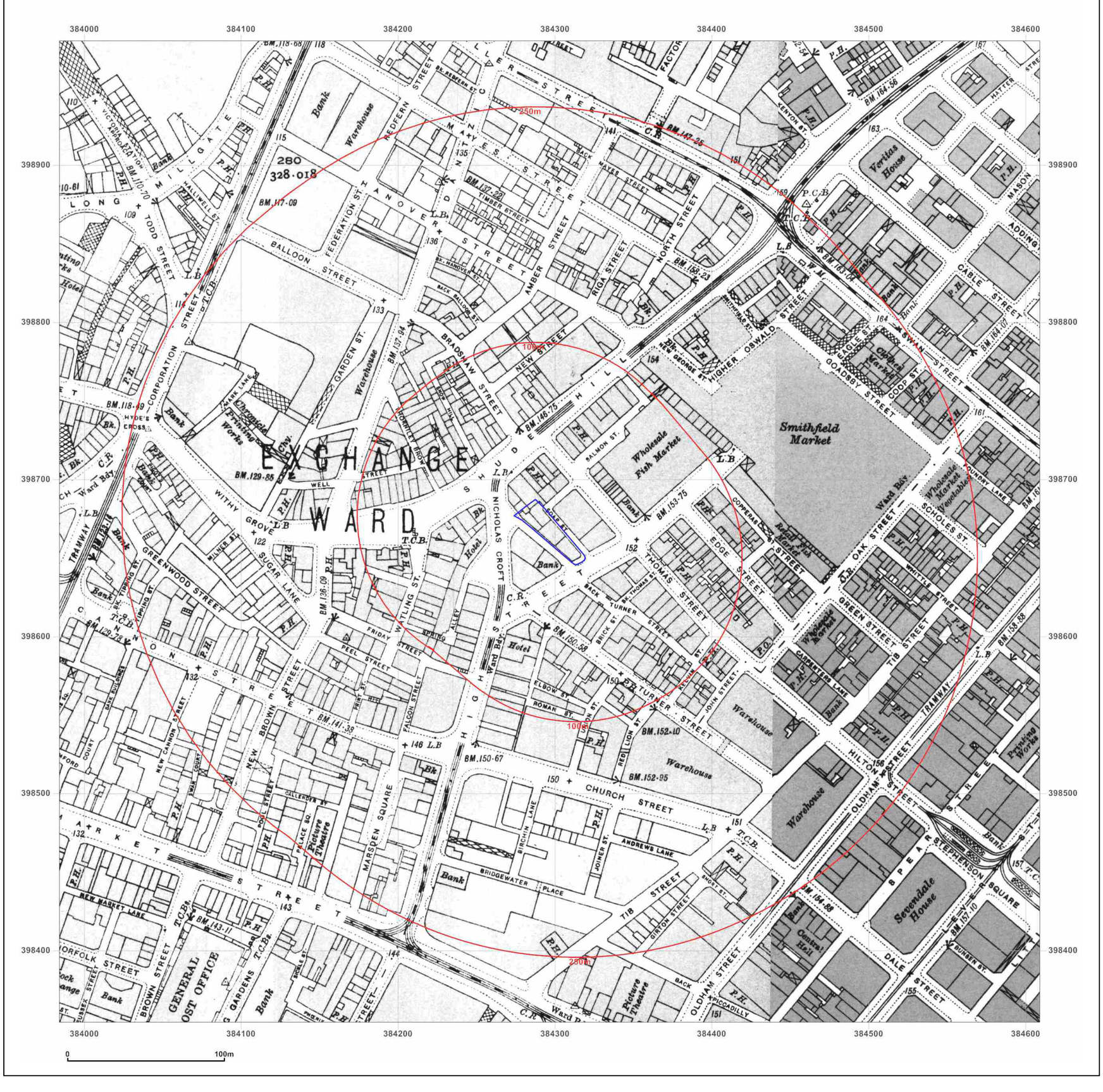
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1931-1933**

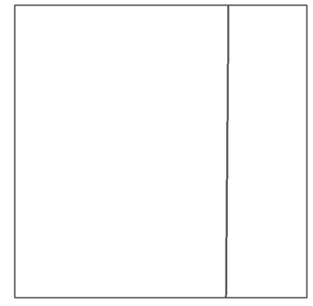
Scale: 1:2,500

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Surveyed 1873
Revised 1933
Edition N/A
Copyright N/A
Levelled 1927

Surveyed 1873
Revised 1931
Edition N/A
Copyright N/A
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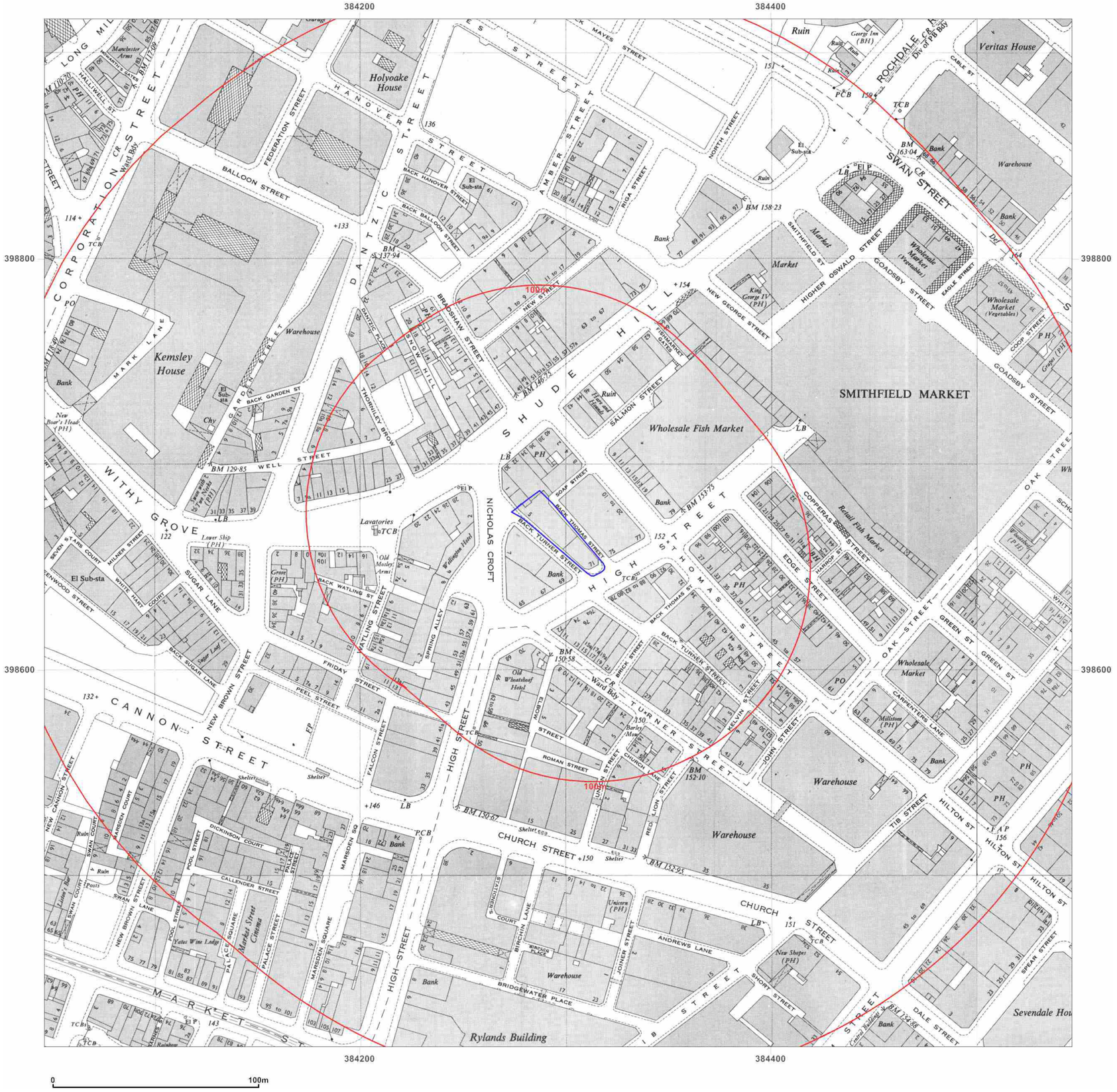
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1948-1953**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1948 Revised 1948 Edition N/A Copyright 1948 Levelled 1929	Surveyed 1948 Revised 1953 Edition N/A Copyright 1953 Levelled 1929
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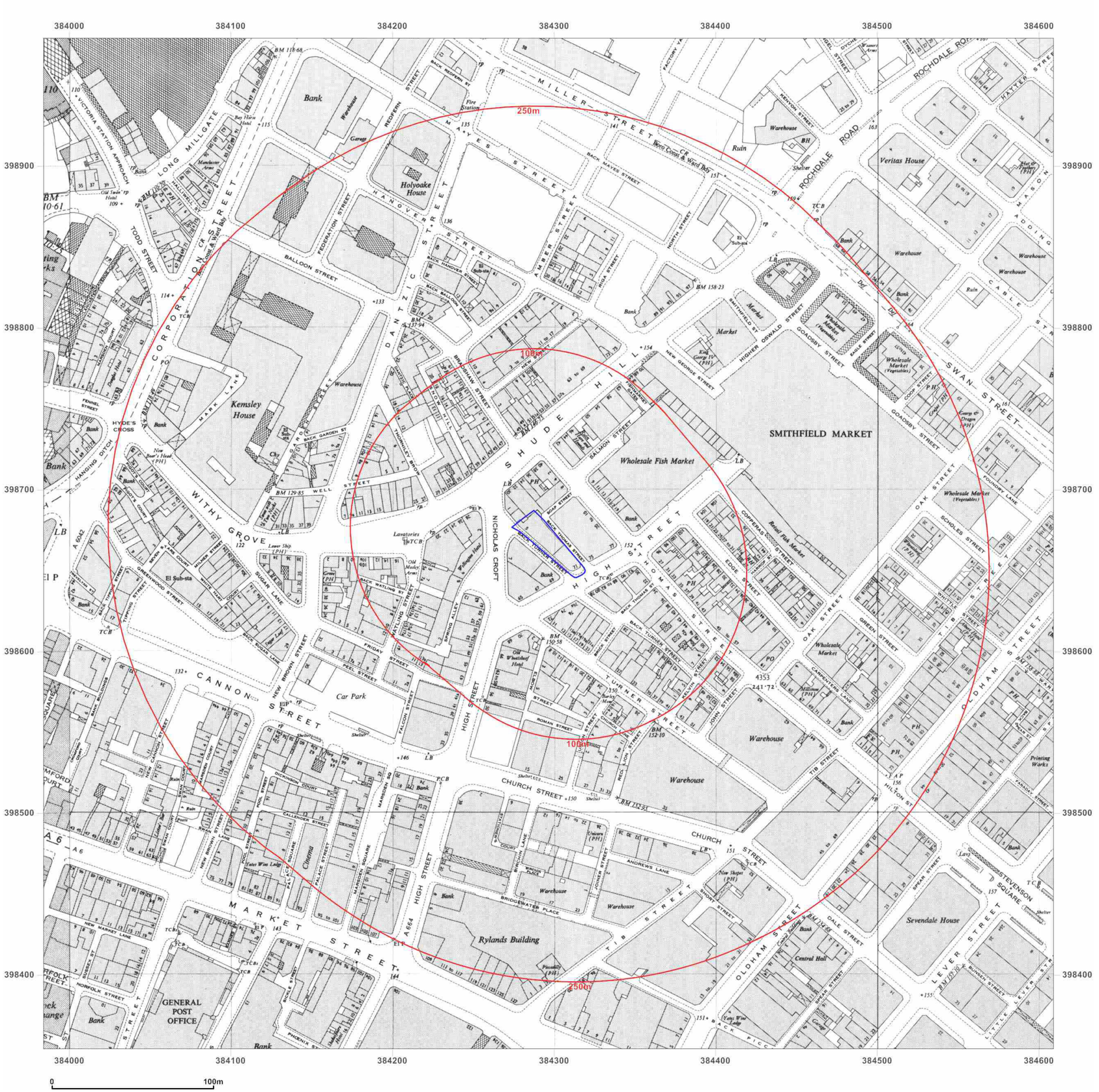
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

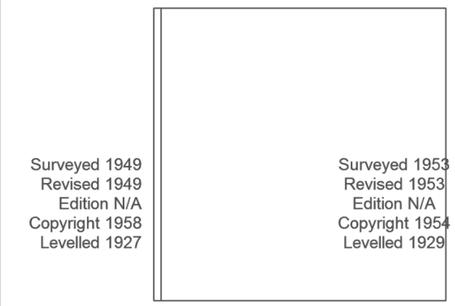
Map Name: National Grid

Map date: **1953-1957**

Scale: 1:2,500

Printed at: 1:2,500

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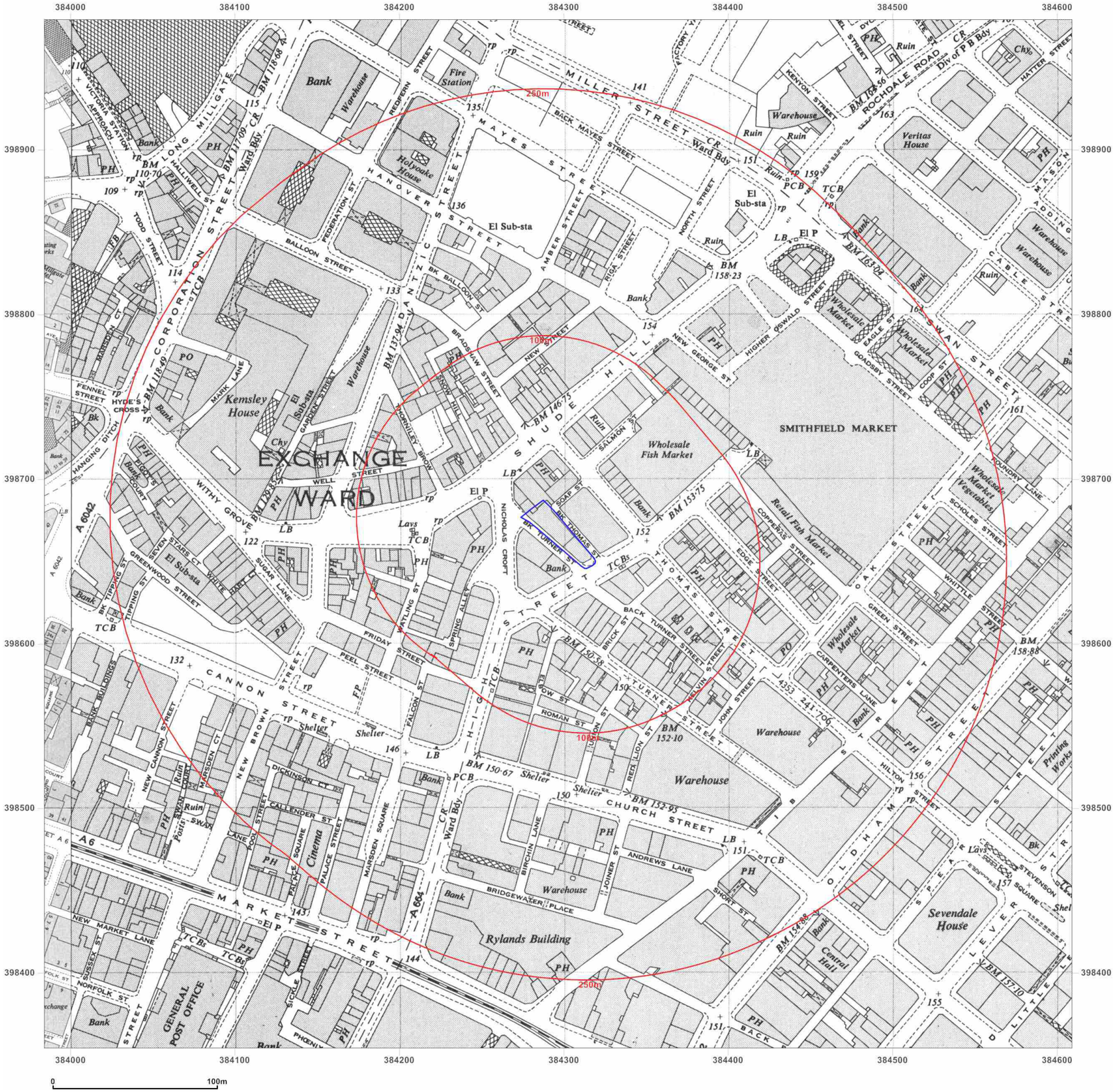
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1953-1958**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed N/A
Revised 1957
Edition N/A
Copyright 1958
Levelled 1927

Surveyed 1948
Revised 1948
Edition N/A
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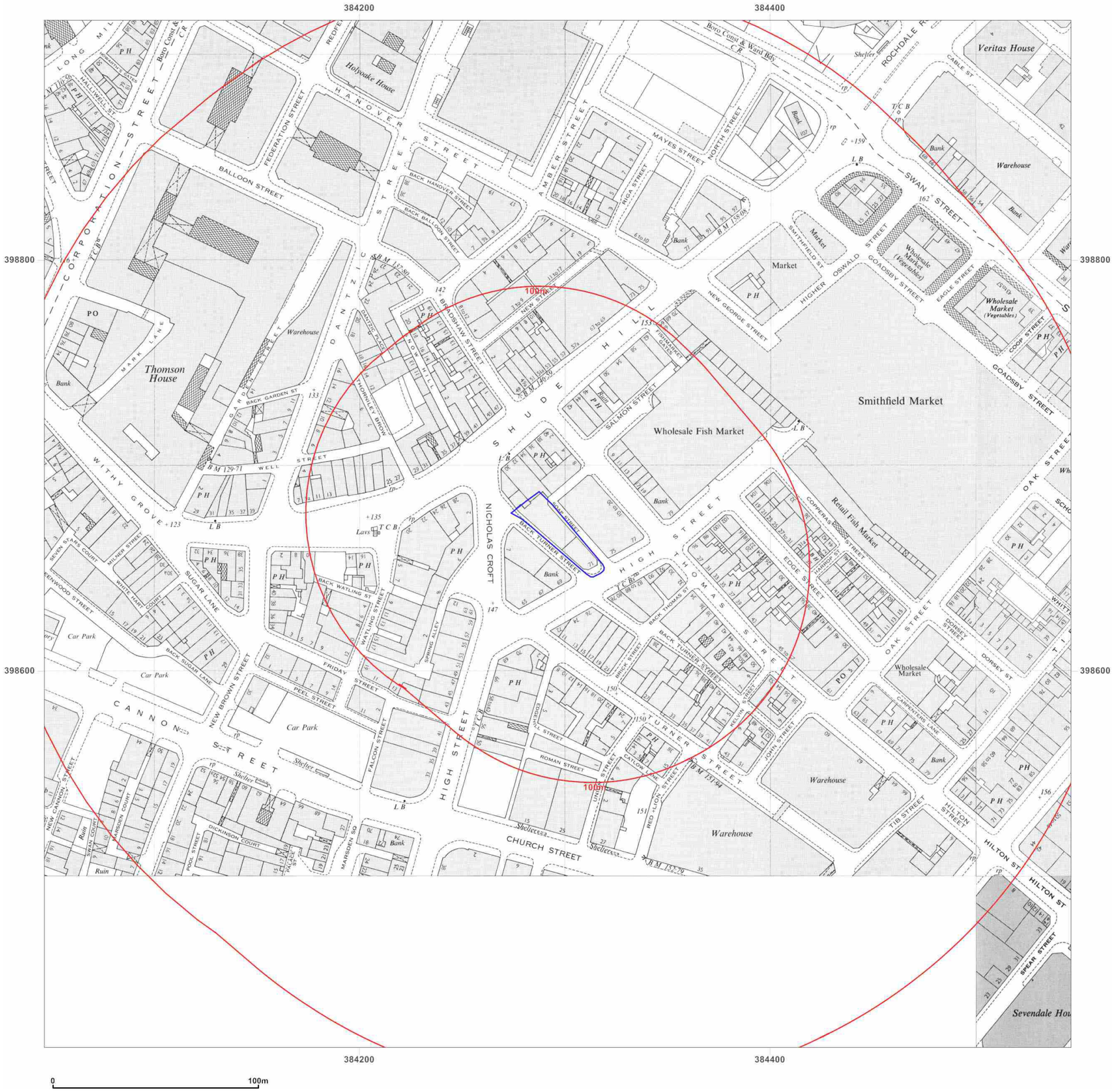
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1960-1963**

Scale: 1:1,250

Printed at: 1:2,000

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	Surveyed 1953 Revised 1953 Edition N/A Copyright 1960 Levelled 1929

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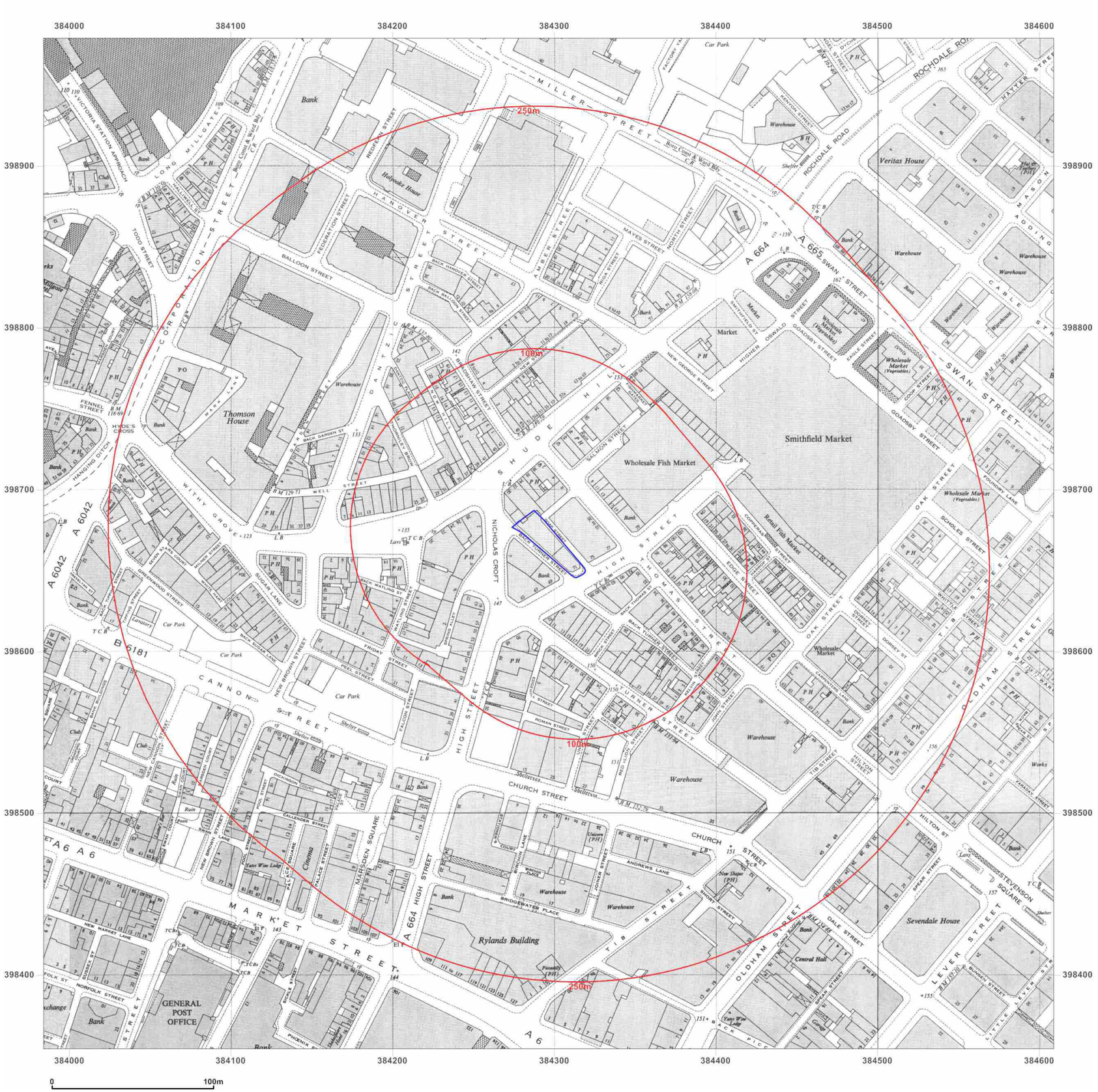
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1963-1965**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed N/A
Revised 1962
Edition N/A
Copyright 1963
Levelled 1958

Surveyed N/A
Revised 1964
Edition N/A
Copyright 1965
Levelled 1959

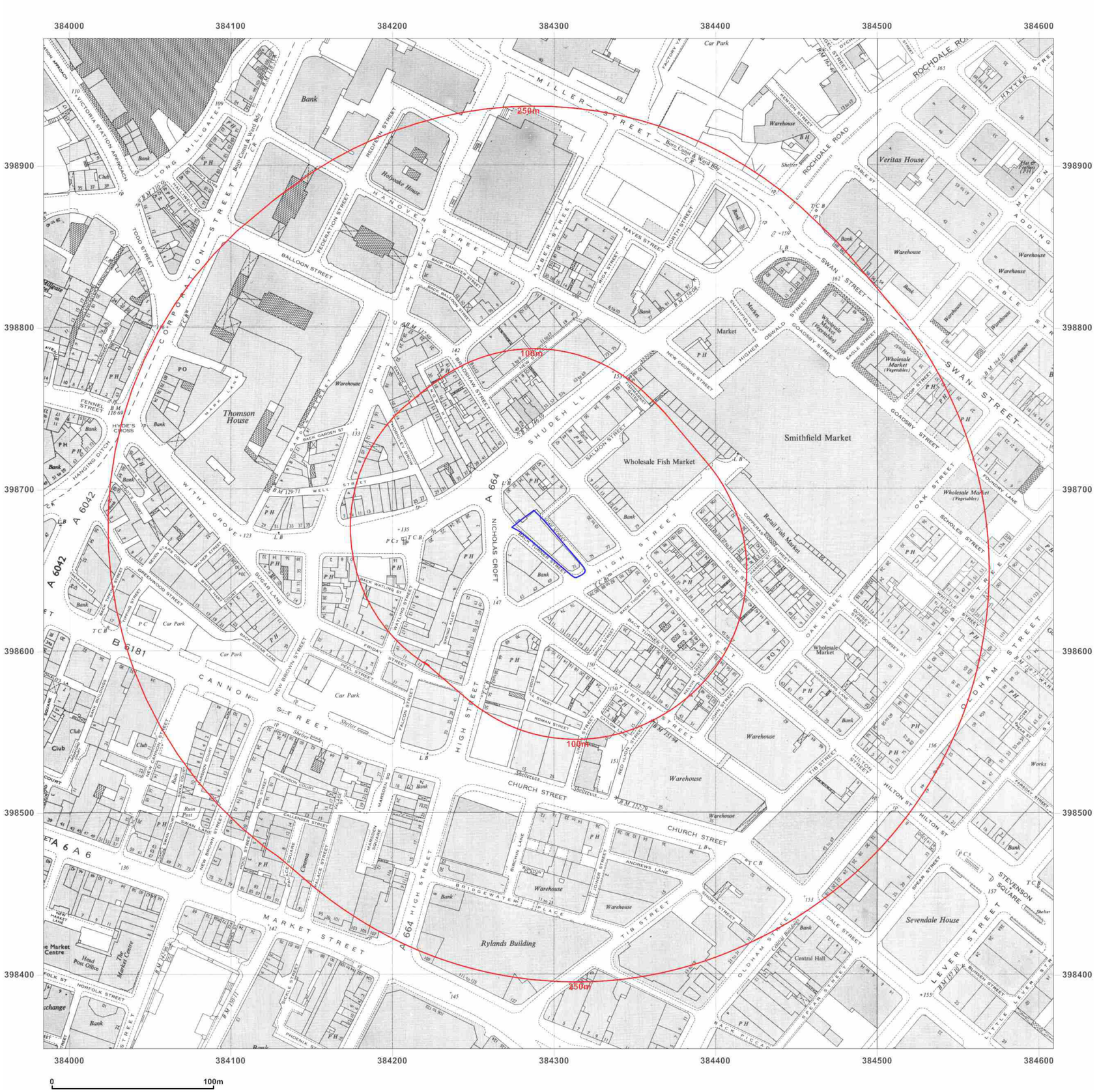
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1967-1970**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1970
Edition N/A
Copyright 1971
Levelled 1964

Surveyed 1967
Revised 1967
Edition N/A
Copyright 1969
Levelled 1964

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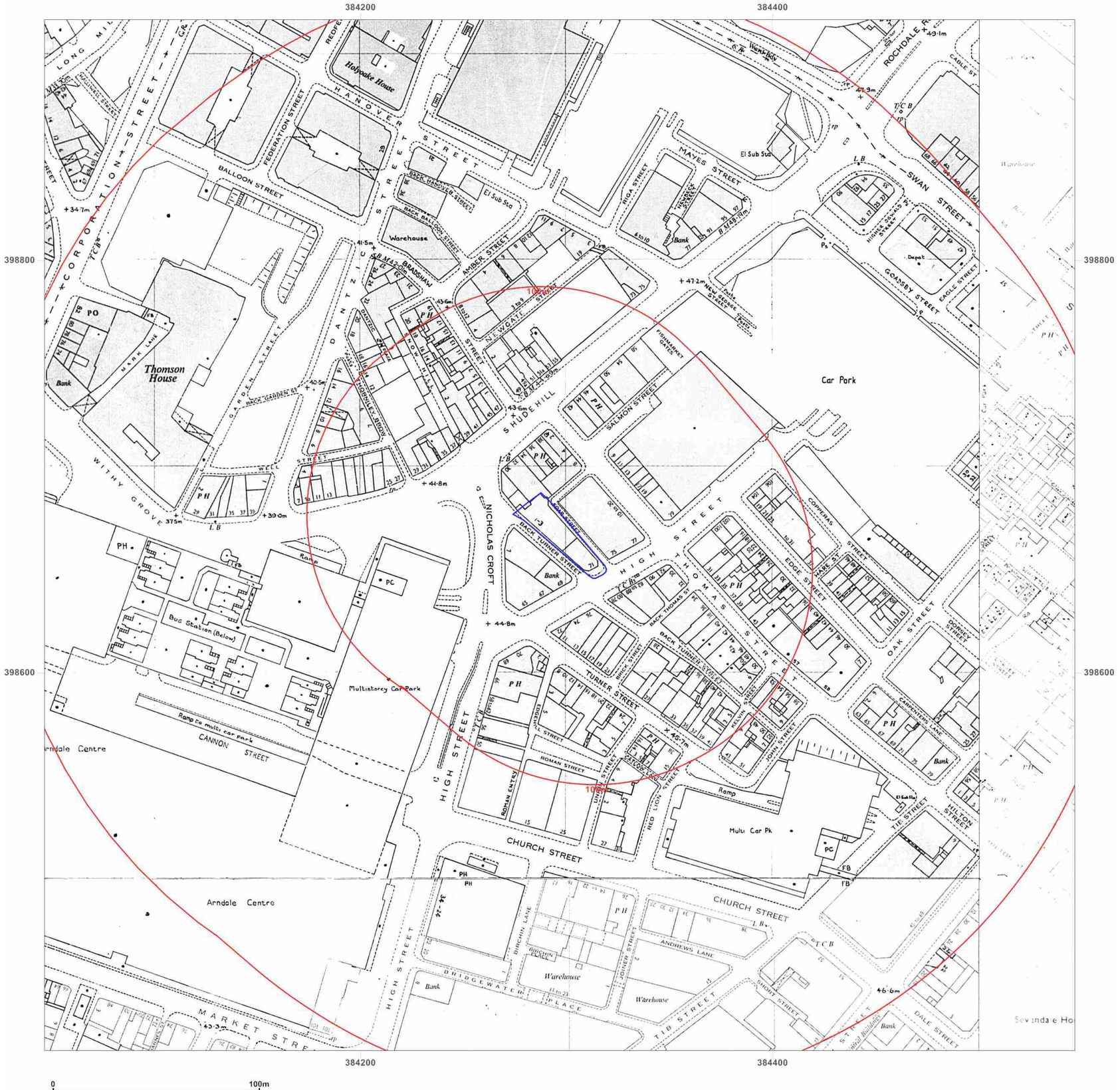
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1980-1985**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright 1980 Levelled 1964	Surveyed N/A Revised N/A Edition N/A Copyright 1984 Levelled 1964
Surveyed N/A Revised N/A Edition N/A Copyright 1980 Levelled 1964	Surveyed N/A Revised N/A Edition N/A Copyright 1985 Levelled N/A

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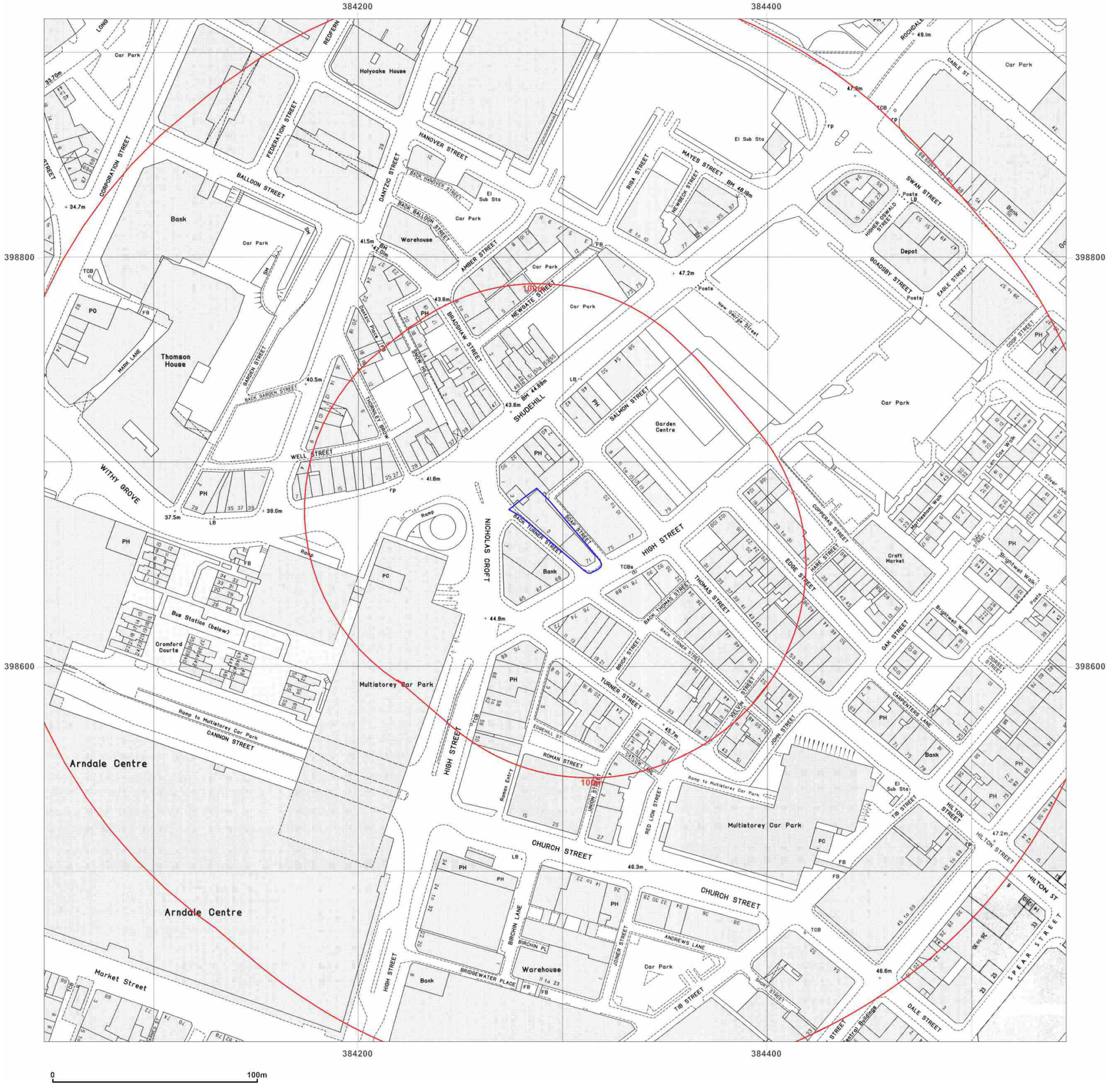
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1986-1990**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1948 Revised 1985 Edition N/A Copyright 1986 Levelled 1964	Surveyed 1948 Revised 1987 Edition N/A Copyright 1988 Levelled 1964
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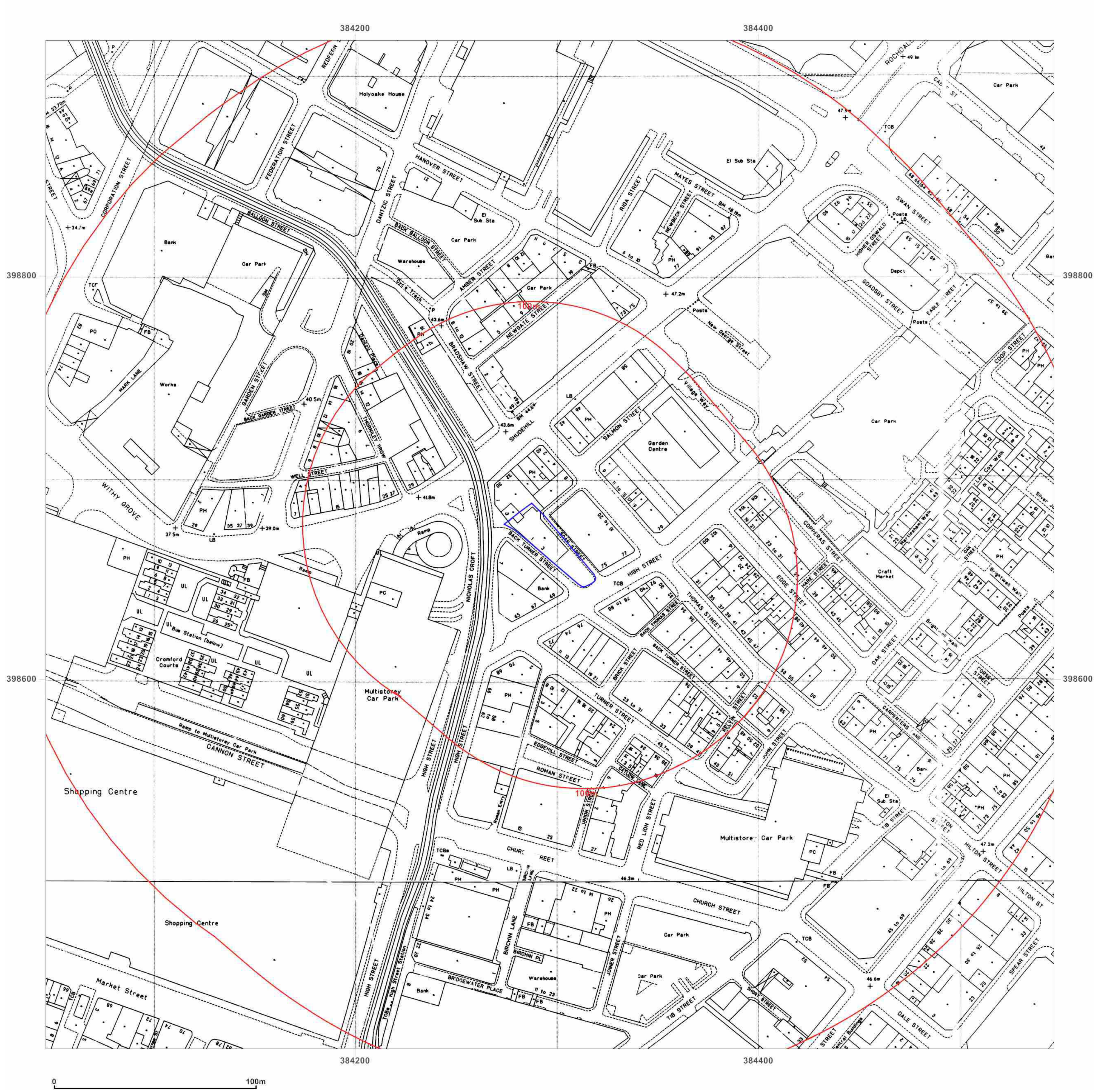
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1992**

Scale: 1:1,250

Printed at: 1:2,000

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Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

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Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

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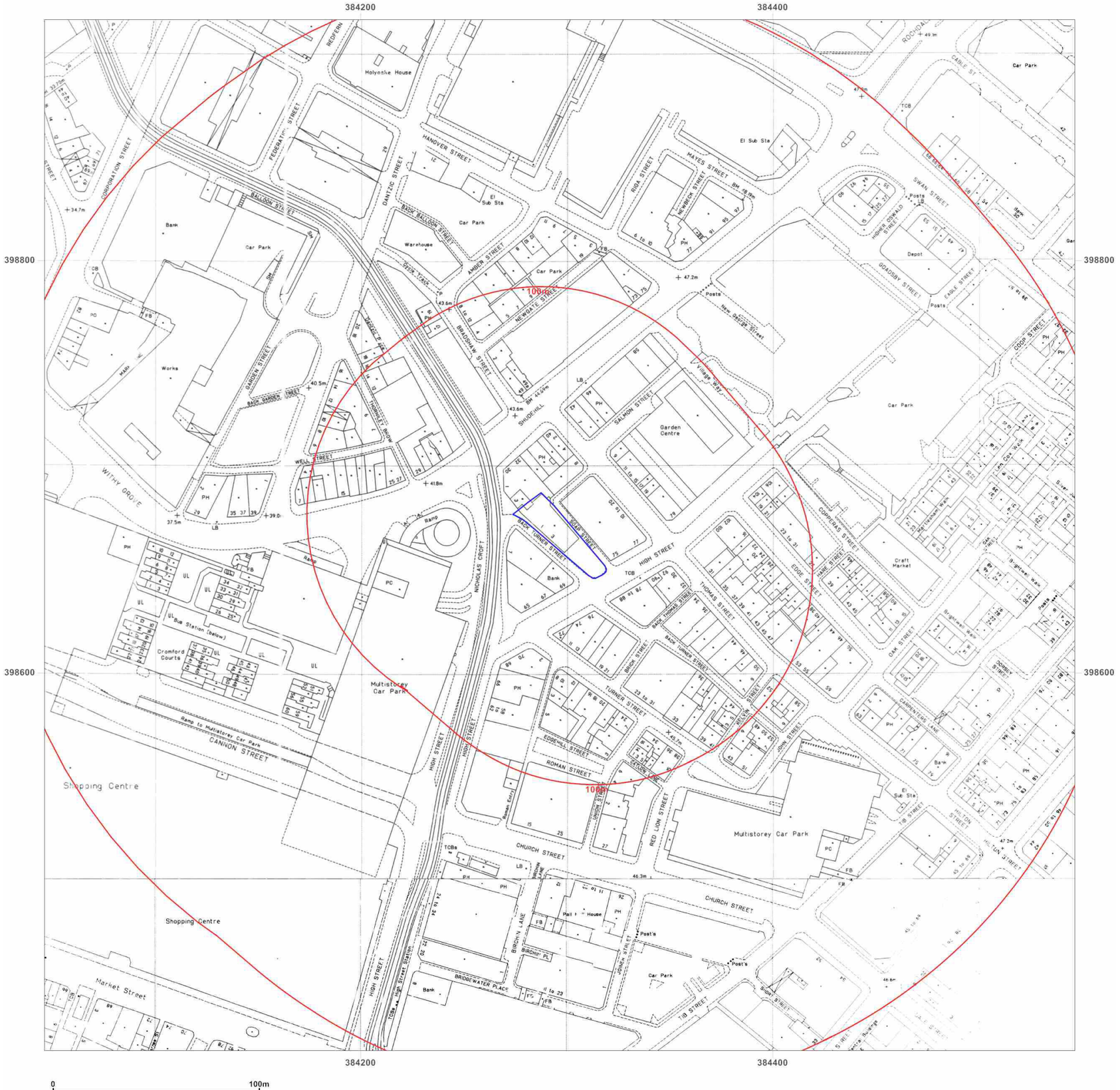
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1992-1995**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1995
Revised 1995
Edition N/A
Copyright 1995
Levelled N/A

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Revised 1995
Edition N/A
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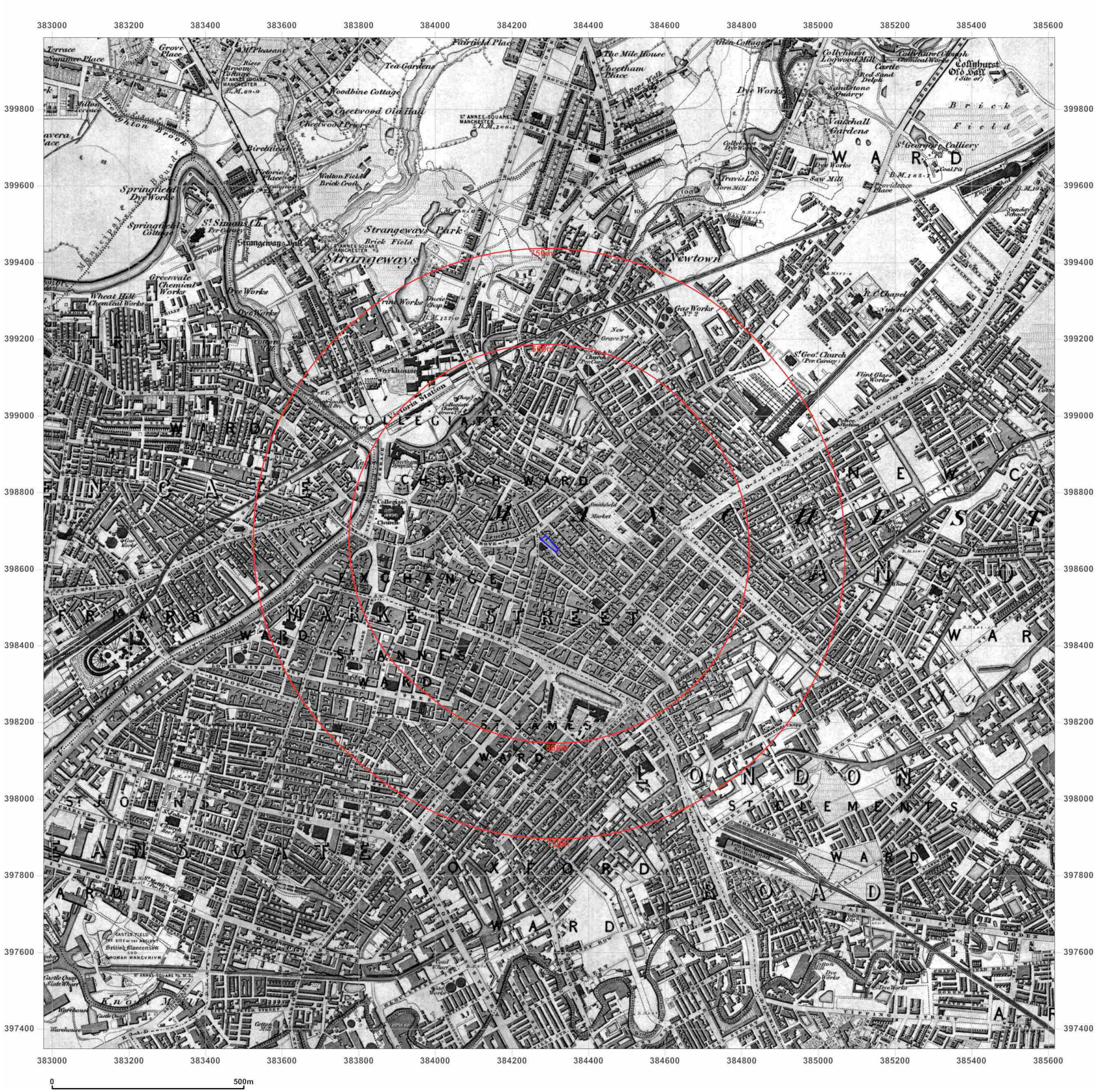
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1848**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1845
Revised N/A
Edition 1848
Copyright N/A
Levelled N/A

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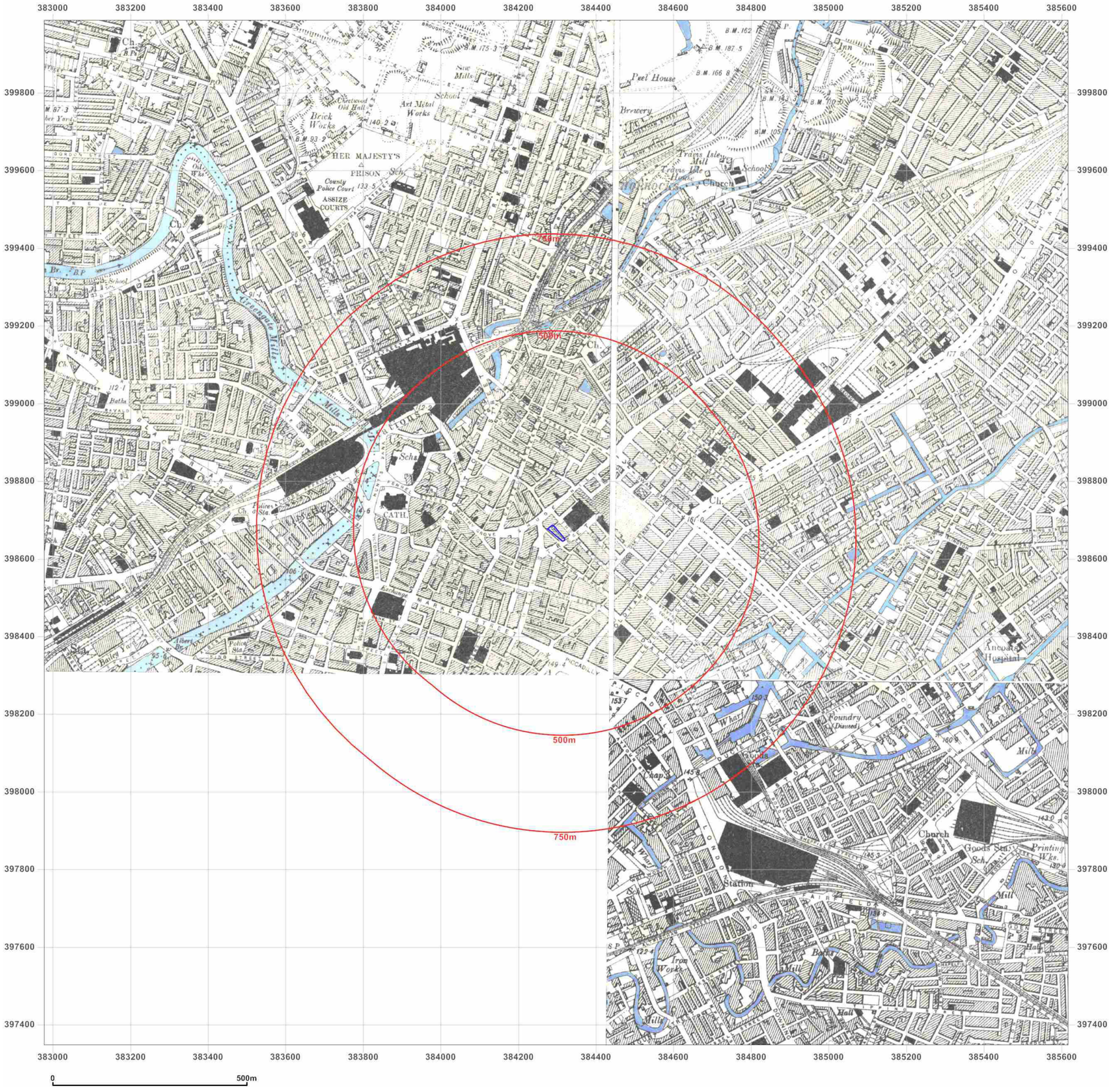
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1890-1894**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1889
Revised 1889
Edition 1894
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1891
Edition 1891
Copyright N/A
Levelled N/A

Surveyed 1890
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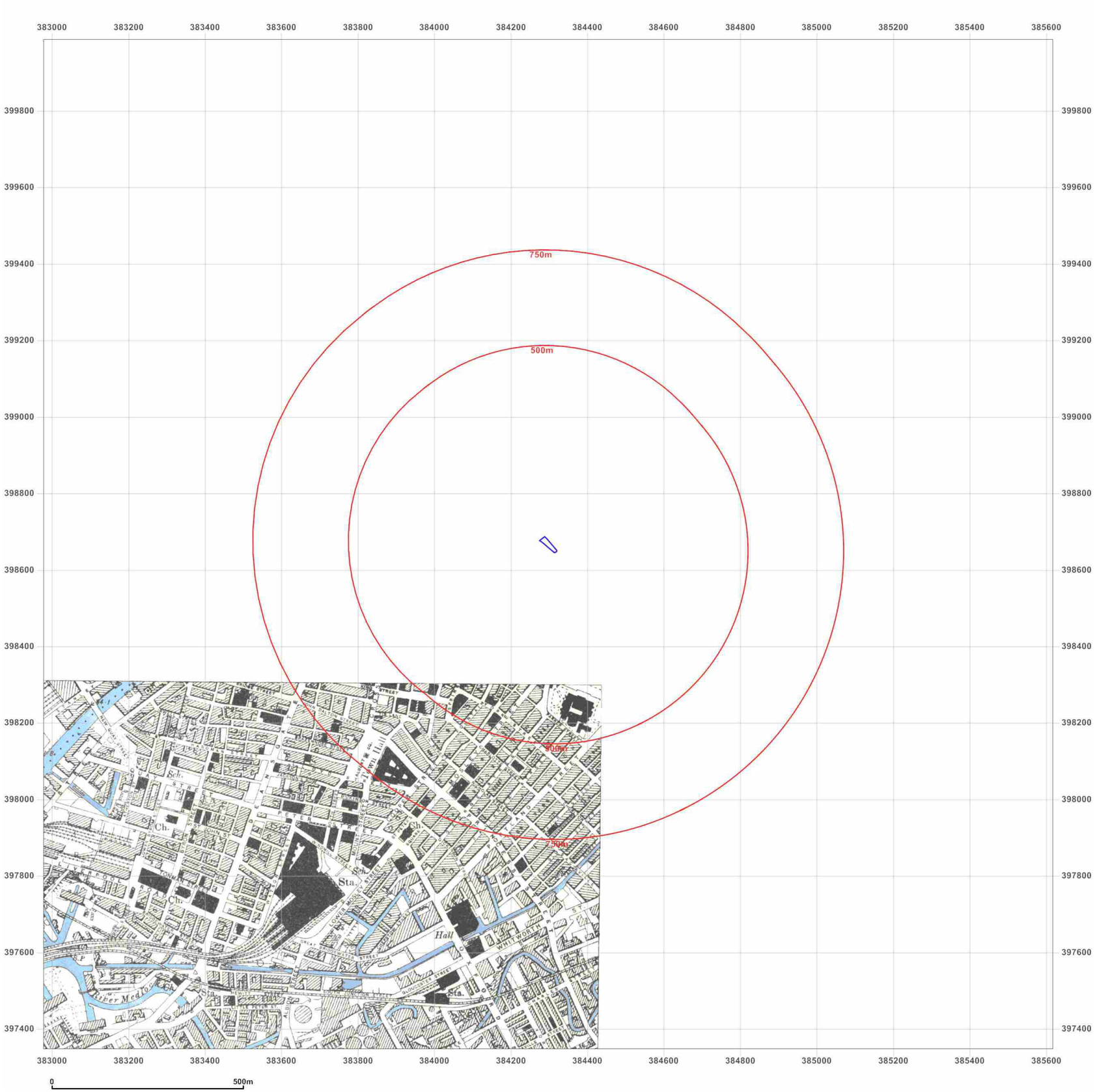
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1896**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1896
Edition 1896
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1905-1906**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1844
Revised 1906
Edition 1906
Copyright N/A
Levelled N/A

Surveyed 1844
Revised 1906
Edition 1906
Copyright N/A
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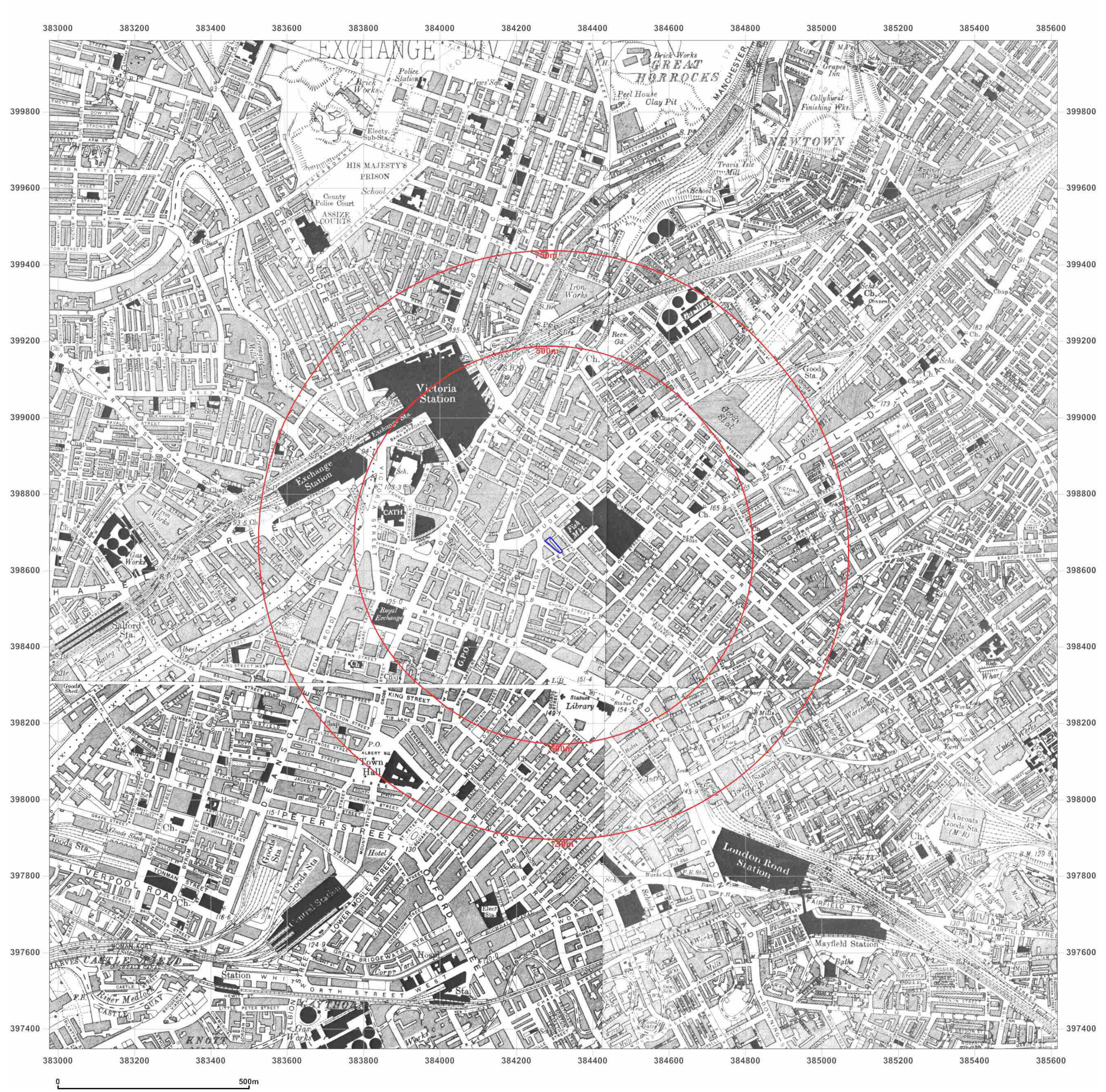
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1EZ

Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1916
Edition 1923
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Surveyed 1844
Revised 1921
Edition 1923
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Levelled 1906

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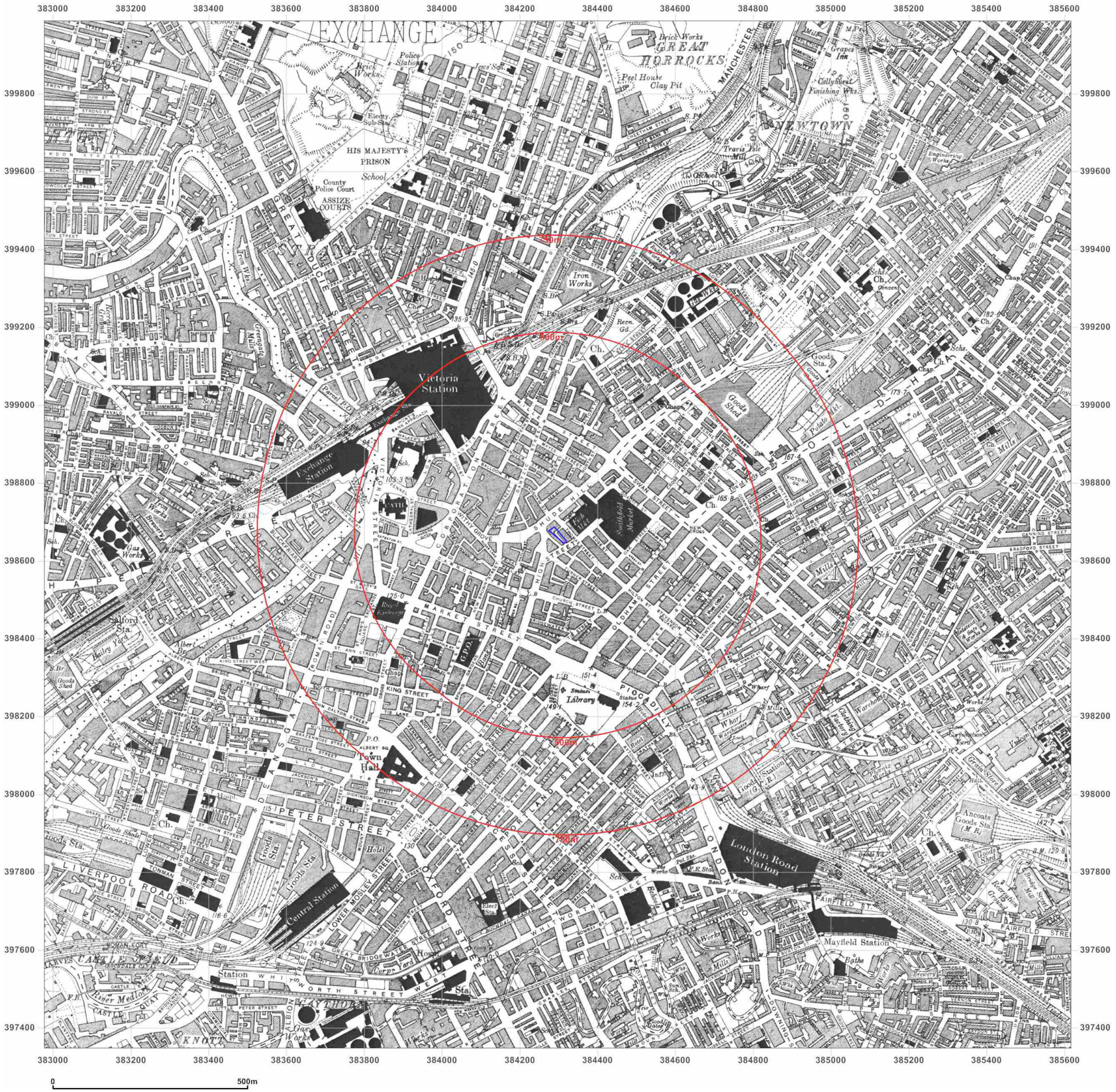
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Client Ref: EMS_488118_655938
Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
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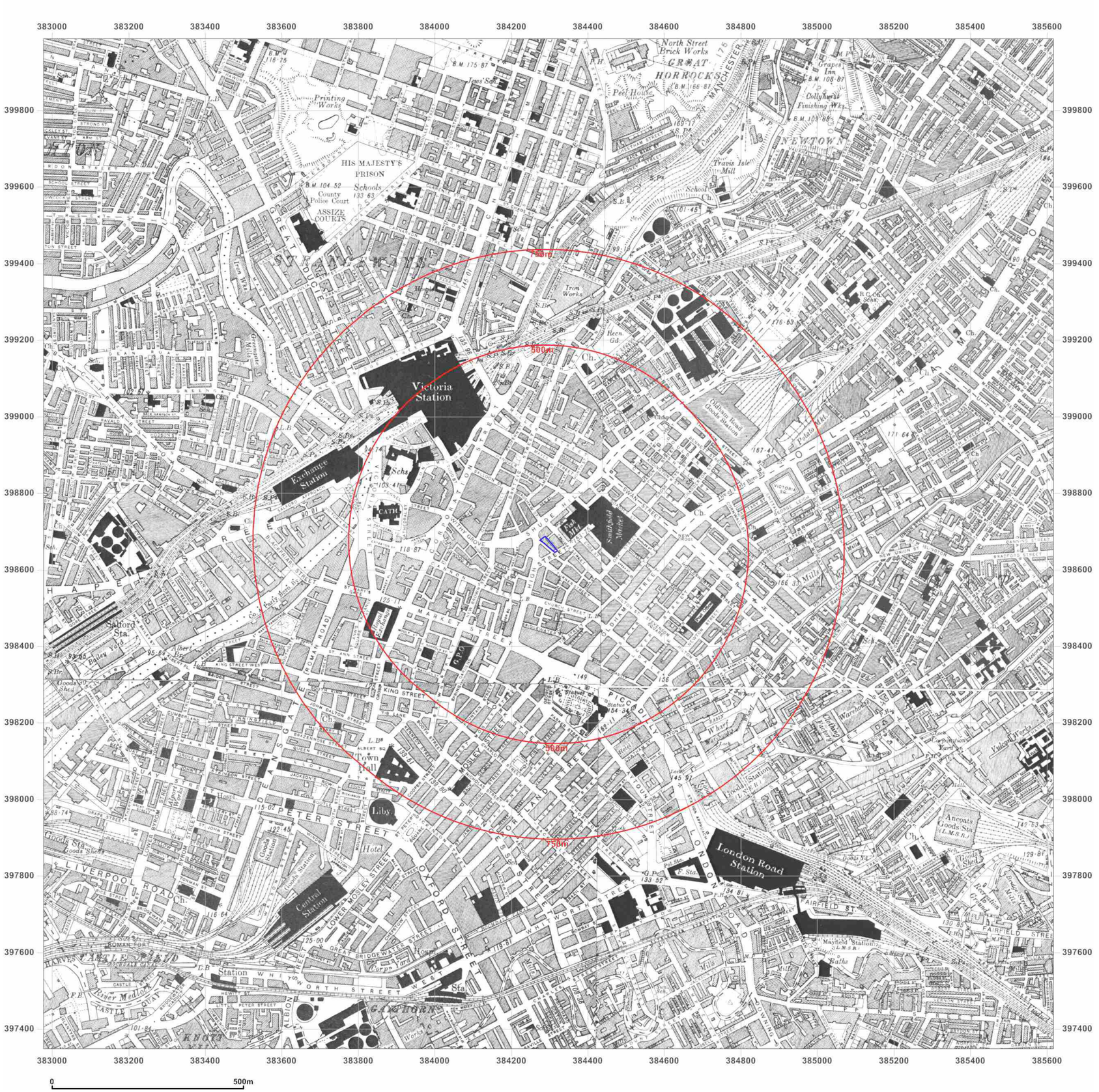
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Map Name: County Series

Map date: **1931-1934**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1931
Edition 1931
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Map Name: County Series

Map date: **1938**

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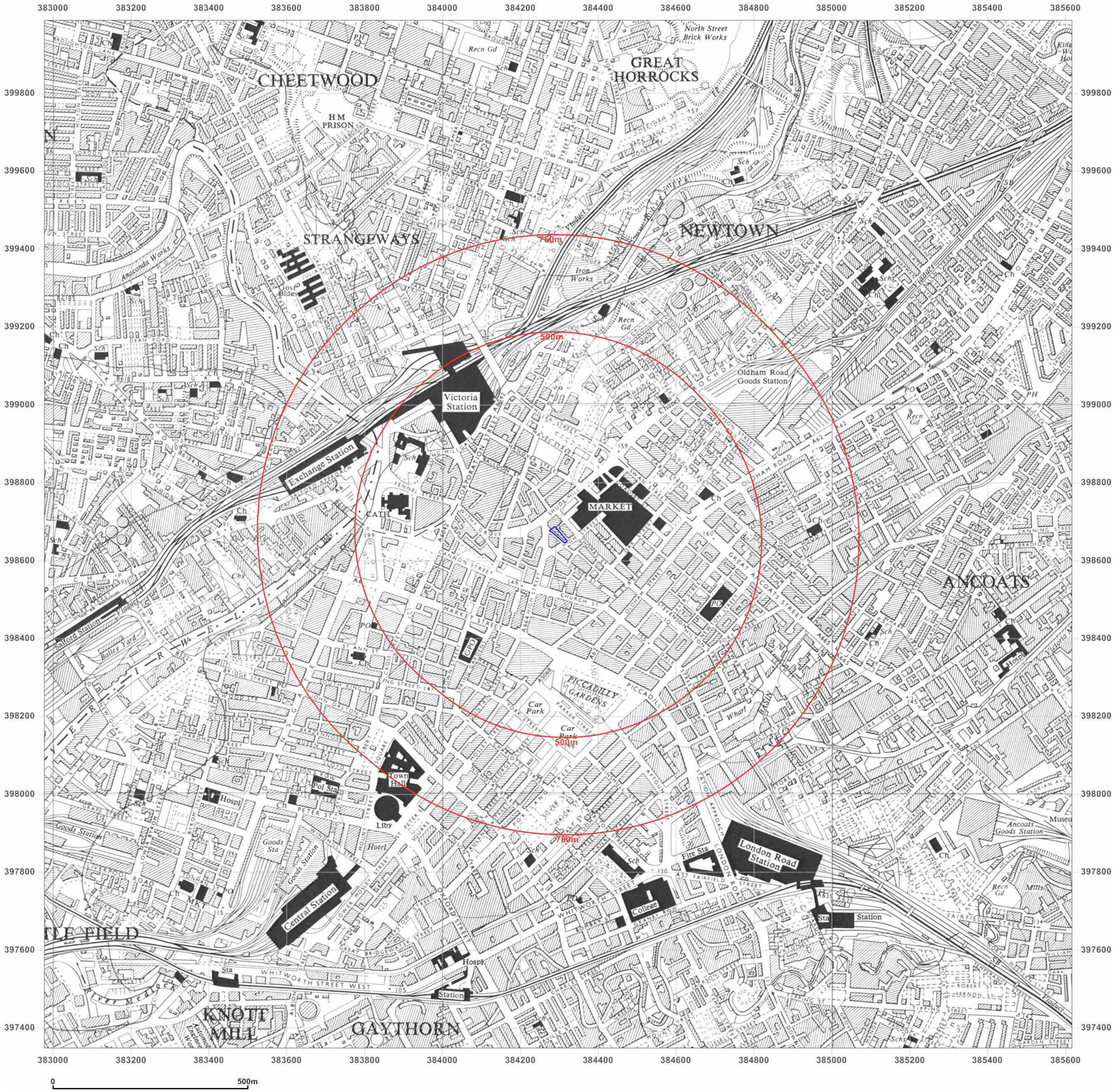
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Map Name: Provisional

Map date: **1956**

Scale: 1:10,560

Printed at: 1:10,560

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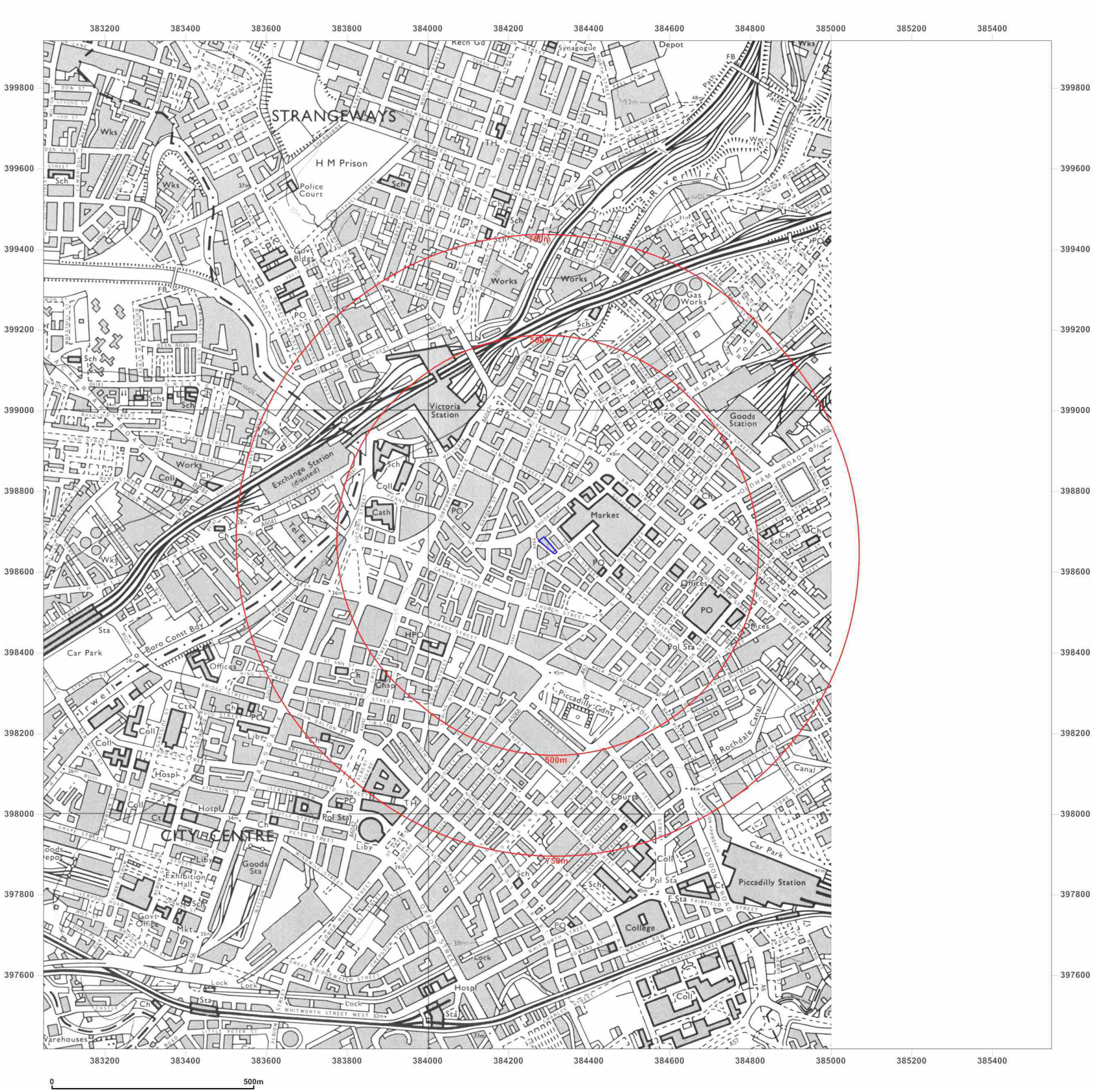
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Map Name: National Grid

Map date: **1972**

Scale: 1:10,000

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Map Name: National Grid

Map date: **1980-1981**

Scale: 1:10,000

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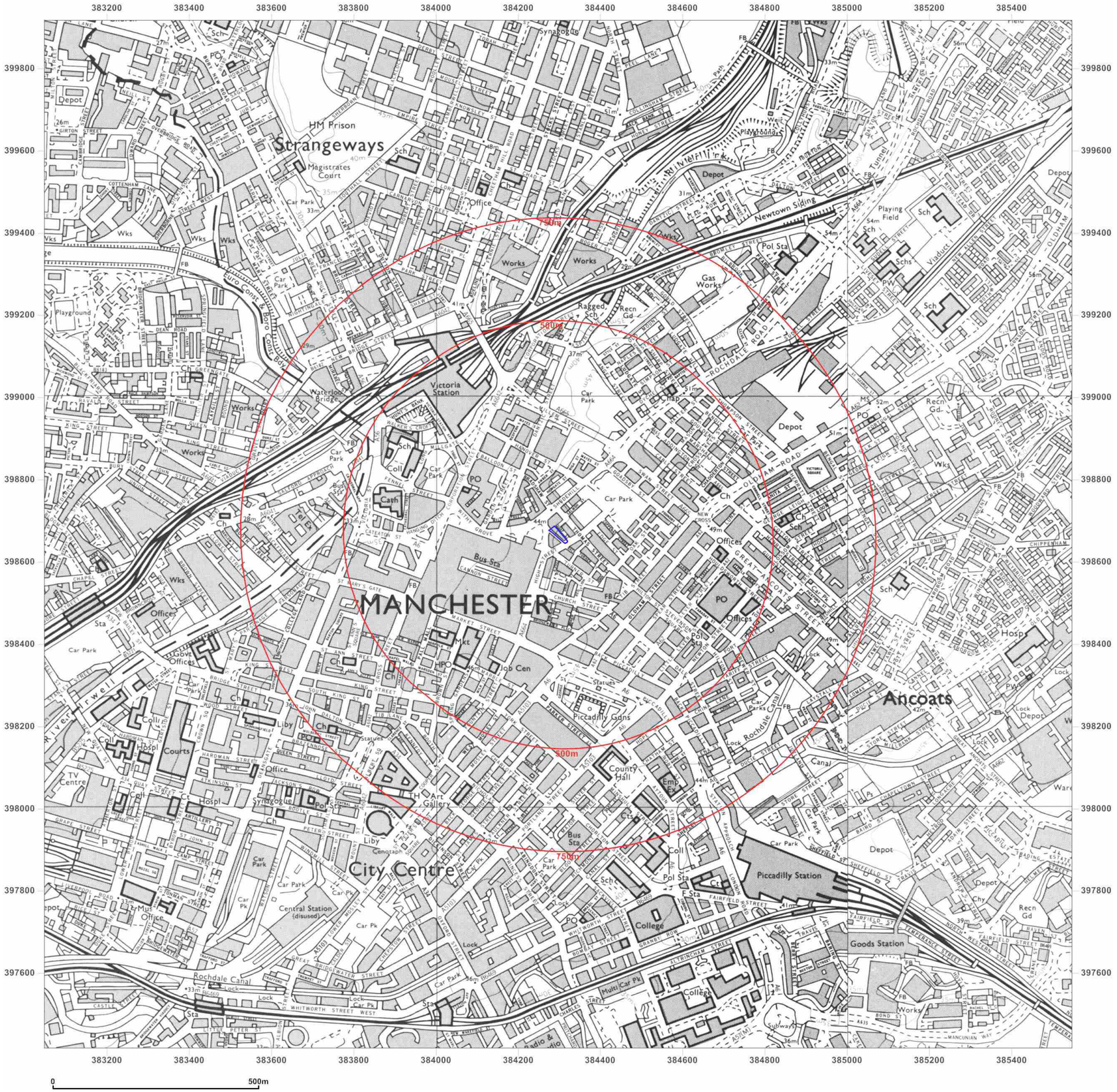
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Map Name: National Grid

Map date: **1985**

Scale: 1:10,000

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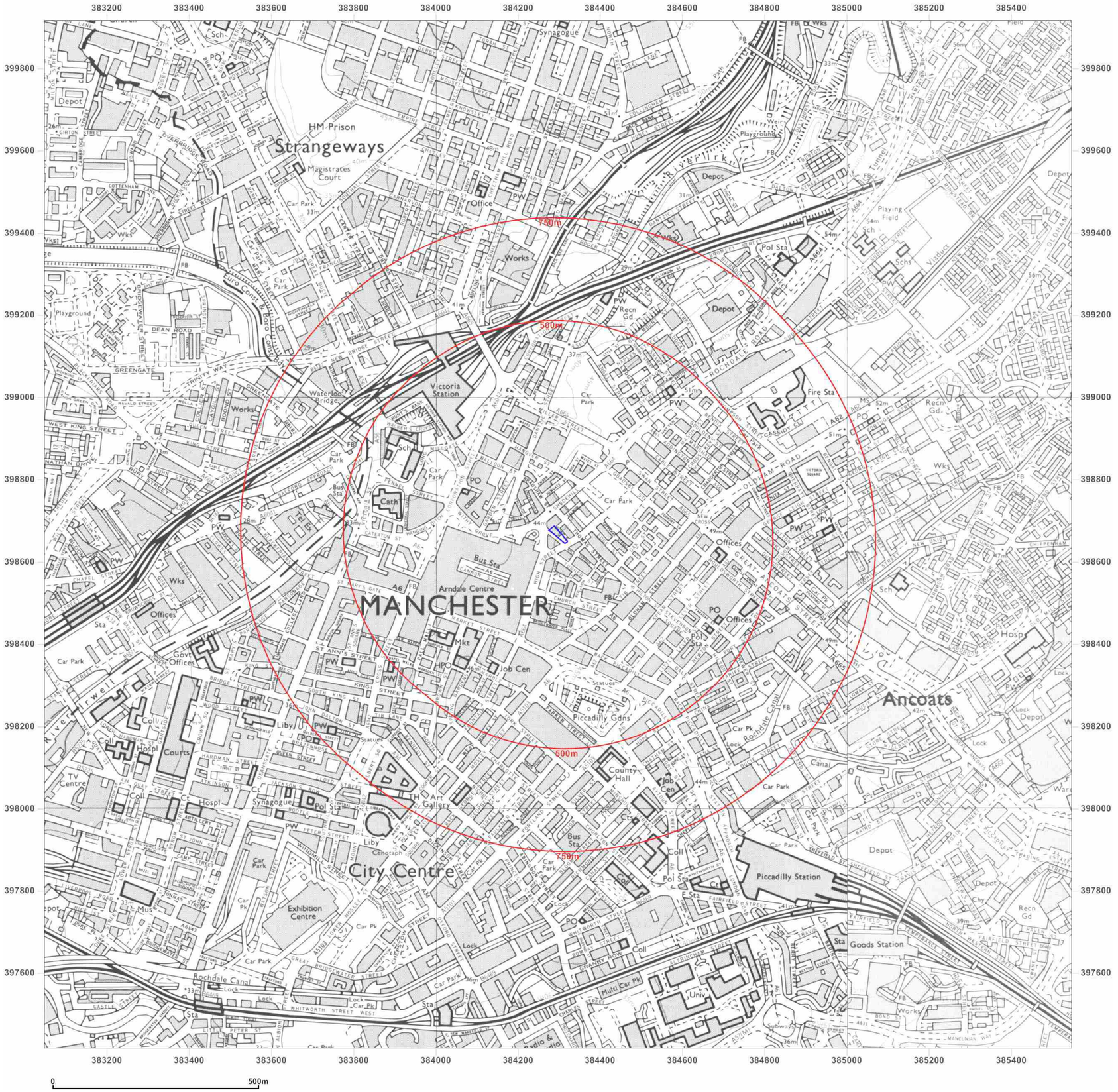
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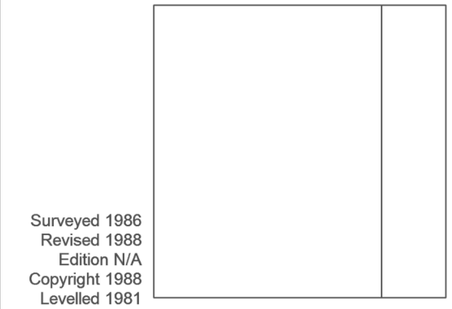
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Map date: **1988-1991**

Scale: 1:10,000

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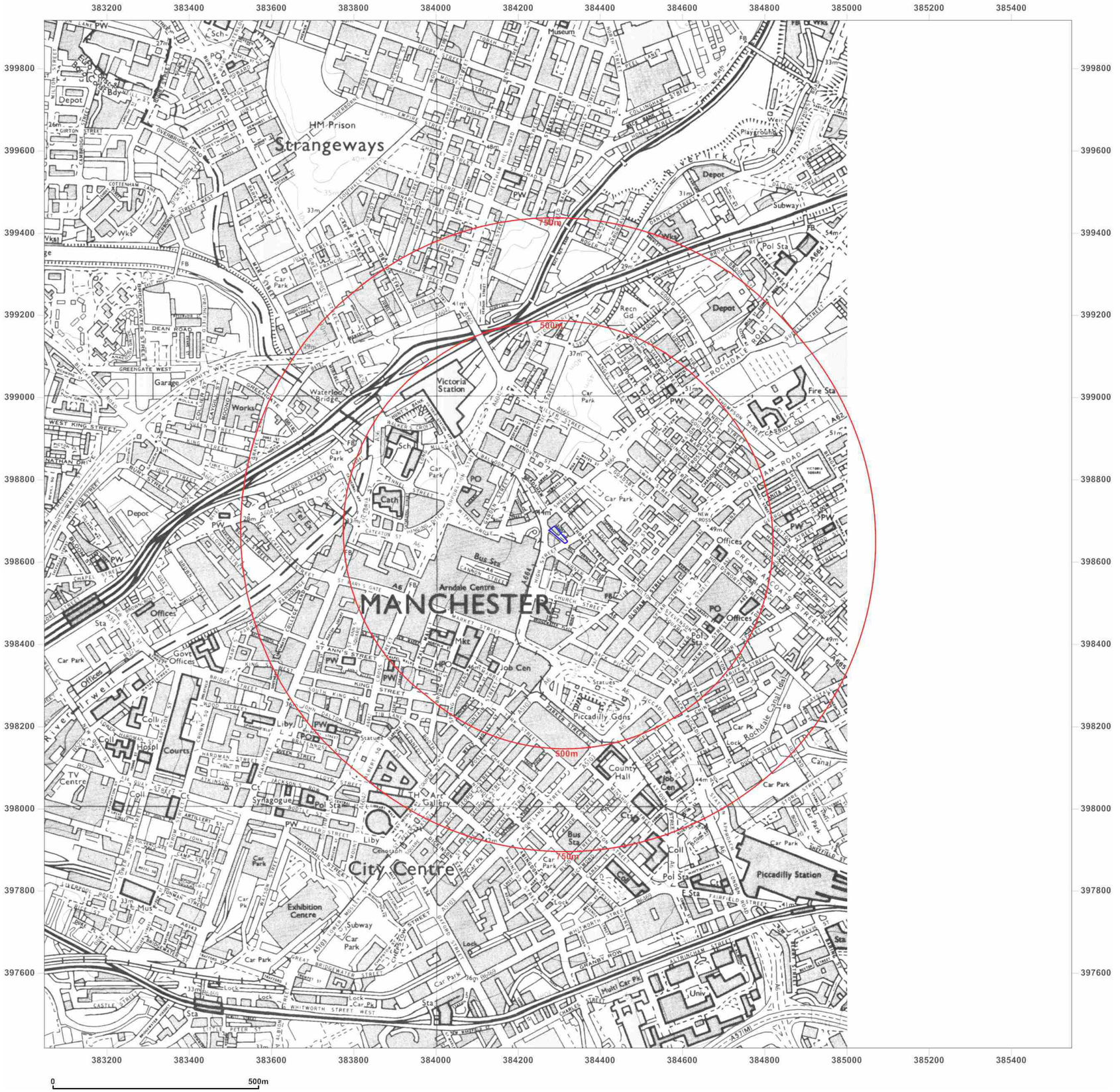
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Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **1994**

Scale: 1:10,000

Printed at: 1:10,000

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Map date: **2002**

Scale: 1:10,000

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Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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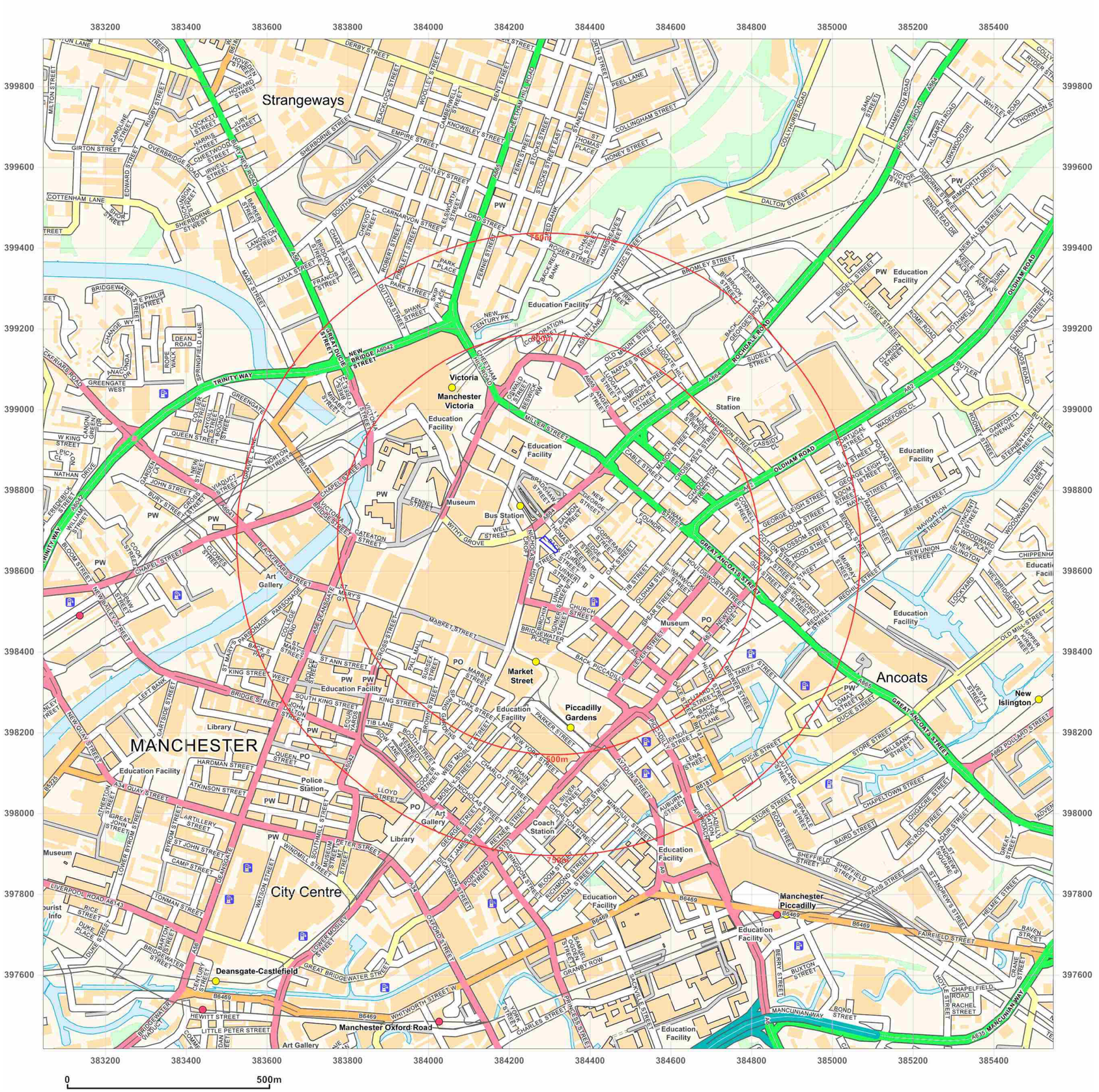
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Report Ref: EMS-488118_655938
Grid Ref: 384296, 398667

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

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2014

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APPENDIX C
GroundSure Report

EmapSite

Masdar House, 1 Reading Road,
Eversley, RG27 0RP

Groundsure Reference:	EMS-488118_655939
Your Reference:	EMS_488118_655939
Report Date	6 Jul 2018
Report Delivery Method:	Email - pdf

Enviro Insight

Address: Back Turner , Manchester , M4 1EZ,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Enviroinsight

Enviro Insight

Address:	**Back Turner , Manchester , M4 1EZ,**
Date:	**6 Jul 2018**
Reference:	**EMS-488118_655939**
Client:	**EmapSite**

NW N NE

W E



SW S SE

Aerial Photograph Capture date:	11-Jun-2015
Grid Reference:	384297,398667
Site Size:	0.06ha

Report Reference: EMS-488118_655939
Client Reference: EMS_488118_655939

Contents Page

Contents Page 3
Overview of Findings 6
Using this report 10
1. Historical Land Use 11
1. Historical Industrial Sites 12
1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping....12
1.2 Additional Information – Historical Tank Database....14
1.3 Additional Information – Historical Energy Features Database....15
1.4 Additional Information – Historical Petrol and Fuel Site Database....16
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database....16
1.6 Potentially Infilled Land....17
2. Environmental Permits, Incidents and Registers Map 19
2. Environmental Permits, Incidents and Registers 20
2.1 Industrial Sites Holding Licences and/or Authorisations....20
2.1.1 Records of historic IPC Authorisations within 500m of the study site:....20
2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:....20
2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:....20
2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:....20
2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:....20
2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 21
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:....21
2.1.8 Records of Licensed Discharge Consents within 500m of the study site:....21
2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 23
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:....24
2.2 Dangerous or Hazardous Sites....24
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents....24
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:....24
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:....24
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990....24
3. Landfill and Other Waste Sites Map 25
3. Landfill and Other Waste Sites 26
3.1 Landfill Sites....26
3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site: 26
3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site: 26
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:....27
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:....27
3.2 Other Waste Sites....27
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site: 27
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site: 28
4. Current Land Use Map 33
4. Current Land Uses 34
4.1 Current Industrial Data....34
4.2 Petrol and Fuel Sites....35
4.3 National Grid High Voltage Underground Electricity Transmission Cables....36
4.4 National Grid High Pressure Gas Transmission Pipelines....36

5. Geology 37
5.1 Artificial Ground and Made Ground 37
5.2 Superficial Ground and Drift Geology 37
5.3 Bedrock and Solid Geology 37
6 Hydrogeology and Hydrology 38
6a. Aquifer Within Superficial Geology 38
6b. Aquifer Within Bedrock Geology and Abstraction Licenses 39
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses 40
6d. Hydrogeology – Source Protection Zones within confined aquifer 41
6e. Hydrology – Watercourse Network and River Quality 42
6.Hydrogeology and Hydrology 43
6.1 Aquifer within Superficial Deposits 43
6.2 Aquifer within Bedrock Deposits 43
6.3 Groundwater Abstraction Licences 44
6.4 Surface Water Abstraction Licences 51
6.5 Potable Water Abstraction Licences 51
6.6 Source Protection Zones 54
6.7 Source Protection Zones within Confined Aquifer 54
6.8 Groundwater Vulnerability and Soil Leaching Potential 54
6.9 River Quality 54
6.9.1 Biological Quality: 55
6.9.2 Chemical Quality: 56
6.10 Ordnance Survey MasterMap Water Network 57
6.11 Surface Water Features 58
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea) 59
7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map 60
7 Flooding 61
7.1 River and Coastal Zone 2 Flooding 61
7.2 River and Coastal Zone 3 Flooding 61
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating 61
7.4 Flood Defences 61
7.5 Areas benefiting from Flood Defences 61
7.6 Areas benefiting from Flood Storage 62
7.7 Groundwater Flooding Susceptibility Areas 62
7.8 Groundwater Flooding Confidence Areas 62
8. Designated Environmentally Sensitive Sites Map 63
8. Designated Environmentally Sensitive Sites 64
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site: 64
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site: 64
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site: 64
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site: 64
8.5 Records of Ramsar sites within 2000m of the study site: 64
8.6 Records of Ancient Woodland within 2000m of the study site: 65
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site: 65
8.8 Records of World Heritage Sites within 2000m of the study site: 65
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site: 65
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: 65
8.11 Records of National Parks (NP) within 2000m of the study site: 65
8.12 Records of Nitrate Sensitive Areas within 2000m of the study site: 65
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site: 66

8.14 Records of Green Belt land within 2000m of the study site:.....66
9. Natural Hazards Findings 67
9.1 Detailed BGS GeoSure Data.....67
9.1.1 Shrink Swell.....67
9.1.2 Landslides.....67
9.1.3 Soluble Rocks.....67
9.1.4 Compressible Ground.....68
9.1.5 Collapsible Rocks.....68
9.1.6 Running Sand.....68
9.2 Radon.....69
9.2.1 Radon Affected Areas.....69
9.2.2 Radon Protection.....69
10. Mining 70
10.1 Coal Mining.....70
10.2 Non-Coal Mining.....70
10.3 Brine Affected Areas 70
Contact Details 71
Standard Terms and Conditions 73

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	3	5	74
1.2 Additional Information – Historical Tank Database	0	0	0	18
1.3 Additional Information – Historical Energy Features Database	0	0	25	24
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	3	48
1.6 Potentially Infilled Land	0	0	1	19

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	1
2.1.8 Records of Licensed Discharge Consents	0	0	0	14
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	1
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	0	5
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	1
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	1	10	10

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	4	28	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	2
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	None identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	29	15
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	11	1
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	Yes	Yes
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	0	20	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Enviroment Agency Zone 2 floodplains within 250m of the study site	None identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Limited potential
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Low

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	0	0	1	2
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 Maximum risk of natural ground subsidence	Very Low
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Very Low
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Negligible
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Very Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Coal mining areas within 75m of the study site	Identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

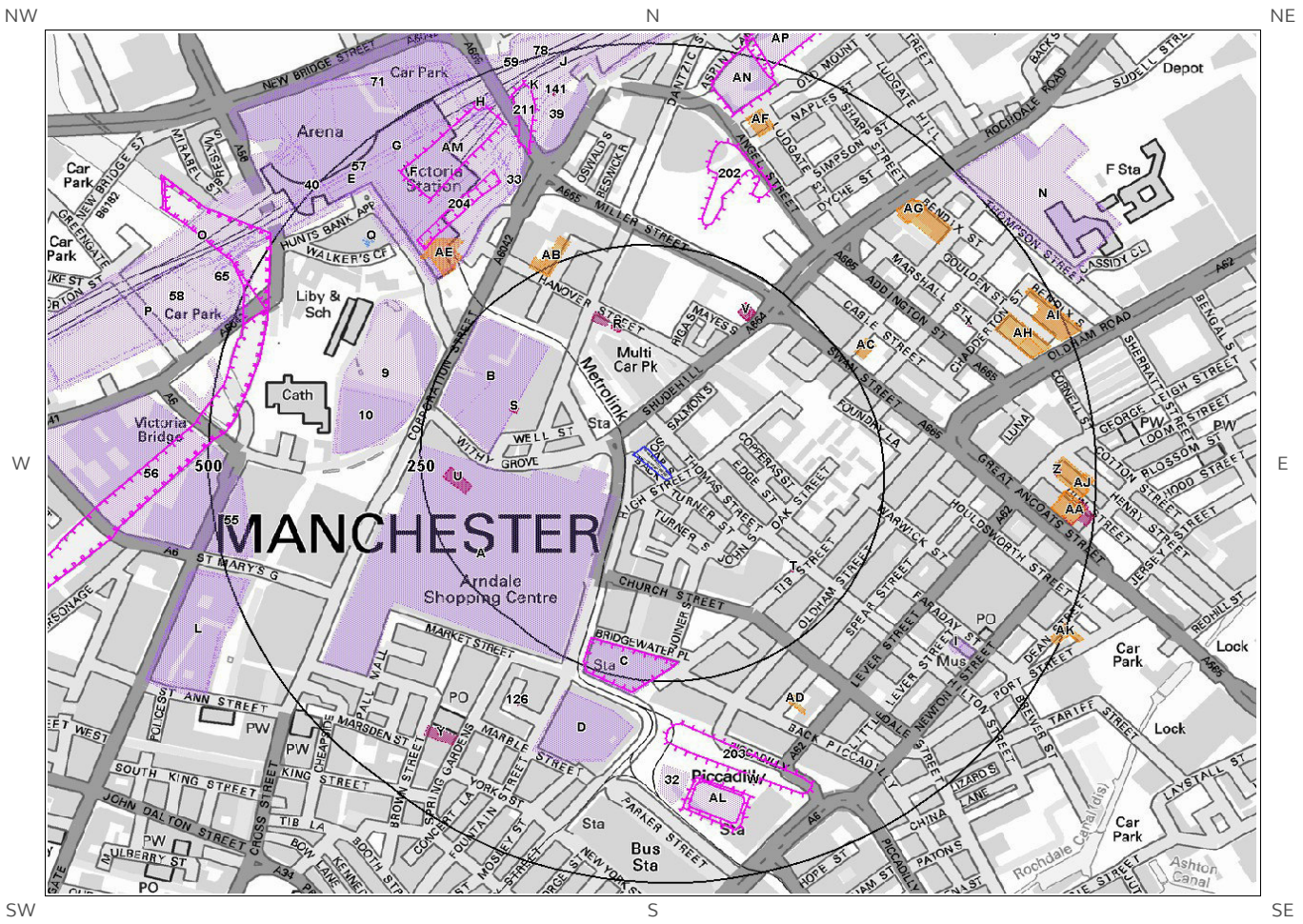
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Site Outline

250
500
Search Buffers (m)

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 82

ID	Distance [m]	Direction	Use	Date
1A	37	SW	Bus Station	1988
2A	37	SW	Bus Station	1985
3A	37	SW	Bus Station	1994
4B	150	NW	Unspecified Commercial/Industrial	1938
5B	151	NW	Unspecified Commercial/Industrial	1931
6B	151	NW	Unspecified Commercial/Industrial	1916
7C	213	S	Unspecified Ground Workings	1931
8C	216	S	Unspecified Commercial/Industrial	1938
9	258	NW	Unspecified Commercial/Industrial	1938
10	265	W	Unspecified Commercial/Industrial	1931
11D	286	SW	Unspecified Commercial/Industrial	1931
12D	286	SW	Unspecified Commercial/Industrial	1916
13D	287	SW	Unspecified Commercial/Industrial	1938
14G	311	NW	Railway Station	1923
15E	314	NW	Railway Sidings	1971
16F	314	NW	Railway Station	1971
17E	314	NW	Railway Sidings	1956
18F	314	NW	Railway Station	1956
19E	314	NW	Railway Sidings	1988
20E	314	NW	Railway Sidings	1978
21F	314	NW	Railway Station	1978
22E	314	NW	Railway Sidings	1985
23E	314	NW	Railway Sidings	1994
24G	316	NW	Railway Station	1906
25G	316	NW	Railway Station	1916
26G	316	NW	Railway Station	1931
27G	316	NW	Railway Station	1938
28F	316	NW	Railway Station	1988

29F	316	NW	Railway Station	1985
30F	320	NW	Railway Station	1994
31	350	NW	Railway Sidings	1923
32	353	S	Bus Station	1978
33	354	NW	Railway Building	1923
34H	366	NW	Railway Sidings	1931
35H	366	NW	Railway Sidings	1916
36H	366	NW	Railway Sidings	1938
37H	366	NW	Railway Sidings	1906
38AL	377	S	Unspecified Pit	1956
39	378	N	Unspecified Commercial/Industrial	1923
40	381	NW	Railway Stations	1894
41I	387	SE	Police Station	1978
42I	387	SE	Police Station	1971
43I	387	SE	Police Station	1985
44AM	396	NW	Gravel Yard	1851
45J	398	N	Railway Sidings	1923
46I	399	SE	Police Station	1994
47I	399	SE	Police Station	1988
48J	421	N	Railway Sidings	1931
49J	421	N	Railway Sidings	1938
50J	421	N	Railway Sidings	1916
51J	421	N	Railway Sidings	1906
52AN	426	N	Disused Grave Yard	1978
53K	456	N	Railway Building	1916
54K	456	N	Railway Building	1931
55	459	W	Unspecified Commercial/Industrial	1931
56	461	W	Unspecified Commercial/Industrial	1938
57	462	NW	Railway Station	1851
58	462	NW	Exchange Station	1923
59	471	NW	Railway Sidings	1894
60L	476	W	Unspecified Commercial/Industrial	1894
61L	481	W	Unspecified Commercial/Industrial	1916
62L	481	W	Unspecified Commercial/Industrial	1931
63L	481	W	Unspecified Commercial/Industrial	1938
64L	482	W	Unspecified Commercial/Industrial	1906
65	484	W	Cotton Mill	1851
66M	488	W	Bus Station	1988
67M	488	W	Bus Station	1985
68AP	491	N	Grave Yard	1851

69N	495	NE	Goods Station	1938
70N	495	NE	Goods Station	1933
71	495	NW	Workhouse	1851
72N	496	NE	Goods Shed	1923
73N	497	NE	Goods Shed	1921
74O	497	NW	Railway Sidings	1938
75O	497	NW	Railway Sidings	1931
76O	497	NW	Railway Sidings	1916
77O	497	NW	Railway Sidings	1906
78	498	N	Railway Building	1923
79P	499	W	Exchange Station	1931
80P	499	W	Exchange Station	1916
81P	499	W	Exchange Station	1938
82P	499	W	Exchange Station	1906

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 18

ID	Distance (m)	Direction	Use	Date
83Q	404	NW	Unspecified Tank	1949
84Q	404	NW	Unspecified Tank	1970
85Q	404	NW	Unspecified Tank	1955
86Q	404	NW	Unspecified Tank	1957
87Q	404	NW	Unspecified Tank	1963
88Q	404	NW	Unspecified Tank	1970
89Q	404	NW	Unspecified Tank	1958
90Q	404	NW	Unspecified Tank	1933
91Q	404	NW	Unspecified Tank	1922
92Q	404	NW	Unspecified Tank	1908
93Q	406	NW	Unspecified Tank	1891
94K	465	N	Unspecified Tank	1963
95K	465	N	Unspecified Tank	1952
96K	465	N	Unspecified Tank	1949
97K	465	N	Unspecified Tank	1958
98K	465	N	Unspecified Tank	1964
99K	465	N	Unspecified Tank	1949
100K	465	N	Unspecified Tank	1952

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 49

ID	Distance (m)	Direction	Use	Date
101R	144	N	Electricity Substation	1992
102R	144	N	Electricity Substation	1948
103R	144	N	Electricity Substation	1951
104R	144	N	Electricity Substation	1986
105R	145	N	Electricity Substation	1953
106R	145	N	Electricity Substation	1980
107S	146	NW	Electricity Substation	1948
108S	146	NW	Electricity Substation	1951
109S	146	NW	Electricity Substation	1953
110S	147	W	Electricity Substation	1953
111R	156	N	Electricity Substation	1953
112T	182	SE	Electricity Substation	1980
113T	183	SE	Electricity Substation	1992
114T	183	SE	Electricity Substation	1986
115U	193	W	Electricity Substation	1953
116U	193	W	Electricity Substation	1953
117V	197	NE	Electricity Substation	1992
118V	197	NE	Electricity Substation	1953
119V	197	NE	Electricity Substation	1953
120V	197	NE	Electricity Substation	1980
121V	197	NE	Electricity Substation	1986
122V	197	NE	Electricity Substation	1948
123V	197	NE	Electricity Substation	1951
124U	204	W	Electricity Substation	1948
125U	204	W	Electricity Substation	1951
126	327	SW	Electricity Substation	1995
127W	388	S	Electricity Substation	1986
128W	388	S	Electricity Substation	1995
129X	394	NE	Electricity Substation	1988
130X	395	NE	Electricity Substation	1995
131X	395	NE	Electricity Substation	1984
132Y	401	SW	Electricity Substation	1953
133Y	401	SW	Electricity Substation	1953
134Y	408	SW	Electricity Substation	1953
135Y	408	SW	Electricity Substation	1967
136Y	408	SW	Electricity Substation	1968
137Y	408	SW	Electricity Substation	1948

138Y	408	SW	Electricity Substation	1953
139K	447	N	Electricity Substation	1995
140K	449	N	Electricity Substation	1990
141	449	N	Electricity Substation	1990
142Z	449	E	Electricity Substation	1995
143Z	451	E	Electricity Substation	1988
144AA	462	E	Electricity Substation	1953
145AA	463	E	Electricity Substation	1953
146AA	463	E	Electricity Substation	1988
147AA	463	E	Electricity Substation	1953
148AA	464	E	Electricity Substation	1984
149AA	480	E	Electricity Substation	1995

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 51

ID	Distance (m)	Direction	Use	Date
150AB	239	NW	Garage	1953
151AB	240	NW	Garage	1951
152AB	240	NW	Garage	1948
153AC	264	NE	Garage	1963
154AC	264	NE	Garage	1988
155AC	265	NE	Garage	1995
156AD	305	SE	Garage	1965
157AD	306	SE	Garage	1953
158AD	306	SE	Garage	1953
159AD	307	SE	Garage	1953
160AE	312	NW	Carriage Works	1892
161AE	312	NW	Carriage Works	1892
162AE	312	NW	Carriage Works	1891
163AF	407	N	Garage	1958

164AF	407	N	Garage	1952
165AF	408	N	Garage	1952
166AG	413	NE	Garage	1984
167AG	415	NE	Garage	1963
168AG	415	NE	Garage	1953
169AG	415	NE	Garage	1988
170AG	416	NE	Garage	1967
171AG	416	NE	Garage	1953
172AG	416	NE	Garage	1965
173AG	416	NE	Garage	1995
174AH	421	NE	Garage	1965
175AH	421	NE	Garage	1967
176AH	437	E	Garage	1953
177AH	437	E	Garage	1963
178AH	438	E	Garage	1953
179AA	448	E	Garage	1995
180AA	448	E	Garage	1953
181AA	448	E	Garage	1963
182AA	448	E	Garage	1988
183AA	449	E	Garage	1967
184AA	449	E	Garage	1965
185AA	449	E	Garage	1953
186Z	451	E	Garage	1995
187AI	467	NE	Garage	1963
188AI	467	NE	Garage	1953
189AI	467	NE	Garage	1967
190AI	467	NE	Garage	1965
191AI	467	NE	Garage	1953
192AJ	470	E	Garage	1988
193AJ	470	E	Garage	1953
194AJ	470	E	Garage	1963
195AJ	470	E	Garage	1967
196AJ	470	E	Garage	1953
197AJ	470	E	Garage	1965
198AJ	471	E	Garage	1984
199AK	489	SE	Garage	1971
200AK	492	SE	Garage	1971

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 20

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date

201C	213	S	Unspecified Ground Workings	1931
202	284	N	Pond	1851
203	303	S	Pond	1851
204	354	NW	Pond	1894
205AL	371	S	Pond	1971
206AL	371	S	Pond	1988
207AL	371	S	Pond	1978
208AL	371	S	Pond	1985
209AL	371	S	Pond	1994
210AL	377	S	Unspecified Pit	1956
211	393	N	Pond	1894
212AM	396	NW	Gravel Yard	1851
213AN	426	N	Disused Grave Yard	1978
214AO	455	W	Canal	1994
215AO	455	W	Canal	1985
216AO	455	W	Canal	1978
217AO	455	W	Canal	1988
218AO	455	W	Canal	1971
219AO	455	W	Canal	1956
220AP	491	N	Grave Yard	1851

2. Environmental Permits, Incidents and Registers Map



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- Site Outline
- Search Buffers (m) (250, 500)
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licenced Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

2

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
16	174	S	384253 398482	Address: Johnsons Cleaners UK Ltd, 24 High Street, City Centre, Manchester, M4 1QB Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
17	402	E	384703 398532	Address: Express Printers Manchester Ltd, Hery Street, Ancoats, M60 4HB Process: Coating processes. Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

1

The following RAS Licence (3 or 4) records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Address	Operator	Type	Permission Number	Dates	Status
19E	354	NE	384470 398990	Brooke Edgley Specialist Technical Services Ltd, Unit 4, Angel Industrial Estate, Angel Street, Manchester, M4 4BQ	Brooke Edgley Specialist Technical Services Ltd	Disposal Of Radioactive Waste (was Rsa60 Section 6).	BI9880	Date of Approval:7/8/2000 Effective from:7/8/2000 Last date of update:2015-01-01	Revoked/cancelled

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

14

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
2A	360	NW	384000 398910	Address: LONG MILLGATE -TODD ST, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0160 Permit Version: 1	Receiving Water: RIVER IRK Status: CONSENT REVOKED OR REVISED - NEW CONSENT ISSUED (37(1)) Issue date: 01/01/1995 Effective Date: 01-Jan-1995 Revocation Date: 31/05/2005

ID	Distance (m)	Direction	NGR	Details	
3A	360	NW	384000 398910	Address: LONG MILLGATE -TODD ST, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016993741 Permit Version: 1	Receiving Water: RIVER IRK Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY Issue date: 01/06/2005 Effective Date: 01-Jun-2005 Revocation Date: -
4B	367	NW	384044 398963	Address: HANOVER STREET CSO, HANOVER STREET/LONG MILL GATE, ., MANCHESTER, GREATER MANCHESTER, M60 0AD Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0158 Permit Version: 3	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 05/02/2016 Effective Date: 05-Feb-2016 Revocation Date: -
5B	369	NW	384050 398970	Address: HANOVER STREET CSO, HANOVER STREET/LONG MILL GATE, ., MANCHESTER, GREATER MANCHESTER, M60 0AD Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0158 Permit Version: 1	Receiving Water: RIVER IRK Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 Issue date: - Effective Date: 01-Jan-1995 Revocation Date: 02/09/2010
6B	369	NW	384050 398970	Address: HANOVER STREET CSO, HANOVER STREET/LONG MILL GATE, ., MANCHESTER, GREATER MANCHESTER, M60 0AD Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0158 Permit Version: 2	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 03/09/2010 Effective Date: 03-Sep-2010 Revocation Date: 04/02/2016
7C	381	NW	384120 399030	Address: CORPORATION STREET CSO, CORPORATION ST NR JCT MILLER ST, ., MANCHESTER, GREATER MANCHESTER, M60 0AB Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0159 Permit Version: 2	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 03/09/2010 Effective Date: 03-Sep-2010 Revocation Date: 21/03/2016
8C	381	NW	384120 399030	Address: CORPORATION STREET CSO, CORPORATION ST NR JCT MILLER ST, ., MANCHESTER, GREATER MANCHESTER, M60 0AB Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0159 Permit Version: 1	Receiving Water: RIVER IRK Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 Issue date: - Effective Date: 01-Jan-1995 Revocation Date: 02/09/2010
9C	381	NW	384120 399030	Address: CORPORATION STREET CSO, CORPORATION ST NR JCT MILLER ST, ., MANCHESTER, GREATER MANCHESTER, M60 0AB Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0159 Permit Version: 3	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 22/03/2016 Effective Date: 22-Mar-2016 Revocation Date: -

ID	Distance (m)	Direction	NGR	Details	
10D	401	N	384140 399060	Address: MILLER STREET/CORPORATION ST CSO, MILLER STREET, ., MANCHESTER, GREATER MANCHESTER, M4 4DY Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0161 Permit Version: 1	Receiving Water: RIVER IRK Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 Issue date: - Effective Date: 01-Jan-1995 Revocation Date: 02/09/2010
11D	401	N	384140 399060	Address: MILLER STREET/CORPORATION ST CSO, MILLER STREET, ., MANCHESTER, GREATER MANCHESTER, M4 4DY Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0161 Permit Version: 2	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 03/09/2010 Effective Date: 03-Sep-2010 Revocation Date: 10/01/2017
12D	401	N	384140 399060	Address: MILLER STREET/CORPORATION ST CSO, MILLER STREET, ., MANCHESTER, GREATER MANCHESTER, M4 4DY Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0161 Permit Version: 3	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 11/01/2017 Effective Date: 11-Jan-2017 Revocation Date: -
13	428	W	383850 398740	Address: SUBWAY - VICTORIA AVENUE, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY Permit Number: 01MAN0175 Permit Version: 1	Receiving Water: RIVER IRK Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 15-Sep-1993 Revocation Date: 15/09/1993
14	448	NW	383938 398974	Address: HUNTS BANK CSO, HUNTS BANK, ., MANCHESTER, GREATER MANCHESTER, M3 1AX Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0176 Permit Version: 3	Receiving Water: RIVER IRK Status: VARIED UNDER EPR 2010 Issue date: 05/02/2016 Effective Date: 05-Feb-2016 Revocation Date: -
15	460	W	383820 398750	Address: VICTORIA ARCHES, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0357 Permit Version: 1	Receiving Water: - Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 Issue date: - Effective Date: 01-Jan-1995 Revocation Date: -

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

1

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1	405	S	384409 398252	Incident Date: 12-Feb-2002 Incident Identification: 57989 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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Site Outline

250
500
Search Buffers (m)

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

5

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1013	NW		Site Address: Overbridge Road, Salford, Greater Manchester Waste Licence: - Site Reference: E090 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1079	N		Site Address: Queens Road Tip - Land to South of Queens Road and North of Collingham Street, Cheetham, Manchester, Greater Manchester Waste Licence: Yes Site Reference: F005,RD/LIC/241/82 Waste Type: Inert, Industrial, Commercial, Household, Special, Liquid sludge Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 01-Jan-1974 Licence Surrendered: Licence Holder Address: - Operator: H Evers Limited Licence Holder: Manchester City Council First Recorded: 31-Dec-1955 Last Recorded: 31-Dec-1970
Not shown	1206	NE		Site Address: Sand Street, Collyhurst, Greater Manchester Waste Licence: - Site Reference: F027 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
Not shown	1249	N		Site Address: Elizabeth Street, Cheetham, Greater Manchester Waste Licence: - Site Reference: F030 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -

ID	Distance (m)	Direction	NGR	Details	
Not shown	1482	NE		Site Address: Land at Fitzgeorge Street, Collyhurst, Manchester, Greater Manchester Waste Licence: - Site Reference: F031 Waste Type: - Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

1

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	1370	NW	383302 399677	Pricewise, 1 Overbridge Road, Salford	Manchester city council	Point

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

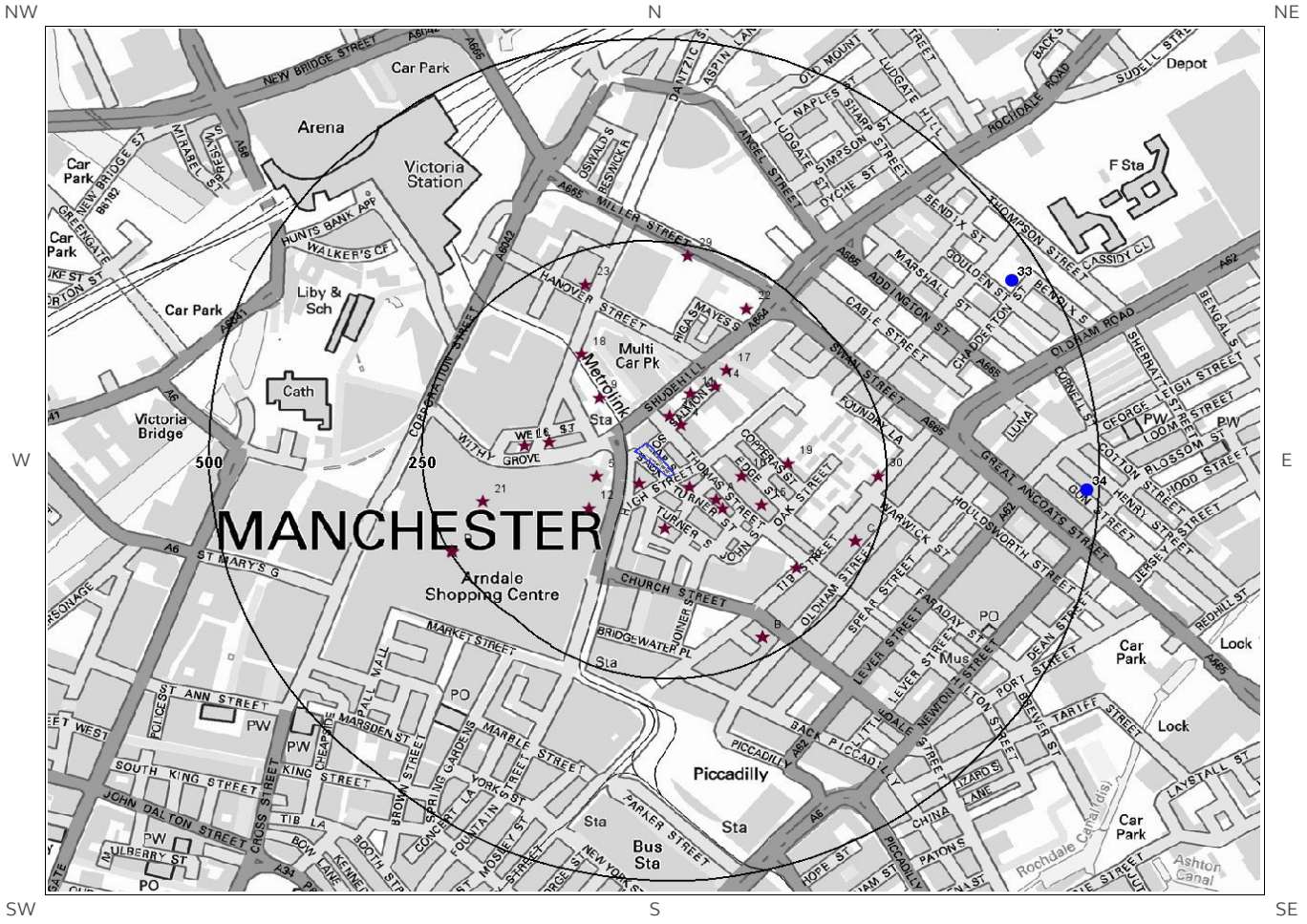
ID	Distance (m)	Direction	NGR	Details	
6	491	NE	384771 398842	Site Address: - Type: ELV Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: KER003 EPR reference: EA/EPR/TP3494CL/S002 Operator: Brendan J Kershaw & Winston Brown Waste Management licence No: 50328 Annual Tonnage: 0.0	Issue Date: 10/08/2004 Effective Date: - Modified: - Surrendered Date: 06/07/2010 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: French Parts Uk Correspondence Address: -
Not shown	713	N	384300 399400	Site Address: Red Bank, Cheetham Hill, Manchester, M8 Type: Mobile Plant Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MEL002 EPR reference: EA/EPR/LP3292ZH/S002 Operator: Mel Ltd Waste Management licence No: 65243 Annual Tonnage: 75000.0	Issue Date: 17/04/2002 Effective Date: - Modified: - Surrendered Date: 06/02/2007 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Mobile Plant Correspondence Address: -
Not shown	722	N	384400 399400	Site Address: - Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: PLT001 EPR reference: EA/EPR/CP3998CM/A001 Operator: Placemix Ltd Waste Management licence No: 50017 Annual Tonnage: 24900.0	Issue Date: 31/03/2000 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Placemix Ltd Transfer Station Correspondence Address: -
Not shown	800	NE	384650 399400	Site Address: Warford Street, Collyhurst, Manchester, M4 4JJ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: FPL001 EPR reference: EA/EPR/DP3098CF/A001 Operator: Farlam Properties Ltd Waste Management licence No: 50118 Annual Tonnage: 24999.0	Issue Date: 27/08/2002 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Farlam Properties Ltd Correspondence Address: -
Not shown	800	NE	384650 399400	Site Address: Warford Street, Collyhurst, Manchester, M4 4DD Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: FAR008 EPR reference: - Operator: Farlam Waste Management Ltd Waste Management licence No: 50461 Annual Tonnage: 0.0	Issue Date: 20/02/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Farlam Waste Management Ltd Correspondence Address: Warford Street, Off Dantzic Street, Collyhurst, Manchester, M4 4DD

ID	Distance (m)	Direction	NGR	Details	
Not shown	800	NE	384650 399400	Site Address: Land/premises At, Warford Street, Collyhurst, Manchester, M4 4DD Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: FAR008 EPR reference: EA/EPR/YP3594CH/V002 Operator: Farlam Waste Management Ltd Waste Management licence No: 50461 Annual Tonnage: 74999.0	Issue Date: 20/02/2007 Effective Date: - Modified: 12/11/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Farlam Waste Management Ltd Correspondence Address: -
Not shown	862	NE	384690 399449	Site Address: Dulwich Street, Collyhurst, Manchester, M4 4JJ Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: JR001 EPR reference: - Operator: J Ryan & Co Ltd Waste Management licence No: 50084 Annual Tonnage: 0.0	Issue Date: 15/03/2002 Effective Date: - Modified: 26/07/2004 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: J Ryan & Co Ltd Correspondence Address: Brian Cook, Pearl Environmental Services, 13, Middleton Road, Reddish, Stockport, Cheshire, SK5 6SG
Not shown	862	NE	384690 399449	Site Address: Land/premises At, Dulwich Street, Collyhurst, Manchester, M4 4JJ Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: JRC001 EPR reference: EA/EPR/WP3898CJ/T003 Operator: Ryan John Waste Management licence No: 50084 Annual Tonnage: 75000.0	Issue Date: 15/03/2002 Effective Date: 04/07/2007 Modified: 26/07/2004 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: J Ryan Correspondence Address: -
Not shown	862	NE	384690 399449	Site Address: Dulwich Street, Collyhurst, Manchester, M4 4JJ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: JR001 EPR reference: - Operator: J Ryan & Co Ltd Waste Management licence No: 50084 Annual Tonnage: 0.0	Issue Date: 15/03/2002 Effective Date: - Modified: 26/07/2004 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: J Ryan & Co Ltd Correspondence Address: Pearl Environmental Services, 13, Middleton Road, Reddish, Stockport, Cheshire, SK5 6SG
Not shown	862	NE	384690 399449	Site Address: Dulwich Street, Collyhurst, Manchester, M4 4JJ Type: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: JR001 EPR reference: - Operator: J Ryan & Co Ltd Waste Management licence No: 50084 Annual Tonnage: 0.0	Issue Date: 15/03/2002 Effective Date: - Modified: 26/07/2004 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: J Ryan & Co Ltd Correspondence Address: Pearl Environmental Services, 13, Middleton Road, Reddish, Stockport, Cheshire, SK5 6SG

ID	Distance (m)	Direction	NGR	Details	
Not shown	895	NE	384690 399487	Site Address: Dulwich Street, Collyhurst, Manchester, M4 4JJ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: JR001 EPR reference: - Operator: J Ryan & Co Ltd Waste Management licence No: 50084 Annual Tonnage: 25000.0	Issue Date: 15/03/2002 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: J Ryan & Co Correspondence Address: Pearl Environmental Services, 13, Middleton Road, Reddish, Stockport, Cheshire, SK5 6SG
Not shown	1017	N	384545 399671	Site Address: 21-23, Honey Street, Collyhurst, Manchester, M8 8RG Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: UKS001 EPR reference: EA/EPR/YP3498CV/T002 Operator: U K Skip Hire Ltd Waste Management licence No: 50136 Annual Tonnage: 24999.0	Issue Date: 02/01/2003 Effective Date: 14/05/2005 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Revoked Site Name: Honey Street Transfer Station Correspondence Address: -
Not shown	1111	N	384610 399750	Site Address: 23, Honey Street, Collyhurst, Manchester, M8 8RG Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: UKS001 EPR reference: - Operator: Uk Skip Hire Ltd Waste Management licence No: 50136 Annual Tonnage: 0.0	Issue Date: 02/01/2003 Effective Date: 14/05/2005 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Honey Street Transfer Station Correspondence Address: 23, Honey Street, Collyhurst, Manchester, M8 8RG
Not shown	1111	N	384610 399750	Site Address: 23, Honey Street, Collyhurst, Manchester, M8 8RG Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MBS001 EPR reference: - Operator: Manchester And Bury Skip Hire Ltd Waste Management licence No: 50136 Annual Tonnage: 0.0	Issue Date: 02/01/2003 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Honey Street Transfer Station Correspondence Address: 28, Alnwick Drive, Bury, Lancashire, BL9 8BZ
Not shown	1230	NW	383354 399493	Site Address: 23, Cottenham Lane, Salford, Manchester, M7 1TH Type: ELV Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MOT002 EPR reference: EA/EPR/SP3694CX/A001 Operator: Motor Body Services (salford) Ltd Waste Management licence No: 50240 Annual Tonnage: 2500.0	Issue Date: 13/07/2004 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: M B S & Partfirst Correspondence Address: -

ID	Distance (m)	Direction	NGR	Details	
Not shown	1230	NW	383354 399493	Site Address: 23, Cottenham Lane, Salford, Manchester, M7 1TH Type: ELV Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MOT002 EPR reference: EA/EPR/SP3694CX/A001 Operator: Motor Body Services (Salford) Ltd Waste Management licence No: 50240 Annual Tonnage: 2500.0	Issue Date: 13/07/2004 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: M B S & Partfirst Correspondence Address: -
Not shown	1310	S	383998 397374	Site Address: Little Ireland Phase B, Great Marlborough Street, Manchester, M1 5NN Type: Mobile Plant Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: TER003 EPR reference: - Operator: Terra Vac (uk) Ltd Waste Management licence No: 50191 Annual Tonnage: 0.0	Issue Date: 17/06/2002 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Terra Vac (uk) Ltd Correspondence Address: Unit 7a, Whitwood Enterprise Park, Castleford, WF10 5PX
Not shown	1394	NW	383200 399566	Site Address: Cambridge Industrial Area, Cottenham Lane, Salford, Lancashire, M7 1GS Type: Special Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GSC001 EPR reference: EA/EPR/UP3692CM/S002 Operator: Granyte Surface Coatings Plc Waste Management licence No: 53446 Annual Tonnage: 50000.0	Issue Date: 21/09/1999 Effective Date: - Modified: - Surrendered Date: 03/07/2002 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Granyte Surface Coatings Plc Correspondence Address: -
Not shown	1446	SE	385296 397583	Site Address: Hoyle Street, Hoyle Trading Estate, Manchester, M12 6JL Type: Inert & excavation Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CIT060 EPR reference: EA/EPR/CB3905MR/A001 Operator: City Excavations Ltd Waste Management licence No: 402399 Annual Tonnage: 75000.0	Issue Date: 01/06/2015 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: City Excavations Aggregate Yard Correspondence Address: -
Not shown	1448	SE	385200 397500	Site Address: 2, Hoyle Street, Ardwick, Manchester, M12 6HG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ADO001 EPR reference: EA/EPR/AP3092CD/A001 Operator: Donnelly Mr. A. Waste Management licence No: 53582 Annual Tonnage: 310.0	Issue Date: 11/10/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Suspended Site Name: Ardwick Auto Spares Correspondence Address: -
Not shown	1465	SE	385235 397506	Site Address: Hoyle Trading Estate, Hoyle Street, Manchester, M12 6HL Type: Treatment of waste to produce soil <75,000 tpy Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: DEL043 EPR reference: EA/EPR/CB3601KL/A001 Operator: E Delaney Demolition Ltd Waste Management licence No: 402157 Annual Tonnage: 74999.0	Issue Date: 26/02/2015 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Aggregate Recycling Yard Correspondence Address: -

4. Current Land Use Map



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Site Outline

Search Buffers (m)
250
500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 32

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	24	SE	Mark Andrew Developments	384337 398633	The Landmark 17-21, Back Turner Street, Manchester, M4 1FR	Shelving, Storage, Safes and Vaults	Industrial Products
2	28	SW	T R P Consulting	384278 398638	Suite 1c Basil Chambers, 65 High Street, Manchester, M4 1FS	Civil Engineers	Engineering Services
3	44	NE	G W Lofthouse	384314 398722	44, Shudehill, Manchester, M4 4AA	Medals, Trophies, Ceremonial and Religious Goods	Consumer Products
4	44	NE	Electricity Sub Station	384327 398710	M4	Electrical Features	Infrastructure and Facilities
5	54	SW	Shopmobility	384229 398647	Unit L18 New Arkwright Way, Corporation Street, Manchester, M4 3AJ	Disability and Mobility Equipment	Consumer Products
6A	59	SE	David Ellis	384369 398618	40, Thomas Street, Manchester, M4 1ER	Jewellery, Gems, Clocks and Watches	Consumer Products
7	63	S	Breathworks	384308 398583	16-20, Turner Street, Manchester, M4 1DZ	Medical Equipment, Supplies and Pharmaceuticals	Industrial Products
8A	72	SE	Shop Fittings Manchester Ltd	384376 398607	42-46, Thomas Street, Manchester, M4 1ER	Office and Shop Equipment	Industrial Products
9	78	NW	Shudehill (Manchester Metrolink)	384232 398744	M4	Tram, Metro and Light Railway Stations and Stops	Public Transport, Stations and Infrastructure
10	80	E	Marc the Printers	384398 398647	28-30, Edge Street, Manchester, M4 1HN	Published Goods	Industrial Products
11	81	NE	H J Barton	384339 398749	60, Shudehill, Manchester, M4 4AA	Jewellery, Gems, Clocks and Watches	Consumer Products
12	88	SW	tshirts2print.com	384219 398607	49, High Street, Manchester, M4 3AH	Clothing, Components and Accessories	Consumer Products
13	101	W	D & J Jewellery	384173 398689	9, Shudehill, Manchester, M4 2AF	Jewellery, Gems, Clocks and Watches	Consumer Products
14	107	NE	Electricity Sub Station	384368 398758	M4	Electrical Features	Infrastructure and Facilities
15	110	E	The Print Room	384422 398611	46, Edge Street, Manchester, M4 1HN	Plate Makers, Print Finishers and Type Setters	IT, Advertising, Marketing and Media Services
16	130	W	Withy Grove Stores Ltd	384144 398685	35-39, Withy Grove, Manchester, M4 2BJ	Office and Shop Equipment	Industrial Products
17	130	NE	Design Icons	384381 398778	2, New George Street, Manchester, M4 4AE	Furniture	Consumer Products

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
18	134	NW	Electricity Sub Station	384211 398798	M4	Electrical Features	Infrastructure and Facilities
19	135	E	Tracey Birchwood	384453 398662	Manchester Craft Centre 17, Oak Street, Manchester, M4 5JD	Jewellery, Gems, Clocks and Watches	Consumer Products
20	184	SE	Electricity Sub Station	384463 398534	M4	Electrical Features	Infrastructure and Facilities
21	188	W	High Street Meat Market LLP	384095 398615	Unit L/37 Arndale Centre, Corporation Street, Manchester, M4 3AJ	Fish, Meat and Poultry Products	Foodstuffs
22	203	NE	Electricity Sub Station	384404 398854	M60	Electrical Features	Infrastructure and Facilities
23	210	N	The Co-operative Press	384214 398884	Holyoake House, Hanover Street, Manchester, M60 0AS	Published Goods	Industrial Products
24B	226	SE	Hempology	384423 398448	Unit 4b Afflecks Arcade, 3539 Oldham Street, Manchester, M1 1JG	Agricultural Machinery and Goods	Industrial Products
25B	226	SE	Chezzie Le Choux	384423 398448	Aflex Palace 52, Church Street, Manchester, M4 1PW	Baking and Confectionery	Foodstuffs
26B	226	SE	Kustom Korner	384423 398448	Aflex Place 52, Church Street, Manchester, M4 1PW	Clothing, Components and Accessories	Consumer Products
27C	228	E	T Shirt Xpress	384531 398566	89-95, Oldham Street, Manchester, M4 1LW	Published Goods	Industrial Products
28C	228	E	T-shirt Xpress	384531 398566	89-95, Oldham Street, Manchester, M4 1LW	Clothing, Components and Accessories	Consumer Products
29	238	N	Electricity Sub Station	384335 398920	M60	Electrical Features	Infrastructure and Facilities
30	240	E	Manchester Seeds	384559 398647	49, Tib Street, Manchester, M4 1LS	Agricultural Machinery and Goods	Industrial Products
31D	247	SW	Imzi Communications	384059 398554	Arndale Centre, Manchester, M4 3AQ	Electrical Equipment Repair and Servicing	Repair and Servicing
32D	248	SW	Premier Foods	384058 398555	Arndale House Arndale Centre, Market Street, Manchester, M4 3AQ	Catering and Non Specific Food Products	Foodstuffs

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
33	462	NE	384715 398888	Unbranded	Smithfield Service Station, 12, Rochdale Road, Rochdale Road, Bendix Street, Collyhurst, Manchester, Greater Manchester, M24 6DP	Not Applicable	Obsolete

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
34	484	E	384803 398629	Obsolete	Blossom Motor Company, 27, Gun Street, Gun Street, Ancoats, Manchester, Greater Manchester, M4 5DN	Not Applicable	Obsolete

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

5.3 Bedrock and Solid Geology

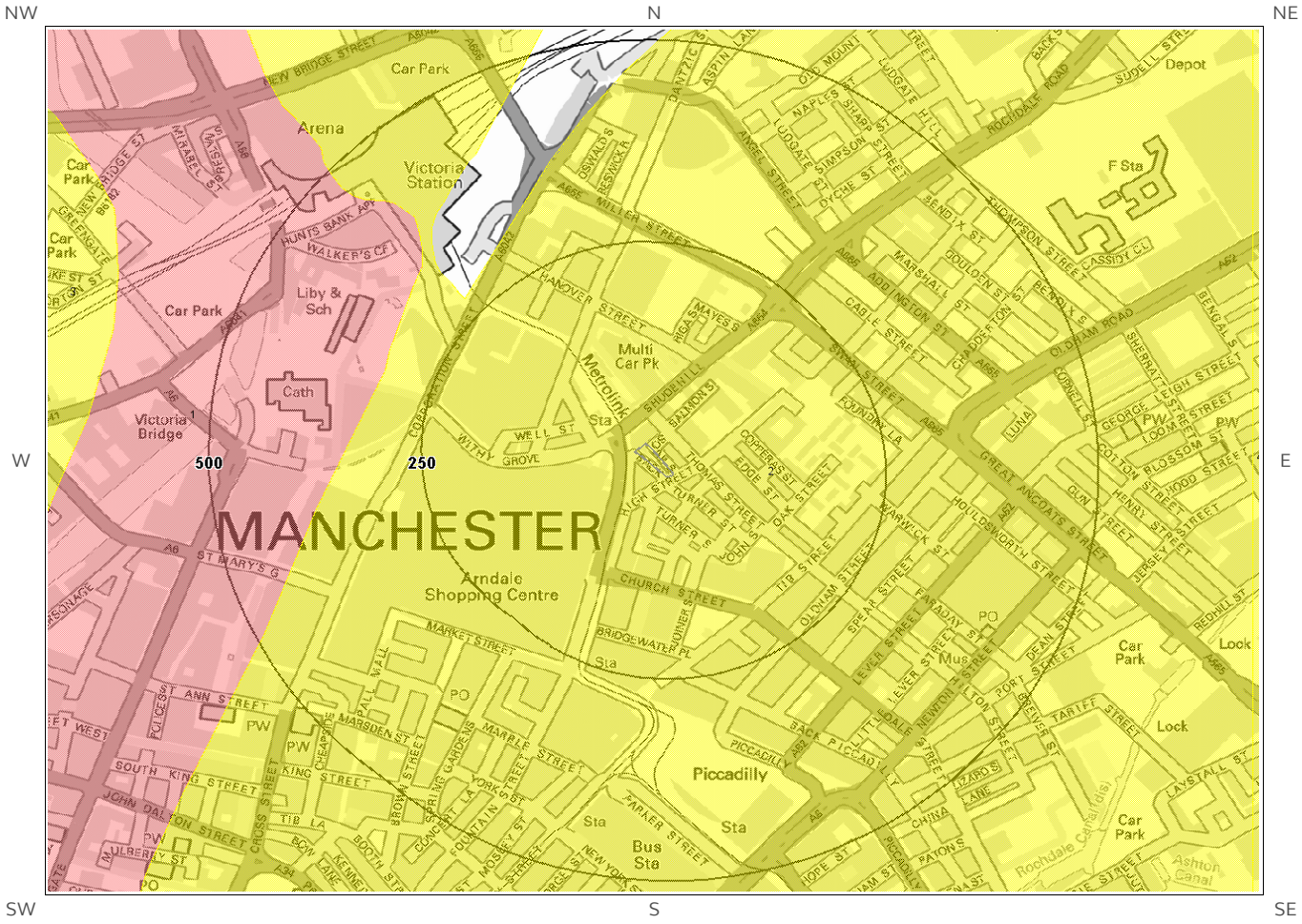
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
CHES-SDST	CHESTER FORMATION	SANDSTONE
CHES-SDST	CHESTER FORMATION	SANDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology



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Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

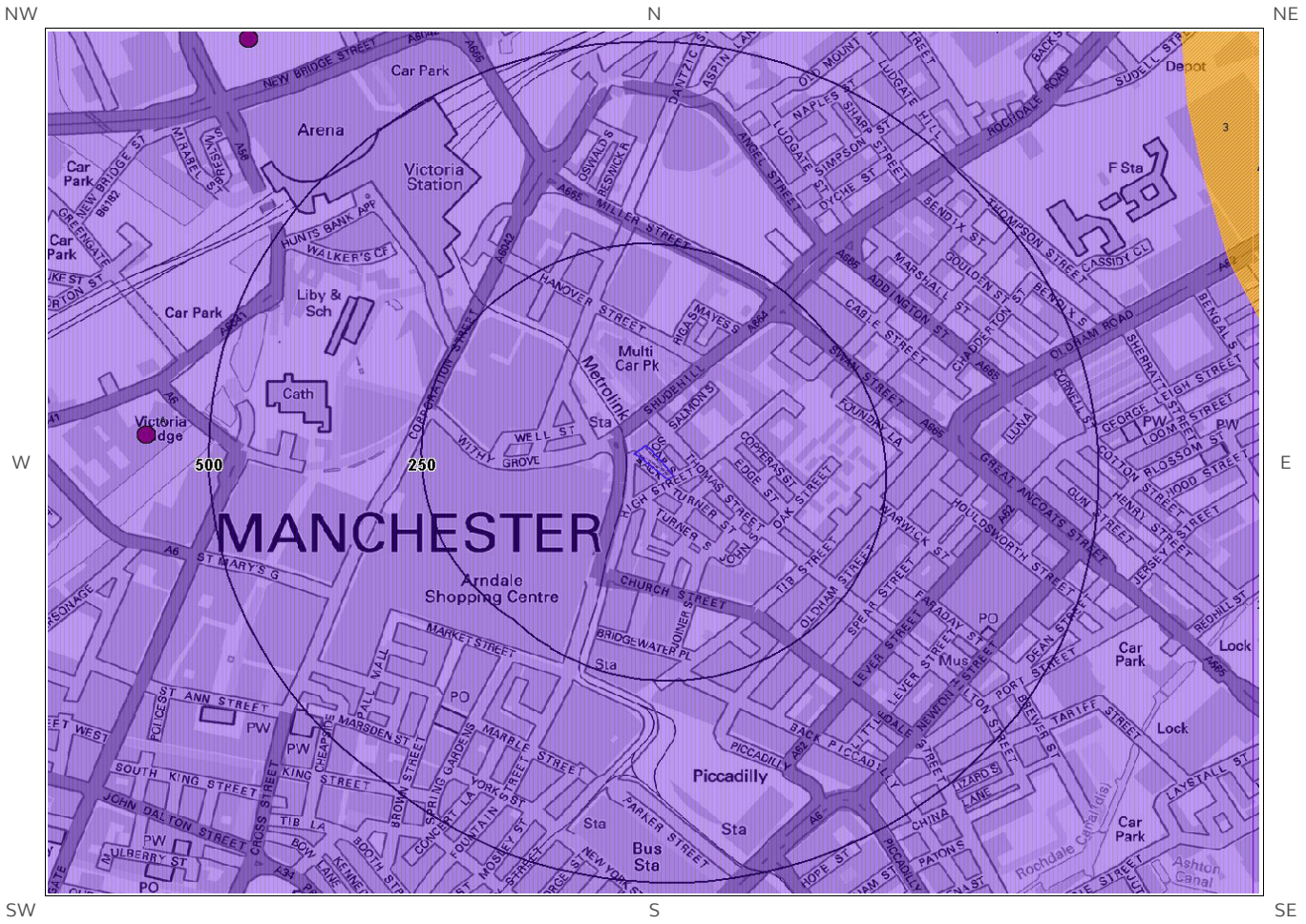
Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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Site Outline

250
500
Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

Surface Water Abstraction Licence

6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



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Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

6d. Hydrogeology – Source Protection Zones within confined aquifer



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Site Outline

250
500
Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

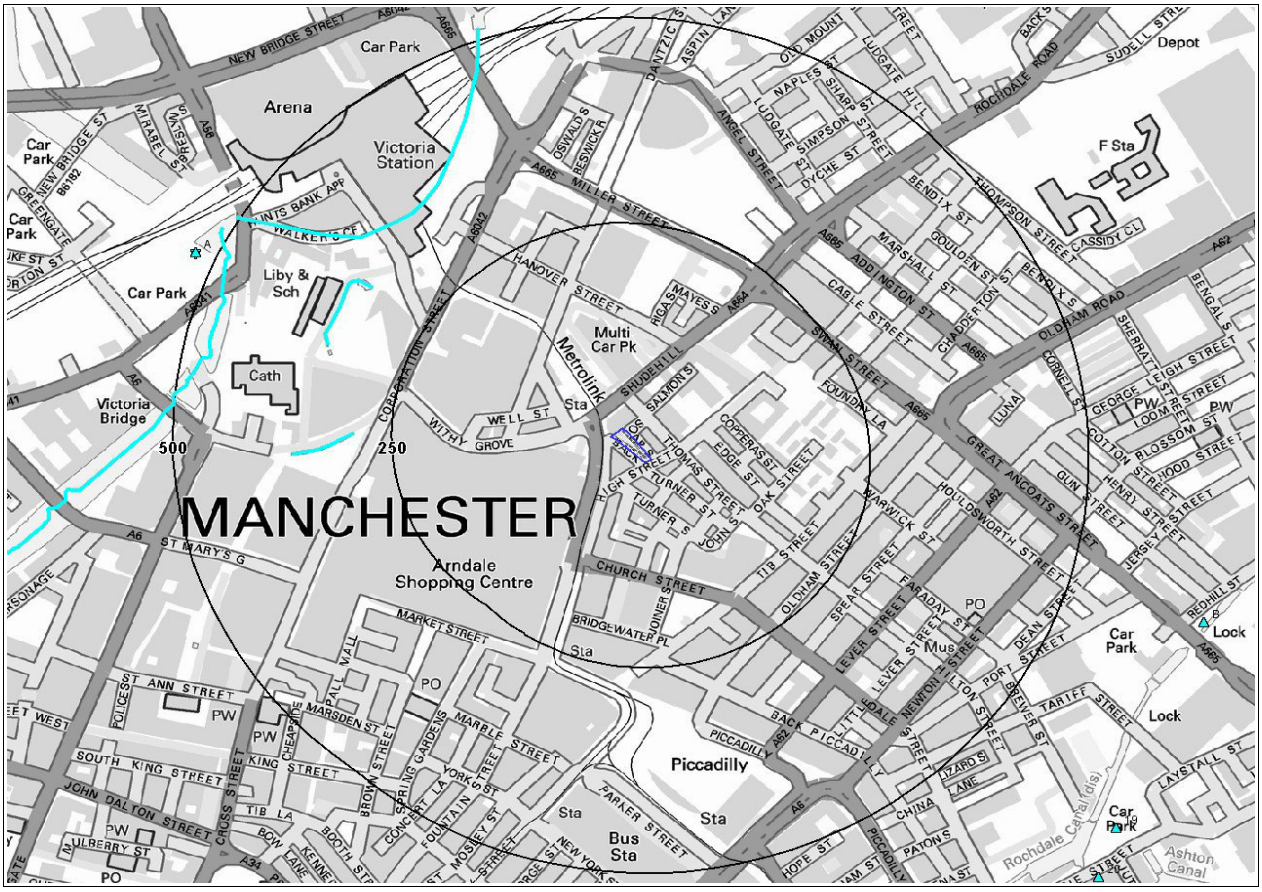
Potable Water Abstraction Licence

6e. Hydrology – Watercourse Network and River Quality

NW N NE

W E

SW S SE



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Site Outline

250
500
Search Buffers (m)

Tidal River
Inland River
Underground or Elevated Tidal River
Underground or Elevated Inland River
Foreshore
General Quality Assessment: Chemistry

Canal
Underground or Elevated Canal
Lock or Flight of Locks
Lake, Reservoir, or Marsh
Drain or Transfer
General Quality Assessment: Biology

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
2	0	On Site	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
1	310	W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site — Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
6A	574	W	383700 398700	Status: Historical Licence No: 2569007070 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: "borehole At Dial House, Chapel St, Salford" Data Type: Point Name: BRITISH TELECOM	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 2333 Original Start Date: 27/1/1971 Expiry Date: - Issue No: 100 Version Start Date: 27/1/1971 Version End Date:
7A	574	W	383700 398700	Status: Historical Licence No: 2569007070 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: Borehole At Dial House, Chapel St, Salford Data Type: Point Name: BRITISH TELECOMMUNICATIONS PLC	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 2333 Original Start Date: 27/1/1971 Expiry Date: - Issue No: 101 Version Start Date: 1/4/1984 Version End Date:
8A	574	W	383700 398700	Status: Active Licence No: 2569007070 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: Borehole At Dial House Chapel Street Salford Data Type: Point Name: BRITISH TELECOMMUNICATIONS PLC	Annual Volume (m^3): 45 Max Daily Volume (m^3): 30 Original Application No: 2333 Original Start Date: 27/1/1971 Expiry Date: - Issue No: 101 Version Start Date: 1/4/2007 Version End Date:
Not shown	680	S	384100 398000	Status: Historical Licence No: 2569007069 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "borehole At George St, Manchester" Data Type: Point Name: BRITISH TELECOM	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 2332 Original Start Date: 27/1/1971 Expiry Date: - Issue No: 100 Version Start Date: 27/1/1971 Version End Date:
Not shown	680	S	384100 398000	Status: Historical Licence No: 2569007069 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: Borehole At George St, Manchester Data Type: Point Name: BRITISH TELECOMMUNICATIONS PLC	Annual Volume (m^3): 1100 Max Daily Volume (m^3): 860 Original Application No: 2332 Original Start Date: 1/4/1984 Expiry Date: - Issue No: 100 Version Start Date: 1/4/2007 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
11B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: "borehole (no 2) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/8/2000 Version End Date:
12B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "borehole (no 2) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/8/2000 Version End Date:
13B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole (no 2) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
14B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: Borehole (no 2) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
15B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 2 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
16B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: Borehole Number 2 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
17B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 2 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
18B	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Process Water Direct Source: Ground Water - North West Region Point: Borehole Number 2 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: "borehole (no 3) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/8/2000 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "borehole (no 3) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/8/2000 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole (no 3) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: Borehole (no 3) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 3 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: Borehole Number 3 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 3 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Process Water Direct Source: Ground Water - North West Region Point: Borehole Number 3 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "borehole (no 1) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/8/2000 Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: "borehole (no 1) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/8/2000 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole (no 1) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Process water Direct Source: Ground Water - North West Region Point: Borehole (no 1) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 1 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Process Water Direct Source: Ground Water - North West Region Point: Borehole Number 1 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 1/1/2004 Version End Date:
Not shown	915	S	384378 397733	Status: Historical Licence No: NW0690006001 Details: Non-Evaporative Cooling Direct Source: Ground Water - North West Region Point: Boreholes At Origin Developments, Manchester Data Type: Point Name: West Contracting	Annual Volume (m^3): 139128 Max Daily Volume (m^3): 1010 Original Application No: 7623 Original Start Date: 19/1/2009 Expiry Date: 31/3/2015 Issue No: 1 Version Start Date: 19/1/2009 Version End Date:
Not shown	915	S	384378 397733	Status: Historical Licence No: NW/069/0006/001 Details: Non-Evaporative Cooling Direct Source: Ground Water - North West Region Point: Boreholes At Origin Developments, Manchester Data Type: Point Name: West Contracting	Annual Volume (m^3): 139128 Max Daily Volume (m^3): 1010 Original Application No: 7623 Original Start Date: 19/1/2009 Expiry Date: 31/3/2015 Issue No: 1 Version Start Date: 19/1/2009 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1008	W	383335 398310	Status: Historical Licence No: 2569007089 Details: Non-Evaporative Cooling Direct Source: Ground Water - North West Region Point: 2 Boreholes At Gartside Street Manchester Data Type: Line Name: HER MAJESTY'S COURT SERVICE	Annual Volume (m^3): 200000 Max Daily Volume (m^3): 1179 Original Application No: 7546 Original Start Date: 26/1/2005 Expiry Date: 31/3/2011 Issue No: 2 Version Start Date: 10/7/2008 Version End Date:
Not shown	1030	N	384100 399700	Status: Historical Licence No: 2569004011 Details: Process water Direct Source: Ground Water - North West Region Point: "borehole At Derby Brewery, Cheetham, Manchester 3" Data Type: Point Name: JOSEPH HOLT LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 423 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 17/2/1966 Version End Date:
Not shown	1030	N	384100 399700	Status: Historical Licence No: 2569004011 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "borehole At Derby Brewery, Cheetham, Manchester 3" Data Type: Point Name: JOSEPH HOLT LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 423 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 17/2/1966 Version End Date:
Not shown	1030	N	384100 399700	Status: Active Licence No: 2569004011 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: Borehole At Derby Brewery, Cheetham, Manchester 3 Data Type: Point Name: JOSEPH HOLT LTD	Annual Volume (m^3): 45460 Max Daily Volume (m^3): 181.84 Original Application No: 0423 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 17/2/1966 Version End Date:
Not shown	1030	N	384100 399700	Status: Active Licence No: 2569004011 Details: Process Water Direct Source: Ground Water - North West Region Point: Borehole At Derby Brewery, Cheetham, Manchester 3 Data Type: Point Name: JOSEPH HOLT LTD	Annual Volume (m^3): 45460 Max Daily Volume (m^3): 181.84 Original Application No: 0423 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 17/2/1966 Version End Date:
Not shown	1178	N	383900 399800	Status: Historical Licence No: 2569004021 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: Borehole At Premises, Derby Street, Cheetham, Manchester Data Type: Point Name: LANCASHIRE DAIRIES LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 1749 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/4/1993 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1178	N	383900 399800	Status: Historical Licence No: 2569004021 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole At Premises, Derby Street, Cheetham, Manchester Data Type: Point Name: LANCASHIRE DAIRIES LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 1749 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/4/1993 Version End Date:
Not shown	1442	SE	385240 397540	Status: Historical Licence No: 2569006001 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "borehole At Premises, Broadie St, Ardwick, Manchester" Data Type: Point Name: MOSELEY RUBBER CO LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 6 Original Start Date: 8/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 8/2/1966 Version End Date:
Not shown	1442	SE	385240 397540	Status: Historical Licence No: 2569006001 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: Borehole At Premises, Broadie St, Ardwick, Manchester Data Type: Point Name: MOSELEY RUBBER CO LTD	Annual Volume (m^3): 331858 Max Daily Volume (m^3): 909.2 Original Application No: 0006 Original Start Date: 8/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 8/2/1966 Version End Date:
Not shown	1561	S	384180 397091	Status: Active Licence No: NW/069/0006/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: Borehole 1 At Lower Chatham Street Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m^3): 283240 Max Daily Volume (m^3): 1532 Original Application No: NPS/WR/015264 Original Start Date: 4/4/2014 Expiry Date: 31/3/2027 Issue No: 2 Version Start Date: 4/4/2014 Version End Date:
Not shown	1561	S	384180 397091	Status: Active Licence No: NW/069/0006/003 Details: Heat Pump Direct Source: Ground Water - North West Region Point: Borehole 1 At Lower Chatham Street Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m^3): 283240 Max Daily Volume (m^3): 1532 Original Application No: NPS/WR/015264 Original Start Date: 4/4/2014 Expiry Date: 31/3/2027 Issue No: 2 Version Start Date: 4/4/2014 Version End Date:
Not shown	1582	NE	385000 400100	Status: Historical Licence No: 2569005015 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "b/hole, Little Green Works, Collyhurst Rd, Manchester 10" Data Type: Point Name: PACKAGING PRODUCTS LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 689 Original Start Date: 16/2/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/2/1995 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1582	NE	385000 400100	Status: Active Licence No: 2569005015 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: B/hole, Little Green Works, Collyhurst Rd, Manchester 10 Data Type: Point Name: Packaging Products (Coatings) Ltd	Annual Volume (m^3): 438689 Max Daily Volume (m^3): 1636.56 Original Application No: NPS/WR/006003 Original Start Date: 16/2/1966 Expiry Date: - Issue No: 102 Version Start Date: 9/2/2011 Version End Date:
Not shown	1992	S	383715 396746	Status: Active Licence No: NW/069/0004/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: Borehole At Manchester Metropolitan University Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m^3): 274115 Max Daily Volume (m^3): 751 Original Application No: NPS/WR/008077 Original Start Date: 20/9/2013 Expiry Date: 31/3/2027 Issue No: 1 Version Start Date: 1/1/2015 Version End Date:
Not shown	1992	S	383715 396746	Status: Active Licence No: NW/069/0004/003 Details: Heat Pump Direct Source: Ground Water - North West Region Point: Borehole At Manchester Metropolitan University Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m^3): 274115 Max Daily Volume (m^3): 751 Original Application No: NPS/WR/008077 Original Start Date: 20/9/2013 Expiry Date: 31/3/2027 Issue No: 1 Version Start Date: 1/1/2015 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site — None identified

Database searched and no data found.

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site — Identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details	
1A	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 2 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details	
2A	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 2 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
3A	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "borehole (no 2) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
4A	685	NW	383820 399190	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole (no 2) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 3 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 3 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "borehole (no 3) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	701	NW	383830 399220	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole (no 3) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "borehole (no 1) At Premises, Strangeways, Manchester" Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023 Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole (no 1) At Premises, Strangeways, Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	712	NW	383850 399250	Status: Historical Licence No: 2569004023 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole Number 1 At Premises Strangeways Manchester Data Type: Point Name: INTERBREW UK LTD	Annual Volume (m^3): 500000 Max Daily Volume (m^3): 2500 Original Application No: CW0023R Original Start Date: 18/2/1966 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	1178	N	383900 399800	Status: Historical Licence No: 2569004021 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: Borehole At Premises, Derby Street, Cheetham, Manchester Data Type: Point Name: LANCASHIRE DAIRIES LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: 1749 Original Start Date: 17/2/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site — None identified

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site — None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site — Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site — Identified

6.9.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
11A	524	NW	383800 398900	River Name: Irk Reach: Moston Bk. To Irwell End/Start of Stretch: End of Stretch NGR	E	E	E	E	E
Not shown	1368	NE	384900 399910	River Name: Irk Reach: Moston Bk. To Irwell End/Start of Stretch: Start of Stretch NGR	E	E	E	E	E
Not shown	1368	NE	384900 399910	River Name: Moston Bk Reach: Qsl At Hale Lane Failsworth To Irk End/Start of Stretch: End of Stretch NGR	F	F	F	F	E
Not shown	1368	NE	384900 399910	River Name: Irk Reach: Wince Brook To Moston Bk. End/Start of Stretch: End of Stretch NGR	E	E	E	E	E

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

					Chemical Quality Grade				
ID	Distance (m)	Direction	NGR	River Quality Grade	2005	2006	2007	2008	2009
15A	524	NW	383800 398900	River Name: Irk Reach: Moston Bk. To Irwell End/Start of Stretch: End of Stretch NGR	C	C	C	C	D
16B	662	E	384950 398450	River Name: Rochdale Canal Reach: Empress Processing To Ashton Canal End/Start of Stretch: Start of Stretch NGR	A	A	A	A	A
17B	662	E	384950 398450	River Name: Rochdale Canal Reach: Qsl At Summit To Empress Processing End/Start of Stretch: End of Stretch NGR	A	A	A	A	A
Not shown	667	N	384445 399335	River Name: Irk Reach: Moston Bk. To Irwell End/Start of Stretch: Sample Point NGR	C	C	C	C	D
19	696	SE	384850 398200	River Name: Rochdale Canal Reach: Empress Processing To Ashton Canal End/Start of Stretch: End of Stretch NGR	A	A	A	A	A
20	721	SE	384830 398140	River Name: Rochdale Canal Reach: Ashton Canal To Knott Mill End/Start of Stretch: Start of Stretch NGR	A	A	A	A	A
Not shown	1368	NE	384900 399910	River Name: Irk Reach: Moston Bk. To Irwell End/Start of Stretch: Start of Stretch NGR	C	C	C	C	D
Not shown	1368	NE	384900 399910	River Name: Irk Reach: Wince Brook To Moston Bk. End/Start of Stretch: End of Stretch NGR	C	C	C	C	C
Not shown	1464	SW	383330 397558	River Name: Rochdale Canal Reach: Ashton Canal To Knott Mill End/Start of Stretch: Sample Point NGR	A	A	A	A	A

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	293 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.0
55	293 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.0
2	311 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
56	311 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
3	315 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.0
57	315 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.0
4	327 NW	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.6
58	327 NW	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.6
5	336 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
59	336 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
6	345 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.1

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
60	345 W	- Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 2.1
7	353 NW	River Irk Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: Not provided Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
61	353 NW	River Irk Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: Not provided Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
8	467 W	River Irwell Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 24.8
Not shown	467 W	River Irwell Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 24.8
9	476 W	River Irwell Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
Not shown	476 W	River Irwell Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): Not Provided
10	483 W	River Irwell Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 25.0
Not shown	483 W	River Irwell Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Mersey Relationship to Ground Level: On ground surface Permanence: Unclassified. Average Width in Watercourse Section (m): 25.0

6.11 Surface Water Features

Surface water features within 250m of the study site — None identified

Database searched and no data found.

7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)

NW N NE

W E

SW S SE



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Site Outline

100
250
Search Buffers (m)

Zone 2 Floodplain

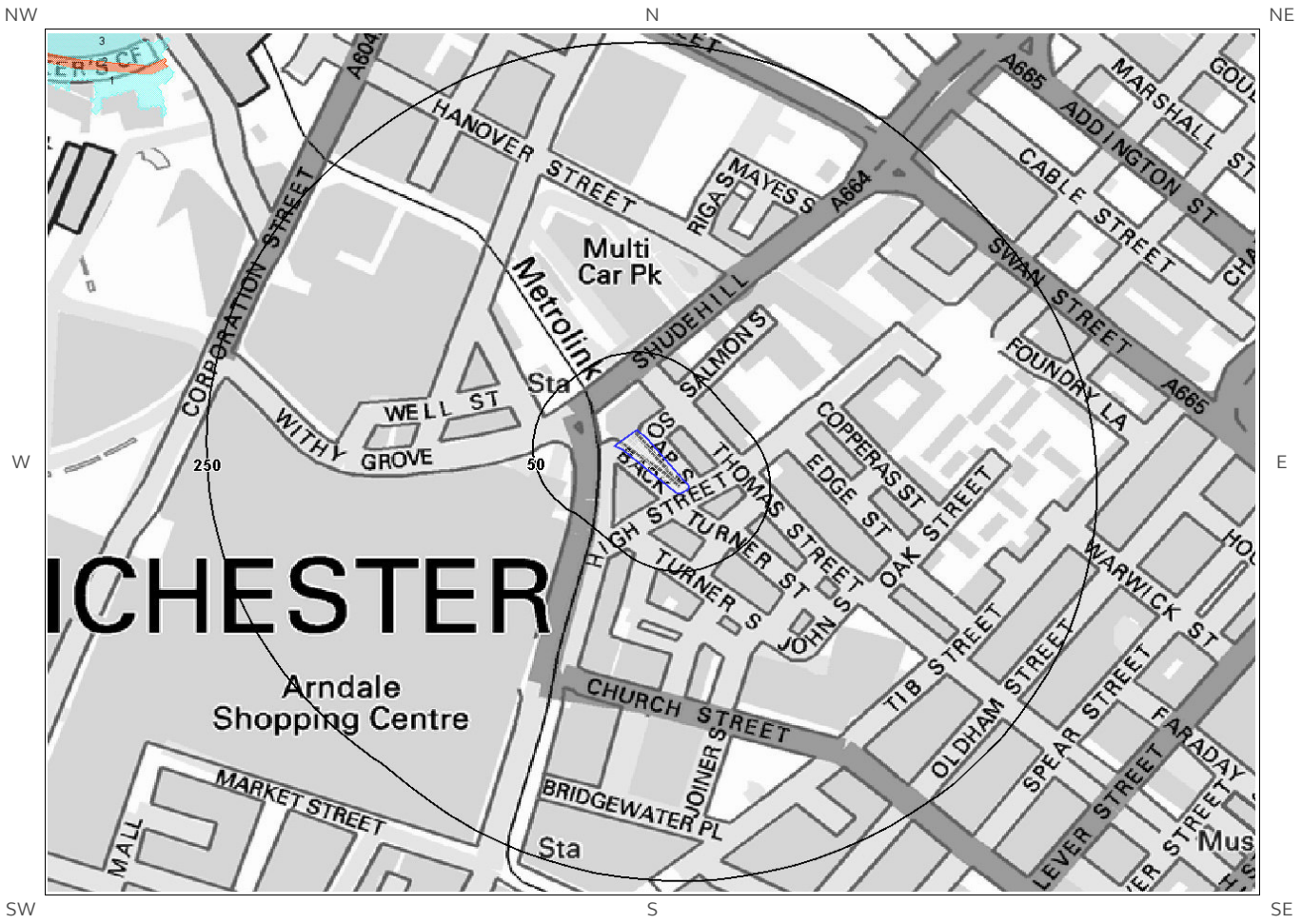
Zone 3 Floodplain

Flood Defences

Area used for Flood Storage

Area Benefiting from Flood Defences

7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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Site Outline

100
250
Search Buffers (m)

RoFRaS Rating

- Very Low
- Low
- Medium
- High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m — None identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m — None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite — Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site — None identified

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site — None identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site	None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site	Identified
Clearwater Flooding or Superficial Deposits Flooding	Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

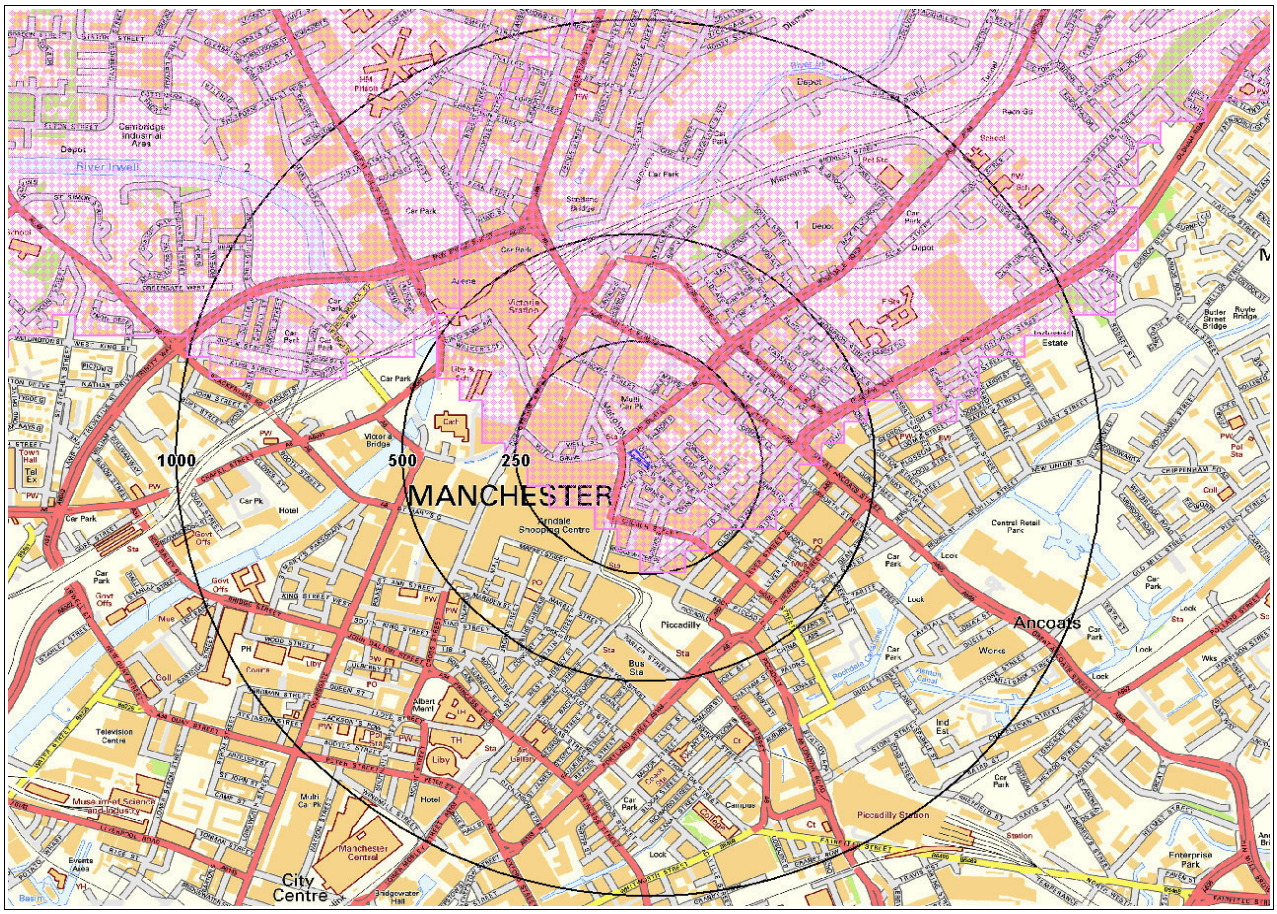
7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result	Low

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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Site Outline

100
250
Search Buffers (m)

AONB

National Park

SSSI

Special Protection Areas

Nitrate Vulnerable Zones

Green Belt

Environmentally Sensitive Areas

Special Areas of Conservation

World Heritage Sites

Nitrate Sensitive Areas

Ancient Woodland

National Nature Reserve

Local Nature Reserves

Ramsar Sites

8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site	Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

4

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	Existing	DEFRA
2	505	NW	Existing	DEFRA
Not shown	1313	N	Existing	DEFRA
Not shown	1313	N	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site — Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site — Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing
ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site — Identified

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary — None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site — None identified
Guidance: No Guidance Required.

Contact Details

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sales@emapsite.com

British Geological Survey Enquiries
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
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Fax: 0115 936 3276.
Email:
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BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency
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Rotherham, S60 1BY
Tel: 03708 506 506
Web: **www.environment-agency.gov.uk**
Email: enquiries@environment-agency.gov.uk

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133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email:**enquiries@phe.gov.uk**
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Local Authority
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Phone: 0161 234 5000
Web: http://www.manchester.gov.uk/
Address: Town Hall, Albert Square, Manchester, M60 2LA

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
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Tel: 01252 845444

Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.
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Standard Terms and Conditions

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https://www.groundsure.com/terms-and-conditions-may25-2018

APPENDIX D
Coal Authority Report

The Coal Authority

Resolving the impacts of mining

CON29M Residential Mining Report





3 BACK TURNER STREET
MANCHESTER
M4 1FR



Date of enquiry:	16 July 2018
Date enquiry received:	16 July 2018
Issue date:	16 July 2018
Our reference:	51001876589001
Your reference:	C3929

CON29M Residential Mining Report

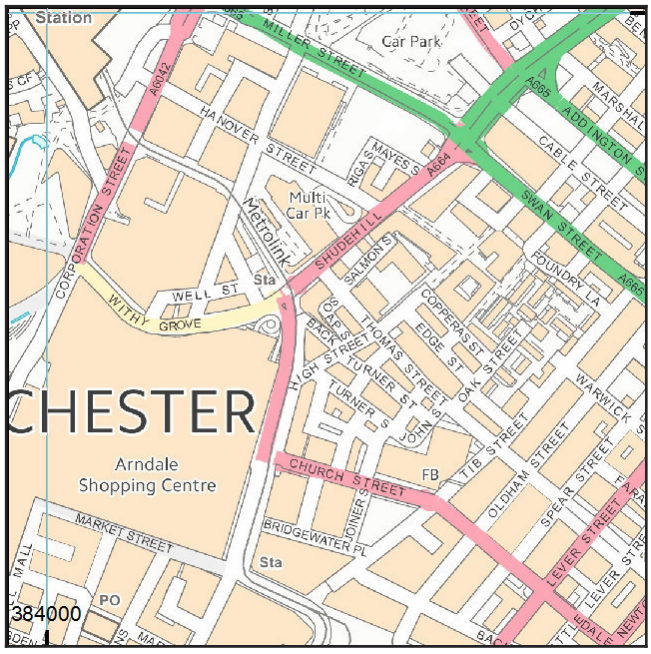
This report is based on, and limited to, the records held by the Coal Authority, at the time we answer the search.

Client name

BROWNFIELD SOLUTIONS LIMITED

Enquiry address

3 BACK TURNER STREET, MANCHESTER, M4 1FR



Approximate position of property

Map data

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NG18 4RG

www.groundstability.com

/company/the-coal-authority
/thecoalauthority
/coalauthority

Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	No
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	No
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is not within a surface area that could be affected by recorded past underground mining.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10. Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

If this Report is for a residential property, insurance is included to cover any loss in property value caused by any changes in the information contained in this report. Please see the attached certificate of insurance for the terms and conditions of this insurance. The insurance does not cover non-residential property or interpretive reports.

Disclaimer

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

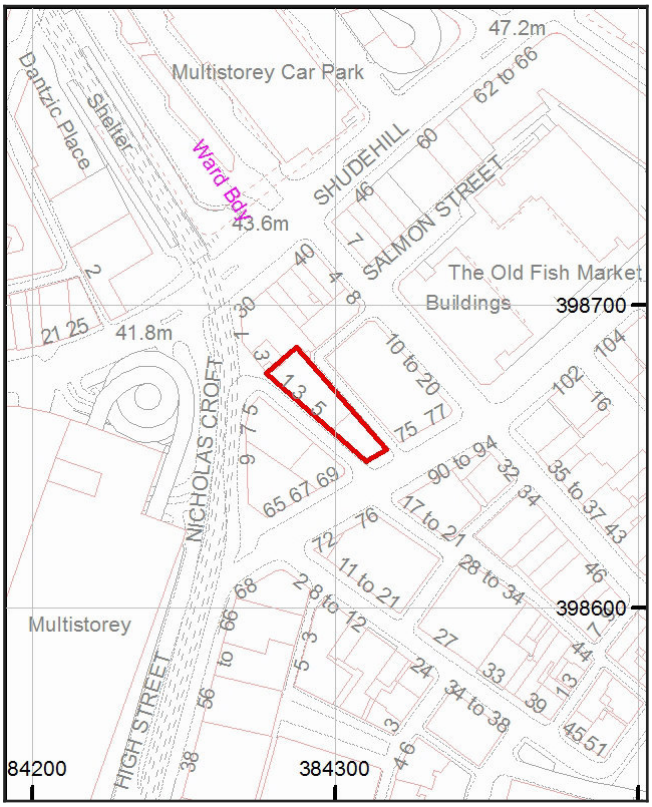
Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

/company/the-coal-authority
/thecoalauthority
/coalauthority

Map data

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Key facts document

General summary

This is a summary of the policy and does not contain the full terms and conditions of the cover which can be found in the policy document. It is important that you read the policy document carefully when you receive it. If you are a solicitor you should also disclose this document to your client, their lender and/or the purchaser's solicitors for the benefit of their client.

Name of insurer

The insurer is Liberty Legal Indemnities, part of Liberty Mutual Insurance Europe Limited. The underwriting agency is Legal and Insurance Services Limited, PO Box 234, Tunbridge Wells, Kent TN3 0LX.

Legal and Insurance Services Limited is regulated by the Financial Conduct Authority (FCA) and authorised to arrange general insurance contracts. Register number: 305910.

The Coal Authority

The Coal Authority, a NDPB (non-departmental public body) sponsored by BEIS (Department for Business, Energy and Industrial Strategy) 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG, is responsible for producing the Coal Search Report, issuing the policy, collecting the premium and declaring the existence of the policy to Liberty Legal Indemnities.

Type of insurance and cover

a. The policy is evidenced by the policy that is attached to the Coal Search Report provided by the Coal Authority in respect of a search in form CON29M (2006).
b. Where a Coal Search Report has been obtained in connection with a sale of the property, cover is provided for the benefit of a purchaser and their lender; in the case of a re-mortgage or where the existing owner chooses to obtain a Coal Search Report, cover is provided for the benefit of the owner and their lender.
c. The policy offers protection against loss sustained by the owner of the property if any new problems or adverse entries are revealed in a subsequent Coal Search Report which were not revealed by the original report to which the policy was attached.

Significant features or benefits under the policy and the term/duration of the policy

a. Cover is provided for loss that you suffer up to an amount of £50,000.00.

b. For the purposes of the policy loss includes:

   (i) any reduction in the market value of the property directly attributable to changes in the information revealed in the Coal Search Report compiled against the property; and

   (ii) all other costs and expenses incurred which we have agreed, in writing, to cover.

c. A single premium has been paid in respect of the cover provided under the policy; the policy remains in effect until you sell the property, or if you are the lender, the debt secured by the mortgage has been repaid.

d. You cannot transfer the benefits of the policy to anyone else. However, if you die whilst you still have the benefit of the cover provided by the policy, the benefit will pass to your estate and beneficiaries.

Significant or unusual Exclusions or Conditions under the policy

a. Full details can be found in the Cover and Exclusions sections of the policy.

b. The policy does not cover your costs in relation to the loss of a transaction for the sale or purchase of the property.

c. The property must be an existing (i.e. it must have been lived in) single residential house, flat or maisonette in the United Kingdom.

d. The policy does not cover loss relating to structural or other physical damage caused to the property by subsidence, flooding or otherwise.

e. The policy does not cover you for any loss in relation to any matter revealed in the Coal Search Report to which the policy is attached nor in relation to any matter that you were otherwise aware of on or before the policy was issued.

Cancellation rights

You can cancel your policy within 14 days of the commencement date. Please telephone or email Legal and Insurance Services Limited on 01892 863863 or at enquiries@goodtitle.co.uk quoting your policy number.

How to claim

If you need to make a claim, please write to Legal and Insurance Services Limited, PO Box 234, Tunbridge Wells, Kent TH3 0LX quoting your policy number. You can also telephone 01892 863863 or contact them via email at enquiries@goodtitle.co.uk. Please enclose your policy and the Coal Search Report attached to it together with the subsequent report giving rise to the claim.

If you have a complaint

In the first instance, please contact the Underwriting Manager (Complaints) Legal and Insurance Services Limited, PO Box 234, Tunbridge Wells, Kent TN3 0LX.

Tel: 01892 863863

Fax: 01892 861025

Email: enquiries@goodtitle.co.uk

If you are unable to resolve your complaint with the above please contact:

Liberty Specialty Markets
20 Fenchurch Street
London
EC3M 3AW

Tel: 020 3758 0000

Complaints that cannot be resolved may be referred to the Financial Ombudsman Service (www.financial-ombudsman.org.uk). Further details will be provided at the appropriate stage of the complaints process.

Financial services compensation scheme

Legal and Insurance Services Limited are members of the Financial Services Compensation Scheme (FSCS). You may be entitled to compensation from this scheme if they cannot meet their obligations, depending on the type of insurance and the circumstances of your claim.

Further information about the scheme is available from:

The Financial Services Compensation Scheme, 10th Floor, Beaufort House, 15 St. Botolph Street, London, EC3A 7QU. The FSCS website may be viewed at www.fscs.org.uk

On behalf of the insurer

Coal Search Report Insurance Policy

Schedule

Policy number: **25142096**

The insurer: **Liberty Legal Indemnities – underwritten by Liberty Mutual Insurance Europe Limited**

Binding Authority contract number: **RNMFP1803841**

Property: **3 BACK TURNER STREET, MANCHESTER, M4 1FR**

Report reference number: **51001876589001**

Limit of cover: **£50,000.00**

Dated: **16 July 2018**

This policy and schedule shall be read together and any word or expression to which a specific meaning has been attached in either shall bear such meaning wherever it may appear.

Where a Coal Search Report has been obtained in connection with a sale of the property, cover is provided for the benefit of a purchaser and their lender; in the case of a re-mortgage or where the existing owner chooses to obtain a Coal Search Report, cover is provided for the benefit of the owner and their lender.

The policy offers protection against loss sustained by the owner of the property if any new problems or adverse entries are revealed in a subsequent Coal Search Report which were not revealed by the original report to which the policy was attached.

The insured shall at all times comply with the requirements of the Conditions of this Policy.

Definitions

In this policy unless the context requires otherwise the following words or expressions shall have the following meanings:

Date of the report means the date of the Coal Search Report attached to this policy.

Coal Search Report means the attached Coal Search Report that the Coal Authority has prepared for the property following a Coal Search Report providing information compiled from the Coal Authority's records in relation to past, present and future underground and opencast coal-mining activity, shafts and adits (vertical and horizontal entries to mines) coal-mining geology, coal-mining related hazards, coal-mining subsidence and mine gas.

The Coal Authority is a NDPB (non-departmental public body) sponsored by BEIS (Department for Business, Energy and Industrial Strategy) 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG. The Coal Authority is responsible for producing the Coal Search Report, issuing this policy, collecting the premium and declaring the existence of this policy to the insurer.

Insurer means Liberty Legal Indemnities – part of Liberty Mutual Insurance Europe Limited.

Insured means the person insured by this policy. This may be:

i. the person who asked for the Coal Search Report in connection with your purchase of the property (and your mortgagee)

ii. the person who purchased the property (and your mortgagee) if the person selling the property has asked for a Coal Search Report for the benefit of the purchaser as part of a seller's pack or if the property has been purchased by way of auction

iii. the owner of the property (and your mortgagee) if you are re-mortgaging the property or the owner of the property who has chosen to obtain a Coal Search Report

Knowledge means actual knowledge or notice but not knowledge or notice which may be imputed to the insured by reason of the public records as defined in this policy or any other records which impute notice of matters affecting the property.

Market value means the average of the estimates given by 2 independent valuers (one to be appointed by and paid for by the insurer and the other by the insured) as to the price which could have been obtained for the property on the open market at the date on which the insured first becomes aware of the existence of the defect and under normal sale conditions at the time.

Property means the residential property at each address shown in the Schedule to this Policy and in respect of which the Coal Authority has provided the attached Coal Search Report.

Public records means records established by the Crown or any local or statutory authority at the date of the mortgage pursuant to the Land Registration Acts 1925 and 2002 the Land Charges Act 1972 and the Local Land Charges Act 1975 including any replacement or amending legislation.

Period of insurance means the period from the date of the report until:

i. the property is sold

ii. the debt secured by the mortgage is repaid if the insured is a mortgagee

Premium means the total amount paid in consideration of the cover provided by this policy which includes Insurance Premium Tax at the appropriate rate.

Cover

Subject to the terms and conditions of this policy and provided the Coal Authority has collected the premium cover will be provided up to the limit of cover for all claims made during the period of insurance in respect of:

i. the loss in market value of the property directly attributable to any changes in the information revealed in a subsequent Coal Search Report which was not revealed in the Coal Search Report attached to this policy which was carried out on the date of the report, such loss in market value to be calculated at the date of the subsequent Coal Search Report, and

ii. any costs and expenses incurred with the consent of the insurer

Exclusions

This policy does not cover any loss:

1. if at the date of the claim you are not the legal or beneficial owner of the property
2. if the property is not a single private home in the United Kingdom which is used only for residential purposes
3. in relation to loss of a transaction for the sale or for the purchase of the property nor for any costs incurred by you in relation to the loss of such transaction
4. in respect of structural or other physical damage caused to the property by subsidence, flooding or otherwise
5. as a result of any change in information in response to questions 3(a), 3(b), 8(a) or 8(b) of a Coal Search Report (form CON29M (2006))
6. for any entry on any subsequent Coal Search Report after the date of the report if this entry also appears on the attached Coal Search Report
7. for any problem revealed by the first Coal Search Report after the date of the report if the insured or their legal representative knew about the problem on or before the date of the report
8. for any change in the interpretation of data upon which the Coal Search Report was produced provided such data remains unchanged

The insurer will not be responsible for any loss for which the Coal Authority may be required to pay by law.

Conditions

1. On becoming aware of any potential or actual claim against this policy the insured must:
   a) provide written notice and details to the insurer without unnecessary delay
   b) provide all information and assistance that the insurer (and/or their agents solicitors or surveyors) require at the insured's own expense
2. Any act or omission by the insured or anyone acting on the insured's behalf which in whole or in part induces a claim under this policy (save as may already have occurred and be recorded in this policy or schedule and save in relation to carrying out the insured use) shall void this policy.
3. If at the time of a claim under this policy there is other insurance (whether incepted by the insured or any other party) under which the insured may be entitled to make a claim either wholly or partly in respect of the same interest or risk covered by this policy the insurer will not be liable to pay or contribute more than their rateable proportion of the claim.
4. The law of England and Wales will apply to this contract unless at the date of the report you are a resident of Scotland or Northern Ireland in which case the law of that country will apply.

Cancellation rights

You can cancel a policy by contacting us within 14 days of the policy commencement date provided all parties that have an interest in the policy (for example mortgage lender) also consent to the cancellation. Please telephone or email us in the first instance on 01892 863863 or at enquiries@goodtitle.co.uk referencing the policy number.

Non-invalidation clause

The interest of any insured under this policy will not be invalidated or affected by any other party breaching the policy terms and conditions, or providing false or misleading information to the insurer, unless:

a) such party acted on the insured's behalf or with the insured's knowledge and consent

b) where the insured is a successor in title or mortgagee, chargee or lessee, they had knowledge of a breach of the policy terms or conditions, or that false or misleading information has been provided to the insurer prior to the date of commencement

General

1. Unless otherwise indicated, no term of this insurance contract is intended to limit or affect the statutory rights or obligations of any of the parties to this contract under, and/or the effect of, parts 2, 3, 4 or 5 of the Insurance Act 2015 (the "2015 Act").
2. Any term of this insurance contract which would, but for this clause, put the insured in a worse position as respects any of the matters provided for in parts 2, 3, 4 or 5 of the 2015 Act than it would be by virtue of the provisions of those parts is, to that extent, of no effect, unless the insurer has complied with the transparency requirements in section 17 of the 2015 Act.
3. The insured should ask the insurer or its broker or solicitor for clarification of any matters which are not clear to it regarding the scope of disclosure required or the provisions of this insurance contract.

The duty of fair presentation

1. Before this insurance contract is entered into, the insured (including anyone acting on behalf of the insured in arranging this insurance contract) must make a fair presentation of the risk to the insurer, in accordance with section 3 of the 2015 Act. In summary, they must:
   a) disclose to the insurer every material circumstance which the insured knows or ought to know. Failing that, they must give the insurer sufficient information to put a prudent insurer on notice that it needs to make further enquiries in order to reveal material circumstances. A matter is material if it would influence the judgement of a prudent insurer as to whether to accept the risk, or the terms of the insurance (including premium)
   b) make the disclosure in clause 1 a) above in a reasonably clear and accessible way
   c) ensure that every material representation of fact is substantially correct, and that every material representation of expectation or belief is made in good faith
2. For the purposes of clause 1 a) above, the insured is expected to know the following:
   a) if the insured is an individual, what is known to the individual and anybody who is responsible for arranging his or her insurance
   b) if the insured is not an individual, what is known to anybody who is part of the insured's management; or anybody who is responsible for arranging the insured's insurance
   c) whether the insured is an individual or not, what should have reasonably been revealed by a reasonable search of information available to the insured. The information may be held within the insured's organisation, or by any third party (including but not limited to the broker, solicitor, subsidiaries, affiliates or any other person who will be covered under the insurance). If the insured is insuring subsidiaries, affiliates or other parties, the insurer expects that the insured will have included them in its enquiries, and that the insured will inform the insurer if it has not done so. The reasonable search may be conducted by making enquiries or by any other means

Breach of warranty: suspensory

If the insured breaches a warranty in this insurance contract, the insurer's liability under the contract shall be suspended from the time of the breach until the time when the breach is remedied (if it is capable of being remedied). The insurer will have no liability to the insured for any loss which occurs, or which is attributable to something happening, during the period when the insurer's liability is suspended.

Terms not relevant to the actual loss

Where: (i) there has been a failure to comply with a term (express or implied) of this insurance contract, other than a term that defines the risk as a whole; and (ii) compliance with such term would tend to reduce the risk of loss of a particular kind and/or loss at a particular location and/or loss at a particular time, the insurer cannot rely on the breach of such term to exclude, limit or discharge its liability if the insured shows that the failure to comply with such term could not have increased the risk of the loss which actually occurred in the circumstances in which it occurred.

Fraudulent claims clause

1. If the insured makes a fraudulent claim under this insurance contract, the insurer:
   a) is not liable to pay the claim
   b) may recover from the insured any sums paid by the insurer to the insured or to any third party in respect of the claim
   c) may by notice to the insured treat the contract as having been terminated with effect from the time of the fraudulent act
2. If the insurer exercises its right under Clause 1 c) above:
   a) the insurer shall not be liable to the insured in respect of a relevant event occurring after the time of the fraudulent act. A relevant event is whatever gives rise to the insurer's liability under the insurance contract (such as the occurrence of a loss, the making of a claim, or the notification of a potential claim)
   b) the insurer need not return any of the premiums paid

Fraudulent claims - group insurance

If this insurance contract provides cover for any person or entity who is not a party to the contract (a covered person), and a fraudulent claim is made under the contract by or on behalf of a covered person, the insurer may exercise the rights set out in the preceding clause above as if there were an individual insurance contract between the insurer and the covered person. However the exercise of any of those rights shall not affect the cover provided under the contract for any other person or entity.

Remedies for breach of the duty of fair presentation

1. If, prior to entering into this insurance contract, the duty of fair presentation shall have been breached, the remedies available to the insurer are set out below:
   a) if the breach of the duty of fair presentation is deliberate or reckless:
      i) the insurer may avoid the contract, and refuse to pay all claims
      ii) the insurer need not return any of the premiums paid
   b) if the breach of the duty of fair presentation is not deliberate or reckless, the insurer's remedy shall depend upon what the insurer would have done if the duty of fair presentation had been complied with:
      i) if the insurer would not have entered into the contract at all, the insurer may avoid the contract and refuse all claims, but must return the premiums paid
      ii) if the insurer would have entered into the contract, but on different terms (other than terms relating to the premium), the contract is to be treated as if it had been entered into on those different terms from the outset, if the insurer so requires
      iii) in addition, if the insurer would have entered into the contract, but would have charged a higher premium, the insurer may reduce proportionately the amount to be paid on a claim (and, if applicable, the amount already paid on prior claims). In those circumstances, the insurer shall pay only X% of what it would otherwise have been required to pay, where X = (premium actually charged/higher premium) X 100

2. If, prior to entering into a variation to this insurance contract, the duty of fair presentation shall have been breached, the remedies available to the insurer are set out below:
   a) if the breach of the duty of fair presentation is deliberate or reckless:
      i) the insurer may by notice to the insured treat the contract as having been terminated from the time when the variation was concluded
      ii) the insurer need not return any of the premiums paid
   b) if the breach of the duty of fair presentation is not deliberate or reckless, the insurer's remedy shall depend upon what the insurer would have done if the duty of fair presentation had been complied with:
      i) if the insurer would not have agreed to the variation at all, the insurer may treat the contract as if the variation was never made, but must in that event return any extra premium paid
      ii) if the insurer would have agreed to the variation of the contract, but on different terms (other than terms relating to the premium), the variation is to be treated as if it had been entered into on those different terms, if the insurer so requires
      iii) if the insurer would have increased the premium by more than it did or at all, then the insurer may reduce proportionately the amount to be paid on a claim arising out of events after the variation. In those circumstances, the insurer shall pay only X% of what it would otherwise have been required to pay, where X = (premium actually charged/higher premium) X 100
      iv) if the insurer would not have reduced the premium by more than it did or at all, then the insurer may reduce proportionately the amount to be paid on a claim arising out of events after the variation. In those circumstances, the insurer shall pay only X% of what it would otherwise have been required to pay, where X = (premium actually charged/reduced total premium) X 100

Notice to the insured

Any enquiry or complaint should be addressed in the first instance to:

Legal and Insurance Services Limited
PO Box 234
Tunbridge Wells
Kent
TN3 0LX

Tel: 01892 863863

Fax: 01892 861025

Email: enquiries@goodtitle.co.uk

If you are unable to resolve your enquiry or complaint with the above please contact:

Liberty Specialty Markets
20 Fenchurch Street
London
EC3M 3AW

Tel: 020 3758 0000

Complaints that cannot be resolved may be referred to the Financial Ombudsman Service (www.financial-ombudsman.org.uk). Further details will be provided at the appropriate stage of the complaints process.

Notifying a claim

If anything should happen which might give rise to a claim under the policy please forward full details to Legal and Insurance Services Limited at the above address. Please include mention of the Policy Number shown at the top of the Schedule to the policy.

If you do not receive a reply or acknowledgement within 10 working days please forward the details to Liberty Specialty Markets at the above address.

APPENDIX E
Exploratory Hole Logs

BROWNFIELD SOLUTIONS LTD

William Smith House,
173 - 183 Witton Street,
Northwich, Cheshire,
CW9 5LP

Rotary Core Log

Borehole No.
BH1
Sheet 1 of 3

Project Name: BACK TURNER STREET	Project No. C3967	Co-ords:	Hole Type CP+RC
Location: MANCHESTER		Level:	Scale 1:50
Client: DOMIS CONSTRUCTION LTD		Dates: 06/08/2018 - 08/08/2018	Logged By JM

Well	Water Strikes	Depth (m)	Type /FI	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
							0.20			MADE GROUND: Grey subangular fine to coarse gravel of limestone and sandstone.
		0.50	ES							MADE GROUND: Reddish brown slightly sandy gravel with high, angular brick cobble content. Sand is fine to medium of ash. Gravel is subangular to subrounded fine to coarse of brick, quartzite, mudstone and sandstone. Rare fragments of plastic, timber and glass.
		N=5 (1,2/2,1,1,1) 1.50	ES							
		N=3 (4,2/2,1,0,0)								
							2.40			
							2.50			MADE GROUND: Vinyl coated floor covering (Suspected basement structure)
		N=18 (4,2/4,8,4,2)					3.00			MADE GROUND: Brownish grey ashy angular gravel predominantly of brick with rare rotten timber fragments. (Suspected basement structure)
		3.50	D				3.40			MADE GROUND: Reddish brown sandy gravel. High, angular brick cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse of brick and sandstone.
		4.00 N=25 (4,4/5,6,7,7)	D							Stiff brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded, fine to medium of mudstone.
		5.00 N=22 (2,3/5,5,6,6)	D							
		5.50 - 6.00	U							
		6.00 N=19 (4,4/4,5,5,5)	D							*Becoming firm below 6.2m bgl.*
		7.00 N=22 (3,4/4,6,6,6)	D							*Becoming stiff and more gravelly below 7.0m bgl.*
		8.00 - 8.50	U				8.00			Stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium of mudstone and sandstone.
							8.70			Stiff brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is subangular fine to medium of mudstone.
		9.30 N=43 (5,7/8,8,12,15)	D							*Sand lens at 9.50-9.55m bgl.*

Remarks

1. Hand excavated inspection pit to 1.20m bgl.
2. Groundwater strike at 16.3m bgl rising to 15.1m bgl after 20 minutes.
3. Installation to 16.0m bgl; G.L. to 4.0m plain pipe, 4.0 m- 16.0m slotted pipe.

AGS

BROWNFIELD SOLUTIONS LTD
William Smith House,
173 - 183 Witton Street,
Northwich, Cheshire,
CW9 5LP

Rotary Core Log

Borehole No. **BH1**

Project Name: BACK TURNER STREET	Project No. C3967	Co-ords:	Hole Type CP+RC
Location: MANCHESTER		Level:	Scale 1:50
Client: DOMIS CONSTRUCTION LTD		Dates: 06/08/2018 - 08/08/2018	Logged By JM

Well	Water Strikes	Depth (m)	Type /Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
		50 (25 for 75mm/50 for 75mm)								Stiff brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is subangular fine to medium of mudstone.
		50 (25 for 75mm/50 for 75mm)					11.80			Dense to very dense reddish brown gravelly fine to coarse SAND. Gravel is subrounded to rounded fine to medium of sandstone.
		15.00 - 16.50	10	67	60	24	13.60			Very dense red coarse grained SAND. (COMPLETELY WEATHERED CHESTER PEBBLE BEDS FORMATION)
		16.50 - 18.00	19	100	100	15	15.60			Weak thinly bedded red coarse grained SANDSTONE. Joint set 1: joints are horizontal to sub-horizontal (typically <5 degrees), medium spaced, planar and tight. (CHESTER PEBBLE BEDS FORMATION).
		18.00 - 19.50	14	60	60	0				

11 12 13 14 15 16 17 18 19 20

Remarks

1. Hand excavated inspection pit to 1.20m bgl.
2. Groundwater strike at 16.3m bgl rising to 15.1m bgl after 20 minutes.
3. Installation to 16.0m bgl; G.L. to 4.0m plain pipe, 4.0 m- 16.0m slotted pipe.

AGS

BROWNFIELD SOLUTIONS LTD William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	**Rotary Core Log**		Borehole No. **BH1** Sheet 3 of 3
Project Name: BACK TURNER STREET	Project No. C3967	Co-ords:	Hole Type CP+RC
Location: MANCHESTER		Level:	Scale 1:50
Client: DOMIS CONSTRUCTION LTD		Dates: 06/08/2018 - 08/08/2018	Logged By JM

Well	Water Strikes	Depth (m)	Type /Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
		19.50 - 21.00	19	100	100	35				
		21.00 - 22.50	13	100	100	68				
		22.50 - 24.00	10	100	100	75				*Partially unweathered sandstone from 22.50m bgl.*
							24.00			End of Borehole at 24.000m

Remarks

1. Hand excavated inspection pit to 1.20m bgl.
2. Groundwater strike at 16.3m bgl rising to 15.1m bgl after 20 minutes.
3. Installation to 16.0m bgl; G.L. to 4.0m plain pipe, 4.0 m- 16.0m slotted pipe.

AGS

BROWNFIELD SOLUTIONS LTD William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	**Rotary Core Log**		Borehole No. **BH2** Sheet 1 of 3
Project Name: BACK TURNER STREET	Project No. C3967	Co-ords:	Hole Type CP+RC
Location: MANCHESTER		Level:	Scale 1:50
Client: DOMIS CONSTRUCTION LTD		Dates: 08/08/2018 - 10/08/2018	Logged By JM

Well	Water Strikes	Depth (m)	Type /Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
		0.30	ES				0.25			MADE GROUND: Grey subangular fine to coarse gravel of limestone and sandstone.
		1.00 N=16 (3,4/4,4,5,3)	ES							MADE GROUND: Reddish brown slightly sandy gravel with high, angular brick cobble content. Sand is fine to medium of ash. Gravel is subangular to subrounded, fine to coarse of brick, quartzite, mudstone, limestone and sandstone. Rare fragments of timber, plastic, glass and cloth.
		1.50	ES							*Scrap metal bar at 0.4m bgl.*
		N=16 (1,2/4,4,5,3)								
							2.60 2.70			MADE GROUND: Vinyl coated floor covering (Suspected basement structure)
		N=22 (2,6/8,4,5,5)								MADE GROUND: Brownish grey ashy angular gravel predominantly of brick with rare rotten timber fragments. (Suspected basement structure)
		3.50	D				3.20			Stiff brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium of mudstone and sandstone.
		4.00 - 4.50	U							
		4.50 - 5.00	U							
		5.00 N=24 (4,4/5,7,6,6)	D							*Becoming firm below 5.5m bgl.*
		6.00 N=34 (6,7/7,7,10,10)	D							
		7.00 N=30 (5,5/6,7,8,9)	D							*Returning to stiff below 7.2m bgl.* *Becoming gravelly below 7.5m bgl.*
		8.00 N=28 (3,4/4,6,8,10)	D							
		9.00 50 (7,7/50 for 295mm)	D							
							9.60			Stiff reddish brown gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to

Remarks

1. Hand excavated inspection pit to 1.20m bgl.
2. Groundwater strike at 17.1m bgl, rising to 15.9m bgl after 20 minutes.
3. Installation to 4.0m bgl: G.L. to 1.0m plain pipe, 1.0m - 4.0m slotted pipe.

AGS

BROWNFIELD SOLUTIONS LTD William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	**Rotary Core Log**		Borehole No. **BH2** Sheet 2 of 3
Project Name: BACK TURNER STREET	Project No. C3967	Co-ords:	Hole Type CP+RC
Location: MANCHESTER		Level:	Scale 1:50
Client: DOMIS CONSTRUCTION LTD		Dates: 08/08/2018 - 10/08/2018	Logged By JM

Well	Water Strikes	Depth (m)	Type /Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
		50 (7,8/50 for 210mm)								medium of sandstone. *Sand lens encountered between 10.0m and 10.08m bgl.*
							11.10			Very dense red coarse grained SAND. (COMPLETELY WEATHERED CHESTER PEBBLE BEDS FORMATION)
							14.05			Weak thinly bedded red coarse grained SANDSTONE. Joint set 1: joints are horizontal to sub-horizontal (typically <5 degrees), medium spaced, planar and tight. (CHESTER PEBBLE BEDS FORMATION).
	▼	15.00 - 16.50	14	57	43	10				
	▽	16.50 - 18.00	18	87	87	23				
		18.00 - 19.50	17	100	100	25				

11 12 13 14 15 16 17 18 19 20

Remarks

1. Hand excavated inspection pit to 1.20m bgl.
2. Groundwater strike at 17.1m bgl, rising to 15.9m bgl after 20 minutes.
3. Installation to 4.0m bgl: G.L. to 1.0m plain pipe, 1.0m - 4.0m slotted pipe.

AGS

BROWNFIELD SOLUTIONS LTD
William Smith House,
173 - 183 Witton Street,
Northwich, Cheshire,
CW9 5LP

Rotary Core Log

Borehole No.
BH2
Sheet 3 of 3

Project Name: BACK TURNER STREET	Project No. C3967	Co-ords:	Hole Type CP+RC
Location: MANCHESTER		Level:	Scale 1:50
Client: DOMIS CONSTRUCTION LTD		Dates: 08/08/2018 - 10/08/2018	Logged By JM

Well	Water Strikes	Depth (m)	Type /Fl	Coring TCR	Coring SCR	Coring RQD	Depth (m)	Level (m)	Legend	Stratum Description
		19.50 - 21.00	16	100	100	53				
		21.00 - 22.50	10	100	100	72				*Partially unweathered sandstone from 22m bgl.*
		22.50 - 24.00	9	100	100	80				
							24.00			End of Borehole at 24.000m

21 22 23 24 25 26 27 28 29 30

Remarks

1. Hand excavated inspection pit to 1.20m bgl.
2. Groundwater strike at 17.1m bgl, rising to 15.9m bgl after 20 minutes.
3. Installation to 4.0m bgl: G.L. to 1.0m plain pipe, 1.0m - 4.0m slotted pipe.

AGS

BROWNFIELD SOLUTIONS LTD

Borehole Log

Cable Percussion with Rotary Core No.

BH03

Sheet 1 of 3

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** CP+RC
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:51
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 12/04/21 - 13/04/21	**Logged** MS / **Checked** NS

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.10	ES					MADE GROUND: Brown and grey sand and gravel with medium cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of brick, concrete, glass, metal, plastic, wood and wires. Cobbles are angular of brick and concrete upto 200mm in diameter.
		1.00	ES					
		1.20	SPT	N=16 (2,3/3,5,3,5)				
		2.00	D					
			ES					
			SPT	N=23 (1,4/4,7,5,7)				
								Becoming slightly clayey from 2.80m to 3.30m bgl.
		3.00	D					
			SPT	N=27 (1,6/7,8,7,5)				
		3.30	ES		3.30			Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to medium of mudstone.
		4.00	D					
			SPT	N=23 (2,5/5,5,6,7)				
		5.00	D					
			SPT	N=31 (6,7/9,7,7,8)				
		6.00-6.45	U					
		7.50	D					
			SPT	N≥50 (6,8/50 for 295mm)				
					8.80			Orange brown fine to coarse SAND.
		9.00	D					
			SPT	N≥50 (7,10/51 for 155mm)	9.10			Very dense orange brown slightly clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of mudstone and sandstone.
		9.20	D					
					10.00			

Remarks

1. Domis assisted excavation to 2.00m bgl with tracked excavator to prove absence of services and ground conditions to be recently placed demolition rubble.
2. Groundwater encountered at 15.50m bgl.
3. Dual installation: 1.00m plain, 2.00m slotted & 9.00m plain, 7.00m slotted.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Cable Percussion with Rotary Core No.

BH03

Sheet 2 of 3

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** CP+RC
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:51
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 12/04/21 - 13/04/21	**Logged** MS / **Checked** NS

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		10.50	SPT	N≥50 (0 for 0mm/75 for 95mm)				Very dense brownish red gravelly fine to coarse SAND. Gravel is subrounded to rounded fine to coarse of sandstone.
		12.00	SPT	N≥50 (0 for 0mm/75 for 100mm)				
		13.50	SPT	N≥50 (0 for 0mm/75 for 110mm)	14.50			
	▼	15.00 - 16.50	11	52 52 14	16.05			Extremely weak red coarse grained destructured SANDSTONE recovered as sand.
		16.50 - 18.00	21	100 96 25				Weak thinly bedded red coarse grained distinctly weathered SANDSTONE. Discontinuities are very medium spaced, planar and horizontal to 5 degrees sub-horizontal.
		18.00 - 19.50	24	75 58 0				*Becoming very weak between 17.25 and 17.45m bgl.*
				92 77 10				
				TCR SCR RQD				

11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Domis assisted excavation to 2.00m bgl with tracked excavator to prove absence of services and ground conditions to be recently placed demolition rubble.
2. Groundwater encountered at 15.50m bgl.
3. Dual installation: 1.00m plain, 2.00m slotted & 9.00m plain, 7.00m slotted.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Cable Percussion with Rotary Core No.

BH03

Sheet 3 of 3

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** CP+RC
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:51
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 12/04/2021 - 13/04/2021	**Logged** MS / **Checked** NS

Well	Water Strike	Depth (m)	Type / FI	Coring TCR (%)	Coring SCR (%)	Coring RQD (%)	Depth (m)	Level (m OD)	Legend	Stratum Description
		19.50 - 21.00	27	100	87	0				
		21.00 - 22.50	41	20	20	0	22.50			Extremely weak red coarse grained destructered SANDSTONE recovered as sand.
		22.50 - 24.00	8	75	70	24	23.75			Weak thinly bedded red coarse grained distinctly weathered SANDSTONE. Discontinuities are very medium spaced, planar and horizontal to 5 degrees sub-horizontal.
		24.00 - 25.50	19				25.50			End of Borehole at 25.50m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0

Remarks

1. Domis assisted excavation to 2.00m bgl with tracked excavator to prove absence of services and ground conditions to be recently placed demolition rubble.
2. Groundwater encountered at 15.50m bgl.
3. Dual installation: 1.00m plain, 2.00m slotted & 9.00m plain, 7.00m slotted.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP01
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.17-0.51	ES		0.09 0.17			MADE GROUND: Concrete. MADE GROUND: Light brown sandy angular to sub-angular fine to coarse gravel of brick and concrete.
	0.51-0.71	ES		0.45			MADE GROUND: Dark brown slightly sandy gravelly clay with high cobble content of brick. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of brick and concrete. Cobbles are angular to sub-angular up to 200mm in diameter of brick and concrete.
				0.81			Dark brown mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone. End of Trial Pit at 0.81m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP02
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.18-0.30	ES		0.07			MADE GROUND: Concrete.
				0.18			MADE GROUND: Orangish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
				0.45			MADE GROUND: Dark brown mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded of brick, concrete and mudstone.
				0.72			Dark brown mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone.
							End of Trial Pit at 0.72m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP03
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.05			MADE GROUND: Concrete.
	0.20-0.65	ES		0.20			MADE GROUND: Orangish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
	0.65-0.75	ES		0.65			MADE GROUND: Greyish brown gravelly fine to coarse sand low cobble content. Gravel is angular to sub-angular fine to coarse of brick and concrete. Cobbles are angular to sub-angular up to 260mm of concrete.
				0.84			Dark brown mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone.
							End of Trial Pit at 0.84m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP04
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.05-0.18	ES		0.05			MADE GROUND: Concrete.
				0.18			MADE GROUND: Orangish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
							MADE GROUND: Concrete.
				0.65			End of Trial Pit at 0.65m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP05
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.05-0.16	ES		0.05			MADE GROUND: Concrete.
	0.16-0.32	ES		0.16			MADE GROUND: Dark brown slightly sandy gravelly clay with high cobble content of brick. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of brick and concrete. Cobbles are angular to sub-angular up to 200mm in diameter of brick and concrete.
				0.32			MADE GROUND: Blackish brown gravelly fine to coarse sand. Gravel is angular to sub-angular fine to coarse of brick and concrete.
				0.75			Dark brown mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone.
							End of Trial Pit at 0.75m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP06
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.05			MADE GROUND: Concrete.
	0.17-0.32	ES		0.17			MADE GROUND: Orangish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
							MADE GROUND: Dark brown slightly sandy gravelly clay with high cobble content of brick. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of brick and concrete. Cobbles are angular to sub-angular up to 200mm in diameter of brick and concrete.
				0.85			End of Trial Pit at 0.85m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
Block B TP07
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 27/01/21	**Logged** PG / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15-0.50	ES		0.05			MADE GROUND: Concrete.
				0.15			MADE GROUND: Orangish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
				0.50			MADE GROUND: Greyish brown gravelly fine to coarse sand medium cobble content. Gravel is angular to sub-angular fine to coarse of brick and concrete. Cobbles are angular to sub-angular up to 300mm of brick and concrete.
				0.95			Dark brown mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded of mudstone.
							End of Trial Pit at 0.95m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
S01
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 01/02/21	**Logged** JM / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.10			MADE GROUND: Reinforced concrete.
				0.16			MADE GROUND: Brick cobbles.
	0.50	ES PID	0.0PPM				Firm brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular fine to coarse of sandstone and limestone.
	1.00	ES PID	0.0PPM				
				1.20			End of Trial Pit at 1.20m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
S02
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 01/02/21	**Logged** JM / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.10			MADE GROUND: Reinforced concrete.
				0.16			MADE GROUND: Brick cobbles.
				0.25			MADE GROUND: Firm brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular fine to coarse of brick, sandstone and limestone.
	0.50	ES PID	127.0PPM				Firm blackish grey very sandy clay. Sand is fine to coarse.
							Strong sweet volatile odour with black staining encounter at 0.25m bgl.
	0.80	ES PID	317.0PPM	0.80			End of Trial Pit at 0.80m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
S03
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** TP
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:25
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 01/02/21	**Logged** JM / **Checked**

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.10			MADE GROUND: Reinforced concrete.
				0.16			MADE GROUND: Brick cobbles.
	0.50	ES PID	0.0PPM				Firm brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular fine to coarse of sandstone and limestone.
	1.20	ES PID	0.0PPM	1.20			End of Trial Pit at 1.20m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Trial pit sides stable.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
BHB1
Sheet 1 of 1

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** WS
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:30
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:** 14/09/21	**Logged** CM / **Checked** NS

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.04			MADE GROUND: Concrete.
					0.15			MADE GROUND: Reddish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
					0.34			MADE GROUND: Greyish brown gravelly fine to coarse sand. Gravel is angular to sub-angular fine to coarse of brick and concrete.
		0.50	D		0.45			MADE GROUND: Concrete
		0.50-1.00	U					Stiff dark brown mottled grey slightly gravelly CLAY. Gravel is angular to sub-rounded fine to coarse of mudstone.
		1.00	D SPT	N=27 (3,3/4,6,8,9)	0.95			Stiff to very stiff dark brown slightly gravelly CLAY. Gravel is angular to rounded fine to coarse of mudstone.
		1.50-2.00	U					
		2.10	D					
		3.00	U SPT	N=43 (5,6/8,11,12,12)				
					3.45			End of Borehole at 3.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand pit dug to 0.50m bgl.
2. Refusal at 2.10m. Smaller barrel used to progress.
3. No groundwater encountered.
4. Dynamic probe follow on to 7.00m bgl.
5. Backfilled with arisings and bentonite upon completion.

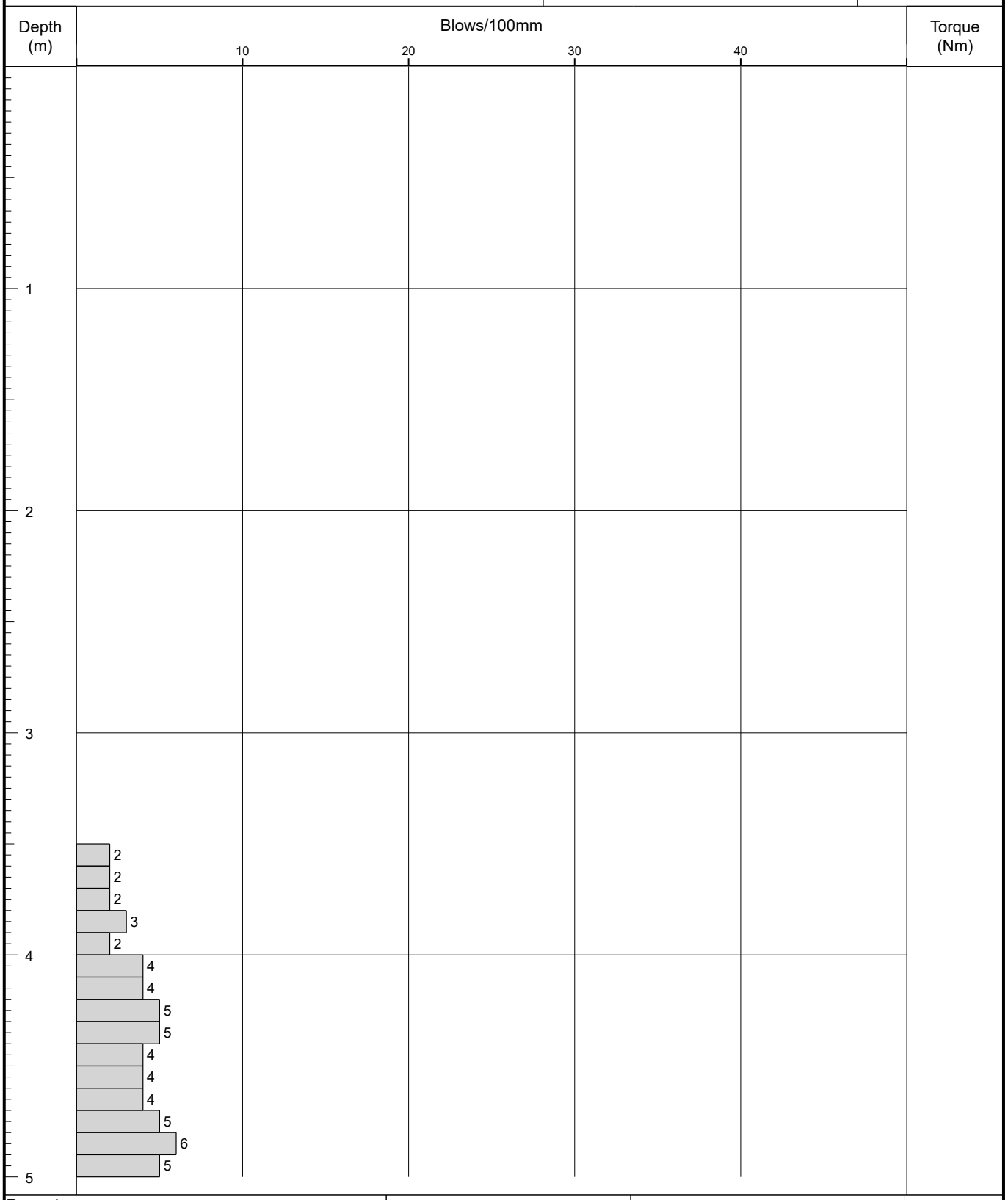
ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Probe Log

Borehole No.
BHB1.
Sheet 1 of 2

Project Name: BACK TURNER STREET	Project No. C3967	Co-ords: -	Hole Type DP
Location: MANCHESTER		Level:	Scale 1:25
Client: DOMIS CONSTRUCTION LTD		Dates: 16/09/2021 -	Logged By



Remarks		Fall Height	500	Cone Base Diameter	
		Hammer Wt	63	Final Depth	7.45
		Probe Type		Log Scale	1:25

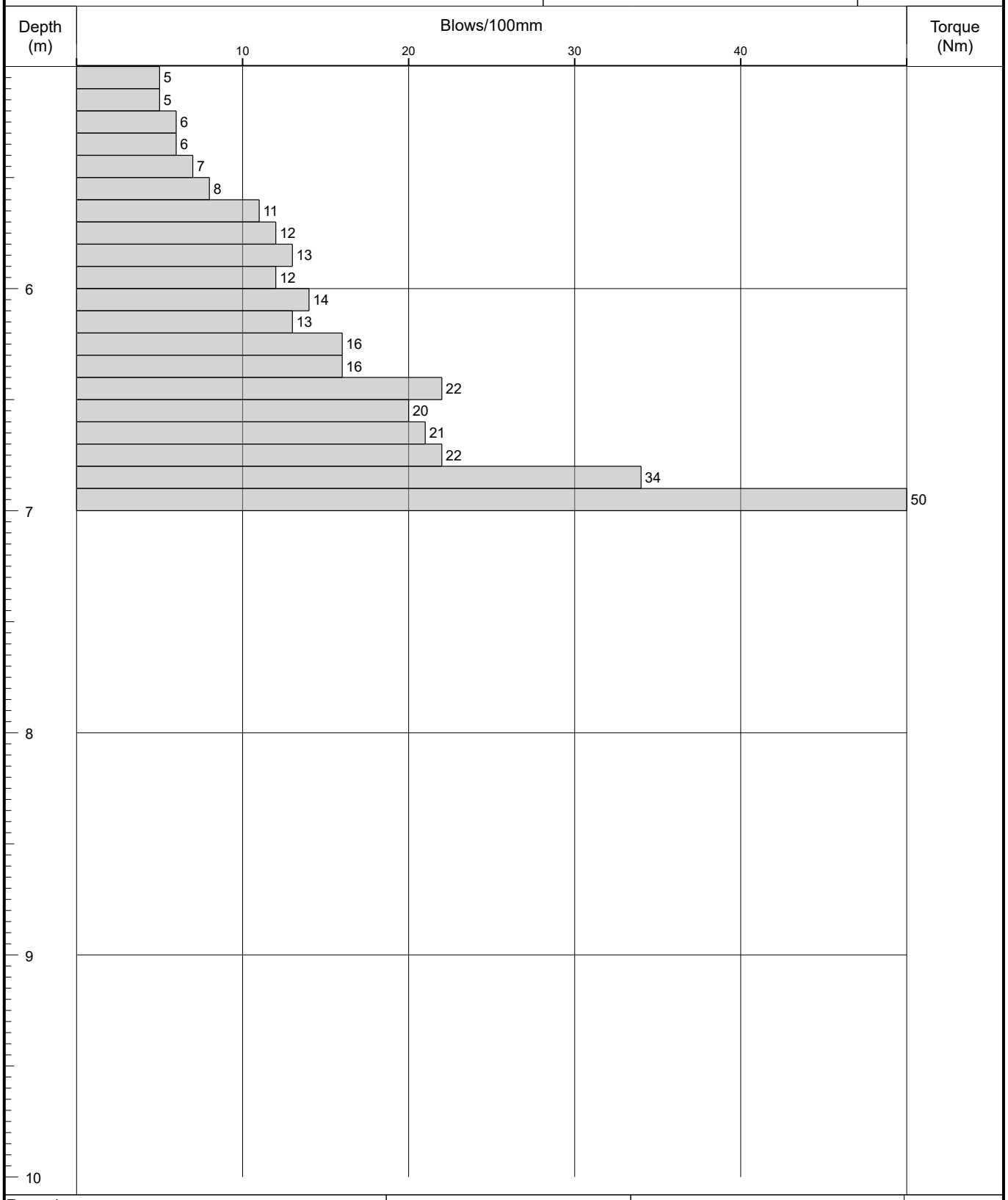
AGS

BROWNFIELD SOLUTIONS LTD

Probe Log

Borehole No.
BHB1.
Sheet 2 of 2

Project Name: BACK TURNER STREET	Project No. C3967	Co-ords: -	Hole Type DP
Location: MANCHESTER		Level:	Scale 1:25
Client: DOMIS CONSTRUCTION LTD		Dates: 16/09/2021 -	Logged By



Remarks

Fall Height	500	Cone Base Diameter	
Hammer Wt	63	Final Depth	7.45
Probe Type		Log Scale	1:25

AGS

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
BHB2
Sheet 1 of 2

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type** WS
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale** 1:30
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:**	14/09/21

Logged	Checked
CM	NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.02			MADE GROUND: Concrete
					0.10			MADE GROUND: Reddish brown sandy angular to sub-angular fine to coarse. gravel of brick and concrete. Sand is fine to coarse.
		0.45	D		0.45			MADE GROUND: Greyish brown gravelly fine to coarse sand. Gravel is angular to sub-angular fine to coarse of brick and concrete.
		0.50	D					
			SPT	N=16 (2,2/4,4,4,4)				Stiff dark brown slightly gravelly CLAY. Gravel is angular to rounded fine to coarse of mudstone.
		1.00-1.50	U					
		1.50-2.00	U					
		2.00	D					*Becoming very stiff at 2.00m bgl.*
			SPT	N=23 (4,4/4,5,6,8)				
		2.50-3.00	U					
		3.00	D					
			SPT	N=25 (3,4/4,6,7,8)				
		3.50-4.00	U					
		4.00	D					
			SPT	N=26 (4,4/4,8,7,7)				
		5.00	D					*Becoming very stiff at 5.00m bgl.*
			SPT	N=33 (4,4/6,9,9,9)				
		5.50-6.00	U					
		6.00	D					
			SPT	N=21 (3,4/5,5,5,6)				

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand pit dug to 0.50m bgl.
2. Refusal at 2.50m. Smaller barrel used to progress.
3. No groundwater encountered.
4. Backfilled with arisings and bentonite upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **BHB2**

Sheet 2 of 2

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type:** WS
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale:** 1:30
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:**	14/09/21

Logged	Checked
CM	NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		6.50-7.00	U					*Becoming stiff at 6.00m bgl.*
		7.00	D					
			SPT	N=23 (4,6/6,5,6,6)				
		7.10-7.60	U					
		7.60	D					
			SPT	N≥50 (4,5/50 for 85mm)				
					7.83			End of Borehole at 7.83m

7.0
8.0
9.0
10.0
11.0
12.0

Remarks

1. Hand pit dug to 0.50m bgl.
2. Refusal at 2.50m. Smaller barrel used to progress.
3. No groundwater encountered.
4. Backfilled with arisings and bentonite upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **BHB3**

Sheet 1 of 2

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type:** WS
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale:** 1:30
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:**	14/09/21

Logged	Checked
CM	NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Concrete
					0.13			MADE GROUND: Reddish brown sandy angular to sub-angular fine to coarse gravel of brick and concrete. Sand is fine to coarse.
					0.24			MADE GROUND: Greyish brown gravelly fine to coarse sand. Gravel is angular to sub-angular fine to coarse of brick and concrete.
					0.30			MADE GROUND: Concrete
					0.45			MADE GROUND: Dark brown slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of brick and mudstone.
		0.50	D					Firm dark brown slightly gravelly CLAY. Gravel is angular to rounded fine to coarse of mudstone.
		0.50-1.00	U					
		1.00	D					
			SPT	N=7 (1,1/2,2,1,2)				
		2.00	D					
			SPT	N=13 (2,2/3,3,3,4)				
		2.50-3.00	U					
		3.00	D					*Becoming stiff at 3.00m bgl.*
			SPT	N=13 (3,4/3,3,3,4)				
		3.50-4.00	U					
		4.00	D					
			SPT	N=19 (4,3/4,5,5,5)				
		4.50-5.00	U					
		5.00	D					
			SPT	N=18 (4,3/4,4,5,5)				
		5.50-6.00	U					
		6.00	D					
			SPT	N=22 (4,4/5,5,6,6)				

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand pit dug to 0.50m bgl.
2. SPT refusal at 7.70m.
3. No groundwater encountered.
4. Backfilled with arisings and bentonite upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.: **BHB3**

Sheet 2 of 2

PROJECT NO:	C3967	**CO-ORDS:**	**Hole Type:** WS
PROJECT NAME:	BACK TURNER STREET	**LEVEL:**	**Scale:** 1:30
CLIENT:	DOMIS CONSTRUCTION LTD	**DATES:**	14/09/21

Logged	Checked
CM	NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		6.50-7.00	U					
		7.00	D					*Becoming very stiff at 7.00m bgl.*
			SPT	N=33 (4,4/6,7,10,10)				
		7.10-7.70	U					
		7.70	D					
			SPT	N≥50 (25,25/50 for 20mm)	7.87			End of Borehole at 7.87m

7.0
8.0
9.0
10.0
11.0
12.0

Remarks

1. Hand pit dug to 0.50m bgl.
2. SPT refusal at 7.70m.
3. No groundwater encountered.
4. Backfilled with arisings and bentonite upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

APPENDIX F
Chemical Testing Results

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Herts,
WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 21-54670

Project / Site name:	Back Turner Street	**Samples received on:**	03/02/2021
Your job number:	C3976	**Samples instructed on/ Analysis started on:**	03/02/2021
Your order number:	JWC3987-1601	**Analysis completed by:**	09/02/2021
Report Issue Number:	1	**Report issued on:**	09/02/2021
Samples Analysed:	1 soil sample		

Signed:

Rachel Bradley
Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 21-54670
Project / Site name: Back Turner Street
Your Order No: JWC3987-1601

Lab Sample Number				1757826
Sample Reference				S02A
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				01/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	18
Total mass of sample received	kg	0.001	NONE	1.5

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1000
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.5
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	501
Organic Matter	%	0.1	MCERTS	0.3

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.29
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.93
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.43
Pyrene	mg/kg	0.05	MCERTS	0.52
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.17

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2
Chromium (III)	mg/kg	1	NONE	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	51
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70

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Analytical Report Number: 21-54670
Project / Site name: Back Turner Street
Your Order No: JWC3987-1601

Lab Sample Number				1757826
Sample Reference				S02A
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				01/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Monoaromatics & Oxygenates				
Benzene	mg/kg	0.001	MCERTS	< 0.001
Toluene	mg/kg	0.001	MCERTS	< 0.001
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001
o-xylene	mg/kg	0.001	MCERTS	< 0.001
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	0.55
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	12
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	53
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	50
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	100
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	110
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	28
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	38

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Analytical Report Number: 21-54670
Project / Site name: Back Turner Street
Your Order No: JWC3987-1601

Lab Sample Number				1757826
Sample Reference				S02A
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				01/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
VOCs				
Chloromethane	µg/kg	1	ISO 17025	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	25000
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0

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

Analytical Report Number: 21-54670
Project / Site name: Back Turner Street
Your Order No: JWC3987-1601

Lab Sample Number				1757826
Sample Reference				S02A
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				01/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	0.29
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.93
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.43
Pyrene	mg/kg	0.05	MCERTS	0.52
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3

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

Analytical Report Number: 21-54670
Project / Site name: Back Turner Street
Your Order No: JWC3987-1601

Lab Sample Number				1757826
Sample Reference				S02A
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				01/02/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 21-54670
Project / Site name: Back Turner Street

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1757826	S02A	None Supplied	0.5	Brown clay and sand with gravel.

Analytical Report Number : 21-54670
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 21-54670
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

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

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Analytical Report Number : 21-53757

Replaces Analytical Report Number: 21-53757, issue no. 1
Additional analysis undertaken.

Project / Site name:	Back Turner Street, Manchester	**Samples received on:**	28/01/2021
Your job number:	C3967	**Samples instructed on/ Analysis started on:**	29/01/2021
Your order number:	1646	**Analysis completed by:**	08/02/2021
Report Issue Number:	2	**Report issued on:**	08/02/2021
Samples Analysed:	5 soil samples		

Signed: Karolina Marek

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 21-53757
Project / Site name: Back Turner Street, Manchester
Your Order No: 1646

Lab Sample Number				1751884	1751885	1751886	1751887	1751888
Sample Reference				Block B TP02	Block B TP03	Block B TP05	Block B TP06	Block B TP07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.18-0.30	0.20-0.65	0.16-0.32	0.16-0.32	0.15-0.50
Date Sampled				27/01/2021	27/01/2021	27/01/2021	27/01/2021	27/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	22	14	31	18	9.7
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.0	1.5	1.5
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.8	8.2	8.2	8.7
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1400	6900	1500	3100	1800
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.68	3.5	0.76	1.5	0.9
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	682	3470	755	1530	897
Organic Matter	%	0.1	MCERTS	3.7	6.4	5.5	0.9	1.4
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.63	0.85	0.37	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	2.6	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.37	0.85	0.17	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.34	0.94	0.13	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.8	14	2.2	0.45	0.99
Anthracene	mg/kg	0.05	MCERTS	0.53	5.1	0.32	< 0.05	0.21
Fluoranthene	mg/kg	0.05	MCERTS	3.9	76	3.4	2.1	1.2
Pyrene	mg/kg	0.05	MCERTS	4.1	75	3.6	2.7	1.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.6	55	2.1	1.8	0.77
Chrysene	mg/kg	0.05	MCERTS	1.7	41	2.1	1.8	0.46
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2	37	1.9	1.7	0.58
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.1	36	1.5	0.74	0.29
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.9	46	1.7	1.6	0.47
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.88	19	0.92	0.74	0.27
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.31	6.3	0.29	0.27	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	21	1.2	0.86	0.3
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	24.1	435	21.9	14.8	6.68
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	22	44	9.4	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	8.6	< 0.2	2	0.7
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	26	25	23	29	25
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	25	23	29	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	50	62	110	25	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	590	1200	52	170
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	28	46	33	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93	610	130	230	93

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Analytical Report Number: 21-53757
Project / Site name: Back Turner Street, Manchester
Your Order No: 1646

Lab Sample Number				1751884	1751885	1751886	1751887	1751888
Sample Reference				Block B TP02	Block B TP03	Block B TP05	Block B TP06	Block B TP07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.18-0.30	0.20-0.65	0.16-0.32	0.16-0.32	0.15-0.50
Date Sampled				27/01/2021	27/01/2021	27/01/2021	27/01/2021	27/01/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
Toluene	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
Ethylbenzene	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
p & m-xylene	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
o-xylene	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	9.6	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	38	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	34	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	81	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 21-53757
Project / Site name: Back Turner Street, Manchester
Your Order No: 1646

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1751885	Block B TP03	0.20-0.65	113	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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

Analytical Report Number : 21-53757
Project / Site name: Back Turner Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1751884	Block B TP02	None Supplied	0.18-0.30	Black clay and sand with gravel and vegetation.
1751885	Block B TP03	None Supplied	0.20-0.65	Brown loam and clay with gravel.
1751886	Block B TP05	None Supplied	0.16-0.32	Brown clay and sand with gravel.
1751887	Block B TP06	None Supplied	0.16-0.32	Brown clay and sand with gravel.
1751888	Block B TP07	None Supplied	0.15-0.50	Light brown sand with gravel.

Analytical Report Number : 21-53757
Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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Analytical Report Number : 18-96491

Replaces Analytical Report Number : 18-96491, issue no. 1

Project / Site name:	Back Turner Street, Manchester	**Samples received on:**	14/08/2018
Your job number:	C3967	**Samples instructed on:**	14/08/2018
Your order number:	C3967/5842/JM	**Analysis completed by:**	28/08/2018
Report Issue Number:	2	**Report issued on:**	28/08/2018
Samples Analysed:	4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 18-96491

Project / Site name: Back Turner Street, Manchester
Your Order No: C3967/5842/JM

Lab Sample Number				1023736	1023737	1023738	1023739	
Sample Reference				BH1	BH1	BH2	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50	1.50	0.30	1.50	
Date Sampled				06/08/2018	06/08/2018	08/08/2018	08/08/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	12	17	5.9	9.9	
Total mass of sample received	kg	0.001	NONE	1.1	1.0	1.3	1.1	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	7.9	10.1	8.6	
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.37	1.8	0.20	1.2	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	368	1810	198	1240	
Organic Matter	%	0.1	MCERTS	3.8	4.8	2.0	2.2	
Phenols by HPLC								
Catechol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	
Resorcinol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	
2-Isopropylphenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	
Phenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	
Total Phenols								
Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	< 1.3	< 1.3	< 1.3	< 1.3	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.23	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	0.22	< 0.05	1.1	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.74	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	2.0	0.90	6.8	1.5	
Anthracene	mg/kg	0.05	MCERTS	0.45	0.15	1.7	0.24	
Fluoranthene	mg/kg	0.05	MCERTS	3.0	1.2	12	2.5	
Pyrene	mg/kg	0.05	MCERTS	2.9	1.2	11	2.8	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.4	0.63	5.5	1.2	
Chrysene	mg/kg	0.05	MCERTS	1.1	0.58	4.7	1.2	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.6	0.76	6.6	1.6	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.59	0.26	1.9	0.57	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.2	0.58	5.0	1.2	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.77	0.36	2.9	0.67	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.13	0.92	0.20	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.0	0.48	3.7	0.88	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	16.2	7.23	64.3	14.6	

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Analytical Report Number: 18-96491

Project / Site name: Back Turner Street, Manchester
Your Order No: C3967/5842/JM

Lab Sample Number				1023736	1023737	1023738	1023739	
Sample Reference				BH1	BH1	BH2	BH2	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50	1.50	0.30	1.50	
Date Sampled				06/08/2018	06/08/2018	08/08/2018	08/08/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	14	9.7	15	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	1.2	0.7	0.7	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	
Chromium (III)	mg/kg	1	NONE	18	18	18	19	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	18	18	19	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	71	110	110	71	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	770	1300	200	380	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.7	1.0	0.9	1.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	56	17	51	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.5	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	360	160	160	
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	19	-	-	110	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	19	-	-	110	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	2.9	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	37	-	-	91	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	47	-	-	100	

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Analytical Report Number: 18-96491
Project / Site name: Back Turner Street, Manchester
Your Order No: C3967/5842/JM

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1023736	BH1	0.50	144	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 18-96491

Project / Site name: Back Turner Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1023736	BH1	None Supplied	0.50	Brown sandy loam with vegetation and brick.
1023737	BH1	None Supplied	1.50	Grey loam and sand with brick and gravel.
1023738	BH2	None Supplied	0.30	Light grey sandy loam with gravel and brick.
1023739	BH2	None Supplied	1.50	Brown sandy loam with gravel and brick.

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Analytical Report Number : 18-96491

Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Phenols, speciated, in soil, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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Analytical Report Number : 20-24799

Project / Site name:	Back Turner Street	**Samples received on:**	13/08/2020
Your job number:	C36976	**Samples instructed on/ Analysis started on:**	13/08/2020
Your order number:	MS-C3967-1184	**Analysis completed by:**	20/08/2020
Report Issue Number:	1	**Report issued on:**	20/08/2020
Samples Analysed:	3 soil samples		

Signed:

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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Analytical Report Number: 20-24799
Project / Site name: Back Turner Street
Your Order No: MS-C3967-1184

Lab Sample Number				1592998	1592999	1593000
Sample Reference				TP04	TP06	TP07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.40	0.10-0.30	0.50-0.70
Date Sampled				11/08/2020	11/08/2020	11/08/2020
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	10	20	19
Total mass of sample received	kg	0.001	NONE	1.6	1.2	1.5
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	7.7	8.1	8.9
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	3500	4900	44
Water Soluble SO4 16hr extraction (2:1 Leachate Equivale	g/l	0.00125	MCERTS	1.8	2.4	0.022
Water Soluble SO4 16hr extraction (2:1 Leachate Equivale	mg/l	1.25	MCERTS	1770	2440	21.9
Organic Matter	%	0.1	MCERTS	5.3	5.3	4
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	3.8	0.64	1
Anthracene	mg/kg	0.05	MCERTS	0.88	0.13	0.21
Fluoranthene	mg/kg	0.05	MCERTS	6.8	0.73	1.5
Pyrene	mg/kg	0.05	MCERTS	6.3	0.75	1.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	4.3	0.44	0.88
Chrysene	mg/kg	0.05	MCERTS	3.7	0.41	0.66
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.3	0.28	0.63
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.3	0.26	0.45
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.6	0.31	0.61
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	0.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.45	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	< 0.05	0.35
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	38.8	3.95	8.07
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	20	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.2	0.7	0.5
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	27	16	18
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	17	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	48	41	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	430	1100	1000
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3.3	1.1	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	19	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	270	390	330
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-

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Analytical Report Number: 20-24799
Project / Site name: Back Turner Street
Your Order No: MS-C3967-1184

Lab Sample Number				1592998	1592999	1593000
Sample Reference				TP04	TP06	TP07
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.40	0.10-0.30	0.50-0.70
Date Sampled				11/08/2020	11/08/2020	11/08/2020
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-

Monoaromatics & Oxygenates

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
Toluene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
Ethylbenzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
p & m-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
o-xylene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	13	3.1	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	21	23	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	51	100	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	85	130	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	13	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	110	23	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	390	120	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	510	140	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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

Analytical Report Number : 20-24799
Project / Site name: Back Turner Street

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1592998	TP04	None Supplied	0.20-0.40	Brown loam and clay with gravel and vegetation.
1592999	TP06	None Supplied	0.10-0.30	Brown loam and clay with gravel and vegetation.
1593000	TP07	None Supplied	0.50-0.70	Brown loam and clay with gravel and vegetation.

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

Analytical Report Number : 20-24799
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Matthew Shore
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
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CW9 5LP

e: m.shore@brownfield-solutions.co.uk

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

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

Analytical Report Number : 21-68795

Project / Site name:	Back Tumer Street, Manchester	**Samples received on:**	15/04/2021
Your job number:	C3967	**Samples instructed on/ Analysis started on:**	15/04/2021
Your order number:		**Analysis completed by:**	21/04/2021
Report Issue Number:	1	**Report issued on:**	21/04/2021
Samples Analysed:	3 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

Analytical Report Number: 21-68795
Project / Site name: Back Tumer Street, Manchester

Lab Sample Number				1837710	1837711	1837712
Sample Reference				BH03	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				1.00	2.00	0.10
Date Sampled				12/04/2021	12/04/2021	12/04/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.7	5.6	13
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.40
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	11.0	10.7	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	3500	3500	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.7	1.7	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1740	1750	-
Organic Matter	%	0.1	MCERTS	1.8	2.9	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	1.7	1.4
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.48	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.26	-
Phenanthrene	mg/kg	0.05	MCERTS	0.46	2.4	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.58	-
Fluoranthene	mg/kg	0.05	MCERTS	0.48	1.8	-
Pyrene	mg/kg	0.05	MCERTS	0.46	1.6	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.24	0.52	-
Chrysene	mg/kg	0.05	MCERTS	0.24	0.44	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.41	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.32	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.39	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	1.88	9.17	-
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	24	12	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	-
Chromium (III)	mg/kg	1	NONE	18	19	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	20	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	20	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	90	53	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	16	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	97	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 21-68795
Project / Site name: Back Tumer Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1837710	BH03	None Supplied	1	Brown loam and sand with gravel and brick.
1837711	BH03	None Supplied	2	Brown loam and sand with gravel and brick.
1837712	BH03	None Supplied	0.1	Brown loam and sand with gravel and brick.

Analytical Report Number : 21-68795
Project / Site name: Back Tumer Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

APPENDIX G
Geotechnical Testing Results

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client	Brownfield Solutions
Address	William Smith House 173-183 Witton Street Northwich Cheshire CW9 5LP
Contract	C3967 - Back Turner Street
Job Number	MRN 4242/11
Date of Issue	20 October 2021
Total Pages	1 of 19

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

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

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

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

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

Andrew House, Hadfield Street,
Dukinfield, Cheshire SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

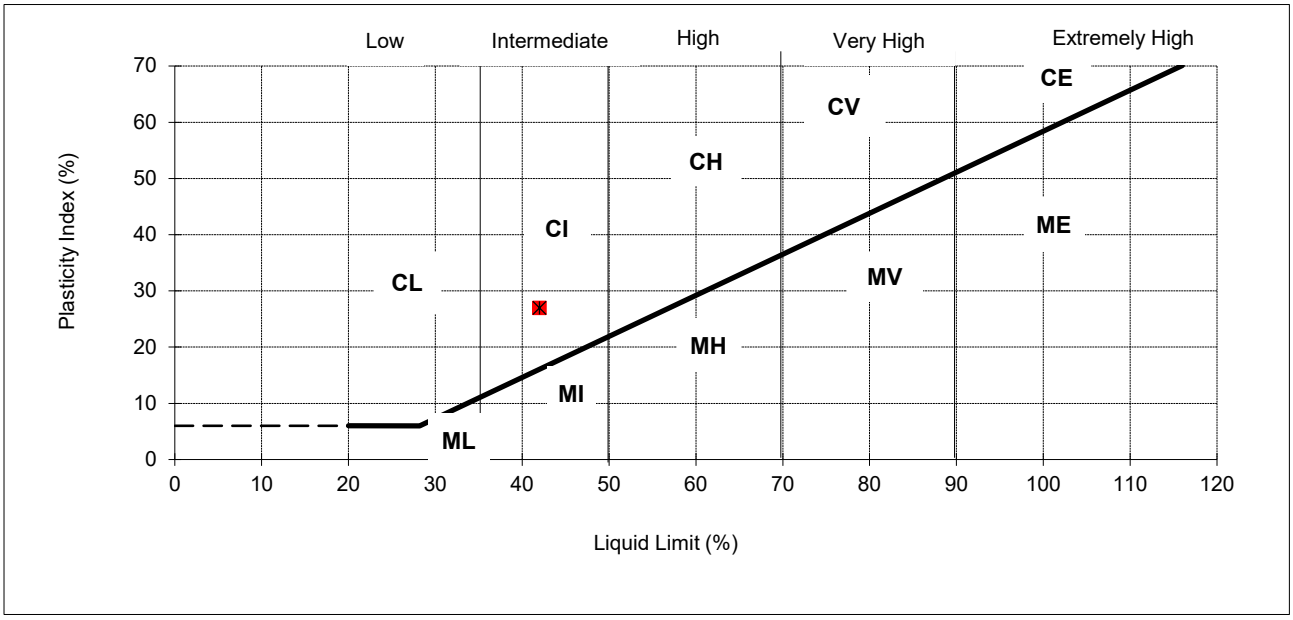
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB1 0.5m	DATE SAMPLED	14-Sep-21
SAMPLE No.	104521	DATE RECEIVED	21-Sep-21
DATE TESTED	13-Oct-21	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19	42	15	27	97



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Oct-21

MURRAY RIX

Andrew House, Hadfield Street,
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UKAS TESTING 1580

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LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

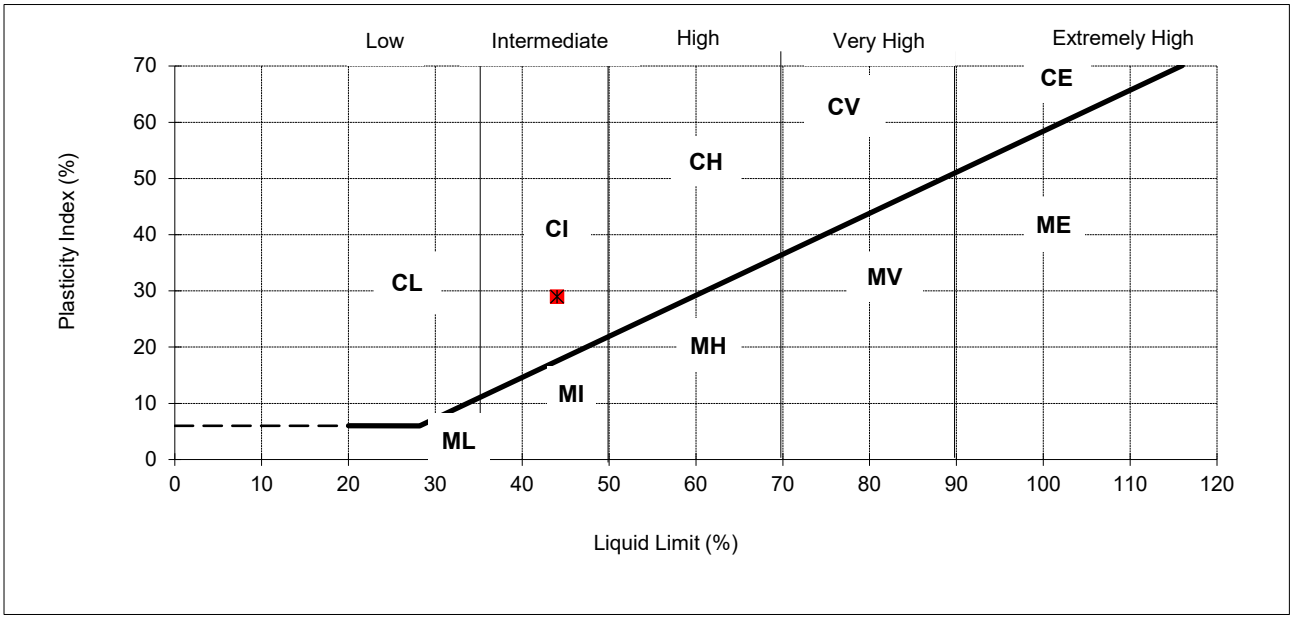
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB1 1.0m	DATE SAMPLED	14-Sep-21
SAMPLE No.	104522	DATE RECEIVED	21-Sep-21
DATE TESTED	13-Oct-21	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19	44	15	29	94



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Oct-21

MURRAY RIX

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TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

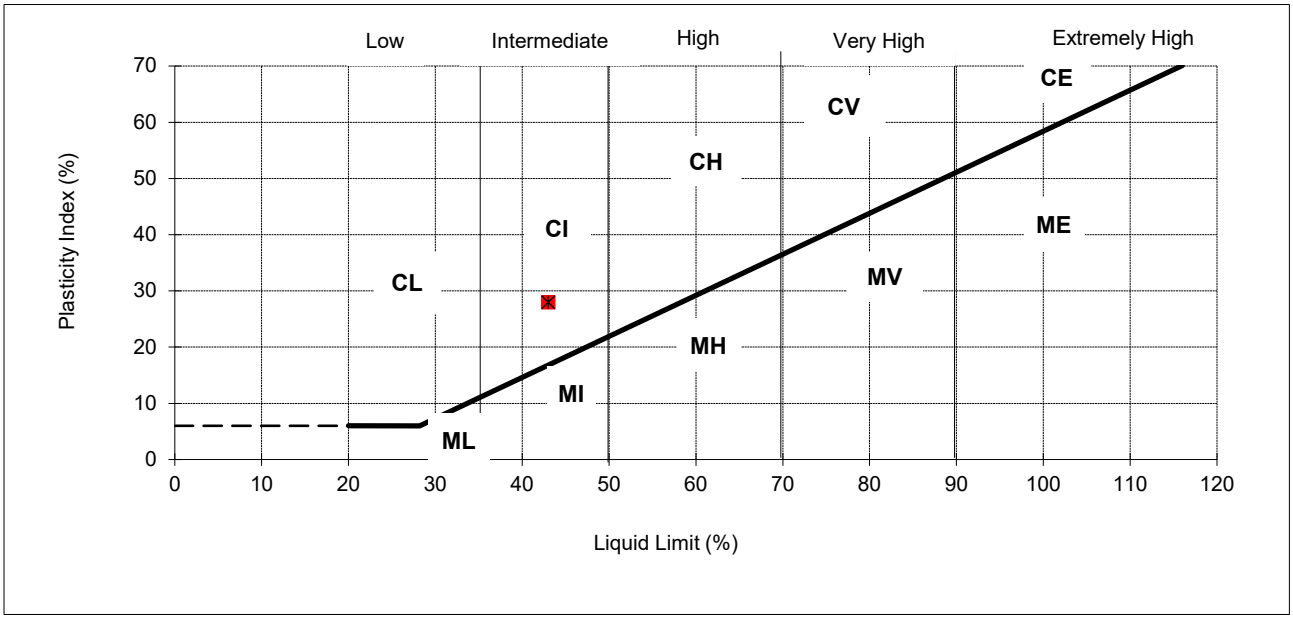
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB2 0.45m	DATE SAMPLED	14-Sep-21
SAMPLE No.	104523	DATE RECEIVED	21-Sep-21
DATE TESTED	13-Oct-21	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
21	43	15	28	95



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Oct-21

MURRAY RIX

Andrew House, Hadfield Street,
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UKAS TESTING 1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

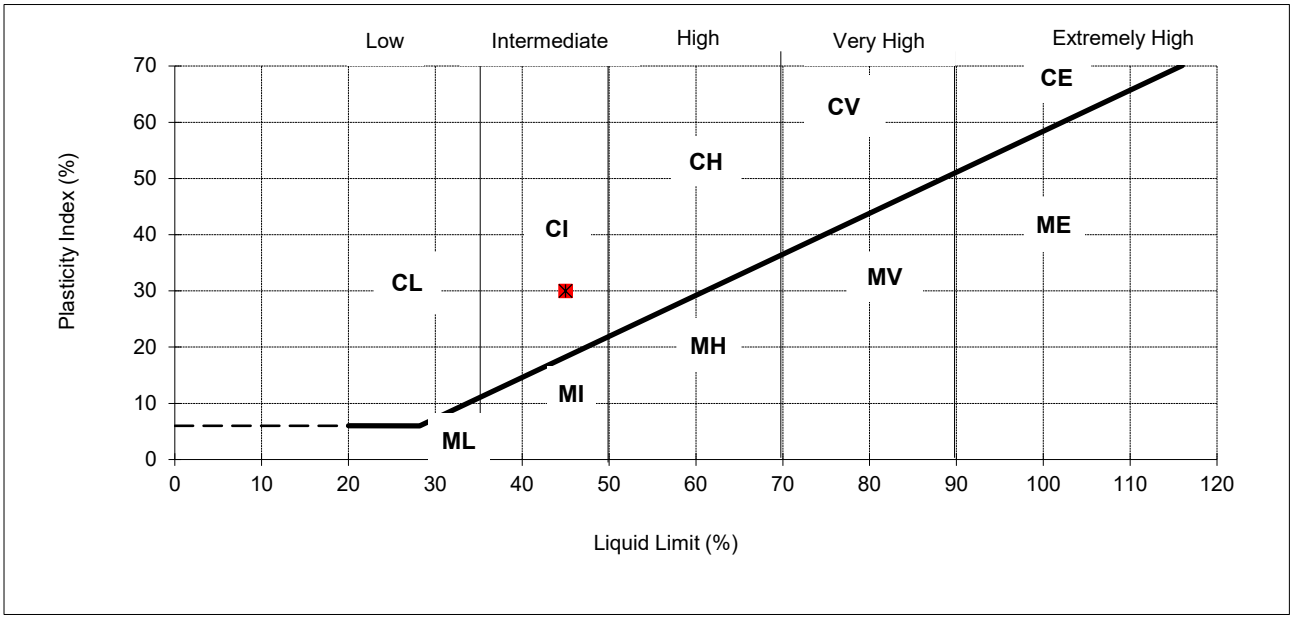
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB2 2m	DATE SAMPLED	14-Sep-21
SAMPLE No.	104524	DATE RECEIVED	21-Sep-21
DATE TESTED	13-Oct-21	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19	45	15	30	98



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Oct-21

MURRAY RIX

Andrew House, Hadfield Street,
Dukinfield, Cheshire SK16 4QX
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UKAS TESTING 1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

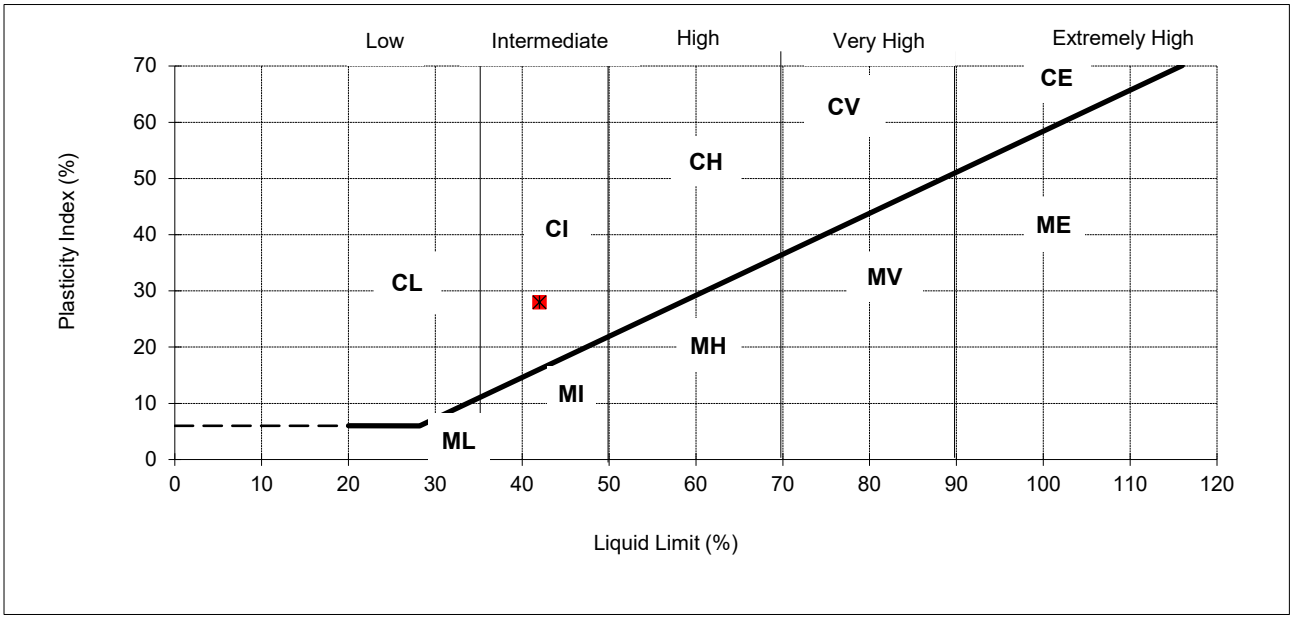
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB3 1m	DATE SAMPLED	15-Sep-21
SAMPLE No.	104525	DATE RECEIVED	21-Sep-21
DATE TESTED	13-Oct-21	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18	42	14	28	98



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Oct-21

MURRAY RIX

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Dukinfield, Cheshire SK16 4QX
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UKAS TESTING
1580

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

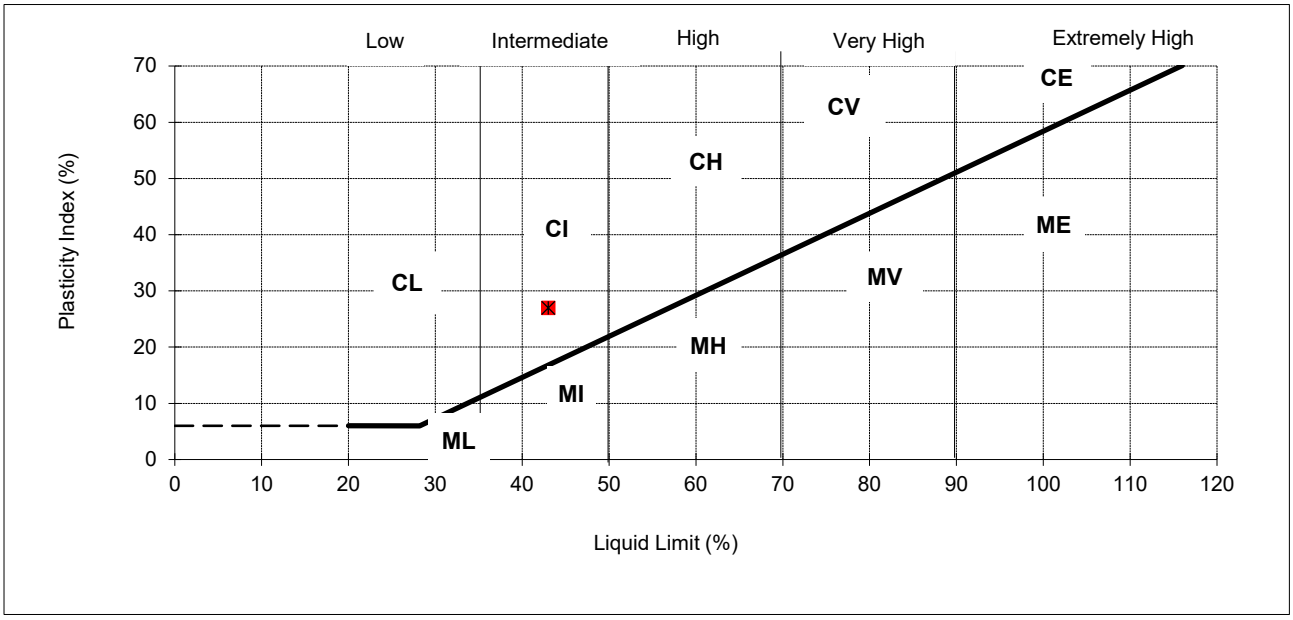
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB3 3m	DATE SAMPLED	15-Sep-21
SAMPLE No.	104526	DATE RECEIVED	21-Sep-21
DATE TESTED	13-Oct-21	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19	43	16	27	96



REMARKS
Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Oct-21

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES
BS 1377 : PART 5 : Clause 3 : 1990

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB1 0.50-1.00	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104527	**DATE RECEIVED**	21-Sep-21
DATE TESTED	24-Sep-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

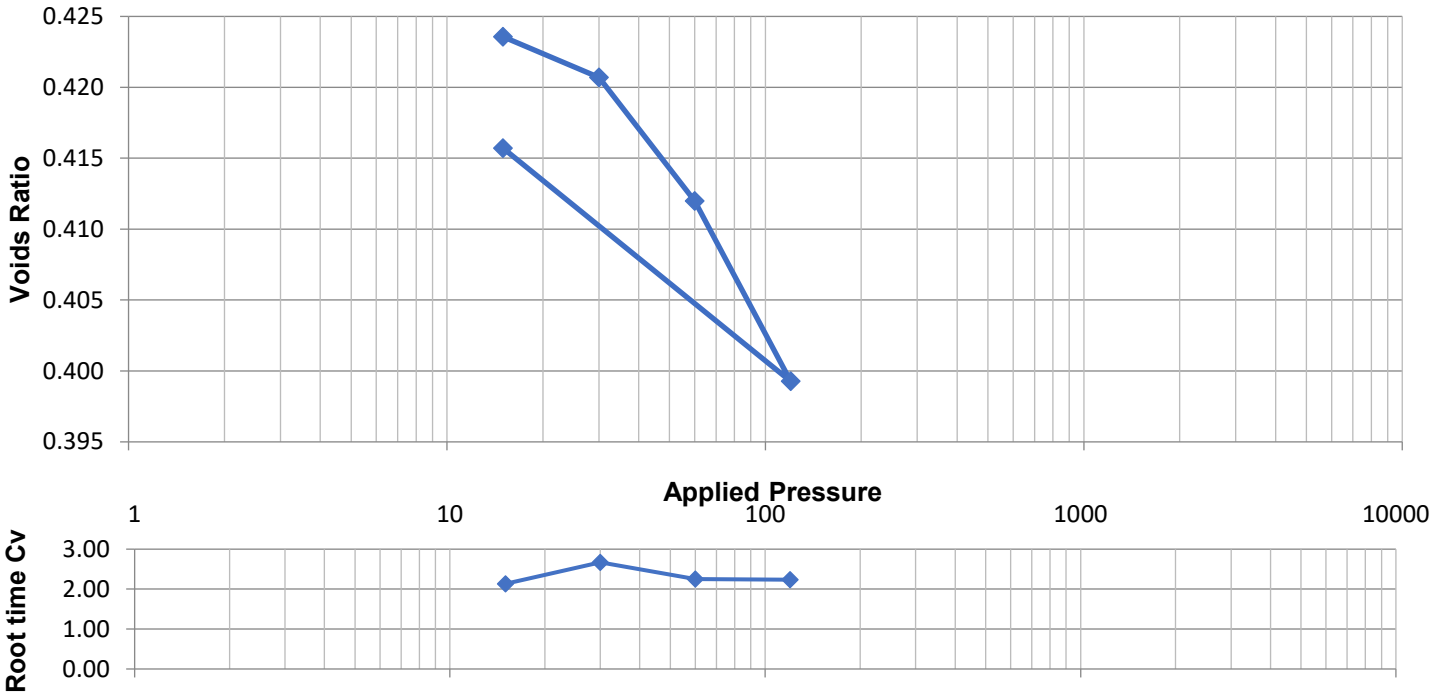
Specimen Location

Sample Length (mm)	320	Specimen depth from top of Sample (mm)	150
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.1	mm	Particle density	2.68	Ass
Diameter	75.0	mm	Initial void ratio	0.43	
Weight wet	191.3	g	Deg. of sat.	96	%
Moist. cont.	16	%	Swell. press.	5	kN/m2
Bulk Density	2.16	Mg/m3	Dry density	1.87	Mg/m3

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m2/MN	Temp °C	Cv t90 root m2/yr	Cv t50 log m2/yr
1	15	19.93	0.424	0.12	20	2.13	2.74
2	30	19.89	0.421	0.14	20	2.67	2.29
3	60	19.76	0.412	0.21	20	2.25	2.76
4	120	19.59	0.399	0.15	20	2.23	2.26
5	15	19.82	0.416	0.11	20		
6							
7							



Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Laboratory Manager)

Signed

Date 20 October 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : Clause 3 : 1990

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB2 1.0-1.5	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104528	**DATE RECEIVED**	21-Sep-21
DATE TESTED	28-Sep-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

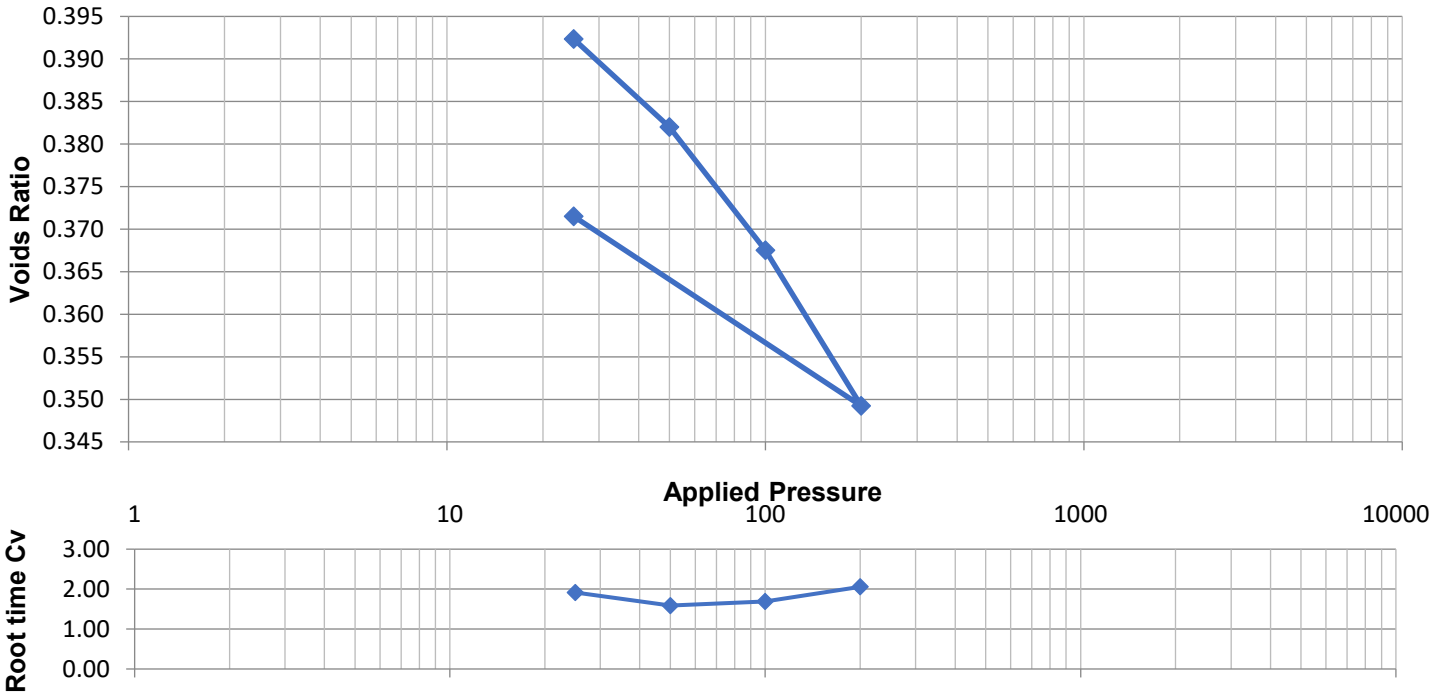
Specimen Location

Sample Length (mm)	450	Specimen depth from top of Sample (mm)	250
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.1	mm	Particle density	2.68	Ass
Diameter	75.0	mm	Initial void ratio	0.42	
Weight wet	193.1	g	Deg. of sat.	99	%
Moist. cont.	16	%	Swell. press.	5	kN/m2
Bulk Density	2.18	Mg/m3	Dry density	1.88	Mg/m3

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m2/MN	Temp °C	Cv t90 root m2/yr	Cv t50 log m2/yr
1	25	19.63	0.392	0.67	20	1.91	1.69
2	50	19.49	0.382	0.30	20	1.59	1.51
3	100	19.28	0.368	0.21	20	1.69	1.69
4	200	19.02	0.349	0.14	20	2.06	2.37
5	25	19.34	0.371	0.10	20		
6							
7							



Remarks/Abnormalities

Name O.P. Davies BA (Hons) (Laboratory Manager) Signed Date 20 October 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : Clause 3 : 1990

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB2 5.5-6.0	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104529	**DATE RECEIVED**	21-Sep-21
DATE TESTED	28-Sep-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

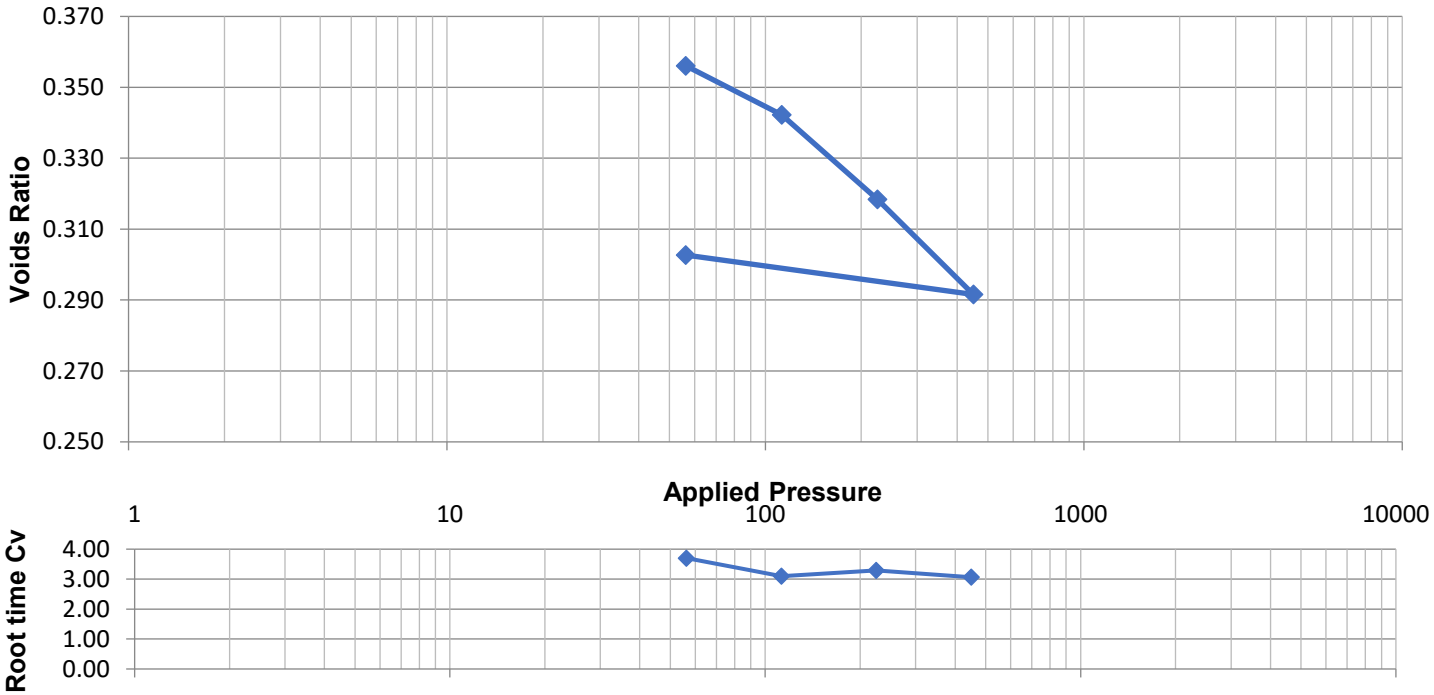
Specimen Location

Sample Length (mm)	900	Specimen depth from top of Sample (mm)	400
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.0	mm	Particle density	2.68	Ass
Diameter	49.9	mm	Initial void ratio	0.38	
Weight wet	86.1	g	Deg. of sat.	95	%
Moist. cont.	14	%	Swell. press.	11	kN/m2
Bulk Density	2.20	Mg/m3	Dry density	1.94	Mg/m3

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m2/MN	Temp °C	Cv t90 root m2/yr	Cv t50 log m2/yr
1	56	19.59	0.356	0.33	20	3.70	3.34
2	113	19.39	0.342	0.19	20	3.10	2.70
3	225	19.05	0.318	0.16	20	3.29	3.26
4	450	18.66	0.292	0.09	20	3.06	3.47
5	56	18.82	0.303	0.02	20		
6							
7							



Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed

Date 20 October 2021

MURRAY RIX

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TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : Clause 3 : 1990

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB2 7.1-7.6	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104530	**DATE RECEIVED**	21-Sep-21
DATE TESTED	28-Sep-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

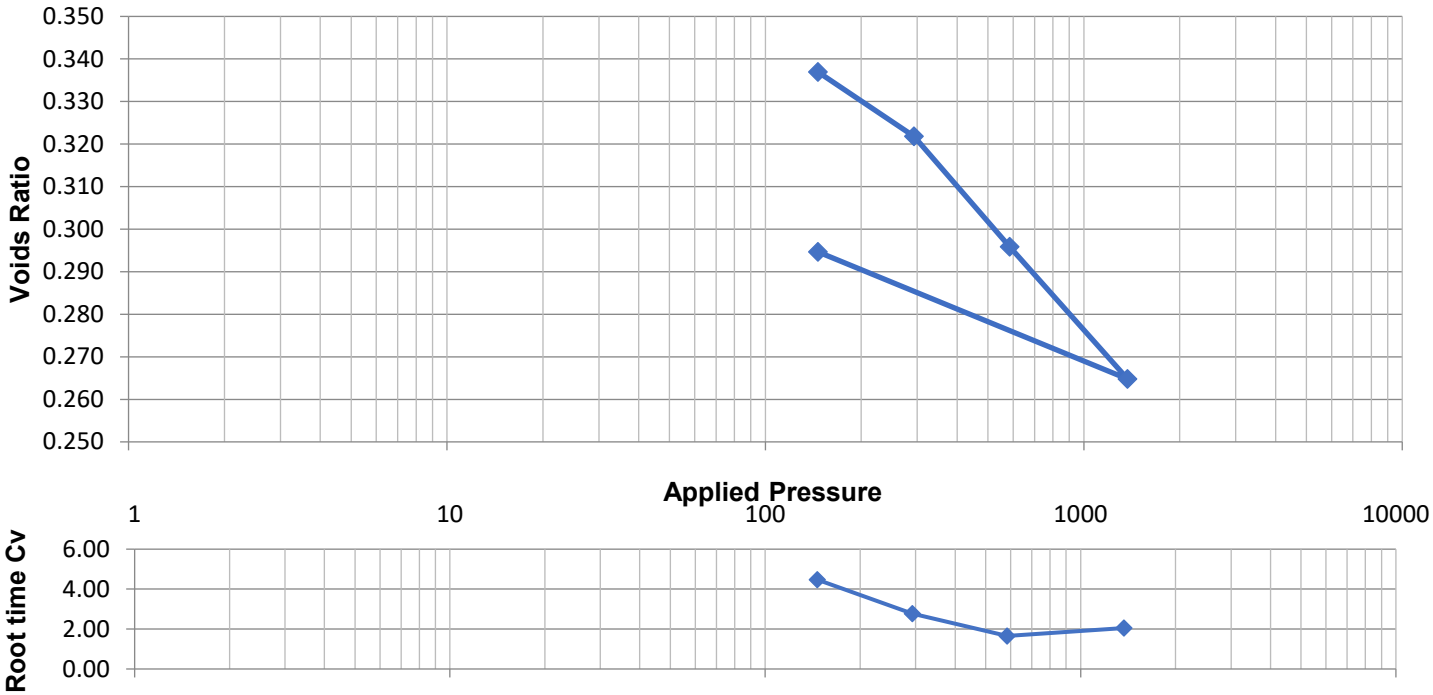
Specimen Location

Sample Length (mm)	600	Specimen depth from top of Sample (mm)	300
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.0	mm	Particle density	2.68	Ass
Diameter	50.0	mm	Initial void ratio	0.37	
Weight wet	87.6	g	Deg. of sat.	99	%
Moist. cont.	14	%	Swell. press.	11	kN/m2
Bulk Density	2.23	Mg/m3	Dry density	1.96	Mg/m3

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m2/MN	Temp °C	Cv t90 root m2/yr	Cv t50 log m2/yr
1	146	19.60	0.337	0.13	20	4.47	4.27
2	293	19.38	0.322	0.08	20	2.77	2.10
3	585	19.00	0.296	0.07	20	1.65	1.72
4	1373	18.54	0.265	0.03	20	2.05	2.26
5	146	18.98	0.295	0.02	20		
6							
7							



Remarks/Abnormalities

Name O.P Davies BA (Hons) (Laboratory Manager) Signed Date 20 October 2021

MURRAY RIX

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TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : Clause 3 : 1990

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB3 2.50-3.0	**DATE SAMPLED**	15-Sep-21
LAB SAMPLE No.	104531	**DATE RECEIVED**	21-Sep-21
DATE TESTED	07-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

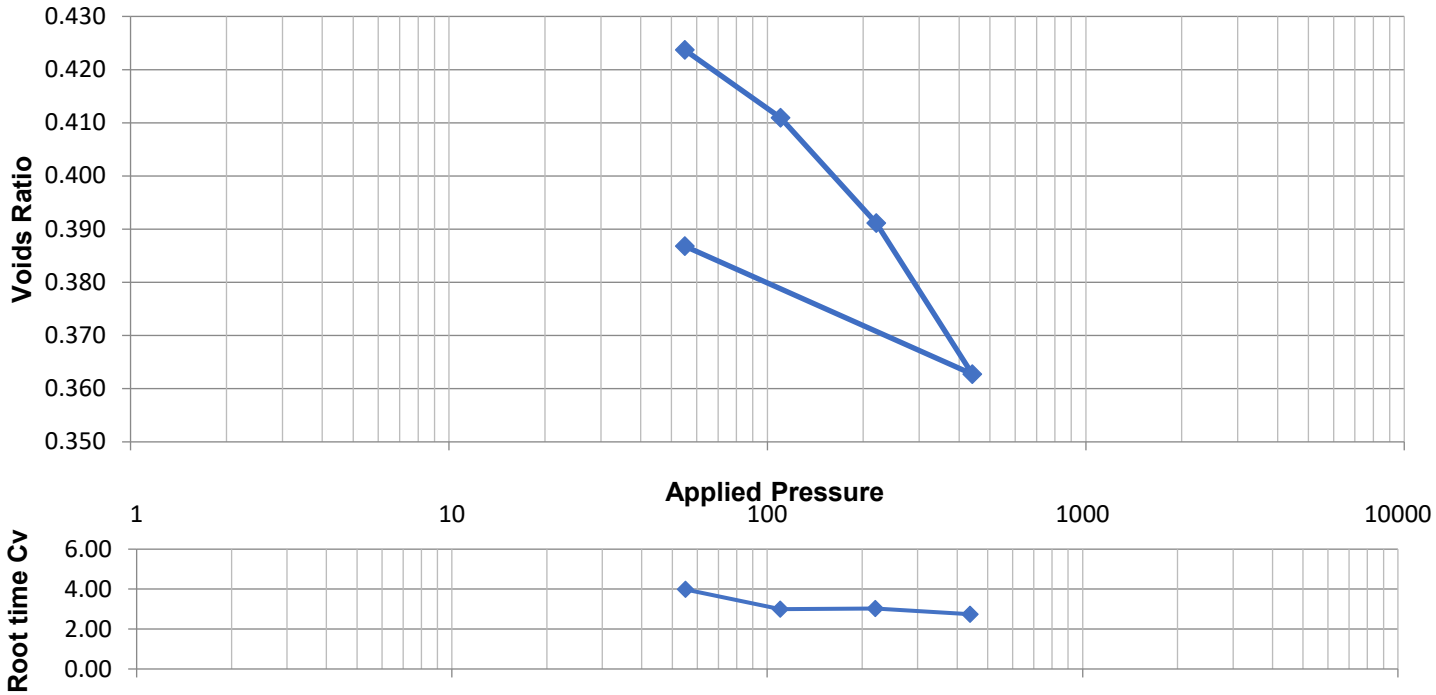
Specimen Location

Sample Length (mm)	780	Specimen depth from top of Sample (mm)	550
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.1	mm	Particle density	2.68	Ass
Diameter	74.9	mm	Initial void ratio	0.45	
Weight wet	189.1	g	Deg. of sat.	96	%
Moist. cont.	16	%	Swell. press.	5	kN/m2
Bulk Density	2.14	Mg/m3	Dry density	1.85	Mg/m3

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m2/MN	Temp °C	Cv t90 root m2/yr	Cv t50 log m2/yr
1	55	19.67	0.424	0.27	20	3.98	3.73
2	110	19.49	0.411	0.17	20	3.00	3.12
3	220	19.22	0.391	0.13	20	3.02	3.41
4	440	18.83	0.363	0.09	20	2.74	3.11
5	55	19.16	0.387	0.05	20		
6							
7							



Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Laboratory Manager)

Signed

Date 20 October 2021

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : Clause 3 : 1990

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

SAMPLE LABEL	BHB2 7.1-7.6	**DATE SAMPLED**	15-Sep-21
LAB SAMPLE No.	104532	**DATE RECEIVED**	21-Sep-21
DATE TESTED	28-Sep-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

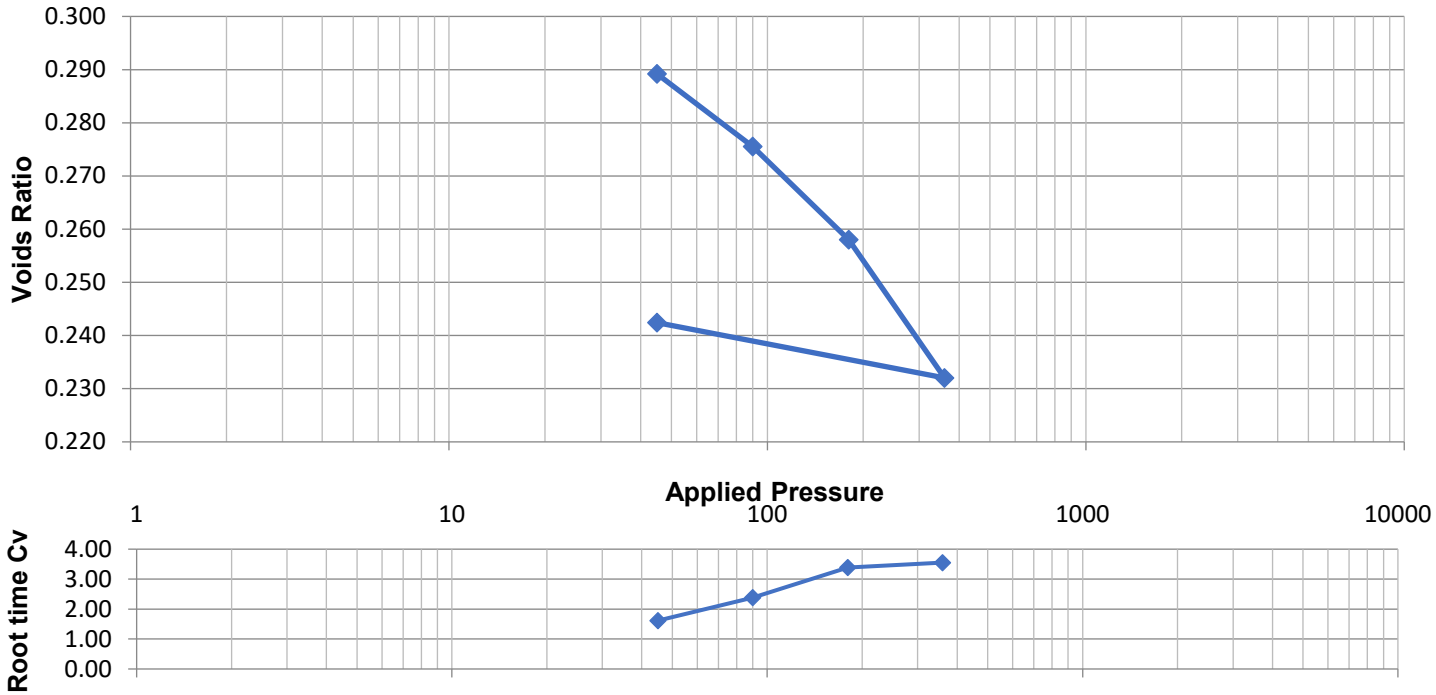
Specimen Location

Sample Length (mm)	770	Specimen depth from top of Sample (mm)	450
Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS

Height	20.1	mm	Particle density	2.68	Ass
Diameter	50.0	mm	Initial void ratio	0.33	
Weight wet	89.6	g	Deg. of sat.	101	%
Moist. cont.	12	%	Swell. press.	11	kN/m2
Bulk Density	2.27	Mg/m3	Dry density	2.02	Mg/m3

Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m2/MN	Temp °C	Cv t90 root m2/yr	Cv t50 log m2/yr
1	45	19.57	0.289	0.44	20	1.61	1.60
2	90	19.36	0.276	0.24	20	2.39	2.39
3	180	19.10	0.258	0.16	20	3.39	3.34
4	360	18.70	0.232	0.12	20	3.55	3.59
5	45	18.86	0.242	0.03	20		
6							
7							



Remarks/Abnormalities

Name O.P Davies BA (Hons) (Laboratory Manager) Signed Date 20 October 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

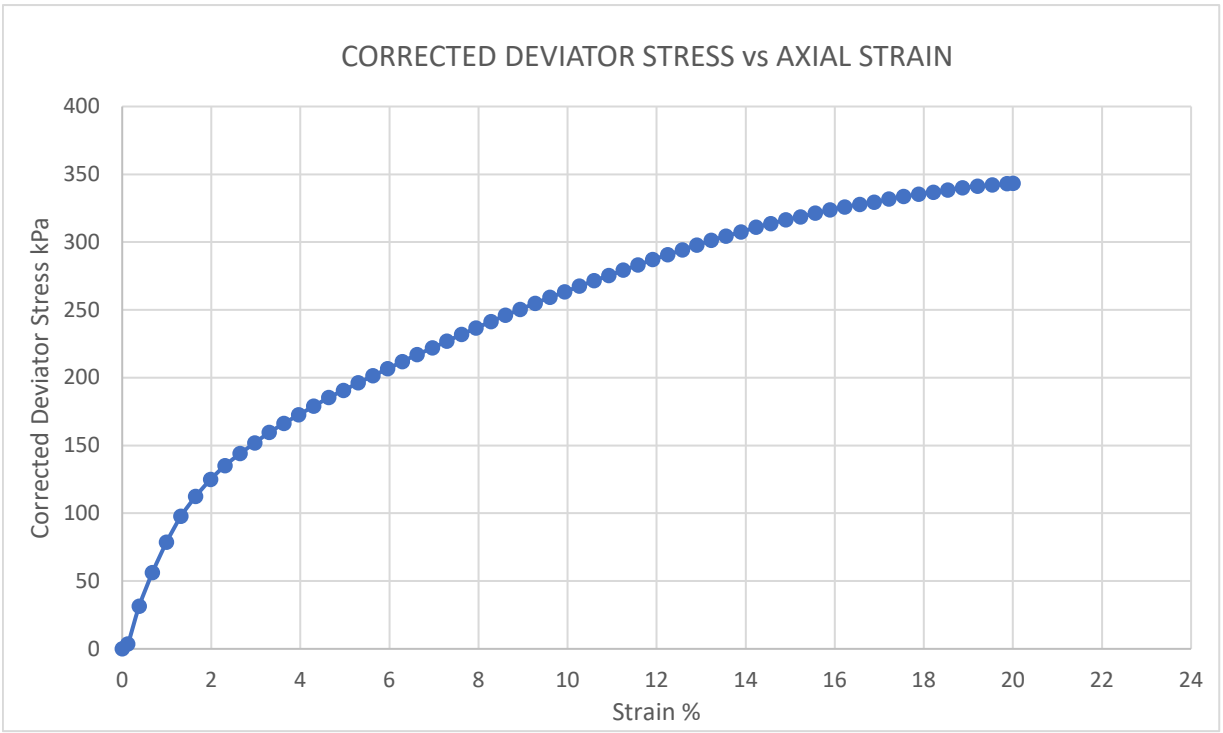
SAMPLE LABEL	BHB1 1.5-2.10	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104533	**DATE RECEIVED**	21-Sep-21
DATE TESTED	13-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

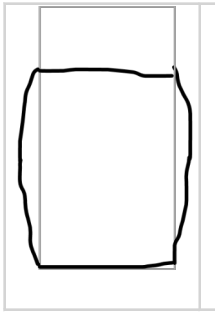


Sample Length (mm)	450	Specimen depth from top of Sample (mm)	70
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	166	Specimen Moisture Content (%)	18
Specimen Diameter (mm)	83	Specimen Bulk Density (Mg/m3)	2.10
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.78
Membrane Correction	1.81		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
40	20	2	343	171

Remarks/Abnormalities
Young's Modulus, E_u50 = 4.1MPa

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 20 October 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

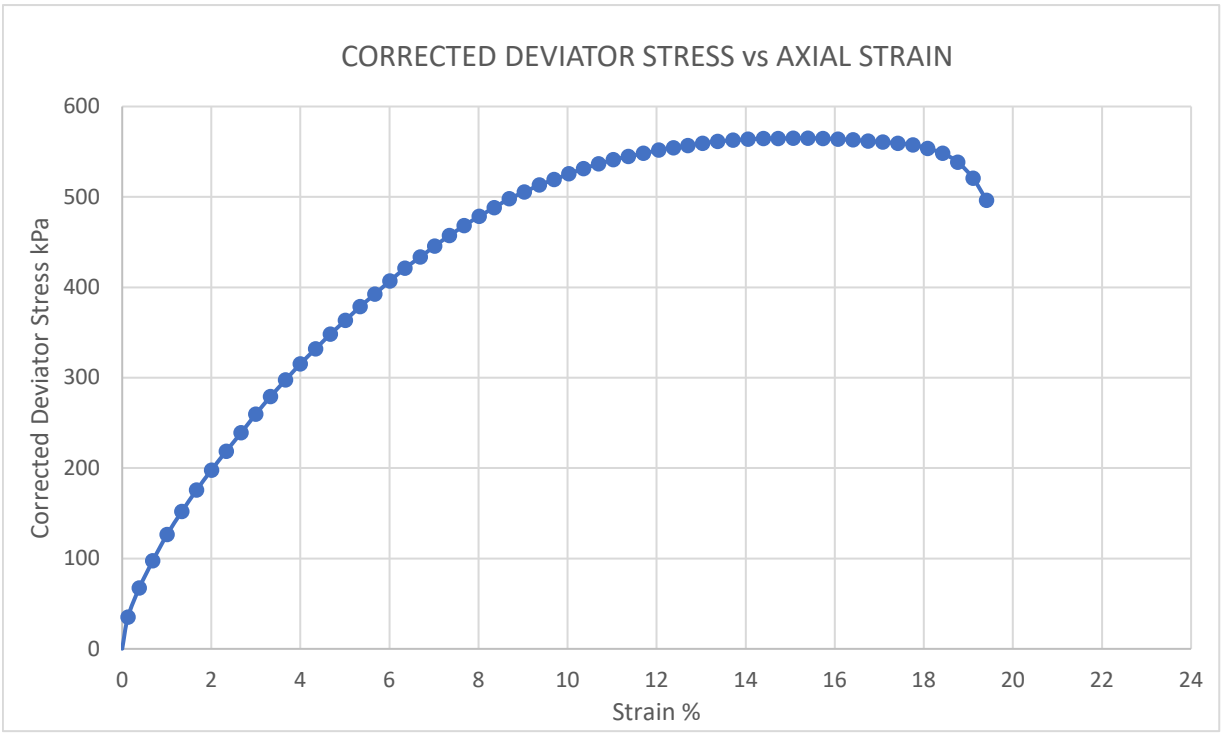
SAMPLE LABEL	BHB2 1.5-2.0	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104534	**DATE RECEIVED**	21-Sep-21
DATE TESTED	13-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

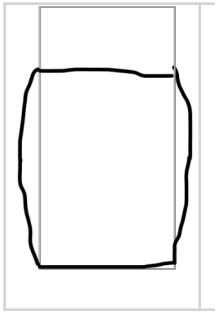


Sample Length (mm)	450	Specimen depth from top of Sample (mm)	30
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	169	Specimen Moisture Content (%)	18
Specimen Diameter (mm)	84	Specimen Bulk Density (Mg/m3)	2.16
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.84
Membrane Correction	1.76		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
40	15	2	565	283

Remarks/Abnormalities
Young's Modulus, E_u50 = 8.6MPa

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 20 October 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

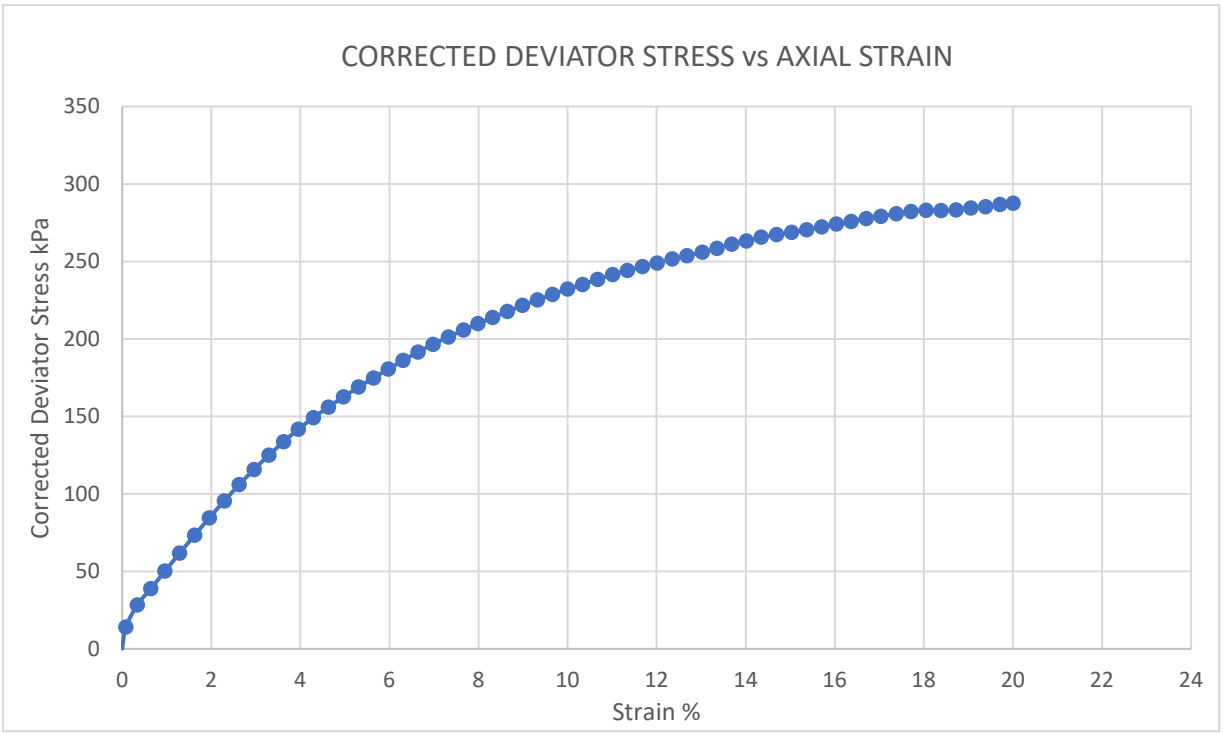
SAMPLE LABEL	BHB2 2.5-3.0	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104535	**DATE RECEIVED**	21-Sep-21
DATE TESTED	13-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

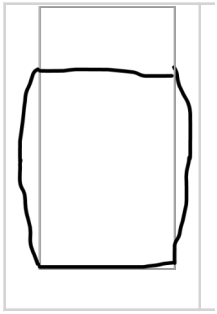


Sample Length (mm)	450	Specimen depth from top of Sample (mm)	80
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	159	Specimen Moisture Content (%)	20
Specimen Diameter (mm)	85	Specimen Bulk Density (Mg/m3)	2.21
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.84
Membrane Correction	1.78		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
60	20	2	287	143

Remarks/Abnormalities
Young's Modulus, E_u50 = 3.5MPa

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 20 October 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

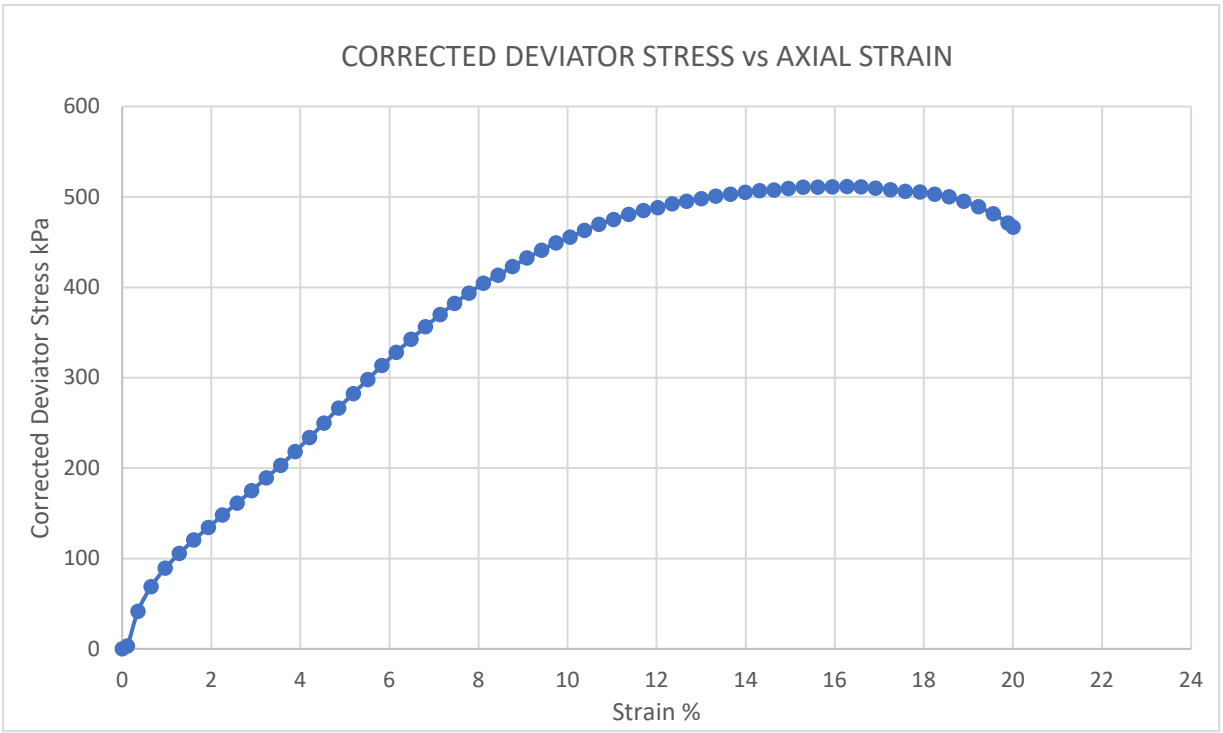
SAMPLE LABEL	BHB3 0.50-0.80m	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104536	**DATE RECEIVED**	21-Sep-21
DATE TESTED	13-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

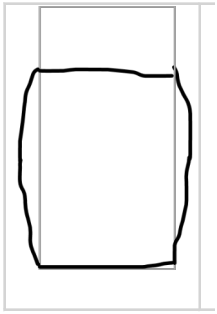


Sample Length (mm)	390	Specimen depth from top of Sample (mm)	110
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	204	Specimen Moisture Content (%)	18
Specimen Diameter (mm)	98	Specimen Bulk Density (Mg/m3)	2.17
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.85
Membrane Correction	1.54		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
10	16	2	512	256

Remarks/Abnormalities
Young's Modulus, E_u50 = 5.3MPa

Name O.P Davies BA (Hons) (Laboratory Manager) Signed  Date 20 October 2021

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

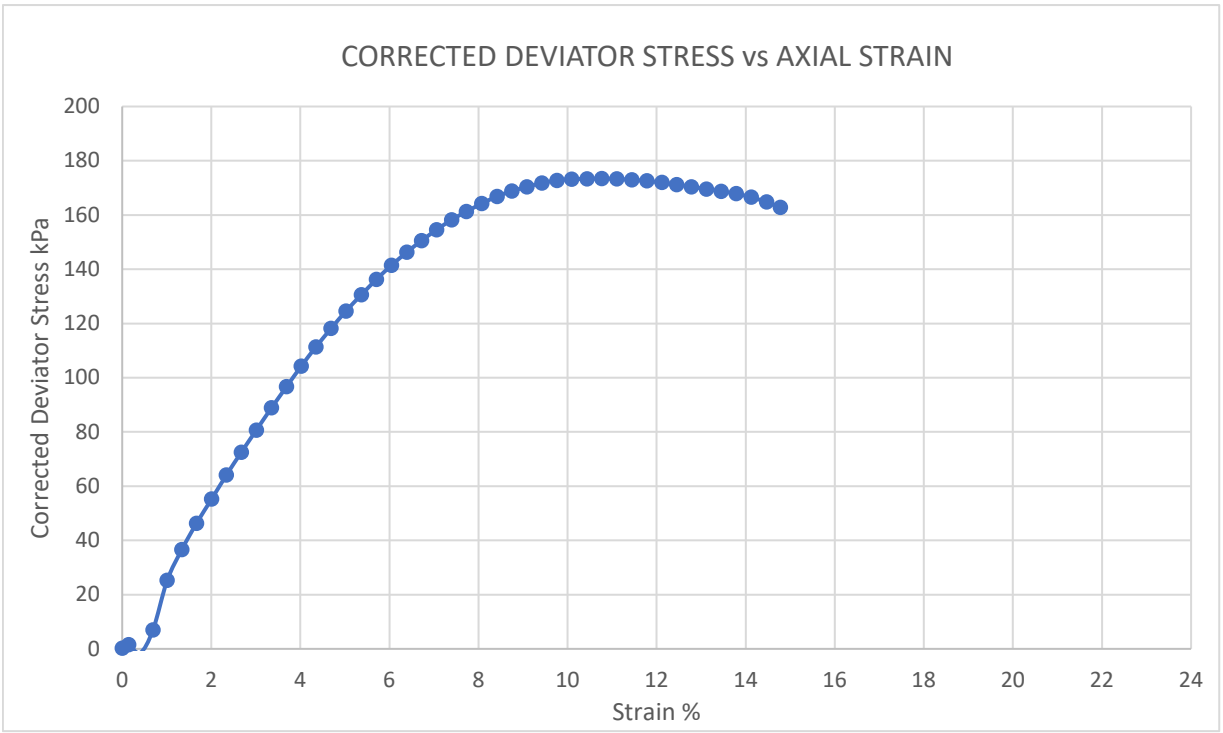
SAMPLE LABEL	BHB3 3.5-4.0m	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104537	**DATE RECEIVED**	21-Sep-21
DATE TESTED	13-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

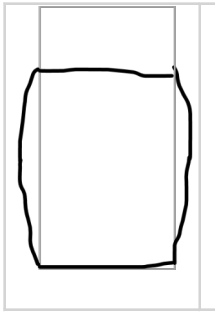


Sample Length (mm)	450	Specimen depth from top of Sample (mm)	115
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	144	Specimen Moisture Content (%)	24
Specimen Diameter (mm)	77	Specimen Bulk Density (Mg/m3)	2.13
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.72
Membrane Correction	1.58		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
80	11	2	173	87

Remarks/Abnormalities
Young's Modulus, E_u50 = 2.6MPa

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 20 October 2021

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	Brownfield Solutions Ltd
SITE	Back Turner Street
JOB NUMBER	MRN 4242/11

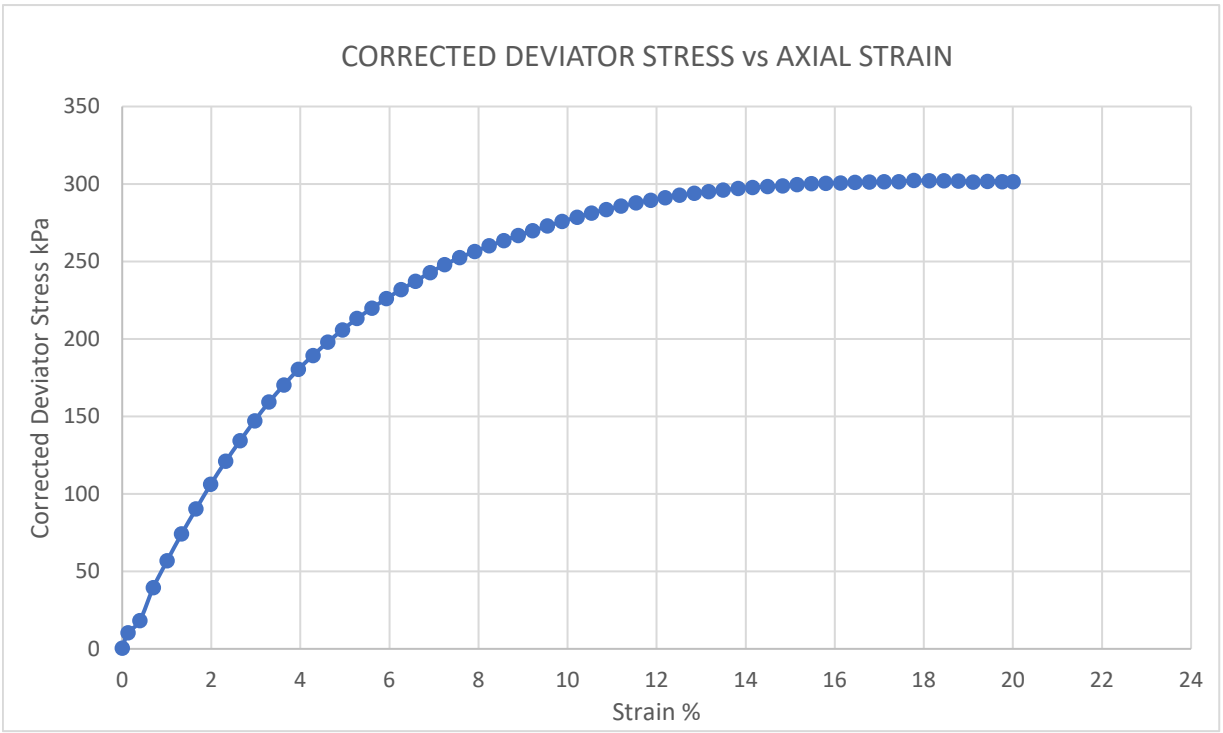
SAMPLE LABEL	BHB3 5.10-6.00m	**DATE SAMPLED**	14-Sep-21
LAB SAMPLE No.	104538	**DATE RECEIVED**	21-Sep-21
DATE TESTED	13-Oct-21	**SAMPLED BY**	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

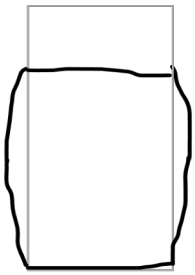


Sample Length (mm)	870	Specimen depth from top of Sample (mm)	60
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	127	Specimen Moisture Content (%)	15
Specimen Diameter (mm)	63	Specimen Bulk Density (Mg/m3)	2.23
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.94
Membrane Correction	2.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
120	18	2	302	151

Remarks/Abnormalities
Young's Modulus, E_u50 = 5.1MPa

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 20 October 2021

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

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

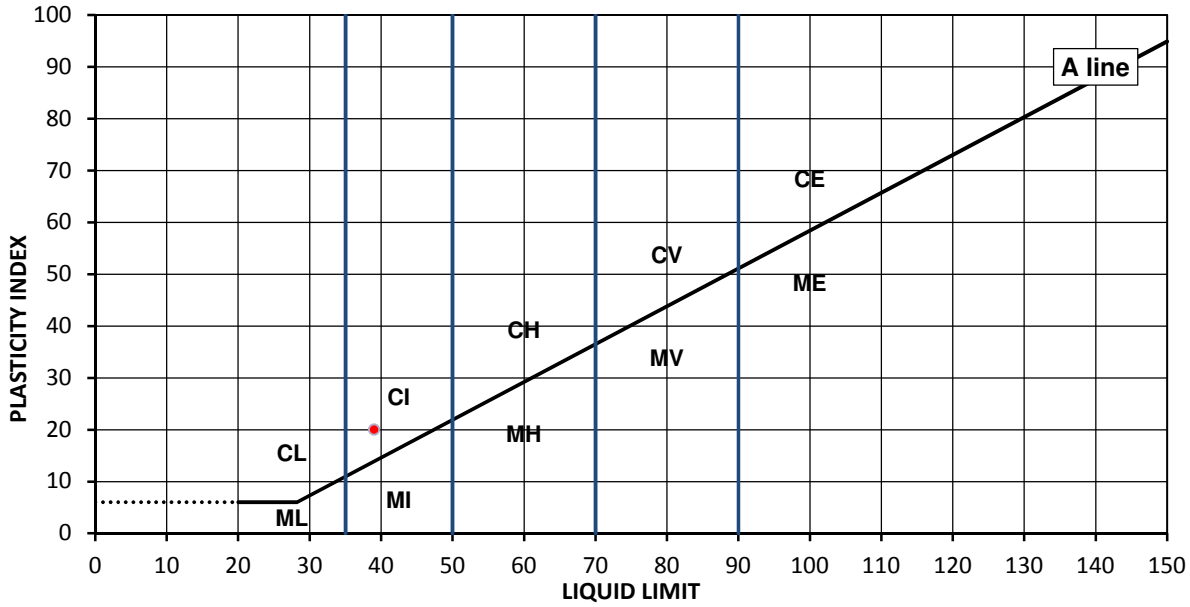
4041

Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024368	Depth Top [m]:	3.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	39	19	20	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks: Preliminary report

Approved:

Maria Chandler
Site Manager
Northampton
Date Reported: 29/08/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

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

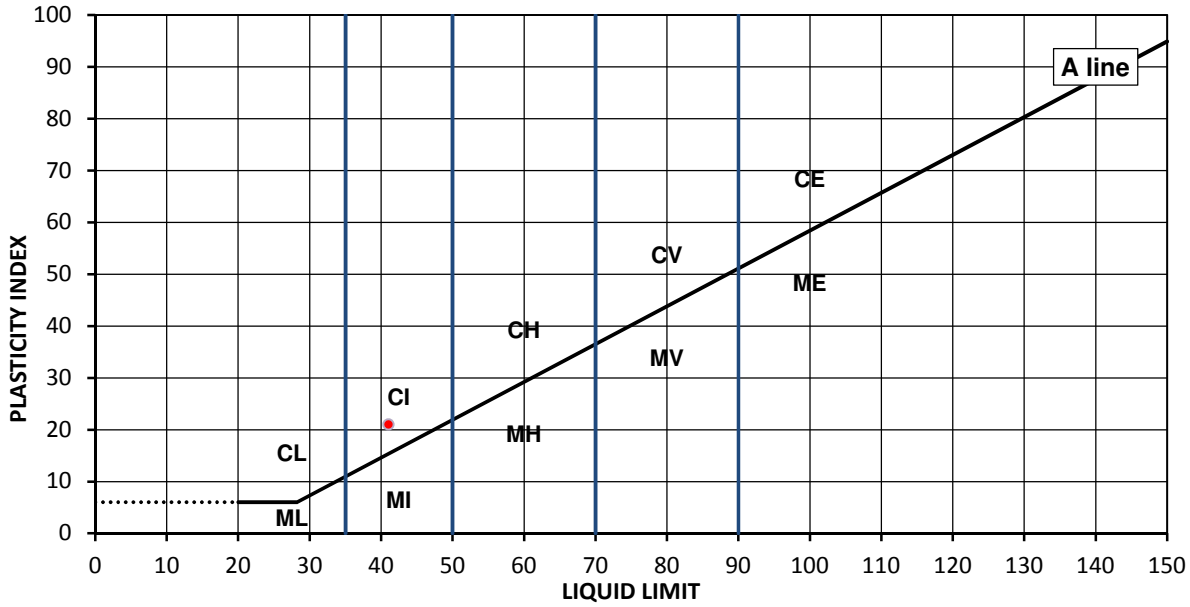
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Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024369	Depth Top [m]:	5.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	41	20	21	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

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Watford Herts WD18 8YS

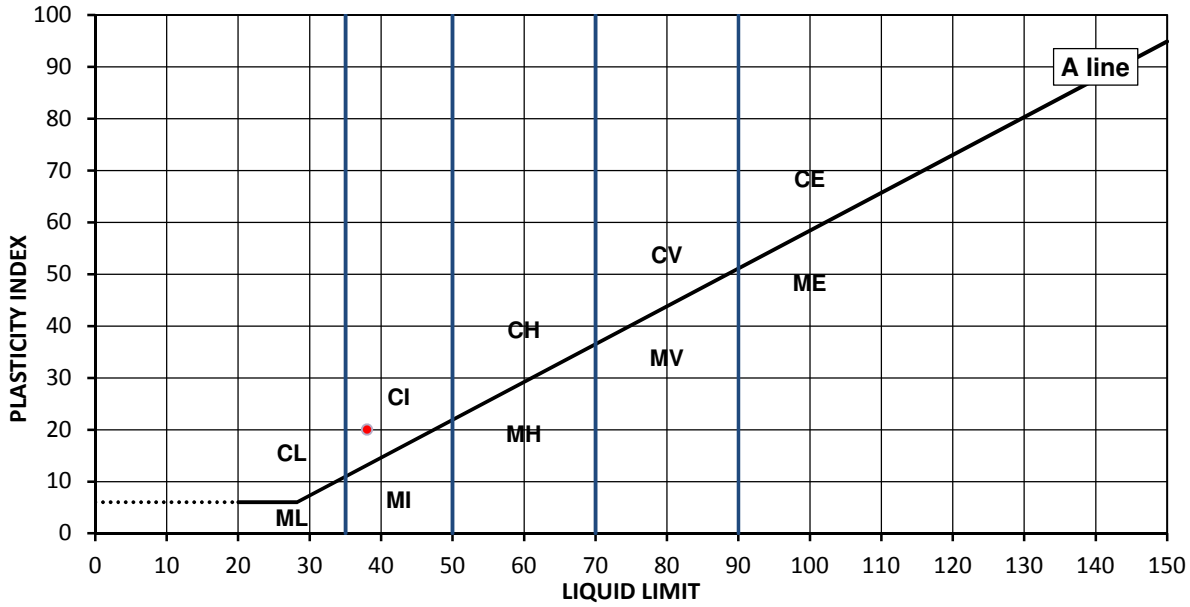
4041

Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024370	Depth Top [m]:	7.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	38	18	20	95



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks: Preliminary report

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

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Watford Herts WD18 8YS

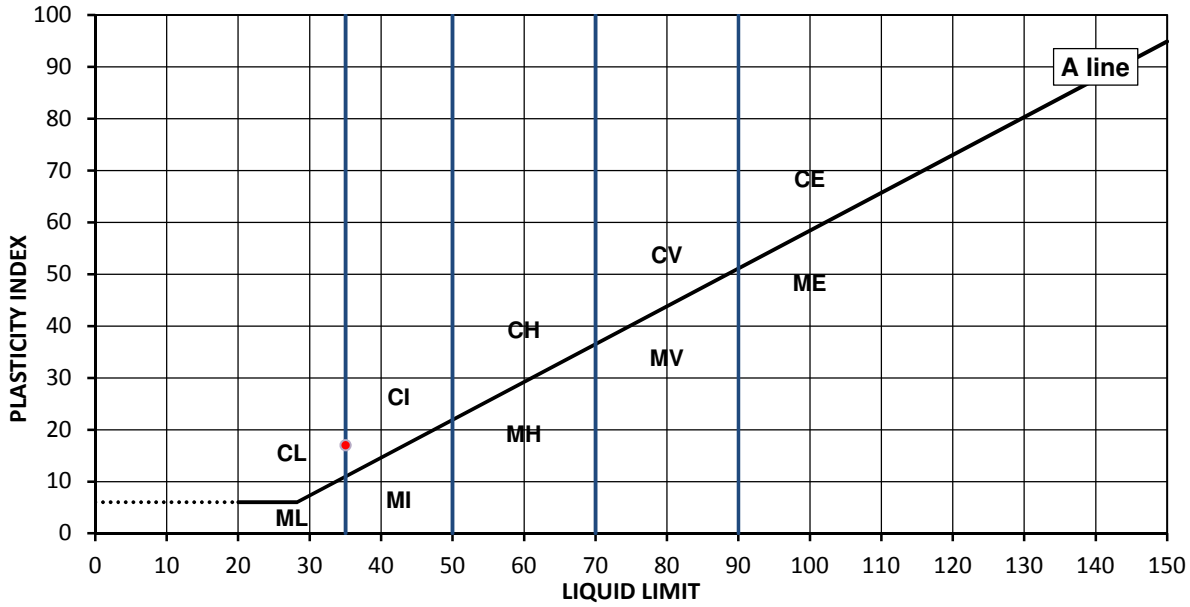
4041

Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024371	Depth Top [m]:	9.30
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	35	18	17	96



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks: Preliminary report

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

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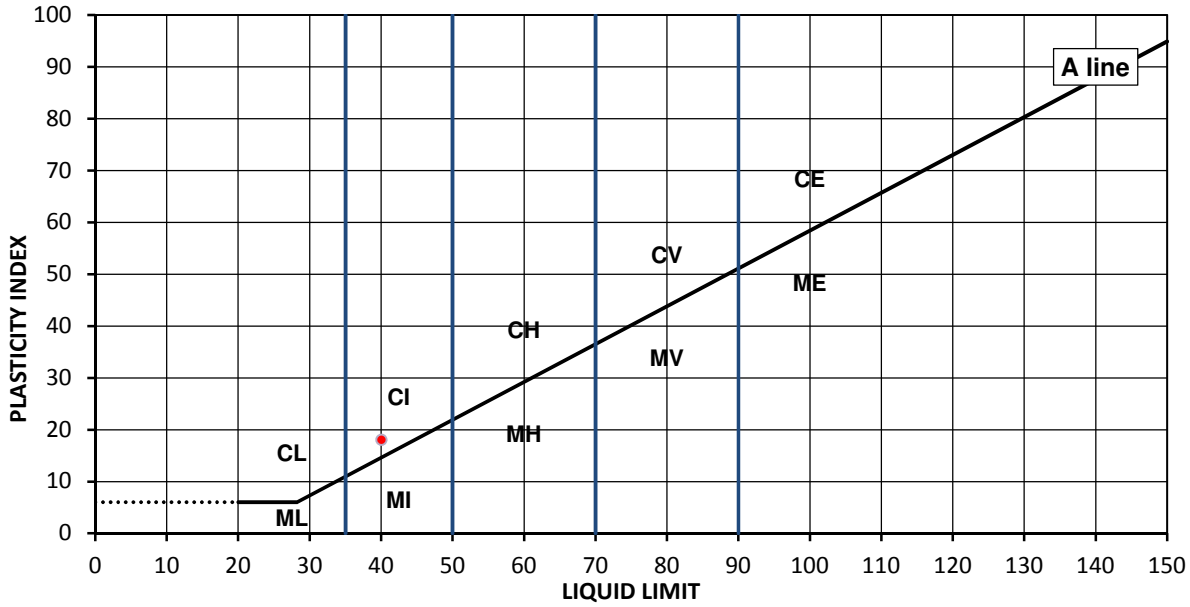
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Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024372	Depth Top [m]:	3.50
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	40	22	18	93



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks: Preliminary report

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TEST CERTIFICATE

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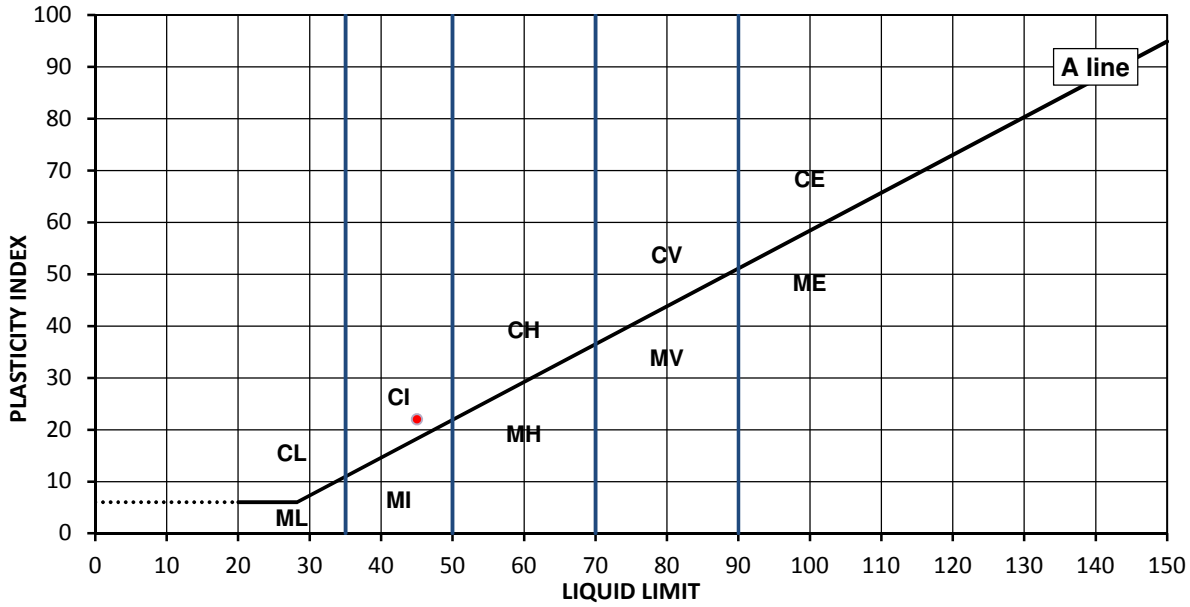
4041

Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024373	Depth Top [m]:	5.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
22	45	23	22	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

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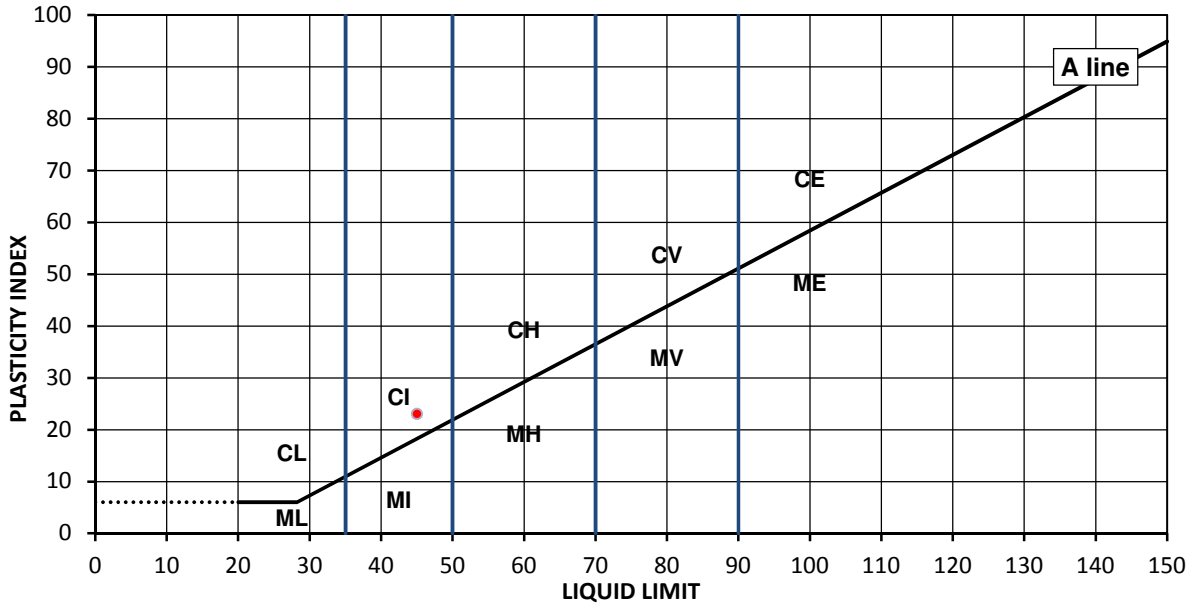
4041

Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024374	Depth Top [m]:	6.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
20	45	22	23	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

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Determination of Liquid and Plastic Limits

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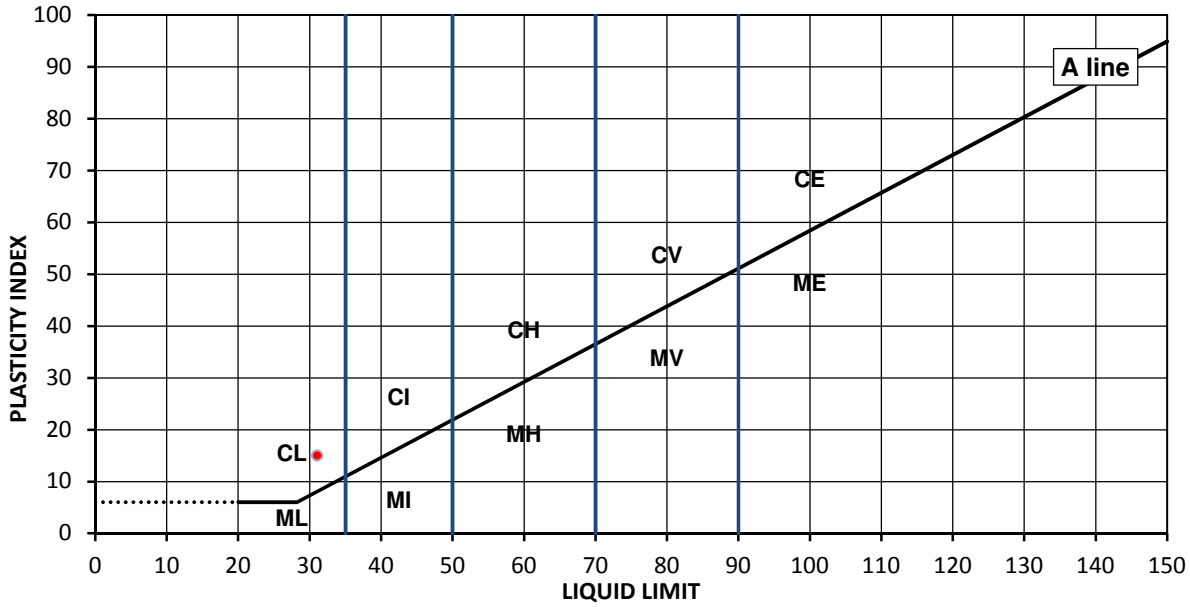
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Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	22/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JM
Site Address:	Not Given		

Test Results

Laboratory Reference:	1024375	Depth Top [m]:	8.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	31	16	15	96



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

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TEST CERTIFICATE

Summary of Classification Test Results

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

Client: Brownfield Solutions Ltd
Client Address: William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP
Contact: Jack Mather
Site Name: Back Turner Street, Manchester
Site Address: Not Given

Client Reference: C3967
Job Number: 18-96626
Date Sampled: Not Given
Date Received: 14/08/2018
Date Tested: 22/08/2018
Sampled By: JM

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	M/C	Atterberg				Density		Total Porosity
		Reference	Top depth [m]	Base depth [m]	Type			% Passing 425um	LL	PL	PI	bulk	PD	
							%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3
1024368	BH1	Not Given	3.50	Not Given	D	Brown sandy CLAY	17	100	39	19	20			
1024369	BH1	Not Given	5.00	Not Given	D	Brown sandy CLAY	18	100	41	20	21			
1024370	BH1	Not Given	7.00	Not Given	D	Brown slightly gravelly sandy CLAY	19	95	38	18	20			
1024371	BH1	Not Given	9.30	Not Given	D	Brown slightly gravelly sandy CLAY	16	96	35	18	17			
1024372	BH2	Not Given	3.50	Not Given	D	Brown slightly gravelly sandy CLAY	19	93	40	22	18			
1024373	BH2	Not Given	5.00	Not Given	D	Brown sandy CLAY	22	100	45	23	22			
1024374	BH2	Not Given	6.00	Not Given	D	Brown sandy CLAY	20	100	45	22	23			
1024375	BH2	Not Given	8.00	Not Given	D	Brown slightly gravelly very sandy CLAY	15	96	31	16	15			

Comments: Preliminary report

Approved:

Maria Chandler
Site Manager Northampton

Signed:

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Date Reported: 29/08/2018

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TEST CERTIFICATE

Determination of uniaxial compression test on rock - summary of results

Tested in Accordance with International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007

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

Client: Brownfield Solutions Ltd
Client Address: William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP
Contact: Jack Mather
Site Name: Back Turner Street, Manchester
Site Address: Not Given

Client Reference: C3967
Job Number: 18-96626
Date Sampled: Not Given
Date Received: 14/08/2018
Date Tested: 23/08/2018
Sampled By: JM

Test Results

Laboratory Reference	Hole No.	Sample				Description	Specimen Dimensions2				Bulk Density2	Water Content1	Uniaxial Compression3				Remarks
		Reference	Depth Top [m]	Depth Base [m]	Type		Dia. mm	Length mm	H/D	Orientation of sample	Mg/m3	%	Condition	Stress Rate MPa/s	Mode of failure	UCS MPa	
1024390	BH1	Not Given	18.50	Not Given	C	Brown SANDSTONE	85.7	126.3	1.5	Vertical	2.32	8.4	as received	0.3465	MS + AC	12.6	Sample is too short.
1024391	BH1	Not Given	22.00	Not Given	C	Brown SANDSTONE	85.7	194.1	2.3	Vertical	2.91	7.9	as received	0.3467	MS + AC	19.7	
1024392	BH2	Not Given	19.50	Not Given	C	Brown SANDSTONE	85.6	240.4	2.8	Vertical	2.30	8.3	as received	0.3478	MS + AC	16.1	
1024393	BH2	Not Given	22.50	Not Given	C	Brown SANDSTONE	85.8	230.6	2.7	Vertical	2.34	10.2	as received	0.3462	MS + AC	22.2	

Notes: 1 - ISRM p87 test 1, water content at 105 ± 3 oC, specimen as tested for UCS, 2 - ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density, 3 - ISRM p153 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials, above notes apply unless annotated otherwise in the remarks. Compaction machine: VJ Tech AUTOCON - VJT 51-3011

Mode of failure : S - Single shear, MS - multiple shear, AC - Axial cleavage, F - Fragmented

Comments: Preliminary report

Approved:

Maria Chandler
Site Manager Northampton

Date Reported: 29/08/2018

Signed:

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Geotechnical General Manager

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

UKAS TESTING 4041

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

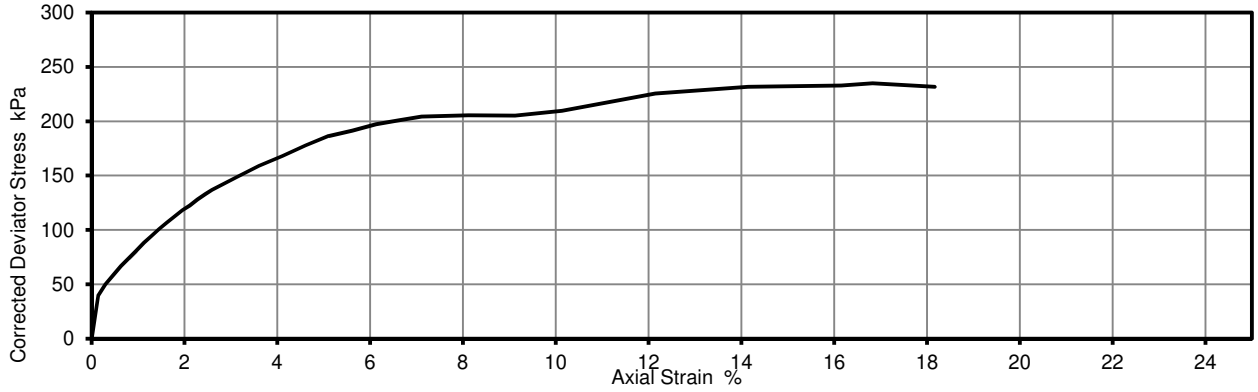
Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	23/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JW
Site Address:	Not Given		

Test Result

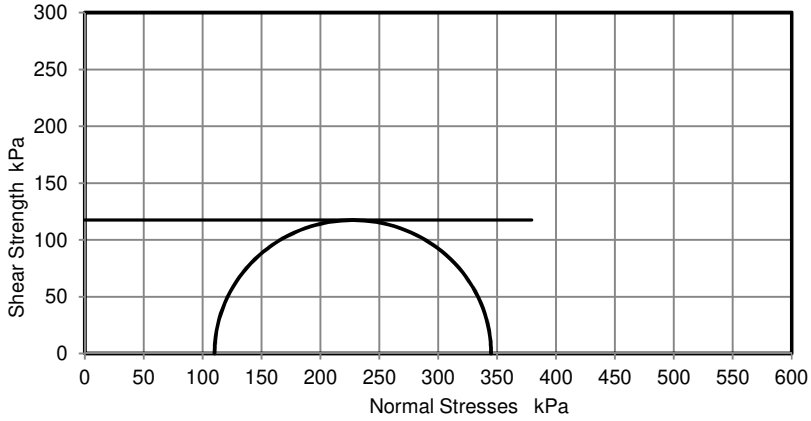
Laboratory Reference:	1024376	Depth Top [m]:	5.50
Hole No.:	BH1	Depth Base [m]:	6.00
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	195.64	mm	Cell Pressure	110	kPa	
Diameter	103.11	mm	Axial Strain at failure	16.8	%	
Bulk Density	2.10	Mg/m3	Deviator Stress, (σ1 - σ3)f	235	kPa	
Moisture Content	21	%	Undrained Shear Strength, cu	117	kPa	½(σ1 - σ3)f
Dry Density	1.73	Mg/m3	Mode of Failure	Compound		
Membrane Correction	1.13	kPa	Membrane thickness	0.35	mm	

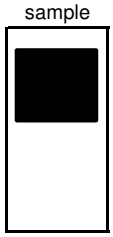
Deviator Stress v Axial Strain



Mohr Circles



Position within sample





Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments: Preliminary report

Approved:

Maria Chandler
Site Manager Northampton

Signed:

Darren Berrill
Geotechnical General Manager

Date Reported: 29/08/2018

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

UKAS TESTING 4041

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

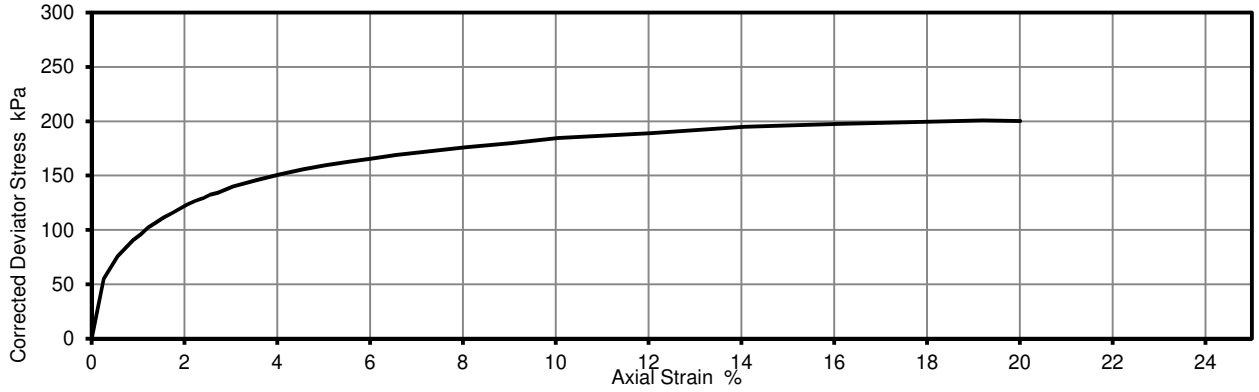
Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	23/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JW
Site Address:	Not Given		

Test Result

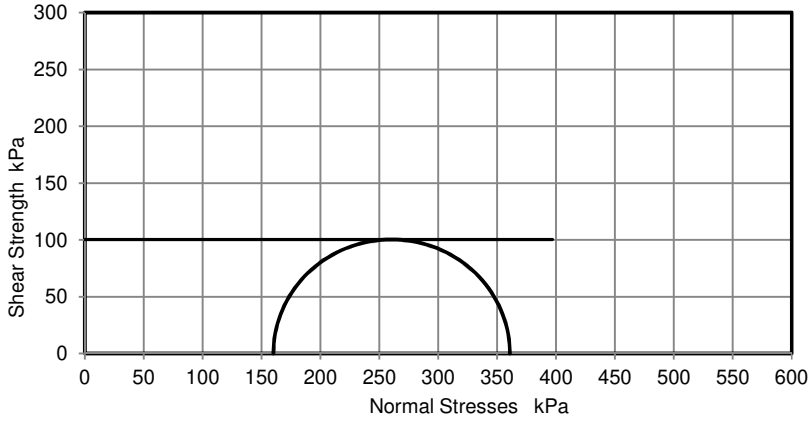
Laboratory Reference:	1024377
Hole No.:	BH1
Sample Reference:	Not Given
Sample Description:	Brown CLAY
Depth Top [m]:	8.00
Depth Base [m]:	8.50
Sample Type:	U

Test Number	1		Rate of Strain	2.00	%/min
Length	137.52	mm	Cell Pressure	160	kPa
Diameter	70.41	mm	Axial Strain at failure	19.2	%
Bulk Density	2.12	Mg/m3	Deviator Stress, (σ1 - σ3)f	201	kPa
Moisture Content	19	%	Undrained Shear Strength, cu	100	kPa ½(σ1 - σ3)f
Dry Density	1.79	Mg/m3	Mode of Failure	Plastic	
Membrane Correction	1.79	kPa	Membrane thickness	0.34	mm

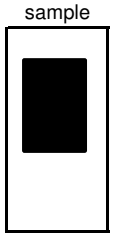
Deviator Stress v Axial Strain



Mohr Circles



Position within sample





Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments: Preliminary report

Approved:

Maria Chandler
Site Manager Northampton

Signed:

Darren Berrill
Geotechnical General Manager

Date Reported: 29/08/2018

for and on behalf of i2 Analytical Ltd

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Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

UKAS TESTING 4041

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

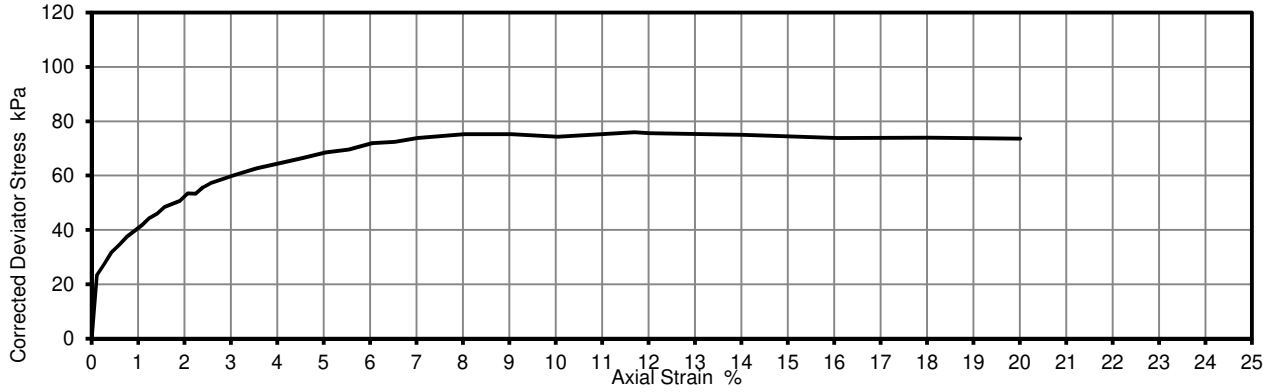
Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	23/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JW
Site Address:	Not Given		

Test Result

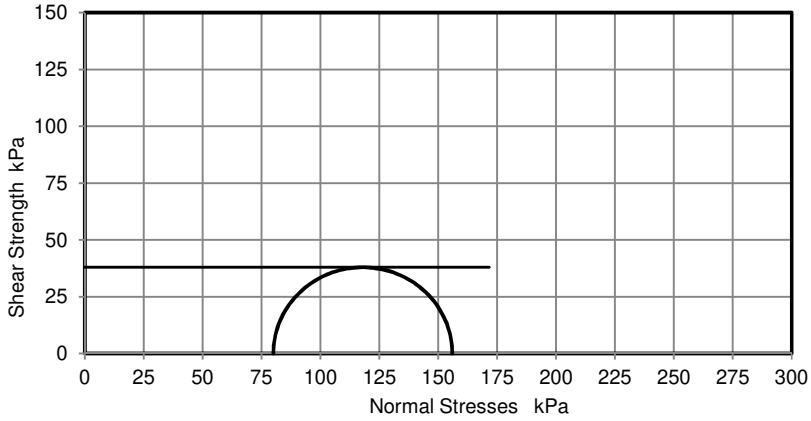
Laboratory Reference:	1024378	Depth Top [m]:	4.00
Hole No.:	BH2	Depth Base [m]:	4.50
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown sandy CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	99.50	mm	Cell Pressure	80	kPa	
Diameter	50.50	mm	Axial Strain at failure	11.7	%	
Bulk Density	2.11	Mg/m3	Deviator Stress, (σ1 - σ3)f	76	kPa	
Moisture Content	20	%	Undrained Shear Strength, cu	38	kPa	½(σ1 - σ3)f
Dry Density	1.75	Mg/m3	Mode of Failure	Brittle		
Membrane Correction	1.24	kPa	Membrane thickness	0.25	mm	

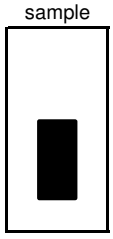
Deviator Stress v Axial Strain



Mohr Circles



Position within sample





Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments: Preliminary report

Approved:

Maria Chandler
Site Manager Northampton

Signed:

Darren Berrill
Geotechnical General Manager

Date Reported: 29/08/2018

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

UKAS TESTING 4041

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

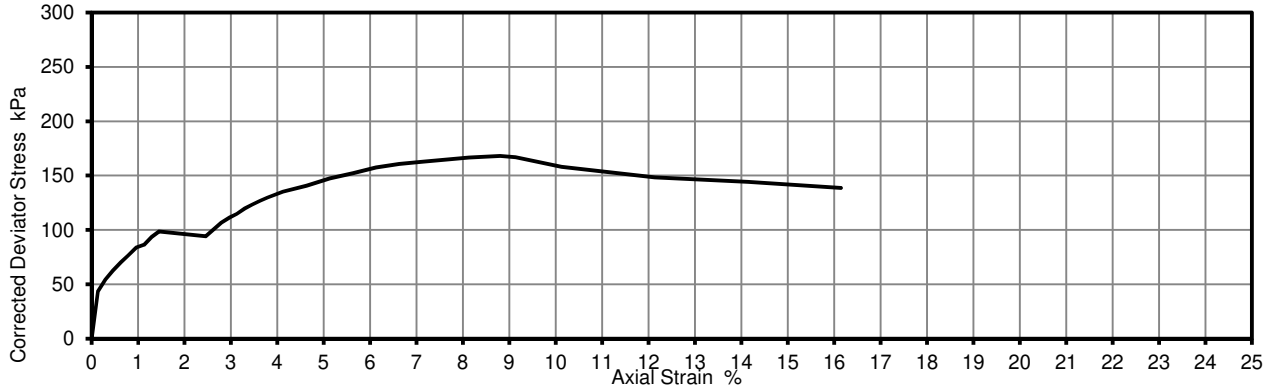
Client:	Brownfield Solutions Ltd	Client Reference:	C3967
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire CW9 5LP	Job Number:	18-96626
		Date Sampled:	Not Given
		Date Received:	14/08/2018
Contact:	Jack Mather	Date Tested:	23/08/2018
Site Name:	Back Turner Street, Manchester	Sampled By:	JW
Site Address:	Not Given		

Test Result

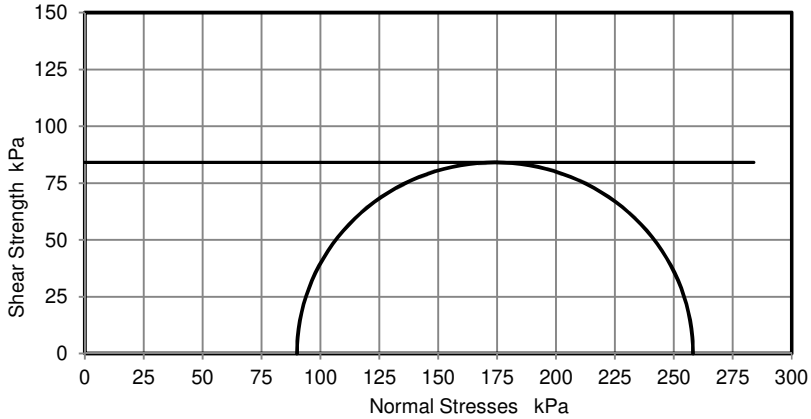
Laboratory Reference:	1024379	Depth Top [m]:	4.50
Hole No.:	BH2	Depth Base [m]:	5.00
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	198.86	mm	Cell Pressure	90	kPa	
Diameter	103.42	mm	Axial Strain at failure	8.8	%	
Bulk Density	2.11	Mg/m3	Deviator Stress, (σ1 - σ3)f	168	kPa	
Moisture Content	17	%	Undrained Shear Strength, cu	84	kPa	½(σ1 - σ3)f
Dry Density	1.81	Mg/m3	Mode of Failure	Brittle		
Membrane Correction	0.69	kPa	Membrane thickness	0.35	mm	

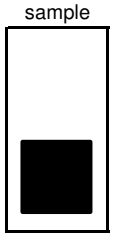
Deviator Stress v Axial Strain



Mohr Circles



Position within sample





Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments: Preliminary report

Approved:

Maria Chandler
Site Manager Northampton

Signed:

Darren Berrill
Geotechnical General Manager

Date Reported: 29/08/2018

for and on behalf of i2 Analytical Ltd

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Jack Mather
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

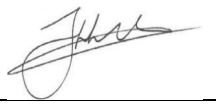
e: j.mather@brownfield-solutions.co.uk

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

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

Analytical Report Number : 18-96529

Project / Site name:	Back Turner Street, Manchester	**Samples received on:**	14/08/2018
Your job number:	C3967	**Samples instructed on:**	14/08/2018
Your order number:	C3967-5843-JM	**Analysis completed by:**	29/08/2018
Report Issue Number:	1	**Report issued on:**	29/08/2018
Samples Analysed:	6 soil samples		

Signed: 

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-96529

Project / Site name: Back Turner Street, Manchester
Your Order No: C3967-5843-JM

Lab Sample Number				1023941	1023942	1023943	1023944	1023945
Sample Reference				BH1	BH1	BH1	BH2	BH2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.50	5.00	7.00	5.00	6.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	12	13	15	16
Total mass of sample received	kg	0.001	NONE	0.32	0.30	0.34	0.33	0.31
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.8	8.7	8.7	8.6	8.6
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.077	0.080	0.079	0.069

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Analytical Report Number: 18-96529

Project / Site name: Back Turner Street, Manchester
Your Order No: C3967-5843-JM

Lab Sample Number				1023946				
Sample Reference				BH2				
Sample Number				None Supplied				
Depth (m)				8.00				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	11				
Total mass of sample received	kg	0.001	NONE	0.34				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.7				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.084				

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Analytical Report Number : 18-96529

Project / Site name: Back Turner Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1023941	BH1	None Supplied	3.50	Brown clay.
1023942	BH1	None Supplied	5.00	Brown clay.
1023943	BH1	None Supplied	7.00	Brown clay.
1023944	BH2	None Supplied	5.00	Brown clay.
1023945	BH2	None Supplied	6.00	Brown clay.
1023946	BH2	None Supplied	8.00	Brown clay.

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Analytical Report Number : 18-96529

Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS

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

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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH1		S	18-96529	1023941	a			
BH1		S	18-96529	1023942	a			
BH1		S	18-96529	1023943	a			
BH2		S	18-96529	1023944	a			
BH2		S	18-96529	1023945	a			
BH2		S	18-96529	1023946	a			

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	Brownfield Solutions Ltd	Client Reference:	C3976
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	21-69375
		Date Sampled:	12/04/2021
		Date Received:	19/04/2021
Contact:	Matthew Shore	Date Tested:	07/05/2021
Site Address:	Back Turner Street, Manchester	Sampled By:	i2 - MS

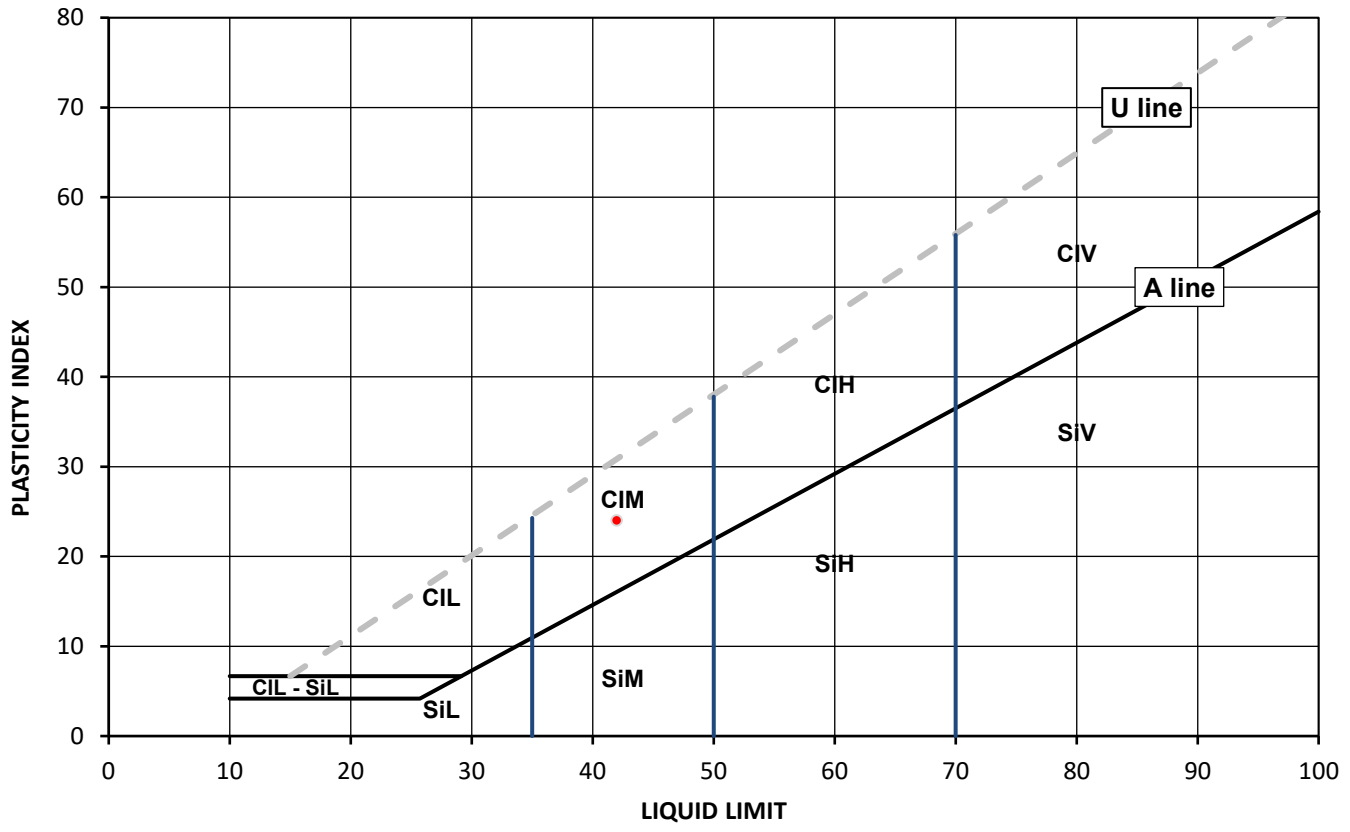
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1840540	Depth Top [m]:	4.00
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown sandy CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
20	42	18	24	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 232.10

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

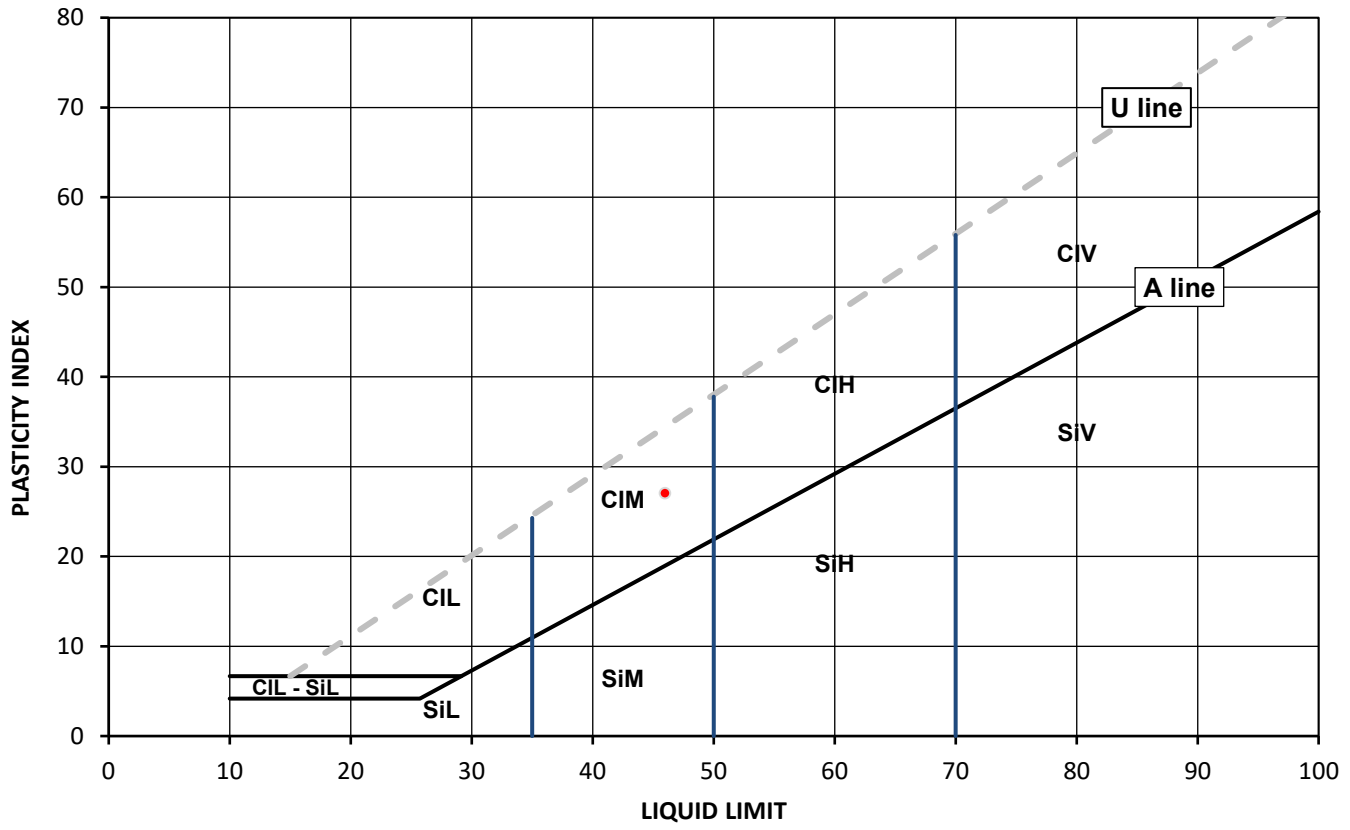
Client:	Brownfield Solutions Ltd	Client Reference:	C3976
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	21-69375
		Date Sampled:	12/04/2021
		Date Received:	19/04/2021
Contact:	Matthew Shore	Date Tested:	07/05/2021
Site Address:	Back Turner Street, Manchester	Sampled By:	i2 - MS

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1840541	Depth Top [m]:	5.00
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
20	46	19	27	95



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

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Date Reported: 14/05/2021

GF 232.10

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

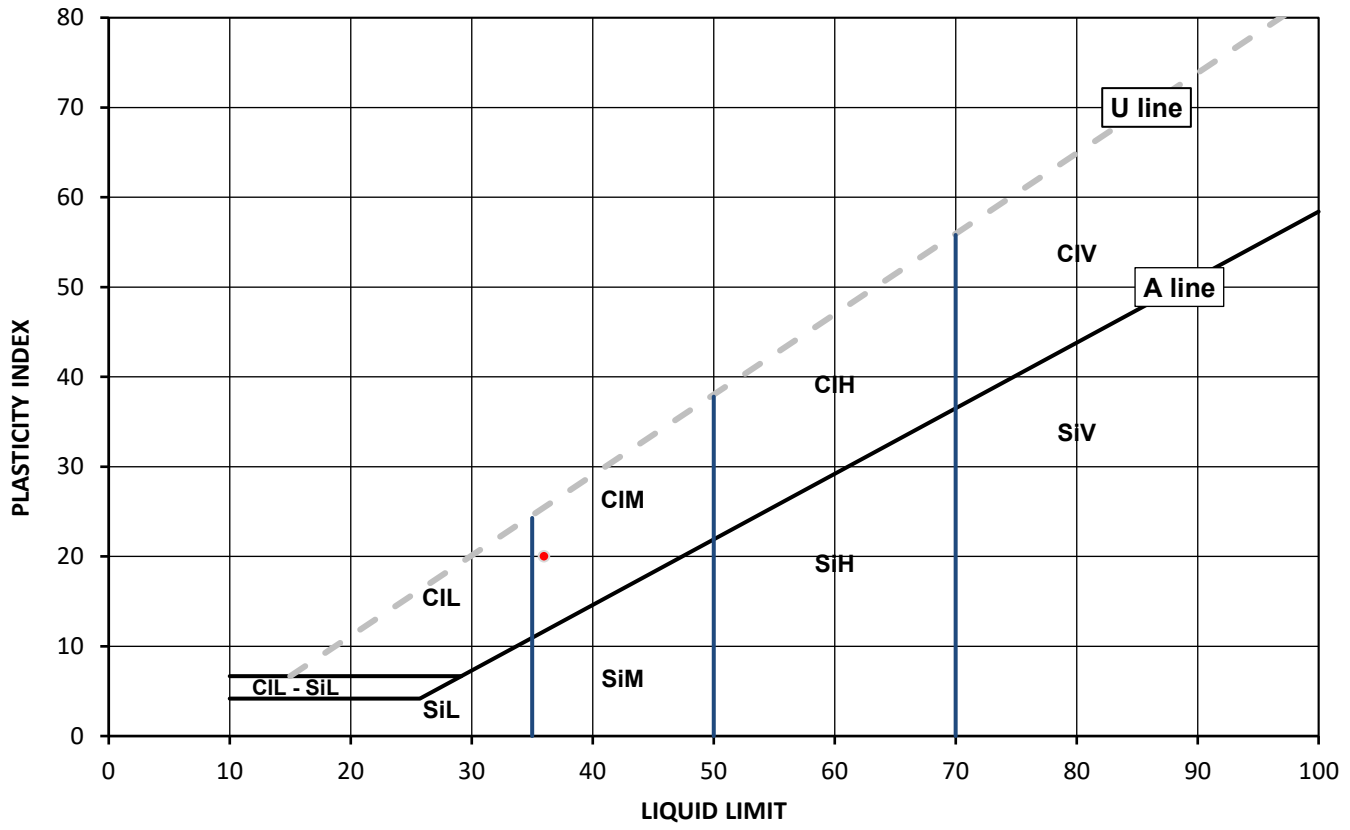
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Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	21-69375
		Date Sampled:	12/04/2021
		Date Received:	19/04/2021
Contact:	Matthew Shore	Date Tested:	07/05/2021
Site Address:	Back Turner Street, Manchester	Sampled By:	i2 - MS

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1840542	Depth Top [m]:	6.00
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	36	16	20	93



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

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Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 232.10

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

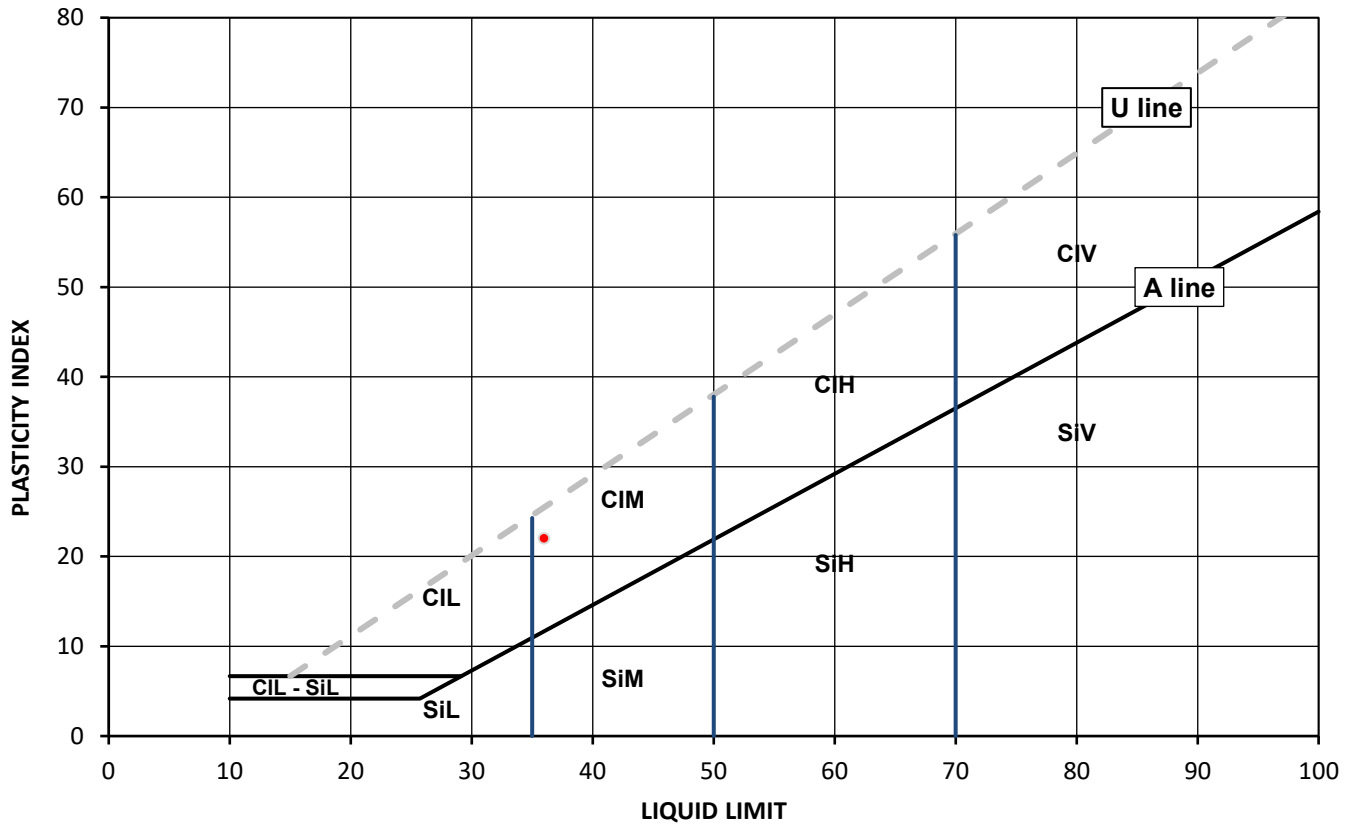
Client:	Brownfield Solutions Ltd	Client Reference:	C3976
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	21-69375
		Date Sampled:	12/04/2021
		Date Received:	19/04/2021
Contact:	Matthew Shore	Date Tested:	07/05/2021
Site Address:	Back Turner Street, Manchester	Sampled By:	i2 - MS

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1840543	Depth Top [m]:	7.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
13	36	14	22	95



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 232.10

SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: Brownfield Solutions Ltd

Client Address: William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP

Contact: Matthew Shore

Site Address: Back Turner Street, Manchester

Client Reference: C3976
Job Number: 21-69375
Date Sampled: 12/04/2021
Date Received: 19/04/2021
Date Tested: 07/05/2021
Sampled By: i2 - MS

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top m	Depth Base m	Type			%	%	% Passing 425um %	WL %	Wp %	Ip %	bulk Mg/m3	dry Mg/m3	PD Mg/m3	%		
1840540	BH03	Not Given	4.00	Not Given	D	Brown sandy CLAY	Atterberg 1 Point	20		100	42	18	24						
1840541	BH03	Not Given	5.00	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	20		95	46	19	27						
1840542	BH03	Not Given	6.00	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	17		93	36	16	20						
1840543	BH03	Not Given	7.50	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	13		95	36	14	22						

Note: # Non accredited; NP - Non plastic

Comments:

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Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 234.12

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	Brownfield Solutions Ltd	Client Reference:	C3976
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	21-69375
		Date Sampled:	12/04/2021
		Date Received:	19/04/2021
Contact:	Matthew Shore	Date Tested:	28/04/2021
Site Address:	Back Turner Street, Manchester	Sampled By:	i2 - MS

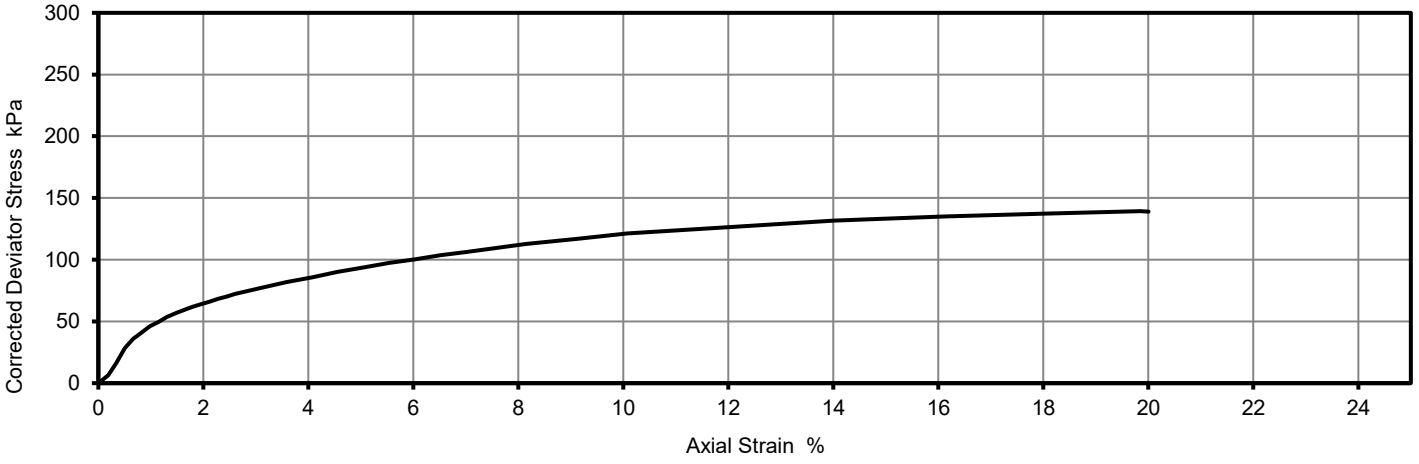
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

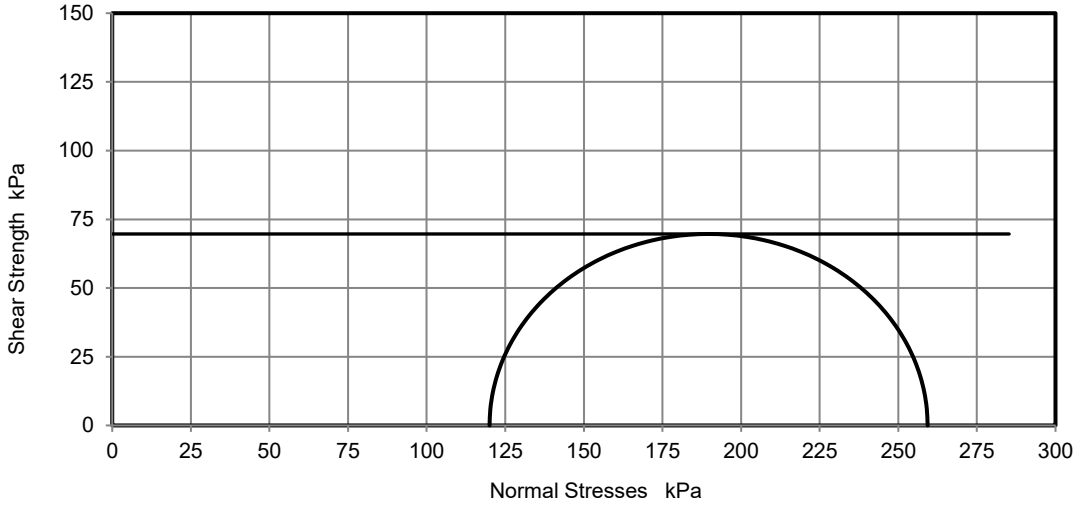
Laboratory Reference:	1840539	Depth Top [m]:	6.00
Hole No.:	BH03	Depth Base [m]:	6.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Greyish brown slightly gravelly CLAY		

Test Number	1		Rate of Strain	1.97	%/min	
Length	203.46	mm	Cell Pressure	120	kPa	
Diameter	103.40	mm	Axial Strain at failure	19.9	%	
Bulk Density	2.21	Mg/m3	Deviator Stress, (σ1 - σ3)f	139	kPa	
Moisture Content	17	%	Undrained Shear Strength, cu	70	kPa	½(σ1 - σ3)f
Dry Density	1.89	Mg/m3	Mode of Failure	Compound		
Membrane Correction	1.07	kPa	Membrane thickness	0.29	mm	

Deviator Stress v Axial Strain

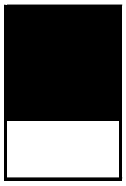


Mohr Circles





Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 184.11

SUMMARY REPORT

Summary of Point Load Strength Index Tests Results

Tested in Accordance with: ISRM: 2007, pages 125-132

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client: Brownfield Solutions Ltd

Client Address: William Smith House, 173 - 183 Witton Street,
Northwich, Cheshire,
CW9 5LP

Contact: Matthew Shore

Site Address: Back Turner Street, Manchester

Client Reference: C3976
Job Number: 21-69375
Date Sampled: 13/04/2021
Date Received: 19/04/2021
Date Tested: 06/05 - 09/05/2021
Sampled By: i2 - MS

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks # (including water content if measured)	Specimen Reference	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P	Equivalent diameter, De	Point Load Strength Index	
		Reference	Depth Top	Depth Base	Type				Type (D, A, I, B)	Direction (L, P or U)		Lne	W	Dps	Dps'			Is	Is(50)
			m	m								mm	mm	mm	mm	kN	mm	MPa	MPa
1840544	BH03	Not Given	16.00	16.10	C	Brown SANDSTONE	WC = 9.0%	1	A	U	YES	-	70.8	64.0	60.0	0.6	73.5	0.11	0.13
1840545	BH03	Not Given	17.61	17.76	C	Brown SANDSTONE	WC = 10.3%	1	I	U	YES	66.2	71.3	66.0	65.0	0.3	76.8	0.05	0.06
1840546	BH03	Not Given	18.50	18.55	C	Brown SANDSTONE	WC = 10.0%	1	A	U	YES	-	69.8	52.0	48.0	0.2	65.3	0.04	0.04
1840548	BH03	Not Given	23.93	24.00	C	Brown SANDSTONE	WC = 8.0%	1	A	U	YES	-	71.2	63.0	59.0	2.2	73.1	0.40	0.48
1840547	BH03	Not Given	25.06	25.20	C	Brown SANDSTONE	WC = 9.4%	1	I	U	YES	42.7	70.9	68.0	65.0	0.2	76.6	0.03	0.04
1840549	BH03	Not Given	25.20	25.30	C	Brown SANDSTONE	WC = 10.0%	1	A	U	YES	-	71.4	48.0	44.0	0.6	63.2	0.15	0.17

Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;
Dimensions: Dps - Distance between platens (platen separation), Dps' - at failure (see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;
Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Comments:

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Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 134.12

TEST CERTIFICATE

One Dimensional Consolidation Test

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

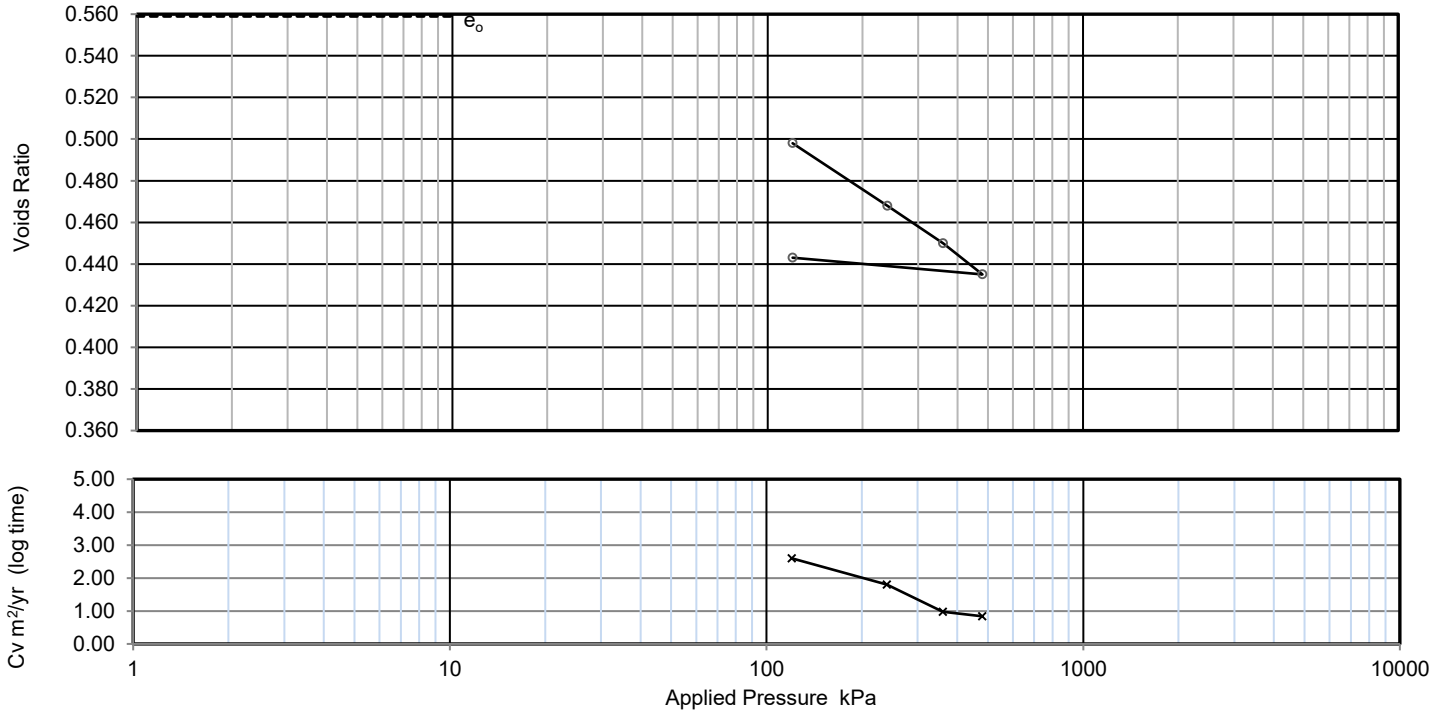
Tested in Accordance with: BS 1377-5: 1990: Clause 3

Client:	Brownfield Solutions Ltd	Client Reference:	C3976
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	21-69375
		Date Sampled:	12/04/2021
		Date Received:	19/04/2021
Contact:	Matthew Shore	Date Tested:	06/05/2021
Site Address:	Back Turner Street, Manchester	Sampled By:	i2 - MS

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1840539	Depth Top [m]:	6.00
Hole No.:	BH03	Depth Base [m]:	6.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Greyish brown slightly gravelly CLAY		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.559	-	-	-	-
120	0.498	0.33	2.6	8.9	0.0013
240	0.468	0.16	1.8	3.5	0.0013
360	0.450	0.11	0.98	2.6	0.00043
480	0.435	0.084	0.84	1.7	0.0013
120	0.443	0.015			

Preparation

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.10	-	mm
Height	20.02	18.53	mm
Moisture Content	22	17	%
Bulk density	2.08	2.16	Mg/m3
Dry density	1.70	1.84	Mg/m3
Voids Ratio	0.559	0.443	
Saturation	106	104	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%

Note: Cv corrected to 20°C

Remarks: Test carried out on bottom part of U100

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Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 14/05/2021

GF 172.15

Matthew Shore
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

e: m.shore@brownfield-solutions.co.uk

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

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

Analytical Report Number : 21-69380

Project / Site name:	Back Turner Street, Manchester	**Samples received on:**	19/04/2021
Your job number:	C3976	**Samples instructed on/ Analysis started on:**	19/04/2021
Your order number:		**Analysis completed by:**	29/04/2021
Report Issue Number:	1	**Report issued on:**	05/05/2021
Samples Analysed:	4 soil samples		

Signed: A. Czerwińska

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 21-69380
Project / Site name: Back Turner Street, Manchester

Lab Sample Number				1840555	1840556	1840557	1840558
Sample Reference				BH03	BH03	BH03	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	5.00	6.00	7.50
Date Sampled				12/04/2021	12/04/2021	12/04/2021	12/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	15	12	10
Total mass of sample received	kg	0.001	NONE	0.50	0.50	0.50	0.50
General Inorganics							
pH - Automated	pH Units	N/A	MCERTS	8.6	8.3	8.5	8.7
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200	130	110	130
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.10	0.063	0.056	0.067
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	101	62.9	56.3	67.0

U/S = Unsuitable Sample I/S = Insufficient Sample

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

Analytical Report Number : 21-69380
Project / Site name: Back Turner Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1840555	BH03	None Supplied	4	Brown clay and sand with gravel.
1840556	BH03	None Supplied	5	Brown clay and sand with gravel.
1840557	BH03	None Supplied	6	Brown clay and sand with gravel.
1840558	BH03	None Supplied	7.5	Brown clay and sand.

Analytical Report Number : 21-69380
Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

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

APPENDIX H
Ground Gas Monitoring Results

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD

CLIENT:	Date	Operator	Analsyer	Weather Observations			Temp (°C)	Pressure Trend	Min Barometric Pressure (mb)	Notes
DOMIS CONSTRUCTION	31/08/2018	JM	GA2000	Sunny	Light breeze	Warm	15	Steady	1020	
JOB NO.	13/09/2018	JM	GA2000	Overcast	Light breeze	Warm	12	Steady	1024	
C3967	23/11/2020	MS	GA5000	Sunny	No wind	Cold	4	Falling	1017	
SITE:	27/11/2020	MS	GA5000	Overcast	Light breeze	Cool	8	Steady	1011	
BACK TURNER STREET, MANCHESTER	02/12/2020	PG	GFM436	Sunny	Light breeze	Cool	8	Falling	1010	
	03/12/2020	PG	GFM436	Light rain	No wind	Cold	4	Falling	978	
	04/12/2020	PG	GA5000	Overcast	No wind	Cold	3	Falling	967	
	07/12/2020	PG	GA5000	Overcast	No wind	Cold	3	Falling	994	
	09/12/2020	PG	GFM436	Overcast	No wind	Cool	6	Rising	1003	
	11/12/2020	PG	GFM436	Light rain	Light breeze	Cool	8	Falling	979	
	19/04/2021	PG	GA5000	Sunny	No wind	Warm	16	Falling	1015	
	26/04/2021	PG	GA5000	Overcast	No wind	Warm	14	Falling	1018	

Notes: mb = milibars; CH_4 = methane; LEL = lower explosive limit = 5%v/v; CO_2 = carbon dioxide; O_2 = oxygen; CO=carbon monoxide; H_2S = hydrogen sulphide; TVOC= Total volatile organic compounds; PPM = parts per million. Where the flow is less than the limit of detection of the instrument, the detection limit is reported (Highlighted in green). Gas Screening Values (GSVs) are rounded to 3 decimal places. Calibration Records for analysers used availble on request.

Date	Time	Location	Response zone (m)	Pressures (mb)		Gas flows (l/hr)		CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases (PPM)			Depth to Water (m)	Well Base (m)	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes
				Atmospheric Pressure	Relative Well Pressure	Initial	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO	H_2S	TVOC (PID)					
				Summary Statistcs																			
			Max. values:	1024	1.3	0.6	0.6	0.1	0.1	2.0	2.0	6.3	6.2	22.0	22.3	0.0	0.0	0.0	15.7	16.0	0.000	0.006	
			Min. values:	967	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	16.6	15.7	0.0	0.0	0.0	2.8	3.0	0.000	0.000	
																							Worst-case GSVs based on maximum recorded steady flow and maximum individual peak concentrations:	0.001	0.038	
31/08/2018	AM	Ambient		1020																			
		BH01	4.00 - 16.00		0.1	0.2	0.2	0.1	0.1	2.0	2.0	1.7	1.4	22.0	22.3	0.0	0.0	NA	NGW	16.00	0.000	0.003	
		BH02	1.00 - 4.00		0.1	0.1	0.1	0.1	0.1	2.0	2.0	2.8	2.7	20.3	20.6	0.0	0.0	NA	3.40	4.00	0.000	0.003	
31/08/2018	AM	Ambient		1020																			
13/09/2018	AM	Ambient		1024																			
		BH01	4.00 - 16.00		0.1	0.1	0.1	0.1	0.1	2.0	2.0	2.3	2.0	20.3	21.5	0.0	0.0	NA	NGW	16.00	0.000	0.002	
		BH02	1.00 - 4.00		0.1	0.1	0.1	0.1	0.1	2.0	2.0	3.0	2.5	21.7	21.7	0.0	0.0	NA	2.87	4.00	0.000	0.003	
19/09/2018	AM	Ambient		1024																			
23/11/2020	AM	Ambient		1017				0.1		2.0		0.1		21.1									
		BH01	4.00 - 16.00		-0.1	NA	0.1	NA	0.1	NA	2.0	NA	0.3	NA	20.8	0.0	0.0	NA	NGW	15.85	0.000	0.000	No peak, installation located & repaired during visit
		BH02	1.00 - 4.00		-0.1	NA	0.2	NA	0.1	NA	2.0	NA	2.5	NA	19.4	0.0	0.0	NA	3.55	4.10	0.000	0.005	No peak, installation located & repaired during visit
23/11/2020	AM	Ambient		1017				0.1		2.0		0.1		21.1									
27/11/2020	AM	Ambient		1011				0.1		2.0		0.1		21.2									
		BH01	4.00 - 16.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.4	0.1	20.8	21.0	0.0	0.0	NA	NGW	15.85	0.000	0.000	
		BH02	1.00 - 4.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	1.1	0.4	20.0	20.3	0.0	0.0	NA	3.63	4.10	0.000	0.001	
27/11/2020	AM	Ambient		1011				0.1		2.0		0.1		21.1									
02/12/2020	PM	Ambient		1010				0.1		2.0		0.1		20.0									
		BH01	4.00 - 16.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	2.7	3.3	17.6	17.3	0.0	0.0	NA	15.54	15.85	0.000	0.003	
		BH02	1.00 - 4.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.1	0.1	19.8	20.0	0.0	0.0	NA	2.75	4.10	0.000	0.000	
02/12/2020	PM	Ambient		1010				0.1		2.0		0.1		20.0									
03/12/2020	PM	Ambient		978				0.1		2.0		0.1		19.7									
		BH01	4.00 - 16.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	NA	NA	NA	NA	0.0	0.0	NA	15.49	15.85	0.000	-	
		BH02	1.00 - 4.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.6	0.1	18.7	19.7	0.0	0.0	NA	2.77	4.10	0.000	0.001	
03/12/2020	PM	Ambient		978				0.1		2.0		0.1		19.7									

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD

Date	Time	Location	Response zone (m)	Pressures (mb)		Gas flows (l/hr)		CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases (PPM)			Depth to Water (m)	Well Base (m)	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes
				Atmospheric Pressure	Relative Well Pressure	Initial	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO	H_2S	TVOC (PID)					
04/12/2020	PM	Ambient		967					0.1		2.0		0.1		21.6								
		BH01	4.00 - 16.00		-0.3	0.1	0.1	0.1	0.1	2.0	2.0	6.3	6.2	17.7	17.8	0.0	NA	NA	15.52	15.85	0.000	0.006	
		BH02	1.00 - 4.00		-0.3	0.1	0.1	0.1	0.1	2.0	2.0	0.1	0.1	21.6	21.6	0.0	NA	NA	2.76	4.10	0.000	0.000	
04/12/2020	PM	Ambient		967					0.1		2.0		0.1		21.6								
07/12/2020	AM	Ambient		994					0.1		2.0		0.1		21.8								
		BH01	4.00 - 16.00		-0.1	0.1	0.1	0.1	0.1	2.0	2.0	3.0	2.0	19.8	20.4	0.0	NA	NA	15.56	15.85	0.000	0.003	
		BH02	1.00 - 4.00		-0.2	0.1	0.1	0.1	0.1	2.0	2.0	0.3	0.1	21.3	21.7	0.0	NA	NA	2.77	4.10	0.000	0.000	
07/12/2020	AM	Ambient		994					0.1		2.0		0.1		21.8								
09/12/2020	AM	Ambient		1003					0.1		2.0		0.1		19.3								
		BH01	4.00 - 16.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.1	0.1	19.1	19.2	0.0	0.0	NA	15.66	15.85	0.000	0.000	
		BH02	1.00 - 4.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.1	0.1	19.1	19.2	0.0	0.0	NA	2.76	4.10	0.000	0.000	
09/12/2020	AM	Ambient		1003					0.1		2.0		0.1		19.3								
11/12/2020	AM	Ambient		979					0.1		2.0		0.1		19.3								
		BH01	4.00 - 16.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	3.8	4.9	16.6	15.7	0.0	0.0	NA	15.66	15.85	0.000	0.004	
		BH02	1.00 - 4.00		0.0	0.1	0.1	0.1	0.1	2.0	2.0	0.8	0.8	17.9	18.0	0.0	0.0	NA	2.75	4.17	0.000	0.001	
11/12/2020	AM	Ambient		979					0.1		2.0		0.1		19.3								
19/04/2021	PM	Ambient		1015					0.1		2.0		0.1		21.4		0.0						
		BH03 Shalow	1.00 - 3.00		0.3	0.6	0.6	0.0	0.1	0.0	2.0	0.1	0.1	21.0	21.2	NA	0.0	NA	NGW	3.02	0.000	0.001	
		BH03 Deep	7.00 - 9.00		1.3	0.1	0.1	0.1	0.1	2.0	2.0	6.2	0.7	20.7	17.1	NA	0.0	NA	NGW	15.24	0.000	0.006	
19/04/2021	PM	Ambient		1015					0.1		2.0		0.1		21.4		0.0						
26/04/2021	PM	Ambient		1018					0.1		2.0		0.1		21.4		0.0						
		BH03 Shalow	1.00 - 3.00		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	21.1	21.2	NA	0.0	NA	NGW	3.03	0.000	0.000	
		BH03 Deep	7.00 - 9.00		0.3	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	18.3	21.2	NA	0.0	NA	NGW	15.25	0.000	0.000	
26/04/2021	PM	Ambient		1018					0.1		2.0		0.1		21.4		0.0						

APPENDIX I
Waste Classification Report

Waste Classification Report

VDTAH-P8C4U-A63EN

Job name

Back Turner Street, Manchester

Description/Comments

Project

C3967

Site

Back Turner Street, Manchester

Related Documents

#	Name	Description
None		

Waste Stream Template

BSL Suite

Classified by

Name:
Nicola Swallow
Date:
10 Feb 2021 11:50 GMT
Telephone:
01606 334 844

Company:
Brownfield Solutions Ltd
William Smith House
173 – 183 Witton Street
Northwich
CW9 5LP

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	-
Advanced Hazardous Waste Classification	-

Report

Created by: Nicola Swallow
Created date: 10 Feb 2021 11:50 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP04	0.20-0.40	Non Hazardous		3
2	TP06	0.10-0.30	Non Hazardous		5
3	TP07	0.50-0.70	Non Hazardous		7
4	BH1	0.50	Non Hazardous		9
5	BH1[2]	1.50	Non Hazardous		11
6	BH2	0.30	Non Hazardous		13
7	BH2[2]	1.50	Non Hazardous		15
8	Block B TP02	0.18-0.30	Non Hazardous		17
9	Block B TP03	0.20-0.65	Non Hazardous		19
10	Block B TP05	0.16-0.32	Non Hazardous		21
11	Block B TP06	0.16-0.32	Non Hazardous		24
12	Block B TP07	0.15-0.50	Non Hazardous		26

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
13	S02A	0.50	Non Hazardous		28

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	30
Appendix B: Rationale for selection of metal species	31
Appendix C: Version	32

Classification of sample: TP04

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP04
Sample Depth:
0.20-0.40 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	22.446 mg/kg	0.00224 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	2.2 mg/kg	1.285	2.828 mg/kg	0.00022 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27 mg/kg	1.462	39.462 mg/kg	0.00395 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		48 mg/kg	1.126	54.043 mg/kg	0.0054 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	430 mg/kg		430 mg/kg	0.043 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		3.3 mg/kg	1.353	4.467 mg/kg	0.000447 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18 mg/kg	1.579	28.431 mg/kg	0.00284 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		270 mg/kg	1.245	336.073 mg/kg	0.0336 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
12	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	acenaphthene		201-469-6	83-32-9		0.27 mg/kg		0.27 mg/kg	0.000027 %	✓	
14	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		phenanthrene											
			201-581-5	85-01-8		3.8	mg/kg		3.8	mg/kg	0.00038 %	✓	
16		anthracene											
			204-371-1	120-12-7		0.88	mg/kg		0.88	mg/kg	0.000088 %	✓	
17		fluoranthene											
			205-912-4	206-44-0		6.8	mg/kg		6.8	mg/kg	0.00068 %	✓	
18		pyrene											
			204-927-3	129-00-0		6.3	mg/kg		6.3	mg/kg	0.00063 %	✓	
19		benzo[a]anthracene											
		601-033-00-9	200-280-6	56-55-3		4.3	mg/kg		4.3	mg/kg	0.00043 %	✓	
20		chrysene											
		601-048-00-0	205-923-4	218-01-9		3.7	mg/kg		3.7	mg/kg	0.00037 %	✓	
21		benzo[b]fluoranthene											
		601-034-00-4	205-911-9	205-99-2		3.3	mg/kg		3.3	mg/kg	0.00033 %	✓	
22		benzo[k]fluoranthene											
		601-036-00-5	205-916-6	207-08-9		2.3	mg/kg		2.3	mg/kg	0.00023 %	✓	
23		benzo[a]pyrene; benzo[def]chrysene											
		601-032-00-3	200-028-5	50-32-8		3.6	mg/kg		3.6	mg/kg	0.00036 %	✓	
24		indeno[123-cd]pyrene											
			205-893-2	193-39-5		1.4	mg/kg		1.4	mg/kg	0.00014 %	✓	
25		dibenz[a,h]anthracene											
		601-041-00-2	200-181-8	53-70-3		0.45	mg/kg		0.45	mg/kg	0.000045 %	✓	
26		benzo[ghi]perylene											
			205-883-8	191-24-2		1.7	mg/kg		1.7	mg/kg	0.00017 %	✓	
27		TPH (C6 to C40) petroleum group											
				TPH		598	mg/kg		598	mg/kg	0.0598 %	✓	
28		benzene											
		601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
29		toluene											
		601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
30		ethylbenzene											
		601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
										Total:	0.156 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The absence of a free draining liquid and the relatively low concentrations of short-chain hydrocarbons reported indicates that this hazard property is not applicable to this waste.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0598%)

Classification of sample: TP06

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP06
Sample Depth:
0.10-0.30 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20 mg/kg	1.32	26.407 mg/kg	0.00264 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.7 mg/kg	1.285	0.9 mg/kg	0.00007 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		41 mg/kg	1.126	46.161 mg/kg	0.00462 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	1100 mg/kg		1100 mg/kg	0.11 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.1 mg/kg	1.353	1.489 mg/kg	0.000149 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		19 mg/kg	1.579	30.01 mg/kg	0.003 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		390 mg/kg	1.245	485.438 mg/kg	0.0485 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
12	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
13	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		phenanthrene				0.64	mg/kg		0.64	mg/kg	0.000064 %	✓	
			201-581-5	85-01-8									
16		anthracene				0.13	mg/kg		0.13	mg/kg	0.000013 %	✓	
			204-371-1	120-12-7									
17		fluoranthene				0.73	mg/kg		0.73	mg/kg	0.000073 %	✓	
			205-912-4	206-44-0									
18		pyrene				0.75	mg/kg		0.75	mg/kg	0.000075 %	✓	
			204-927-3	129-00-0									
19		benzo[a]anthracene				0.44	mg/kg		0.44	mg/kg	0.000044 %	✓	
		601-033-00-9	200-280-6	56-55-3									
20		chrysene				0.41	mg/kg		0.41	mg/kg	0.000041 %	✓	
		601-048-00-0	205-923-4	218-01-9									
21		benzo[b]fluoranthene				0.28	mg/kg		0.28	mg/kg	0.000028 %	✓	
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				0.26	mg/kg		0.26	mg/kg	0.000026 %	✓	
		601-036-00-5	205-916-6	207-08-9									
23		benzo[a]pyrene; benzo[def]chrysene				0.31	mg/kg		0.31	mg/kg	0.000031 %	✓	
		601-032-00-3	200-028-5	50-32-8									
24		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
25		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
26		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
27		TPH (C6 to C40) petroleum group				269.1	mg/kg		269.1	mg/kg	0.0269 %	✓	
				TPH									
28		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
29		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
30		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
										Total:	0.199 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The absence of a free draining liquid and the relatively low concentrations of short-chain hydrocarbons reported indicates that this hazard property is not applicable to this waste.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0269%)

Classification of sample: TP07

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP07	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.50-0.70 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
1		arsenic { arsenic trioxide }		12 mg/kg	1.32	15.844 mg/kg	0.00158 %	✓	
		033-003-00-0 / 215-481-4 / 1327-53-3							
2		cadmium { cadmium sulfide }	1	0.5 mg/kg	1.285	0.643 mg/kg	0.00005 %	✓	
		048-010-00-4 / 215-147-8 / 1306-23-6							
3		chromium in chromium(VI) compounds { chromium(VI) oxide }		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<**LOD**
		024-001-00-0 / 215-607-8 / 1333-82-0							
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		18 mg/kg	1.462	26.308 mg/kg	0.00263 %	✓	
		/ 215-160-9 / 1308-38-9							
5		copper { dicopper oxide; copper (I) oxide }		31 mg/kg	1.126	34.903 mg/kg	0.00349 %	✓	
		029-002-00-X / 215-270-7 / 1317-39-1							
6		lead { lead compounds with the exception of those specified elsewhere in this Annex }	1	1000 mg/kg		1000 mg/kg	0.1 %	✓	
		082-001-00-6 / /							
7		mercury { mercury dichloride }		0.5 mg/kg	1.353	0.677 mg/kg	0.0000677 %	✓	
		080-010-00-X / 231-299-8 / 7487-94-7							
8		nickel { nickel dihydroxide }		15 mg/kg	1.579	23.692 mg/kg	0.00237 %	✓	
		028-008-00-X / 235-008-5 [1] 234-348-1 [2] / 12054-48-7 [1] 11113-74-9 [2]							
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }		<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
		034-002-00-8 / /							
10		zinc { zinc oxide }		330 mg/kg	1.245	410.756 mg/kg	0.0411 %	✓	
		030-013-00-7 / 215-222-5 / 1314-13-2							
11		naphthalene		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
		601-052-00-2 / 202-049-5 / 91-20-3							
12		acenaphthylene		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
		/ 205-917-1 / 208-96-8							
13		acenaphthene		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
		/ 201-469-6 / 83-32-9							
14		fluorene		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
		/ 201-695-5 / 86-73-7							

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15	●	phenanthrene	201-581-5	85-01-8		1	mg/kg		1	mg/kg	0.0001 %	✓	
16	●	anthracene	204-371-1	120-12-7		0.21	mg/kg		0.21	mg/kg	0.000021 %	✓	
17	●	fluoranthene	205-912-4	206-44-0		1.5	mg/kg		1.5	mg/kg	0.00015 %	✓	
18	●	pyrene	204-927-3	129-00-0		1.5	mg/kg		1.5	mg/kg	0.00015 %	✓	
19		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.88	mg/kg		0.88	mg/kg	0.000088 %	✓	
20		chrysene	601-048-00-0	205-923-4	218-01-9	0.66	mg/kg		0.66	mg/kg	0.000066 %	✓	
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.63	mg/kg		0.63	mg/kg	0.000063 %	✓	
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.45	mg/kg		0.45	mg/kg	0.000045 %	✓	
23		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.61	mg/kg		0.61	mg/kg	0.000061 %	✓	
24	●	indeno[123-cd]pyrene	205-893-2	193-39-5		0.3	mg/kg		0.3	mg/kg	0.00003 %	✓	
25		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
26	●	benzo[ghi]perylene	205-883-8	191-24-2		0.35	mg/kg		0.35	mg/kg	0.000035 %	✓	
										Total:	0.152 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH1

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
BH1	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.50 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	18.485 mg/kg	0.00185 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.7 mg/kg	1.285	0.9 mg/kg	0.00007 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		71 mg/kg	1.126	79.938 mg/kg	0.00799 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	770 mg/kg		770 mg/kg	0.077 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.7 mg/kg	1.353	2.301 mg/kg	0.00023 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		15 mg/kg	1.579	23.692 mg/kg	0.00237 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.5 mg/kg	1.405	2.108 mg/kg	0.000211 %	✓	
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		180 mg/kg	1.245	224.049 mg/kg	0.0224 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
12	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	acenaphthene		201-469-6	83-32-9		0.22 mg/kg		0.22 mg/kg	0.000022 %	✓	
14	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		phenanthrene				2	mg/kg		2	mg/kg	0.0002 %	✓	
			201-581-5	85-01-8									
16		anthracene				0.45	mg/kg		0.45	mg/kg	0.000045 %	✓	
			204-371-1	120-12-7									
17		fluoranthene				3	mg/kg		3	mg/kg	0.0003 %	✓	
			205-912-4	206-44-0									
18		pyrene				2.9	mg/kg		2.9	mg/kg	0.00029 %	✓	
			204-927-3	129-00-0									
19		benzo[a]anthracene				1.4	mg/kg		1.4	mg/kg	0.00014 %	✓	
		601-033-00-9	200-280-6	56-55-3									
20		chrysene				1.1	mg/kg		1.1	mg/kg	0.00011 %	✓	
		601-048-00-0	205-923-4	218-01-9									
21		benzo[b]fluoranthene				1.6	mg/kg		1.6	mg/kg	0.00016 %	✓	
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				0.59	mg/kg		0.59	mg/kg	0.000059 %	✓	
		601-036-00-5	205-916-6	207-08-9									
23		benzo[a]pyrene; benzo[def]chrysene				1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
		601-032-00-3	200-028-5	50-32-8									
24		indeno[123-cd]pyrene				0.77	mg/kg		0.77	mg/kg	0.000077 %	✓	
			205-893-2	193-39-5									
25		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
26		benzo[ghi]perylene				1	mg/kg		1	mg/kg	0.0001 %	✓	
			205-883-8	191-24-2									
27		TPH (C6 to C40) petroleum group				56	mg/kg		56	mg/kg	0.0056 %	✓	
				TPH									
28		asbestos				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.123 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The absence of a free draining liquid and the relatively low concentrations of short-chain hydrocarbons reported indicates that this hazard property is not applicable to this waste.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0056%)

Classification of sample: BH1[2]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
BH1[2]	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
1.50 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	18.485 mg/kg	0.00185 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1.2 mg/kg	1.285	1.542 mg/kg	0.00012 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		110 mg/kg	1.126	123.848 mg/kg	0.0124 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	1300 mg/kg		1300 mg/kg	0.13 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1 mg/kg	1.353	1.353 mg/kg	0.000135 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		56 mg/kg	1.579	88.452 mg/kg	0.00885 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		360 mg/kg	1.245	448.097 mg/kg	0.0448 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
12	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
14	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15	•	phenanthrene	201-581-5	85-01-8		0.9	mg/kg		0.9	mg/kg	0.00009 %	✓	
16	•	anthracene	204-371-1	120-12-7		0.15	mg/kg		0.15	mg/kg	0.000015 %	✓	
17	•	fluoranthene	205-912-4	206-44-0		1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
18	•	pyrene	204-927-3	129-00-0		1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
19		benzo[a]anthracene	200-280-6	56-55-3		0.63	mg/kg		0.63	mg/kg	0.000063 %	✓	
		601-033-00-9											
20		chrysene	205-923-4	218-01-9		0.58	mg/kg		0.58	mg/kg	0.000058 %	✓	
		601-048-00-0											
21		benzo[b]fluoranthene	205-911-9	205-99-2		0.76	mg/kg		0.76	mg/kg	0.000076 %	✓	
		601-034-00-4											
22		benzo[k]fluoranthene	205-916-6	207-08-9		0.26	mg/kg		0.26	mg/kg	0.000026 %	✓	
		601-036-00-5											
23		benzo[a]pyrene; benzo[def]chrysene	200-028-5	50-32-8		0.58	mg/kg		0.58	mg/kg	0.000058 %	✓	
		601-032-00-3											
24	•	indeno[123-cd]pyrene	205-893-2	193-39-5		0.36	mg/kg		0.36	mg/kg	0.000036 %	✓	
25		dibenz[a,h]anthracene	200-181-8	53-70-3		0.13	mg/kg		0.13	mg/kg	0.000013 %	✓	
		601-041-00-2											
26	•	benzo[ghi]perylene	205-883-8	191-24-2		0.48	mg/kg		0.48	mg/kg	0.000048 %	✓	
										Total:	0.202 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH2

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
BH2	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.30 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.7 mg/kg	1.32	12.807 mg/kg	0.00128 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.7 mg/kg	1.285	0.9 mg/kg	0.00007 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		110 mg/kg	1.126	123.848 mg/kg	0.0124 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	200 mg/kg		200 mg/kg	0.02 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.9 mg/kg	1.353	1.218 mg/kg	0.000122 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		17 mg/kg	1.579	26.851 mg/kg	0.00269 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		160 mg/kg	1.245	199.154 mg/kg	0.0199 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
12	acenaphthylene		205-917-1	208-96-8		0.23 mg/kg		0.23 mg/kg	0.000023 %	✓	
13	acenaphthene		201-469-6	83-32-9		1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
14	fluorene		201-695-5	86-73-7		0.74 mg/kg		0.74 mg/kg	0.000074 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		phenanthrene											
			201-581-5	85-01-8		6.8	mg/kg		6.8	mg/kg	0.00068 %	✓	
16		anthracene											
			204-371-1	120-12-7		1.7	mg/kg		1.7	mg/kg	0.00017 %	✓	
17		fluoranthene											
			205-912-4	206-44-0		12	mg/kg		12	mg/kg	0.0012 %	✓	
18		pyrene											
			204-927-3	129-00-0		11	mg/kg		11	mg/kg	0.0011 %	✓	
19		benzo[a]anthracene											
		601-033-00-9	200-280-6	56-55-3		5.5	mg/kg		5.5	mg/kg	0.00055 %	✓	
20		chrysene											
		601-048-00-0	205-923-4	218-01-9		4.7	mg/kg		4.7	mg/kg	0.00047 %	✓	
21		benzo[b]fluoranthene											
		601-034-00-4	205-911-9	205-99-2		6.6	mg/kg		6.6	mg/kg	0.00066 %	✓	
22		benzo[k]fluoranthene											
		601-036-00-5	205-916-6	207-08-9		1.9	mg/kg		1.9	mg/kg	0.00019 %	✓	
23		benzo[a]pyrene; benzo[def]chrysene											
		601-032-00-3	200-028-5	50-32-8		5	mg/kg		5	mg/kg	0.0005 %	✓	
24		indeno[123-cd]pyrene											
			205-893-2	193-39-5		2.9	mg/kg		2.9	mg/kg	0.00029 %	✓	
25		dibenz[a,h]anthracene											
		601-041-00-2	200-181-8	53-70-3		0.92	mg/kg		0.92	mg/kg	0.000092 %	✓	
26		benzo[ghi]perylene											
			205-883-8	191-24-2		3.7	mg/kg		3.7	mg/kg	0.00037 %	✓	
										Total:	0.0659 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH2[2]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
BH2[2]	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
1.50 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	19.805 mg/kg	0.00198 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.7 mg/kg	1.285	0.9 mg/kg	0.00007 %	✓	
3	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<**LOD**
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		71 mg/kg	1.126	79.938 mg/kg	0.00799 %	✓	
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	380 mg/kg		380 mg/kg	0.038 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.3 mg/kg	1.353	1.76 mg/kg	0.000176 %	✓	
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		51 mg/kg	1.579	80.554 mg/kg	0.00806 %	✓	
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		160 mg/kg	1.245	199.154 mg/kg	0.0199 %	✓	
11	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
12	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
14	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		phenanthrene				1.5	mg/kg		1.5	mg/kg	0.00015 %	✓	
			201-581-5	85-01-8									
16		anthracene				0.24	mg/kg		0.24	mg/kg	0.000024 %	✓	
			204-371-1	120-12-7									
17		fluoranthene				2.5	mg/kg		2.5	mg/kg	0.00025 %	✓	
			205-912-4	206-44-0									
18		pyrene				2.8	mg/kg		2.8	mg/kg	0.00028 %	✓	
			204-927-3	129-00-0									
19		benzo[a]anthracene				1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
		601-033-00-9	200-280-6	56-55-3									
20		chrysene				1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
		601-048-00-0	205-923-4	218-01-9									
21		benzo[b]fluoranthene				1.6	mg/kg		1.6	mg/kg	0.00016 %	✓	
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				0.57	mg/kg		0.57	mg/kg	0.000057 %	✓	
		601-036-00-5	205-916-6	207-08-9									
23		benzo[a]pyrene; benzo[def]chrysene				1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
		601-032-00-3	200-028-5	50-32-8									
24		indeno[123-cd]pyrene				0.67	mg/kg		0.67	mg/kg	0.000067 %	✓	
			205-893-2	193-39-5									
25		dibenz[a,h]anthracene				0.2	mg/kg		0.2	mg/kg	0.00002 %	✓	
		601-041-00-2	200-181-8	53-70-3									
26		benzo[ghi]perylene				0.88	mg/kg		0.88	mg/kg	0.000088 %	✓	
			205-883-8	191-24-2									
27		TPH (C6 to C40) petroleum group				203.9	mg/kg		203.9	mg/kg	0.0204 %	✓	
				TPH									
										Total:	0.101 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The absence of a free draining liquid and the relatively low concentrations of short-chain hydrocarbons reported indicates that this hazard property is not applicable to this waste.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0204%)

Classification of sample: Block B TP02

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
Block B TP02
Sample Depth:
0.18-0.30 m
Moisture content:
22%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	pH			PH		8.4	pH		8.4	pH	8.4 pH		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19	mg/kg	1.32	19.567	mg/kg	0.00196 %	✓	
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	29.64	mg/kg	0.00296 %	✓	
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		50	mg/kg	1.126	43.91	mg/kg	0.00439 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	120	mg/kg		93.6	mg/kg	0.00936 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
9	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		34	mg/kg	1.579	41.888	mg/kg	0.00419 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
11	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		93	mg/kg	1.245	90.292	mg/kg	0.00903 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.63	mg/kg		0.491	mg/kg	0.0000491 %	✓	
13	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.37	mg/kg		0.289	mg/kg	0.0000289 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.34	mg/kg		0.265	mg/kg	0.0000265 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				2.8	mg/kg		2.184	mg/kg	0.000218 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.53	mg/kg		0.413	mg/kg	0.0000413 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				3.9	mg/kg		3.042	mg/kg	0.000304 %	✓	
			205-912-4	206-44-0									
19		pyrene				4.1	mg/kg		3.198	mg/kg	0.00032 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				2.6	mg/kg		2.028	mg/kg	0.000203 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				1.7	mg/kg		1.326	mg/kg	0.000133 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				2	mg/kg		1.56	mg/kg	0.000156 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.1	mg/kg		0.858	mg/kg	0.0000858 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				1.9	mg/kg		1.482	mg/kg	0.000148 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.88	mg/kg		0.686	mg/kg	0.0000686 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.31	mg/kg		0.242	mg/kg	0.0000242 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.1	mg/kg		0.858	mg/kg	0.0000858 %	✓	
			205-883-8	191-24-2									
										Total:	0.0342 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: Block B TP03

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
Block B TP03
Sample Depth:
0.20-0.65 m
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		pH			PH		8.8	pH		8.8	pH	8.8 pH		
2		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22	mg/kg	1.32	24.981	mg/kg	0.0025 %	✓	
3		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	8.6	mg/kg	1.285	9.506	mg/kg	0.00074 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25	mg/kg	1.462	31.423	mg/kg	0.00314 %	✓	
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		62	mg/kg	1.126	60.032	mg/kg	0.006 %	✓	
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	590	mg/kg		507.4	mg/kg	0.0507 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.6	mg/kg	1.353	0.698	mg/kg	0.0000698 %	✓	
9		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		28	mg/kg	1.579	38.034	mg/kg	0.0038 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
11		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		610	mg/kg	1.245	652.977	mg/kg	0.0653 %	✓	
12		naphthalene	601-052-00-2	202-049-5	91-20-3		0.85	mg/kg		0.731	mg/kg	0.0000731 %	✓	
13		acenaphthylene		205-917-1	208-96-8		2.6	mg/kg		2.236	mg/kg	0.000224 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.85	mg/kg		0.731	mg/kg	0.0000731 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.94	mg/kg		0.808	mg/kg	0.0000808 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				14	mg/kg		12.04	mg/kg	0.0012 %	✓	
			201-581-5	85-01-8									
17		anthracene				5.1	mg/kg		4.386	mg/kg	0.000439 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				76	mg/kg		65.36	mg/kg	0.00654 %	✓	
			205-912-4	206-44-0									
19		pyrene				75	mg/kg		64.5	mg/kg	0.00645 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				55	mg/kg		47.3	mg/kg	0.00473 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				41	mg/kg		35.26	mg/kg	0.00353 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				37	mg/kg		31.82	mg/kg	0.00318 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				36	mg/kg		30.96	mg/kg	0.0031 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				46	mg/kg		39.56	mg/kg	0.00396 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				19	mg/kg		16.34	mg/kg	0.00163 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				6.3	mg/kg		5.418	mg/kg	0.000542 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				21	mg/kg		18.06	mg/kg	0.00181 %	✓	
			205-883-8	191-24-2									
28		asbestos				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.171 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: Block B TP05

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
Block B TP05
Sample Depth:
0.16-0.32 m
Moisture content:
31%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 31% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		pH			PH		8.2	pH		8.2	pH	8.2 pH		
2		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		44	mg/kg	1.32	40.085	mg/kg	0.00401 %	✓	
3		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
5		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	23.195	mg/kg	0.00232 %	✓	
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		110	mg/kg	1.126	85.455	mg/kg	0.00855 %	✓	
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	1200	mg/kg		828	mg/kg	0.0828 %	✓	
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
9		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		46	mg/kg	1.579	50.133	mg/kg	0.00501 %	✓	
10		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
11		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		130	mg/kg	1.245	111.651	mg/kg	0.0112 %	✓	
12		naphthalene	601-052-00-2	202-049-5	91-20-3		0.37	mg/kg		0.255	mg/kg	0.0000255 %	✓	
13		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				0.17	mg/kg		0.117	mg/kg	0.0000117 %	✓	
			201-469-6	83-32-9									
15		fluorene				0.13	mg/kg		0.0897	mg/kg	0.00000897 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				2.2	mg/kg		1.518	mg/kg	0.000152 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.32	mg/kg		0.221	mg/kg	0.0000221 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				3.4	mg/kg		2.346	mg/kg	0.000235 %	✓	
			205-912-4	206-44-0									
19		pyrene				3.6	mg/kg		2.484	mg/kg	0.000248 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				2.1	mg/kg		1.449	mg/kg	0.000145 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				2.1	mg/kg		1.449	mg/kg	0.000145 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				1.9	mg/kg		1.311	mg/kg	0.000131 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				1.5	mg/kg		1.035	mg/kg	0.000104 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				1.7	mg/kg		1.173	mg/kg	0.000117 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.92	mg/kg		0.635	mg/kg	0.0000635 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.29	mg/kg		0.2	mg/kg	0.00002 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				1.2	mg/kg		0.828	mg/kg	0.0000828 %	✓	
			205-883-8	191-24-2									
28		TPH (C6 to C40) petroleum group				81.6	mg/kg		56.304	mg/kg	0.00563 %	✓	
				TPH									
29		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
31		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
32		xylene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
										Total:	0.121 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The absence of a free draining liquid and the relatively low concentrations of short-chain hydrocarbons reported indicates that this hazard property is not applicable to this waste.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00563%)

Classification of sample: Block B TP06

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
Block B TP06
Sample Depth:
0.16-0.32 m
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	pH			PH		8.2	pH		8.2	pH	8.2 pH		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4	mg/kg	1.32	10.177	mg/kg	0.00102 %	✓	
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	2	mg/kg	1.285	2.108	mg/kg	0.000164 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	34.756	mg/kg	0.00348 %	✓	
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	23.081	mg/kg	0.00231 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	52	mg/kg		42.64	mg/kg	0.00426 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
9	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		33	mg/kg	1.579	42.741	mg/kg	0.00427 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
11	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		230	mg/kg	1.245	234.753	mg/kg	0.0235 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				0.45	mg/kg		0.369	mg/kg	0.0000369 %	✓	
			201-581-5	85-01-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
18		fluoranthene				2.1	mg/kg		1.722	mg/kg	0.000172 %	✓	
			205-912-4	206-44-0									
19		pyrene				2.7	mg/kg		2.214	mg/kg	0.000221 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				1.8	mg/kg		1.476	mg/kg	0.000148 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				1.8	mg/kg		1.476	mg/kg	0.000148 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				1.7	mg/kg		1.394	mg/kg	0.000139 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.74	mg/kg		0.607	mg/kg	0.0000607 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				1.6	mg/kg		1.312	mg/kg	0.000131 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.74	mg/kg		0.607	mg/kg	0.0000607 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.27	mg/kg		0.221	mg/kg	0.0000221 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.86	mg/kg		0.705	mg/kg	0.0000705 %	✓	
			205-883-8	191-24-2									
										Total:	0.0406 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: Block B TP07

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
Block B TP07
Sample Depth:
0.15-0.50 m
Moisture content:
9.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	pH			PH		8.7	pH		8.7	pH	8.7 pH		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	15.499	mg/kg	0.00155 %	✓	
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.7	mg/kg	1.285	0.812	mg/kg	0.0000632 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25	mg/kg	1.462	32.995	mg/kg	0.0033 %	✓	
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		33	mg/kg	1.126	33.55	mg/kg	0.00336 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	170	mg/kg		153.51	mg/kg	0.0154 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
9	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		21	mg/kg	1.579	29.952	mg/kg	0.003 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
11	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		93	mg/kg	1.245	104.53	mg/kg	0.0105 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
15		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
16		phenanthrene				0.99	mg/kg		0.894	mg/kg	0.0000894 %	✓	
			201-581-5	85-01-8									
17		anthracene				0.21	mg/kg		0.19	mg/kg	0.000019 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				1.2	mg/kg		1.084	mg/kg	0.000108 %	✓	
			205-912-4	206-44-0									
19		pyrene				1.1	mg/kg		0.993	mg/kg	0.0000993 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				0.77	mg/kg		0.695	mg/kg	0.0000695 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				0.46	mg/kg		0.415	mg/kg	0.0000415 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				0.58	mg/kg		0.524	mg/kg	0.0000524 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.29	mg/kg		0.262	mg/kg	0.0000262 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.47	mg/kg		0.424	mg/kg	0.0000424 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.27	mg/kg		0.244	mg/kg	0.0000244 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.3	mg/kg		0.271	mg/kg	0.0000271 %	✓	
			205-883-8	191-24-2									
										Total:	0.0381 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: S02A

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
S02A
Sample Depth:
0.50 m
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	pH			PH		9	pH		9	pH	9pH		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.4	mg/kg	1.32	9.094	mg/kg	0.000909 %	✓	
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	27.565	mg/kg	0.00276 %	✓	
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		29	mg/kg	1.126	26.774	mg/kg	0.00268 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	51	mg/kg		41.82	mg/kg	0.00418 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
9	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		32	mg/kg	1.579	41.446	mg/kg	0.00414 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
11	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		70	mg/kg	1.245	71.447	mg/kg	0.00714 %	✓	
12	naphthalene	601-052-00-2	202-049-5	91-20-3		0.29	mg/kg		0.238	mg/kg	0.0000238 %	✓	
13	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
			201-469-6	83-32-9									
15	●	fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
			201-695-5	86-73-7									
16	●	phenanthrene				0.93	mg/kg		0.763	mg/kg	0.0000763 %	✓	
			201-581-5	85-01-8									
17	●	anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
			204-371-1	120-12-7									
18	●	fluoranthene				0.43	mg/kg		0.353	mg/kg	0.0000353 %	✓	
			205-912-4	206-44-0									
19	●	pyrene				0.52	mg/kg		0.426	mg/kg	0.0000426 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
25	●	indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
27	●	benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
			205-883-8	191-24-2									
28	●	TPH (C6 to C40) petroleum group				150.55	mg/kg		123.451	mg/kg	0.0123 %	✓	
				TPH									
29		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
		601-020-00-8	200-753-7	71-43-2									
30		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
		601-021-00-3	203-625-9	108-88-3									
31	●	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
		601-023-00-4	202-849-4	100-41-4									
										Total:	0.0348 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The absence of a free draining liquid and the relatively low concentrations of short-chain hydrocarbons reported indicates that this hazard property is not applicable to this waste.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0123%)

Appendix A: Classifier defined and non CLP determinands

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **lead compounds with the exception of those specified elsewhere in this Annex**

CLP index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers many simple lead compounds to be Carcinogenic category 2
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

cadmium {cadmium sulfide}

Worst case species based on hazard statements

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species based on hazard statements

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Given the absence of chromium VI within the site soils, lead chromate is not understood to be present at the site, given this and the absence of hardstanding the next most conservative low solubility species has been selected.

mercury {mercury dichloride}

Worst case species based on hazard statements

nickel {nickel dihydroxide}

Worst case species based on hazard statements

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on hazard statements

zinc {zinc oxide}

Given the absence of chromium VI within the site soils, zinc chromate is not understood to be present at the site, given this and the absence of hardstanding the next most conservative low solubility species has been selected.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2021.40.4645.8952 (09 Feb 2021)
HazWasteOnline Database: 2021.40.4645.8952 (09 Feb 2021)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2019 - UK: 2019 No. 720 of 27th March 2019
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

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Analytical Report Number : 18-96493

Project / Site name:	Back Turner Street, Manchester	**Samples received on:**	14/08/2018
Your job number:	C3967	**Samples instructed on:**	14/08/2018
Your order number:	C3967/5842/JM	**Analysis completed by:**	23/08/2018
Report Issue Number:	1	**Report issued on:**	23/08/2018
Samples Analysed:	1 WAC 10:1 Sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**18-96493**						
					Client:	**BSL**	
Location	**Back Turner Street, Manchester**						
Lab Reference (Sample Number)	1023741 / 1023742				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	08/08/2018				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH2						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	2.1				3%	5%	6%
Loss on Ignition (%) **	5.3				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	71				500	--	--
Total PAH (WAC-17) (mg/kg)	13				100	--	--
pH (units)**	8.0				--	>6	--
Acid Neutralisation Capacity (mol / kg)	26				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0041			0.0339	0.5	2	25
Barium *	0.0983			0.808	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0018			0.015	0.5	10	70
Copper *	0.018			0.15	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0028			0.0228	0.5	10	30
Nickel *	0.0018			0.015	0.4	10	40
Lead *	0.040			0.33	0.5	10	50
Antimony *	0.0081			0.067	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.029			0.24	4	50	200
Chloride *	1.3			11	800	4000	25000
Fluoride	0.61			5.0	10	150	500
Sulphate *	100			840	1000	20000	50000
TDS*	140			1200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.50			53.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.2						
Dry Matter (%)	91						
Moisture (%)	9.3						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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

Analytical Report Number : 18-96493

Project / Site name: Back Turner Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1023741	BH2	None Supplied	1.00	Brown loam and sand with gravel and brick.

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Analytical Report Number : 18-96493

Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	in-house method	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE

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

Analytical Report Number : 18-96493

Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS

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

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Analytical Report Number : 21-53766

Project / Site name:	Back Turner Street, Manchester	**Samples received on:**	28/01/2021
Your job number:	C3967	**Samples instructed on/ Analysis started on:**	28/01/2021
Your order number:	1646	**Analysis completed by:**	04/02/2021
Report Issue Number:	1	**Report issued on:**	04/02/2021
Samples Analysed:	1 10:1 WAC sample		

Signed:

Claire Brown-Crociquia
Group Customer Services Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**21-53766**						
					Client:	**BSL**	
Location	**Back Turner Street, Manchester**						
Lab Reference (Sample Number)	1751953 / 1751954				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	27/01/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	Block B TP06						
Depth (m)	0.16-0.32						
Solid Waste Analysis							
TOC (%)**	0.8				3%	5%	6%
Loss on Ignition (%) **	2.1				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	13.8				100	--	--
pH (units)**	8.6				--	>6	--
Acid Neutralisation Capacity (mol / kg)	21				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0040			0.0323	0.5	2	25
Barium *	0.0283			0.231	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0012			0.0097	0.5	10	70
Copper *	0.0032			0.026	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0117			0.0952	0.5	10	30
Nickel *	0.0018			0.015	0.4	10	40
Lead *	0.0030			0.025	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.013			0.10	4	50	200
Chloride *	65			530	800	15000	25000
Fluoride	0.22			1.8	10	150	500
Sulphate *	160			1300	1000	20000	50000
TDS*	360			2900	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	5.10			41.5	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.5						
Dry Matter (%)	82						
Moisture (%)	18						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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

Analytical Report Number : 21-53766
Project / Site name: Back Turner Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1751953	Block B TP06	None Supplied	0.16-0.32	Brown clay and sand with gravel.

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

Analytical Report Number : 21-53766
Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-53766
Project / Site name: Back Turner Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

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

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Analytical Report Number : 21-54671

Project / Site name:	Back Turner Street	**Samples received on:**	03/02/2021
Your job number:	C3976	**Samples instructed on/ Analysis started on:**	03/02/2021
Your order number:	JWC3967-1601	**Analysis completed by:**	11/02/2021
Report Issue Number:	1	**Report issued on:**	11/02/2021
Samples Analysed:	10:1 WAC sample		

Signed: Karolina Marek

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**21-54671**						
					Client:	**BSL**	
Location	**Back Turner Street**						
Lab Reference (Sample Number)	1757844 / 1757845				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	01/02/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	S02A						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	1.0				3%	5%	6%
Loss on Ignition (%) **	3.2				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	240				500	--	--
Total PAH (WAC-17) (mg/kg)	1.78				100	--	--
pH (units)**	8.8				--	>6	--
Acid Neutralisation Capacity (mol / kg)	24				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0026			0.0207	0.5	2	25
Barium *	0.0705			0.566	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0009			0.0069	0.5	10	70
Copper *	0.0066			0.053	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0177			0.142	0.5	10	30
Nickel *	0.0065			0.052	0.4	10	40
Lead *	0.0033			0.026	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0086			0.069	4	50	200
Chloride *	25			200	800	15000	25000
Fluoride	0.30			2.4	10	150	500
Sulphate *	24			190	1000	20000	50000
TDS*	150			1200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	0.016			0.13	1	-	-
DOC	24.2			195	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.5						
Dry Matter (%)	82						
Moisture (%)	18						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Analytical Report Number : 21-54671
Project / Site name: Back Turner Street

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1757844	S02A	None Supplied	0.5	Brown clay and sand with gravel.

Analytical Report Number : 21-54671
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-54671
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
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Analytical Report Number : 20-24800

Project / Site name:	Back Turner Street	**Samples received on:**	13/08/2020
Your job number:	C3976	**Samples instructed on/ Analysis started on:**	13/08/2020
Your order number:	MS-C3967-1184	**Analysis completed by:**	24/08/2020
Report Issue Number:	1	**Report issued on:**	24/08/2020
Samples Analysed:	10:1 WAC sample		

Signed: A. Czerwińska

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**20-24800**						
					Client:	**BSL**	
Location	**Back Turner Street**						
Lab Reference (Sample Number)	1593001 / 1593002				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	11/08/2020				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP06						
Depth (m)	0.10-0.30						
Solid Waste Analysis							
TOC (%)**	3.7				3%	5%	6%
Loss on Ignition (%) **	8.0				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	110				500	--	--
Total PAH (WAC-17) (mg/kg)	3.86				100	--	--
pH (units)**	7.6				--	>6	--
Acid Neutralisation Capacity (mol / kg)	9.1				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0059			0.0434	0.5	2	25
Barium *	0.0500			0.365	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0009			0.0067	0.5	10	70
Copper *	0.0087			0.063	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0057			0.0420	0.5	10	30
Nickel *	0.0039			0.029	0.4	10	40
Lead *	0.010			0.075	0.5	10	50
Antimony *	0.0051			0.037	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.048			0.35	4	50	200
Chloride *	2.2			16	800	15000	25000
Fluoride	0.46			3.4	10	150	500
Sulphate *	2000			15000	1000	20000	50000
TDS*	1300			9600	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	13.9			102	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.2						
Dry Matter (%)	80						
Moisture (%)	20						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
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** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Analytical Report Number : 20-24800
Project / Site name: Back Turner Street

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1593001	TP06	None Supplied	0.10-0.30	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 20-24800
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025

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Analytical Report Number : 20-24800
Project / Site name: Back Turner Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
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Analytical Report Number : 21-68796

Project / Site name:	Back Tumer Street, Manchester	**Samples received on:**	15/04/2021
Your job number:	C3967	**Samples instructed on/ Analysis started on:**	15/04/2021
Your order number:		**Analysis completed by:**	22/04/2021
Report Issue Number:	1	**Report issued on:**	22/04/2021
Samples Analysed:	10:1 WAC sample		

Signed: Karolina Marek

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**21-68796**						
					Client:	**BSL**	
Location	**Back Tumer Street, Manchester**						
Lab Reference (Sample Number)	1837713 / 1837714				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	12/04/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	BH03						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.9				3%	5%	6%
Loss on Ignition (%) **	4.0				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	3.52				100	--	--
pH (units)**	10.7				--	>6	--
Acid Neutralisation Capacity (mol / kg)	49				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0010			< 0.0100	0.5	2	25
Barium *	0.0491			0.397	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.011			0.088	0.5	10	70
Copper *	0.024			0.20	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0094			0.0759	0.5	10	30
Nickel *	0.0026			0.021	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0014			0.011	4	50	200
Chloride *	29			230	800	15000	25000
Fluoride	0.62			5.0	10	150	500
Sulphate *	1500			12000	1000	20000	50000
TDS*	1200			9400	4000	60000	100000
Phenol Index (Monohydric Phenols) *	0.064			0.51	1	-	-
DOC	18.2			147	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.40						
Dry Matter (%)	93						
Moisture (%)	6.7						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
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** = MCERTS accredited

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Analytical Report Number : 21-68796
Project / Site name: Back Tumer Street, Manchester

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1837713	BH03	None Supplied	1	Brown loam and sand with gravel and brick.

Analytical Report Number : 21-68796
Project / Site name: Back Tumer Street, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-68796
Project / Site name: Back Tumer Street, Manchester

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Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

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

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

APPENDIX J
Limitations

Standard Limitations

This ground investigation was conducted and has been prepared for the sole internal use and reliance of the Client, Domis Construction Limited. This report shall not be relied upon or transferred to any other parties without the express written authorisation of BSL. If an unauthorised third party comes into possession of this report they rely on it at their risk and the authors owe them no duty of care or skill.

The findings and opinions conveyed via the desk study within this report are based on information obtained from a variety of sources as detailed within this report, which BSL believes are reliable. In addition, if information has been used from third parties and in particular other investigations and reports this information has been used in good faith. BSL cannot and does not guarantee the authenticity or reliability of third party information it has relied upon.

The investigation carried out on the site has been conducted to provide the best information and assessment on the ground conditions within site access and budgetary constraints. Exploratory holes only investigate a small area in relation to the overall site area and can therefore only provide a general indication of overall site conditions. Therefore the findings, opinions, geotechnical and environmental recommendations within this report are based on the ground conditions encountered at each location. It should be noted that different ground conditions may exist that have not been identified within this investigation.

The occurrence of and depths to groundwater may vary seasonally due to changes in weather, it should be noted that any observations and recommendations made on groundwater within this report are based on a select number of site visits over a limited period of time and may not be fully representative of groundwater conditions on the site.

Current UK guidance and legislation has been used in the geotechnical and environmental assessment of the site, BSL is not liable for any subsequent changes in the guidance and legislation.

The recommendations within this report are based upon the proposed site end use provided to BSL at the time of the investigation. If the end use or development layout changes from the proposal then the recommendations may change or become invalid.

Although every effort has been made to position exploratory holes in the least sensitive areas of the site, exploratory hole positions were located approximately as part of this investigation and no guarantee can be given as to their accuracy. Consideration should be given to the possibility that exploratory holes excavated as part of this investigation and indeed any previous ground investigation work by others may be encountered beneath or within the influence of individual foundations. BSL cannot be held responsible for structural failures caused by the location of foundations of any form of structure within the influence of exploratory holes.

No existing manhole covers were lifted or drainage runs inspected during the course of this ground investigation. The site plans enclosed in this report should not be scaled off.