

CCG-C-24-14676

**PHASE I-II GEOENVIRONMENTAL REPORT
FOR LAND OFF SANDBROOK WAY
STONEYFIELD
ROCHDALE
OL11 1LQ
JUNE 2024**

Prepared for:

NORTHERN TRUST

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DOCUMENT CONTROL FORM

Client:	Northern Trust
Project Title:	Phase I-II Geoenvironmental & Coal Mine Risk Assessment Report for land located within the curtilage of Sandbrook Business Park, Rochdale, OL11 1LQ
Reference Number:	CCG-C-24-14676
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Date:	July 2024
Revision Number:	02
Comments:	Report updated July 2024 following the completion of a gas – groundwater monitoring programme.
Status:	Final
Distribution:	Northern Trust

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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (CCG) is providing consultancy services to **NORTHERN TRUST** (the *Client*) in connection with the proposed redevelopment of land located immediately to the east of Sandbrook Way, Stoneyfield, Rochdale, OL11.

It is understood that the site is to be redeveloped for commercial use by the construction of 4nr steel framed commercial blocks (A-D) providing a combined total of 9nr self contained units with associated office space and welfare facilities, together with external hard paved off-road car parking and small areas of soft landscaping. It is proposed that each unit will be constructed in low-level dado brick walls with corrugated rain screen cladding above.

It is further understood that to prepare the area to development level, an advance preparatory earthworks contract will be undertaken, in which a “cut and fill” exercise will be undertaken to prepare the site levels to accommodate each unit and as such the blocks will be terraced. Access points will be formed at the north and south of the site, leading off Sandbrook Way.

The existing site layout is as shown on **NORTHERN TRUST** architectural drawings contained herein.

The proposed development falls within the administrative jurisdiction of **ROCHDALE METROPOLITAN BOROUGH COUNCIL**.

A combined desk study and ground investigation report was prepared, to provide environmental and geotechnical data relevant to the planning, design, and construction of the project.

The findings of these studies and investigations are discussed hereunder.

This report should be read in conjunction with the Notes on Limitations, given in Appendix O.

2.0 PURPOSE & AIMS OF THE STUDY & INVESTIGATION

The primary aim of the Phase I Desk Study was to assess whether the site is likely to be affected by contamination, to an extent that it may pose a risk to human health and/or the built environment and/or the wider natural environment or is affected by any other natural or artificial feature which may impact on the proposed development. Specific tasks undertaken to achieve this were as follows:

- A review of available information including historical mapping, commercial environmental databases, and Environment Agency Data
- The undertaking of a site walkover
- The development of a Preliminary Conceptual Model

The main purpose of the Phase II Intrusive Investigation was to confirm the conclusions of the desk study, with reference to:

- The assessment of the nature and extent of contamination in relation to potential risks to human health for end users, construction workers, and worker occupants of adjacent properties
- The assessment of the nature and extent of contamination in relation to potential risks to controlled waters
- The assessment of the nature and extent of contamination in relation to potential risks to the fabric of buildings and services
- The refinement of the Preliminary Conceptual Model confirming pollution linkages that have been demonstrated to be present
- The identification of feasible remediation measures to remove or break the identified pollution linkages
- The provision of information and interpretative comment on ground conditions in relation to foundation selection / design / construction, and the design of associated infrastructure.

3.0 SITE DATA

3.1 Site Location

The site comprises a rectangular parcel of vacant land located immediately to the east of public pavements extending along Sandbrook Way, Stoneyfield, Rochdale, OL11 1LQ, as illustrated on **CCG** Drawing No. CCG-C-24-14676-1 and Aerial Plate No. CCG-C-24-14676-2 contained herein.

The **ORDNANCE SURVEY** co-ordinates for the approximate site centre are 389618, 411995.

The appended topographical survey drawings show the northern site boundary to stand at an elevation of c. 137maOD, with the southern boundary standing at c. 131maOD.

3.2 Site Description & Walkover Observations

The site was visited in May 2024, on completion of a review of historical mapping and environmental data presented herein.

Photographs associated with the above site visit are presented in Appendix K.

It was observed that the site comprises a rectangular parcel of land which extends to the approximate dimensions of c. 123m x 61m (7500m²); its long axis being on an approximate north – south alignment. It is bound to the north and west by recently constructed commercial units, and to the west by a public pathway, beyond which lies a development of residential properties and associated private gardens fronting onto Maragold Street. Its southern boundary has an open aspect.

The surface topography was seen to fall gradually in a southerly direction from around c. 137maOD to 131.5maOD with surface cover comprising gravels set within a sandy clayey matrix, and areas of mixed unkempt perennial grasses and perennial herbs and localised pockets of bramble, with a low-lying vegetated earth bund extending along the western and northern site boundaries.

Given that the site has previously been developed, there is a potential for buried services to be present beneath the site as identified within the appended photographs.

At the time of undertaking the site walkover survey, there was no visual evidence of the presence of non-native / native invasive plant species within or adjoining the site boundary.

Vehicle / pedestrian access to the site via Sandbrook Way to the west.

The information obtained from the visit is summarised in Table 1 hereunder.

Table 1: Summary of Walkover Observations

FEATURE	OBSERVATION
Current use of proposed development Land	Vacant / derelict land
Context	commercial / residential context
Surface & Topography	The surface topography was seen to fall gradually in a southerly direction from around c. 137maOD to 131.5maOD with surface cover comprising locally gravels set within a sandy clayey matrix and mixed unkempt perennial grasses and perennial herbs and localised pockets of bramble, with a low-lying vegetated earth bund extending along the western and northern site boundaries.
Dimensions	c. 123m x 61m (5752 m ²); its long axis being on an approximate north – south alignment
Access	Vehicle / pedestrian access to the site via Sandbrook Way to the west
Buildings Adjacent to the Site	Commercial units to the N & W
Services	Given that the site was previously developed, there is a potential for remnants of buried services to be present beneath the site.
Material storage	None observed
Waste disposal	None observed
Other potential contamination	None observed

4.0 SITE HISTORY

The history of the site and its immediate surrounds was investigated by consultation with a range of archive resources. Geographical information, historical mapping and environmental data were primarily based on a GroundSure Reports (CMAPS-AAG-1164341-4165-100524) dated May 2024, as presented in Appendix L, along with accompanying historical mapping data.

Table 2: Historical Map Review

YEAR	SCALE	ON SITE	ADJACENT TO SITE	<250M
1848 1851	1:1,056 1:10,560	Undeveloped / vacant land	Undeveloped / vacant land	Much of the land surrounding the site is undeveloped / vacant land c.50m SE: Sudden Brook [flowing E > W] c.100m W: Unspecified properties delineating Ashfield Road c.120m SW: Lower Hey Mill (Cotton) c.150m SE: Rochdale Canal, with associated Towing Path c.250m NW: Railway Line [approx. SW/NE alignment]
1890-91 1891	1:10,560 1:2,500	NSC	NSC	c.120m SW: Lower Hey Mill now recognised as "Primrose Hill Mill (Disused)" c.250m NE: St. Luke's Church
1907-08 1908-09 1910	1:10,560 1:10,560 1:2,500	Footpath transects the site along its W and N borders. Much of the site comprise rectangular segments. Possible allotment gardens Unspecified small buildings located within site boundary, & immediately adjoining	W/N: Footpath	c.50m NW: Terraced residential properties delineating Ashfield Road c.100mm E: Terraced properties delineating Rumbold Street [extending to the NE] c.180m E/SE: Firewood Works c.200m N: Marble works, in close proximity to Saw Mill to the E c.230m NW: Carriage Shed, along Railway Line
1928	1:10,560	NSC	NSC	c.200m SE: Semi-detached residential properties [extending to the SE]
1930 1938 1954-56	1:2,500 1:10,560 1:10,560	NSC	NSC	c.200m N: Empress Works (Slipper) [former Saw Mill]
1956-57 1957 1957-58 1967-68	1:1,250 1:2,500 1:1,250 1:10,560	Land recognised as forming part of Allotment Gardens	Land recognised as forming part of Allotment Gardens	c.75m NE: Development of unspecified properties c.80m S: Allotment Gardens c.120m NE: Builder's Yard recognised c.130m E: Builder's Yard recognised c.140m W: Semi-detached residential properties [extending to the W]
1971-73 1975 1975-76 1976-78 1984 1987 1990 1990-92 1992 1992 1990-94 1990-94	1:1,250 1:1,250 1:10,000 1:1,250 1:1,250 1:10,000 1:1,250 1:1,250 1:10,000 1:1,250 1:1,250	Development of residential flats Electric Sub-Station located at approx. site centre Ashfield Avenue located in the N portion of the site [the only road on the site] Playground located in the S portion of the site [extending to the W]	N: Extension of Ashfield Avenue SW: Extension of residential flats / Playground	Much of the land to the immediate NE of the site is developed for residential land use (semi-detached) Much of the land to the immediate SW of the site forms an extension of residential flats c.85m S: Development of residential flats [extending to the W/SW] c.120m NE: Tank recognised c.130m W: Electric Sub-Station c.130m N: Playing Field recognised c.150m NE: Warehouses recognised c.150m S: Electric Sub-Station
2001	1:10,000	Site fully vacant; except for Ashfield Avenue	SW: Residential flats and Playground no longer recognised	c.85m S: Only the residential flats to the E are present; the others to the W/SW no longer recognised cm SW: Car Park
2003	1:1,250	Ashfield Avenue no longer recognised Footpath transects the site from N-S	N/SE/SW: Extension of Footpaths	c.70m SW: Car Parks [extending to the SW]
2010 2024	1:10,000 1:10,000	Land forms part of Business Park	Land to the SW of the site recognised as Business Park SW: Road	Land to the SW of the site recognised as Business Parks

5.0 ENVIRONMENTAL SETTING

5.1 Geology

The geology of the site was researched by reference to the 1:50000 scale **BRITISH GEOLOGICAL SURVEY (BGS)** Sheet 085 Manchester (2010 - 2011) 1: 50,000 Scale Solid and Drift Editions and Crofts. R.G. *et.al* (2012) '*Geology of the Manchester district: a brief*

explanation of the geological map Sheet 85 Manchester' British Geological Survey. Keyworth, Nottingham.

The **BGS** superficial drift mapping data indicates that the site is underlain with natural drift deposits comprising glaciofluvial deposits consisting of poorly stratified sand and gravel overlying diamictons (clay silt sand and gravel), with both geological units being of glacial origin (*Pleistocene Epoch - Late Quaternary - Devensian Sub Age*).

The solid geology is documented to generally comprise the Pennine Lower Coal Measure Formations of the Pennine Coal Measures Group comprising dark grey interbedded argillaceous mudstone, siltstones, fluvial sandstones, and productive coal measure with the Great Arc Sandstone comprising grey fine to medium grained micaceous cross – ripple bedded sandstone sub-cropping to the west of the site, of the Upper Carboniferous Period (*Silesian Stage: Westphalian C/A: Langsettian Sub Age*).

The study site is located within an area where ancient earth movements have caused significant displacements and misalignments of the underlying country rock. The general dip of the underlying country rock is not annotated on the BGS solid mapping data.

The '*Indicative Atlas of Radon in England and Wales*' (Miles. J.C.H et.al, 2007) Map 13 '*Northern Welsh Marches and Liverpool*', shows the site to be situated within an area where it is believed that less than 1% of the properties within the area are affected by Radon and therefore no Radon Protection Measures will be required for new structures in contact with the ground.

As with many brownfield sites superficial made ground deposits of an unknown composition thickness and extent associated with the development of the site and its immediate environs may underlie the site.

Geological Information obtained from the GroundSure Environmental Report is presented in Appendix L, and summarised hereunder:

Table 3: Summary of Geological Data from GroundSure Report

GEOLOGY		
Data	Distance	Comments
Artificial Ground	On Site	Artificial ground and/or reworked ground deposits associated with the development of the site & its immediate surroundings.
Superficial Deposits / Drift Geology	On Site	Diamicton overlain with glaciofluvial deposits, both of post glacial origin
Permeability of Diamicton	Maximum Permeability	High
	Minimum Permeability	Low
Permeability of Glaciofluvial deposits	Maximum Permeability	Very High
	Minimum Permeability	High
Bedrock and Solid Geology	On Site	Pennine Lower Coal Measures Formation
Permeability of Bedrock: On Site	Maximum Permeability	Moderate
	Minimum Permeability	Low
Geological Lines of Weakness	On Site	No records
	<250m	65m S. Fault
Radon Affected Area	On Site	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
Radon Protection	On Site	No radon protective measures are necessary
MINING, GROUNDWORKINGS AND NATURAL CAVITIES		
Data	Distance	Comments
BritPits	<500m	231m NW: Bookfield Gravel Pit [Sand and Gravel] – Ceased 269m W: Castleton Hall Gravel Pit [Sand and Gravel] – Ceased 385m NE: Deepish Hall Gravel Pit [Sand and Gravel] – Ceased 418m SW: Castleton Gales Sand Pit [Sand] - Ceased
Surface ground workings	<250m	1m N: Refuse Heap 58m NE: Refuse Heap 66m S: Pond 90m S: Unspecified Pit 103m E: Unspecified Ground Workings 115m S: Unspecified Pit 124m N: Unspecified Pit 126m N: Unspecified Pit 145m SE: Canal 147mm NW: Pond

		148m SE: Canal / Disused Canal 154m SE: Canal 157m W: Unspecified Ground Workings 158m W: Unspecified Pit 177m N: Unspecified Ground Workings 212m NW: Gravel Pit 233m NW: Cuttings 240m N: Unspecified Pit 241m W: Unspecified Ground Workings 242m W: Unspecified Heap 246m N: Cuttings
Underground workings	<1000m	No records
Underground mining extents	<500m	No records
Historical Mineral Planning Areas	<500m	No records
Non-coal mining	<1000m	No records
The Coal Authority non-coal mining	<500m	No records
Researched mining	<500m	No records
Mining record office plans	<500m	No records
BGS mine plans	<500m	57m SE. Coal
Coal mining	On site	The site is located within a coal mining area as defined by the Coal Authority
Brine areas	On site	No records
Gypsum areas	On site	No records
Tin mining	On site	No records
Clay mining	On site	No records
Natural cavities	<500m	No records
Mining cavities	<500m	No records
Reported recent incidents	<500m	No records
Historical incidents	<500m	No records
National karst database	<500m	No records
RAILWAY INFRASTRUCTURE AND PROJECTS		
Data	Distance	Comments
Underground railways (Non-London)	<250m	No records
Railway tunnels	<250m	No records
Historical railway and tunnel features	<250m	On Site: Railway Sidings [1892] 196m NW: Railway Sidings [1928] 198-99m NW: Railway Sidings [1908-68] 207m NW: Railway Sidings [1957] 214m N: Railway Sidings [1891-1938] 215-16m NW: Railway Sidings [1910-38] 222m NW: Railway Sidings [1957] 233m W: Railway Sidings [1908] 237m W: Railway Sidings [1910-30] 238m NW: Railway Sidings [19973] 241-43m NW: Railway Sidings [1910-57]
Royal Mail tunnels	<250m	No records
Historical railways	<250m	No records
Railways	<250m	232m NW: Caldervale Line. Type: Rail 233-34m NW: Name not given. Type: Multi-Track 237m NW: Caldervale Line. Type: Rail
Crossrail 1	<250m	No records
Crossrail 2	<250m	No records
HS2	<250m	No records
HAZARDS		
Data	Distance	Comments
Maximum shrink swell clays	On site	Negligible > Very Low
Maximum running sands	On site	Very Low > Low
Maximum compressible deposits	On site	Negligible > Moderate
Maximum collapsible deposits	On site	Negligible > Very Low
Maximum landslides	On site	Very Low
Maximum ground dissolution of soluble rocks	On site	Negligible

5.2 Historical Coal Mining

The appended environmental data, **BGS** mapping data **COAL AUTHORITY GAZETTEER** confirm that application site falls within a **COAL AUTHORITY** defined Development High Risk Area and consequently may underlain by productive coal measures which may have been worked in the past and therefore a **COAL AUTHORITY** mining report was procured (Report Reference No. 51002152148001, dated July 2019: Report presented within Appendix M), and summarised hereunder:

5.3 Coal Mine Risk Assessment

Since the site is located in an area underlain by productive coal measures, a Coal Mine Risk Assessment (CMRA) was required to assess if the site is at risk of surface instability or other risk factors arising from shallow historical coal mining activities.

This CMRA was required to demonstrate to **ROCHDALE METROPOLITAN BOROUGH COUNCIL** that coal mining information has been considered by the applicant, and that any issues of potential surface instability have been identified and, if warranted by the assessment, have been considered in the scope of any intrusive site investigation carried out as part of the assessment.

Coal mining may present hazards to proposed development in a number of ways. Such hazards may currently exist or may be caused as a result of the construction of the proposed development, or could occur at some time in the future, and may include:

- Collapse of shallow historical coal workings
- Collapse of or risk of entry into historical shafts or adits
- Gas emissions from historical coal mines including methane and/or carbon dioxide
- Spontaneous combustion or ignition of coal which may lead to underground heating and production of CO₂
- Transmission of gases to adjacent properties
- Coal mining subsidence
- Water emissions from historical coal mine workings

In assessing mining related risks at this site, the following sources of information were consulted:

- 1:50000 scale **BRITISH GEOLOGICAL SURVEY (BGS)** Sheet 085 Manchester (2010 - 2011) 1: 50,000 Scale Solid and Drift Editions
- Crofts. R.G. *et.al* (2012) '*Geology of the Manchester district: a brief explanation of the geological map Sheet 85 Manchester*' British Geological Survey. Keyworth, Nottingham.
- **COAL AUTHORITY** Interactive Mine Entry Viewer (<http://coal.decc.gov.uk/en/coal/cms/publications/data/map/mapaspx>) (Accessed: May 2024)
- Healy. P.R. *et.al.* (1984) '*Construction over Abandoned Mine Workings*'. CIRA Special Publication 32 – PSA Civil Engineering Technical Guide 34. London
- Parry. D.N. *et.al* (2019) 'Abandoned Mine Working Manual' Ciria. London
- **COAL AUTHORITY** Consultants Mining Report (Reference No. 51002152148001, dated July 2019), Presented in Appendix M)
- **BGS** Solid Drift interactive mapping (<https://www.bgs.ac.uk/technologies/web-map-services-wms/web-map-services-geology-50k/>) (Accessed June 2024)

5.3 Summary of the Documented Geology & Historical Mining

5.3.1 Solid & Drift Geology

The geology of the site was researched by reference to the **BGS** 1:50000 scale Sheet 085 Manchester (2010 - 2011) 1: 50,000 Scale Solid and Drift Editions and Crofts. R.G. *et.al* (2012) '*Geology of the Manchester district: a brief explanation of the geological map Sheet 85 Manchester*' British Geological Survey. Keyworth, Nottingham.

The **BGS** superficial drift mapping data indicates that the site is underlain with natural drift deposits comprising glaciofluvial deposits consisting of poorly stratified sands and gravel of overlying diamictons (clay silt sand and gravel), with both geological units being of glacial origin (*Pleistocene Epoch - Late Quaternary - Devensian Sub Age*).

The solid geology is documented to generally comprise the Pennine Lower Coal Measure Formations of the Pennine Coal Measures Group comprising dark grey interbedded argillaceous mudstone, siltstones, fluvial sandstones, and productive coal measure with the Great Arc Sandstone comprising grey fine to medium grained micaceous cross – ripple bedded sandstone sub-cropping to the west of the site, of the Upper Carboniferous Period (*Silesian Stage: Westphalian C/A: Langsettian Sub Age*).

The study site is located within an area where ancient earth movements have caused significant displacements and misalignments of the underlying country rock. Notwithstanding this, the general dip of the underlying country rock is not annotated on the **BGS** solid mapping data.

Notwithstanding the above, the general dip of the underlying solid geology is not documented on the **BGS** solid mapping data.

As with many brownfield sites superficial made ground deposits of an unknown composition thickness and extent associated with the development of the site and its immediate environs may underlie the site.

5.4.2 Geological Lines of Weakness – Faults, Marine Bands, Coal Seams

The nearest geological line of weakness is documented to comprise a geological fault line (inferred) which extending on a northwest – southeast alignment, lies c. 65m south of the study site. Its downthrow is documented to be in a northeasterly direction.

As illustrated on the appended drawings (**CCG** Drawing No's, CCG-C-24-14676--4 to 6), the documented geological liner features within the surrounding area (<500m) include:

1. Geological fault (inferred) trending on a northwest – southeast alignment c. 84m southwest of the site boundary
2. Geological fault (inferred) trending on an northeast – southwest alignment c. 377m northwest of the site
3. Arley Coal trending on a northwest – southeast alignment sub cropping c. 330m northeast of the site

5.4.3 Historical Underground Coal Mining Activities & Geology

- o There are no records relating to the undertaking of any coal mining activities beneath the site
- o There are no records relating to the presence of potential shallow (<30m) coal mining beneath the site
- o There are no records relating to the presence of spine roadways at shallow depth (<30m) beneath the site
- o There are no records relating to the presence of any mine entries, within, or within 100m of, the site
- o There are no records relating to presence of any geological faults, fissures, and/or break lines within, or within 50m of the site
- o There are no records relating to the presence of open cast mining within, or within 500m of, the site from which coal has been removed by opencast methods
- o There are no records relating to the presence of any **COAL AUTHORITY** managed tips within, or within 500m of, the site

5.4.4 Investigative &/or Remedial Activities

- o There are no records relating to any documented site investigation within, or within 50m of, the site
- o has received information relating to coal mining risk investigation and/or remediation by third parties.
- o There are no records relating to any remedial works have been undertaken by the **COAL AUTHORITY** within, or within 50m of, the site
- o The **COAL AUTHORITY** has not received a damage notice or claim for the site, or any property within 50m since 31st October 1994
- o There is no record of a mine gas emission requiring action by the **COAL AUTHORITY** within, or within 500m of, the boundary of the site.
- o There are no records pertaining to the treatment of mine water schemes within 500m of the site boundary

5.4.5 SUMMARY RISK

By reference to the information sources listed above a risk assessment was constructed as tabulated in Table 4 hereunder:

Table 4: Summary of Coal Mining Information

Potential Hazards	Source	Comments
Is the site within a Coal Mining Referral Area?	Rochdale District (B) Coal Mining Development Referral Area 1:50000@A1 Rochdale District (B) Specific Coal	Mapping indicates a strong probability that the site lies over an area of coal mining as defined on the Rochdale District (B) Plan of Coal Mining Development Referral Area, & Rochdale District (B) Specific Coal Mining Risk Plan

	Mining Risk Plan 1:50000@A1	
Is the site within a Surface Mining Resource Area?	Rochdale District (B) Surface Coal Resources Plan 1:50000@A1	Mapping indicates that the site is not within an area of surface mining resources as defined on the Rochdale District (B) Surface Mining Coal Resource Area
Is the site within the likely zone of influence of present underground coal mining?	COAL AUTHORITY Consultant Coal Mining Report (Ref' No. 51002152148001	Report indicates that the property is not within the likely zone of influence of any present underground coal workings
Is the site within the likely zone of influence of past underground coal mining?	COAL AUTHORITY Consultant Coal Mining Report (Ref' No. 51002152148001	Report indicates that the property is in the likely zone of influence at the surface arising from historical underground workings
Is there a possibility of unrecorded shallow mine workings and/or mine entries?	COAL AUTHORITY Consultant Coal Mining Report (Ref' No. 51002152148001 BGS mapping Sheet 085: Manchester COAL AUTHORITY Interactive Mine Entry Viewer	The site is not located within an area where it is believed that coal has been extracted at shallow depth (<30m) There are no documented mine entries within, or within 100m of, the study site
Is there a record of mine gas emissions within the site boundary?	COAL AUTHORITY Consultant Coal Mining Report (Ref' No. 51002152148001	Report indicates that there are no records of the property ever having been affected by mine gas emissions
Is the proposed development in an area for which the COAL AUTHORITY is determining or has granted a license to remove coal by underground methods?	COAL AUTHORITY Consultant Coal Mining Report (Ref' No. 51002152148001	Report indicates that the property is not in an area for which a licence has been granted to remove coal by underground methods
Are there any known faults or other lines of weakness due to coal mining at the site?	BGS mapping Sheet 085: Manchester	There are no records pertaining to a geological fault within and/or adjoining the site area
Has the site been subject to any remedial works by or on behalf of the COAL AUTHORITY under its surface hazard call out procedures?	COAL AUTHORITY Consultant Coal Mining Report (Ref' No. 51002152148001	Report indicates that the site has not been subject to remedial works by or on behalf of the Authority under its Emergency Surface Hazard Call Out procedures

5.4.6 **COAL MINE RISK ASSESSMENT CONCLUSIONS**

Taking account of the prevailing geology, and the Coal Authority mining records for this area, it is concluded that there is no evidence of a potential risk of mining related surface instability at this site and an intrusive investigation for mining related voids is not required.

5.5 **Hydrology and Hydrogeology**

Information on hydrology and hydrogeology obtained from a GroundSure Environmental Report is presented in Appendix L, and summarised hereunder:

Table 5: Summary of GroundSure Environmental Report

HYDROGEOLOGY AND HYDROLOGY		
Aquifer within Superficial Drift Deposits (Diamicton)	On site	Diamicton: 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
Aquifer within Superficial Drift Deposits (Glaciofluvial Deposits)	On-site	Glaciofluvial Deposits: 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
Aquifer within Bedrock Deposits	On site	Pennine Lower Coal Measures Formation- 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
Groundwater Abstraction Licenses	<1000m	No records
Surface Water Abstraction Licenses	<1000m	410m E: Sealocrete PLA Ltd. Licence No: 2569002107 - Historical 560m E: Dunphy Combustion Ltd. Licence No: 2569002178 - Historical 720m NE: J & J Makin Convertors Ltd. Licence No: 2569002076 - Historical
Potable Water Abstraction Licences	<1000m	No records
Source Protection Zones	<500m	No records
Source Protection Zones (confined aquifer)	<500m	No records

Water Network (OS Mastermap)	<250m	14m S: Inland river not influenced by normal tidal action 29m SE: Inland river not influenced by normal tidal action 15m SE: Inland river not influenced by normal tidal action
Surface water features	<250m	3nr within 250m of study site
WFD Surface water body catchments	On Site	On Site: River. Water body catchment: Roch (Spodden to Irwell). Operational catchment: Roch Irk Medlock
WFD Surface water bodies	<250m	15m S: River [Roch (Spodden to Irwell)]. Overall rating: Moderate [2019] 153m SE: Canal [Rochdale Canal, western section]. Overall rating: Moderate [2019]
WFD Groundwater bodies	<250m	On Site: Northern Manchester Carboniferous Aquifers. Overall rating: Poor [2019]
FLOODING		
Risk of Flooding from Rivers and Sea (RoFRaS)	<50m	On Site: Medium 0-50m: High
Historical Flood Events	<250m	No records
Flood Defences	<250m	No records
Areas Benefitting from Flood Defences	<250m	No records
Flood Storage Areas	<250m	No records
Flood Zone 2	<50m	On Site: Zone 2 (Fluvial / Tidal Models)
Flood Zone 3	<50m	22m SE: Zone 3 (Fluvial Models)
Surface water flooding: Highest risk	On Site	Negligible
	<50m	1 in 30 years, Greater than 1.0m
Groundwater flooding: Highest risk	On Site	Moderate
	<50m	Moderate

For simplified interpretation, the geological succession underlying the site may be regarded as a series of discrete units in terms of their hydrogeological significance, as illustrated hereunder:

Table 6: Hydrogeological Interpretation

UNIT	PROPERTIES	HYDROGEOLOGICAL DESIGNATION
Made / Reworked Ground	If present, likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.	Unproductive Aquifer
Diamicton	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	Secondary Undifferentiated
Glaciofluvial Deposits:	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	Secondary A:
Pennine Lower Coal Measures Formation	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	Secondary A:

6.0 FURTHER ENVIRONMENTAL DATA

Environmental data was researched using several sources including Environment Agency Maps and GroundSure Envirosight Report presented in Appendix L and is summarised in Table 7 hereunder.

Table 7: Further Environmental Data

POTENTIALLY CONTAMINATIVE USES IDENTIFIED FROM 1:10,000 SCALE MAPPING		
Data	Distance	Comments
Historical industrial land uses	<250m	58m NE: Refuse Heap [1928-49] 71m NE: Shed [1851] 90m S: Unspecified Pit [1949] 103m E: Unspecified Ground Workings [1949-87] 105-06m S: Cotton Mill / Unspecified Disused Mill [1851-91] 115m S: Unspecified Pit [1992] 124m N: Unspecified Pit [1949] 125m NE: Shed [1851] 126m N: Unspecified Pit [1928-38] 144m N: Unspecified Works [1975-92] 148m SE: Disused Canal [1975-92] 157m W: Unspecified Ground Workings [1928] 158m W: Unspecified Pit [1949] 177m N: Unspecified Ground Workings [1949] 181m N: Unspecified Works [1938] 185m N: Unspecified Mill [1908-28] 196m NW: Railway Sidings [1928] 198-99m NW: Railway Sidings [1908-76] 204m NW: Carriage Shed [1949] 204m N: Marble Works [1949] 207-08m NW: Carriage Shed [1908-38] 210m N: Marble Works [1908-38]

		212m NW: Gravel Pit [1851] 214m N: Railway Sidings [1891-1938] 215m NW: Railway Sidings [1928-38] 219-20m NW: Railway Building [1908-38] 220m N: Engineering Works [1949] 226m N: Engineering Works [1928-38] 227m N: Unspecified Works [1908] 231m N: Unspecified Commercial / Industrial [1968-92] 233m NW: Cuttings [1851] 233m W: Railway Sidings [1908] 240m N: Unspecified pit [1968] 241m W: Unspecified Ground Workings [1968] 242m W: Unspecified Heap [1949] 246m N: Cuttings [1968] 248m N: Iron Works [1891]
Historical tanks	<250m	121m NE: Unspecified Tank [1971]
Historical energy features	<250m	On Site: Electric Sub-Station [1972-90] 135m W: Electric Sub-Station [1972-96] 148-49m S: Electric Sub-Station [1972-90] 224m N: Electric Sub-Station [1971-96]
Historical petrol stations	<250m	No records
Historical garages	<250m	207m NW: Carriage Shed [1957] 209m NW: Carriage Shed [1910-30] 219m NW: Carriage Shed [1910-30]
Historical military land	<250m	No records
Records of Current Industrial Land Use		
Data	Distance	Comments
Recent industrial land uses	<250m	On Site: Business Park [Business Parks and Industrial Estates] 42m NW: Electric Sub-Station [Electrical Features] 132m NE: IK Recovery [Scrap Metal Merchants] 148m W: Electric Sub-Station [Electrical Features] 224m N: Works [Unspecified Works or Factories]
Current or recent petrol stations	<250m	No records
Electricity cables	<250m	No records
Gas pipelines	<250m	No records
Sites determined as Contaminated Land	<250m	No records
Control of Major Accident Hazards (COMAH)	<250m	No records
Regulated explosive sites	<250m	No records
Hazardous substance storage/usage	<250m	No records
Historical licensed industrial activities (IPC)	<250m	No records
Licensed industrial activities (Part A(1))	<250m	No records
Licensed pollutant release (Part A(2)/B)	<250m	No records
Radioactive Substance Authorisations	<250m	No records
Licensed Discharges to controlled waters	<250m	No records
Pollutant release to surface waters (Red list)	<250m	No records
Pollutant release to public sewer	<250m	No records
List 1 Dangerous Substances	<250m	No records
List 2 Dangerous Substances	<250m	No records
Pollution Incidents (EA/NRW)	<250m	149m S: 5/8/2003. ID: 179424. Pollutant: Not Identified
Pollution inventory substances	<250m	No records
Pollution inventory waste transfers	<250m	No records
Pollution inventory radioactive waste	<250m	No records
WASTE AND LANDFILL		
Data	Distance	Comments
Active or recent landfill	<250m	On Site: Wimpey Construction (UK) Limited. Landfill Type: Landfill taking Non-Biodegradable Wastes
Historical landfill (BGS records)	<250m	No records
Historical landfill (LA/mapping records)	<250m	No records
Historical landfill (EA/NRW records)	<250m	No records
Historical waste sites	<250m	No records
Licensed waste sites	<250m	No records
Waste exemptions	<250m	No records
ENVIRONMENTAL DESIGNATIONS		
Data	Distance	Comments
Sites of Special Scientific Interest (SSSI)	<500m	147m SE: Rochdale Canal [Natural England] 174m S: Rochdale Canal [Natural England] 431m SW: Rochdale Canal [Natural England]
Conserved wetland sites (Ramsar sites)	<500m	None
Special Areas of Conservation (SAC)	<500m	147m SE: Rochdale Canal [Natural England] 174m S: Rochdale Canal [Natural England] 431m SW: Rochdale Canal [Natural England]
Special Protection Areas (SPA)	<500m	None

National Nature Reserves (NNR)	<500m	None
Local Nature Reserves (LNR)	<500m	None
Designated Ancient Woodland	<500m	None
Biosphere Reserves	<500m	None
Forest Parks	<500m	None
Marine Conservation Zones	<500m	None
Green Belt	<500m	None
Proposed Ramsar sites	<500m	None
Possible Special Areas of Conservation (PSAC)	<500m	None
Potential Special Protection Areas (pSPA)	<500m	None
Nitrate Sensitive Areas	<500m	None
Nitrate Vulnerable Zones	<500m	None

7.0 ARCHAEOLOGICAL DATA

Examination of historical maps indicates no features of significant archaeological interest in the general vicinity of the site.

8.0 PREVIOUS SITE INVESTIGATIONS / REPORTS

Searches and consultations have not established evidence of previous ground investigation works having been undertaken on this site.

9.0 PRELIMINARY QUALITATIVE RISK ASSESSMENT (TIER 1)

9.1 Introduction

The risk assessment methodologies adopted by **CCG** are based on current available guidance from several sources and are included in Appendix N.

The Tier 1 Risk Assessment and Preliminary Conceptual Model (PCM) were formulated using the information discussed above and based on the following assumptions:

- It is understood that the site is to be redeveloped for commercial use by the construction of 4nr steel framed commercial blocks (A-D) providing a combined total of 9nr self contained units with associated ancillary office space and welfare facilities together with associated hard paved off road car parking bays and small areas of soft landscaping. It is proposed that each unit will be constructed of low-level dado brick walls with corrugated rain screen cladding above.

It is further understood that to prepare the area to development level, an advance preparatory earthworks contract will be undertaken, in which a "cut and 'fill' exercise will be undertaken to prepare the site levels to accommodate each unit and as such the blocks will be terraced with access points at the north and south of the site, leading off Sandbrook Way. The existing and proposed site layout is as shown on **NORTHERN TRUST** architectural drawings contained herein.

- Drinking water will be from a mains supply.

In constructing the Preliminary Conceptual Model (PCM), **CCG** applied the guidance contained in CIRIA C552: 2001. This recommends use of a Risk Matrix which classifies risk based on the product of Probability of a source being present, and the Consequence of receptors being exposed to the source. Guidance tables setting out the classifications of probability and consequence together with a risk matrix are given in Tables 8-10 hereunder. In using this approach **CCG** generally recommends actual intrusive investigation of any Risk Classification of "Moderate" or over. In the case of residential housing, risk ratings of 'Low' may also warrant investigation.

Table 8: Matrix of consequences against probability to gain a risk classification [CIRIA C552, 2001]

		CONSEQUENCE			
		SEVERE	MEDIUM	MILD	MINOR
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

9.2 Preliminary Conceptual Model

By application of the risk assessment methodology outlined above, the following PCM was constructed. There is very little evidence obtained from the desk study and site inspections of a likely significant risk of contamination being present on the site. The development of adjoining land to the southeast may have resulted in the deposition of some deleterious matter at the boundary of the site, although none was evident from site inspection. On the basis of the absence of specific indicators, a precautionary approach to development of a Preliminary Conceptual Model was adopted as summarised in the table hereunder:

Table 9: Preliminary Conceptual Model (PCM)

POLLUTANT LINKAGE	SOURCE	PATHWAY	RECEPTOR	PROBABILITY	CONSEQUENCE	RISK RATING
1	Broad spectrum of heavy metals, aggressive pH, hydrocarbons, PAH's in superficial soils associated with historical developments & demolition works etc.	Soil and / or soil dust ingestion	Construction workers Future worker occupants Offsite receptors Flora	Likely	Medium	Moderate
2	Asbestos containing materials (ACM) in superficial soils associated with historical developments & demolition works etc.	Fibre Inhalation	Construction workers Future worker occupants Offsite receptors	Likely	Severe (ACM)	High
3	Inhalation of ground gases from onsite or offsite sources i.e., made ground soils associated with historical developments & demolition works etc.	Inhalation	Future residents	Low	Medium	Moderate
4	pH & Sulphate attack on concrete	Future building	Future building	Likely	Mild	Moderate / Low
5	Organic contamination in superficial soils associated with historical on-site parking facilities etc.	Direct contact with water mains	Potable water supply	Unlikely	Medium	Moderate

The contaminants of concern associated with those risks which require intrusive investigation were researched by reference to published industry profiles, and are summarised on Table 9 hereunder:

Table 10: Summary of Contaminants of Concern based on PCM

LINKAGE NO.	METALS	NON-METALS	ORGANICS	GASES	OTHERS
PL1, PL2, PL4, PL5	Cd, Cr (total & hexavalent), Ni, Cu, Zn, Pb, Hg, Se, Mo, Sb	As, sulphates, sulphides, boron, free cyanide	TPHCWG, PAH's, BTEX, Volatiles (by PID), SOM	-	pH Asbestos
PL3	-	-	-	CH ₄ , CO ₂ , CO, H ₂ S	-
PL1-PL5	Cd, Cr, Ni, Cu, Pb, Hg, Se, Zn	As, sulphates	TPHCWG, BTEX PAH's, Volatiles (by PID), SOM	CH ₄ , CO ₂ , CO, H ₂ S	pH Asbestos

9.3 Summary of Risks

The foregoing analysis identified several potential risks, and if present, these could adversely impact on human or environmental receptors. Since no previous site investigation has been undertaken, an intrusive phase of investigation was undertaken to determine whether the postulated pollutant linkages are present on site.

10.0 SCOPE OF PHASE II INTRUSIVE INVESTIGATION

Based on the findings of the Phase I desk study and taking account of the potential presence of pollution linkages an intrusive investigation was undertaken. The Phase II Intrusive Investigation provided for exploratory boreholes to be excavated through made ground into the underlying natural strata to allow for sampling of soils and groundwater if present.

The primary objectives of the investigation were to obtain enough soil and groundwater contamination data to reliably assess risks to human and environmental receptors, and to provide engineering parameters on which suitable foundation solutions could be

selected.

11.0 FIELDWORK

11.1 Introduction

A programme of fieldwork investigation was undertaken in June 2024. The combined programme works comprised:

- The manual excavation and CAT scanning of 6nr borehole starter extending from GL-1.2mbgl
- The subsampling of borehole arisings for soil contamination analyses
- The advancement of each borehole starter pit using light dynamic sampling methods with associated *in-situ* testing to a termination depth of 5mbgl
- The subsampling of borehole arisings for soil classification testing
- The advancement of 1nr borehole WS06) from the base using dynamic probe tests methods to a notional depth of 10mbgl in accordance with BS 1377: Part 9: Clause 3.2
- The installation of 50mm HDPE plain and slotted well-tube complete with non-lime pea gravel surround and bentonite seals together with associated headworks at 3nr borehole positions
- The instigation of a gas – groundwater monitoring programme comprising 4nr rounds over a 1-month period
- The mechanical excavation, logging and photographing 3nr trial pit excavations using a tracked 360° excavator with associated 600mm buckets to a maximum termination depth of 2.2mbgl.
- The subsampling of trial pit arisings for soil contamination analyses and classification testing
- The undertaking of soil permeability tests in accordance with BRE Digest at each trial pit location
- The reinstatement of trial pit excavations to GL using extracted soil arisings
- The undertaking of dynamic probe tests alongside 1nr trial pit location (TP02) to a notional depth of 10mbgl in accordance with BS 1377: Part 9: Clause 3.2

The fieldwork was planned in accordance with BS10175: 2011 and carried out in accordance with BS10175: 2011 and BS5930: 2015, and the sampling and monitoring methodologies employed by **CCG** as presented in Appendix B, as far as they related to the scope of the investigation.

The layout of the proposed investigation is as annotated on **CCG** Drawing No. CCG-C-24-14676-3 '*Site Investigation Plan*' contained herein.

11.2 Borehole Drilling & Monitoring Installations

11.2.1 Light Dynamic Sampling Boreholes

In accordance with the ground investigation plan, 6nr boreholes were sunk using light dynamic sampling methods deploying 100mm diameter casings and tools

The boreholes were positioned clear of overhead services and were scanned for buried services using a CAT cable avoidance scanner before and during hand excavation of 1.2m deep borehole starter pits.

Boring tools were decontaminated prior to commencement of fieldworks.

In this method of investigation samples of subsoils are recovered by driving and extracting a series of reducing diameter 1m long steel tubes. Standard penetration test's (SPT's) were undertaken at regular depth increments with hand shear vane (HSV) tests being undertaken in cohesive strata. This method of sampling recovers relatively "*undisturbed*" soil profiles in Perspex tubes, which are used to line the steel tubes. The Perspex tubes were split and carefully logged and subsampled. Subsamples for potential chemical analysis were removed at appropriate positions from the profile and transferred to chilled amber glass jars and vials for laboratory analysis.

The logs of the light dynamic sampling boreholes, annotated with sampling details, SPT 'N' / HSV 'Cu(kN/m² values and details of

standpipe construction is presented in Appendix C.

The results of the above-mentioned dynamic probe tests, annotated with 'Equivalent SPT 'N' values presented alongside its corresponding borehole log contained within Appendix C.

11.2.3 Monitoring Installations

Standpipes comprising 50mm diameter HDPE plain and slotted well-tube set in bentonite and non-limestone pea gravel surround were installed at 3nr borehole positions. Each standpipe was fitted with a gas valve connector and was protected by a flush cover set in concrete.

Details of standpipe installations are provided on the relevant borehole logs in Appendix D and summarised in the tabulation hereunder:

Table 11: Borehole Installation Details

BOREHOLE	DEPTH OF BOREHOLE (mbgl)	DEPTH OF STANDPIPE [mbgl]	RESPONSE ZONE	
			FROM [mbgl]	TO [mbgl]
WS01	5.0m	5.0m	0.5m	5.0m
WS02	5.0m	5.0m	0.5m	5.0m
WS06	5.0m	5.0m	0.5m	5.0m

The standpipe installations were periodically monitored for flow rate and composition of ground gas using a Geotechnical Instruments GA infra-red analyser. The installations were also monitored for standing water levels with an electronic dip meter.

The results of the gas and groundwater monitoring, together with calibration certificates of the monitoring instruments are given in Appendix F.

11.2.4 Trial Pit Excavations

3nr trial pits were excavated, logged, sampled, and photographed at locations as annotated on **CCG** Drawing No. CCG-C-24-14665-3 contained herein. with each trial pit location being utilised for the determination of Soil Infiltration Rates in accordance with 'BRE Digest 365'.

Each trial pit location was mechanically excavated using a tracked 360° excavator with associated 600mm excavation buckets.

Each trial pit location was positioned clear of known buried and overhead services and was CAT scanned before and during excavation works.

Materials were excavated in thin layers and all arisings placed adjacent to the excavation with the stratigraphy at each position being carefully logged and photographed.

Bulk disturbed samples, small-disturbed jar samples and vials were recovered at regular incremental depths and changes in stratum within each trial pit.

On completion of excavation works each trial pit was charged with water and the initial depth to the surface of the water was recorded. Further readings of depth to water were recorded at regular time intervals in accordance with *BRE Digest 365*. The water levels at each trial pit failed to drop measurably (<300mm) over a 4-hour test period and hence it was concluded that soakaways at these locations are not a practical proposition and therefore alternative forms of attenuation will be required. Furthermore, the depth of made ground over the site is consistently in excess of 2.5m, thus precluding the formation of soakaways as required by the guidance contained in *BRE Digest 365*.

The ground alongside 1nr trial pit location (TP02) was probed using dynamic probe super heavy (DP3SH) tests methods in accordance with BS 1377: Part 9: Clause 3.2.

The trial pit logs annotated with sampling details are given in Appendix D

The results of the above-mentioned dynamic probe tests, annotated with 'Equivalent SPT 'N' values are contained alongside its

corresponding trial pit log contained within Appendix D.

Trial pit photographs are provided in Appendix E.

12.0 OBSERVED GROUND CONDITIONS

The stratigraphy of the boreholes / trial pits was not consistent with the documented geology.

Table 12: Observed Stratigraphy

Location	STRATIGRAPHY
WS01	Grassed topsoil overlying deep made ground deposits comprising firm dark brown clay deposits extending to 3.1mbgl, locally interbedded with a thin silty sand horizon, overlying medium dense dark brown very gravelly sands, proven to 5mbgl. Base of made ground deposits not proven. Borehole reported to be dry on completion
WS02	Grassed topsoil overlying deep made ground deposits comprising medium dense clayey sands and gravel to 1.4mbgl, underlain with firm reworked clay deposits to 2mbgl, underlain with medium dense dark brown clayey gravelly sands to 2.45mbgl then firm dark brown clay to 3.1mbgl. The sequence thereafter continues in natural drift deposits comprising loose becoming medium dense brown gravelly sands proven to 5mbgl. Borehole reported to be dry on completion
WS03a	Grassed topsoil overlying made ground deposits comprising dark brown sands and gravel extending to 0.7mbgl. Unable to progress borehole due to buried obstructions
WS03b	Grassed topsoil overlying made ground deposits comprising firm dark brown clay deposits extending to 0.9mbgl. Unable to progress borehole due to buried obstructions
WS03c	Grassed topsoil overlying made ground deposits comprising dark brown clayey sands and gravel extending to 1.1mbgl. Unable to progress borehole due to buried obstructions
WS04	Grassed topsoil overlying deep made ground deposits comprising medium dense locally becoming loose dark brown gravelly sand to 5mbgl. Base of made ground deposits not proven. Water ingress reported from around 1.5mbgl
WS05	Grassed topsoil overlying deep made ground deposits comprising medium dense becoming loose dark brown gravelly sand to 2.6mbgl. The sequence thereafter continues in natural drift deposits comprising loose dark brown varying to brown silty fine and medium grained sands to 4.7mbgl, then firm brown boulder clay, thereafter, proven to 5mbgl. Groundwater ingress reported at around 2.1mbgl
WS06	Deep made ground deposits comprising medium dense varying to very loose dark brown very clayey gravelly sand extending to 3.2mbgl. Thereafter the sequence continues in natural drift deposits comprising very loose black / dark brown pseudo-fibrous peat deposits to 4.5mbgl, then very soft grey clay to 4.85mbgl overlying dark brown silty sand, proven to 5mbgl. Water ingress reported from around 3.5mbgl
TP01	Grassed topsoil overlying made ground deposits comprising black / grey reworked clay deposits extending to 1.8mbgl, overlying brown / grey silty gravelly sand, proven to 2.2mbgl. Base of made ground deposits not proven Trial pit reported to be dry on completion
TP02	Made ground deposits comprising brown very gravelly sandy clay to 0.7mbgl, overlying brown silty gravelly sands, proven to 1.7mbgl. Trial pit reported to be dry on completion
TP03	Grassed topsoil overlying made ground deposits comprising grey / black gravelly sandy clay with occasional fragments of wood to 1.5mbgl, underlain with black / grey very silty gravelly sand, proven to 2.2mbgl. Base of made ground deposits not proven Slight ingress recorded at c. 1.5mbgl

12.2 Groundwater Regime

Groundwater ingress recorded within positions located towards the southern section of the site with monitored standing water levels being in the order of 0.9m > 3.88bgl during the initial rounds of gas – groundwater monitoring.

13.0 CONTAMINATION TESTING

13.1 Soil – Groundwater Contamination Analyses

A programme of soil chemical analyses was undertaken at a **UKAS / MCERTS** accredited laboratory:

- 6nr subsamples of made ground were analysed to a broad-spectrum suite of contaminants including metals, non-metals, heavy metals, speciated PAH's, BTEX and MBTE compounds,
- 6nr subsamples of made ground soil were analysed for hydrocarbons to the TPHCWG methodology.
- 8nr subsamples of made ground soils were screened for asbestos containing materials (ACM's)
- 2nr subsamples of made ground soils were analysed for semi-volatile organic compounds
- 2nr subsamples of made ground soils were analysed for volatile organic compounds
- Determination of 2nr subsamples of organic soils (peat) recovered at 3.2m – 4.2mbgl from borehole WS06
- Quantification testing was undertaken on 4nr positive asbestos detections

- Groundwater recovered from 1nr borehole position (WS06) was analysed to a broad-spectrum suite of contaminants including metals, non-metals, heavy metals, and speciated PAH's,
- Groundwater recovered from 1nr borehole position was analysed for hydrocarbons to the TPHCWG methodology.

The soil / groundwater contamination test results and certificates are presented in Appendix G.

13.2 Soil Classification Testing

The following programme of soil geotechnical testing was undertaken at the **UKAS** laboratory of **CCG**.

- Determination of soil moisture content in accordance with BS: 1377: Part 2: 1990
- Determination of Atterberg Limits in accordance with BS: 1377: Part 2: 1990
- Determination of Particle Size Distribution using wet sieving methods in accordance with BS 1377: Part 2: 1990
- Determination of soil pH and water-soluble sulphate content

The soil engineering test results are presented in Appendix I, with soil pH and water-soluble sulphate content results being presented within Appendix H.

14.0 RISK ASSESSMENT FOR THE PROTECTION OF HUMAN HEALTH

14.1 Generic Quantitative Risk Assessment (Tier 2 / GQRA)

An assessment of the soil analysis data was carried out in accordance with the guidance presented in CLR11 and in accordance with current guidance and legislation.

The Human Health Risk Assessment was carried out in accordance with the **CCG** methodology for assessing soil contamination data as contained in Appendix M, and since it is proposed that the site be retained for continued commercial land use with small areas of proposed landscaping the assessment was based on criteria contained in publication LQM/CIEH S4UL's for Human Health Risk Assessment (2015) (**CCG** licence S4UL3233), applicable to "*Commercial Land*" use scenario. This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.

14.2 Assessment of Contamination Data

Based on a Soil Organic Matter content of 2.5%, the assessment of the soil data is summarised in the tabulations hereunder, and presented on the worksheets in Appendix H.

14.2.1 Assessment of Metal Data

The assessment of the metal data is presented hereunder:

Table 13: Assessment of Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Cadmium	190	0.4	-	-
Chromium	8600	18	-	-
Copper	68000	38	-	-
Lead	2300	110	-	-
Mercury	980	<0.3	-	-
Nickel	980	19	-	-
Zinc	730000	99	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.2 Assessment of Non-Metal Data

The assessment of the non-metal data is presented hereunder:

Table 14: Assessment of Non-Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Arsenic	640	10	-	-
Selenium	12000	<1.0	-	-
Total Cyanide	120	<1.0	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.3 Assessment of Polycyclic Aromatic Hydrocarbon [PAH's] Data

The assessment of the Polycyclic Aromatic Hydrocarbon (PAH's) data is presented hereunder:

Table 15: Assessment of PAH Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Naphthalene	460	2.0	-	-
Acenaphthylene	97000	0.12	-	-
Acenaphthene	97000	2.5	-	-
Fluorene	68000	1.9	-	-
Phenanthrene	22000	12.0	-	-
Anthracene	540000	3.2	-	-
Fluoranthene	23000	14.0	-	-
Pyrene	54000	12.0	-	-
Benz(a)anthracene	170	5.8	-	-
Chrysene	350	6.2	-	-
Benzo(b)fluoranthene	44	5.6	-	-
Benzo(k)fluoranthene	1200	2.6	-	-
Benzo(a)pyrene	35	5.4	-	-
Indeno(123-cd)pyrene	510	2.6	-	-
Dibenzo(ah)anthracene	3.6	0.62	-	-
Benzo(ghi)perylene	4000	3.0	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.4 Assessment of Total Petroleum Hydrocarbon [TPH's] Data

The assessment of TPH data is presented hereunder:

Table 16: Assessment of Hydrocarbon Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Aromatic EC5-EC7	46000	<0.010	-	-
Aromatic EC7-EC8	110000	<0.010	-	-
Aromatic EC8-EC10	8100	<0.050	-	-
Aromatic EC10-EC12	28000	1.4	-	-
Aromatic EC12-EC16	37000	22.0	-	-
Aromatic EC16-EC21	28000	89.0	-	-
Aromatic EC21-EC35	28000	200	-	-
Aliphatic EC5-EC6	5900	<0.010	-	-
Aliphatic EC6-EC8	17000	<0.010	-	-
Aliphatic EC8-EC10	4800	<0.050	-	-
Aliphatic EC10-EC12	23000	3.2	-	-
Aliphatic EC12-EC16	82000	9.7	-	-
Aliphatic EC16-EC35	1700000	104	-	-

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.5 Assessment of BTEX / MBTE Data

All BTEX / MBTE compounds were reported to be below their limit of detection and therefore no risk to human health is indicated.

14.2.6 Assessment of Asbestos Data

Asbestos containing materials (ACM's) in the form of Chrysotile and Amosite (loose fibres and debris) were identified in soils recovered from 4nr sampling positions (WS02 > WS05). Hence a potential risk to human health is indicated.

Quantification tests undertaken on 4nr asbestos detections confirm the presence of <0.001 - 0.001% ACMs'.

14.2.7 Summary of Human Health Risk Assessment

The above human health risk assessment confirms the presence of the following contaminants:

- ACMs in soil recovered from 4nr sampling positions (WS02 > WS05)

On the basis of the above, a potential risk to human health is indicated.

Quantification tests undertaken on 4nr asbestos detections confirm the presence of <0.001 - 0.001% ACMs'.

Exposure risk associated with asbestos arise via the inhalation pathway and as such some remedial works and appropriate site management practices will be required to mitigate such risk.

Since the proposed works will involve removal / disturbance of soils in which positive asbestos detections were recorded in the form of Amosite (Sheeting/Board Debris), it is incumbent on the developer / contractor to devise a Health and Safety Plan which takes account of the risks of human exposure to airborne fibres during excavation and similar works which may cause disturbance of the ground. Developers / contractors should refer to CIRIA C733: 'Asbestos in Soils and Made Ground: A Guide to Understanding and Managing Risks'. Further guidance is contained in CL:aire document 'Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials – Industry Guidance.'

In all areas of proposed landscaping, it is required that site levels in such areas be reduced by 600mm below proposed finished site level with levels then being reconstructed by the placement of clean imported topsoil, placed under a strict validation regime comprising 1nr analyses per 50m³, with a minimum of 4nr analyses per material source.

In addition to the above, and taking into account the presence of ACMs', it is required that all topsoil imported for landscaping be placed on a high visibility woven geotextile fabric, such as 'Terram 1000', or similar.

In addition to the above, contractors must remain aware that disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination as far as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon **CCG** to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.

15.0 SPECIFICATION OF BURIED CONCRETE

The data obtained in the investigations was assessed against the guidance given in BRE Special Digest 1: 2005, as summarised hereunder:

Table 17: Design Chemical Class Based on Soil Data

CONCRETE SPECIFICATION DATA SHEET		
Is the site Brownfield or Greenfield?	Brownfield	
Is the water table static or mobile?	Static	
Highest water-soluble Sulphate results	151mg/l	Design Sulphate Class of DS-1 Class of AC-1s
Lowest pH result	7.9	
Intended Working Life	50 years	Adopt Design Chemical Classification of DC-1

Table 18: Design Chemical Class Based on Groundwater Data

CONCRETE SPECIFICATION DATA SHEET		
Is the site Brownfield or Greenfield?	Brownfield	
Is the water table static or mobile?	Static	
Highest water-soluble Sulphate results	60.8mg/l	Design Sulphate Class of DS-1 Class of AC-1s
Lowest pH result	7.4	
Intended Working Life	50 years	Adopt Design Chemical Classification of DC-1

Based on the foregoing assessment, concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class DC-1, as defined in BRE Special Digest 1: 2005.

16.0 CONTROLLED WATERS RISK ASSESSMENT

16.1 Assessment of Groundwater Metals, Non-Metals & Polycyclic Aromatic Hydrocarbon (PAH) Data

Groundwater recovered from WS06 was analysed for a broad range of contaminants including speciated PAH and TPH concentrations. The results were assessed against Environmental Quality Standards (AA-EQS) for freshwater as shown hereunder.

Table 19: Assessment of Groundwater Data

Contaminant	WS06 Result (ug/l)	AA-EQS (ug/l)
Naphthalene	0.23	2.4
Lead	0.2	20
Fluoranthene	0.12	0.1
Phenanthrene	0.12	-
Anthracene	<0.01	-
Acenaphthylene	<0.01	-
Pyrene	0.11	-
Chrysene	<0.01	-
Fluorene	0.04	-
Nickel	4.1	150
Indeno(123-cd)pyrene	<0.01	0.02
Benzo(ghi)perylene	<0.01	0.02
Copper	0.8	40
Benzo[a]pyrene	<0.01	0.05
Benzo[a]anthracene	<0.01	0.05
Benzo[k]fluoranthene	<0.01	0.03
Benzo[b]fluoranthene	<0.01	0.03
Boron	64	1000
Cyanide	<1.0	-
Arsenic	2.91	25
Mercury	<0.05	1
Selenium	2.4	-
Cadmium	<0.02	5
pH	7.4	-
Sulphate	60.8	400000

The above assessment confirms that no groundwater contaminant exceeds its respective guideline criteria. Hence no risk to controlled waters is indicated.

16.2 Assessment of Groundwater Hydrocarbon Data

Speciated hydrocarbon results were assessed by comparison with AA-EQS values for inland waters. In case of determinands not covered by AA-EQS values, results were compared to EQS Freshwater Criteria values or where no EQS Freshwater Criterion is available, then WHO guidelines for Drinking Water are adopted.

Table 20: Assessment of Groundwater Hydrocarbon Data

Contaminant	WS06 Result (ug/l)	AA-EQS (ug/l)	WHO (ug/l)
Aromatic EC5-EC7 (benzene)	<1.0	10	10
Aromatic EC7-EC8 (toluene)	<1.0	-	700
Aromatic EC8-EC10 (ethyl benzene)	<1.0	-	300
Aromatic EC10-EC12	<10	-	100
Aromatic EC12-EC16	30	-	100
Aromatic EC16-EC21	50	-	90
Aromatic EC21-EC35	<10	-	90
Aliphatic EC5-EC6	<1.0	-	15000
Aliphatic EC6-EC8	<1.0	-	15000
Aliphatic EC8-EC10	<1.0	-	300
Aliphatic EC10-EC12	<10	-	300
Aliphatic EC12-EC16	50	-	300
Aliphatic EC16-EC21	77	-	(300)*
Aliphatic EC21-EC35	780	-	(300)*

The above assessment confirms the presence of Aliphatic EC21-EC35 in groundwaters. Hence a potential risk to controlled waters /

human health is indicated.

16.3 Summary of Controlled Waters Risk Assessment

The above assessment confirms the presence of Aliphatic EC21-EC35 in groundwaters. Hence a potential risk to controlled waters / human health is indicated.

Taking into account the above observations and given the absence of sensitive receptors (*i.e. source protection zones, active groundwater abstraction points etc.*) it is concluded that the risk posed to controlled waters and/or human health is insignificant.

17.0 ASSESSMENT OF RISK FROM GROUND GASES

Standpipes were constructed such that response zones were within permeable strata. Using the data gathered in the monitoring programme, a gas risk assessment was undertaken in accordance with the ground gas risk assessment methodology (See Appendix M) employed by **CCG**. The ground gas risk assessment methodology conforms to current UK guidance on the assessment of risks posed by ground gases.

The potential sources of gas identified in the desk study were generally considered as sources of “Low” generation potential, and high sensitivity, resulting in a programme of monitoring comprising of 4nr rounds distributed over a 1-month period.

A gas risk assessment was undertaken in accordance with current UK guidelines set out in CIRCA C665 2007 “Assessing Risk Posed by Hazardous Gases to Buildings”. The CIRIA risk assessment methodology uses typical maximum soil gas concentrations and worse case borehole flow rates to define a “Characteristic Situation” for the shallow gas regime.

The volumetric gas flow rate used by the risk assessment is termed “Gas Screening Value (GSV)” in the guidance and is defined below.

$$\text{Where: GSV (litres/hr)} = \text{borehole flow rate (litres/hr)} \times \text{gas concentration.}$$

There are also two stages to the assessment method proposed in CIRIA C665; compliance with a GSV Threshold Value and secondly, compliance with additional factors such as maximum permissible gas concentration. A summary of the gas monitoring data is presented hereunder and presented in Appendix F.

Table 21: Summary of Gas Monitoring Data

Position	WS01	WS03	WS04
No Monitoring Visits	4	4	4
Highest CH ₄ (%)	Nil	Nil	Nil
Highest CO ₂ (%)	<0.1	0.3	0.4
Lowest O ₂ (%)	10.8	19.2	18.7
Highest H ₂ S (ppm)	Nil	Nil	Nil
Highest CO (ppm)	Nil	Nil	Nil
Highest Flow (l/hr)	<0.1	<0.01	<0.1
Water Levels (m)	3.88 - Dry	Dry	0.90 – 0.95
Highest PID response	0.0	0.0	0.0
Pressure Range (mb)	999 - 1018mbar		

After 4nr round of monitoring, a Gas Screening Value (GSV) of <0.00004l/hrs is calculated for CO₂ and <0.00001l/hr for CH₄.

Using these GSV values, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1 (CS1). Based on this classification gas protection measures are not required.

18.0 POST INVESTIGATION CONCEPTUAL MODEL

Based on the findings of the investigation, a conceptual model could be constructed illustrating proven pollution linkages and summarising the conceptual remediation recommendations discussed above, as tabulated hereunder.

Table 22: Conceptual Model

Source	Pathway	Receptor	Remedial Options
Asbestos in soils in the form of Chrysotile & Amosite (Loose fibres & debris) <0.001% – 0.001%)	Oral / ingestion pathways	Construction workers Future worker occupants Adjoining properties	In all areas of proposed landscaping, it is required that site levels in such areas be reduced by 600mm below proposed finished site level with levels then being reconstructed by the placement of clean imported topsoil, placed under a strict validation regime comprising 1nr analyses per 50m³, with a minimum of 4nr analyses per material source. In addition to the above, and taking into account the presence of ACMs', it is required that all topsoil imported for landscaping be placed on a high visibility woven geotextile fabric, such as 'Terram 1000', or similar. In addition to the above, contractors must remain aware that disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination as far as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report. Since the proposed works will involve removal / disturbance of soils in which a positive asbestos detection was recorded in the form of Amosite (loose fibres / debris), it is incumbent on the developer / contractor to devise a Health and Safety Plan which takes account of the risks of human exposure to airborne fibres during excavation and similar works which may cause disturbance of the ground. Developers / contractors should refer to CIRIA C733: 'Asbestos in Soils and Made Ground: A Guide to Understanding and Managing Risks'. Further guidance is contained in CL:aire document 'Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials – Industry Guidance.' Where fully suspended block and beam floors are to be adopted, the base of the subfloor void must receive a 50mm cover of blinding concrete

19.0 PRELIMINARY WASTE CLASSIFICATION

A waste classification exercise was undertaken in relation to potential offsite disposal of excavation arisings. The first stage entailed the assessment of the basic soil contamination data via the **HAZWASTE** online program. The output data from this basic assessment is provided in Appendix J. This program generates the baseline 'Hazardous / Non-Hazardous' classification of soils.

Asbestos quantification testing undertaken on 4nr positive asbestos detections confirm the presence, by weight (%), <0.001% - 0.001% ACM in soils analysed at WS02 > WS05.

Taking into account the above asbestos detections, with regards offsite disposal, current legislations, 'The Hazardous Waste (England and Wales) Regulations 2005' and 'The Special Waste Amendment (Scotland) Regulations 2004', state that any soil having an asbestos content greater than 0.1% weight/weight (w/w) is classified as Hazardous Waste, and any soil with an asbestos content of less than 0.1% w/w can be classified as Non-Hazardous waste, unless there are other contaminants present which would make the waste hazardous. In this case the asbestos quantification confirms the disposal route of *Non-Hazardous*' landfill.

The appended **HAZWASTE** report classifies all soils analysed to be 'Non-Hazardous,' and therefore surplus soils generated for off-site purposes may be disposed at a licenced 'Non-Hazardous' landfill facility.

Notwithstanding the above, should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.

20.0 NEW WATER MAINS SUPPLY

The specification for new water mains at this site was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' published by UK Water Industry Research (UKWIR) January 2011.

The preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species EC10 – EC16 aliphatic and aromatic hydrocarbon fractions (36.3mg/kg) are above the threshold concentrations as specified by the UKWIR for the adoption of normal PE water mains and therefore new water mains must be specified as a multi-layer barrier pipe (PE-AI-PE) type construction.

Good practice requires that mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.

Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure.

Notwithstanding the above preliminary assessment, the developer should contact the relevant water supply company (**UNITED UTILITIES**) to obtain concurrence with the recommendations given above and may be required to return a completed Risk Assessment.

21.0 FOUNDATIONS & FLOOR SLABS RECOMMENDATIONS

21.1 Introduction

It is understood that the site is to be redeveloped for commercial use by the construction of 4nr steel framed commercial blocks (A-D) providing a combined total of 9nr self-contained units. It is proposed that each unit will be constructed of low-level dado brick walls with corrugated rain screen cladding above.

It is further understood that to prepare the area to development level, an advance preparatory earthworks contract will be undertaken, in which a "cut and fill" exercise will be undertaken to prepare the site levels to accommodate each unit and as such the site will be terraced with vehicle / pedestrian access points being located at the north and south of the development, leading onto Sandbrook Way .

The existing site layout is as shown on **NORTHERN TRUST** architectural drawings contained herein.

This intrusive ground investigation confirms the presence of grassed topsoil overlying beep made ground deposits generally comprising firm / soft reworked clay deposits and medium dense locally loose, very loose silty gravelly sands with low to medium cobble content to depths varying between 3.2mbgl - 5mbgl. The sequence thereafter continues in natural drift deposits comprising medium dense /loose silty fine and medium grained sands with deep very loose black / dark brown pseudo-fibrous peat deposits standing at 3.2mbgl > 4.5mbgl at borehole WS06, with determination of loss of ignition tests undertaken on peat deposits at 3.2m – 4.2mbgl confirming 66% - 86% organic content.

The base of made ground deposits was not encountered within 5m of the surface at WS01, WS04, and buried obstructions prohibited the advancement of boreholes after 3nr attempts (WS03a - WS03c).

Dynamic probing undertaken at 2nr positions (TP02 and WS06), confirmed a slight increase in soils density from around 6mbgl.

21.2 Piling for Foundations & Ground Slabs

Taking into account the above observations and the nature of the proposed redevelopment, given the variable depth and composition of the underlying made ground deposits, the adoption of traditional strip (*spread*) and/or pad foundations is not recommended since there is a potential for differential and/or total settlements.

It is considered that the ground conditions prevailing at this site warrant the adoption of piled foundations. Driven precast concrete or bottom driven steel cased piles would be suitable options in these conditions. The proposed piles would carry reinforced ground beams from which structural steel and dado walls may be constructed.

For the purposes of preliminary design, the structural carrying capacity of precast concrete and steel cased bottom driven piles may be taken as:

Table 23: Pile Carrying Capacity

Pile Section mm x mm	Carrying Capacity kN
200 x 200	350
250 x 250	700

Table 24: Pile Carrying Capacity

Pile Diameter mm	Carrying Capacity kN
150	140
220	250

A piling layout and calculated pile loadings should be prepared and piling contractors must be required to provide dynamic installation set calculations corresponding to the actual loadings calculated to be imposed on each pile, and to provide pile installation records.

Cast *in-situ* suspended ground slabs should be adopted in conjunction with piled foundations, with the slabs bearing on a grid of piled ground beams.

21.3 Vibro Foundations & Ground Slabs

Ground improvement by installation of vibro replacement stone columns may provide a suitable solution in these conditions. Columns can be installed in groups under isolated loads or directly under linear loads such as strip footings. Column diameters are between 400mm to 600mm and are constructed from either quarried stone or washed, screened recycled aggregate. Columns can be arranged in a grid pattern to provide support to uniformly loaded structures such as ground floor slabs, improving the bearing capacity of the soils. Specialist contractors should be consulted regarding the suitability of this technique for application in these conditions.

21.4 Raft Slabs

Consideration may be given to adoption of a raft foundation subject to rigorous preparation of the subgrade. Such preparation should include as a minimum:

- Reduction in site levels to 450mm below raft slab underside including under thickenings
- Through compaction at reduced level grubbing out and refilling in 200mm increments any areas exhibiting excessive deflection
- Placement of combined geogrid / geotextile layer at base of prepared area (Tensar SS20 or similar / Terram 1000)
- Placement and compaction of 3 x 150mm layers DTp Type 1 subbase or equivalent well-graded, durable, granular fill
- Construction of sand blinding, radon barrier, insulation, slab and screed

The raft should incorporate thickenings along structurally loaded alignments, of sufficient width to limit stress on the prepared ground to 80kN/m². The rafts should be designed to span a notional void of 2m and to cantilever 1.5m at corners.

21.5 Reuse of Materials

There is a requirement for cut and fill earthworks to prepare the site to levels. The existing made ground soils are generally inert and, subject to moisture condition at the time of the earthworks, are likely to be suitable for reuse, provided they are placed and compacted in layers not exceeding 200mm and that all particles over 100mm are removed. It is recommended that all materials within 300mm of finished earthworks levels composed of clean imported well graded granular fill.

21.6 Excavations & Asbestos Management

In the ground conditions prevailing at this site, excavations may be undertaken by light hydraulic excavators.

Excavations in excess of 1.2mbgl within the observed made ground deposits will require side support.

With regards proposed groundworks and the presence of ACMs, it is incumbent on the contractor to develop method statements designed to minimise risks to construction workers and the general public.

As a priority, it is essential that dust releases be effectively eliminated during groundworks, to ensure there are no risk of releases of airborne fibres, and to this end contractors engaged in works involving disturbance of the ground must develop an Asbestos Management Plan. This plan may be based on the guidance contained in CIRIA C733 *“Asbestos in soil and made ground: a guide to understanding and managing risks”*. This provides a basis for the contractor to develop good working practice.

Contractors may obtain further guidance from CL:AIRE which has published the Joint Industry Working Group Asbestos in Soil and Construction & Demolition (C&D) Materials guidance titled *“Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition Materials: Industry Guidance (shortened name CAR-SOIL™)”*.

This authoritative document has been prepared with the support of the Health and Safety Executive and presents the definitive explanation of how the legal requirements of the Control of Asbestos Regulations 2012 (CAR 2012 or the Regulations) have been interpreted to apply to work with asbestos contaminated soil and construction & demolition materials.

As a precautionary measure, wagons carting spoil offsite must be sheeted and must pass through a wheel wash before leaving the site.

It should also be noted that as with all brownfield developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination *insofar* as the exposed conditions may have the potential to impact on receptors including *inter alia* humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon **CCG** to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.

21.7 Soakaways

3nr trial pits were mechanically excavated to a maximum depth of 2.2mbgl. On completion of excavation works each trial pit was charged with water and the initial depth to the surface of the water was recorded. Further readings of depth to water were recorded at regular time intervals in accordance with *BRE Digest 365*. The water levels at each trial pit failed to drop measurably (<300mm) over a 4-hour test period and hence it was concluded that soak-a-ways at these locations are not a practical proposition and therefore alternative forms of attenuation will be required. Furthermore, the depth of made ground over the site is consistently in excess of 2.5m, thus precluding the formation of soakaways as required by the guidance contained in *BRE Digest 365*.

21.8 Groundwater Management

Groundwater ingress recorded within positions located towards the southern section of the site with monitored standing water levels being in the order of 0.9m > 3.88bgl during the initial rounds of gas – groundwater monitoring.

Taking into account the above groundwater observations, a prudent contractor would allow for pumping to maintain dry working conditions during foundation construction / service installations particularly during heavy and/or prolonged periods of precipitation.

22.0 CONCLUSIONS & RECOMMENDATIONS

The conclusions and recommendations hereunder are based on the salient sections of the report and should not be referred to in isolation of the relevant sections of the text. All recommendations are subject to Regulatory Authority review.

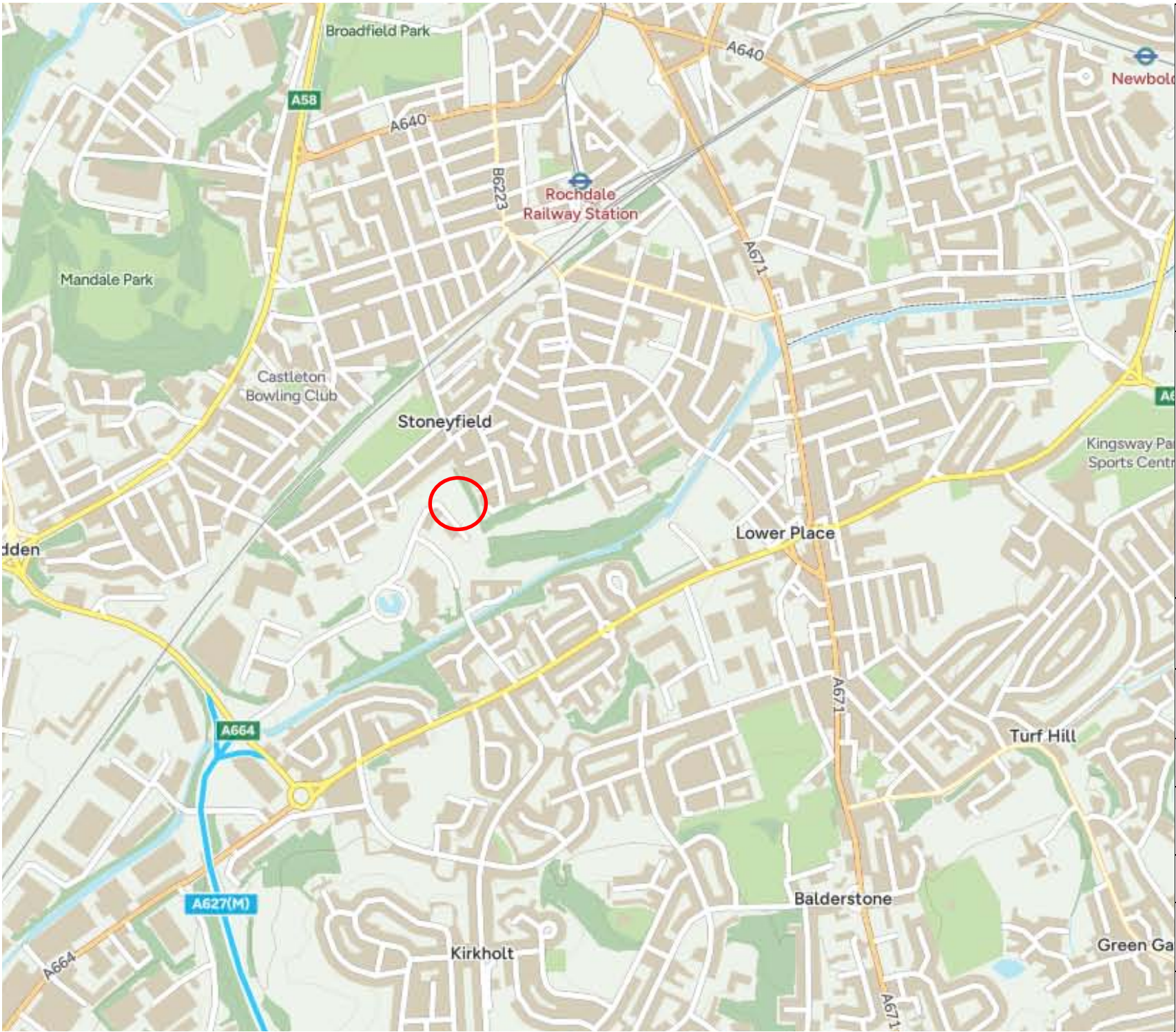
Table 24: Conclusions & Recommendations

Soil Contamination	Asbestos containing materials (ACM's) in the form of Chrysotile and Amosite (loose fibres and debris) were identified in soils recovered from 4nr sampling positions (WS02 > WS05). Hence a potential risk to human health is indicated. Quantification tests undertaken on 4nr asbestos detections confirm the presence of <0.001 - 0.001% ACMs'.
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Asbestos Management	No remedial works required under areas of permanent hard standing. In all areas of proposed landscaping, it is required that site levels in such areas be reduced by 600mm below proposed finished site level with levels then being reconstructed by the placement of clean imported topsoil, placed under a strict validation regime comprising 1nr analyses per 50m³, with a minimum of 4nr analyses per material source. In addition to the above, and taking into account the presence of ACMs', it is required that all topsoil imported for landscaping be placed on a high visibility woven geotextile fabric, such as 'Terram 1000', or similar. In addition to the above, contractors must remain aware that disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination as far as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report. Since the proposed works will involve removal / disturbance of soils in which a positive asbestos detection was recorded in the form of Amosite (loose fibres / debris), it is incumbent on the developer / contractor to devise a Health and Safety Plan which takes account of the risks of human exposure to airborne fibres during excavation and similar works which may cause disturbance of the ground. Developers / contractors should refer to CIRIA C733: 'Asbestos in Soils and Made Ground: A Guide to Understanding and Managing Risks'. Further guidance is contained in CL:aire document 'Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials – Industry Guidance.' Where fully suspended block and beam floors are to be adopted, the base of the subfloor void must receive a 50mm cover of blinding concrete
	With regards proposed groundworks and the presence of ACMs,' it is incumbent on the contractor to develop method statements designed to minimise risks to construction workers and the general public.
	As a priority, it is essential that dust releases be effectively eliminated during groundworks, to ensure there are no risk of releases of airborne fibres, and to this end contractors engaged in works involving disturbance of the ground must develop an Asbestos Management Plan. This plan may be based on the guidance contained in CIRIA C733 "Asbestos in soil and made ground: a guide to understanding and managing risks". This provides a basis for the contractor to develop good working practice.
	Contractors may obtain further guidance from CL:AIRE which has published the Joint Industry Working Group Asbestos in Soil and Construction & Demolition (C&D) Materials guidance titled "Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition Materials: Industry Guidance (shortened name CAR-SOIL™)".
	This authoritative document has been prepared with the support of the Health and Safety Executive and presents the definitive explanation of how the legal requirements of the Control of Asbestos Regulations 2012 (CAR 2012 or the Regulations) have been interpreted to apply to work with asbestos contaminated soil and construction & demolition materials.
	As a precautionary measure, wagons carting spoil offsite must be sheeted and must pass through a wheel wash. It should also be noted that as with all brownfield developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination <i>insofar</i> as the exposed conditions may have the potential to impact on receptors including <i>inter alia</i> humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.
Controlled Waters	The above assessment confirms the presence of Aliphatic EC21-EC35 in groundwaters. Hence a potential risk to controlled waters / human health is indicated. Taking into account the above observations, given the absence of sensitive receptors (i.e. source protection zones, active groundwater abstraction points etc.) it is concluded that the risk posed to controlled waters and/or human health is insignificant.
Concrete Specification	Based on the foregoing assessment, concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class DC-1, as defined in BRE Special Digest 1: 2005. The specification for new water mains at this site was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' published by UK Water Industry Research (UKWIR) January 2011.
Water Mains	The preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species EC10 – EC16 aliphatic and aromatic hydrocarbon fractions (36.3mg/kg) are above the threshold concentrations as specified by the UKWIR for the adoption of normal PE water mains and therefore new water mains must be specified as a multi-layer barrier pipe (PE-Al-PE) type construction. Good practice requires that mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside. Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure. Notwithstanding the above preliminary assessment, the developer should contact the relevant water supply company (United Utilities) to obtain concurrence with the recommendations given above and may be required to return a completed Risk Assessment.
Gas Risk	After 4nr round of monitoring, a Gas Screening Value (GSV) of <0.00004l/hrs is calculated for CO₂ and <0.00001l/hr for CH₄.

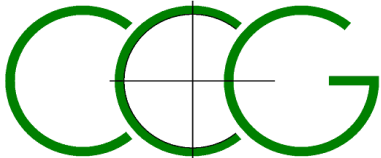
Assessment	Using these GSV values, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1 (CS1) and based on this classification gas protection measures are not required.
Groundwater Management	Groundwater ingress recorded within positions located towards the southern section of the site with monitored standing water levels being in the order of 0.9m > 3.88bgl during the initial rounds of gas – groundwater monitoring. Taking into account the above groundwater observations, a prudent contractor would allow for pumping to maintain dry working conditions during foundation construction / service installations particularly during heavy and/or prolonged periods of precipitation.
Waste Classification	Asbestos quantification testing undertaken on 4nr positive asbestos detections confirm the presence, by weight (%), <0.001% - 0.001% ACM in soils analysed at WS02 > WS05. Taking into account the above asbestos detections, with regards offsite disposal, current legislations, 'The Hazardous Waste (England and Wales) Regulations 2005' and 'The Special Waste Amendment (Scotland) Regulations 2004', state that any soil having an asbestos content greater than 0.1% weight/weight (w/w) is classified as Hazardous Waste, and any soil with an asbestos content of less than 0.1% w/w can be classified as Non-Hazardous waste, unless there are other contaminants present which would make the waste hazardous. In this case the asbestos quantification confirms the disposal route of <i>Non-Hazardous</i> landfill. The appended Hazwaste report classifies all soils analysed to be '<i>Non-Hazardous</i>,' and therefore surplus soils generated for off-site purposes may be disposed at a licenced '<i>Non-Hazardous</i>' landfill facility. Notwithstanding the above, should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.
Foundations & Ground Floor Slabs	See Section 21.0 for full discussion
Soak-a-Ways	3nr trial pits were mechanically excavated to a maximum depth of 2.2mbgl. On completion of excavation works each trial pit was charged with water and the initial depth to the surface of the water was recorded. Further readings of depth to water were recorded at regular time intervals in accordance with <i>BRE Digest 365</i>. The water levels at each trial pit failed to drop measurably (<300mm) over a 4-hour test period and hence it was concluded that soak-a-ways at these locations are not a practical proposition and therefore alternative forms of attenuation will be required.
Excavations	Excavations may be undertaken by light hydraulic excavators.
Further Work	Excavations more than 1.2mbgl will require side support. • Prepare Phase III Remediation Strategy Report • Prepare Phase IV Validation Report

APPENDIX A: DRAWINGS



DO NOT SCALE

Notes: Study Site



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Client:
Northern Trust

Project:
Phase I-II Geoenvironmental Report for Land at
Sandbrook Business Park, Rochdale

Title:
Site Location

Scale:
NTS

Issue:
01

Drawn by:
DG

Date:
May 2024

Project No.
CCG-C-24-14676

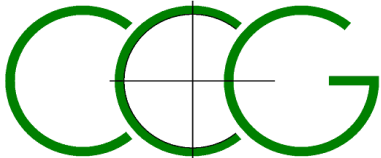
Drawing No.
01

© CC GEOTECHNICAL LIMITED



DO NOT SCALE

Notes: Study Site



CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
Northern Trust

Project:
Phase I-II Geoenvironmental Report for Land at
Sandbrook Business Park, Rochdale

Title:
Aerial Photograph

Scale:
NTS

Issue:
01

Drawn by:
DG

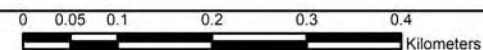
Date:
May 2024

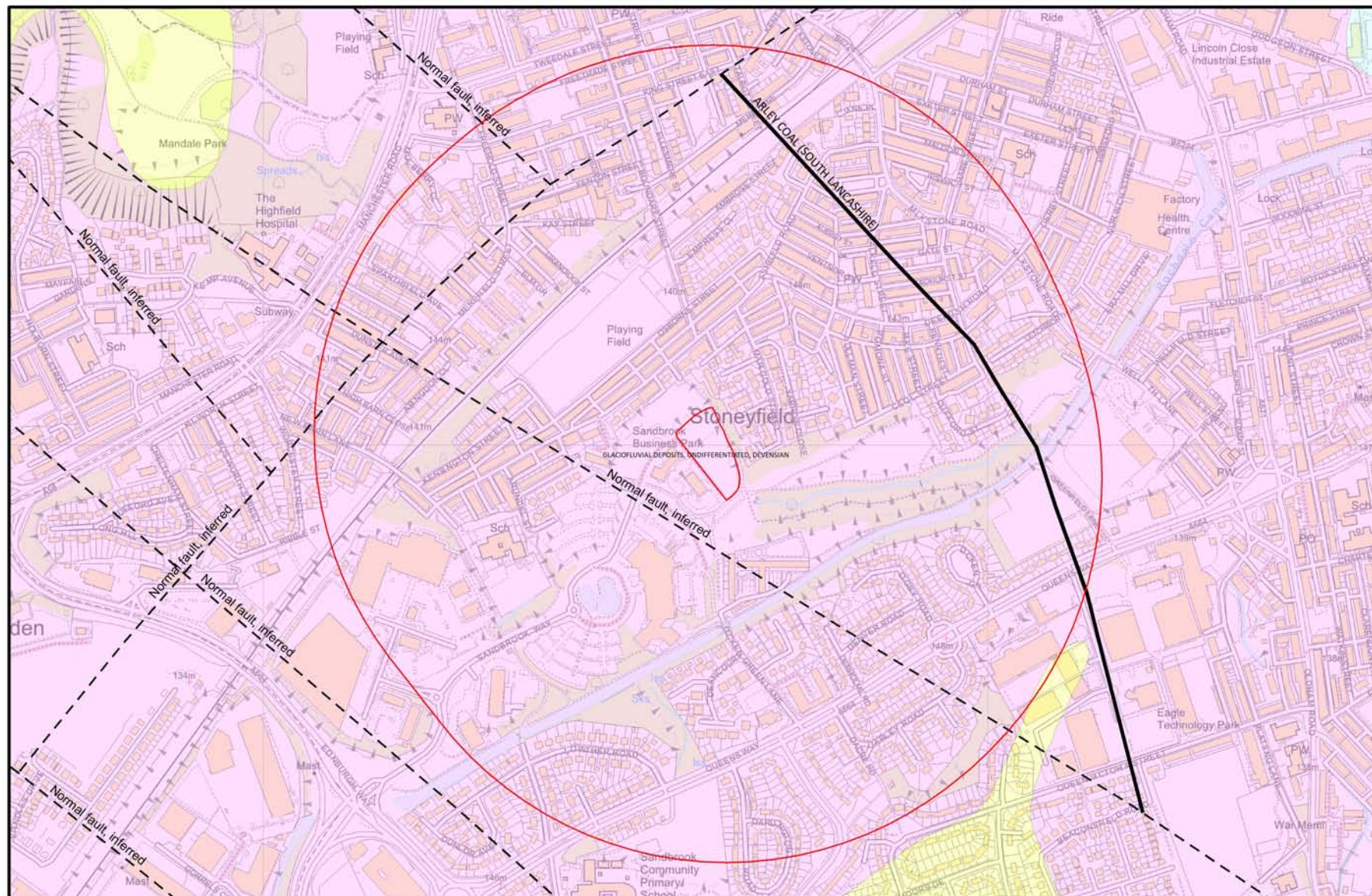
Project No.
CCG-C-24-14676

Drawing No.
02

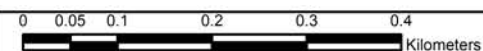


SandbrookWay, Stoneyfield, Rochdale, OL11
Drawing No. CC G-C-24-14676-5: Site Location
BGS Sheet 085: Manchester Mapping Extraxt
Solid Geology





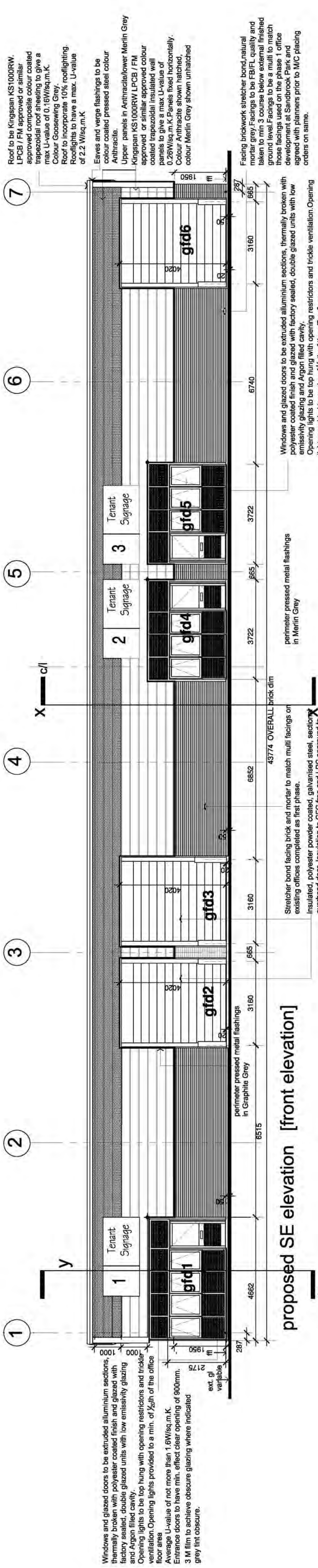
SandbrookWay, Stoneyfield, Rochdale, OL11
Drawing No. CC G-C-24-14676-6: Site Location
BGS Sheet 085: Manchester Mapping Extraxt
Drift Geology



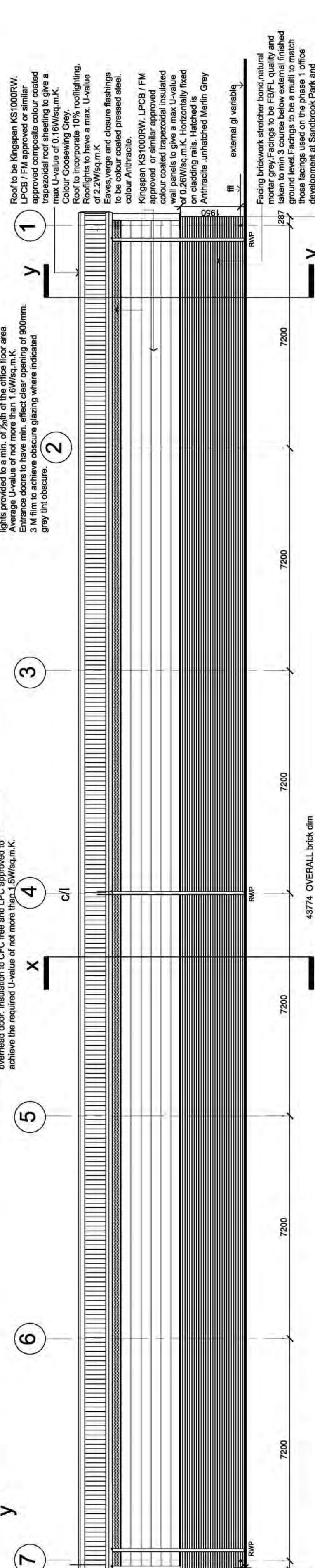


curtain wall wrap dictates internal plan of office to ensure wc3 behind masonry wall.
NB: Fenestration wrap the gable only as a 'feature gable'.
* See section YY for additional detail requirement A1-A2-A3 behind curtain walling for permit detail.

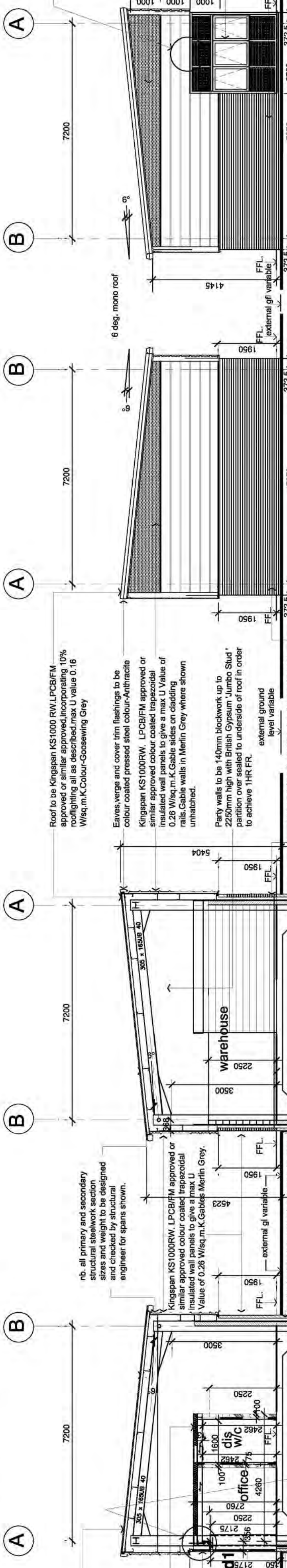
proposed gf plan



proposed SE elevation [front elevation]



proposed NW elevation [rear elevation]



proposed section on x-x

proposed section on y-y

* Internal corner office permit detail as 'closure' to corner curtain walling 'wrap'.
NB: Fenestration wrap the gable only as a 'feature gable'.
* See section YY for additional detail requirement A1-A2-A3 behind curtain walling for permit detail.

proposed North East elevation

proposed South West elevation



NOTES

All insulation to be CFC/HCFC free with zero ozone depletion potential.
All cladding details to comply with Kingspan Enhanced details.

MATERIAL/COLOUR KEY

- Steel paintwork - Merin Grey
- Roof cladding - Kingspan KS1000RW Insulated Roof Panel (LPCBFM Approved) or equal - Goosewing Grey
- Gutters, Fasciae & Vergae - Anthracite
- Rainwater pipes - Colour to match cladding
- Kingspan KS1000RW Insulated Wall Panel (LPCBFM Approved) or equal - Anthracite where shown hatched / Merin Grey where shown unhatched. Flashings to match panel colour.
- Blockwork - Northern Brick Ref-TN06 65mm County Multi Dogfoed.
- Loading doors - Anthracite
- Personnel doors - Anthracite
- Escape doors - Anthracite
- Frame and glazing - Aluminium window sections - Colour Graphite Grey.
- Glazing Unit - Colour Grey

Hatched areas denote contrasting colours, actual locations of horizontal panels / rear doors may vary slightly to suit setting-out of roof.

CRITICAL DOOR DIMENSIONS

- Internal Doors - Minimum effective clear width 800mm
- Entrance Doors - Minimum effective clear width 900mm
- Fire Exit Doors - Minimum effective clear width 850mm
- Roof Exit Doors - Minimum effective clear width 850mm
- All sliding panels to have minimum zones of visibility between 800mm to 800mm and 150mm to 150mm.

REQUIRED U VALUES

- 'Warm Roof' Construction-0.16 W/sq.m.K
- External Wall Construction-0.28 W/sq.m.K
- Ground Floor Construction-0.18 W/sq.m.K [Only applies under heated spaces ie. wc's and offices].
- Windows- 1.6W/sq.m.K
- Rooflights-2.2 W/sq.m.K
- Personnel Doors-1.6W/sq.m.K
- Vehicle Access and Similar Large Doors- 1.3 W/sq.m.K

NB. offices and toilets are to be space heated.
walls to these spaces max U Value-0.26W/sqm K.
roof- 0.16 W/sqmK, floor 0.18 W/sq.m.K.
The warehouses are to remain unheated so the ground bearing slab under the warehouse space does not need to be insulated.

PLANNING

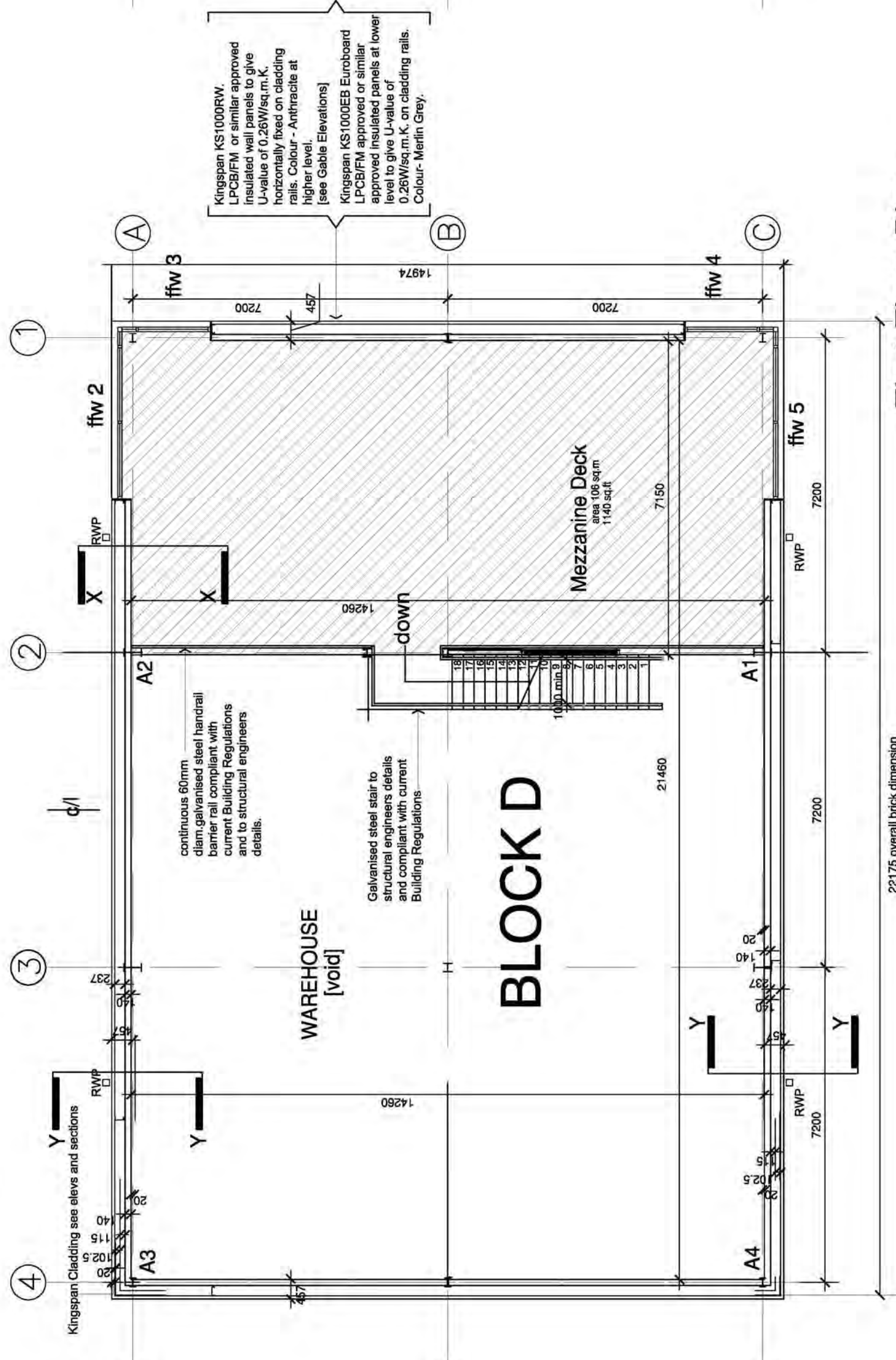
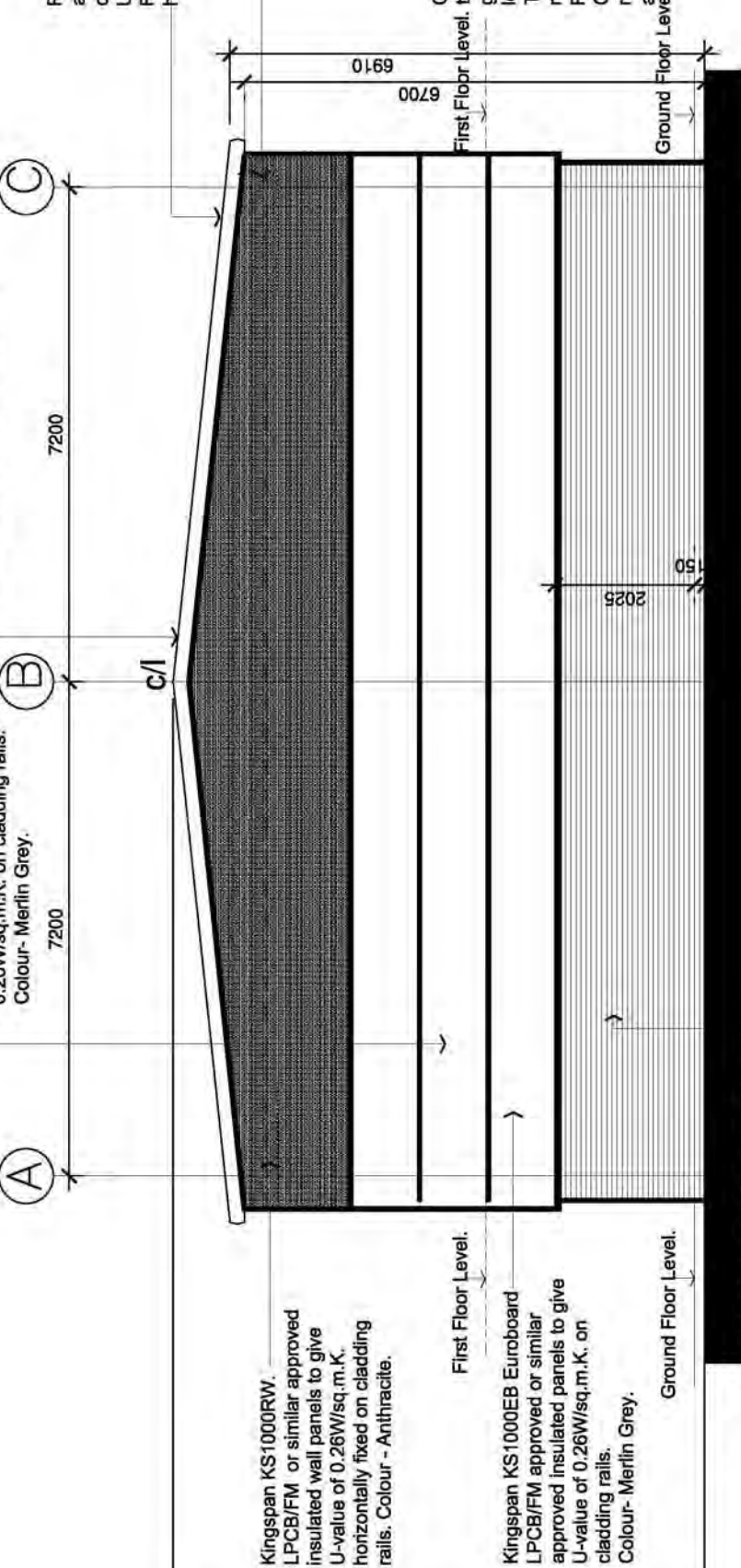
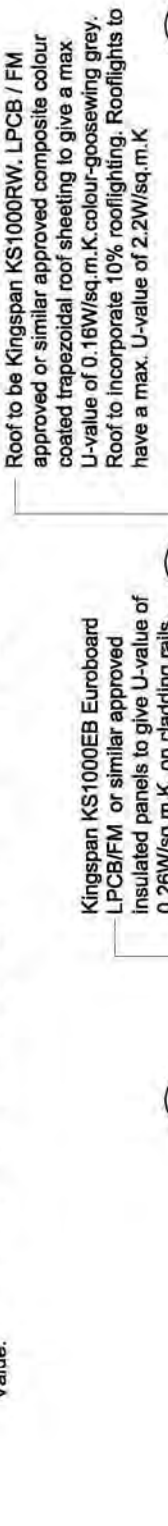
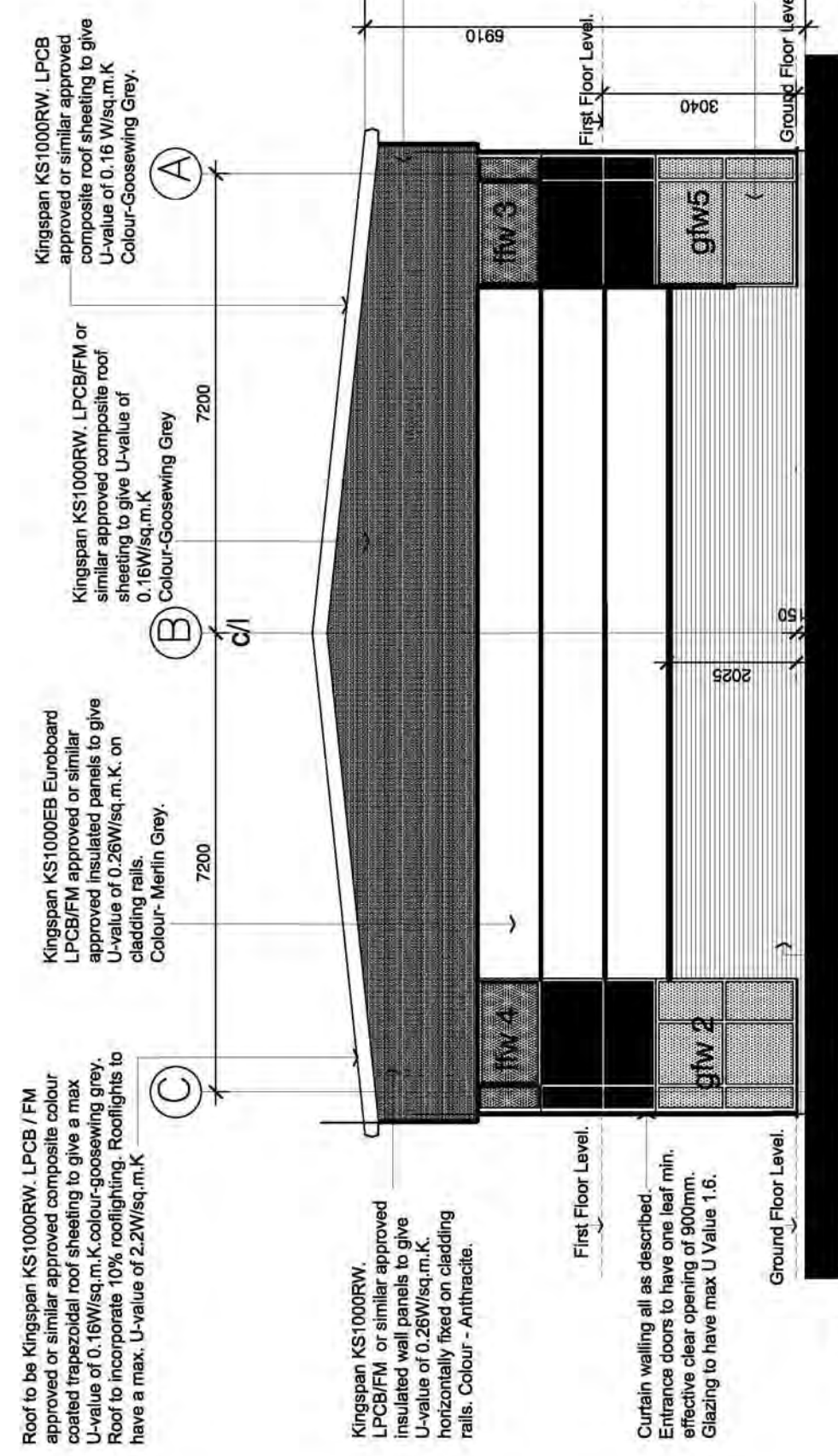


Northern Trust

SANDBROOK PARK
ROCHDALE
INDUSTRIAL BLOCK A

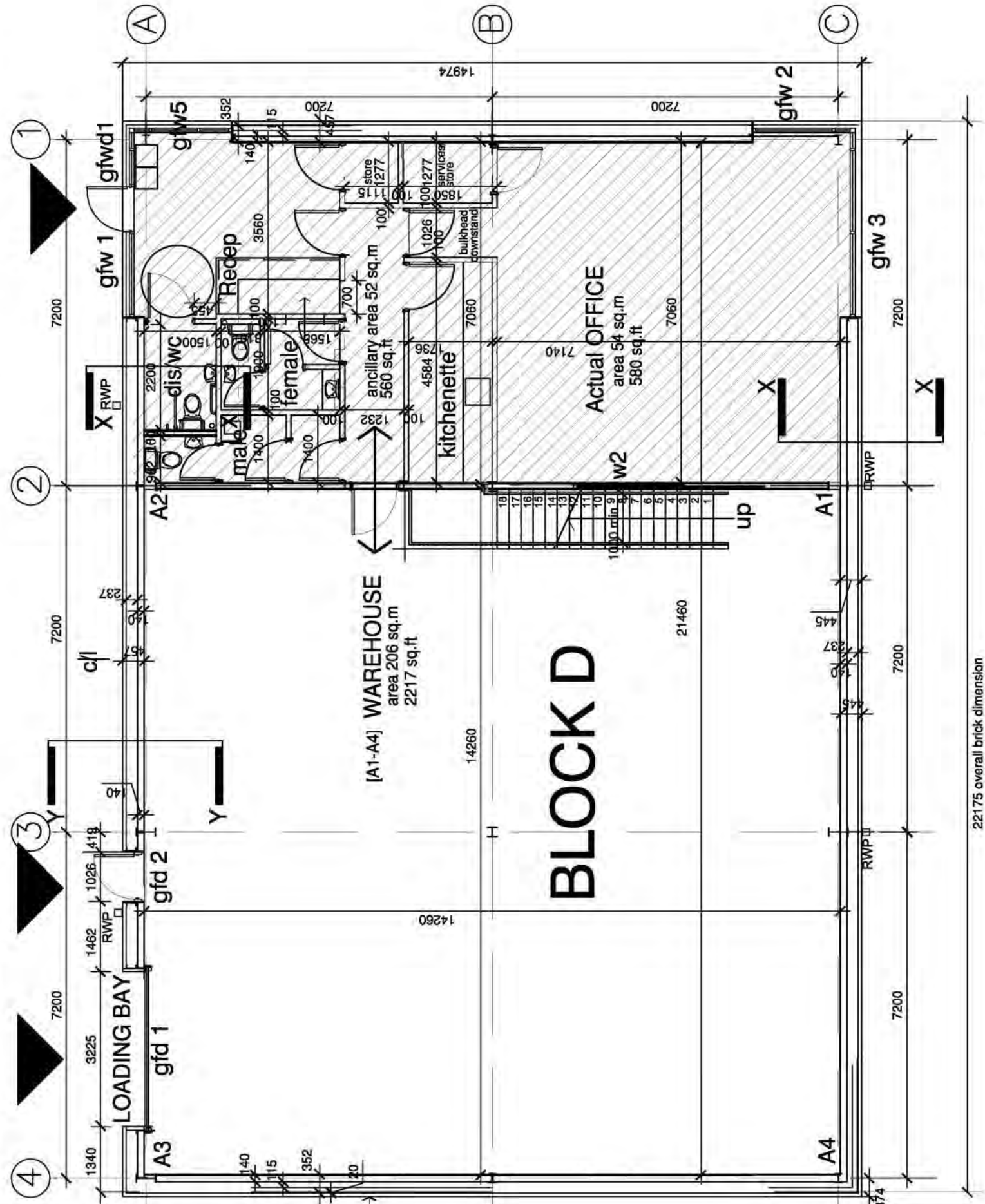
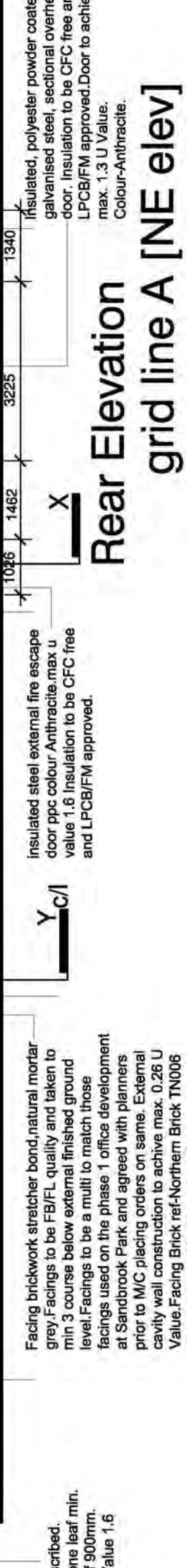
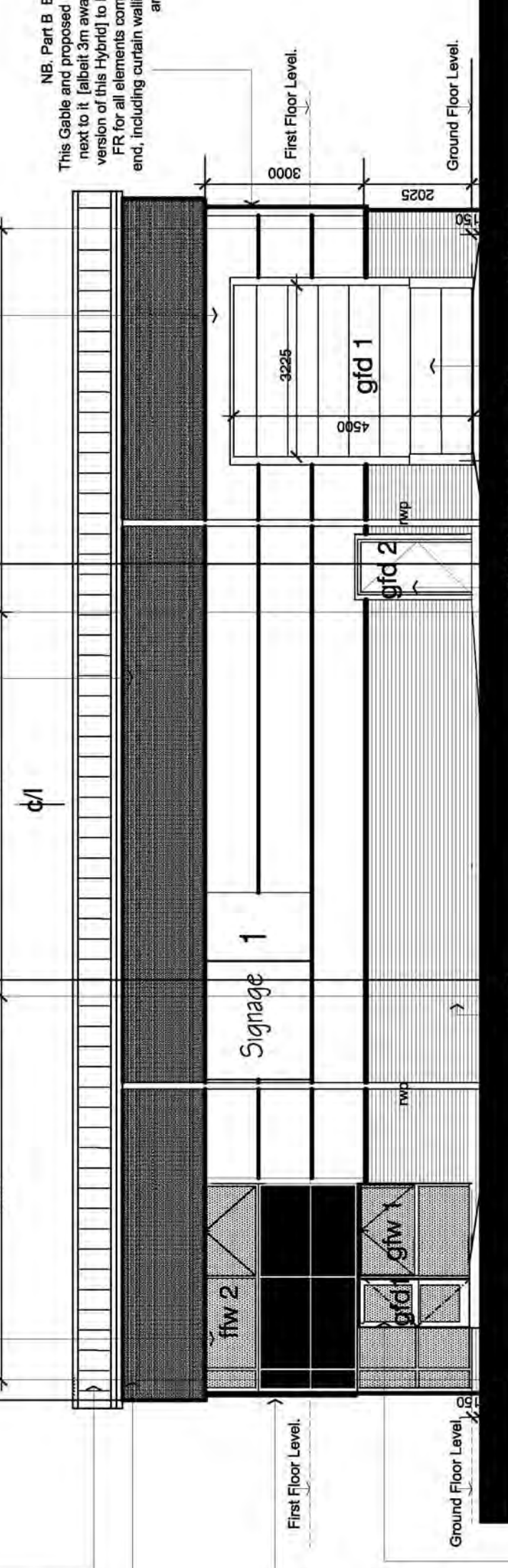
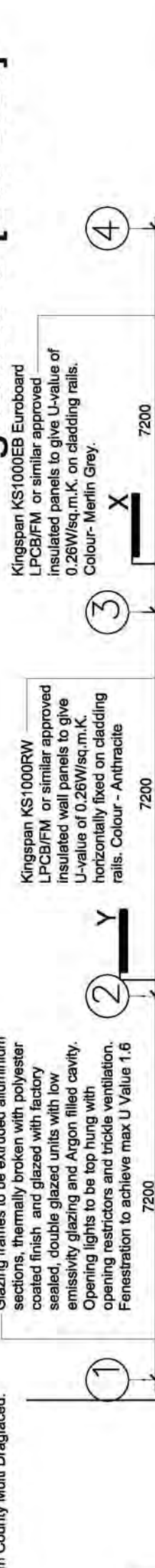
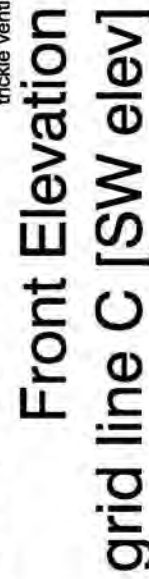
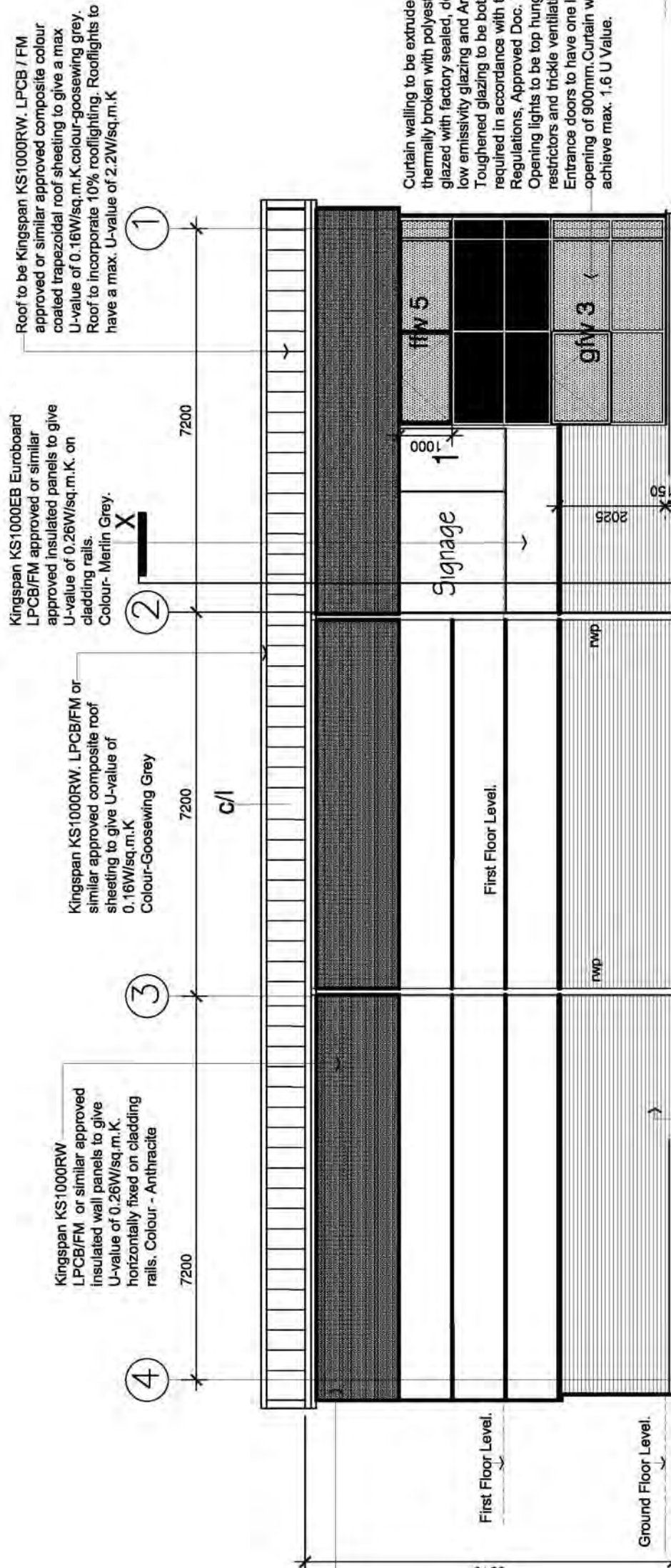
Block A [Alternative]
Plans, Elevations, Section
[higher plinth] Corner glazed

Drawn By	DE	Date	25.5.23	Drawing No.	
Checked By	DE	Date	25.5.23	WJ-204-0019	
Scale	1/100		@A1		

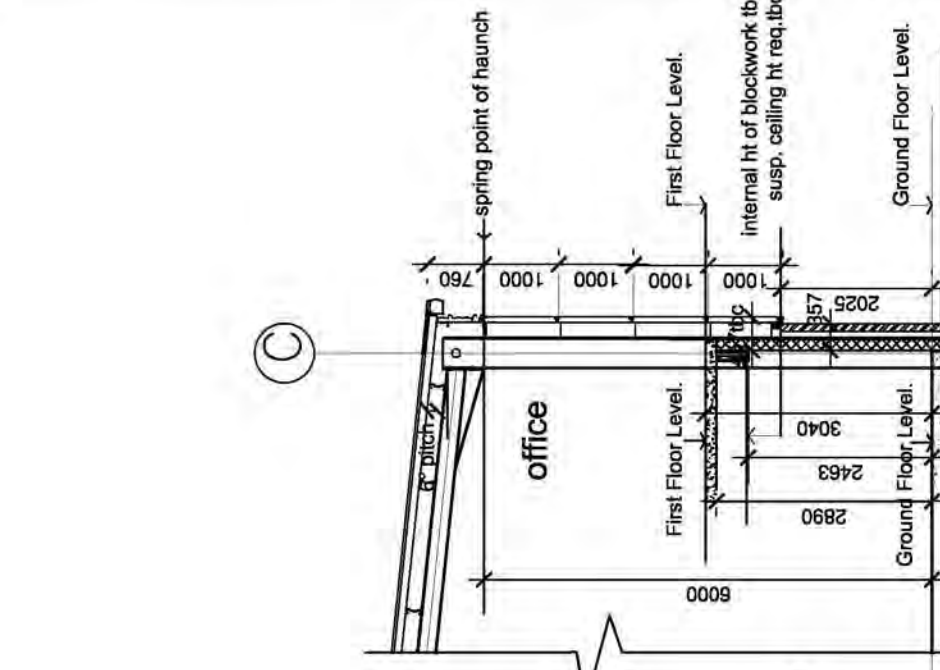


22175 overall brick dimension

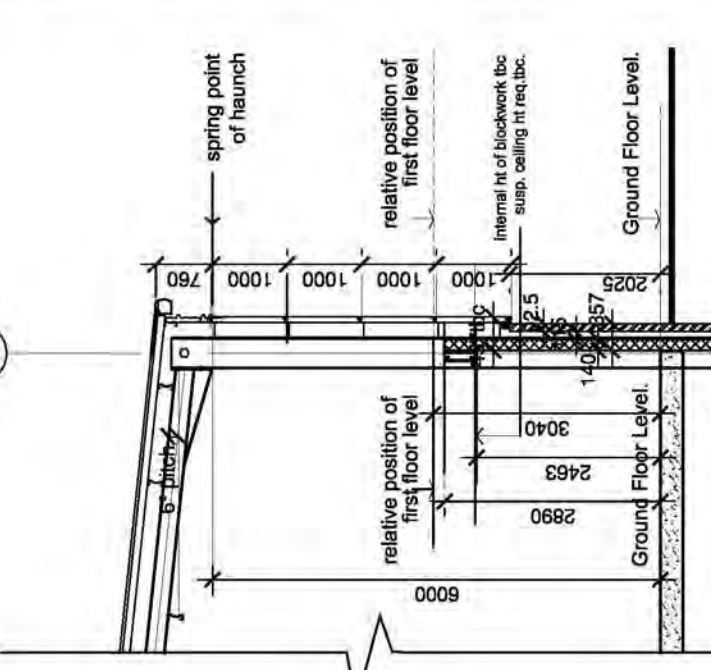
First Floor Plan



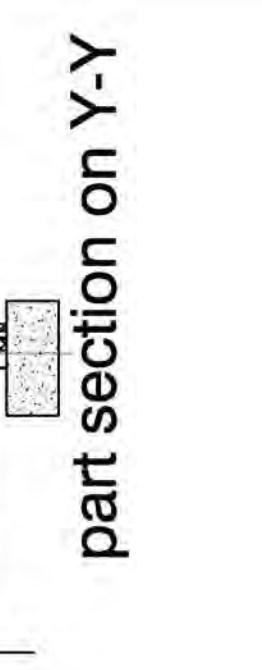
Ground Floor Plan



part section on X-X



part section on Y-Y



Internal Areas
Warehouse= 2217 sq.ft
Actual gf office= 580 sq.ft
Ancillary gf Space=560 sq.ft
FF Mezzanine storage space=1140 sq.ft
Total Space therefore=3357 sq.ft
not including first floor mezzanine storage

Drawn By	DE	Date	6.7.23	Drawing No.	Rev.
Checked By	DE	Date	6.7.23		
Scale	1/100	@A1			

[FINAL CHECKED DE J]
electronic path to this drawing-WJ 204/current dwg

[illegible]

CRITICAL DOOR DIMENSIONS

Internal Doors	-Minimum effective clear width 800mm
Entrance Doors	-Minimum effective clear width 900mm for one least
Fire Exit Doors	-Minimum effective clear width 850mm

All vision panels to have minimum zones of Visibility between 500mm to 800mm and 1150mm to 1500mm.

CRITICAL STAIR DIMENSIONS

Width between walls to be 1225mm [1200 between plaster faces]
Risers 18 No. @ 168.4mm max.
Gonges 250mm
Landings 1200mm
Handrail clearance to walls/steel to be 60mm
Handrails shall project past the first/last riser 300mm.
Handrails shall be between 45 and 45mm in diameter.
Handrails shall be between 900mm and 1000mm above pitch line of stairs
and between 900mm and 1100mm at start and end of stairs

REQUIRED U VALUES

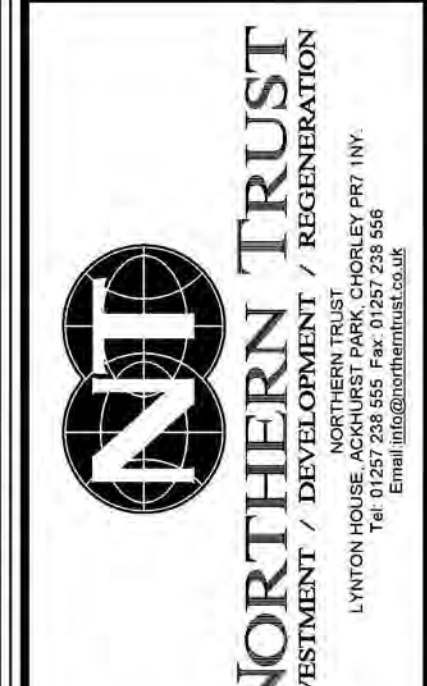
Warm Roof Construction-0.16 W/sq.m.K	Windows-1.6 W/sq.m.K
External Wall Construction-0.26 W/sq.m.K	Doors-2.2 W/sq.m.K
Floor Construction-0.18 W/sq.m.K	Personnel Doors-1.6W/sq.m.K
Applies under heated spaces i.e. wc's and ices).	Vehicle Access and Similar Large Doors- W/sq.m.K

offices and toilets are to be space heated. Mills to these spaces-0.26W/sqm K, 0.16 W/sqmK, floor 0.18 W/sq m K. The warehouses are to remain unheated the ground bearing slab under the warehouse space does not need to be insulated.



Date	Details	Drawn	Checked
25.4.24	resolution reduction req. by planners		
23.8.23	1 corner curtain walling omitted		
16.8.23	Reduced Hybrid for site fit.		

d for: **PLANNING**

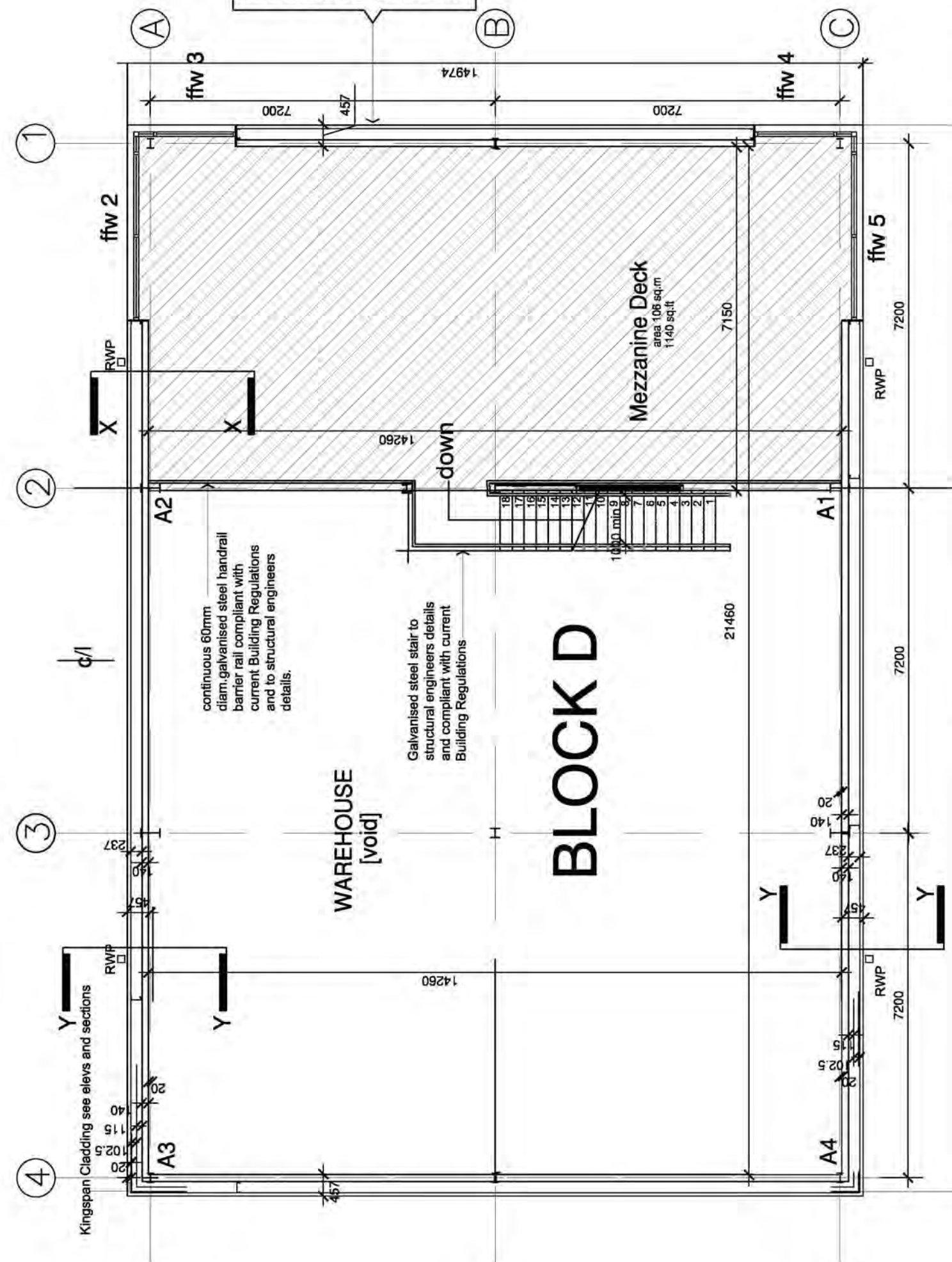
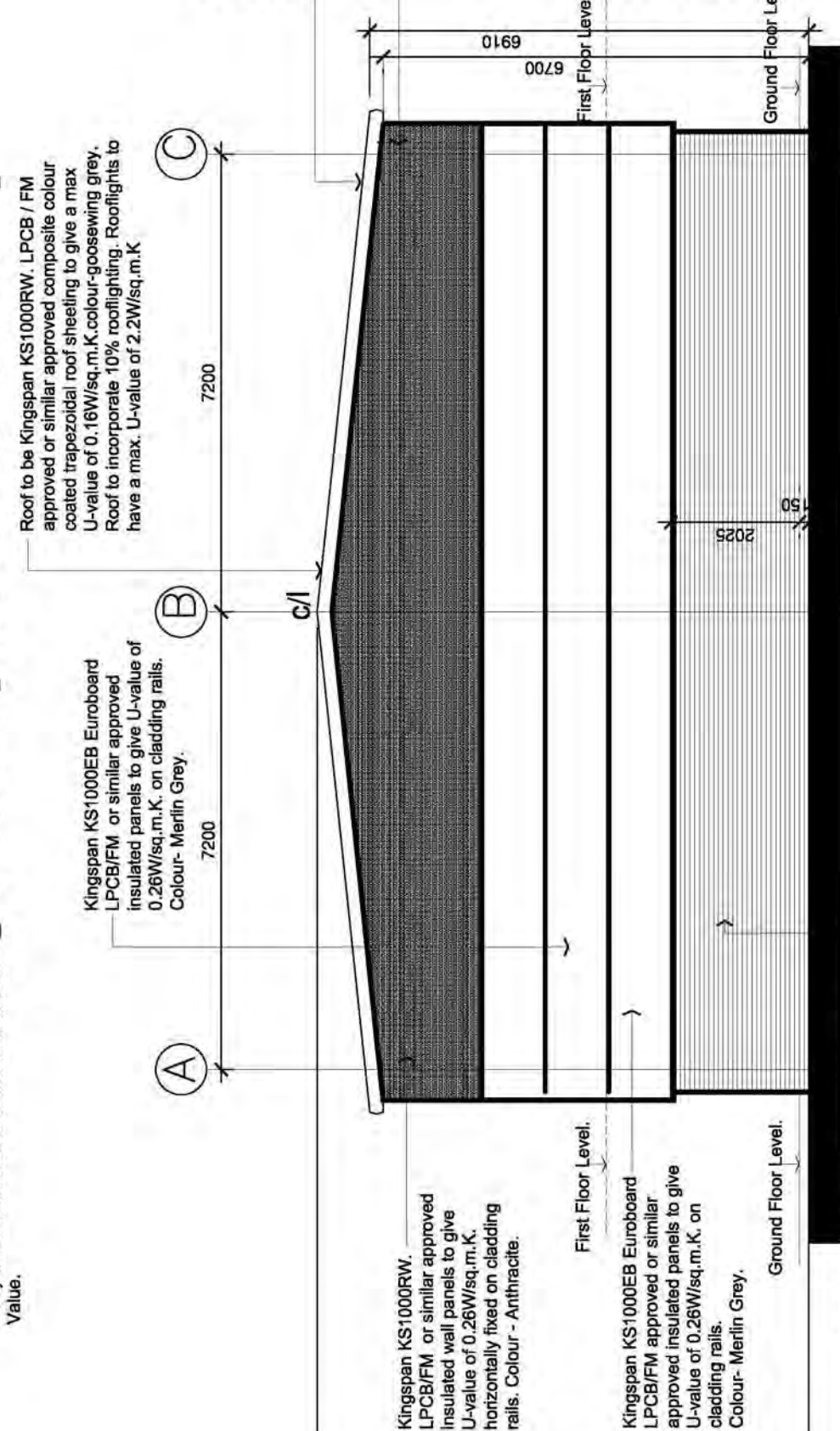
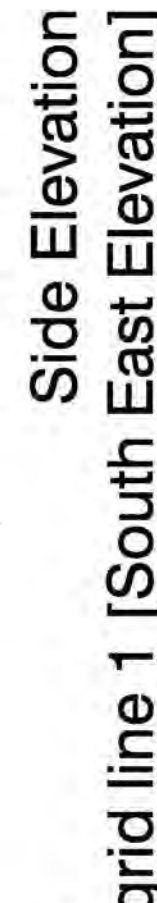
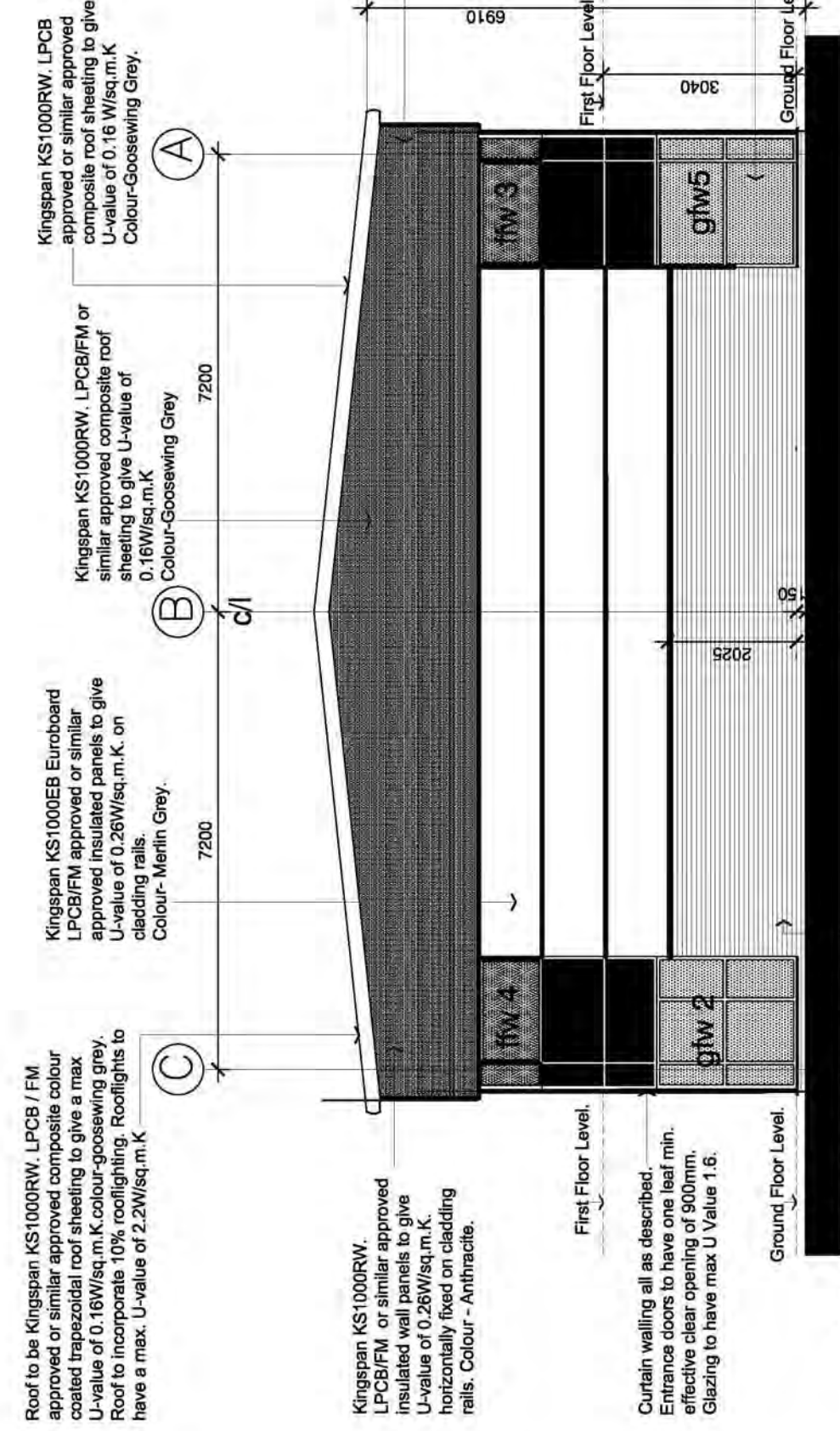


Northern Trust

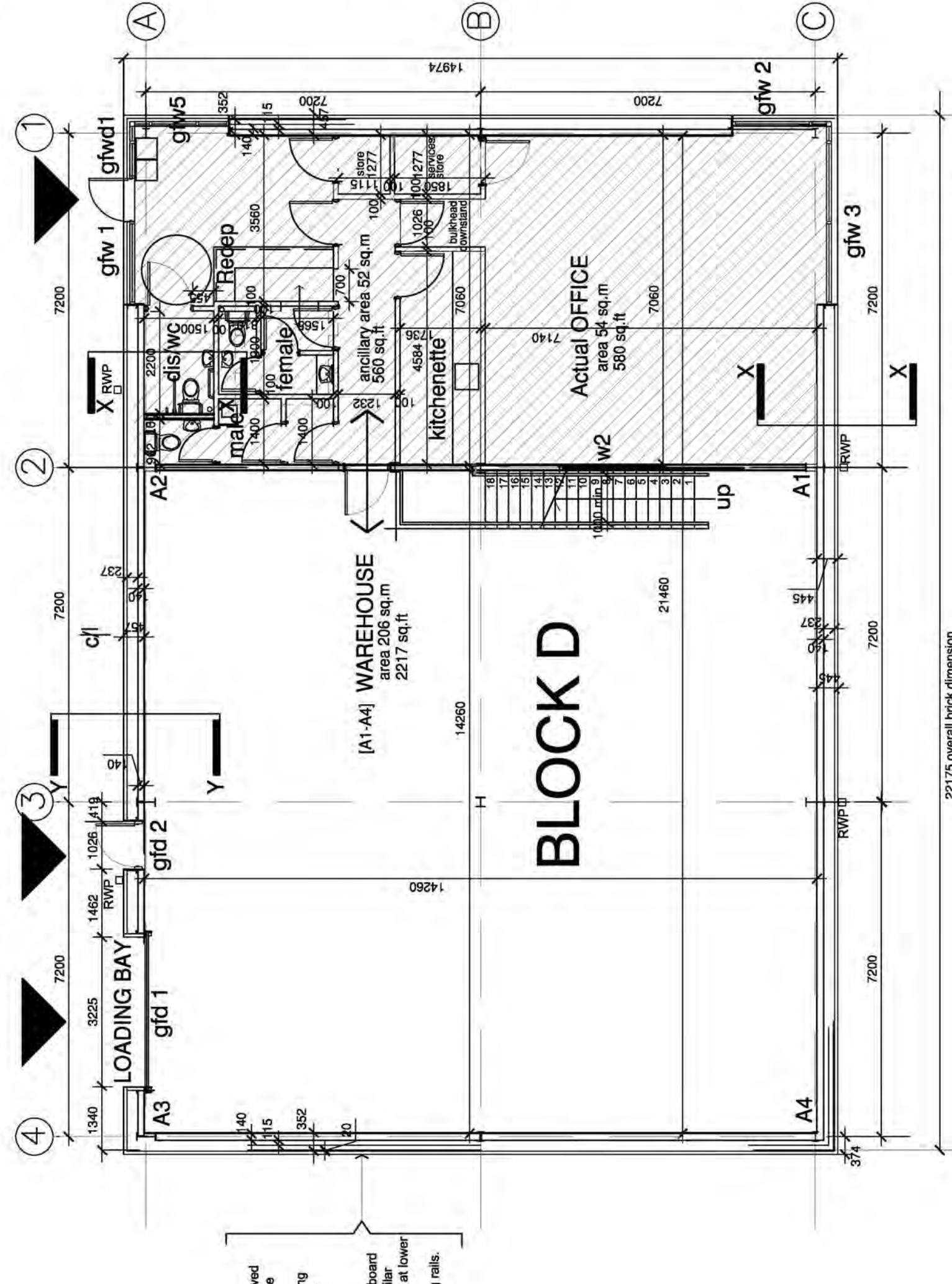
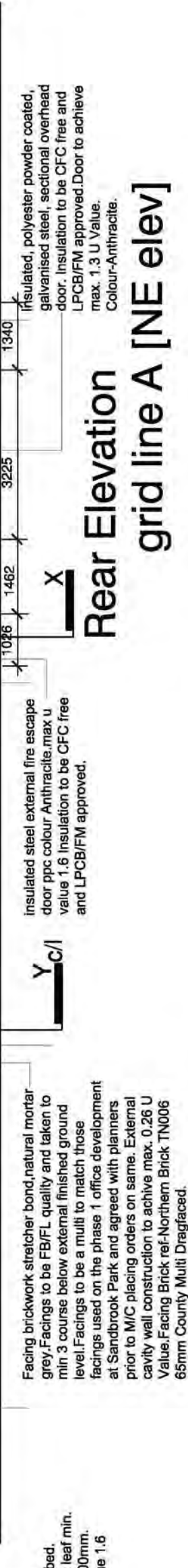
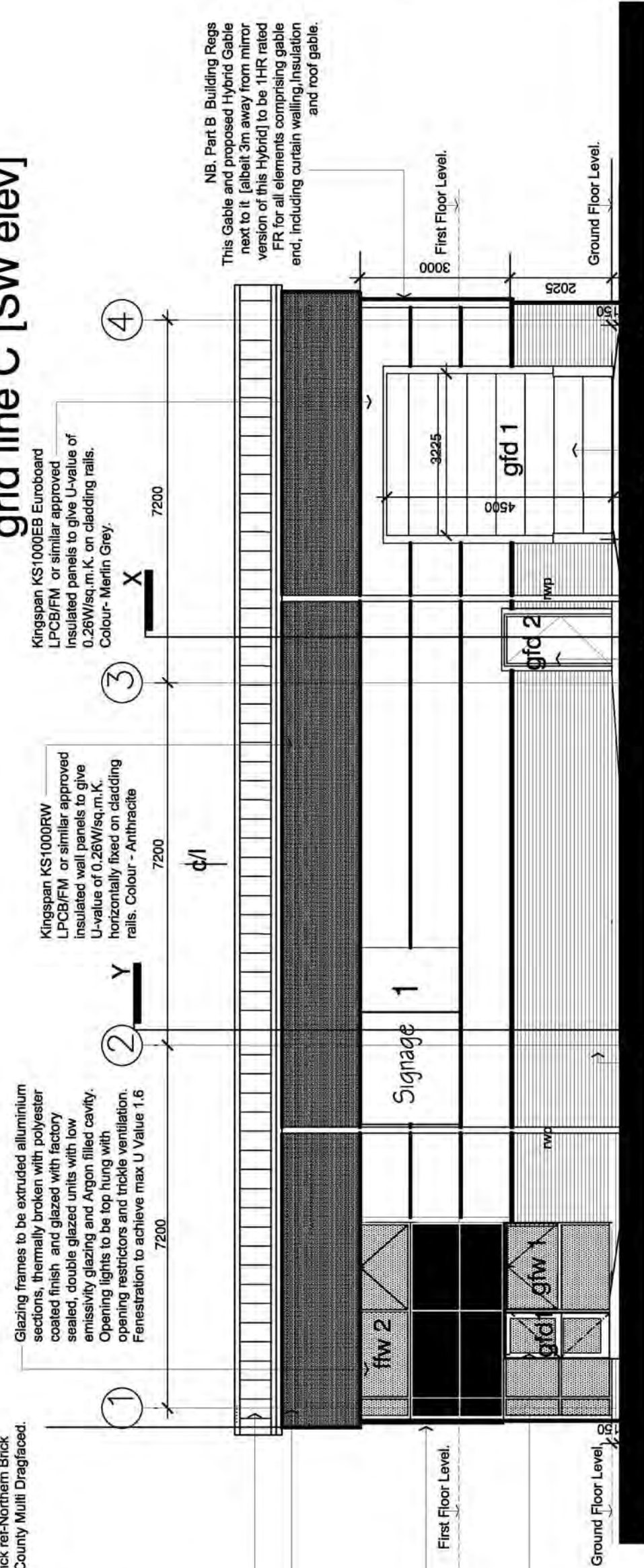
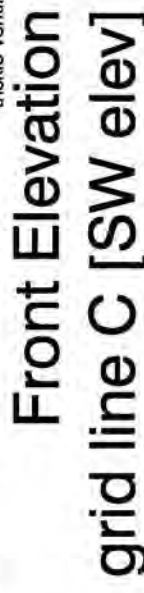
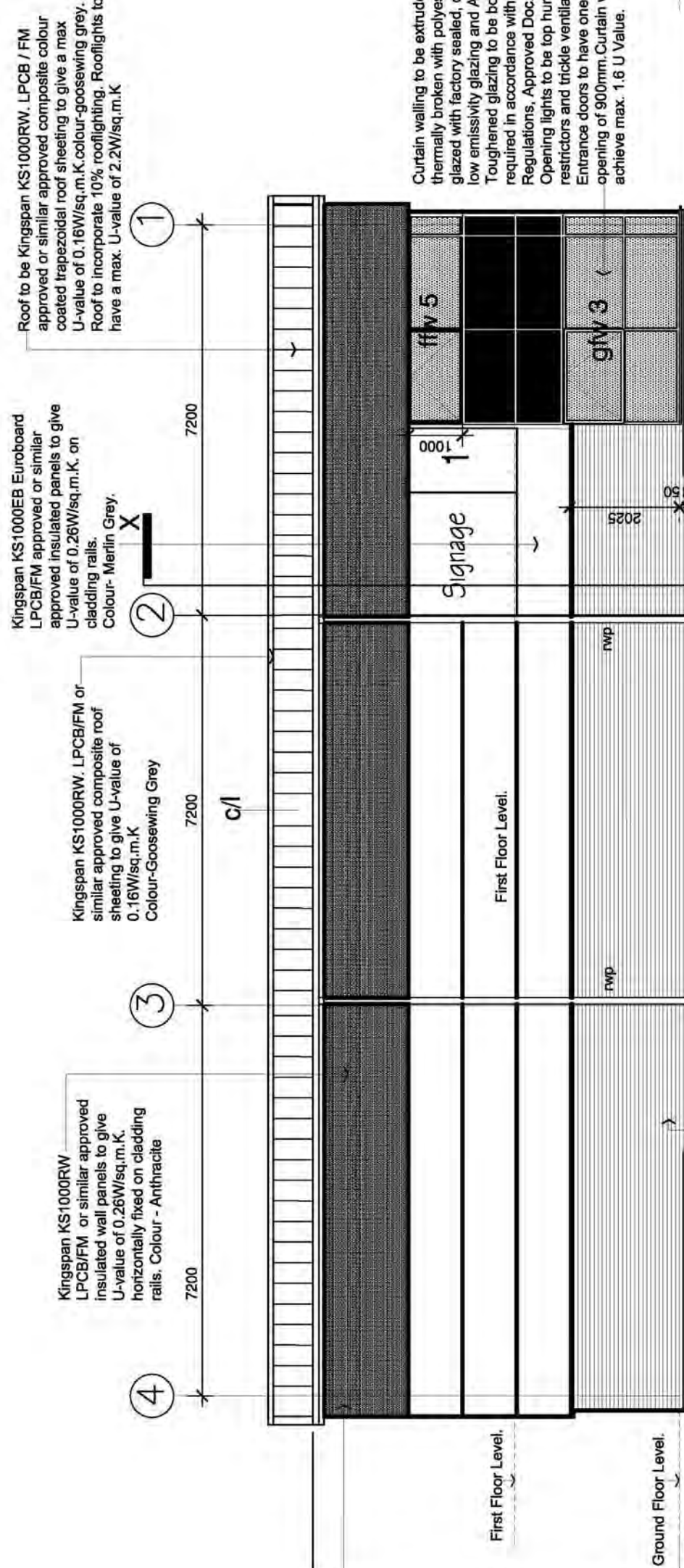
^dSANDBROOK PARK
ROCHDALE [phase 2] OL11 1RY
REDUCED HYBRID TYPE A1
Office/Industrial Unit

REDUCED HYBRID TYPE A1
Plans,Elevations,Section
higher plynth. BLOCK D

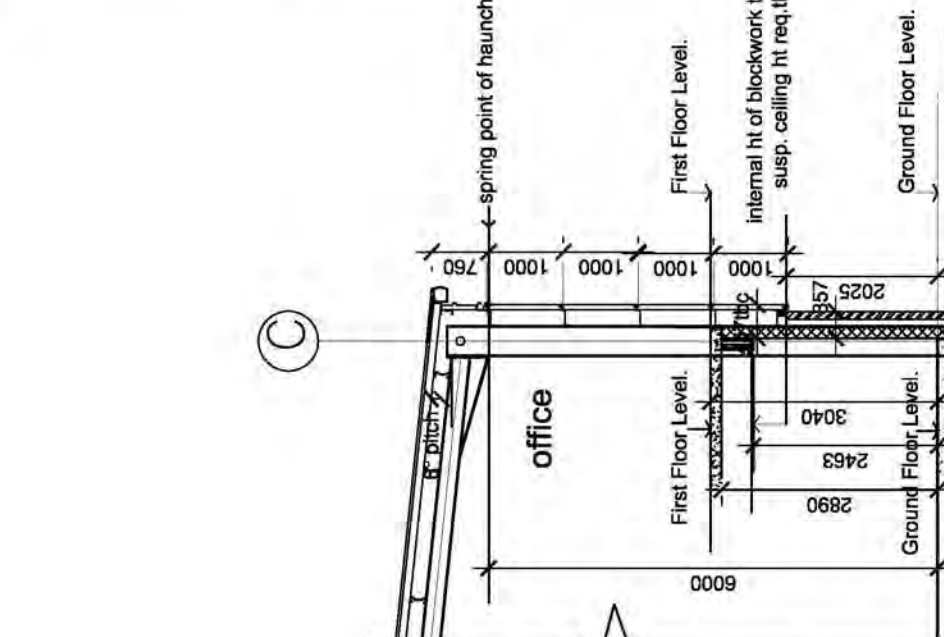
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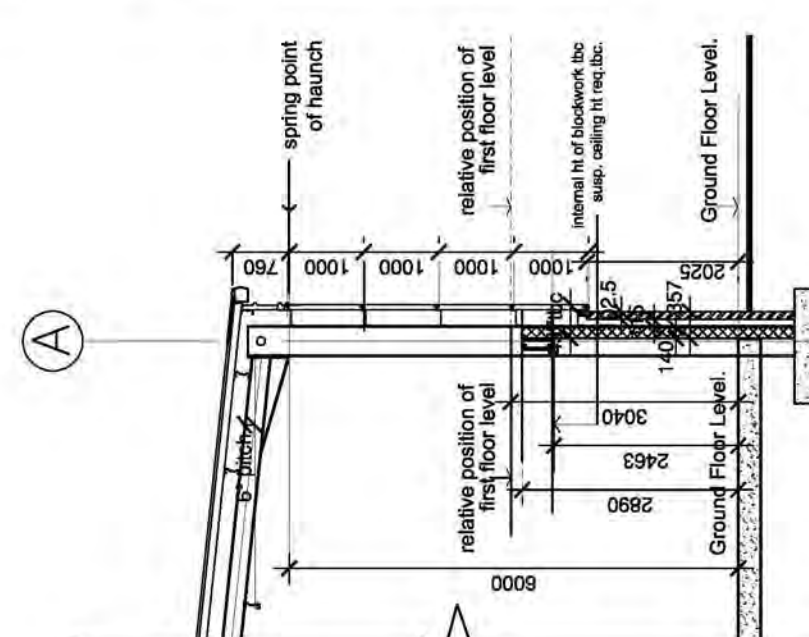
22175 overall brick dimension



Ground Floor Plan



part section on X-X



part section on Y-Y

Internal Areas

Warehouse= 2217 sq.ft

Actual gf office= 580 sq.ft

Ancillary gf Space=560 sq.ft

FF Mezzanine storage space=1140 sq.ft

Total Space therefore = 3357 sq.ft.

not including first floor mezzanine storage



Rev.	Date	Details	Drawn	Checked
C	25.4.24	resolution reduction req. by planners		
B	23.8.23	1 corner curtain walling omitted		
A	16.8.23	Reduced Hybrid for site fit.		

issued for: **PLANNING**



NORTHERN TRUST
INVESTMENT / DEVELOPMENT / REGENERATION

NORTHERN TRUST
LYNTON HOUSE, ACKHURST PARK, CHORLEY PR7 1NY.
Tel: 01257 238 555 Fax: 01257 238 556

Client
Northern Trust

Project **SANDBROOK PARK**

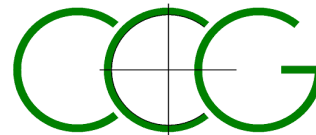
ROCHDALE [phase 2] OL11 1RY

REDUCED HYBRID TYPE A1

Drawing
REDUCED HYBRID TYPE A1
Plans, Elevations, Section
higher plyth. BLOCK D

Drawn By	DE	Date	6.7.23	Drawing No. WJ204-025	Rev. C
Checked By	DE	Date	6.7.23		
Scale	1/100		@A1		

APPENDIX B: SAMPLING METHODOLOGIES



SAMPLING, SAMPLE TRANSPORTATION, AND FIELD MONITORING PROTOCOLS

Soil, water and gas sampling and monitoring methodologies employed by **CC GEOTECHNICAL LTD** are presented hereunder.

SAMPLING OF SOIL FOR CHEMICAL ANALYSIS

Soil samples may be recovered from a variety of intrusive investigation methods including *inter alia* dynamic sampling boreholes, cable percussion boreholes, machine or manual excavation of trial pits.

All equipment which has the potential to introduce extraneous materials into soils – borehole casings, sampling drilling rods, borehole sampling tools, hand tools such as trowels and spades etc. – must be cleaned by jet washing before initial use and between sampling positions.

Cable Percussion Boreholes

In this method of investigation disturbed bulk and small disturbed samples are recovered at regular depth increments throughout the length of the borehole. Each bulk/small disturbed sample is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. Where possible, samples are immediately scanned by PID.

Light Dynamic Sampling Boreholes

In this method of investigation samples are recovered in relatively undisturbed 1m long Perspex liners. Each liner is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. The liner tubes are sealed by air tight caps fitted at each end, and are temporarily stored out of sunlight. Where possible, samples are immediately split, scanned by PID, logged and subsampled. In the event that splitting and logging on site is not practicable, then the liners are immediately transported to the laboratory where they are immediately split, scanned by PID, logged and subsampled.

Trial Pits

Samples are to be taken from the bucket of an excavator and placed in appropriate airtight containers. Each container is uniquely labelled with the Project No / Trial Pit No / Depth / Date. The samples are then immediately placed in a cool box chilled by ice packs, and the boxes are sealed for transportation to the chemical laboratory.

Sampling Containers

Containers used to store soil samples are selected dependant on the required analysis. The testing laboratory will be consulted should there be any doubt as to the correct sampling container. Typically, a minimum of 1nr 1kg plastic tub, 1nr 500g plastic tub, 1nr 250g amber glass jar and 2nr glass vials are taken at each sample depth. Samples held on site awaiting same day courier collection are stored at 4°C in a cool box. Only in circumstances where same day collection cannot be arranged are samples held overnight, and in this event all samples are refrigerated at 4 °C either on site (if a refrigerator is available) or at CC GEOTECHNICAL soil laboratory. Courier collection is then arranged for immediate pick up the following day.

Chain of Custody records

A Chain of Custody Record (CoC) is to be sent with each batch of samples submitted to the testing laboratory. A copy of the CoC will be made available for inspection by the client, their agents, or any requesting regulatory authority.

HEADSPACE ANALYSES

Duplicate subsamples of all soil samples selected for laboratory analysis may be taken for headspace analyses.

Headspace analysis is undertaken using a MiniRae 2000 Photo Ionisation Detector (PID). In the test method, an amber glass jar is half filled with soil, and the lid is sealed with aluminium foil secured by an elastic band. The jar and contents are agitated for 30 seconds and left for a minimum of 30 minutes out of direct sunlight for the headspace to achieve equilibrium. The PID then pierces the seal and the maximum reading is recorded. Prevailing weather conditions and ambient air temperature are also recorded.

The PID headspace results are recorded on the exploratory borehole or trial pit logs.

PID headspace data is then used to inform the chemical testing schedule for volatile organic compounds analyses.

SAMPLING OF GROUNDWATER FOR CHEMICAL ANALYSIS

Groundwater is sampled from standpipes or piezometers installed during borehole drilling. On completion of the construction of the standpipe, the installation is initially developed by removing up to 10 x the internal volume of the

installation. The volume of water purged is recorded. The installation is then typically left for a week for hydraulic equilibrium to be restored.

Prior to sampling the standpipe, the depth to the water table, and the depth to the base of the installation are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

A minimum of 3 x the installation volume is then removed. The pH of the water is then monitored and the sample is taken when the change in pH between any two consecutive extracts is less than 10%. The volume of water removed is recorded.

A sample comprises of a minimum of 3 litres. Two litres are taken in amber glass bottles, and one litre in a plastic bottle.

To avoid cross-contamination one bailer is used per position.

The samples are uniquely labelled with Project Name / Project No / Borehole No / Depth / Date Sampled. They are placed in a cool box chilled by ice packs, and the containers are sealed for transportation to the laboratory.

Once the samples are received in the **CC GEOTECHNICAL LTD** laboratory, the samples are stored in a refrigerator and returned to the cool boxes once collected.

Water taken from the installations are taken back to the **CC GEOTECHNICAL LTD** laboratory and disposed.

Other data recorded in the sampling comprises:

- Volume of water removed during development of well
- Volume of water removed during purging of the well
- Results of on-site pH analyses
- Sample appearance – colour, suspended solids

MONITORING OF GAS

Prior to embarking on a gas-monitoring round, all equipment is checked for functionality and the calibration status is confirmed.

At the commencement of the monitoring round, the prevailing weather conditions, air temperature, barometric pressure and direction of movement of barometric pressure are recorded.

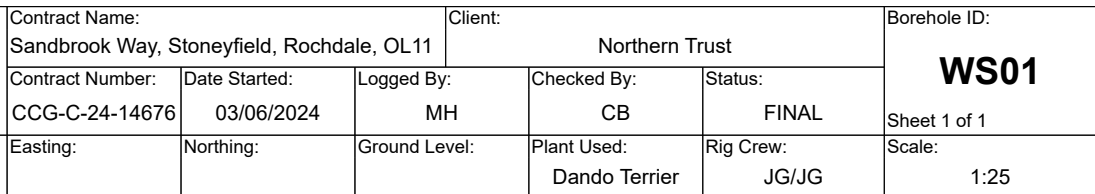
The flow meter is first attached to the standpipe valve, and the flow rate is measured (peak and steady flow) for 1 minute. The results are recorded in l.hr^{-1} . The flow meter tube is protected from the effects of wind by aligning the exhaust downwind.

Following measurement of borehole flow rate, the installation is left for a minimum of 10 minutes for the headspace to restore equilibrium.

Once the gas in the installation has regained equilibrium, the gas analyser is connected and monitoring commences. The peak and steady state readings for CH_4 , CO_2 , CO , H_2S and CO are recorded. The steady state is monitored for a minimum of one minute, and possibly up to a maximum of 10 minutes where fluctuations continue.

When the monitoring is complete, the depth to the water table, and the depth to the base of the well are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

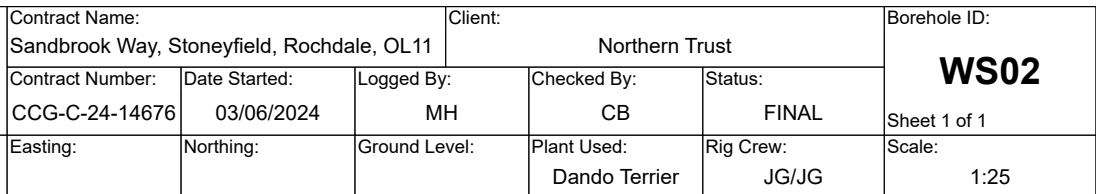
APPENDIX C: BOREHOLE LOGS



Samples & In Situ Testing	Strata Details	Groundwater
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Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U					Grassed TOPSOIL with occasional brick cobbles		
0.30	ES			(0.40)				
0.50	ES			0.40		Firm dark brown slightly sandy gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subround of brick sandstone and concrete (MADE GROUND)		
1.00	ES	HVP=60					1	
1.00 - 2.00	U	SPT(S)N=10 (2,3/2,3,3,2)		(1.45)				
1.50	ES	HVP=70						
2.00 - 3.00	U	SPT(S)N=9 (2,3/3,2,2,2)		1.85 2.00		Grey / light brown very gravelly silty SAND. Gravel is fine to coarse angular to subround of brick and concrete (MADE GROUND) Firm dark brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse angular to subround of brick and sandstone (MADE GROUND)	2	
		HVP=110		(1.10)				
3.00 - 4.00	U	SPT(S)N=12 (2,4/3,3,4,2)		3.10		Medium dense dark brown very gravelly silty SAND with occasional small cobbles and frequent pockets of organic soils. Gravel is fine to coarse angular to subround of brick sandstone quartz and concrete (MADE GROUND)	3	
4.00 - 5.00	U	SPT(S)N=15 (3,2/3,4,4,4)		(1.90)			4	
		SPT(S)N=14 (3,4/3,3,4,4)		5.00		End of Borehole at 5.00m	5	

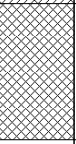
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
									1hr hand digging / CAT scanning borehole starter pit					
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	0.50	PLAIN	50				0		Dry
					0.50	5.00	SLOTTED	50						
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com														

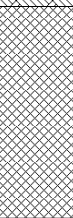


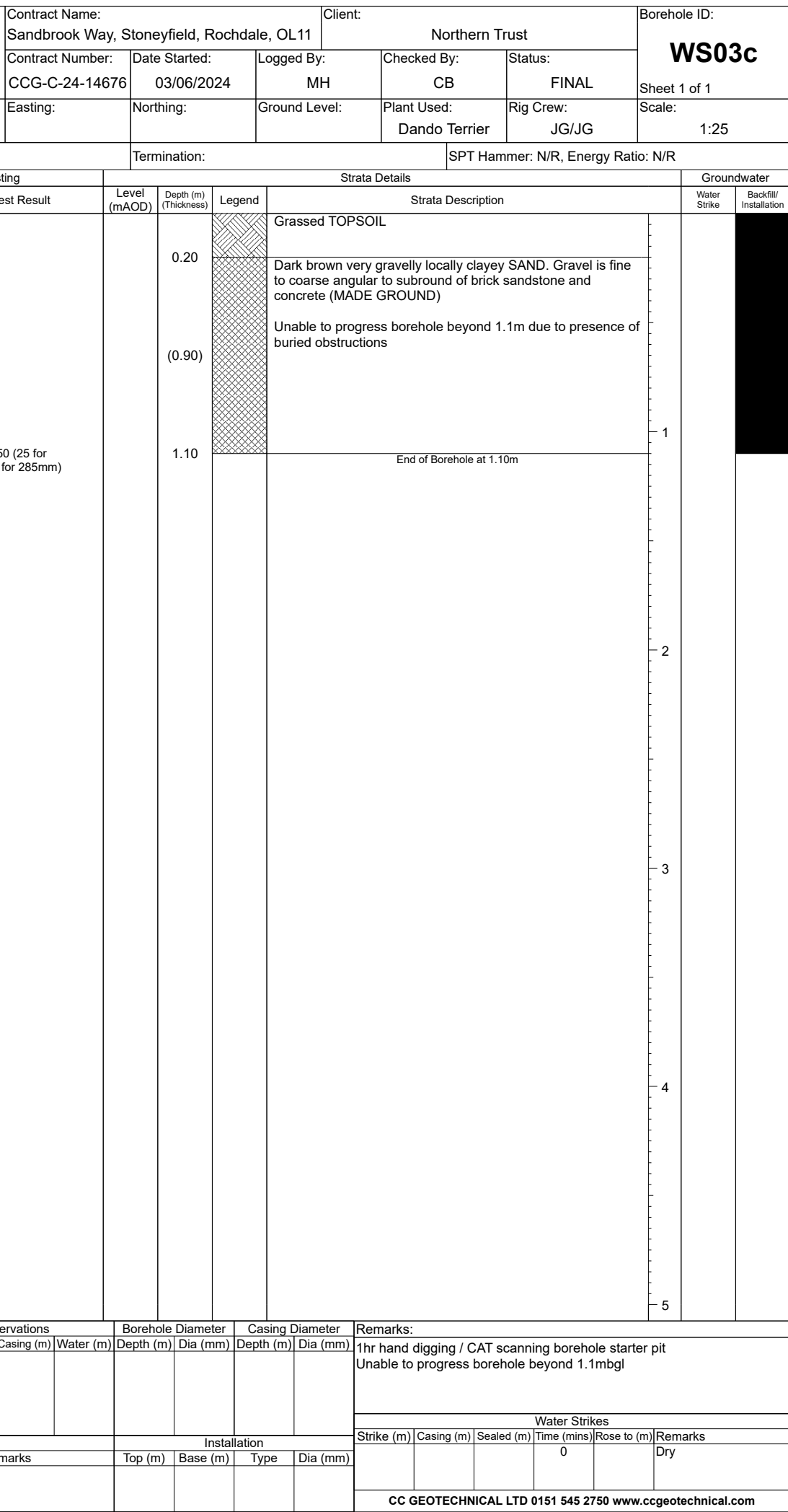
Samples & In Situ Testing	Strata Details	Groundwater
---------------------------	----------------	-------------

Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation
0.00 - 1.00	U					Grassed TOPSOIL			
0.20	ES			0.20		Medium dense dark brown very gravelly, locally clayey silty SAND with medium cobble content. Gravel is fine to coarse angular to subround of brick concrete glass and sandstone (MADE GROUND)			
0.50	ES								
1.00	ES								
1.00 - 2.00	U	SPT(S)N=18 (3,3/2,4,6,6)		(1.20)			1		
1.50	ES			1.40		Firm dark brown slightly gravelly slightly sandy silty CLAY with low cobble content. Gravel is fine to coarse angular to subround of brick cinders and concrete (MADE GROUND)			
				(0.60)					
2.00 - 3.00	U	HVP=70 SPT(S)N=11 (4,4/3,2,3,3)		2.00		Medium dense dark brown clayey gravelly SAND. Gravel is fine to coarse angular to subround of brick and concrete (MADE GROUND)	2		
				(0.45)					
				2.45		Firm dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subround of brick and concrete (MADE GROUND)			
				(0.65)					
3.00 - 4.00	U	SPT(S)N=9 (3,4/3,2,2,2)		3.10		Loose becoming medium dense brown very gravelly silty SAND. Gravel is fine to coarse angular to subangular of sandstone and quartz	3		
4.00 - 5.00	U	SPT(S)N=10 (2,1/2,2,3,3)		(1.70)			4		
				4.80		Brown very gravelly silty SAND. Gravel is fine to coarse angular to subround of sandstone and quartz			
		SPT(S)N=13 (4,3/4,3,3,3)		5.00		End of Borehole at 5.00m	5		

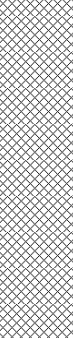
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1hr hand digging / CAT scanning borehole starter pit					
Chiselling					Installation				Water Strikes					
									Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)				0		Dry
					0.00	0.50	PLAIN	50						
					0.50	5.00	SLOTTED	50						
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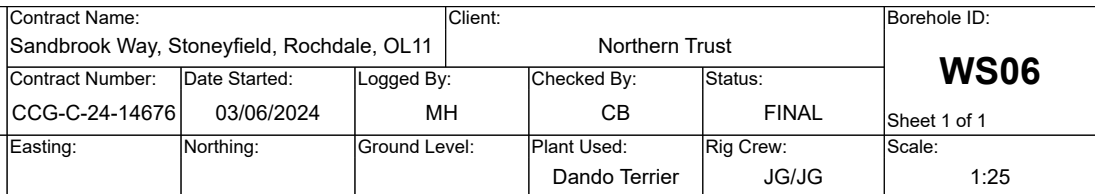
	Contract Name: Sandbrook Way, Stoneyfield, Rochdale, OL11				Client: Northern Trust			Borehole ID: WS03a					
	Contract Number: CCG-C-24-14676		Date Started: 03/06/2024		Logged By: MH	Checked By: CB	Status: FINAL	Sheet 1 of 1					
	Dynamic Sampling Borehole Log		Easting:		Northing:		Ground Level:		Plant Used: Dando Terrier	Rig Crew: JG/JG	Scale: 1:25		
Weather:				Termination:				SPT Hammer: N/R, Energy Ratio: N/R					
Samples & In Situ Testing					Strata Details					Groundwater			
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/ Installation			
0.00 - 0.70	U	SPT(S)50 (10,4/50 for 170mm)				Grassed topsoil with frequent brick gravels							
0.20	ES			0.25			Dark brown gravelly SAND. Gravel is fine to coarse angular to subround of sandstone brick and concrete (MADE GROUND)						
0.50	ES			(0.45)			Unable to progress borehole beyond 0.7mbgl due to buried obstructions						
				0.70			End of Borehole at 0.70m						
										1			
										2			
										3			
										4			
										5			
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1hr hand digging / CAT scanning borehole starter pit Unable to progress borehole beyond 0.7mbgl				
Chiselling					Installation				Water Strikes				
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
											0		Dry
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	Contract Name: Sandbrook Way, Stoneyfield, Rochdale, OL11				Client: Northern Trust			Borehole ID: WS03b					
	Contract Number: CCG-C-24-14676		Date Started: 03/06/2024		Logged By: MH	Checked By: CB	Status: FINAL	Sheet 1 of 1					
	Dynamic Sampling Borehole Log		Easting:		Northing:		Ground Level:		Plant Used: Dando Terrier	Rig Crew: JG/JG	Scale: 1:25		
Weather:				Termination:				SPT Hammer: N/R, Energy Ratio: N/R					
Samples & In Situ Testing					Strata Details					Groundwater			
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description				Water Strike	Backfill/ Installation		
0.00 - 0.90	U	HVP=30		0.20		Grassed TOPSOIL with frequent brick concrete gravels							
0.30	ES			(0.70)		Firm dark brown gravelly sandy CLAY. Gravel is fine to coarse angular to subround of brick concrete and tarmac (MADE GROUND)							
0.50	ES					Unable to progress borehole beyond 0.9m due to presence of buried obstructions							
0.90	ES	SPT(S)50 (25 for 125mm/50 for 200mm)		0.90		End of Borehole at 0.90m				1			
											2		
											3		
											4		
											5		
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1hr hand digging / CAT scanning borehole starter pit Unable to progress borehole beyond 0.9mbgl				
Chiselling					Installation		Water Strikes						
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
											0		Dry
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	Contract Name: Sandbrook Way, Stoneyfield, Rochdale, OL11				Client: Northern Trust			Borehole ID: WS04							
	Contract Number: CCG-C-24-14676		Date Started: 03/06/2024		Logged By: MH		Checked By: CB		Status: FINAL						
	Easting:		Northing:		Ground Level:		Plant Used: Dando Terrier		Rig Crew: JG/JG						
Dynamic Sampling Borehole Log								Scale: 1:25							
Weather:				Termination:				SPT Hammer: N/R, Energy Ratio: N/R							
Samples & In Situ Testing				Strata Details						Groundwater					
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description				Water Strike	Backfill/ Installation				
0.00 - 1.00	U			0.10		Grassed TOPSOIL				1					
0.30	ES			(0.40)		Dark brown very silty gravelly SAND. Gravel is fine to coarse angular to subround of concrete brick and sandstone (MADE GROUND)									
0.50	ES			0.50		Medium dense becoming loose dark brown very sandy silty GRAVEL. Gravel is fine to coarse angular to subround of brick concrete and sandstone (MADE GROUND)									
1.00	ES	SPT(S)N=14 (3,4/4,4,3,3)		(1.90)						2					
1.00 - 2.00	U														
1.50	ES														
2.00 - 3.00	U	SPT(S)N=9 (3,2/2,2,2,3)		2.40		Loose dark brown very gravelly silty SAND. Gravel is fine to coarse angular to subround of brick (MADE GROUND)				3					
3.00 - 4.00	U	SPT(S)N=7 (3,2/2,2,1,2)		(0.90)											
				3.30								Loose dark brown very sandy silty GRAVEL. Gravel is fine to coarse angular to subround of ceramics concrete cinders and brick (MADE GROUND)			
4.00 - 5.00	U	SPT(S)N=7 (1,1/2,2,2,1)		(1.00)						4					
				4.30								Loose becoming medium dense dark brown very gravelly silty SAND. Gravel is fine to coarse angular to subround of concrete and brick (MADE GROUND)			
				(0.70)											
		SPT(S)N=12 (2,3/3,3,3,3)		5.00		End of Borehole at 5.00m				5					
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:						
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1hr hand digging / CAT scanning borehole starter pit						
Chiselling					Installation				Water Strikes						
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks		
								1.50			0		Slight ingress		
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	Contract Name: Sandbrook Way, Stoneyfield, Rochdale, OL11				Client: Northern Trust			Borehole ID: WS05								
	Contract Number: CCG-C-24-14676		Date Started: 03/06/2024		Logged By: MH	Checked By: CB	Status: FINAL	Sheet 1 of 1								
	Easting:		Northing:		Ground Level:	Plant Used: Dando Terrier	Rig Crew: JG/JG	Scale: 1:25								
Dynamic Sampling Borehole Log																
Weather:					Termination:					SPT Hammer: N/R, Energy Ratio: N/R						
Samples & In Situ Testing					Strata Details					Groundwater						
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description				Water Strike	Backfill/ Installation					
0.00 - 1.00	U	SPT(S)N=14 (3,3/4,4,3,3)		(0.30)		Grassed TOPSOIL with frequent brick gravels				1						
0.20	ES			0.30		Medium dense dark brown very gravelly silty SAND. Gravel is fine to coarse angular to subround of brick sandstone and concrete (MADE GROUND)										
0.50	ES															
1.00	ES															
1.00 - 2.00	U			(2.30)												
1.50	ES															
2.00 - 3.00	U	SPT(S)N=8 (3,3/2,2,2,2)														
2.60	U										2.80	Loose brown silty fine and medium grained SAND				
3.00 - 4.00											2.60					Dark brown silty fine and medium grained SAND
4.00 - 5.00	U	(1.90)														
								4.70	Firm brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse angular to subround of quartz sandstone and mudstone							
								5.00					End of Borehole at 5.00m			
SPT(S)N=9 (1,2/2,2,2,3)									5							
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
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SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
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SPT(S)N=14 (3,3/4,4,3,3)																
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SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=9 (1,2/2,2,2,3)																
HVP=60																
SPT(S)N=8 (2,3/2,2,2,2)																
SPT(S)N=4 (1,0/0,1,1,2)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=14 (3,3/4,4,3,3)																
SPT(S)N=8 (3,3/2,2,2,2)																
SPT(S)N=4 (1,0/0																

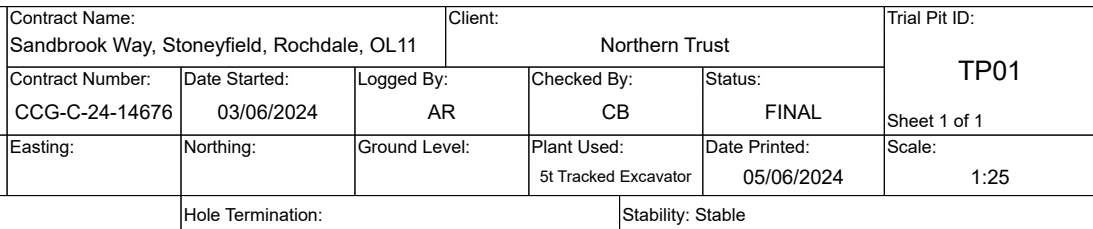


Samples & In Situ Testing	Strata Details	Groundwater
---------------------------	----------------	-------------

Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U					Medium dense varying to very loose dark brown very clayey locally gravelly SAND. Gravel is fine to coarse angular to subround of limestone sandstone brick and concrete (MADE GROUND)		
0.30	ES							
0.50	ES							
1.00	ES						1	
1.00 - 2.00	U	SPT(S)N=26 (2,2/3,8,8,7)						
1.50	ES			(3.20)				
2.00 - 3.00	U	SPT(S)N=12 (3,3/3,2,3,4)					2	
3.00 - 4.00	U	SPT(S)N=3 (3,3/2,0,0,1)					3	
				3.20		Very loose black / dark brown pseudo-fibrous PEAT		
				(1.30)				
4.00 - 5.00	U	SPT(S)N=5 (0,0/1,1,2,1)					4	
				4.50		Very soft grey / brown slightly sandy silty CLAY		
				(0.35)				
		HVP=30		4.85		Dark brown silty fine and medium grained SAND		
		SPT(S)N=5 (1,1/2,1,1,1)		5.00		End of Borehole at 5.00m	5	

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1hr hand digging / CAT scanning borehole starter pit					
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	0.50	PLAIN	50	3.50			0		Slight ingress
					0.50	5.00	SLOTTED	50						
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APPENDIX D: TRIAL PIT LOGS



Dimensions:

Final Depth: 2.20m

Length (m)

1.20m

Width (m)

0.60m

Orientation: °

Inclination: °

General Remarks:

TP utilised for undertaking soil permeability tests in accordance with BRE Digest 365

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

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	Contract Name: Sandbrook Way, Stoneyfield, Rochdale, OL11		Client: Northern Trust			Trial Pit ID: TP02																				
	Contract Number: CCG-C-24-14676	Date Started: 03/06/2024	Logged By: AR	Checked By: CB	Status: FINAL	Sheet 1 of 1																				
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5t Tracked Excavator	Date Printed: 05/06/2024	Scale: 1:25																				
	Weather:		Hole Termination:		Stability: Stable																					
Samples & In Situ Testing			Strata Details				Water	Backfill																		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description																				
0.20	ES			0.15		Grassed TOPSOIL with occasional brick gravels																				
0.40	B			(0.55)		Brown very gravelly sandy CLAY. Gravel is fine to coarse angular to subround of brick concrete and ceramic (MADE GROUND)																				
0.50	ES																									
0.80	B			0.70		Brown silty gravelly SAND (Possibly MADE GROUND)																				
0.90	ES																									
1.40	B			(1.00)			1																			
				1.70		End of Trial Pit at 1.70m	2																			
							3																			
Dimensions:			General Remarks:																							
Final Depth: 1.70m			TP utilised for undertaking soil permeability tests in accordance with BRE Digest 365																							
← Length (m) → 1.60m ↑ Width (m) ↓ 0.60m Orientation: ° ←																										
Inclination: °			<table><tr><td colspan="6">Water Strikes</td></tr><tr><td>Strike (m)</td><td>Casing (m)</td><td>Sealed (m)</td><td>Time (mins)</td><td>Rose to (m)</td><td>Remarks</td></tr><tr><td></td><td></td><td></td><td>0</td><td></td><td>Dry</td></tr></table>						Water Strikes						Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks				0		Dry
Water Strikes																										
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																					
			0		Dry																					
			CC GEOTECHNICAL LTD 0151 545 2750 www.ccgteotechnical.com																							

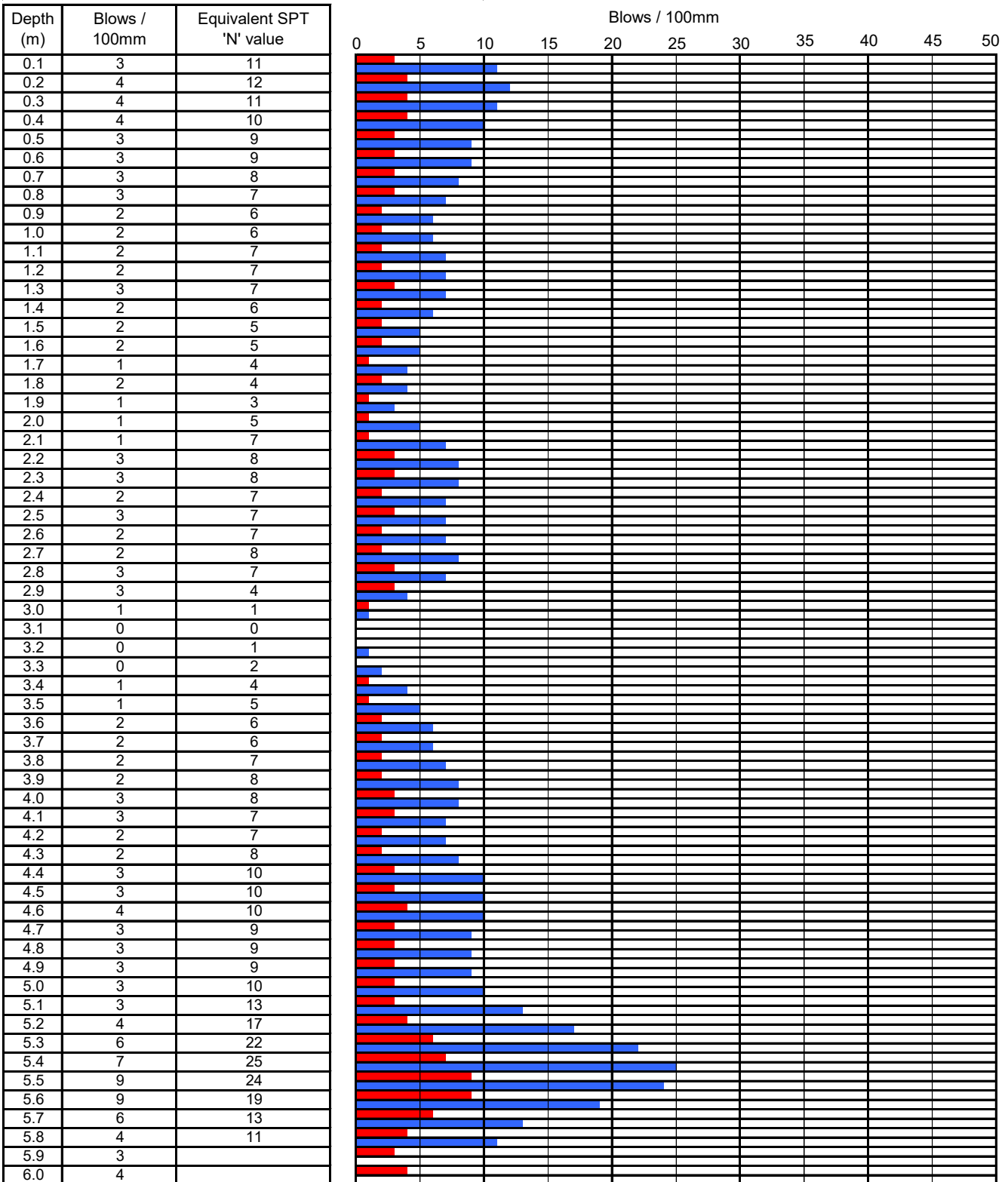


CC GEOTECHNICAL LTD
Unit 1, Deltic Way, Knowsley Industrial Estate,
L33 7BU
Tel: 0151 545 2750 Fax: 0151 548 7892

DYNAMIC PROBE TEST RESULTS SHEET

SITE: Sandbrook Way, Stoneycroft, R'dale
CLIENT: Northern Trust
PROBE NUMBER: TP02 1 of 2
DATE:

DPSH IN ACCORDANCE WITH BS 1377: PART 9: CLAUSE 3.2
CONE BURIED:
PROBE HOLE BACKFILLED:
REMARKS:

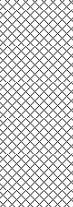


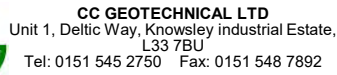
Dynamic probe value (Blows/100mm)



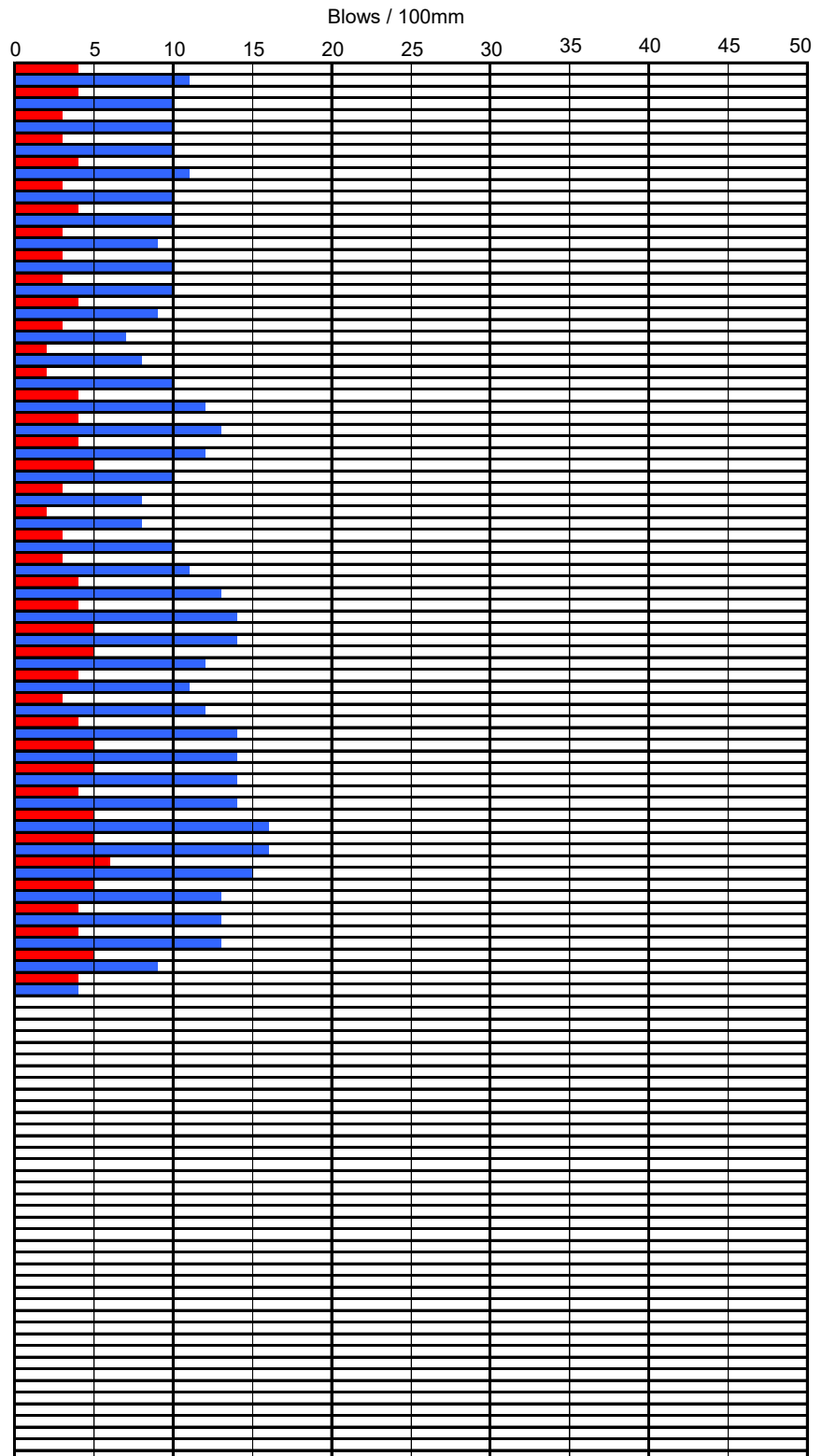
Equivalent SPT 'N' value

Registered in England & Wales, Company No. 5085241. Head Office: Unit 1, Deltic Place, Deltic Way, Knowsley Industrial Estate, Liverpool, L33 7BU

	Contract Name: Sandbrook Way, Stoneyfield, Rochdale, OL11		Client: Northern Trust			Trial Pit ID: TP03																				
	Contract Number: CCG-C-24-14676	Date Started: 03/06/2024	Logged By: AR	Checked By: CB	Status: FINAL	Sheet 1 of 1																				
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 5t Tracked Excavator	Date Printed: 05/06/2024	Scale: 1:25																				
	Weather:		Hole Termination:		Stability: Stable																					
Samples & In Situ Testing			Strata Details				Water	Backfill																		
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description																				
				0.20		Grassed TOPSOIL																				
0.30	ES			(1.30)		Grey / black very gravelly sandy CLAY with high cobble content and occasional fragments of wood. Gravel is fine to coarse angular to subround of brick concrete cinders and sandstone (MADE GROUND)	1																			
0.40	B																									
0.50	ES																									
1.00	B			1.50		Black / grey very silty gravelly SAND. Gravel is fine to coarse angular to subround of brick (MADE GROUND)	2																			
1.10	ES																									
1.60	B			(0.70)																						
2.10	B			2.20	End of Trial Pit at 2.20m			3																		
Dimensions:			General Remarks:																							
Final Depth: 2.20m			TP utilised for undertaking soil permeability tests in accordance with BRE Digest 365																							
← Length (m) → 1.40m ↑ Width (m) ↓ 0.60m Orientation: ° ←																										
Inclination: °			<table><tr><th colspan="6">Water Strikes</th></tr><tr><th>Strike (m)</th><th>Casing (m)</th><th>Sealed (m)</th><th>Time (mins)</th><th>Rose to (m)</th><th>Remarks</th></tr><tr><td>1.50</td><td></td><td></td><td>0</td><td></td><td>Water ingress</td></tr></table>						Water Strikes						Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	1.50			0		Water ingress
Water Strikes																										
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																					
1.50			0		Water ingress																					
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgteotechnical.com																										



SITE:	Sandbrook Way, Stoneycroft, R'dale
CLIENT:	Northern Trust
PROBE NUMBER:	TP02 2of 2
DATE:	

[illegible]

 Dynamic probe value (Blows/100mm)  Equivalent SPT 'N' value

Registered in England & Wales, Company No. 5085241. Head Office: Unit 1, Deltic Place, Deltic Way, Knowsley Industrial Estate, Liverpool, L33 7BU

APPENDIX E: TRIAL PIT PHOTOGRAPHS



1. TP01 Soil profile
2. TP01 Soil arisings





- 3. TP02 Soil profile
- 4. TP02 Soil arisings





- 5. TP03 Soil profile
- 6. TP03 Soil arisings



APPENDIX F: GAS – GROUNDWATER MONITORING RESULTS

GAS AND WATER MONITORING RESULTS



	Date:	18-Jun-24	24-Jun-24	05-Jul-24	17-Jul-24								
	Visit Number	1	2	3	4								
	Atmos Press mb	999	1004	1006	1018								
	Pressure Trend	Steady	Steady	Steady	Steady								
	Air Temp °C	12	20	15	18								
	Cloud cover	Overcast	High white cloud	High white cloud	High white cloud								
	Wind velocity	Light breeze	Light breeze	Windy	Light breeze								
	Precipitation	Dry	Dry	Dry	Dry								
	State of Ground	Dry	Dry	Dry	Dry								
WS01	CH4 (%):	Nil	Nil	Nil	Nil								
	CO2 (%):	<0.1	<0.1	<0.1	<0.1								
	O2 (%):	10.8	11.2	11.4	11.2								
	H2S (ppm):	Nil	Nil	Nil	Nil								
	CO (ppm):	Nil	Nil	Nil	Nil								
	PID (ppm):	0.0	0.0	0.0	0.0								
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1								
WS02	Water Level (mbgl):	3.88	Dry	Dry	Dry								
	CH4 (%):	Nil	Nil	Nil	Nil								
	CO2 (%):	0.3	0.1	0.2	0.3								
	O2 (%):	19.2	19.6	19.7	19.5								
	H2S (ppm):	Nil	Nil	Nil	Nil								
	CO (ppm):	Nil	Nil	Nil	Nil								
	PID (ppm):	0.0	0.0	0.0	0.0								
WS06	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1								
	Water Level (mbgl):	Dry	Dry	Dry	Dry								
	CH4 (%):	Nil	Nil	Nil	Nil								
	CO2 (%):	0.4	0.2	0.2	0.2								
	O2 (%):	18.7	19.1	19.4	19.1								
	H2S (ppm):	Nil	Nil	Nil	Nil								
	CO (ppm):	Nil	Nil	Nil	Nil								
	PID (ppm):	0.0	0.0	0.0	0.0								
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1								
	Water Level (mbgl):	0.90	0.95	0.93	0.97								
	CH4 (%):												
	CO2 (%):												
	O2 (%):												
	H2S (ppm):												
	CO (ppm):												
	PID (ppm):												
	Flow (l/hr):												
	Water Level (mbgl):												
	CH4 (%):												
	CO2 (%):												
	O2 (%):												

CCG-CMS-FO-129

Issue 2

Job No: CCG-C-24-14676

Site: Sandbrook Way

Instrument:

GFM436

Certificate of Calibration

Customer: CC Geotechnical

Instrument: Minirae 3000

Job: Service, Test & Calibration

Serial number: 592-917504

Fleet Number: -

Certificate no: 917504/052723

Next calibration due date: 05.JUL.2024

Tested on: 05.JUL.2023

Calibrated for: Isobutylene

<u>Applied Gas Concentration:</u>	<u>Cylinder Reference:</u>	<u>Final Sensor Reading</u>	<u>Accuracy Limits</u>	<u>Pass / Fail</u>
Isobutylene 100ppm	63098/1423	100ppm	±10%	Pass

The instrument has been calibrated after re-zeroing and introducing span calibration gas, using gas that is traceable to national standards and has been prepared in accordance with BS EN ISO 6145-6:2017

Calibration Engineer: *DAN JACQUES*

Sign: 

Quality Assessed by (Print):	<i>C.S.</i>	Sign:	
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Certificate of Calibration

Customer: CCG

Instrument: Tiger

Job: Service, Test & Calibration

Serial number: T-110194

Fleet Number: -

Certificate no: 110194/110723

Next calibration due date: 11.JUL.2024

Tested on: 11.JUL.2023

Calibrated for: Isobutylene

<u>Applied Gas Concentration:</u>	<u>Cylinder Reference:</u>	<u>Final Sensor Reading</u>	<u>Accuracy Limits</u>	<u>Pass / Fail</u>
Isobutylene 100ppm	63098/1423	100.0ppm	±10ppm	Pass

The instrument has been calibrated after re-zeroing and introducing span calibration gas, using gas that is traceable to national standards and has been prepared in accordance with BS EN ISO 6145-6:2017

Calibration Engineer: *DAN JACQUES*

Sign: _____

Quality Assessed by (Print):	C.S.	Sign:	
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APPENDIX G: SOIL CONTAMINATION REPORTS

CC Geotechnical
Unit 1-2 Deltic Place
Deltic Way
Knowsley Industrial Estate
Liverpool
L33 7BU

t: 0151 545 2750

e: tony.gerrard@ccgeotechnical.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

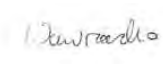
t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 24-022844

Project / Site name:	Sandbrook Business Park, Rochdale	Samples received on:	03/06/2024
Your job number:	CCG-C-24-14676	Samples instructed on/ Analysis started on:	03/06/2024
Your order number:	CCG-PO-14676	Analysis completed by:	10/06/2024
Report Issue Number:	1	Report issued on:	10/06/2024
Samples Analysed:	8 soil samples		

Signed: 

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-022844
Project / Site name: Sandbrook Business Park, Rochdale
Your Order No: CCG-PO-14676

Lab Sample Number	215842	215843	215844	215845	215846
Sample Reference	WS01	WS02	WS03	WS04	WS05
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.50	0.50	0.50	0.50
Date Sampled	01/06/2024	01/06/2024	01/06/2024	01/06/2024	01/06/2024
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	11	8.4	9.4	9.6	9.7
Total mass of sample received	kg	0.1	NONE	1.2	1.3	1.2	1.2	1.3

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Detected	Detected	Detected	Detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	DSA	DSA
Actinolite detected	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
Amosite detected	Type	N/A	ISO 17025	-	Not-detected	Detected	Not-detected	Detected
Anthophyllite detected	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
Chrysotile detected	Type	N/A	ISO 17025	-	Detected	Not-detected	Detected	Not-detected
Crocidolite detected	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
Tremolite detected	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	0.001	< 0.001	< 0.001	< 0.001
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	Loose Fibres	Loose Fibrous Debris	Loose Fibres	Loose Fibres
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.9	9.1	8.4	8.8	8.4
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.089	0.075	0.053	0.077	0.036
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	260	300	140	220	69
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	130	151	69.5	109	34.4
Sulphide	mg/kg	1	MCERTS	33	6.5	11	3.9	2.1
Organic Matter (automated)	%	0.1	MCERTS	2.1	2.4	1.7	1.8	1.5

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.38	2	0.2	0.54	0.21
Acenaphthylene	mg/kg	0.05	MCERTS	0.06	0.12	< 0.05	0.08	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.66	2.5	0.41	1.1	0.47
Fluorene	mg/kg	0.05	MCERTS	0.48	1.9	0.33	0.88	0.32
Phenanthrene	mg/kg	0.05	MCERTS	3.8	12	2.8	6.3	2.7
Anthracene	mg/kg	0.05	MCERTS	0.91	3.2	0.65	1.5	0.59
Fluoranthene	mg/kg	0.05	MCERTS	5.5	14	3.6	7.8	3.5
Pyrene	mg/kg	0.05	MCERTS	5.2	12	3.2	7.2	3.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.7	5.8	1.6	3.5	1.4
Chrysene	mg/kg	0.05	MCERTS	2.9	6.1	1.8	3.8	1.8
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.7	5.6	1.6	3.7	1.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.3	2.6	0.79	1.4	0.73
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.7	5.4	1.6	3.4	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	2.6	0.82	1.7	0.73
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.32	0.62	0.19	0.4	0.17
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.5	3	0.93	1.9	0.87

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	32.4	79.3	20.6	45.2	19.7
-----------------------------	-------	-----	-----------	------	------	------	------	------

Analytical Report Number: 24-022844
Project / Site name: Sandbrook Business Park, Rochdale
Your Order No: CCG-PO-14676

Lab Sample Number	215842	215843	215844	215845	215846
Sample Reference	WS01	WS02	WS03	WS04	WS05
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.50	0.50	0.50	0.50
Date Sampled	01/06/2024	01/06/2024	01/06/2024	01/06/2024	01/06/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.7	3.4	2.2	3	3.2
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	10	8.6	8.9	10
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.5	0.3	0.7	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.4	< 0.2	0.4	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	18	17	16	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	38	32	33	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	63	110	60	67	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	1.1	1.3	1.2	1.1	1.1
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	18	19	19	18
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	73	94	74	99	73

Petroleum Hydrocarbons

TPHCWG - Aliphatic >C5 - C6 HS_ID_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C6 - C8 HS_ID_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C8 - C10 HS_ID_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aliphatic >C10 - C12 EH_CU_ID_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	3.2
TPHCWG - Aliphatic >C12 - C16 EH_CU_ID_AL	mg/kg	2	MCERTS	< 2.0	4.1	< 2.0	< 2.0	9.7
TPHCWG - Aliphatic >C16 - C21 EH_CU_ID_AL	mg/kg	8	MCERTS	9.1	9	< 8.0	< 8.0	19
TPHCWG - Aliphatic >C21 - C35 EH_CU_ID_AL	mg/kg	8	MCERTS	34	41	23	37	85
TPHCWG - Aliphatic >C35 - C40 EH_CU_ID_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	31
TPHCWG - Aliphatic >C5 - C40 EH_CU+HS_ID_AL	mg/kg	10	NONE	43	54	23	37	150

TPHCWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	MCERTS	< 1.0	1.4	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	MCERTS	< 2.0	22	3.2	11	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	MCERTS	22	89	19	33	14
TPHCWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	MCERTS	60	200	65	85	64
TPHCWG - Aromatic >EC35 - EC40 EH_CU_ID_AR	mg/kg	10	NONE	12	32	17	16	33
TPHCWG - Aromatic >EC5 - EC40 EH_CU+HS_ID_AR	mg/kg	10	NONE	94	340	100	140	110

TPH Total >C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	140	390	130	180	260
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Analytical Report Number: 24-022844
 Project / Site name: Sandbrook Business Park, Rochdale
 Your Order No: CCG-PO-14676

Lab Sample Number				215842	215843	215844	215845	215846
Sample Reference				WS01	WS02	WS03	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				01/06/2024	01/06/2024	01/06/2024	01/06/2024	01/06/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Chloroform	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-Dichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Trichloroethene	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromomethane	µg/kg	5	ISO 17025	-	-	-	-	-
Bromodichloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	-	-	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	5	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	µg/kg	5	ISO 17025	-	-	-	-	-
Bromoform	µg/kg	5	NONE	-	-	-	-	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
n-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	5	ISO 17025	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-

Analytical Report Number: 24-022844
Project / Site name: Sandbrook Business Park, Rochdale
Your Order No: CCG-PO-14676

Lab Sample Number				215842	215843	215844	215845	215846
Sample Reference				WS01	WS02	WS03	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				01/06/2024	01/06/2024	01/06/2024	01/06/2024	01/06/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	-	-	-	-

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	ISO 17025	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-

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

Analytical Report Number: 24-022844
Project / Site name: Sandbrook Business Park, Rochdale
Your Order No: CCG-PO-14676

Lab Sample Number	215847	215848	215849
Sample Reference	WS06	TP01	TP03
Sample Number	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.50	0.50
Date Sampled	01/06/2024	01/06/2024	01/06/2024
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	17	11	11
Total mass of sample received	kg	0.1	NONE	1.2	1.3	1.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA
Actinolite detected	Type	N/A	ISO 17025	-	-	-
Amosite detected	Type	N/A	ISO 17025	-	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	-	-
Tremolite detected	Type	N/A	ISO 17025	-	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	-	-
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	-	-
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General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.9	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1.0	-	-
Total Sulphate as SO ₄	%	0.005	MCERTS	0.032	-	-
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	23	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	11.5	-	-
Sulphide	mg/kg	1	MCERTS	< 1.0	-	-
Organic Matter (automated)	%	0.1	MCERTS	3	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	1.5	0.15
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.1	3.4	0.2
Fluorene	mg/kg	0.05	MCERTS	0.07	2.7	0.14
Phenanthrene	mg/kg	0.05	MCERTS	0.68	18	1.3
Anthracene	mg/kg	0.05	MCERTS	0.16	4.9	0.31
Fluoranthene	mg/kg	0.05	MCERTS	1.1	22	2.3
Pyrene	mg/kg	0.05	MCERTS	1.1	21	2.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.52	11	1.1
Chrysene	mg/kg	0.05	MCERTS	0.67	11	1.3
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.61	11	1.5
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.31	3.8	0.49
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.59	10	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.31	4.5	0.67
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.07	1.1	0.16
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.36	5.2	0.74

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	6.65	132	13.8
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Analytical Report Number: 24-022844
Project / Site name: Sandbrook Business Park, Rochdale
Your Order No: CCG-PO-14676

Lab Sample Number	215847	215848	215849
Sample Reference	WS06	TP01	TP03
Sample Number	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.50	0.50
Date Sampled	01/06/2024	01/06/2024	01/06/2024
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.8	-	-
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.9	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	80	-	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >C5 - C6 HS_ID_AL	mg/kg	0.02	NONE	< 0.020	-	-
TPHCWG - Aliphatic >C6 - C8 HS_ID_AL	mg/kg	0.02	NONE	< 0.020	-	-
TPHCWG - Aliphatic >C8 - C10 HS_ID_AL	mg/kg	0.05	NONE	< 0.050	-	-
TPHCWG - Aliphatic >C10 - C12 EH_CU_ID_AL	mg/kg	1	MCERTS	< 1.0	-	-
TPHCWG - Aliphatic >C12 - C16 EH_CU_ID_AL	mg/kg	2	MCERTS	< 2.0	-	-
TPHCWG - Aliphatic >C16 - C21 EH_CU_ID_AL	mg/kg	8	MCERTS	< 8.0	-	-
TPHCWG - Aliphatic >C21 - C35 EH_CU_ID_AL	mg/kg	8	MCERTS	< 8.0	-	-
TPHCWG - Aliphatic >C35 - C40 EH_CU_ID_AL	mg/kg	10	NONE	< 10	-	-
TPHCWG - Aliphatic >C5 - C40 EH_CU+HS_ID_AL	mg/kg	10	NONE	< 10	-	-

TPHCWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.01	NONE	< 0.010	-	-
TPHCWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.01	NONE	< 0.010	-	-
TPHCWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.05	NONE	< 0.050	-	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	MCERTS	< 1.0	-	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	MCERTS	< 2.0	-	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	MCERTS	< 10	-	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	MCERTS	< 10	-	-
TPHCWG - Aromatic >EC35 - EC40 EH_CU_ID_AR	mg/kg	10	NONE	< 10	-	-
TPHCWG - Aromatic >EC5 - EC40 EH_CU+HS_ID_AR	mg/kg	10	NONE	< 10	-	-

TPH Total >C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	< 10	-	-
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Analytical Report Number: 24-022844
 Project / Site name: Sandbrook Business Park, Rochdale
 Your Order No: CCG-PO-14676

Lab Sample Number		215847	215848	215849
Sample Reference		WS06	TP01	TP03
Sample Number		None Supplied	None Supplied	None Supplied
Depth (m)		0.50	0.50	0.50
Date Sampled		01/06/2024	01/06/2024	01/06/2024
Time Taken		None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

VOCs

Chloromethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Chloroethane	µg/kg	5	NONE	-	< 5.0	< 5.0
Bromomethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	-	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	-	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	NONE	-	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	-	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	-	< 5.0	< 5.0
Chloroform	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	NONE	-	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Trichloroethene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	NONE	-	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Styrene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Bromoform	µg/kg	5	NONE	-	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	< 5.0	< 5.0
Bromobenzene	µg/kg	5	NONE	-	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
sec-Butylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0

Analytical Report Number: 24-022844
 Project / Site name: Sandbrook Business Park, Rochdale
 Your Order No: CCG-PO-14676

Lab Sample Number				215847	215848	215849
Sample Reference				WS06	TP01	TP03
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50
Date Sampled				01/06/2024	01/06/2024	01/06/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Butylbenzene	µg/kg	5	NONE	-	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	-	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	-	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	0.9	0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	1.6	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	-	< 0.2	< 0.2
Azobenzene	mg/kg	0.3	NONE	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.30	< 0.30
Carbazole	mg/kg	0.3	MCERTS	-	0.9	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	-	0.8	< 0.3
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	< 0.3	< 0.3

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

Analytical Report Number: 24-022844
 Project / Site name: Sandbrook Business Park, Rochdale
 Your Order No: CCG-PO-14676

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
215843	WS02	0.50	182	Loose Fibres	Chrysotile	0.001	0.001
215844	WS03	0.50	180	Loose Fibrous Debris	Amosite	< 0.001	< 0.001
215845	WS04	0.50	194	Loose Fibres	Chrysotile	< 0.001	< 0.001
215846	WS05	0.50	169	Loose Fibres	Amosite	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 24-022844

Project / Site name: Sandbrook Business Park, Rochdale

* 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 *
215842	WS01	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215843	WS02	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215844	WS03	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215845	WS04	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215846	WS05	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215847	WS06	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215848	TP01	None Supplied	0.5	Brown loam and sand with gravel and vegetation
215849	TP03	None Supplied	0.5	Brown loam and sand with gravel and vegetation

Analytical Report Number : 24-022844
Project / Site name: Sandbrook Business Park, Rochdale

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
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	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
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	L080	W	MCERTS

Analytical Report Number : 24-022844
Project / Site name: Sandbrook Business Park, Rochdale

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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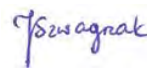
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e: reception@i2analytical.com

Analytical Report Number : 24-023658

Project / Site name:	Sandbrook Business Park, Rochdale	Samples received on:	06/06/2024
Your job number:	CCG C 24 14676	Samples instructed on/ Analysis started on:	06/06/2024
Your order number:	CCG PO 14676	Analysis completed by:	13/06/2024
Report Issue Number:	1	Report issued on:	13/06/2024
Samples Analysed:	2 soil samples		

Signed: _____



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

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

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

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

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

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

Analytical Report Number: 24-023658
 Project / Site name: Sandbrook Business Park, Rochdale
 Your Order No: CCG PO 14676

Lab Sample Number	219776			219777	
Sample Reference	WS06			WS06	
Sample Number	None Supplied			None Supplied	
Depth (m)	3.20			4.20	
Date Sampled	01/06/2024			01/06/2024	
Time Taken	None Supplied			None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	77	78
Total mass of sample received	kg	0.1	NONE	0.5	0.5

General Inorganics

Loss on Ignition @ 450°C	%	0.2	MCERTS	86	66
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-023658
 Project / Site name: Sandbrook Business Park, Rochdale

* 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 *
219776	WS06	None Supplied	3.2	Brown sandy clay with gravel and vegetation
219777	WS06	None Supplied	4.2	Brown sandy clay with gravel and vegetation

Analytical Report Number : 24-023658
Project / Site name: Sandbrook Business Park, Rochdale

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

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.



4041



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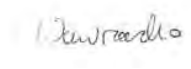
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Analytical Report Number : 24-026189

Project / Site name:	Sandbrook Business Park, Rochdale	Samples received on:	19/06/2024
Your job number:	CCG C 24 14676	Samples instructed on / Analysis started on:	19/06/2024
Your order number:	CCG PO 14676	Analysis completed by:	27/06/2024
Report Issue Number:	1	Report issued on:	27/06/2024
Samples Analysed:	1 water sample		

Signed: 

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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



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Analytical Report Number: 24-026189

Project / Site name: Sandbrook Business Park, Rochdale

Your Order No: CCG PO 14676

Lab Sample Number				233542
Sample Reference				WS06
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				18/06/2024
Time Taken				1000
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.4
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Sulphate as SO ₄	mg/l	0.045	ISO 17025	60.8
Sulphide	µg/l	5	NONE	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	9.09
Hardness - Total	mgCaCO ₃ /l	1	ISO 17025	163

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	0.23
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.05
Fluorene	µg/l	0.01	ISO 17025	0.04
Phenanthrene	µg/l	0.01	ISO 17025	0.12
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.12
Pyrene	µg/l	0.01	ISO 17025	0.11
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	0.67
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.91
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.8
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	4.1
Selenium (dissolved)	µg/l	0.6	ISO 17025	2.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.7

Boron (dissolved)	µg/l	10	ISO 17025	64
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0



4041



Analytical Report Number: 24-026189

Project / Site name: Sandbrook Business Park, Rochdale

Your Order No: CCG PO 14676

Lab Sample Number				233542
Sample Reference				WS06
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				18/06/2024
Time Taken				1000
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH - Aliphatic >EC5 - EC6 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC6 - EC8 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC8 - EC10 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC10 - EC12 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10
TPH - Aliphatic >EC12 - EC16 _{EH_1D_AL_MS}	µg/l	10	NONE	50
TPH - Aliphatic >EC16 - EC21 _{EH_1D_AL_MS}	µg/l	10	NONE	77
TPH - Aliphatic >EC21 - EC35 _{EH_1D_AL_MS}	µg/l	10	NONE	780
TPH - Aliphatic >EC5 - EC35 _{HS+EH_1D_AL_MS}	µg/l	10	NONE	900

TPH - Aromatic >EC5 - EC7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC7 - EC8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC8 - EC10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC10 - EC12 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10
TPH - Aromatic >EC12 - EC16 _{EH_1D_AR_MS}	µg/l	10	NONE	30
TPH - Aromatic >EC16 - EC21 _{EH_1D_AR_MS}	µg/l	10	NONE	50
TPH - Aromatic >EC21 - EC35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC35 _{HS+EH_1D_AR_MS}	µg/l	10	NONE	80

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0

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



4041



Analytical Report Number : 24-026189

Project / Site name: Sandbrook Business Park, Rochdale

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode	In-house method	L029	W	NONE
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphénylcarbazide followed by colorimetry	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW	L080	W	ISO 17025
Free cyanide (low level) in water	Determination of free cyanide by distillation followed by colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total petroleum hydrocarbons by GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS HS	In-house method	L088B	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025

Analytical Report Number : 24-026189
Project / Site name: Sandbrook Business Park, Rochdale

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

APPENDIX H: SOIL CONTAMINATION SUMMARY TABLES

Contaminant	Assessment Criteria for Commercial at 1% SOM (mg/kg)	Assessment Criteria for Commercial at 2.5% SOM (mg/kg)	Assessment Criteria for Commercial at 6% SOM (mg/kg)
Metals			
Arsenic	640	640	640
Boron	240000	240000	240000
Cadmium	190	190	190
Chromium III	8600	8600	8600
Chromium VI	33	33	33
Copper	68000	68000	68000
*Lead	2300	2300	2300
Mercury	58	58	58
Nickel	980	980	980
Selenium	12000	12000	12000
Vanadium	9000	9000	9000
Zinc	730000	730000	730000
Non-Metals			
Phenol	440	690	1300
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	84000	97000	100000
Acenaphthylene	83000	97000	100000
Anthracene	520000	540000	540000
Benz[a]anthracene	170	170	180
Benzo[a]pyrene	35	35	36
Benzo[b]fluoranthene	44	44	45
Benzo[ghi]perylene	3900	4000	4000
Benzo[k]fluoranthene	1200	1200	1200
Chrysene	350	350	350
Dibenz[ah]anthracene	3.5	3.6	3.6
Fluoranthene	23000	23000	23000
Fluorene	63000	68000	71000
Indeno[123-cd]pyrene	500	510	510
Naphthalene	190	460	1100
Phenanthrene	22000	22000	22000
Pyrene	54000	54000	54000
Coal Tar [Bap as surrogate marker]	15	15	15
Petroleum Hydrocarbons			
Aliphatic EC 5-6	3200	5900	12000
Aliphatic EC >6-8	7800	17000	40000
Aliphatic EC >8-10	2000	4800	11000
Aliphatic EC >10-12	9700	23000	47000
Aliphatic EC >12-16	59000	82000	90000
Aliphatic EC >16-35	1600000	1700000	1800000
Aliphatic EC >35-44	1600000	1700000	1800000
Aromatic EC 5-7 (Benzene)	26000	46000	86000
Aromatic EC >7-8 (Toluene)	56000	110000	180000
Aromatic EC >8-10	3500	8100	17000
Aromatic EC >10-12	16000	28000	34000
Aromatic EC >12-16	36000	37000	38000
Aromatic EC >16-21	28000	28000	28000
Aromatic EC >21-35	28000	28000	28000
Aromatic EC >35-44	28000	28000	28000
Aliphatic – Aromatic EC >44-70	28000	28000	28000
Other			
Asbestos Containing Materials (ACM)	No Detection	No Detection	No Detection

Copyright: Land Quality Management Limited (LQM)

The above is based on criteria contained in publication LQM/CIEH S4UL's for Human Health Risk Assessment (2015) (CCG Licence No. S4UL3233), applicable to the "Commercial" land use scenario for soil organic matter (SOM) content of 1% - 6%.

*This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.



METALS DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: **24-14676**

Site name: **Sandbrook Way, Rochdale**

Prepared by: **TG**

Authorised by: **CB**

Proposed land use: **Commercial/Industrial**

SOM % used: **2.5**

 = **Threshold exceeded**

 = **Below Limit of detection**

n/t = **Not tested**

Contaminants			Metals							
			Cadmium	Chromium III	Chromium VI	Copper	Lead	Mercury (elemental)	Nickel	Zinc
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.5	5.0	0.8	5.0	5.0	0.5	5.0	5.0
Human Health Risk Assessment (GAC)			190	8600	33	68000	2300	58	980	730000
Sample Location	Sample Depth (m)	Sample type								
WS01	0.50	Soil	0.3	17	< 1.8	30	63	< 0.3	17	73
WS02	0.50	Soil	0.4	18	< 1.8	38	110	< 0.3	18	94
WS03	0.50	Soil	< 0.2	17	< 1.8	32	60	< 0.3	19	74
WS04	0.50	Soil	0.4	16	< 1.8	33	67	< 0.3	19	99
WS05	0.50	Soil	< 0.2	16	< 1.8	31	54	< 0.3	18	73
WS06	0.50	Soil	0.3	16	< 1.8	37	46	< 0.3	18	80
Human Health Risk Assessment (GAC)			190	8600	33	68000	2300	58	980	730000



SEMI-METALS, NON-METALS, INORGANICS AND OTHER DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 24-14676

Site name: Sandbrook Way, Rochdale

Prepared by: TG

Authorised by: CB

Proposed land use: Commercial/Industrial

SOM % used: 2.5

 = Threshold exceeded

 = Below Limit of detection

n/t = Not tested

			Semi/non-metals		Inorganics			Other		
Contaminants			Arsenic	Boron	Selenium	Cyanide (free)	Sulphate (water soluble)	Sulphate (water soluble)	pH (units)	Soil Organic Matter %
Units			mg/kg	mg/kg	mg/kg	mg/kg	g/l	mg/l	units	units
Limit of Detection			1.0	0.5	1.0	1.0	0.02	20.0	0.1	0.1
Human Health Risk Assessment (GAC)			640	240000	12000	120	NA	NA	NA	NA
Sample Location	Sample Depth (m)	Sample type								
WS01	0.50	Soil	9.3	0.5	< 1.0	< 1.0	n/t	130	8.9	2.1
WS02	0.50	Soil	10	0.5	< 1.0	< 1.0	n/t	151	9.1	2.4
WS03	0.50	Soil	8.6	0.3	< 1.0	< 1.0	n/t	69.5	8.4	1.7
WS04	0.50	Soil	8.9	0.7	< 1.0	< 1.0	n/t	109	8.8	1.8
WS05	0.50	Soil	10	0.2	< 1.0	< 1.0	n/t	34.4	8.4	1.5
WS06	0.50	Soil	8	0.2	< 1.0	< 1.0	n/t	11.5	7.9	3
Human Health Risk Assessment (GAC)			640	240000	190	120	NA	NA	NA	NA



SPECIATED PAH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 24-14676

Site name: Sandbrook Way, Rochdale

Prepared by: TG

Authorised by: CB

Proposed land use: Commercial/Industrial

SOM % used: 2.5

 = Threshold exceeded = Below Limit of detection

n/t = Not tested

Contaminants

PAH's

			Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[ghi]perylene	Benzo[k]fluoranthene	Chrysene	Dibenzo[ah]anthracene	fluoranthene	fluorene	Indeno[123-cd]pyrene	Napthalene	Pheanthrene	Pyrene	Total PAH's
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Human Health Risk Assessment (GAC)			97000	97000	540000	170	35	44	4000	1200	350	3.6	23000	68000	510	460	22000	54000	NA
Sample Location	Sample Depth (m)	Sample type																	
WS01	0.50	Soil	0.66	0.06	0.91	2.7	2.7	2.7	1.5	1.3	2.9	0.32	5.5	0.48	1.3	0.38	3.8	5.2	32.4
WS02	0.50	Soil	2.5	0.12	3.2	5.8	5.4	5.6	3	2.6	6.1	0.62	14	1.9	2.6	2	12	12	79.3
WS03	0.50	Soil	0.41	< 0.05	0.65	1.6	1.6	1.6	0.93	0.79	1.8	0.19	3.6	0.33	0.82	0.2	2.8	3.2	20.6
WS04	0.50	Soil	1.1	0.08	1.5	3.5	3.4	3.7	1.9	1.4	3.8	0.4	7.8	0.88	1.7	0.54	6.3	7.2	45.2
WS05	0.50	Soil	0.47	< 0.05	0.59	1.4	1.5	1.6	0.87	0.73	1.8	0.17	3.5	0.32	0.73	0.21	2.7	3.2	19.7
WS06	0.50	Soil	0.1	< 0.05	0.16	0.52	0.59	0.61	0.36	0.31	0.67	0.07	1.1	0.07	0.31	< 0.05	0.68	1.1	6.65
Human Health Risk Assessment (GAC)			97000	97000	190	170	35	44	4000	1200	350	3.6	23000	68000	510	460	22000	54000	NA



SPECIATED TPH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 24-14676

Site name: Sandbrook Way, Rochdale

Prepared by: TG

Authorised by: CB

Proposed land use: Commercial/Industrial

SOM % used: 2.5

	=	Threshold exceeded
	=	Below Limit of detection
n/t	=	Not tested

			Speciated TPH's															
			Aromatics							Aliphatics								
Contaminants			EC5-7	EC7-8	EC8-10	EC10-12	EC12-16	EC16-21	EC21-35	EC35-44	EC5-6	EC6-8	EC8-10	EC10-12	EC12-16	EC16-35	EC35-44	TOTAL TPH'S
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0	0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0
Human Health Risk Assessment (GAC)			46000	110000	8100	28000	37000	28000	28000	28000	5900	17000	4800	23000	82000	1700000	1700000	NA
Sample Location	Sample Depth (m)	Sample type																
WS01	0.50	Soil	< 0.010	< 0.010	< 0.050	< 1.0	< 2.0	22	60	12	< 0.020	< 0.020	< 0.050	< 1.0	< 2.0	43.1	< 10	140
WS02	0.50	Soil	< 0.010	< 0.010	< 0.050	1.4	22	89	200	32	< 0.020	< 0.020	< 0.050	< 1.0	4.1	50	< 10	390
WS03	0.50	Soil	< 0.010	< 0.010	< 0.050	< 1.0	3.2	19	65	17	< 0.020	< 0.020	< 0.050	< 1.0	< 2.0	23	< 10	130
WS04	0.50	Soil	< 0.010	< 0.010	< 0.050	< 1.0	11	33	85	16	< 0.020	< 0.020	< 0.050	< 1.0	< 2.0	37	< 10	180
WS05	0.50	Soil	< 0.010	< 0.010	< 0.050	< 1.0	< 2.0	14	64	33	< 0.020	< 0.020	< 0.050	3.2	9.7	104	31	260
WS06	0.50	Soil	< 0.010	< 0.010	< 0.050	< 1.0	< 2.0	< 10	< 10	< 10	< 0.020	< 0.020	< 0.050	< 1.0	< 2.0	<8	< 10	< 10
Human Health Risk Assessment (GAC)			46000	110000	190	28000	37000	28000	28000	28000	5900	17000	4800	23000	82000	1700000	1700000	NA



BTEX DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: **24-14676**

Site name: **Sandbrook Way, Rochdale**

Prepared by: **TG**

Authorised by: **CB**

Proposed land use: **Commercial/Industrial**

SOM % used: **2.5**

 = **Threshold exceeded**

 = **Below Limit of detection**

n/t = **Not tested**

			BTEX			
Contaminants			Benzene	Toluene	Ethylbenzene	Total Xylenes
Units			µg/kg	µg/kg	µg/kg	µg/kg
Limit of Detection			10	10	10	10
Human Health Risk Assessment (GAC)			47000	110000000	13000000	14000000
Sample Location	Sample Depth (m)	Sample type				
WS01	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS02	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS03	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS04	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS05	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS06	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
Human Health Risk Assessment (GAC)			47000	190	13000000	14000000

APPENDIX I: SOIL CLASSIFICATION REPORT

Units 1 & 2
Deltic Place
Deltic Way
Knowsley Industrial Estate
Liverpool
L33 7BU

Telephone: (0151) 545 2750
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Email: enquiries@ccgeotechnical.com
www.ccgeotechnical.com



LABORATORY REPORT

CONTRACT NUMBER: CCG-C-24-14676

CONTRACT TITLE: SANDBROOK WAY, ROCHDALE

CLIENT: NORTHERN TRUST

DATE RECEIVED: 05/06/24
DATE COMMENCED: 05/06/24
DATE COMPLETED: 17/06/24
REPORT DATE: 18/06/24

Test Description	Qty
Determination of Moisture Content BS 1377-2:1990 (a)	2
Determination of Liquid & Plastic Limits BS 1377-2:1990 (a)	2
Particle Size Distribution BS 1377-2:1990 (a)	3

Notes: Observations and interpretations are not accredited by UKAS
All testing undertaken at laboratory permanent facilities
denotes non-accredited test
a denotes UKAS accredited test
s denotes test undertaken by approved subcontractor
Test results only relate to the samples tested

This report is issued in accordance with the requirements of the United Kingdom Accreditation Services and EN ISO/IEC 17025:2017. The results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories: Chris Bolan (Managing Director) – Daniel Kerfoot (Laboratory Manager)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Shear Strength (kN/m ²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
WS02	WS	4.30	4.30	-	-	-	-	-	-	-	-	-	Y	Brown very gravelly slightly silty fine to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone and quartz. (BS1377Pt2:9.2)
WS05	WS	3.10	3.10	-	-	-	-	-	-	-	-	-	Y	Brown slightly silty slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded sandstone. (BS1377Pt2:9.2)
WS05	WS	4.30	4.30	-	-	-	-	-	-	-	-	-	Y	Brown gravelly slightly silty fine to medium SAND. Gravel is fine to medium subangular to subrounded sandstone. (BS1377Pt2:9.2)
WS05	WS	4.80	4.80	13	-	-	-	27	14	13	97	CL	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subrounded sandstone, mudstone, quartz. (BS1377Pt2:3.2,4.4,5)
WS06	WS	4.70	4.70	27	-	-	-	36	18	18	99	CI	Y	Greyish brown slightly sandy silty CLAY. (BS1377Pt2:3.2,4.4,5)

SITE: SANDBROOK WAY, ROCHDALE (CCG-C-24-14676)
 CLIENT: NORTHERN TRUST

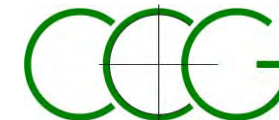
DATE: 18.06.24

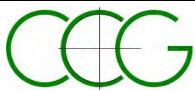
Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample

CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic

(* Denotes Hand Shear Vane test result)

Sample description not accredited by UKAS





CC Geotechnical Ltd
Tel: 0151 545 2750
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PARTICLE SIZE DISTRIBUTION

Job Ref

CCG-C-24-14676

Borehole/Pit No.

WS02

Site Name

SANDBROOK WAY, ROCHDALE

Sample No.

1

Specimen
Description

Brown very gravelly slightly silty fine to coarse SAND

Depth, m

4.30

Specimen
Reference

Specimen
Depth

m

Sample Type

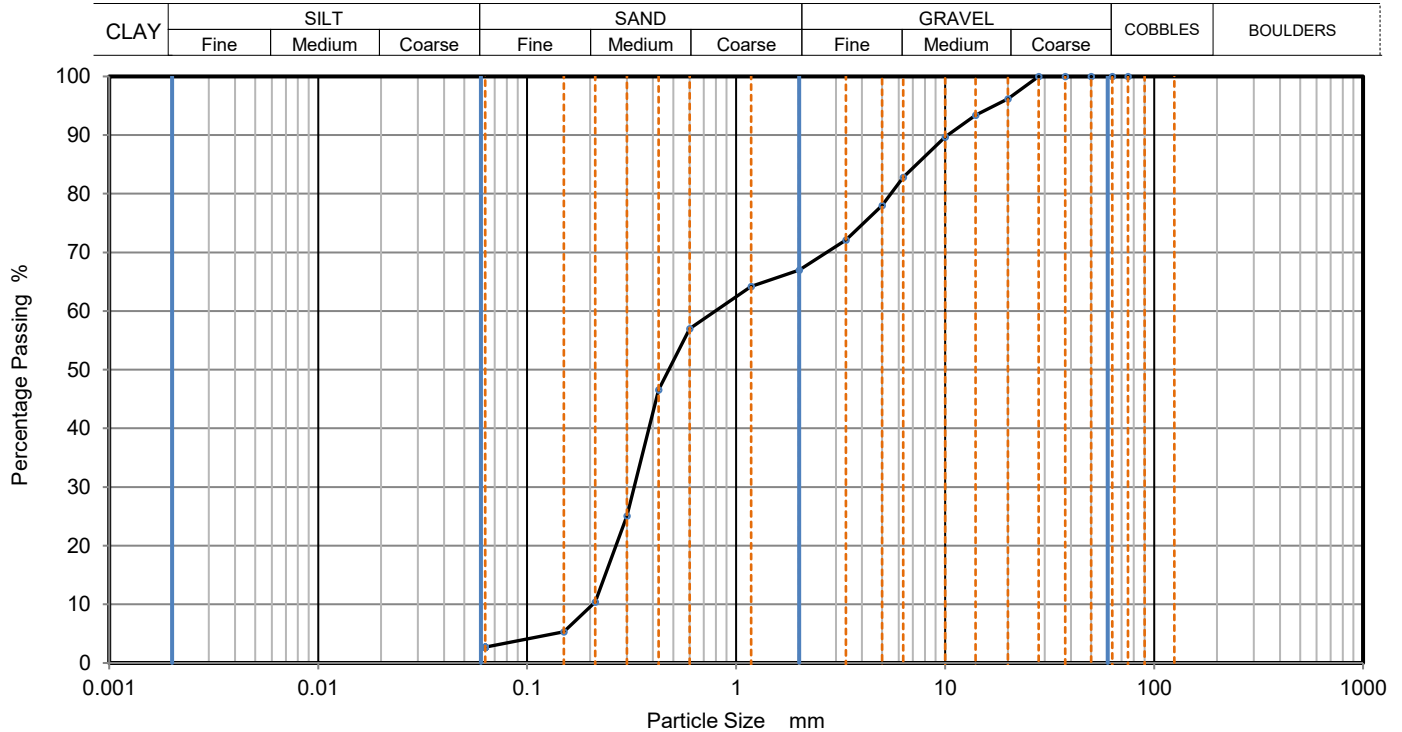
WS

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CCGL2024061812



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	93		
10	90		
6.3	83		
5	78		
3.35	72		
2	67		
1.18	64		
0.6	57		
0.425	47		
0.3	25		
0.212	10		
0.15	5		
0.063	3		

Dry Mass of sample, g

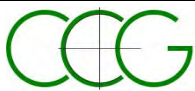
Sample Proportions	% dry mass
Very coarse	0
Gravel	33
Sand	64
Fines <0.063mm	3

Grading Analysis		
D100	mm	
D60	mm	0.797
D30	mm	0.325
D10	mm	0.207
Uniformity Coefficient		3.9
Curvature Coefficient		0.64

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1 Sheet
JE	DK	DK	18/06/2024 13:46	



CC Geotechnical Ltd
Tel: 0151 545 2750
e: lab@ccgeotechnical.com

PARTICLE SIZE DISTRIBUTION

Job Ref

CCG-C-24-14676

Borehole/Pit No.

WS05

Site Name

SANDBROOK WAY, ROCHDALE

Sample No.

1

Specimen
Description

Brown slightly silty slightly gravelly fine to medium SAND

Depth, m

3.10

Specimen
Reference

Specimen
Depth

m

Sample Type

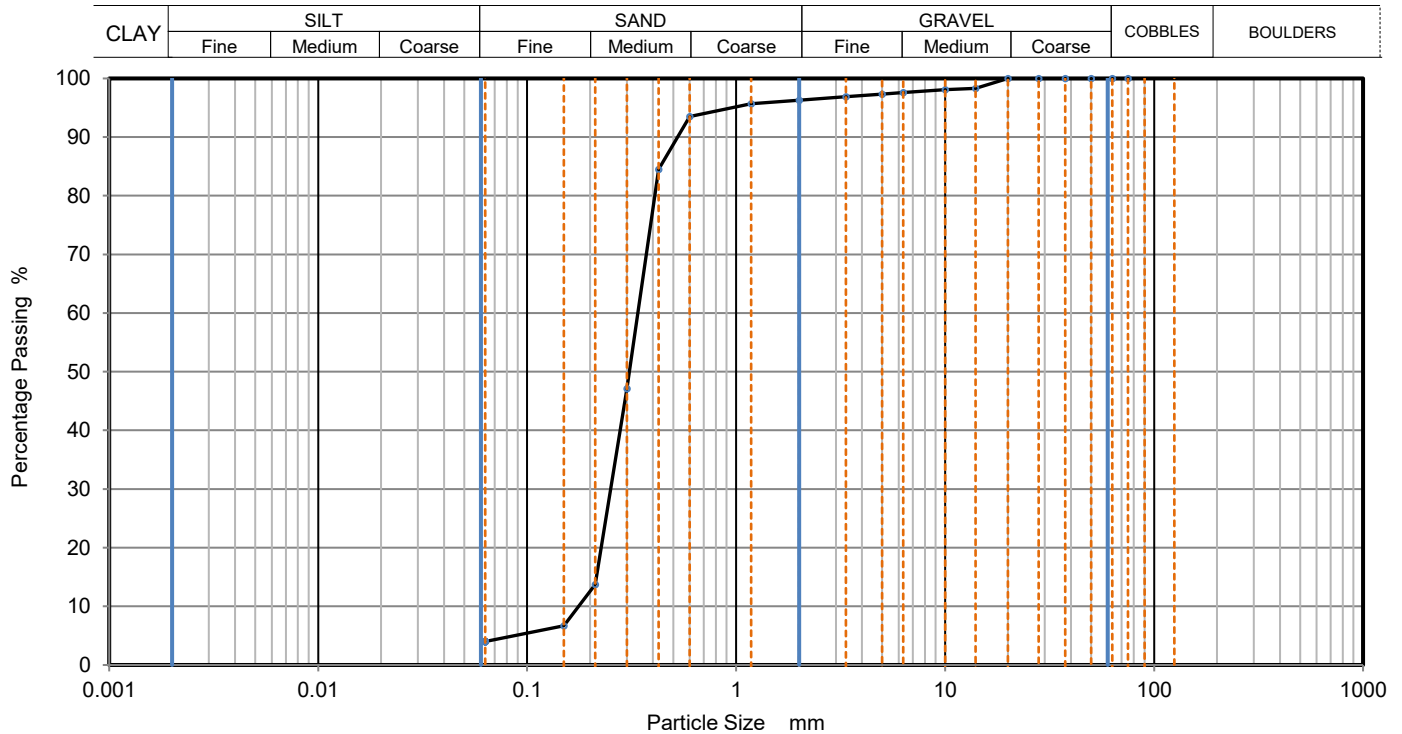
WS

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CCGL2024061813



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	98		
6.3	98		
5	97		
3.35	97		
2	96		
1.18	96		
0.6	94		
0.425	85		
0.3	47		
0.212	14		
0.15	7		
0.063	4		

Dry Mass of sample, g

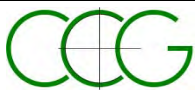
Sample Proportions	% dry mass
Very coarse	0
Gravel	4
Sand	92
Fines <0.063mm	4

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	1.9
Curvature Coefficient	1.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1 Sheet
JE	DK	DK	18/06/2024 13:46	



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e: lab@ccgeotechnical.com

PARTICLE SIZE DISTRIBUTION

Job Ref

CCG-C-24-14676

Borehole/Pit No.

WS05

Site Name

SANDBROOK WAY, ROCHDALE

Sample No.

1

Specimen
Description

Brown gravelly slightly silty fine to medium SAND

Depth, m

4.30

Specimen
Reference

Specimen
Depth

m

Sample Type

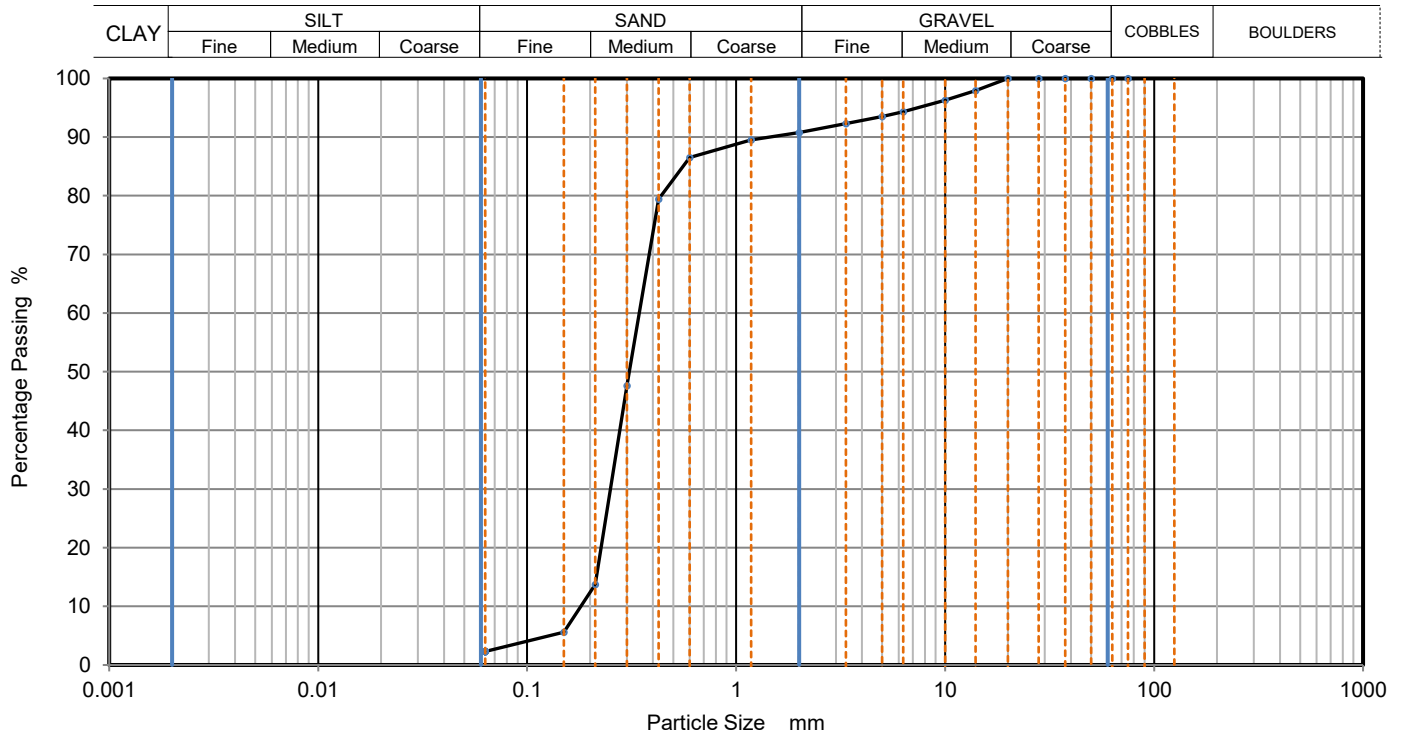
WS

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CCGL2024061814



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	94		
5	94		
3.35	92		
2	91		
1.18	90		
0.6	87		
0.425	79		
0.3	48		
0.212	14		
0.15	6		
0.063	2		

Dry Mass of sample, g

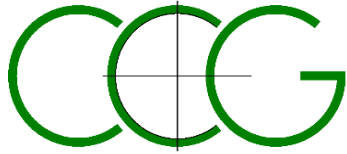
Sample Proportions	% dry mass
Very coarse	0
Gravel	9
Sand	89
Fines <0.063mm	2

Grading Analysis		
D100	mm	
D60	mm	0.343
D30	mm	0.25
D10	mm	0.181
Uniformity Coefficient		1.9
Curvature Coefficient		1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

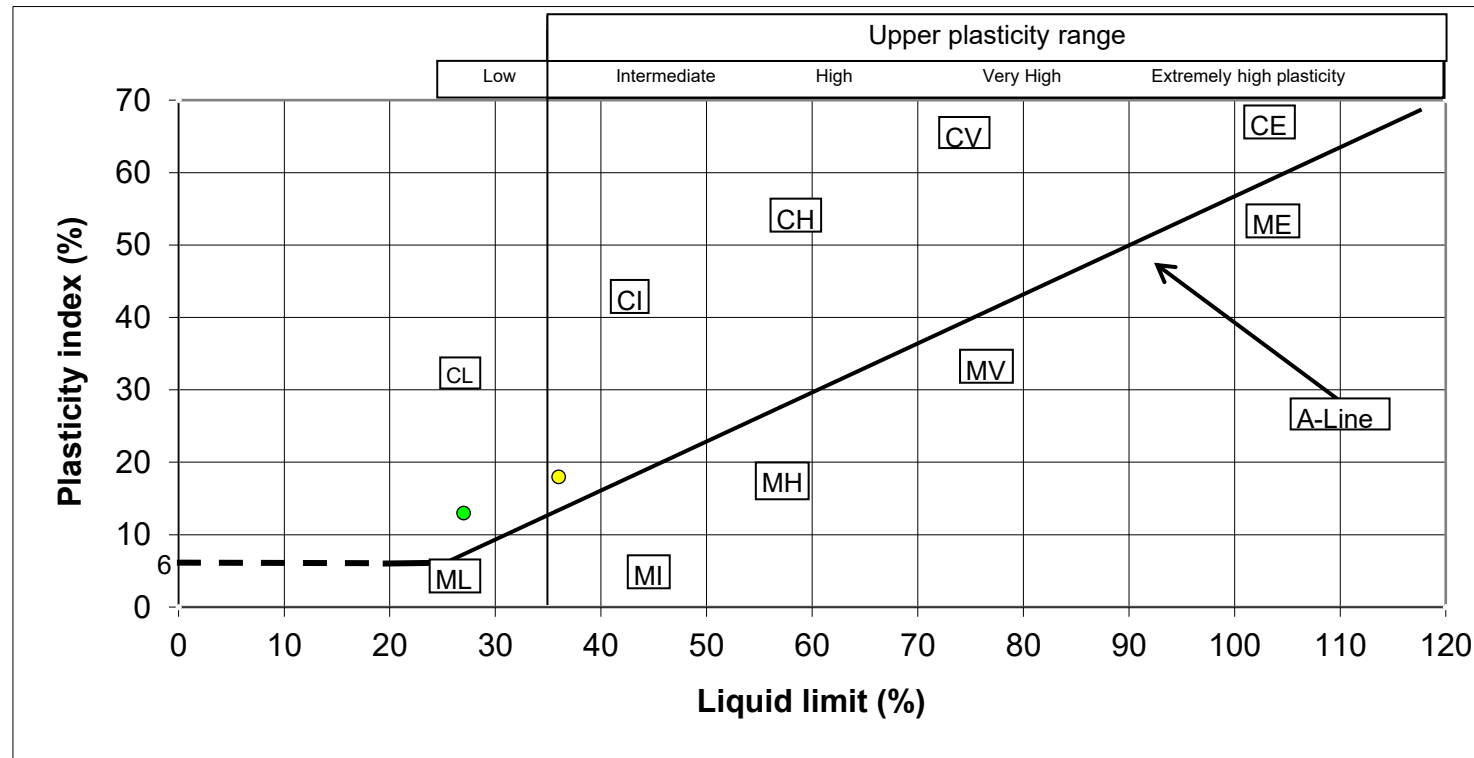
Operator	Checked	Approved	Sheet printed	Fig 1 Sheet
JE	DK	DK	18/06/2024 13:46	



ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS05	4.80	27.0	13.0
WS06	4.70	36.0	18.0



APPROVED BY DK

CLIENT: NORTHERN TRUST SITE: SANDBROOK WAY, ROCHDALE (CCG-C-24-14676)

APPENDIX J: PRELIMINARY WASTE CLASSIFICATION REPORT



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



VSXHJ-ULKZP-KHL0N

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

SANDBROOK BUSINESS PARK, ROCHDALE

Description/Comments

Project

CCG-C-24-14676

Site

SANDBROOK BUSINESS PARK, ROCHDALE

Classified by

Name: **Michael Hartley**
Date: **12 Jun 2024 09:22 GMT**
Telephone: **0151 545 2750**

Company: **CC Geotechnical Ltd**
Units 1 & 2 Deltic Way
Knowsley Industrial Estate
Kirkby
L33 7BU

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:**CERTIFIED****Course**

Hazardous Waste Classification

Date

06 Apr 2023

Next 3 year Refresher due by Apr 2026

Purpose of classification

7 - Disposal of Waste

Address of the waste

SANDBROOK WAY

Post Code **OL11 1RJ**

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

Redevelopment of land for industrial building

Description of the specific process, sub-process and/or activity that created the waste

Waste created during construction preparation

Description of the waste

Made ground granular soils



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01	0.5	Non Hazardous		3
2	WS02	0.5	Non Hazardous		6
3	WS03	0.5	Non Hazardous		9
4	WS04	0.5	Non Hazardous		12
5	WS05	0.5	Non Hazardous		15
6	WS06	0.5	Non Hazardous		18

Related documents

#	Name	Description
1	24-022844_HWOL.hwol	i2 Analytical .hwol file used to populate the Job
2	CCG Soil A 2023	waste stream template used to create this Job

Report

Created by: Michael Hartley

Created date: 12 Jun 2024 09:22 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	21
Appendix B: Rationale for selection of metal species	22
Appendix C: Version	23



Classification of sample: WS01

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS01** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: **0.5 m** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: **11%**
(wet weight correction)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				2.7 mg/kg	1.197	2.877 mg/kg	0.000288 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				9.3 mg/kg	1.32	10.928 mg/kg	0.00109 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.305 mg/kg	0.0000305 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	30.061 mg/kg	0.00301 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	63 mg/kg		56.07 mg/kg	0.00561 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	molybdenum { molybdenum(VI) oxide }				1.1 mg/kg	1.5	1.469 mg/kg	0.000147 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
9	nickel { dinickel hexacyanoferrate }				17 mg/kg	2.806	42.448 mg/kg	0.00424 %	✓	
	028-037-00-8	238-946-3	14874-78-3							
10	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									
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				73 mg/kg	4.398	285.733 mg/kg	0.0286 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
13	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
14	boron { diboron trioxide }				0.5 mg/kg	3.22	1.433 mg/kg	0.000143 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
15	pH		PH		8.9 pH		8.9 pH	8.9 pH		
16	naphthalene				0.38 mg/kg		0.338 mg/kg	0.0000338 %	✓	
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				0.06 mg/kg		0.0534 mg/kg	0.00000534 %	✓	
		205-917-1	208-96-8							
18	acenaphthene				0.66 mg/kg		0.587 mg/kg	0.0000587 %	✓	
		201-469-6	83-32-9							
19	fluorene				0.48 mg/kg		0.427 mg/kg	0.0000427 %	✓	
		201-695-5	86-73-7							
20	phenanthrene				3.8 mg/kg		3.382 mg/kg	0.000338 %	✓	
		201-581-5	85-01-8							
21	anthracene				0.91 mg/kg		0.81 mg/kg	0.000081 %	✓	
		204-371-1	120-12-7							
22	fluoranthene				5.5 mg/kg		4.895 mg/kg	0.000489 %	✓	
		205-912-4	206-44-0							
23	pyrene				5.2 mg/kg		4.628 mg/kg	0.000463 %	✓	
		204-927-3	129-00-0							
24	benzo[a]anthracene				2.7 mg/kg		2.403 mg/kg	0.00024 %	✓	
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				2.9 mg/kg		2.581 mg/kg	0.000258 %	✓	
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				2.7 mg/kg		2.403 mg/kg	0.00024 %	✓	
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				1.3 mg/kg		1.157 mg/kg	0.000116 %	✓	
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				2.7 mg/kg		2.403 mg/kg	0.00024 %	✓	
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				1.3 mg/kg		1.157 mg/kg	0.000116 %	✓	
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				0.32 mg/kg		0.285 mg/kg	0.0000285 %	✓	
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				1.5 mg/kg		1.335 mg/kg	0.000133 %	✓	
		205-883-8	191-24-2							
32	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
33	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
34	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
35	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<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]							
36	TPH (C6 to C40) petroleum group				137.1 mg/kg		122.019 mg/kg	0.0122 %	✓	
			TPH							
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
Total:								0.0614 %		



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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
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 Insufficient concentration to be considered flammable risk. No liquid free phase.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0122%)



Classification of sample: WS02

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS02	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	
Moisture content:	
8.4%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.4% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	antimony { antimony trioxide }				3.4 mg/kg	1.197	3.728 mg/kg	0.000373 %	✓		
	051-005-00-X	215-175-0	1309-64-4								
2	arsenic { arsenic trioxide }				10 mg/kg	1.32	12.094 mg/kg	0.00121 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.419 mg/kg	0.0000419 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
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 }				38 mg/kg	1.126	39.19 mg/kg	0.00392 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	110 mg/kg		100.76 mg/kg	0.0101 %	✓		
	082-001-00-6										
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
	080-010-00-X	231-299-8	7487-94-7								
8	molybdenum { molybdenum(VI) oxide }				1.3 mg/kg	1.5	1.786 mg/kg	0.000179 %	✓		
	042-001-00-9	215-204-7	1313-27-5								
9	nickel { dinickel hexacyanoferrate }				18 mg/kg	2.806	46.258 mg/kg	0.00463 %	✓		
	028-037-00-8	238-946-3	14874-78-3								
10	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										
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				94 mg/kg	4.398	378.679 mg/kg	0.0379 %	✓		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD	
	006-007-00-5										



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
13	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
14	boron { diboron trioxide }				0.5 mg/kg	3.22	1.475 mg/kg	0.000147 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
15	pH		PH		9.1 pH		9.1 pH	9.1 pH			
16	naphthalene				2 mg/kg		1.832 mg/kg	0.000183 %	✓		
	601-052-00-2	202-049-5	91-20-3								
17	acenaphthylene				0.12 mg/kg		0.11 mg/kg	0.000011 %	✓		
		205-917-1	208-96-8								
18	acenaphthene				2.5 mg/kg		2.29 mg/kg	0.000229 %	✓		
		201-469-6	83-32-9								
19	fluorene				1.9 mg/kg		1.74 mg/kg	0.000174 %	✓		
		201-695-5	86-73-7								
20	phenanthrene				12 mg/kg		10.992 mg/kg	0.0011 %	✓		
		201-581-5	85-01-8								
21	anthracene				3.2 mg/kg		2.931 mg/kg	0.000293 %	✓		
		204-371-1	120-12-7								
22	fluoranthene				14 mg/kg		12.824 mg/kg	0.00128 %	✓		
		205-912-4	206-44-0								
23	pyrene				12 mg/kg		10.992 mg/kg	0.0011 %	✓		
		204-927-3	129-00-0								
24	benzo[a]anthracene				5.8 mg/kg		5.313 mg/kg	0.000531 %	✓		
	601-033-00-9	200-280-6	56-55-3								
25	chrysene				6.1 mg/kg		5.588 mg/kg	0.000559 %	✓		
	601-048-00-0	205-923-4	218-01-9								
26	benzo[b]fluoranthene				5.6 mg/kg		5.13 mg/kg	0.000513 %	✓		
	601-034-00-4	205-911-9	205-99-2								
27	benzo[k]fluoranthene				2.6 mg/kg		2.382 mg/kg	0.000238 %	✓		
	601-036-00-5	205-916-6	207-08-9								
28	benzo[a]pyrene; benzo[def]chrysene				5.4 mg/kg		4.946 mg/kg	0.000495 %	✓		
	601-032-00-3	200-028-5	50-32-8								
29	indeno[123-cd]pyrene				2.6 mg/kg		2.382 mg/kg	0.000238 %	✓		
		205-893-2	193-39-5								
30	dibenz[a,h]anthracene				0.62 mg/kg		0.568 mg/kg	0.0000568 %	✓		
	601-041-00-2	200-181-8	53-70-3								
31	benzo[ghi]perylene				3 mg/kg		2.748 mg/kg	0.000275 %	✓		
		205-883-8	191-24-2								
32	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
33	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
34	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
35	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<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]								
36	TPH (C6 to C40) petroleum group				398.5 mg/kg		365.026 mg/kg	0.0365 %	✓		
			TPH								
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
38	asbestos				10 mg/kg		9.16 mg/kg	0.000916 %	✓		
	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
			77536-67-5 12001-29-5							
Total:								0.106 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
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 Insufficient concentration to be considered flammable risk. No liquid free phase.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0365%)



Classification of sample: WS03

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS03** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: **0.5 m** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: **9.4%**
(wet weight correction)

Hazard properties

None identified

Determinands

Moisture content: 9.4% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				2.2 mg/kg	1.197	2.386 mg/kg	0.000239 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				8.6 mg/kg	1.32	10.287 mg/kg	0.00103 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				32 mg/kg	1.126	32.642 mg/kg	0.00326 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	60 mg/kg		54.36 mg/kg	0.00544 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	molybdenum { molybdenum(VI) oxide }				1.2 mg/kg	1.5	1.631 mg/kg	0.000163 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	48.295 mg/kg	0.00483 %	✓	
	028-037-00-8	238-946-3	14874-78-3							
10	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									
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				74 mg/kg	4.398	294.855 mg/kg	0.0295 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
13	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
14	boron { diboron trioxide }				0.3 mg/kg	3.22	0.875 mg/kg	0.0000875 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
15	pH		PH		8.4 pH		8.4 pH	8.4 pH			
16	naphthalene				0.2 mg/kg		0.181 mg/kg	0.0000181 %	✓		
	601-052-00-2	202-049-5	91-20-3								
17	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-917-1	208-96-8								
18	acenaphthene				0.41 mg/kg		0.371 mg/kg	0.0000371 %	✓		
		201-469-6	83-32-9								
19	fluorene				0.33 mg/kg		0.299 mg/kg	0.0000299 %	✓		
		201-695-5	86-73-7								
20	phenanthrene				2.8 mg/kg		2.537 mg/kg	0.000254 %	✓		
		201-581-5	85-01-8								
21	anthracene				0.65 mg/kg		0.589 mg/kg	0.0000589 %	✓		
		204-371-1	120-12-7								
22	fluoranthene				3.6 mg/kg		3.262 mg/kg	0.000326 %	✓		
		205-912-4	206-44-0								
23	pyrene				3.2 mg/kg		2.899 mg/kg	0.00029 %	✓		
		204-927-3	129-00-0								
24	benzo[a]anthracene				1.6 mg/kg		1.45 mg/kg	0.000145 %	✓		
	601-033-00-9	200-280-6	56-55-3								
25	chrysene				1.8 mg/kg		1.631 mg/kg	0.000163 %	✓		
	601-048-00-0	205-923-4	218-01-9								
26	benzo[b]fluoranthene				1.6 mg/kg		1.45 mg/kg	0.000145 %	✓		
	601-034-00-4	205-911-9	205-99-2								
27	benzo[k]fluoranthene				0.79 mg/kg		0.716 mg/kg	0.0000716 %	✓		
	601-036-00-5	205-916-6	207-08-9								
28	benzo[a]pyrene; benzo[def]chrysene				1.6 mg/kg		1.45 mg/kg	0.000145 %	✓		
	601-032-00-3	200-028-5	50-32-8								
29	indeno[123-cd]pyrene				0.82 mg/kg		0.743 mg/kg	0.0000743 %	✓		
		205-893-2	193-39-5								
30	dibenz[a,h]anthracene				0.19 mg/kg		0.172 mg/kg	0.0000172 %	✓		
	601-041-00-2	200-181-8	53-70-3								
31	benzo[ghi]perylene				0.93 mg/kg		0.843 mg/kg	0.0000843 %	✓		
		205-883-8	191-24-2								
32	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
33	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
34	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
35	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<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]								
36	TPH (C6 to C40) petroleum group		TPH		127.2 mg/kg		115.243 mg/kg	0.0115 %	✓		
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
38	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								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
			77536-67-5 12001-29-5							
Total:								0.0621 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
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 Insufficient concentration to be considered flammable risk. No liquid free phase.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0115%)



Classification of sample: WS04

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS04	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	
Moisture content:	
9.6%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.6% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				3 mg/kg	1.197	3.247 mg/kg	0.000325 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				8.9 mg/kg	1.32	10.623 mg/kg	0.00106 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.413 mg/kg	0.0000413 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				33 mg/kg	1.126	33.588 mg/kg	0.00336 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	67 mg/kg		60.568 mg/kg	0.00606 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	molybdenum { molybdenum(VI) oxide }				1.1 mg/kg	1.5	1.492 mg/kg	0.000149 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	48.188 mg/kg	0.00482 %	✓	
	028-037-00-8	238-946-3	14874-78-3							
10	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									
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				99 mg/kg	4.398	393.597 mg/kg	0.0394 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
13	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
14	boron { diboron trioxide }				0.7 mg/kg	3.22	2.038 mg/kg	0.000204 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
15	pH		PH		8.8 pH		8.8 pH	8.8 pH			
16	naphthalene				0.54 mg/kg		0.488 mg/kg	0.0000488 %	✓		
	601-052-00-2	202-049-5	91-20-3								
17	acenaphthylene				0.08 mg/kg		0.0723 mg/kg	0.00000723 %	✓		
		205-917-1	208-96-8								
18	acenaphthene				1.1 mg/kg		0.994 mg/kg	0.0000994 %	✓		
		201-469-6	83-32-9								
19	fluorene				0.88 mg/kg		0.796 mg/kg	0.0000796 %	✓		
		201-695-5	86-73-7								
20	phenanthrene				6.3 mg/kg		5.695 mg/kg	0.00057 %	✓		
		201-581-5	85-01-8								
21	anthracene				1.5 mg/kg		1.356 mg/kg	0.000136 %	✓		
		204-371-1	120-12-7								
22	fluoranthene				7.8 mg/kg		7.051 mg/kg	0.000705 %	✓		
		205-912-4	206-44-0								
23	pyrene				7.2 mg/kg		6.509 mg/kg	0.000651 %	✓		
		204-927-3	129-00-0								
24	benzo[a]anthracene				3.5 mg/kg		3.164 mg/kg	0.000316 %	✓		
	601-033-00-9	200-280-6	56-55-3								
25	chrysene				3.8 mg/kg		3.435 mg/kg	0.000344 %	✓		
	601-048-00-0	205-923-4	218-01-9								
26	benzo[b]fluoranthene				3.7 mg/kg		3.345 mg/kg	0.000334 %	✓		
	601-034-00-4	205-911-9	205-99-2								
27	benzo[k]fluoranthene				1.4 mg/kg		1.266 mg/kg	0.000127 %	✓		
	601-036-00-5	205-916-6	207-08-9								
28	benzo[a]pyrene; benzo[def]chrysene				3.4 mg/kg		3.074 mg/kg	0.000307 %	✓		
	601-032-00-3	200-028-5	50-32-8								
29	indeno[123-cd]pyrene				1.7 mg/kg		1.537 mg/kg	0.000154 %	✓		
		205-893-2	193-39-5								
30	dibenz[a,h]anthracene				0.4 mg/kg		0.362 mg/kg	0.0000362 %	✓		
	601-041-00-2	200-181-8	53-70-3								
31	benzo[ghi]perylene				1.9 mg/kg		1.718 mg/kg	0.000172 %	✓		
		205-883-8	191-24-2								
32	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
33	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
34	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
35	xylene				<0.01 mg/kg		<0.01 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]								
36	TPH (C6 to C40) petroleum group		TPH		182 mg/kg		164.528 mg/kg	0.0165 %	✓		
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
38	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								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
			77536-67-5 12001-29-5							
Total:								0.08 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
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 Insufficient concentration to be considered flammable risk. No liquid free phase.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0165%)



Classification of sample: WS05

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS05** LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: **0.5 m** Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: **9.7%**
(wet weight correction)

Hazard properties

None identified

Determinands

Moisture content: 9.7% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				3.2 mg/kg	1.197	3.459 mg/kg	0.000346 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				10 mg/kg	1.32	11.923 mg/kg	0.00119 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				31 mg/kg	1.126	31.517 mg/kg	0.00315 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	54 mg/kg		48.762 mg/kg	0.00488 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	molybdenum { molybdenum(VI) oxide }				1.1 mg/kg	1.5	1.49 mg/kg	0.000149 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
9	nickel { dinickel hexacyanoferrate }				18 mg/kg	2.806	45.602 mg/kg	0.00456 %	✓	
	028-037-00-8	238-946-3	14874-78-3							
10	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									
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				73 mg/kg	4.398	289.907 mg/kg	0.029 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
13	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
14	boron { diboron trioxide }				0.2 mg/kg	3.22	0.582 mg/kg	0.0000582 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
15	pH		PH		8.4 pH		8.4 pH	8.4 pH			
16	naphthalene				0.21 mg/kg		0.19 mg/kg	0.000019 %	✓		
	601-052-00-2	202-049-5	91-20-3								
17	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		205-917-1	208-96-8								
18	acenaphthene				0.47 mg/kg		0.424 mg/kg	0.0000424 %	✓		
		201-469-6	83-32-9								
19	fluorene				0.32 mg/kg		0.289 mg/kg	0.0000289 %	✓		
		201-695-5	86-73-7								
20	phenanthrene				2.7 mg/kg		2.438 mg/kg	0.000244 %	✓		
		201-581-5	85-01-8								
21	anthracene				0.59 mg/kg		0.533 mg/kg	0.0000533 %	✓		
		204-371-1	120-12-7								
22	fluoranthene				3.5 mg/kg		3.161 mg/kg	0.000316 %	✓		
		205-912-4	206-44-0								
23	pyrene				3.2 mg/kg		2.89 mg/kg	0.000289 %	✓		
		204-927-3	129-00-0								
24	benzo[a]anthracene				1.4 mg/kg		1.264 mg/kg	0.000126 %	✓		
	601-033-00-9	200-280-6	56-55-3								
25	chrysene				1.8 mg/kg		1.625 mg/kg	0.000163 %	✓		
	601-048-00-0	205-923-4	218-01-9								
26	benzo[b]fluoranthene				1.6 mg/kg		1.445 mg/kg	0.000144 %	✓		
	601-034-00-4	205-911-9	205-99-2								
27	benzo[k]fluoranthene				0.73 mg/kg		0.659 mg/kg	0.0000659 %	✓		
	601-036-00-5	205-916-6	207-08-9								
28	benzo[a]pyrene; benzo[def]chrysene				1.5 mg/kg		1.354 mg/kg	0.000135 %	✓		
	601-032-00-3	200-028-5	50-32-8								
29	indeno[123-cd]pyrene				0.73 mg/kg		0.659 mg/kg	0.0000659 %	✓		
		205-893-2	193-39-5								
30	dibenz[a,h]anthracene				0.17 mg/kg		0.154 mg/kg	0.0000154 %	✓		
	601-041-00-2	200-181-8	53-70-3								
31	benzo[ghi]perylene				0.87 mg/kg		0.786 mg/kg	0.0000786 %	✓		
		205-883-8	191-24-2								
32	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
33	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
34	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
35	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<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]								
36	TPH (C6 to C40) petroleum group				258.9 mg/kg		233.787 mg/kg	0.0234 %	✓		
			TPH								
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
38	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								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
			77536-67-5 12001-29-5							
Total:								0.0726 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
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 Insufficient concentration to be considered flammable risk. No liquid free phase.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0234%)



Classification of sample: WS06

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS06	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	
Moisture content:	
17%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	antimony { antimony trioxide }				2.8 mg/kg	1.197	2.782 mg/kg	0.000278 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
2	arsenic { arsenic trioxide }				8 mg/kg	1.32	8.767 mg/kg	0.000877 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.284 mg/kg	0.0000284 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	copper { dicopper oxide; copper (I) oxide }				37 mg/kg	1.126	34.576 mg/kg	0.00346 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	46 mg/kg		38.18 mg/kg	0.00382 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	molybdenum { molybdenum(VI) oxide }				0.9 mg/kg	1.5	1.121 mg/kg	0.000112 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
9	nickel { dinickel hexacyanoferrate }				18 mg/kg	2.806	41.915 mg/kg	0.00419 %	✓	
	028-037-00-8	238-946-3	14874-78-3							
10	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									
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				80 mg/kg	4.398	292.022 mg/kg	0.0292 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
13	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
14	boron { diboron trioxide }				0.2 mg/kg	3.22	0.534 mg/kg	0.0000534 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
15	pH		PH		7.9 pH		7.9 pH	7.9 pH		
16	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
17	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
18	acenaphthene				0.1 mg/kg		0.083 mg/kg	0.0000083 %	✓	
		201-469-6	83-32-9							
19	fluorene				0.07 mg/kg		0.0581 mg/kg	0.00000581 %	✓	
		201-695-5	86-73-7							
20	phenanthrene				0.68 mg/kg		0.564 mg/kg	0.0000564 %	✓	
		201-581-5	85-01-8							
21	anthracene				0.16 mg/kg		0.133 mg/kg	0.0000133 %	✓	
		204-371-1	120-12-7							
22	fluoranthene				1.1 mg/kg		0.913 mg/kg	0.0000913 %	✓	
		205-912-4	206-44-0							
23	pyrene				1.1 mg/kg		0.913 mg/kg	0.0000913 %	✓	
		204-927-3	129-00-0							
24	benzo[a]anthracene				0.52 mg/kg		0.432 mg/kg	0.0000432 %	✓	
	601-033-00-9	200-280-6	56-55-3							
25	chrysene				0.67 mg/kg		0.556 mg/kg	0.0000556 %	✓	
	601-048-00-0	205-923-4	218-01-9							
26	benzo[b]fluoranthene				0.61 mg/kg		0.506 mg/kg	0.0000506 %	✓	
	601-034-00-4	205-911-9	205-99-2							
27	benzo[k]fluoranthene				0.31 mg/kg		0.257 mg/kg	0.0000257 %	✓	
	601-036-00-5	205-916-6	207-08-9							
28	benzo[a]pyrene; benzo[def]chrysene				0.59 mg/kg		0.49 mg/kg	0.000049 %	✓	
	601-032-00-3	200-028-5	50-32-8							
29	indeno[123-cd]pyrene				0.31 mg/kg		0.257 mg/kg	0.0000257 %	✓	
		205-893-2	193-39-5							
30	dibenz[a,h]anthracene				0.07 mg/kg		0.0581 mg/kg	0.00000581 %	✓	
	601-041-00-2	200-181-8	53-70-3							
31	benzo[ghi]perylene				0.36 mg/kg		0.299 mg/kg	0.0000299 %	✓	
		205-883-8	191-24-2							
32	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
33	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
34	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
35	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<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]							
36	TPH (C6 to C40) petroleum group		TPH		<62.16 mg/kg		<62.16 mg/kg	<0.00622 %		<LOD
37	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
Total:								0.0519 %		



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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Appendix A: Classifier defined and non GB MCL 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 (worst case)**

GB MCL index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

• **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• **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

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **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

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Insufficient concentration of chromium(VI) to be present.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight



molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight

nickel {dinickel hexacyanoferrate}

Insufficient concentration of chromium(VI) to be present.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]}

Insufficient concentration of chromium(VI) to be present.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide]

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2024.158.6092.11254 (06 Jun 2024)

HazWasteOnline Database: 2024.158.6092.11254 (06 Jun 2024)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

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 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

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023

GB MCL List v3.0 - version 3.0 of 11th January 2024

GB MCL List v4.0 - version 4.0 of 2nd March 2024

APPENDIX K: SITE PHOTOGRAPHS



1. Northern section of the study site as seen from Sandbrook Road
2. Northern section of the site, adjoined by a development of commercial units, as seen from Sandbrook Road





3. Study site as seen from its northwestern boundary
4. Western site boundary adjoined by public pavement extending along Sandbrook





- 5. Northeastern section of the site
- 6. As above





7. General make up of ground cover within the northern section of the site
8. Eastern section of the site with the eastern site boundary being defined by the line mature trees





9. Southern section of the site as seen from the approx. site centre
10. Tall ruderal herbs and grass covering much of the site as seen from the approx. site centre





- 11. As Figures 09 & 10 above
- 12. Southeastern section of the site as seen from the approx. site centre





- 13. Showing vegetation cover within southern section of the site
- 14. As above





- 15. Showing a combination of vegetation / made ground cover within southern section of the site
- 16. Tall perennial grasses extending into the southern section of the site





- 17. Public pavement extending along the western site boundary. Northerly aspect
- 18. Caution signage located within southern section of the site identifying the presence of standing water





- 19. Study site as seen from its southern boundary
- 20. As above





21. Partially concealed man hole coverers set within rough grassland located within the southern section of the site
22. As above



APPENDIX L: ENVIRONMENTAL DATA REPORT & HISTORICAL MAPPING



Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1851

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1847
Revised N/A
Edition 1851
Copyright N/A
Levelled N/A

Surveyed 1848
Revised N/A
Edition 1851
Copyright N/A
Levelled N/A



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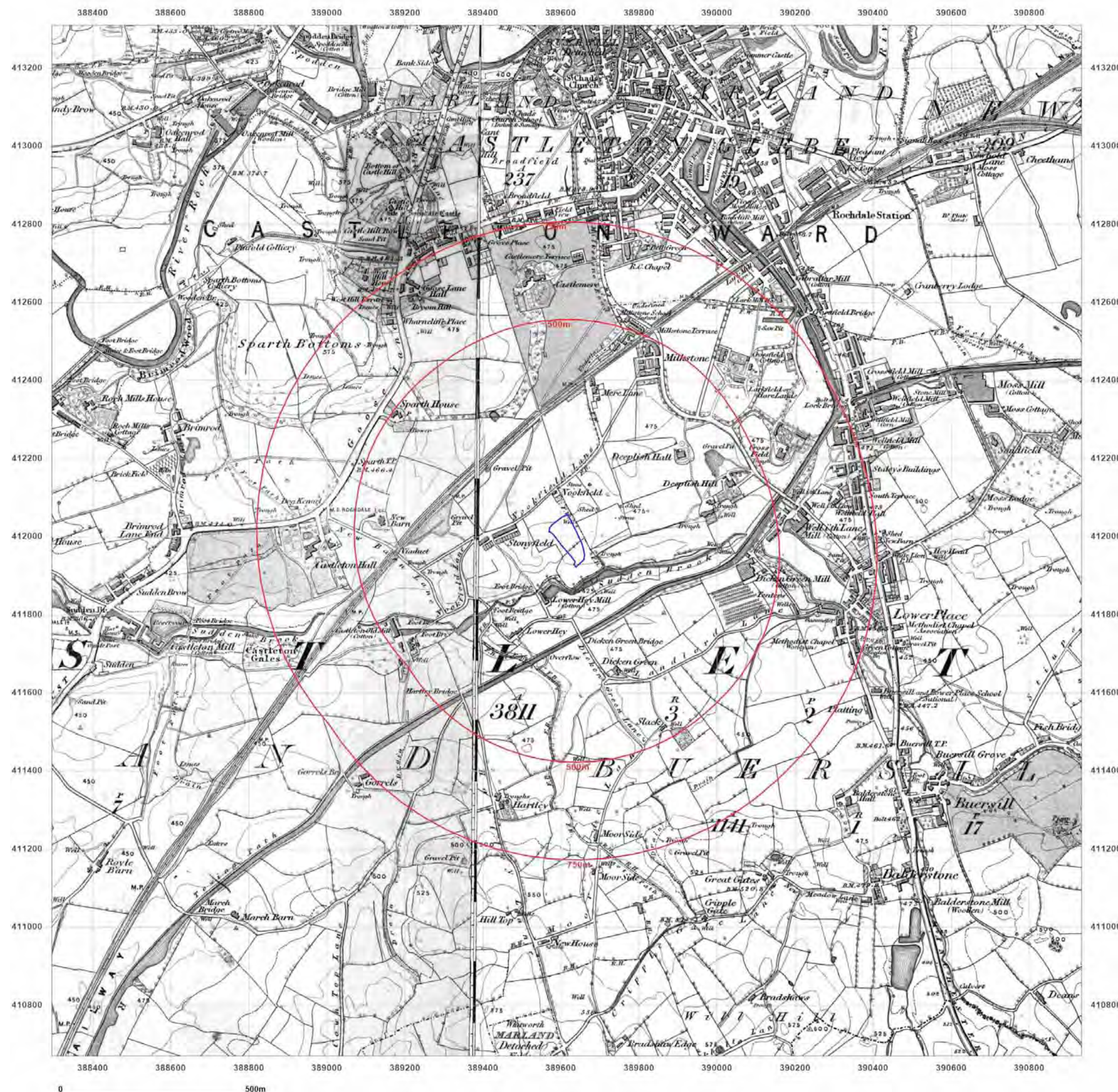


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Production date: 10 May 2024

Map legend available at:
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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1890-1891

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1890
Revised 1890
Edition N/A
Copyright N/A
Levelled N/A

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

Surveyed 1891
Revised 1891
Edition N/A
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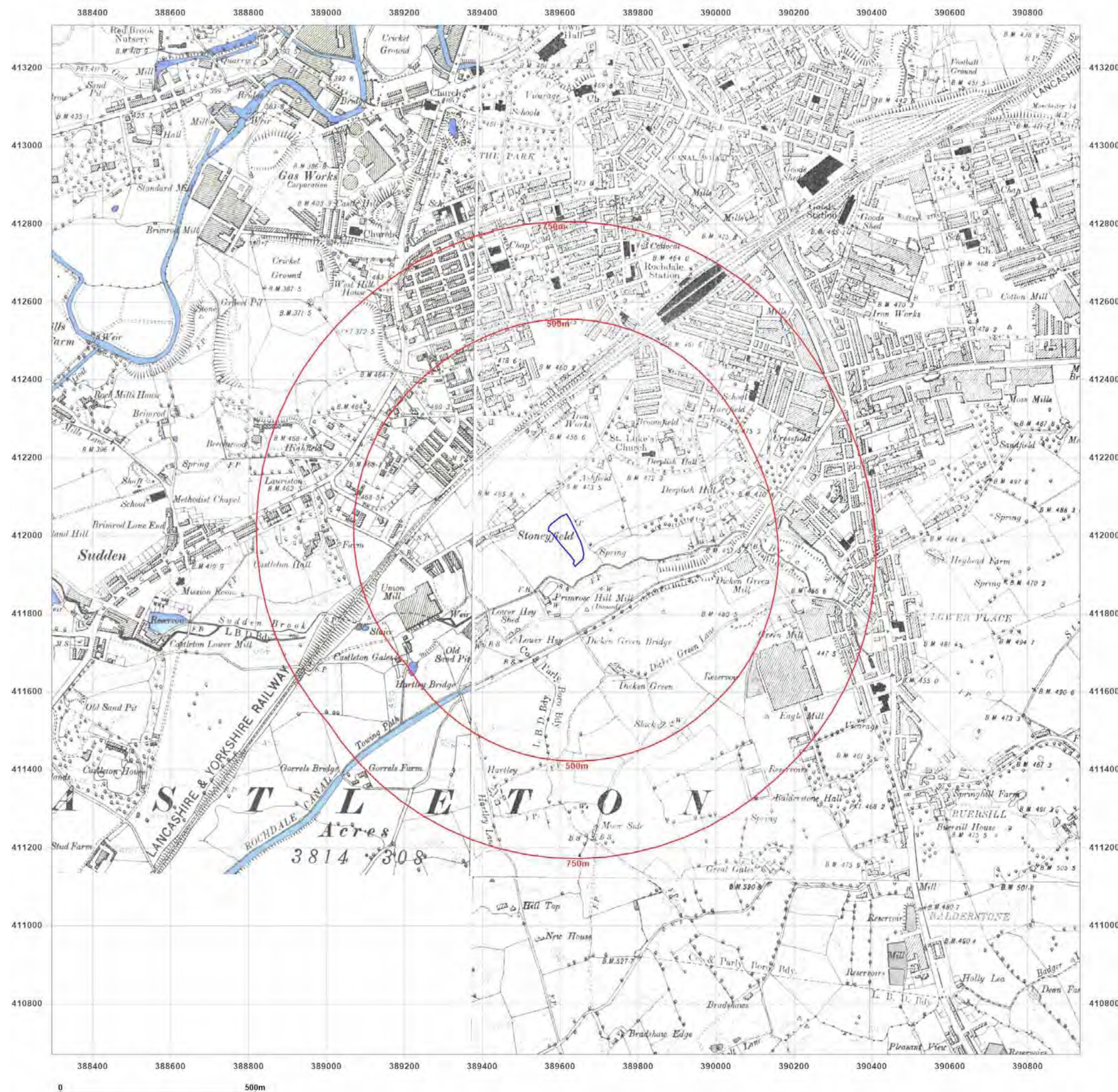


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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

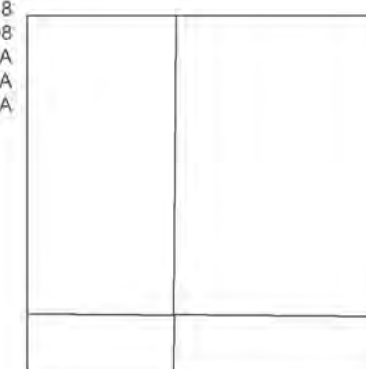
Map date: 1907-1908

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1848
Revised 1908
Edition N/A
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Surveyed 1848
Revised 1907
Edition N/A
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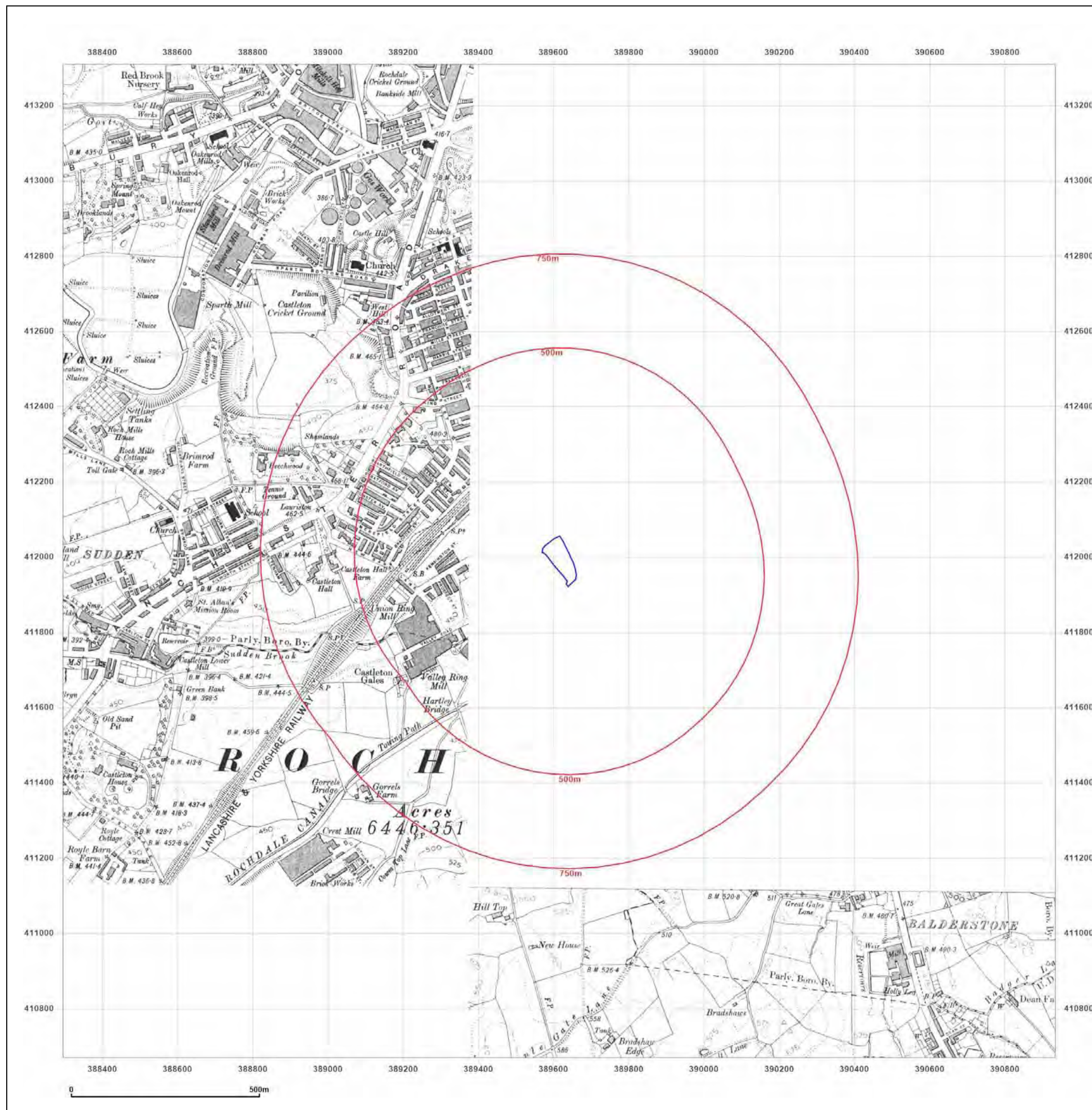


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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1908-1909

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1909
Edition N/A
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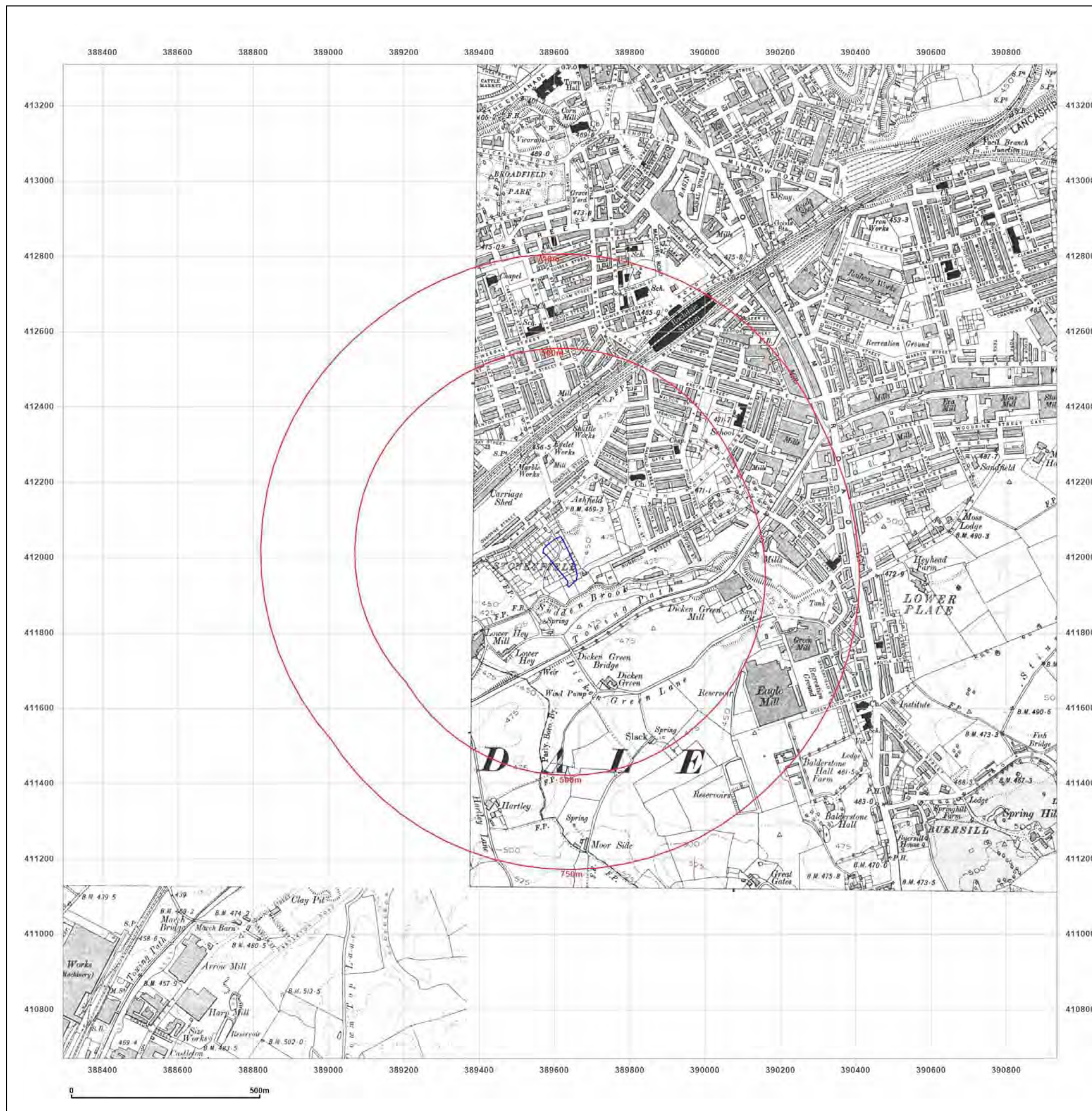


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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1928

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1848
Revised 1928
Edition N/A
Copyright N/A
Levelled N/A

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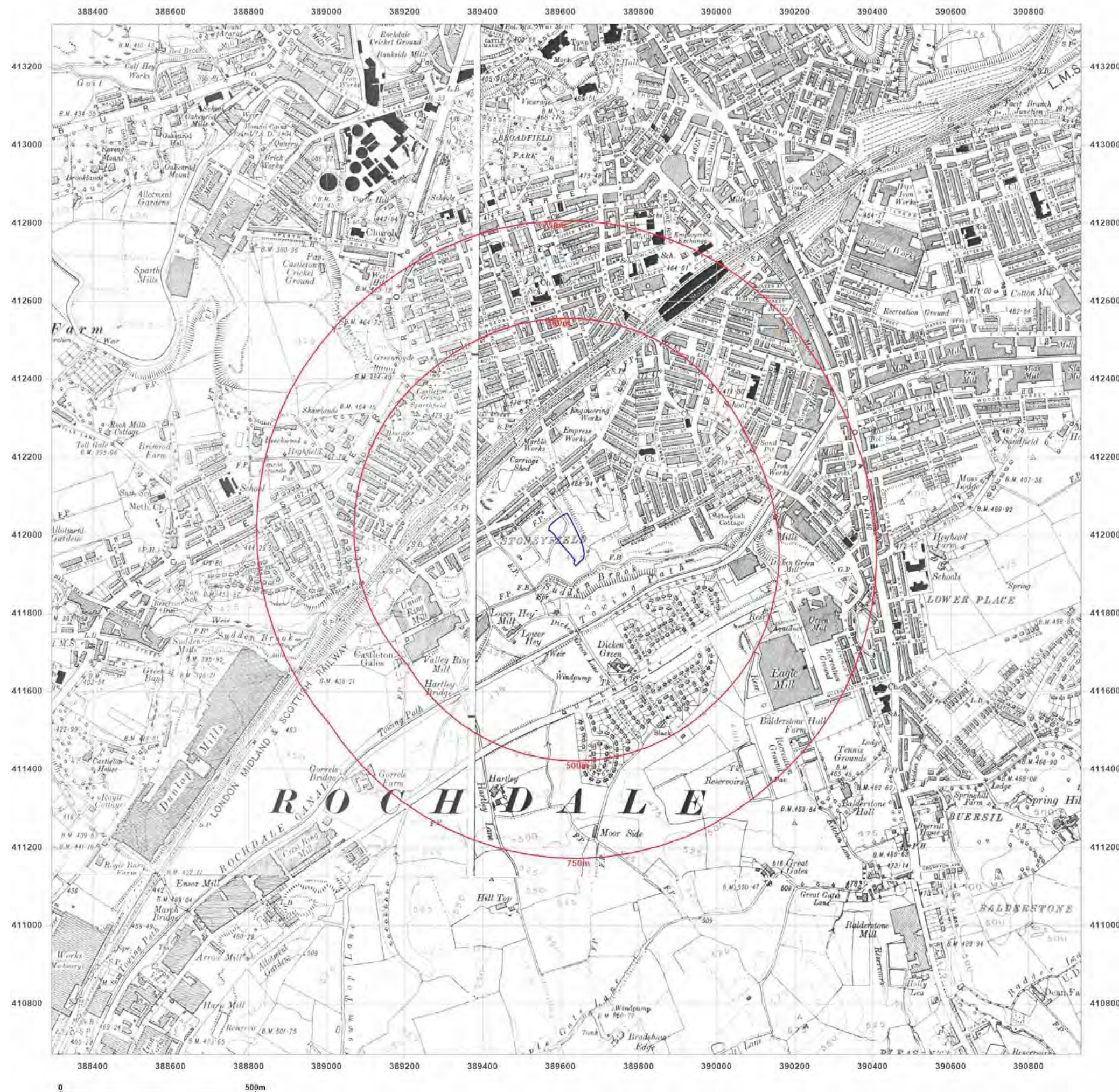


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Site Details:

Sandbrook Business Park,
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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: Provisional

Map date: 1954-1956

Scale: 1:10,560

Printed at: 1:10.560



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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: Provisional

Map date: 1967-1968

Scale: 1:10,560

Printed at: 1:10,560



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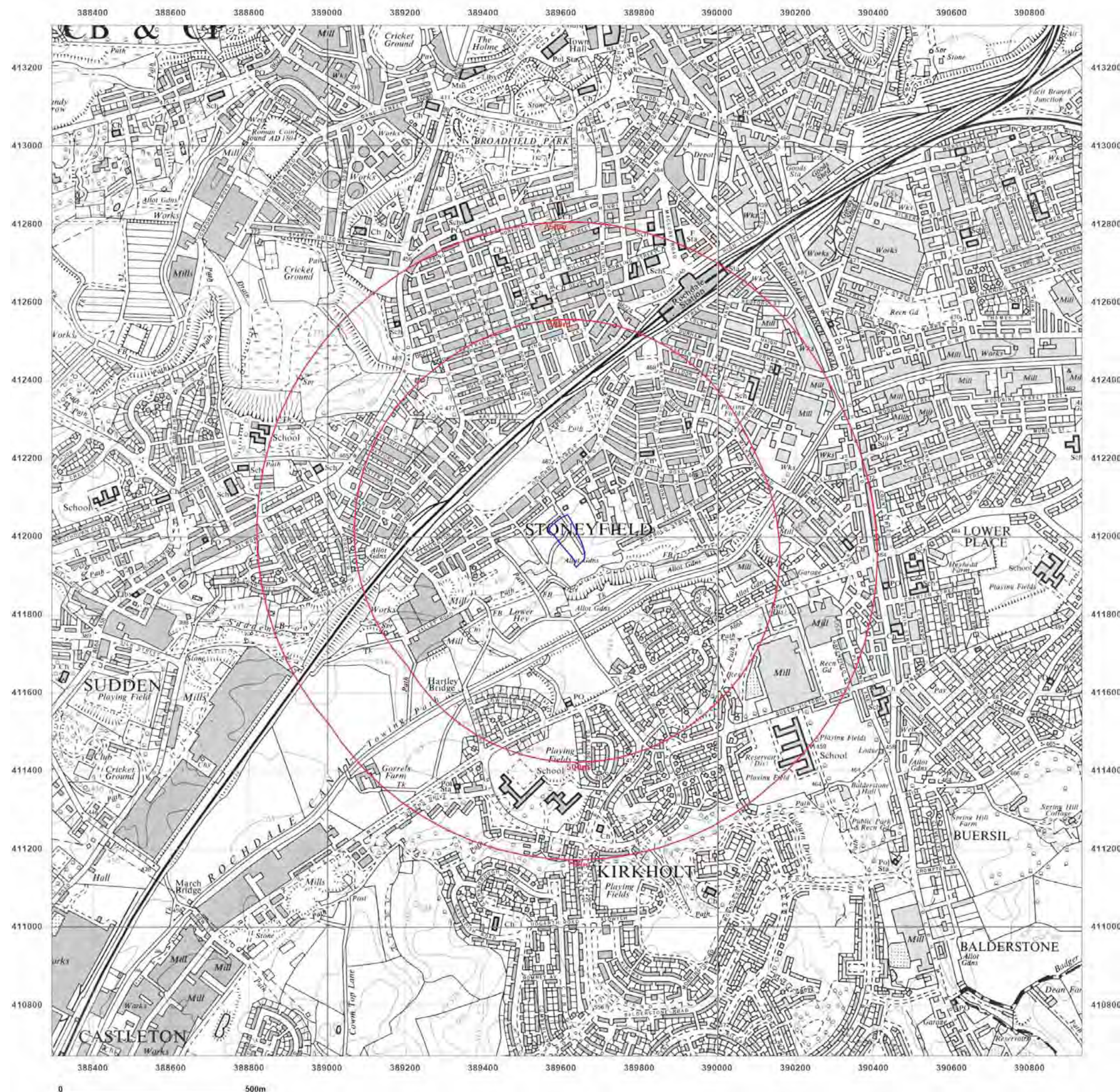


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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 1975-1976

Scale: 1:10,000

Printed at: 1:10,000



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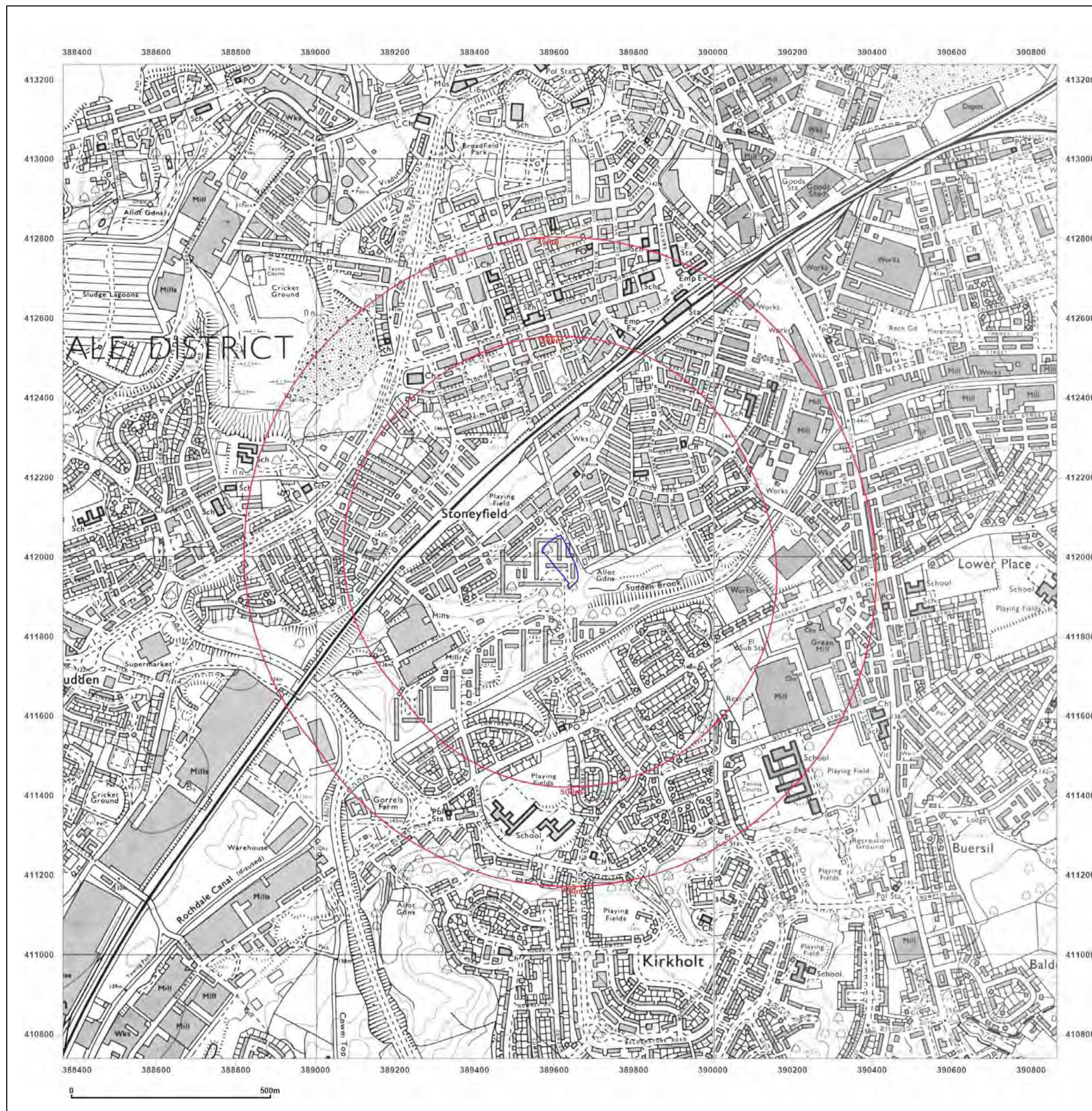


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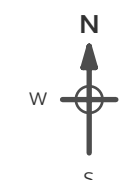
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Map Name: National Grid

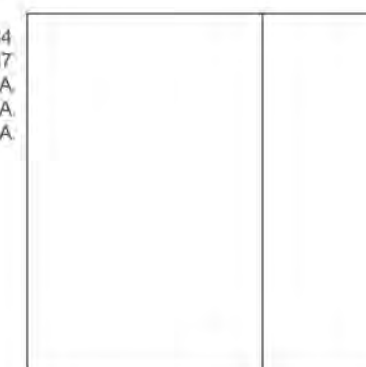
Map date: 1987

Scale: 1:10,000

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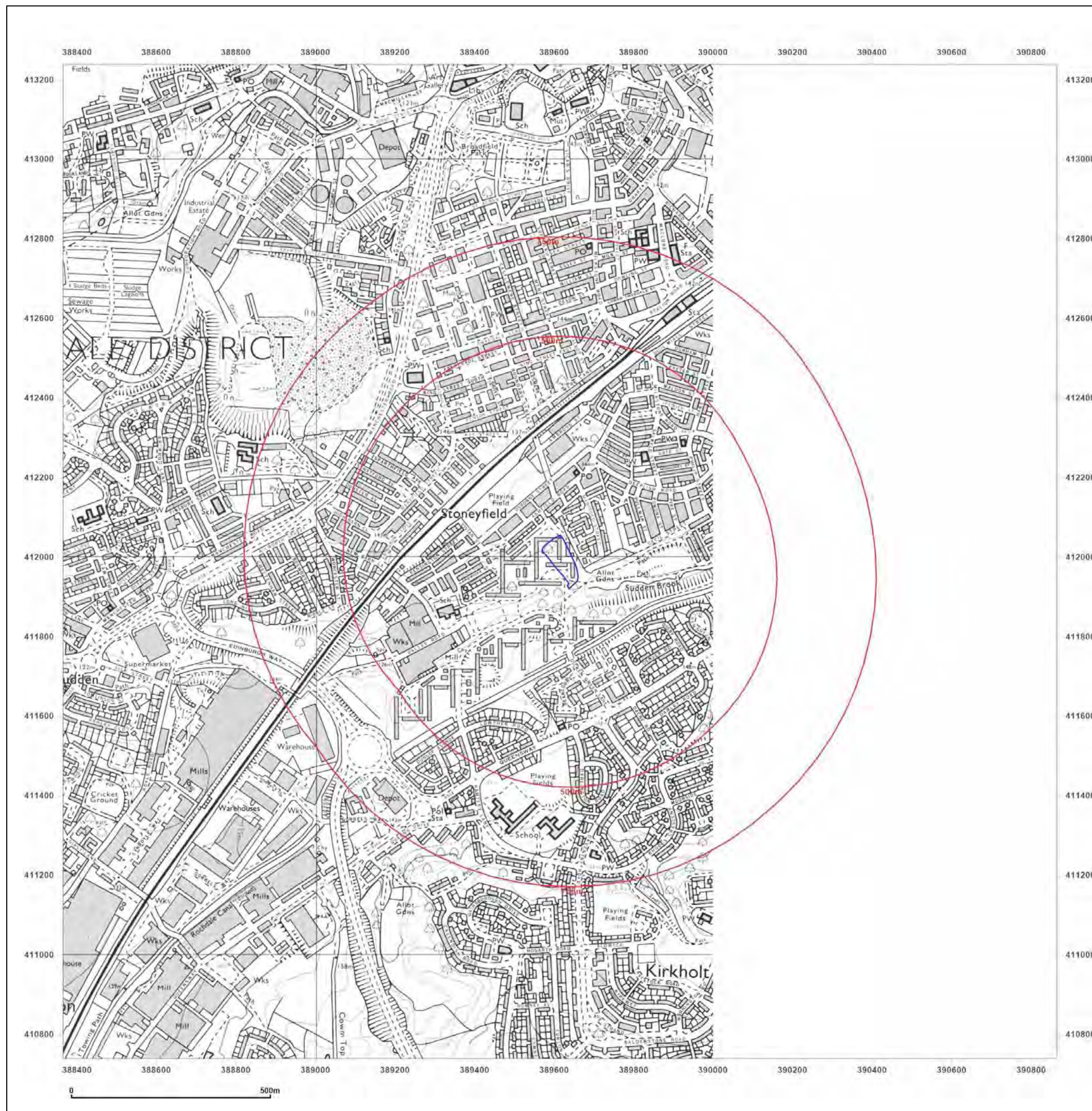


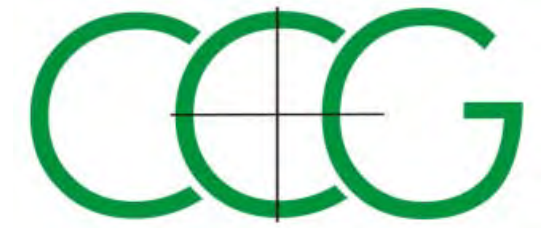
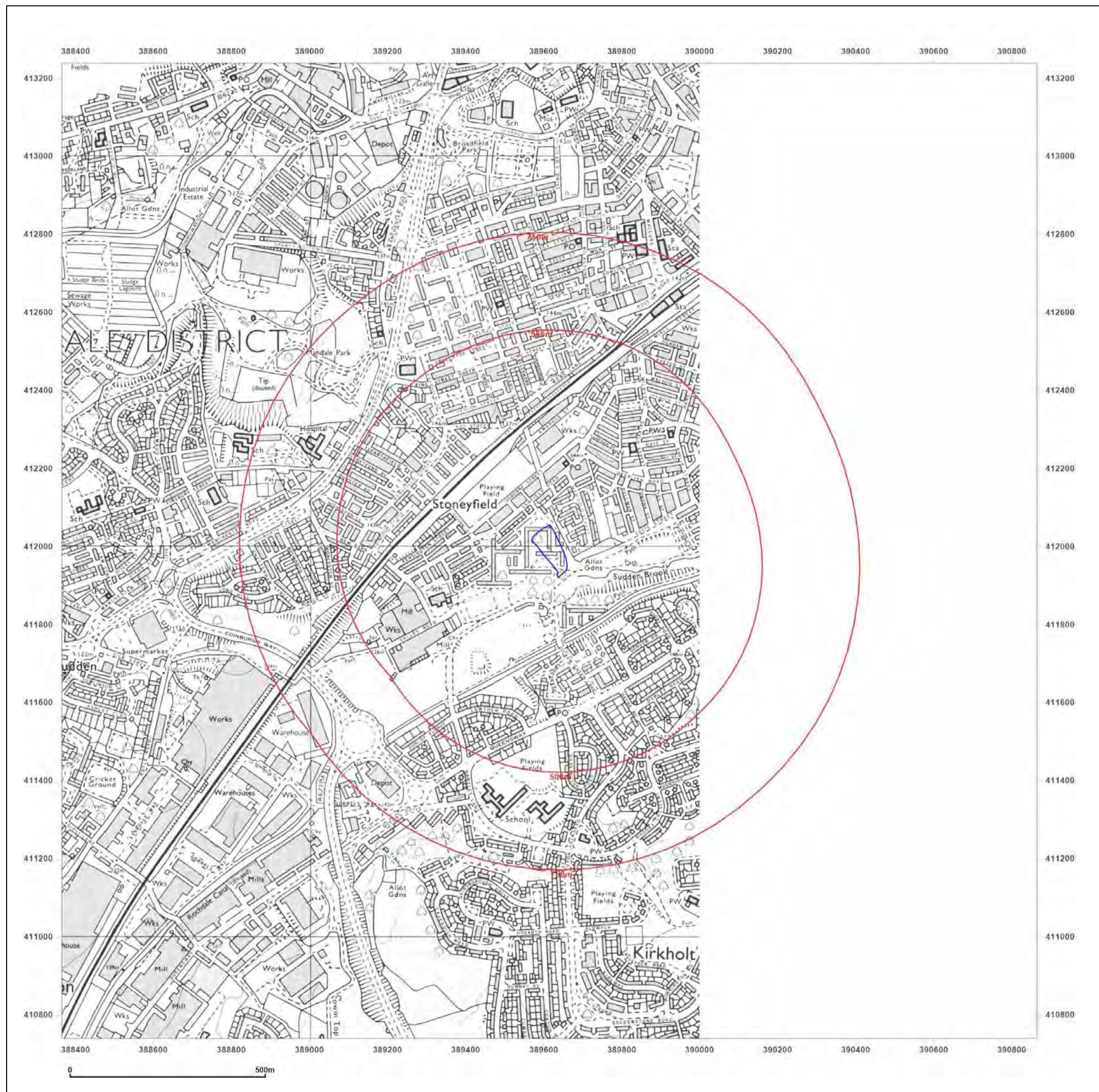
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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

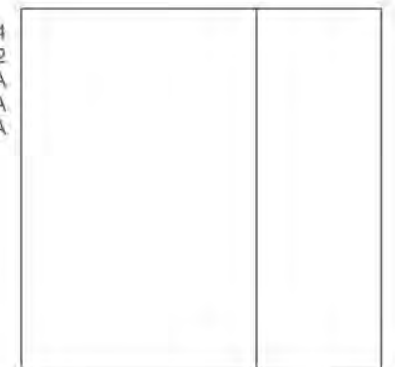
Map date: 1992

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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



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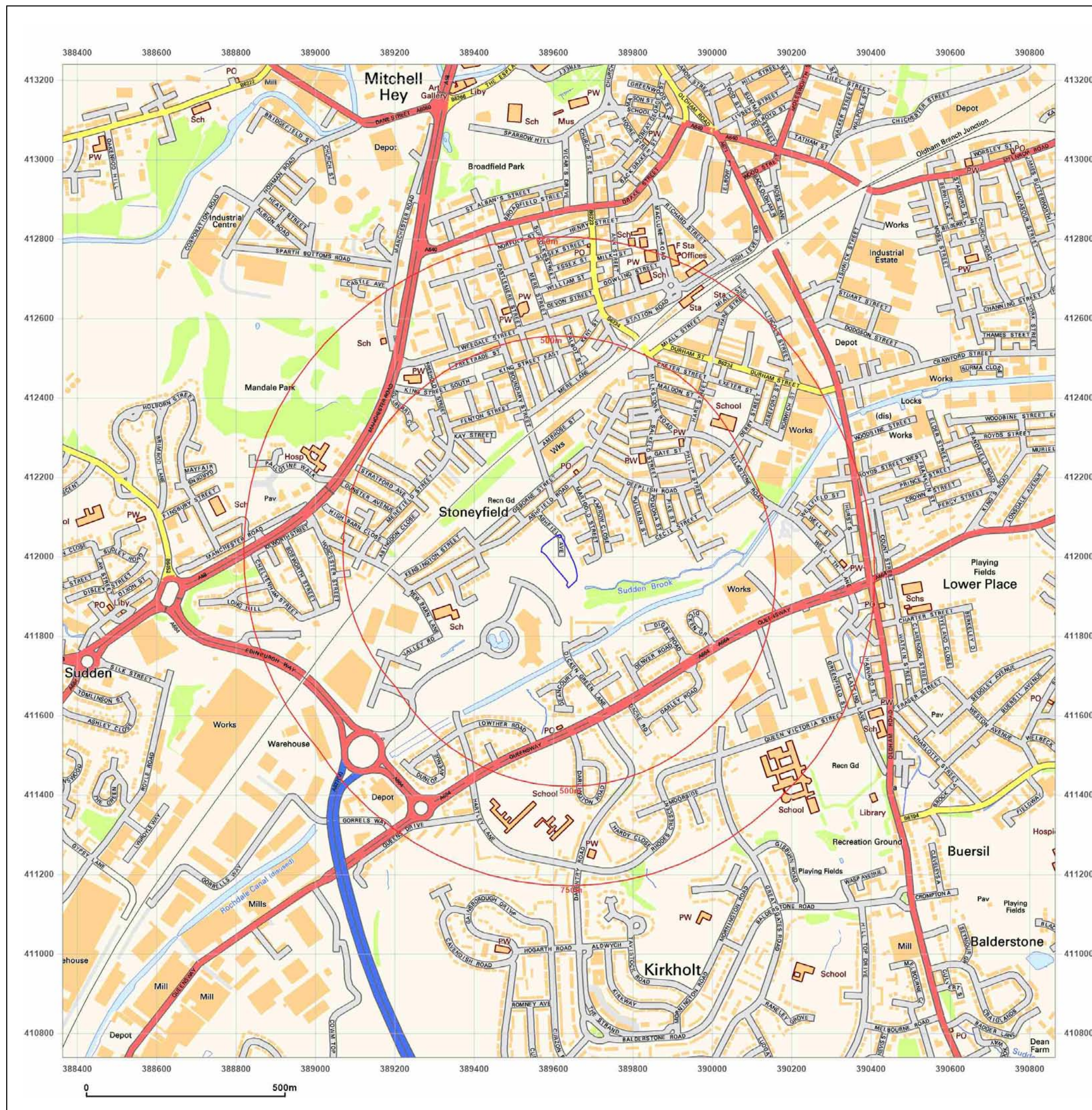


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Site Details:

Sandbrook Business Park,
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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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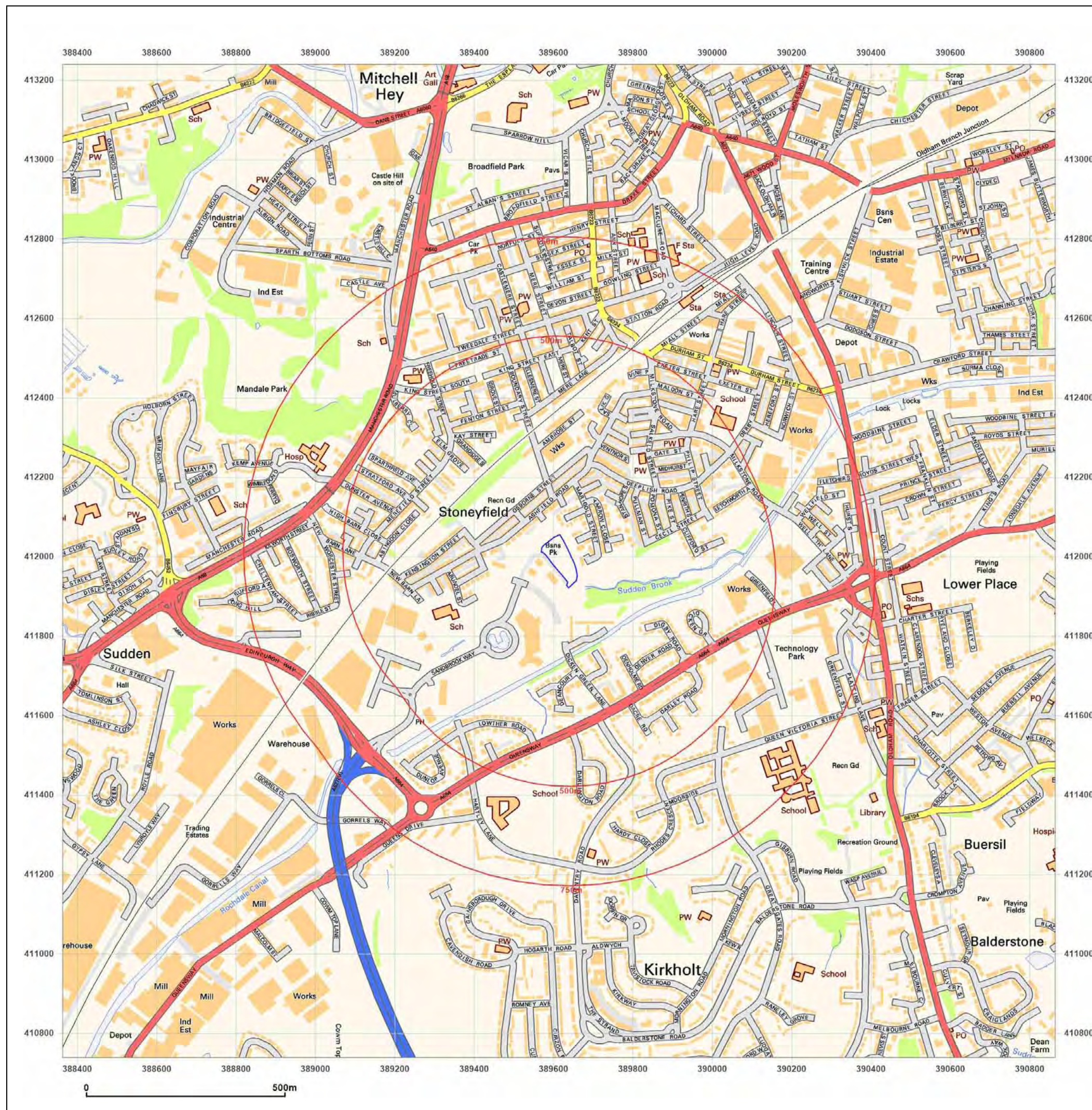


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Site Details:

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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 2024

Scale: 1:10,000

Printed at: 1:10,000



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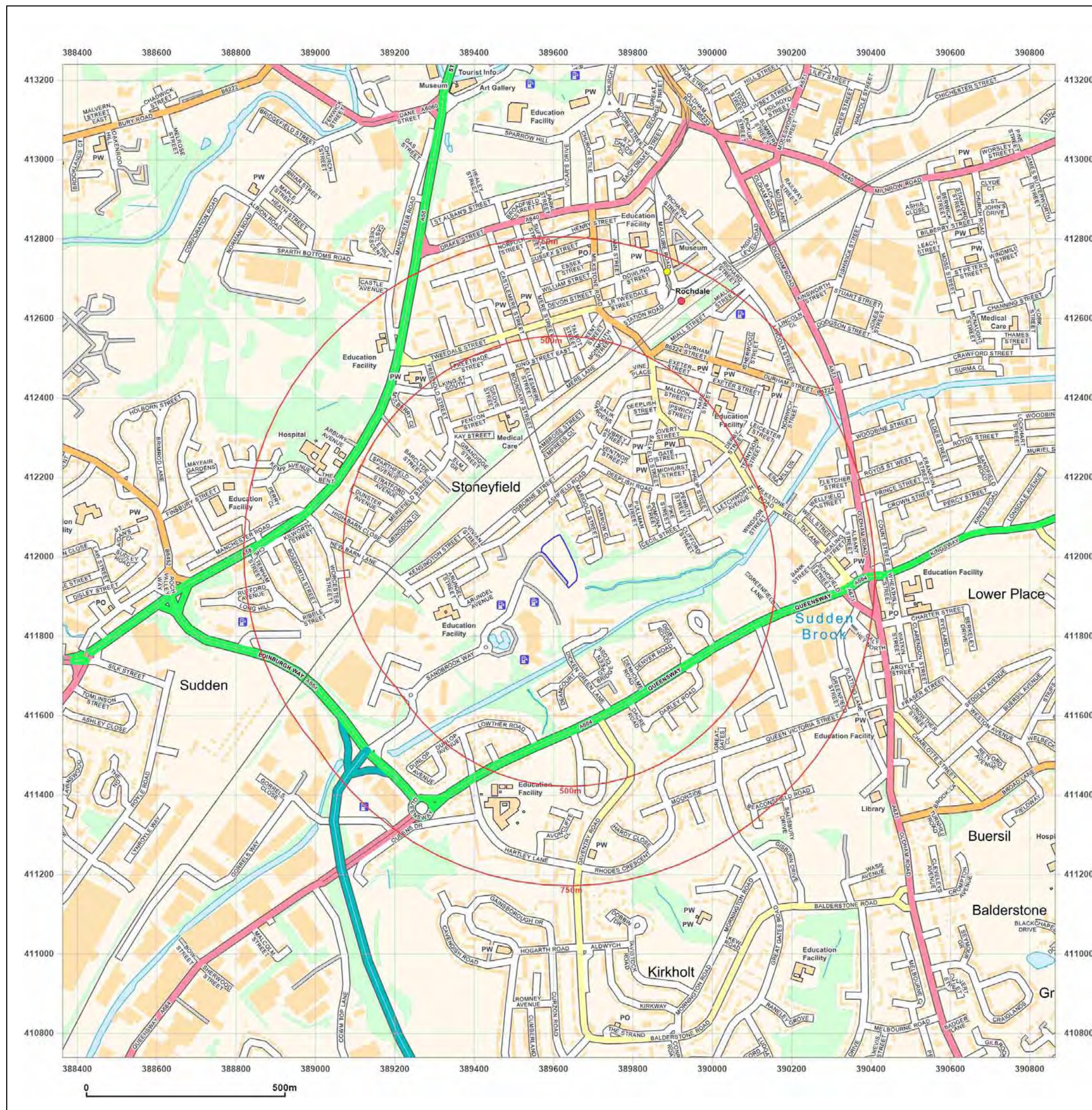


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Site Details:

Sandbrook Business Park,
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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: 1056 Scale Town Plan

Map date: 1848

Scale: 1:1,056

Printed at: 1:1,056



Surveyed 1848
Revised N/A
Edition N/A
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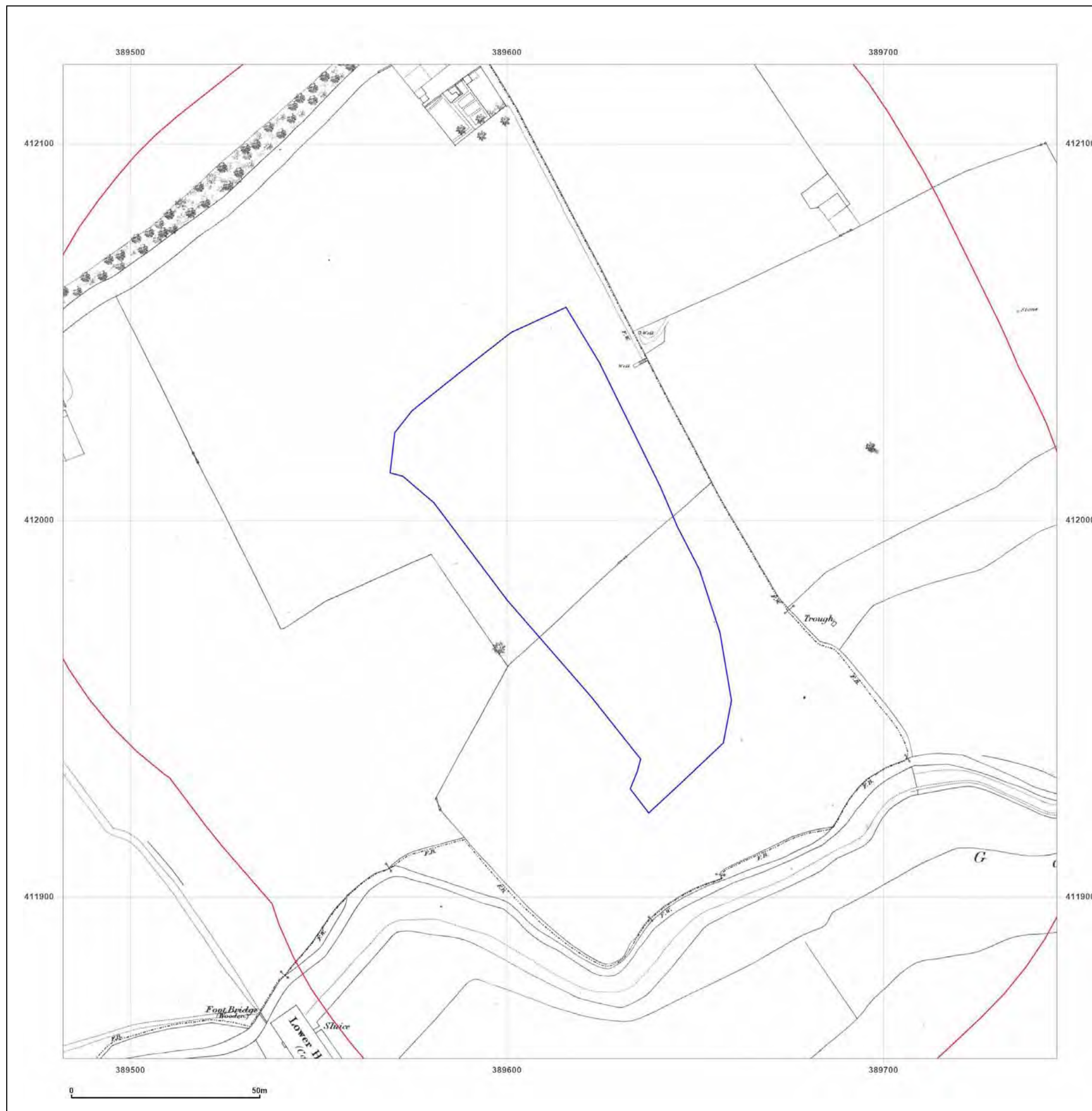


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Site Details:

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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1891

Scale: 1:2,500

Printed at: 1:2,500



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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1910

Scale: 1:2,500

Printed at: 1:2,500



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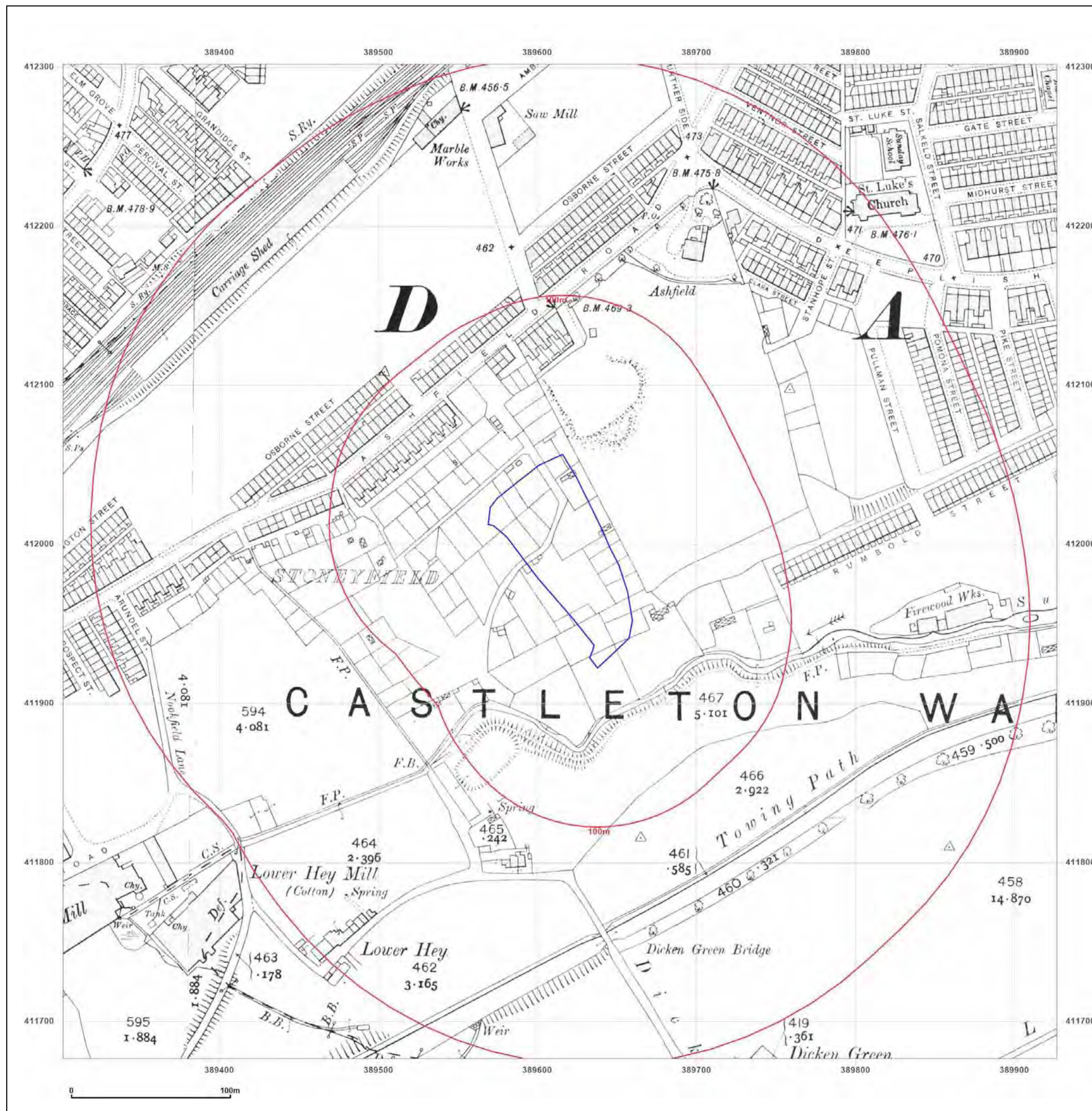


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Site Details:

Sandbrook Business Park,
Rochdale, OL11 1LQ

Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: County Series

Map date: 1930

Scale: 1:2,500

Printed at: 1:2,500



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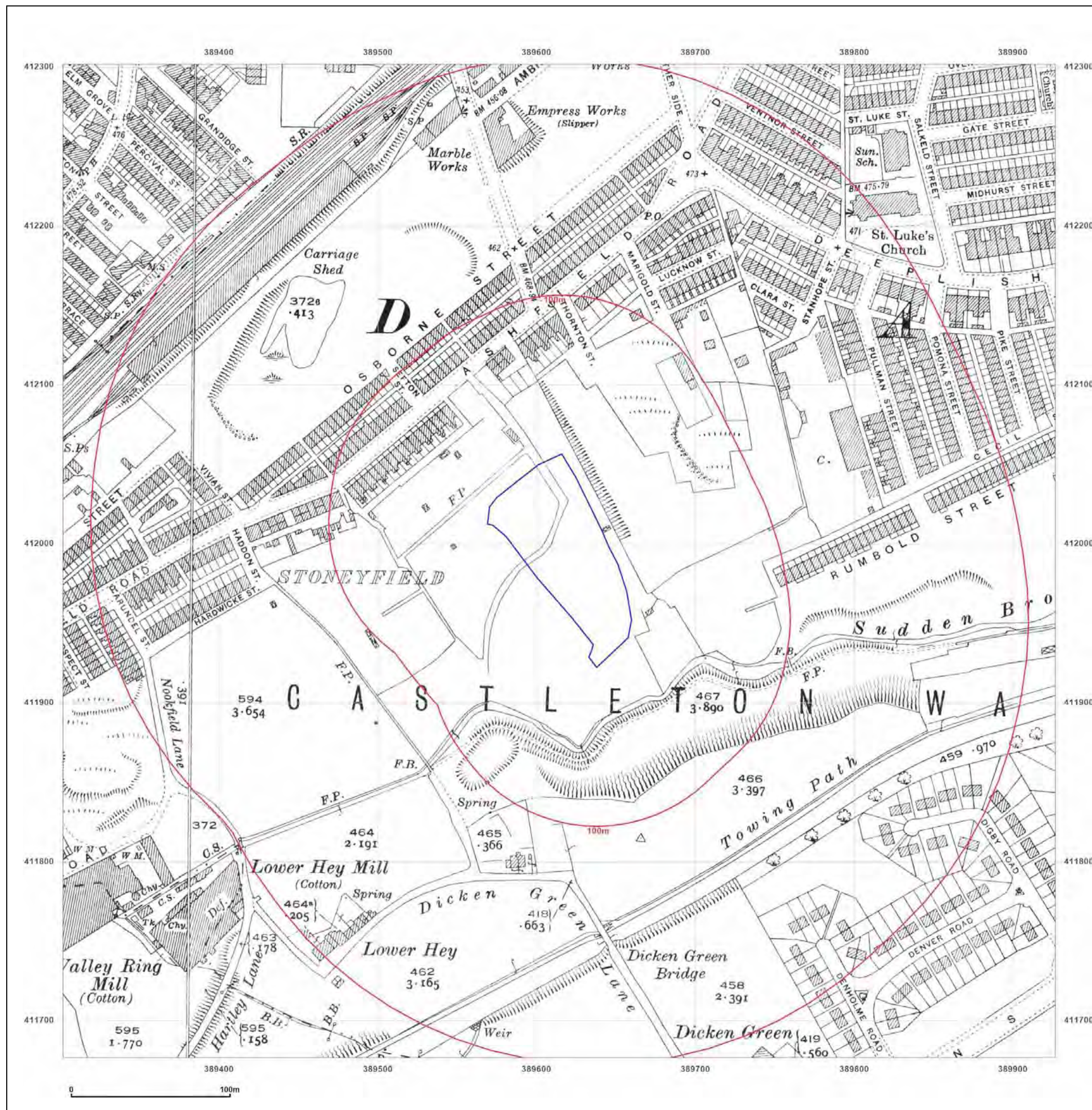


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Site Details:

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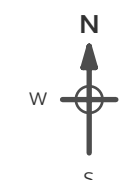
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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 1956-1957

Scale: 1:1,250

Printed at: 1:2,000



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Surveyed 1957
Revised 1957
Edition N/A
Copyright N/A
Levelled 1928

Surveyed 1956
Revised 1956
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Copyright N/A
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Revised 1956
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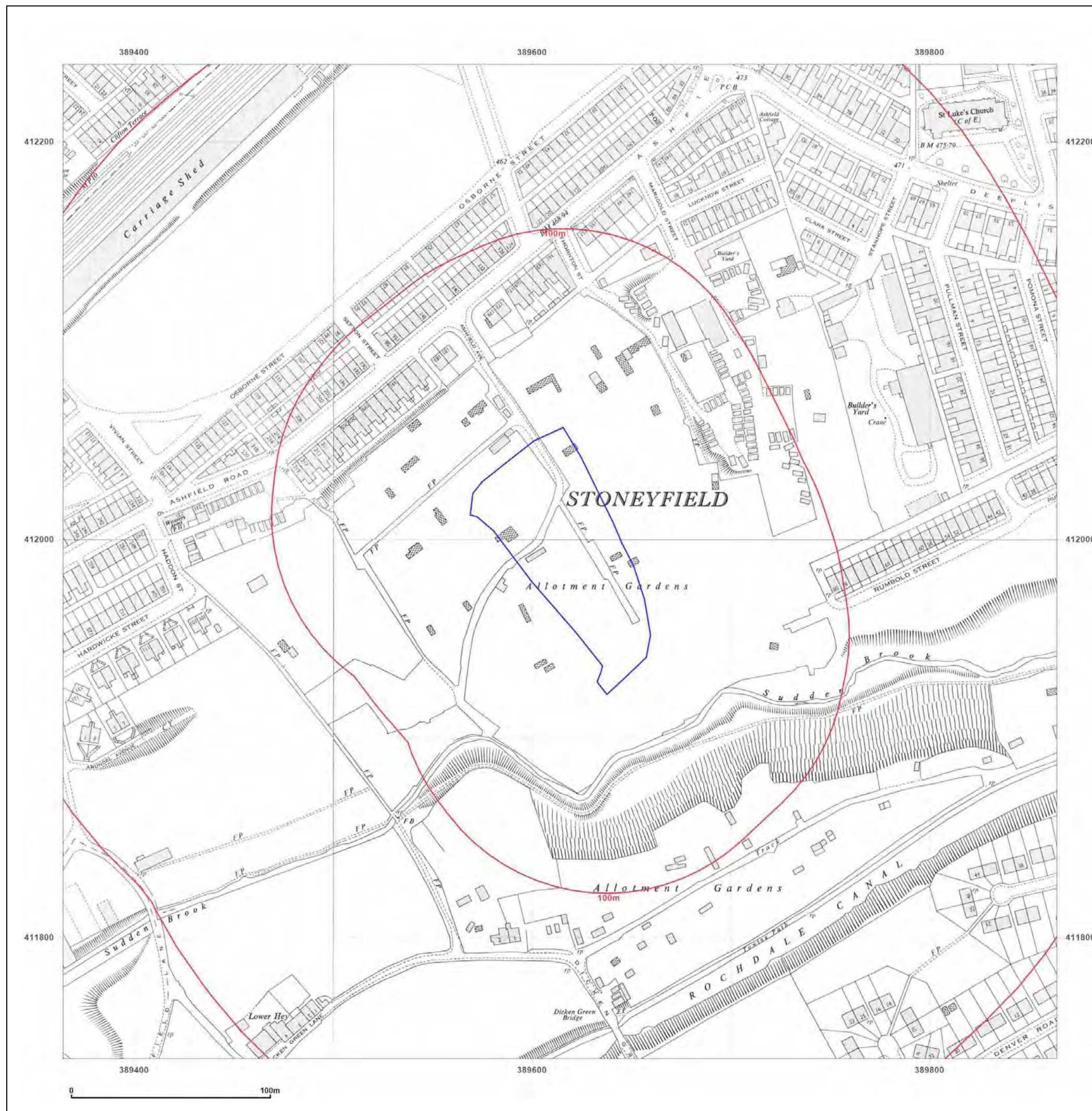


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Site Details:

Sandbrook Business Park,
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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 1957

Scale: 1:2,500

Printed at: 1:2,500



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Edition 1958
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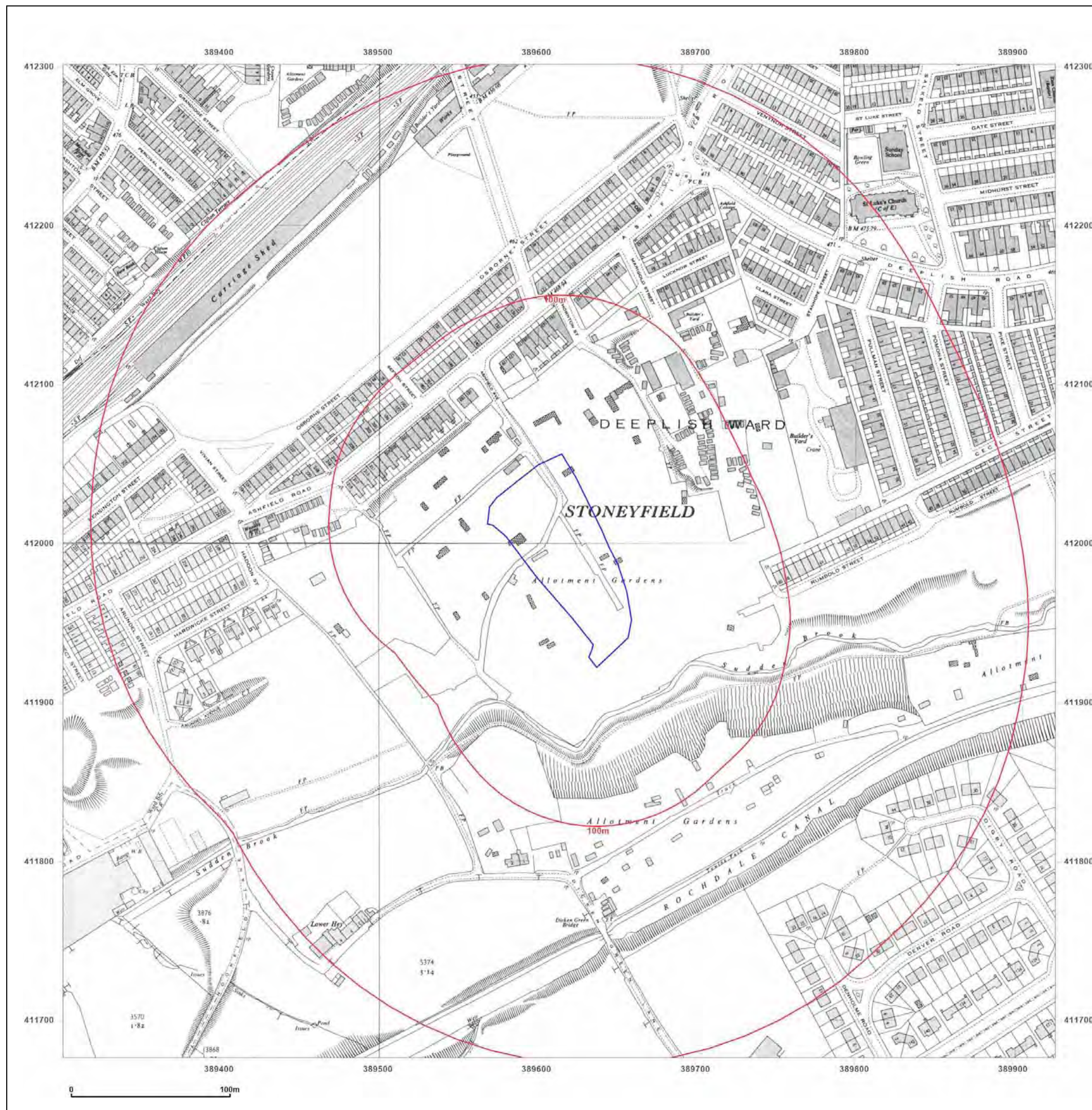


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Site Details:

Sandbrook Business Park,
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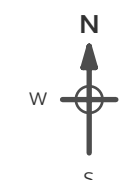
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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 1957-1958

Scale: 1:1,250

Printed at: 1:2,000



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Levelled 1928

Surveyed 1957
Revised N/A
Edition N/A
Copyright 1958
Levelled 1928

Surveyed 1956
Revised N/A
Edition N/A
Copyright 1957
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Revised N/A
Edition N/A
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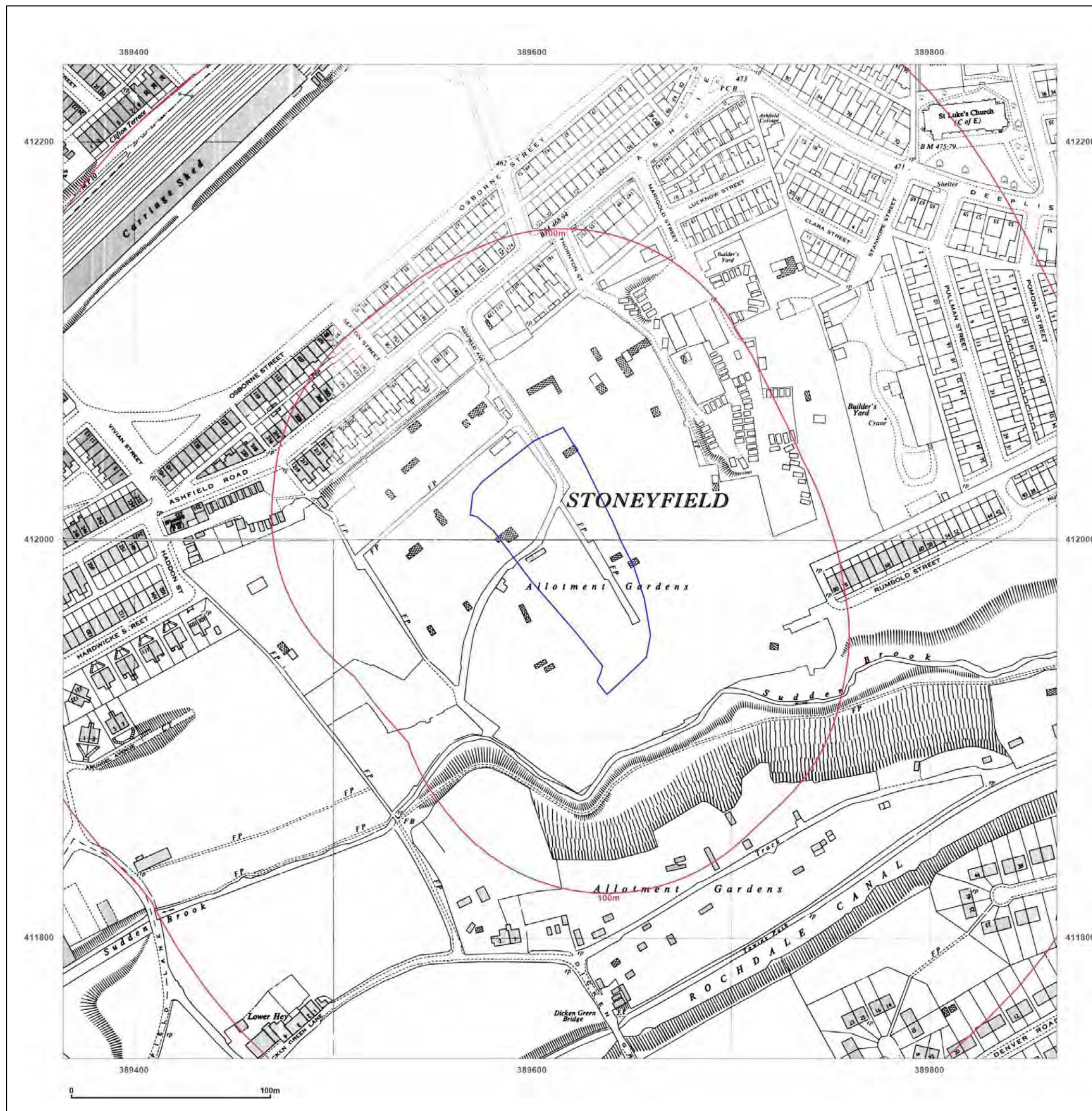


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Site Details:

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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 1971-1973

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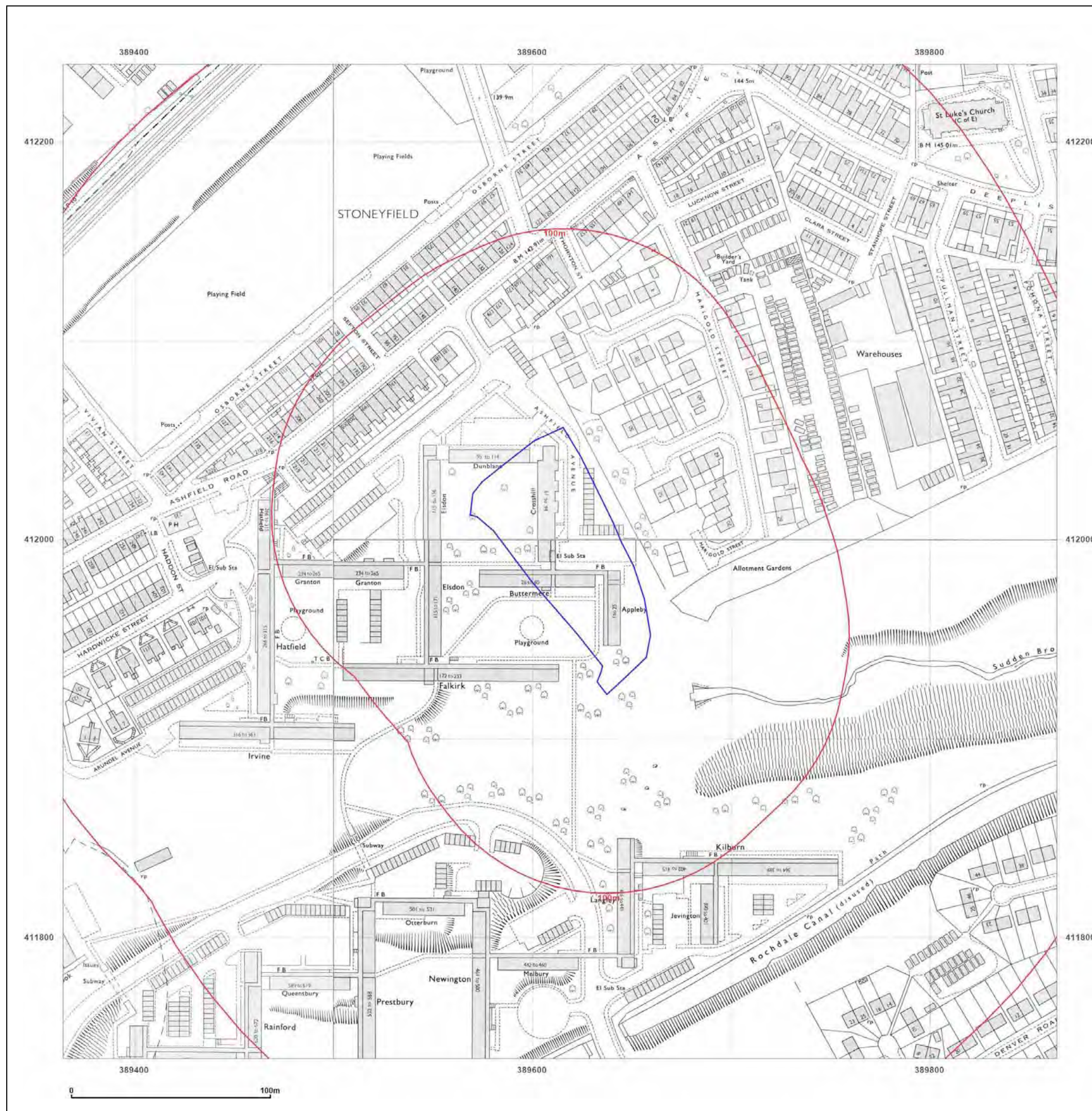


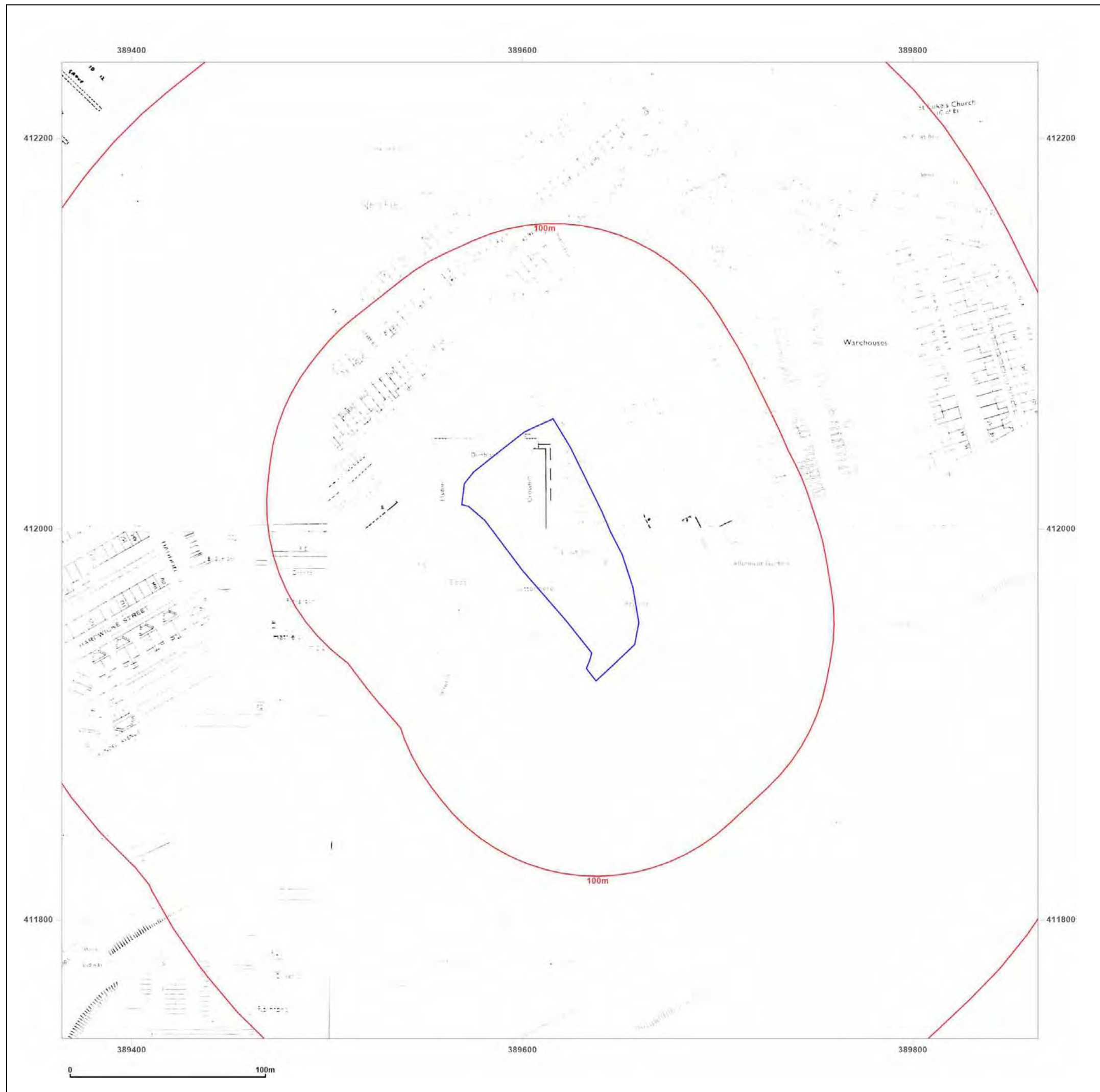
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Site Details:

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Client Ref: CMAPS-AAG-1164341-4165-100524
Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

Map date: 1975

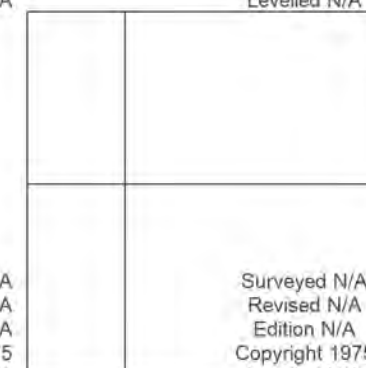
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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: National Grid

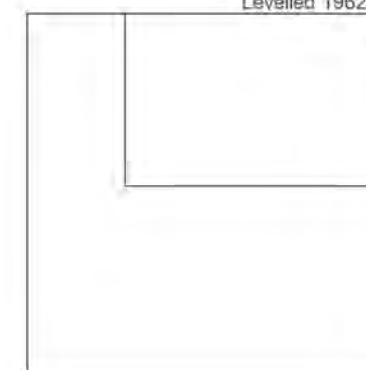
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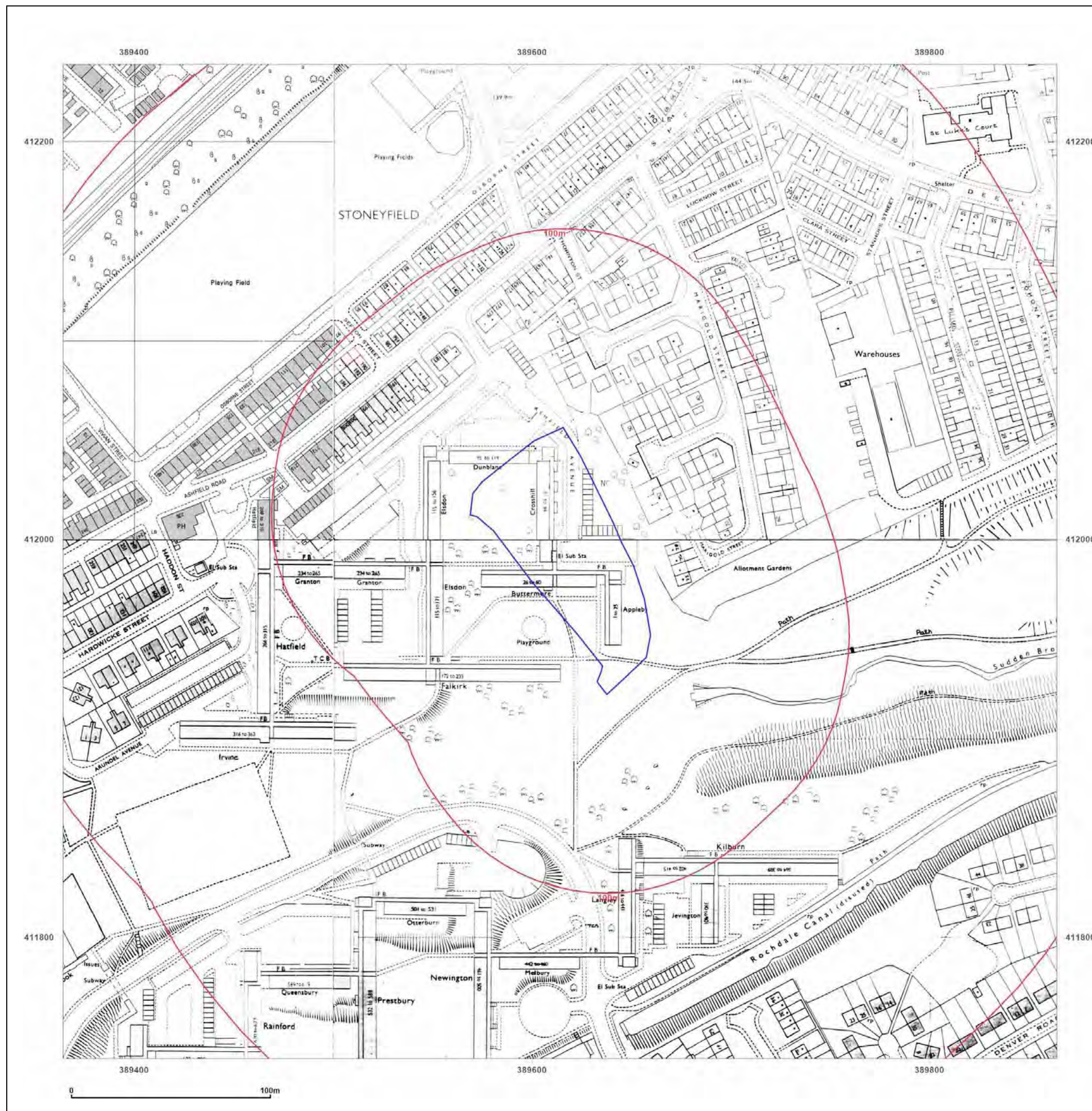


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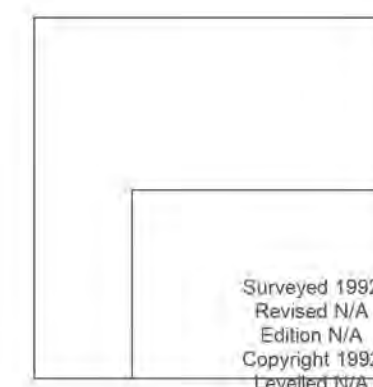
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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
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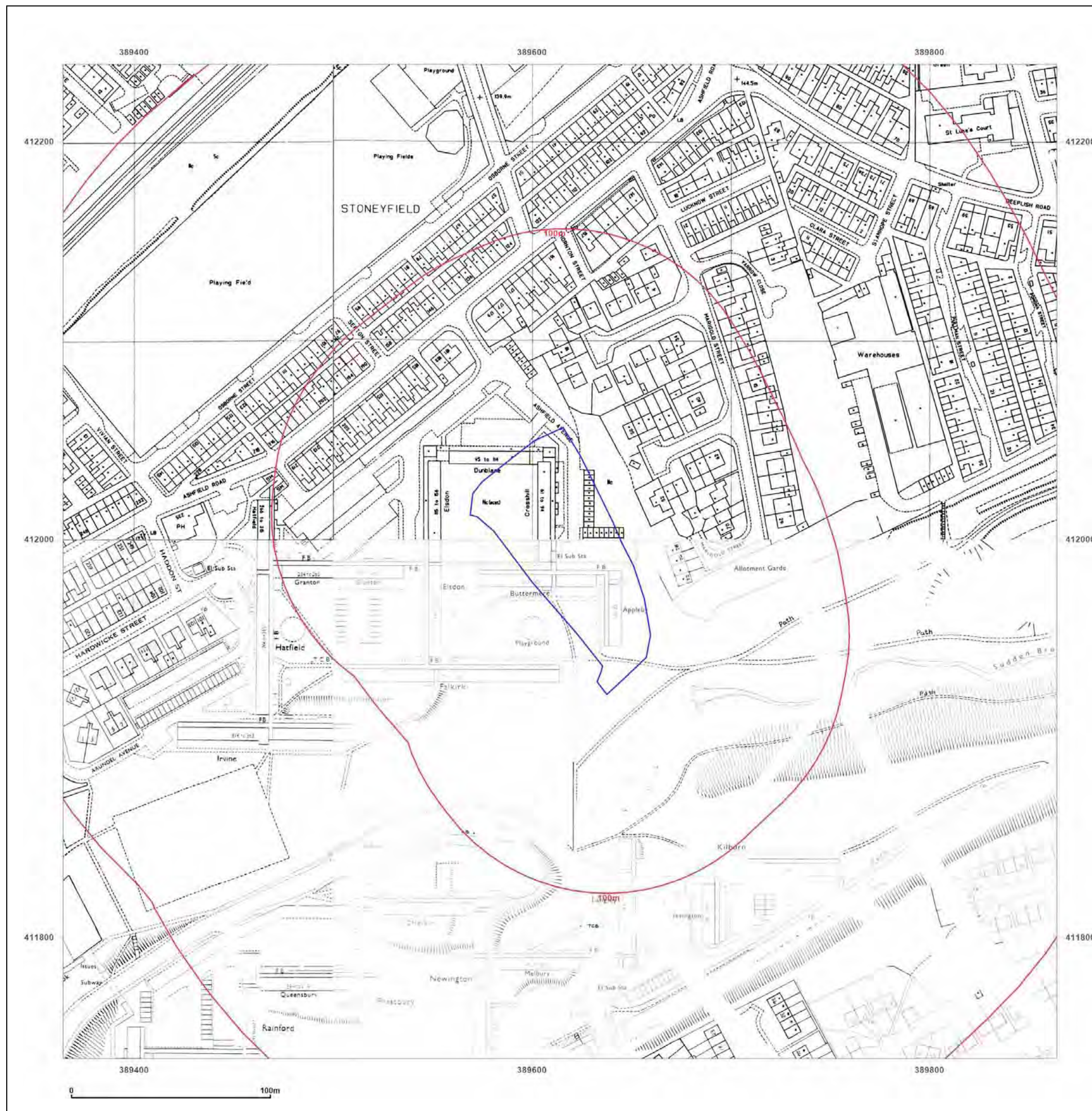


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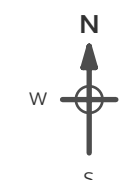
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Grid Ref: 389614, 411989

Map Name: National Grid

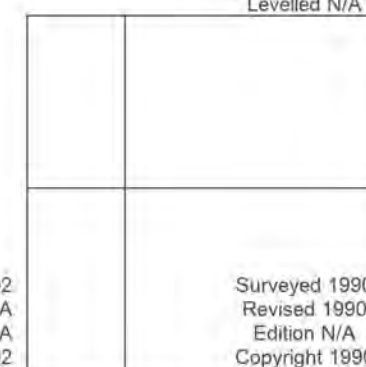
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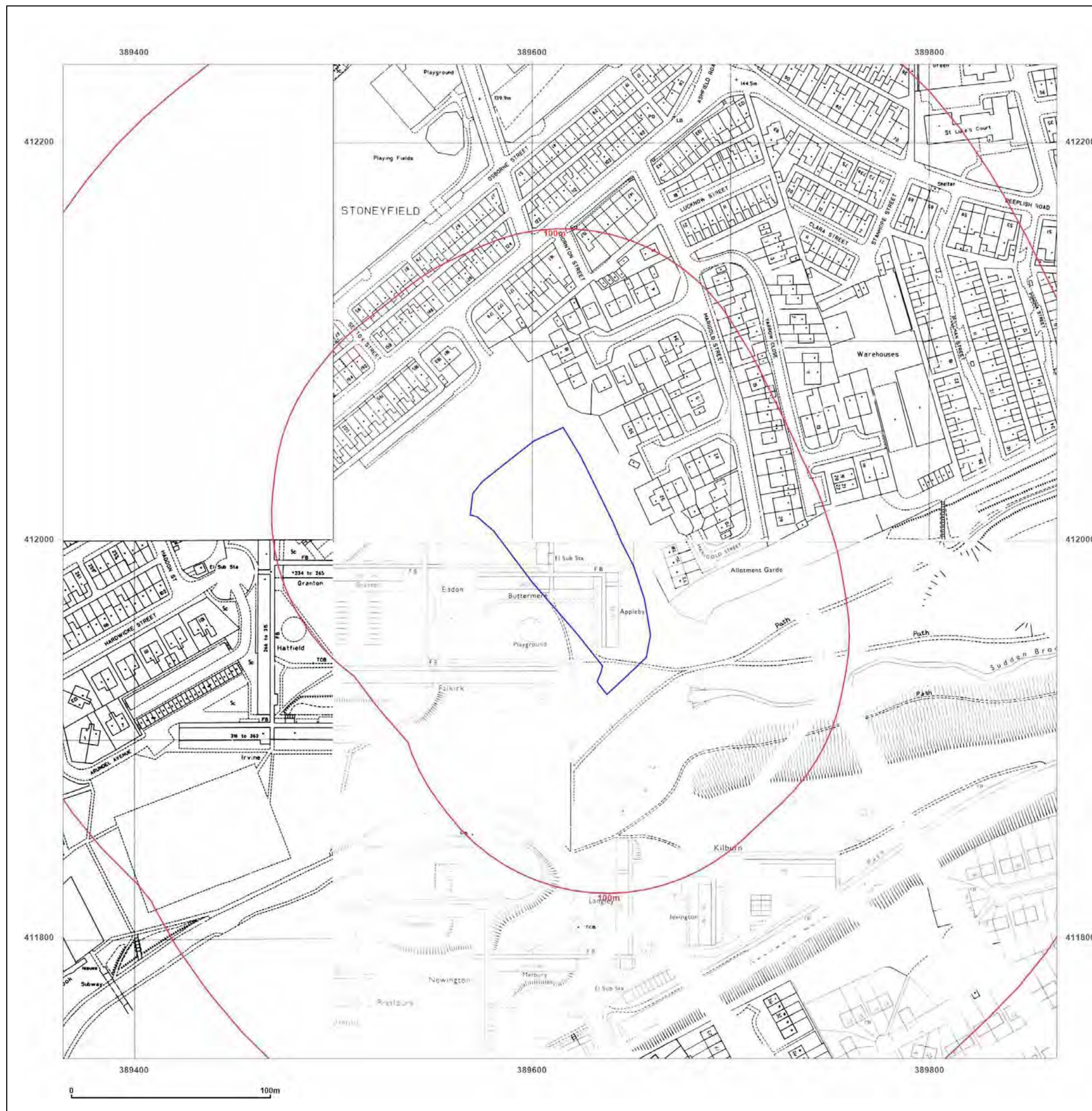


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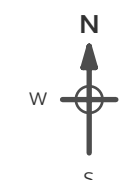
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Grid Ref: 389614, 411989

Map Name: National Grid

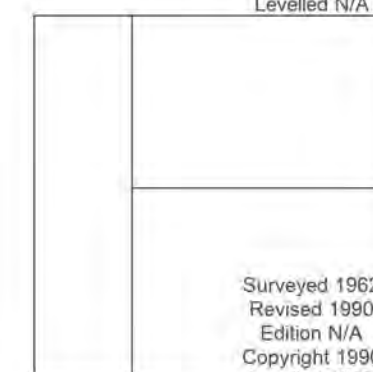
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Report Ref: CMAPS-AAG-1164341-4165-100524HIS
Grid Ref: 389614, 411989

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

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Sandbrook Business Park, Rochdale, OL11 1LQ

Order Details

Date: 10/05/2024
Your ref: CMAPS-AAG-1164341-4165-100524
Our Ref: CMAPS-AAG-1164341-4165-100524EDRGEO

Site Details

Location: 389618 411995
Area: 0.57 ha
Authority: [Rochdale Metropolitan Borough Council](#)
➔



Summary of findings

[p. 2 >](#)

Aerial image

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#)

[Insight User Guide](#) ➔

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Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	1	53	80	-
20 >	1.2 >	Historical tanks >	0	0	1	18	-
21 >	1.3 >	Historical energy features >	1	0	5	18	-
23	1.4	Historical petrol stations	0	0	0	0	-
23 >	1.5 >	Historical garages >	0	0	4	3	-
23	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
24 >	2.1 >	Historical industrial land uses >	0	1	65	121	-
31 >	2.2 >	Historical tanks >	0	0	1	23	-
32 >	2.3 >	Historical energy features >	6	0	15	58	-
36	2.4	Historical petrol stations	0	0	0	0	-
36 >	2.5 >	Historical garages >	0	0	6	4	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
37 >	3.1 >	Active or recent landfill >	1	0	0	0	-
38	3.2	Historical landfill (BGS records)	0	0	0	0	-
38	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
38 >	3.4 >	Historical landfill (EA/NRW records) >	0	0	0	2	-
39	3.5	Historical waste sites	0	0	0	0	-
39 >	3.6 >	Licensed waste sites >	0	0	0	2	-
40 >	3.7 >	Waste exemptions >	0	0	0	10	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
41 >	4.1 >	Recent industrial land uses >	1	1	3	-	-
42 >	4.2 >	Current or recent petrol stations >	0	0	0	1	-
42	4.3	Electricity cables	0	0	0	0	-
42	4.4	Gas pipelines	0	0	0	0	-
42	4.5	Sites determined as Contaminated Land	0	0	0	0	-



43	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
43	4.7	Regulated explosive sites	0	0	0	0	-
43	4.8	Hazardous substance storage/usage	0	0	0	0	-
43	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
43	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
44 >	4.11 >	Licensed pollutant release (Part A(2)/B) >	0	0	0	2	-
44	4.12	Radioactive Substance Authorisations	0	0	0	0	-
44 >	4.13 >	Licensed Discharges to controlled waters >	0	0	0	3	-
45	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
45	4.15	Pollutant release to public sewer	0	0	0	0	-
45	4.16	List 1 Dangerous Substances	0	0	0	0	-
46	4.17	List 2 Dangerous Substances	0	0	0	0	-
46 >	4.18 >	Pollution Incidents (EA/NRW) >	0	0	1	1	-
46	4.19	Pollution inventory substances	0	0	0	0	-
47	4.20	Pollution inventory waste transfers	0	0	0	0	-
47	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
48 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
50 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
52 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
53	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
53	5.5	Groundwater vulnerability- local information	None (within 0m)				
54 >	5.6 >	Groundwater abstractions >	0	0	0	0	8
57 >	5.7 >	Surface water abstractions >	0	0	0	4	5
59	5.8	Potable abstractions	0	0	0	0	0
59	5.9	Source Protection Zones	0	0	0	0	-
60	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
61 >	6.1 >	Water Network (OS MasterMap) >	0	2	1	-	-



62 >	6.2 >	Surface water features >	0	1	2	-	-
62 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
63 >	6.4 >	WFD Surface water bodies >	0	1	1	-	-
63 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding >	On site	0-50m	50-250m	250-500m	500-2000m
64 >	7.1 >	Risk of flooding from rivers and the sea >	High (within 50m)				
65	7.2	Historical Flood Events	0	0	0	-	-
65	7.3	Flood Defences	0	0	0	-	-
65	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
65	7.5	Flood Storage Areas	0	0	0	-	-
66 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
67 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
68 >	8.1 >	Surface water flooding >	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
70 >	9.1 >	Groundwater flooding >	Moderate (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
71 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	2	1	2
72	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
72 >	10.3 >	Special Areas of Conservation (SAC) >	0	0	2	1	2
73	10.4	Special Protection Areas (SPA)	0	0	0	0	0
73	10.5	National Nature Reserves (NNR)	0	0	0	0	0
73	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
74	10.7	Designated Ancient Woodland	0	0	0	0	0
74	10.8	Biosphere Reserves	0	0	0	0	0
74	10.9	Forest Parks	0	0	0	0	0
74	10.10	Marine Conservation Zones	0	0	0	0	0
74 >	10.11 >	Green Belt >	0	0	0	0	2
75	10.12	Proposed Ramsar sites	0	0	0	0	0

75	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
75	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
75	10.15	Nitrate Sensitive Areas	0	0	0	0	0
76 >	10.16 >	Nitrate Vulnerable Zones >	0	0	0	0	1
77 >	10.17 >	SSSI Impact Risk Zones >	3	-	-	-	-
79 >	10.18 >	SSSI Units >	0	0	2	1	2
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
82	11.1	World Heritage Sites	0	0	0	-	-
82	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
82	11.3	National Parks	0	0	0	-	-
82	11.4	Listed Buildings	0	0	0	-	-
83	11.5	Conservation Areas	0	0	0	-	-
83	11.6	Scheduled Ancient Monuments	0	0	0	-	-
83	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
84 >	12.1 >	Agricultural Land Classification >	Urban (within 250m)				
85	12.2	Open Access Land	0	0	0	-	-
85	12.3	Tree Felling Licences	0	0	0	-	-
85	12.4	Environmental Stewardship Schemes	0	0	0	-	-
85	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
86 >	13.1 >	Priority Habitat Inventory >	0	2	8	-	-
87 >	13.2 >	Habitat Networks >	1	0	4	-	-
87	13.3	Open Mosaic Habitat	0	0	0	-	-
88	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
89 >	14.1 >	10k Availability >	Identified (within 500m)				
90 >	14.2 >	Artificial and made ground (10k) >	0	0	3	8	-
92 >	14.3 >	Superficial geology (10k) >	2	0	0	2	-

93	14.4	Landslip (10k)	0	0	0	0	-
94 >	14.5 >	Bedrock geology (10k) >	1	0	1	5	-
95 >	14.6 >	Bedrock faults and other linear features (10k) >	0	0	1	5	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
96 >	15.1 >	50k Availability >	Identified (within 500m)				
97 >	15.2 >	Artificial and made ground (50k) >	0	0	1	1	-
98	15.3	Artificial ground permeability (50k)	0	0	-	-	-
99 >	15.4 >	Superficial geology (50k) >	2	0	0	1	-
100 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
100	15.6	Landslip (50k)	0	0	0	0	-
100	15.7	Landslip permeability (50k)	None (within 50m)				
101 >	15.8 >	Bedrock geology (50k) >	1	0	1	1	-
102 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
102 >	15.10 >	Bedrock faults and other linear features (50k) >	0	0	1	4	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
103 >	16.1 >	BGS Boreholes >	0	0	24	-	-
Page	Section	Natural ground subsidence >					
105 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
106 >	17.2 >	Running sands >	Low (within 50m)				
108 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
110 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
111 >	17.5 >	Landslides >	Very low (within 50m)				
112 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
114 >	18.1 >	BritPits >	0	0	1	3	-
115 >	18.2 >	Surface ground workings >	0	1	34	-	-
117	18.3	Underground workings	0	0	0	0	0
117	18.4	Underground mining extents	0	0	0	0	-
117	18.5	Historical Mineral Planning Areas	0	0	0	0	-

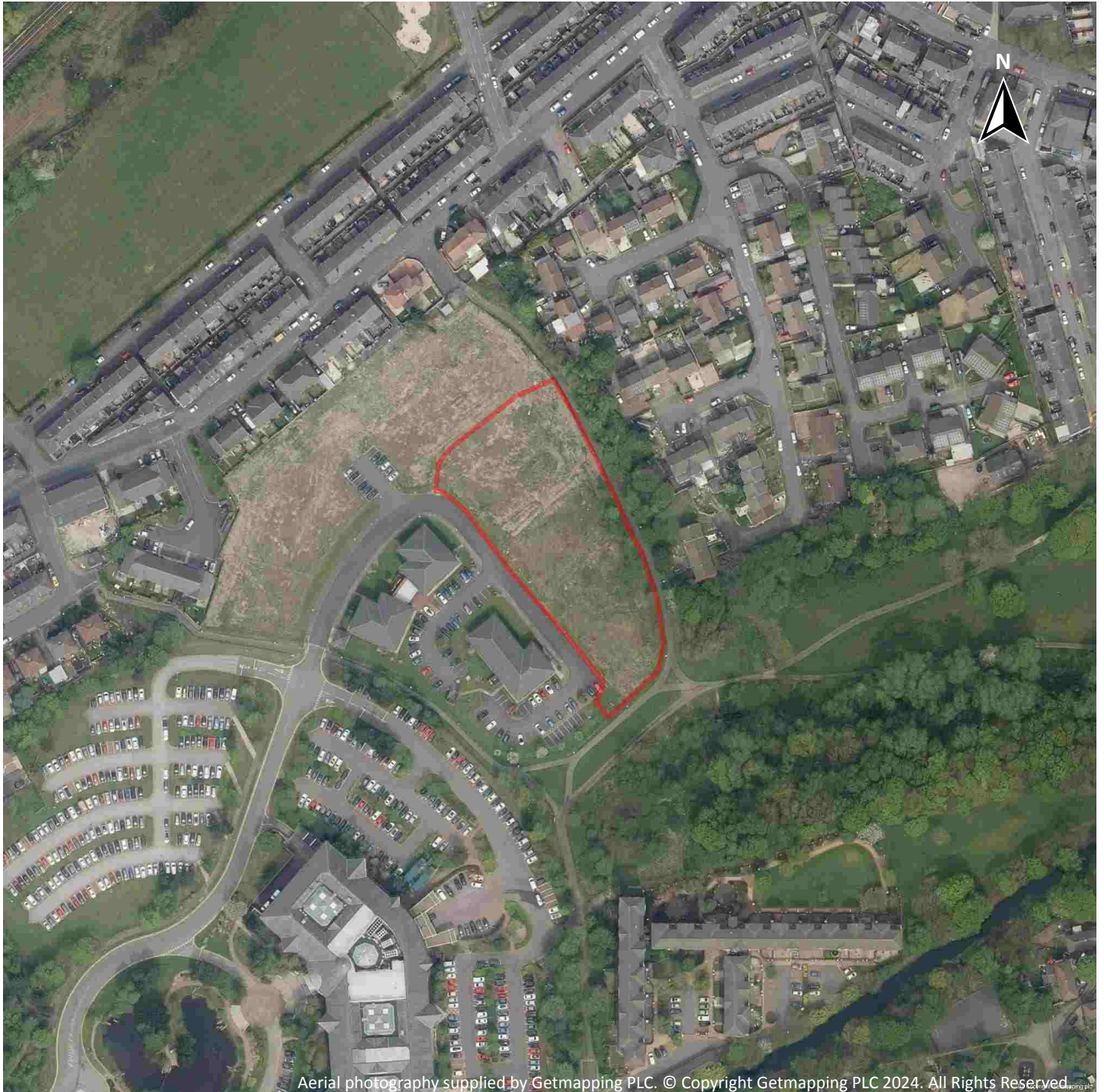


117	18.6	Non-coal mining	0	0	0	0	0
118	18.7	JPB mining areas	None (within 0m)				
118	18.8	The Coal Authority non-coal mining	0	0	0	0	-
118	18.9	Researched mining	0	0	0	0	-
118	18.10	Mining record office plans	0	0	0	0	-
119	18.11	BGS mine plans	0	0	0	0	-
119 >	18.12 >	Coal mining >	Identified (within 0m)				
119	18.13	Brine areas	None (within 0m)				
119	18.14	Gypsum areas	None (within 0m)				
119	18.15	Tin mining	None (within 0m)				
120	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
121	19.1	Natural cavities	0	0	0	0	-
121	19.2	Mining cavities	0	0	0	0	0
121	19.3	Reported recent incidents	0	0	0	0	-
121	19.4	Historical incidents	0	0	0	0	-
122	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
123 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
125 >	21.1 >	BGS Estimated Background Soil Chemistry >	3	0	-	-	-
125	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
125	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects >	On site	0-50m	50-250m	250-500m	500-2000m
126	22.1	Underground railways (London)	0	0	0	-	-
126	22.2	Underground railways (Non-London)	0	0	0	-	-
127	22.3	Railway tunnels	0	0	0	-	-
127 >	22.4 >	Historical railway and tunnel features >	1	0	20	-	-
128	22.5	Royal Mail tunnels	0	0	0	-	-



128	22.6	Historical railways	0	0	0	-	-
128 >	22.7 >	Railways >	0	0	4	-	-
129	22.8	Crossrail 1	0	0	0	0	-
129	22.9	Crossrail 2	0	0	0	0	-
129	22.10	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 23/05/2019

Site Area: 0.57ha



Recent site history - 2018 aerial photograph



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Capture Date: 01/07/2018

Site Area: 0.57ha



Recent site history - 2011 aerial photograph



Capture Date: 02/05/2011

Site Area: 0.57ha



Recent site history - 2000 aerial photograph



Capture Date: 19/06/2000

Site Area: 0.57ha



Recent site history - 1999 aerial photograph



Capture Date: 10/09/1999

Site Area: 0.57ha



OS MasterMap site plan

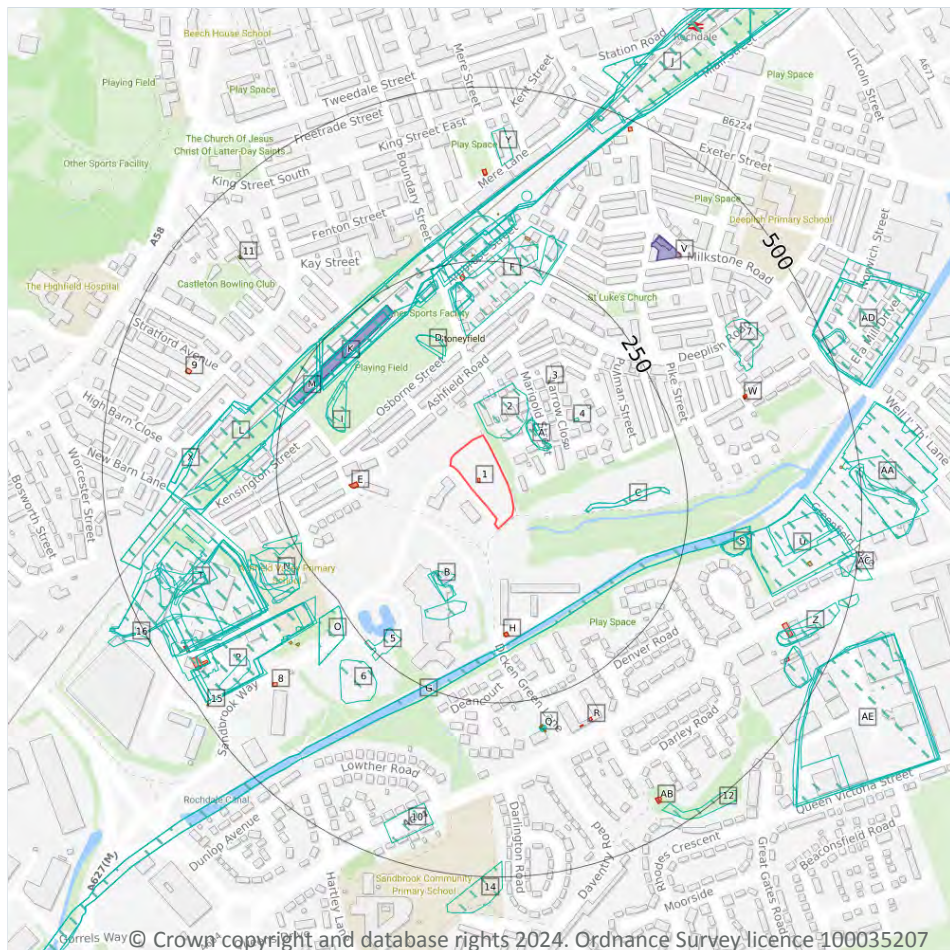


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Site Area: 0.57ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

1.1 Historical industrial land uses

Records within 500m

134

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15](#) >

ID	Location	Land use	Dates present	Group ID
2	8m N	Refuse Heap	1908	677868



ID	Location	Land use	Dates present	Group ID
A	58m NE	Refuse Heap	1949	772448
A	58m NE	Refuse Heap	1928 - 1938	750418
A	71m NE	Shed	1851	659587
B	90m S	Unspecified Pit	1949	690682
C	103m E	Unspecified Ground Workings	1949	731856
C	103m E	Unspecified Ground Workings	1968 - 1987	734866
B	105m S	Cotton Mill	1851	644458
B	106m S	Unspecified Disused Mill	1891	675750
B	115m S	Unspecified Pit	1992	690680
D	124m N	Unspecified Pit	1949	768840
4	125m NE	Shed	1851	659585
D	126m N	Unspecified Pit	1928 - 1938	762523
F	144m N	Unspecified Works	1975 - 1992	726519
G	148m SE	Disused Canal	1987	728752
G	148m SE	Disused Canal	1992	748585
G	148m SE	Disused Canal	1975	789732
I	157m W	Unspecified Ground Workings	1928	648015
I	158m W	Unspecified Pit	1949	690681
F	177m N	Unspecified Ground Workings	1949	648016
F	181m N	Unspecified Works	1938	706896
F	185m N	Unspecified Mill	1908 - 1928	724179
J	196m NW	Railway Sidings	1928	696938
F	198m NW	Railway Sidings	1949	710047
F	198m NW	Railway Sidings	1968 - 1976	750008
J	199m NW	Railway Sidings	1908	695416
K	204m NW	Railway Building	1968	736053
K	204m NW	Carriage Shed	1949	777421
F	204m N	Marble Works	1949	758802



ID	Location	Land use	Dates present	Group ID
K	207m NW	Carriage Shed	1928	710626
K	207m NW	Carriage Shed	1908	775835
K	208m NW	Carriage Shed	1938	760611
F	210m N	Marble Works	1938	704948
F	210m N	Marble Works	1928	771458
F	210m N	Marble Works	1908	723163
5	210m SW	Unspecified Mill	1949	657144
K	212m NW	Gravel Pit	1851	652935
J	214m N	Railway Sidings	1938	728101
J	214m N	Railway Sidings	1891	730419
L	215m NW	Railway Sidings	1928 - 1938	751005
M	219m NW	Railway Building	1908	773580
M	220m NW	Railway Building	1928	734698
M	220m NW	Railway Building	1938	733089
F	220m N	Engineering Works	1949	714422
F	226m N	Engineering Works	1928 - 1938	722806
F	227m N	Unspecified Works	1908	707560
F	231m N	Unspecified Commercial/Industrial	1968 - 1992	762836
M	233m NW	Cuttings	1851	642617
L	233m W	Railway Sidings	1908	786292
F	240m N	Unspecified Pit	1968	690677
N	241m W	Unspecified Ground Workings	1968	705226
N	242m W	Unspecified Heap	1949	650746
F	246m N	Cuttings	1968	642613
F	248m N	Iron Works	1891	672264
O	253m SW	Unspecified Shed	1891	657544
O	253m SW	Unspecified Mill	1908 - 1938	739860
L	253m W	Gravel Pit	1851	652933



ID	Location	Land use	Dates present	Group ID
N	266m SW	Unspecified Ground Workings	1949	702947
L	267m W	Railway Sidings	1851	757075
P	270m SW	Unspecified Mill	1908	790667
6	271m SW	Unspecified Pit	1975 - 1992	754742
N	277m SW	Unspecified Ground Workings	1928 - 1938	752876
F	280m N	Shuttle Works	1908	672399
N	285m SW	Unspecified Heap	1928	650744
P	286m SW	Unspecified Mill	1987 - 1992	704723
Q	289m S	Unspecified Tank	1938	742561
P	289m SW	Unspecified Mill	1968 - 1975	700790
P	289m SW	Unspecified Mill	1949	749349
Q	290m S	Unspecified Tank	1928	711468
Q	292m S	Unspecified Tank	1949	784410
S	302m E	Unspecified Pit	1949	734178
S	303m E	Unspecified Pit	1891	781413
S	303m E	Unspecified Pit	1928	781845
P	305m SW	Unspecified Mill	1928 - 1938	776944
O	316m SW	Chimney	1968 - 1992	761105
T	321m W	Unspecified Mill	1890	698958
L	322m W	Railway Building	1928 - 1949	787525
T	326m W	Unspecified Mill	1987 - 1992	718337
T	328m W	Unspecified Mills	1975	653261
T	330m W	Unspecified Works	1968	762847
T	330m W	Unspecified Mill	1949	763249
U	334m E	Unspecified Mill	1891	713774
T	337m W	Unspecified Mill	1908	731545
T	338m W	Unspecified Mill	1928 - 1938	787719
F	342m N	Unspecified Tank	1891	674715



ID	Location	Land use	Dates present	Group ID
U	344m E	Unspecified Works	1976	678969
U	364m E	Unspecified Mill	1908 - 1954	711684
U	367m E	Unspecified Mill	1967	712154
X	370m W	Railway Buildings	1908 - 1928	741466
X	370m W	Railway Buildings	1938	713928
7	374m NE	Gravel Pit	1851	652943
T	382m SW	Old Cotton Mill	1851	693538
T	385m W	Unspecified Ground Workings	1928 - 1938	779534
T	387m W	Unspecified Heap	1968	650745
U	387m E	Cotton Mill	1851	644454
Y	388m N	Unspecified Mill	1908	657143
T	398m W	Unspecified Works	1987 - 1992	777258
T	399m W	Unspecified Ground Workings	1908	728421
P	402m SW	Old Sand Pit	1890	682522
10	408m S	Cuttings	1928	642614
Z	418m SE	Refuse Heap	1908	732692
Z	418m SE	Refuse Heap	1928 - 1938	754445
Z	418m SE	Refuse Heap	1954	730807
T	428m W	Unspecified Pit	1949	690686
Z	430m SE	Electric Substation	1976	682645
AA	431m E	Unspecified Commercial/Industrial	1976	755423
T	438m W	Refuse Heap	1928 - 1938	715167
Z	443m SE	Refuse Heap	1928 - 1938	769463
Z	445m SE	Refuse Heap	1954	752378
J	463m N	Railway Building	1938	670144
12	465m SE	Unspecified Ground Workings	1968 - 1992	727112
13	465m N	Railway Sidings	1987 - 1992	748827
AC	473m E	Sand Pit	1908	643885



ID	Location	Land use	Dates present	Group ID
AC	475m E	Unspecified Pit	1928	690679
AA	475m E	Unspecified Tanks	1928	666439
14	477m S	Unspecified Pit	1968 - 1992	707147
AA	478m E	Unspecified Mill	1967	657145
J	482m N	Railway Building	1938	670146
AA	484m E	Refuse Heap	1908	677869
AA	484m E	Unspecified Pit	1928 - 1938	768294
AC	485m E	Unspecified Heap	1908	650743
AD	486m NE	Iron Works	1954	723576
AE	488m SE	Unspecified Mill	1967 - 1976	739827
AD	488m NE	Iron Works	1928 - 1938	725459
AD	488m NE	Unspecified Mills	1908	766175
AD	489m E	Sand Pit	1954	788317
AD	490m NE	Unspecified Works	1967 - 1976	713295
J	491m N	Railway Building	1938	670145
AE	492m SE	Unspecified Mill	1954	706278
AE	493m SE	Unspecified Mill	1891	714925
AA	495m E	Unspecified Pit	1954	756693
AE	495m SE	Unspecified Mill	1908 - 1938	772878
AD	497m E	Sand Pit	1928 - 1938	781720
16	498m SW	Unspecified Heap	1975 - 1992	788452

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

19

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.



Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
3	121m NE	Unspecified Tank	1971	84316
F	257m N	Tank or Trough	1910	88429
Q	287m S	Unspecified Tank	1910 - 1930	95858
F	287m N	Unspecified Tank	1971 - 1990	99677
Q	297m S	Unspecified Tank	1990	91774
Q	297m S	Unspecified Tank	1990	93325
Q	297m S	Unspecified Tank	1990	94048
Q	297m S	Unspecified Tank	1978	99953
Q	297m S	Unspecified Tank	1990	100665
Q	297m S	Unspecified Tank	1996	100298
Q	298m S	Unspecified Tank	1972	103327
F	317m N	Unspecified Tank	1957	89432
F	318m N	Unspecified Tank	1957	100879
O	329m SW	Unspecified Tank	1910	84313
O	337m SW	Unspecified Tank	1930	84314
11	416m NW	Unspecified Tank	1973 - 1978	102357
U	429m E	Unspecified Tank	1973 - 1985	89518
AA	472m E	Unspecified Tank	1891	84312
15	485m SW	Unspecified Tank	1910	84290

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

24

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)



ID	Location	Land use	Dates present	Group ID
1	On site	Electricity Substation	1972 - 1990	52334
E	135m W	Electricity Substation	1996	58603
E	135m W	Electricity Substation	1972 - 1990	48500
H	148m S	Electricity Substation	1978 - 1990	50546
H	149m S	Electricity Substation	1972	58559
F	224m N	Electricity Substation	1971 - 1996	51016
R	301m SE	Electricity Substation	1972 - 1996	55303
R	306m S	Electricity Substation	1978 - 1990	56164
W	360m E	Electricity Substation	1971 - 1990	51909
W	360m E	Electricity Substation	1994 - 1996	50450
Y	373m N	Electricity Substation	1971 - 1996	54141
Y	374m N	Electricity Substation	1984	47865
V	376m NE	Electricity Substation	1984 - 1996	54791
8	386m SW	Electricity Substation	1972 - 1990	52044
9	393m W	Electricity Substation	1973 - 1996	48259
Z	418m SE	Electricity Substation	1973 - 1996	53009
Z	442m SE	Electricity Substation	1988 - 1996	55050
T	447m SW	Electricity Substation	1996	47985
AB	448m SE	Electricity Substation	1990	56656
AB	449m SE	Electricity Substation	1956 - 1996	57738
T	458m SW	Electricity Substation	1957	53185
T	459m SW	Electricity Substation	1956 - 1972	55843
T	460m SW	Electricity Substation	1956 - 1990	58725
J	484m NE	Electricity Substation	1971 - 1996	55097

This data is sourced from Ordnance Survey / Groundsure.



1.4 Historical petrol stations

Records within 500m**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m**7**

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
K	207m NW	Carriage Shed	1957	19038
K	209m NW	Carriage Shed	1910	17171
K	209m NW	Carriage Shed	1930	16455
M	219m NW	Carriage Shed	1910 - 1930	19215
V	354m NE	Garage	1984	15674
V	354m NE	Garage	1957	16533
V	373m NE	Garage	1957 - 1971	17891

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

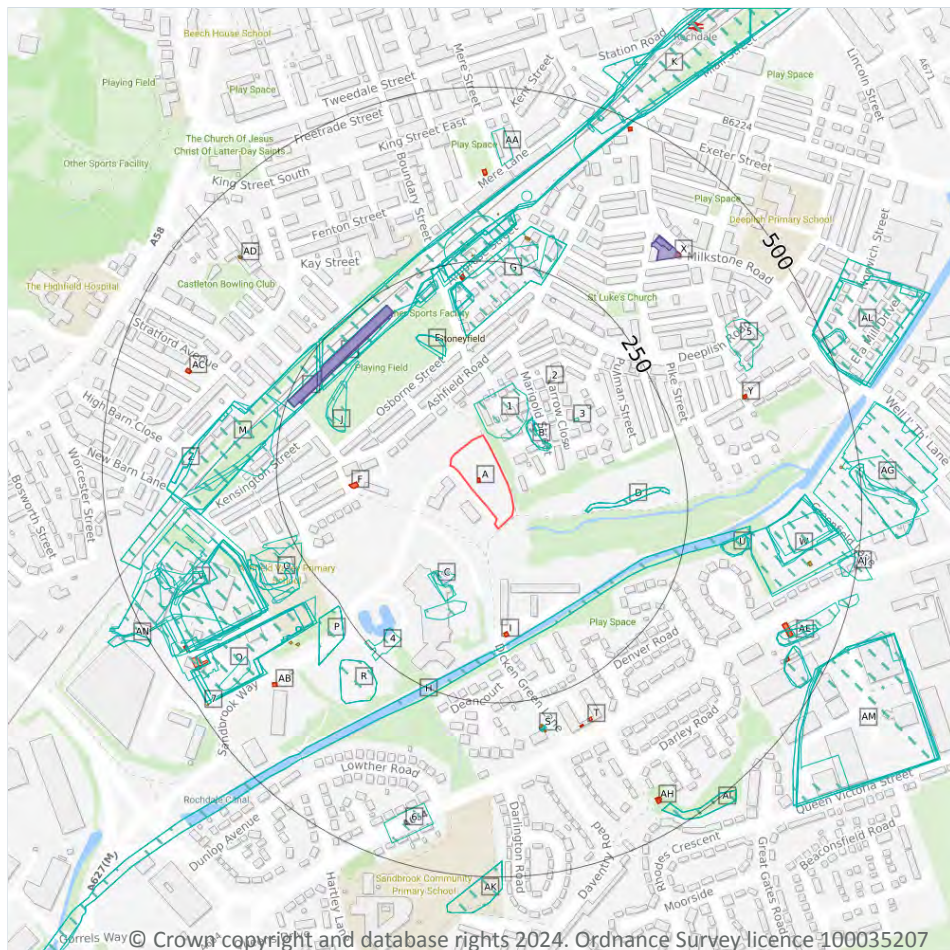
Records within 500m**0**

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

2.1 Historical industrial land uses

Records within 500m

187

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 24](#) >

ID	Location	Land Use	Date	Group ID
1	8m N	Refuse Heap	1908	677868
B	58m NE	Refuse Heap	1949	772448
B	58m NE	Refuse Heap	1938	750418



ID	Location	Land Use	Date	Group ID
B	58m NE	Refuse Heap	1928	750418
B	71m NE	Shed	1851	659587
C	90m S	Unspecified Pit	1949	690682
D	103m E	Unspecified Ground Workings	1987	734866
D	103m E	Unspecified Ground Workings	1975	734866
D	103m E	Unspecified Ground Workings	1949	731856
D	103m E	Unspecified Ground Workings	1968	734866
C	105m S	Cotton Mill	1851	644458
C	106m S	Unspecified Disused Mill	1891	675750
C	115m S	Unspecified Pit	1992	690680
E	124m N	Unspecified Pit	1949	768840
3	125m NE	Shed	1851	659585
E	126m N	Unspecified Pit	1938	762523
E	126m N	Unspecified Pit	1928	762523
G	144m N	Unspecified Works	1992	726519
G	144m N	Unspecified Works	1987	726519
G	144m N	Unspecified Works	1975	726519
H	148m SE	Disused Canal	1992	748585
H	148m SE	Disused Canal	1987	728752
H	148m SE	Disused Canal	1975	789732
J	157m W	Unspecified Ground Workings	1928	648015
J	158m W	Unspecified Pit	1949	690681
G	177m N	Unspecified Ground Workings	1949	648016
G	181m N	Unspecified Works	1938	706896
G	185m N	Unspecified Mill	1928	724179
G	185m N	Unspecified Mill	1908	724179
K	196m NW	Railway Sidings	1928	696938
G	198m NW	Railway Sidings	1949	710047

ID	Location	Land Use	Date	Group ID
G	198m NW	Railway Sidings	1968	750008
K	199m NW	Railway Sidings	1908	695416
L	204m NW	Carriage Shed	1949	777421
L	204m NW	Railway Building	1968	736053
G	204m N	Marble Works	1949	758802
L	207m NW	Carriage Shed	1928	710626
L	207m NW	Carriage Shed	1908	775835
L	208m NW	Carriage Shed	1938	760611
G	210m N	Marble Works	1938	704948
G	210m N	Marble Works	1928	771458
G	210m N	Marble Works	1908	723163
4	210m SW	Unspecified Mill	1949	657144
L	212m NW	Gravel Pit	1851	652935
K	214m N	Railway Sidings	1938	728101
K	214m N	Railway Sidings	1891	730419
M	215m NW	Railway Sidings	1938	751005
M	215m NW	Railway Sidings	1928	751005
N	219m NW	Railway Building	1908	773580
N	220m NW	Railway Building	1938	733089
N	220m NW	Railway Building	1928	734698
G	220m N	Engineering Works	1949	714422
G	226m N	Engineering Works	1938	722806
G	226m N	Engineering Works	1928	722806
G	227m N	Unspecified Works	1908	707560
G	231m N	Unspecified Commercial/Industrial	1992	762836
G	231m N	Unspecified Commercial/Industrial	1987	762836
G	231m N	Unspecified Commercial/Industrial	1975	762836
G	231m N	Unspecified Commercial/Industrial	1968	762836



ID	Location	Land Use	Date	Group ID
N	233m NW	Cuttings	1851	642617
M	233m W	Railway Sidings	1908	786292
G	240m N	Unspecified Pit	1968	690677
O	241m W	Unspecified Ground Workings	1968	705226
O	242m W	Unspecified Heap	1949	650746
G	246m N	Cuttings	1968	642613
G	248m N	Iron Works	1891	672264
P	253m SW	Unspecified Mill	1938	739860
P	253m SW	Unspecified Mill	1928	739860
P	253m SW	Unspecified Mill	1908	739860
P	253m SW	Unspecified Shed	1891	657544
M	253m W	Gravel Pit	1851	652933
O	266m SW	Unspecified Ground Workings	1949	702947
M	267m W	Railway Sidings	1851	757075
Q	270m SW	Unspecified Mill	1908	790667
R	271m SW	Unspecified Pit	1992	754742
R	271m SW	Unspecified Pit	1987	754742
R	271m SW	Unspecified Pit	1975	754742
O	277m SW	Unspecified Ground Workings	1938	752876
O	277m SW	Unspecified Ground Workings	1928	752876
G	280m N	Shuttle Works	1908	672399
O	285m SW	Unspecified Heap	1928	650744
Q	286m SW	Unspecified Mill	1992	704723
Q	286m SW	Unspecified Mill	1987	704723
S	289m S	Unspecified Tank	1938	742561
Q	289m SW	Unspecified Mill	1975	700790
Q	289m SW	Unspecified Mill	1949	749349
Q	289m SW	Unspecified Mill	1968	700790



ID	Location	Land Use	Date	Group ID
S	290m S	Unspecified Tank	1928	711468
S	292m S	Unspecified Tank	1949	784410
U	302m E	Unspecified Pit	1949	734178
U	303m E	Unspecified Pit	1891	781413
U	303m E	Unspecified Pit	1928	781845
Q	305m SW	Unspecified Mill	1938	776944
Q	305m SW	Unspecified Mill	1928	776944
P	316m SW	Chimney	1992	761105
P	316m SW	Chimney	1987	761105
P	316m SW	Chimney	1975	761105
P	316m SW	Chimney	1968	761105
V	321m W	Unspecified Mill	1890	698958
M	322m W	Railway Building	1949	787525
V	326m W	Unspecified Mill	1992	718337
V	326m W	Unspecified Mill	1987	718337
M	326m W	Railway Building	1938	787525
M	326m W	Railway Building	1928	787525
V	328m W	Unspecified Mills	1975	653261
V	330m W	Unspecified Mill	1949	763249
V	330m W	Unspecified Works	1968	762847
W	334m E	Unspecified Mill	1891	713774
V	337m W	Unspecified Mill	1908	731545
V	338m W	Unspecified Mill	1938	787719
V	338m W	Unspecified Mill	1928	787719
G	342m N	Unspecified Tank	1891	674715
W	344m E	Unspecified Works	1976	678969
W	364m E	Unspecified Mill	1938	711684
W	364m E	Unspecified Mill	1928	711684

ID	Location	Land Use	Date	Group ID
W	364m E	Unspecified Mill	1908	711684
W	365m E	Unspecified Mill	1954	711684
W	367m E	Unspecified Mill	1967	712154
Z	370m W	Railway Buildings	1908	741466
Z	370m W	Railway Buildings	1938	713928
Z	370m W	Railway Buildings	1928	741466
5	374m NE	Gravel Pit	1851	652943
V	382m SW	Old Cotton Mill	1851	693538
V	385m W	Unspecified Ground Workings	1938	779534
V	385m W	Unspecified Ground Workings	1928	779534
V	387m W	Unspecified Heap	1968	650745
W	387m E	Cotton Mill	1851	644454
AA	388m N	Unspecified Mill	1908	657143
V	398m W	Unspecified Works	1992	777258
V	398m W	Unspecified Works	1987	777258
V	399m W	Unspecified Ground Workings	1908	728421
Q	402m SW	Old Sand Pit	1890	682522
6	408m S	Cuttings	1928	642614
AE	418m SE	Refuse Heap	1938	754445
AE	418m SE	Refuse Heap	1928	754445
AE	418m SE	Refuse Heap	1908	732692
AE	418m SE	Refuse Heap	1954	730807
AF	418m N	Railway Sidings	1975	750008
V	428m W	Unspecified Pit	1949	690686
AE	430m SE	Electric Substation	1976	682645
AG	431m E	Unspecified Commercial/Industrial	1976	755423
V	438m W	Refuse Heap	1938	715167
V	438m W	Refuse Heap	1928	715167

ID	Location	Land Use	Date	Group ID
AE	443m SE	Refuse Heap	1938	769463
AE	443m SE	Refuse Heap	1928	769463
AE	445m SE	Refuse Heap	1954	752378
K	463m N	Railway Building	1938	670144
AI	465m SE	Unspecified Ground Workings	1992	727112
AI	465m SE	Unspecified Ground Workings	1987	727112
AI	465m SE	Unspecified Ground Workings	1975	727112
AI	465m SE	Unspecified Ground Workings	1968	727112
AF	465m N	Railway Sidings	1992	748827
AF	465m N	Railway Sidings	1987	748827
AJ	473m E	Sand Pit	1908	643885
AJ	475m E	Unspecified Pit	1928	690679
AG	475m E	Unspecified Tanks	1928	666439
AK	477m S	Unspecified Pit	1992	707147
AK	477m S	Unspecified Pit	1987	707147
AK	477m S	Unspecified Pit	1975	707147
AK	477m S	Unspecified Pit	1968	707147
AG	478m E	Unspecified Mill	1967	657145
K	482m N	Railway Building	1938	670146
AG	484m E	Refuse Heap	1908	677869
AG	484m E	Unspecified Pit	1938	768294
AG	484m E	Unspecified Pit	1928	768294
AJ	485m E	Unspecified Heap	1908	650743
AL	486m NE	Iron Works	1954	723576
AM	488m SE	Unspecified Mill	1976	739827
AM	488m SE	Unspecified Mill	1967	739827
AL	488m NE	Iron Works	1938	725459
AL	488m NE	Iron Works	1928	725459



ID	Location	Land Use	Date	Group ID
AL	488m NE	Unspecified Mills	1908	766175
AL	489m E	Sand Pit	1954	788317
AL	490m NE	Unspecified Works	1976	713295
AL	490m NE	Unspecified Works	1967	713295
K	491m N	Railway Building	1938	670145
AM	492m SE	Unspecified Mill	1954	706278
AM	493m SE	Unspecified Mill	1891	714925
AG	495m E	Unspecified Pit	1954	756693
AM	495m SE	Unspecified Mill	1938	772878
AM	495m SE	Unspecified Mill	1928	772878
AM	495m SE	Unspecified Mill	1908	772878
AL	497m E	Sand Pit	1938	781720
AL	497m E	Sand Pit	1928	781720
AN	498m SW	Unspecified Heap	1992	788452
AN	498m SW	Unspecified Heap	1987	788452
AN	498m SW	Unspecified Heap	1975	788452

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

24

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 24 >](#)

ID	Location	Land Use	Date	Group ID
2	121m NE	Unspecified Tank	1971	84316
G	257m N	Tank or Trough	1910	88429
S	287m S	Unspecified Tank	1930	95858
G	287m N	Unspecified Tank	1971	99677



ID	Location	Land Use	Date	Group ID
G	288m N	Unspecified Tank	1984	99677
G	288m N	Unspecified Tank	1990	99677
S	288m S	Unspecified Tank	1910	95858
S	297m S	Unspecified Tank	1978	99953
S	297m S	Unspecified Tank	1990	91774
S	297m S	Unspecified Tank	1990	93325
S	297m S	Unspecified Tank	1990	100665
S	297m S	Unspecified Tank	1990	94048
S	297m S	Unspecified Tank	1996	100298
S	298m S	Unspecified Tank	1972	103327
G	317m N	Unspecified Tank	1957	89432
G	318m N	Unspecified Tank	1957	100879
P	329m SW	Unspecified Tank	1910	84313
P	337m SW	Unspecified Tank	1930	84314
AD	416m NW	Unspecified Tank	1978	102357
AD	417m NW	Unspecified Tank	1973	102357
W	429m E	Unspecified Tank	1973	89518
W	430m E	Unspecified Tank	1985	89518
AG	472m E	Unspecified Tank	1891	84312
7	485m SW	Unspecified Tank	1910	84290

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

79

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 24 >](#)



ID	Location	Land Use	Date	Group ID
A	On site	Electricity Substation	1972	52334
A	On site	Electricity Substation	1978	52334
A	On site	Electricity Substation	1990	52334
A	On site	Electricity Substation	1990	52334
A	On site	Electricity Substation	1990	52334
A	On site	Electricity Substation	1990	52334
F	135m W	Electricity Substation	1996	58603
F	135m W	Electricity Substation	1972	48500
F	135m W	Electricity Substation	1990	48500
F	135m W	Electricity Substation	1990	48500
I	148m S	Electricity Substation	1978	50546
I	148m S	Electricity Substation	1990	50546
I	148m S	Electricity Substation	1990	50546
I	148m S	Electricity Substation	1990	50546
I	148m S	Electricity Substation	1990	50546
I	149m S	Electricity Substation	1972	58559
G	224m N	Electricity Substation	1971	51016
G	226m N	Electricity Substation	1984	51016
G	226m N	Electricity Substation	1990	51016
G	227m N	Electricity Substation	1996	51016
G	227m N	Electricity Substation	1994	51016
T	301m SE	Electricity Substation	1996	55303
T	301m SE	Electricity Substation	1972	55303
T	306m S	Electricity Substation	1978	56164
T	306m S	Electricity Substation	1990	56164
T	306m S	Electricity Substation	1990	56164
T	306m S	Electricity Substation	1990	56164
T	306m S	Electricity Substation	1990	56164



ID	Location	Land Use	Date	Group ID
Y	360m E	Electricity Substation	1971	51909
Y	360m E	Electricity Substation	1996	50450
Y	360m E	Electricity Substation	1994	50450
Y	361m E	Electricity Substation	1984	51909
Y	361m E	Electricity Substation	1990	51909
AA	373m N	Electricity Substation	1971	54141
AA	373m N	Electricity Substation	1996	54141
AA	373m N	Electricity Substation	1994	54141
AA	374m N	Electricity Substation	1984	47865
X	376m NE	Electricity Substation	1984	54791
X	376m NE	Electricity Substation	1990	54791
X	377m NE	Electricity Substation	1996	54791
X	377m NE	Electricity Substation	1994	54791
AB	386m SW	Electricity Substation	1972	52044
AB	388m SW	Electricity Substation	1990	52044
AB	388m SW	Electricity Substation	1990	52044
AC	393m W	Electricity Substation	1978	48259
AC	394m W	Electricity Substation	1996	48259
AC	395m W	Electricity Substation	1973	48259
AC	395m W	Electricity Substation	1990	48259
AE	418m SE	Electricity Substation	1973	53009
AE	418m SE	Electricity Substation	1996	53009
AE	418m SE	Electricity Substation	1994	53009
AE	419m SE	Electricity Substation	1985	53009
AE	419m SE	Electricity Substation	1988	53009
AE	442m SE	Electricity Substation	1996	55050
AE	442m SE	Electricity Substation	1994	55050
AE	442m SE	Electricity Substation	1988	55050



ID	Location	Land Use	Date	Group ID
V	447m SW	Electricity Substation	1996	47985
AH	448m SE	Electricity Substation	1990	56656
AH	448m SE	Electricity Substation	1990	56656
AH	448m SE	Electricity Substation	1990	56656
AH	448m SE	Electricity Substation	1990	56656
AH	449m SE	Electricity Substation	1978	57738
AH	449m SE	Electricity Substation	1972	57738
AH	449m SE	Electricity Substation	1956	57738
AH	450m SE	Electricity Substation	1957	57738
AH	450m SE	Electricity Substation	1996	57738
V	458m SW	Electricity Substation	1957	53185
V	459m SW	Electricity Substation	1972	55843
V	459m SW	Electricity Substation	1956	55843
V	460m SW	Electricity Substation	1957	58725
V	461m SW	Electricity Substation	1972	58725
V	461m SW	Electricity Substation	1956	58725
V	462m SW	Electricity Substation	1990	58725
V	462m SW	Electricity Substation	1990	58725
K	484m NE	Electricity Substation	1971	55097
K	485m N	Electricity Substation	1996	55097
K	485m N	Electricity Substation	1994	55097
K	485m N	Electricity Substation	1984	55097
K	485m N	Electricity Substation	1990	55097

This data is sourced from Ordnance Survey / Groundsure.



2.4 Historical petrol stations

Records within 500m**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m**10**

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

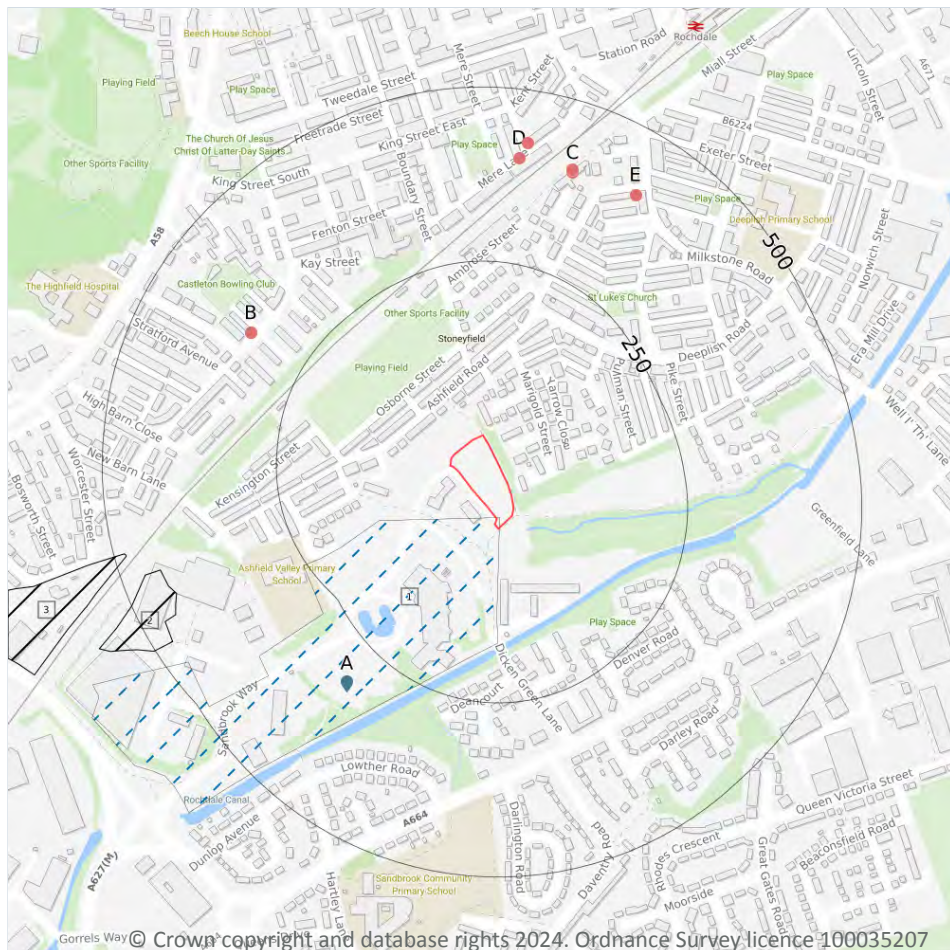
Features are displayed on the Past land use - un-grouped map on [page 24 >](#)

ID	Location	Land Use	Date	Group ID
L	207m NW	Carriage Shed	1957	19038
L	207m NW	Carriage Shed	1957	19038
L	209m NW	Carriage Shed	1910	17171
L	209m NW	Carriage Shed	1930	16455
N	219m NW	Carriage Shed	1910	19215
N	219m NW	Carriage Shed	1930	19215
X	354m NE	Garage	1984	15674
X	354m NE	Garage	1957	16533
X	373m NE	Garage	1971	17891
X	373m NE	Garage	1957	17891

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



3.1 Active or recent landfill

Records within 500m

1

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation. Features are displayed on the Waste and landfill map on [page 37](#) >

ID	Location	Details	
1	On site	Operator: Wimpey Construction (UK) Limited Site Address: Wimpey Construction (UK) Limited, Arundel Avenue, Rochdale, Lancashire, OL11 1QL	WML Number: 53728 EPR Reference: 636833 Landfill type: A05: Landfill taking Non-Biodegradable Wastes Status: Expired IPPC Reference: - EPR Number: EA/EPR/GP3296CN



This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0
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Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0
---------------------	---

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	2
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Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on [page 37 >](#)

ID	Location	Details		
2	433m W	Site Address: Hailwood Street, Deeplish, Rochdale, Greater Manchester Licence Holder Address: -	Waste Licence: - Site Reference: D083 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded - Last Recorded: -
3	483m W	Site Address: Edinburgh Way, Rochdale, Greater Manchester Licence Holder Address: -	Waste Licence: - Site Reference: - Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Rochdale County Borough Council Licence Holder: - First Recorded 30/09/1972 Last Recorded: -

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m**0**

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m**2**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on [page 37](#) >

ID	Location	Details		
A	311m SW	Site Name: Ashfield Valley Inert Landfill Site Site Address: Arundel Avenue, Rochdale, Lancashire, OL11 Correspondence Address: Carillion Building, New Chester Road, Wirral, Merseyside, CH62 3NZ	Type of Site: Landfill taking Non-Biodegradable Wastes Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WCL001 EPR reference: - Operator: Wimpey Construction U K Ltd Waste Management licence No: 53728 Annual Tonnage: 0.001	Issue Date: 21/06/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
A	311m SW	Site Name: Ashfield Valley Inert Landfill Site Site Address: Arundel Avenue, Rochdale, Lancashire, OL11 1QL Correspondence Address: -	Type of Site: Landfill taking Non-Biodegradable Wastes Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: 636833 EPR reference: EA/EPR/GP3296CN Operator: Wimpey Construction (Uk) Limited Waste Management licence No: 53728 Annual Tonnage: 0	Issue Date: 21/06/1994 Effective Date: 21/06/1994 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired

This data is sourced from the Environment Agency and Natural Resources Wales.



3.7 Waste exemptions

Records within 500m	10
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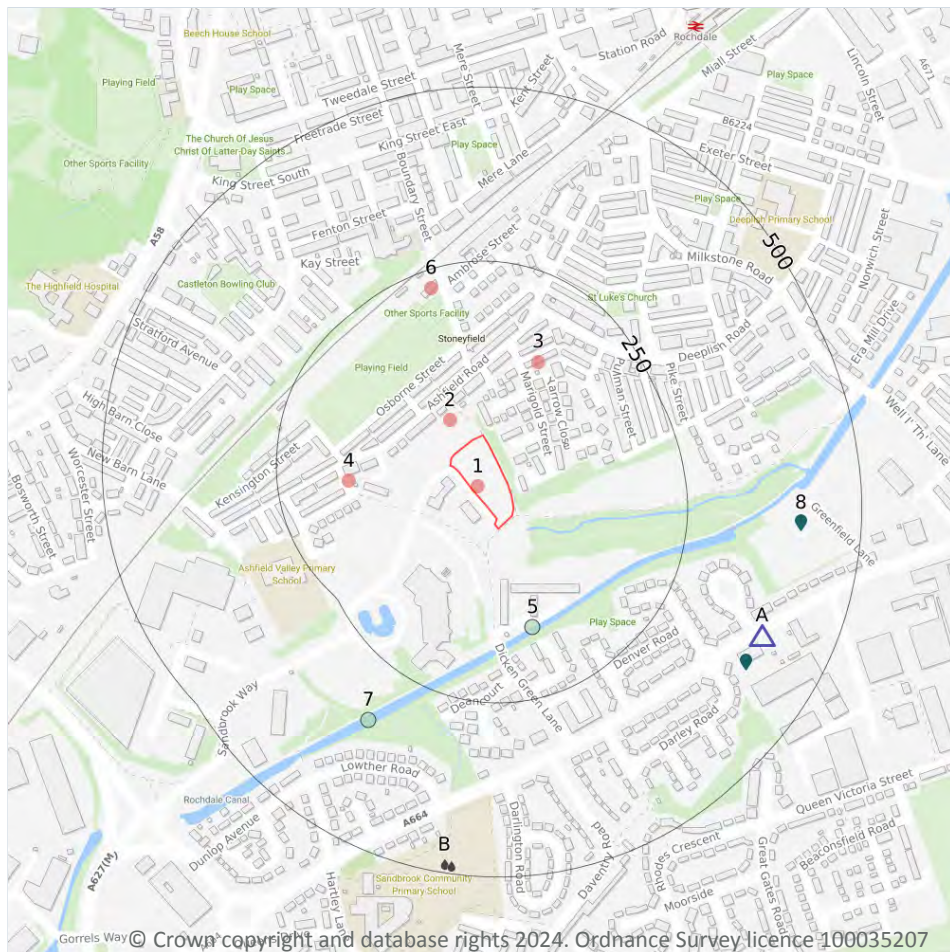
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on [page 37 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
B	340m NW	28, MEREFIELD STREET, ROCHDALE, OL11 3RU	WEX098745	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	340m NW	28, MEREFIELD STREET, ROCHDALE, OL11 3RU	WEX098745	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
B	340m NW	28, MEREFIELD STREET, ROCHDALE, OL11 3RU	WEX098745	Using waste exemption	Not on a farm	Use of waste for a specified purpose
B	340m NW	28, MEREFIELD STREET, ROCHDALE, OL11 3RU	WEX098745	Treating waste exemption	Not on a farm	Sorting mixed waste
C	398m N	Unit 1, Ashfield Road, Rochdale, OL11 1PX	EA/EPR/VP394 3FF/A001	Treating waste exemption	Not on a farm	Repair or refurbishment of WEEE
D	401m N	41 Mere Lane, Rochdale, Lancashire, OL11 3TD	EA/EPR/VP388 4NQ/A001	Treating waste exemption	Not on a farm	Repair or refurbishment of WEEE
C	402m N	Unit 1, Ashfield Road, Rochdale, OL11 1PX	EA/EPR/VP378 9MX/A001	Treating waste exemption	Non-Agricultural waste only	Repair or refurbishment of WEEE
E	408m NE	UNIT 1, THE OLD BAKERY, ASHFIELD ROAD, ROCHDALE, OL11 1PX	EXP/WP3044U F	Treating waste exemption	Not on a farm	Repair or refurbishment of WEEE
E	408m NE	Unit 1 The Old Bakery, Ashfield Road, Rochdale, OL11 1PX	EA/EPR/WP30 44UF/A001	Treating waste exemption	Not on a farm	Repair or refurbishment of WEEE
D	424m N	38, MERE LANE, ROCHDALE, OL11 3TD	WEX345161	Treating waste exemption	Not on a farm	Recovery of scrap metal

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Current or recent petrol stations
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

5

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Company	Address	Activity	Category
1	On site	Business Park	Greater Manchester, OL11	Business Parks and Industrial Estates	Industrial Features
2	42m NW	Electricity Sub Station	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities
3	132m NE	I K Recovery	13, Lucknow Street, Rochdale, Greater Manchester, OL11 1RH	Scrap Metal Merchants	Recycling Services



ID	Location	Company	Address	Activity	Category
4	148m W	Electricity Sub Station	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities
6	224m N	Works	Greater Manchester, OL11	Unspecified Works Or Factories	Industrial Features

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

1

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Company	Address	LPG	Status
A	398m SE	SHELL	Queensway, Rochdale, Greater Manchester, OL11 1TJ	No	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m

0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m

0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m

0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.



4.6 Control of Major Accident Hazards (COMAH)

Records within 500m

0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	2
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Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Address	Details	
A	395m SE	Shell UK Oil Ltd, Eagle Service Station, Queensway, Rochdale, Lancashire, OL11 1TJ	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
8	413m E	Sealocrete, Greenfield Lane, Rochdale, OL11 2LD	Process: Manufacture of Coating Materials Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0
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Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	3
----------------------------	----------

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on [page 41](#) >

ID	Location	Address	Details	
B	488m S	HARTLEY LANE CSO, REAR OF SANDBROOK, HARTLEY LANE, KIRKHOLT, ROCHDALE, GREATER MANCHESTER, OL11 2LR	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01ROC0066 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 01/04/1991 Revocation Date: 31/12/1994

ID	Location	Address	Details	
B	488m S	HARTLEY LANE CSO, REAR OF SANDBROOK, HARTLEY LANE, KIRKHOLT, ROCHDALE, GREATER MANCHESTER, OL11 2LR	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01ROC0066 Permit Version: 2 Receiving Water: -	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: - Effective Date: 01/01/1995 Revocation Date: 21/09/2020
B	490m S	HARTLEY LANE CSO, REAR OF SANDBROOK, HARTLEY LANE, KIRKHOLT, ROCHDALE, GREATER MANCHESTER, OL11 2LR	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: EPRSB3396RE Permit Version: 1 Receiving Water: TRIB OF SUDDON BROOK	Status: VARIED UNDER EPR 2010 Issue date: 21/09/2020 Effective Date: 21/09/2020 Revocation Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0
----------------------------	----------

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0
----------------------------	----------

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0
----------------------------	----------

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m**0**

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m**2**

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on [page 41 >](#)

ID	Location	Details	
5	149m S	Incident Date: 05/08/2003 Incident Identification: 179424 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
7	331m SW	Incident Date: 16/02/2009 Incident Identification: 654206 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m**0**

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



4.20 Pollution inventory waste transfers

Records within 500m

0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m

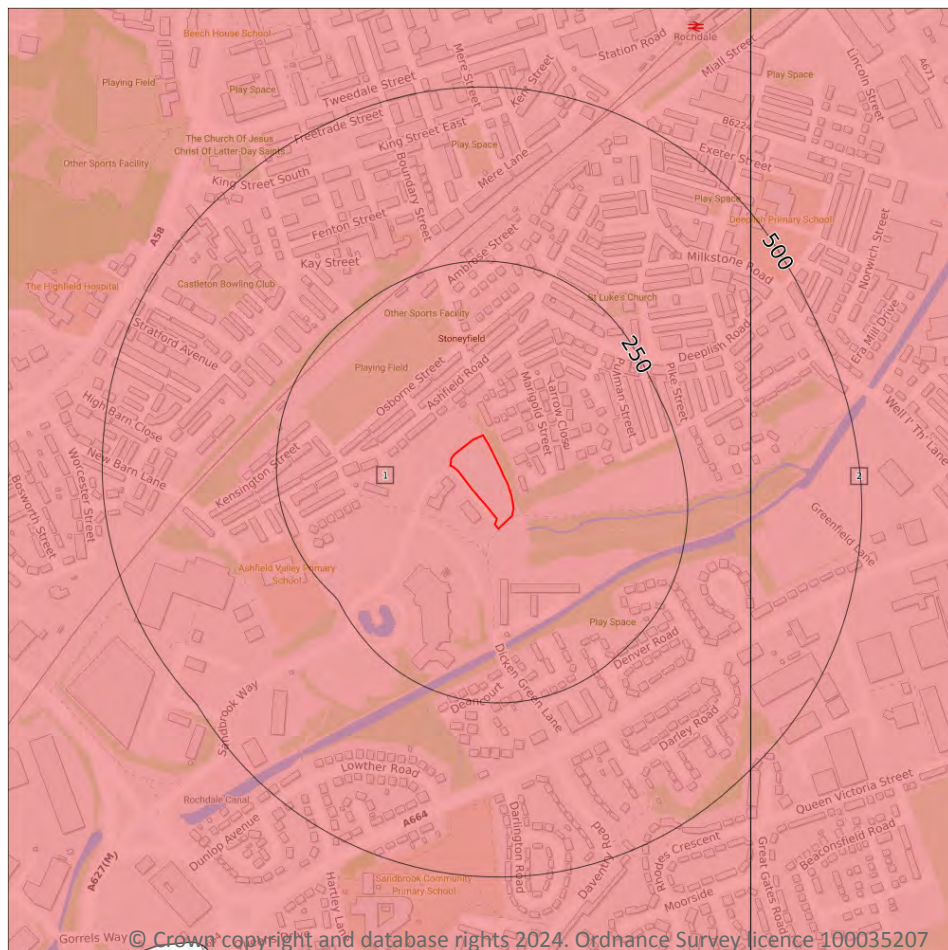
0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

2

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 48 >](#)

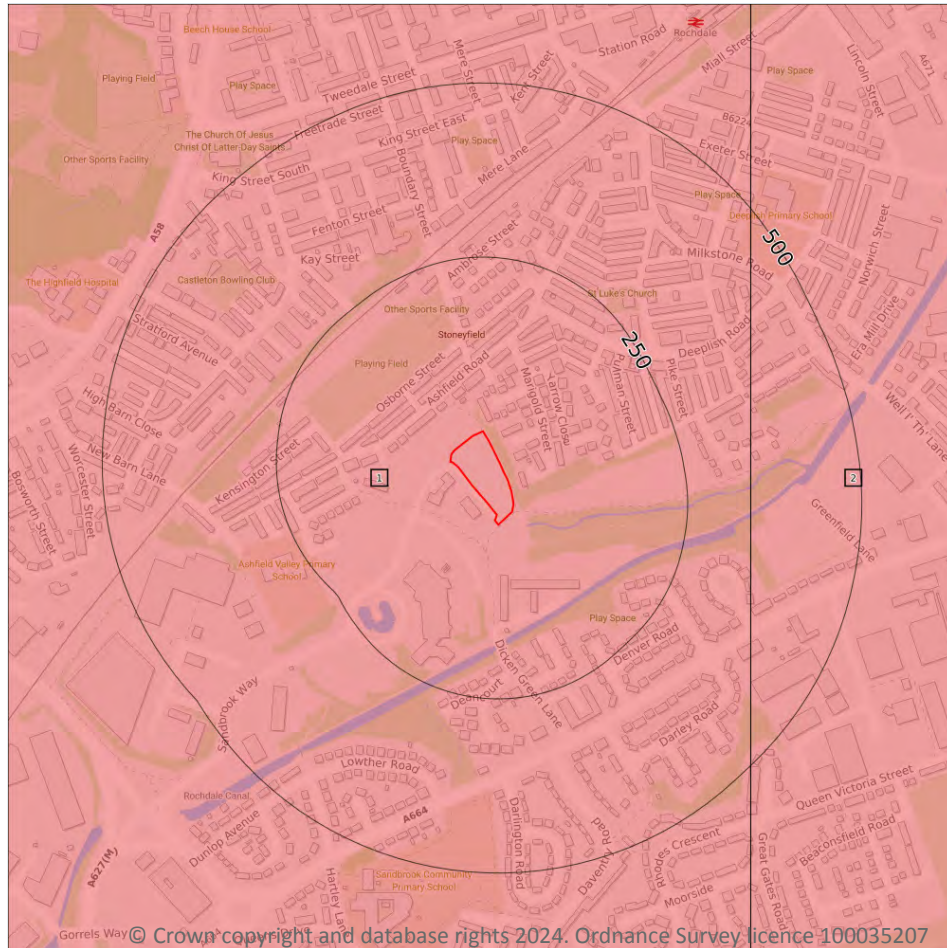
ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	341m E	Secondary 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



This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 50](#) >

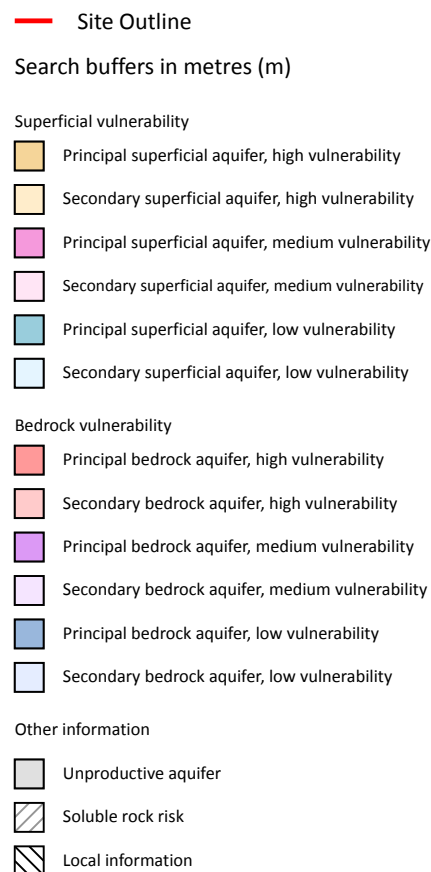
ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	341m E	Secondary 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



This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

2

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on [page 52 >](#)

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: High Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: High	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0
-----------------	---

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

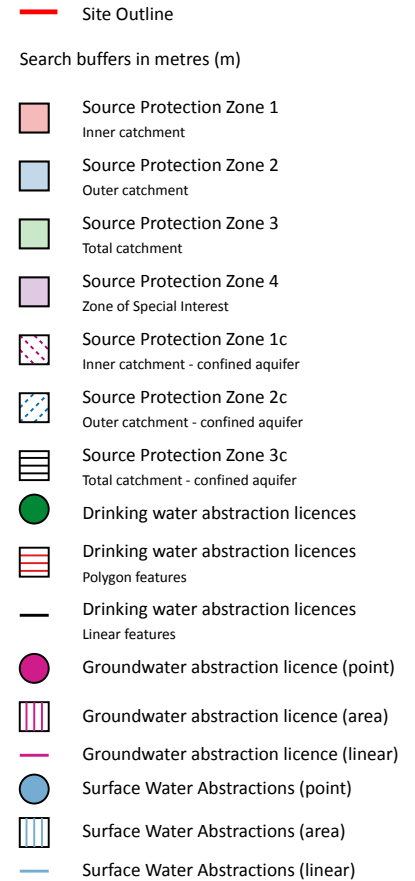
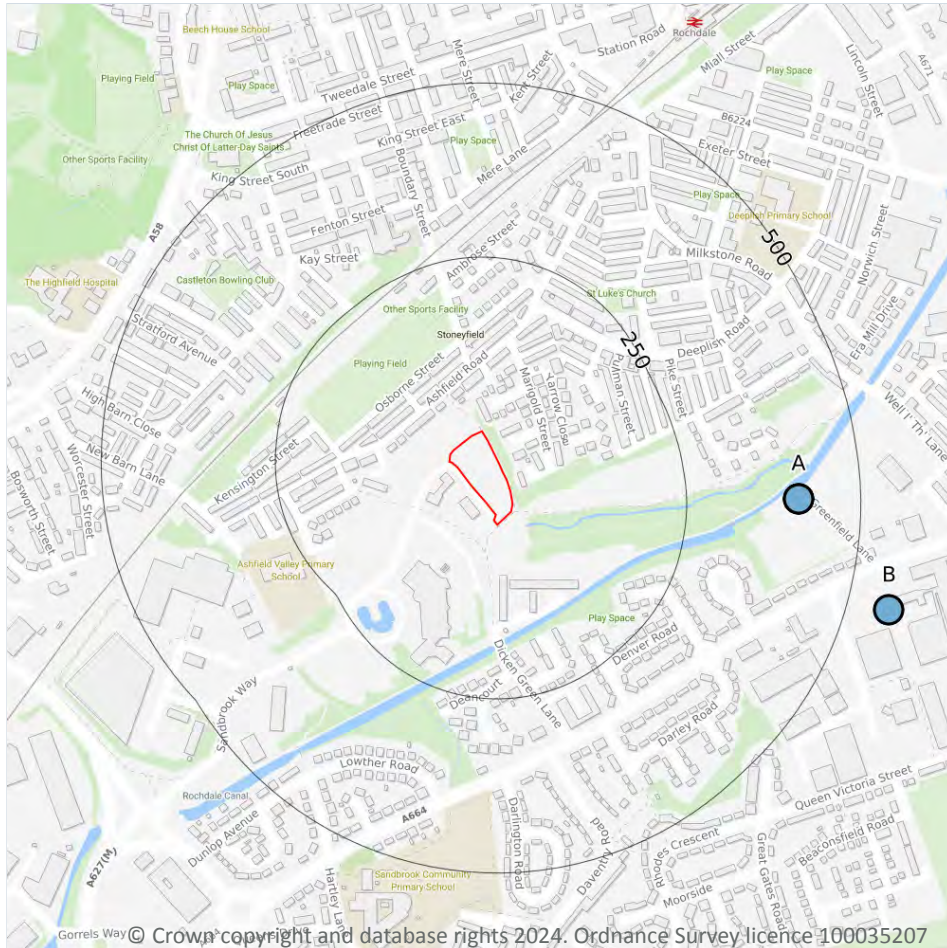
5.5 Groundwater vulnerability- local information

Records on site	0
-----------------	---

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



5.6 Groundwater abstractions

Records within 2000m

8

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 54 >](#)

ID	Location	Details	
-	1707m NW	Status: Historical Licence No: 2569002050 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, SPOTLAND, ROCHDALE" Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 388700 Northing: 413500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 10/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 02/05/2000 Version End Date: -
-	1707m NW	Status: Historical Licence No: 2569002050 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, SPOTLAND, ROCHDALE Data Type: Point Name: ALEXANDER DREW LTD. Easting: 388700 Northing: 413500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 10/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2003 Version End Date: -
-	1707m NW	Status: Historical Licence No: 2569002050 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES SPOTLAND ROCHDALE Data Type: Point Name: ALEXANDER DREW LTD Easting: 388700 Northing: 413500	Annual Volume (m ³): 500000 Max Daily Volume (m ³): 2100 Original Application No: - Original Start Date: 10/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2003 Version End Date: -
-	1775m E	Status: Historical Licence No: 2569002159 Details: General Farming & Domestic Direct Source: Ground Water - North West Region Point: "WELL AT FARM, LOWER LANE, MILNROW, ROCHDALE" Data Type: Point Name: HARTLE Easting: 391400 Northing: 411600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/02/1966 Version End Date: -



ID	Location	Details	
-	1775m E	Status: Historical Licence No: 2569002159 Details: General Farming & Domestic Direct Source: Ground Water - North West Region Point: WELL AT FARM, LOWER LANE, MILNROW, ROCHDALE Data Type: Point Name: HARTLE Easting: 391400 Northing: 411600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/02/1966 Version End Date: -
-	1775m E	Status: Historical Licence No: 2569002159 Details: General Farming & Domestic Direct Source: Ground Water - North West Region Point: WELL AT FARM LOWER LANE MILNROW ROCHDALE Data Type: Point Name: HARTLE Easting: 391400 Northing: 411600	Annual Volume (m ³): 5123.34 Max Daily Volume (m ³): 31.822 Original Application No: - Original Start Date: 01/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2007 Version End Date: -
-	1797m E	Status: Historical Licence No: 2569002060 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "WELL AT CASTLE FARM, LOWER LANE, MILNROW" Data Type: Point Name: SANDERSON Easting: 391400 Northing: 411500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 11/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/02/1966 Version End Date: -
-	1797m E	Status: Historical Licence No: 2569002060 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT CASTLE FARM, LOWER LANE, MILNROW Data Type: Point Name: SANDERSON Easting: 391400 Northing: 411500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 11/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/02/1966 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.7 Surface water abstractions

Records within 2000m

9

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 54 >](#)

ID	Location	Details	
A	410m E	Status: Historical Licence No: 2569002107 Details: Boiler Feed Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT QUEENSWAY,ROCHDALE" Data Type: Point Name: SEALOCRETE PLA LTD Easting: 390070 Northing: 411960	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 02/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/12/1993 Version End Date: -
A	410m E	Status: Historical Licence No: 2569002107 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT QUEENSWAY,ROCHDALE" Data Type: Point Name: SEALOCRETE PLA LTD Easting: 390070 Northing: 411960	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 02/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/12/1993 Version End Date: -
A	410m E	Status: Historical Licence No: 2569002107 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT QUEENSWAY,ROCHDALE Data Type: Point Name: SEALOCRETE PLA LTD Easting: 390070 Northing: 411960	Annual Volume (m ³): 10455.8 Max Daily Volume (m ³): 45.46 Original Application No: - Original Start Date: 02/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -



ID	Location	Details	
A	410m E	Status: Historical Licence No: 2569002107 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT QUEENSWAY,ROCHDALE Data Type: Point Name: SEALOCRETE PLA LTD Easting: 390070 Northing: 411960	Annual Volume (m ³): 10455.8 Max Daily Volume (m ³): 45.46 Original Application No: - Original Start Date: 02/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
B	560m E	Status: Historical Licence No: 2569002178 Details: Boiler Feed Direct Source: "Surface, Non-Tidal - North West Region" Point: "CATCHPIT FED BY SURFACE DRAINAGE AT PREMISES, ROCHDALE" Data Type: Point Name: DUNPHY COMBUSTION LTD. Easting: 390200 Northing: 411800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 18/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 12/02/1991 Version End Date: -
B	560m E	Status: Historical Licence No: 2569002178 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: CATCHPIT FED BY SURFACE DRAINAGE AT PREMISES, ROCHDALE Data Type: Point Name: DUNPHY COMBUSTION LTD Easting: 390200 Northing: 411800	Annual Volume (m ³): 2318.46 Max Daily Volume (m ³): 34.09 Original Application No: CW 1093 Original Start Date: 18/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 12/02/1991 Version End Date: -
-	720m NE	Status: Historical Licence No: 2569002076 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT ROCHDALE, LANCS Data Type: Point Name: J & J MAKIN CONVERTORS LTD Easting: 390300 Northing: 412300	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 18/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1993 Version End Date: -

ID	Location	Details	
-	1303m N	Status: Historical Licence No: NW/069/0002/003 Details: Transfer Between Sources (Post Water Act 2003) Direct Source: Surface, Non-Tidal - North West Region Point: RIVER ROCH AT ROCHDALE WEIR Data Type: Point Name: Transport for Greater Manchester Easting: 389916 Northing: 413325	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: NPS/WR/007633 Original Start Date: 15/06/2010 Expiry Date: 31/03/2026 Issue No: 2 Version Start Date: 23/06/2011 Version End Date: -
-	1303m N	Status: Historical Licence No: NW/069/0002/001 Details: Hydroelectric Power Generation Direct Source: Surface, Non-Tidal - North West Region Point: RIVER ROCH AT ROCHDALE WEIR Data Type: Point Name: Transport for Greater Manchester Easting: 389917 Northing: 413325	Annual Volume (m ³): 36100000 Max Daily Volume (m ³): 164160 Original Application No: NPS/WR/007499 Original Start Date: 15/06/2010 Expiry Date: 31/03/2026 Issue No: 2 Version Start Date: 01/04/2015 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0
-----------------------------	----------

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0
----------------------------	----------

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m

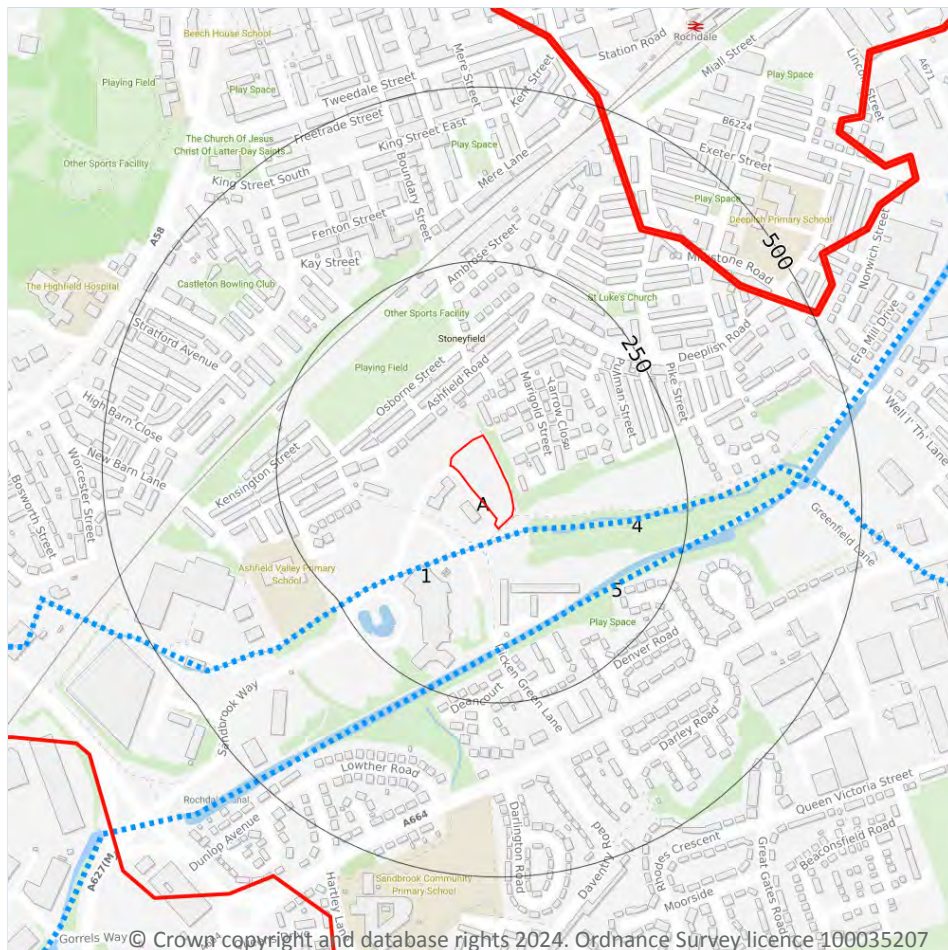
0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



6.1 Water Network (OS MasterMap)

Records within 250m

3

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on [page 61](#) >

ID	Location	Type of water feature	Ground level	Permanence	Name
1	14m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Sudden Brook



ID	Location	Type of water feature	Ground level	Permanence	Name
4	29m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Sudden Brook
5	151m SE	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Rochdale Canal

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	3
----------------------------	----------

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on [page 61](#) >

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on [page 61](#) >

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River	Roch (Spodden to Irwell)	GB112069064600	Roch Irk Medlock	Irwell

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified

2

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on [page 61](#) >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
2	15m S	River	Roch (Spodden to Irwell)	GB112069064600 ↗	Moderate	Fail	Moderate	2019
6	153m SE	Canal	Rochdale Canal, western section	GB71210517 ↗	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site

1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on [page 61](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Northern Manchester Carboniferous Aquifers	GB41202G101800 ↗	Poor	Poor	Good	2019

This data is sourced from the Environment Agency and Natural Resources Wales.



Distance	Flood risk category
On site	Medium
0 - 50m	High

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0
---------------------	---

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0
---------------------	---

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0
---------------------	---

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0
---------------------	---

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones



- Site Outline
- Search buffers in metres (m)
- Flood zone 2
- Flood zone 3

7.6 Flood Zone 2

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on [page 64](#) >

Location	Type
On site	Zone 2 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.



7.7 Flood Zone 3

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

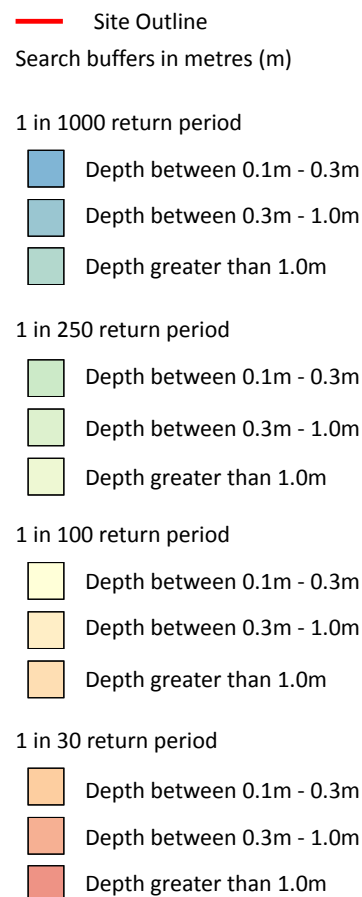
Features are displayed on the River and coastal flooding map on [page 64](#) >

Location	Type
22m SE	Zone 3 - (Fluvial Models)

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

1 in 30 year, Greater than 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on [page 68](#) >

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

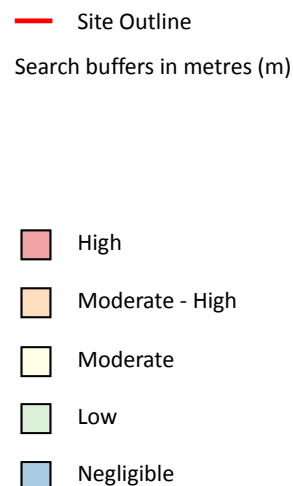
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

Moderate

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on [page 70 >](#)

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- Special Areas of Conservation (SAC)
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

5

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on [page 71](#) >

ID	Location	Name	Data source
A	147m SE	Rochdale Canal	Natural England



ID	Location	Name	Data source
B	174m S	Rochdale Canal	Natural England
C	431m SW	Rochdale Canal	Natural England
D	872m SW	Rochdale Canal	Natural England
-	1921m SW	Rochdale Canal	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0
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Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	5
-----------------------------	----------

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

Features are displayed on the Environmental designations map on [page 71 >](#)

ID	Location	Name	Features of interest	Habitat description	Data source
A	147m SE	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England
B	174m S	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England
C	431m SW	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England

ID	Location	Name	Features of interest	Habitat description	Data source
D	872m SW	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England
-	1921m SW	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0
-----------------------------	----------

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0
-----------------------------	----------

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	0
-----------------------------	----------

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m**0**

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m**0**

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m**0**

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m**0**

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m**2**

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on [page 71 >](#)



ID	Location	Name	Local Authority name
-	1700m SE	Merseyside and Greater Manchester	Rochdale
-	1856m SE	Merseyside and Greater Manchester	Rochdale

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was



closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

1

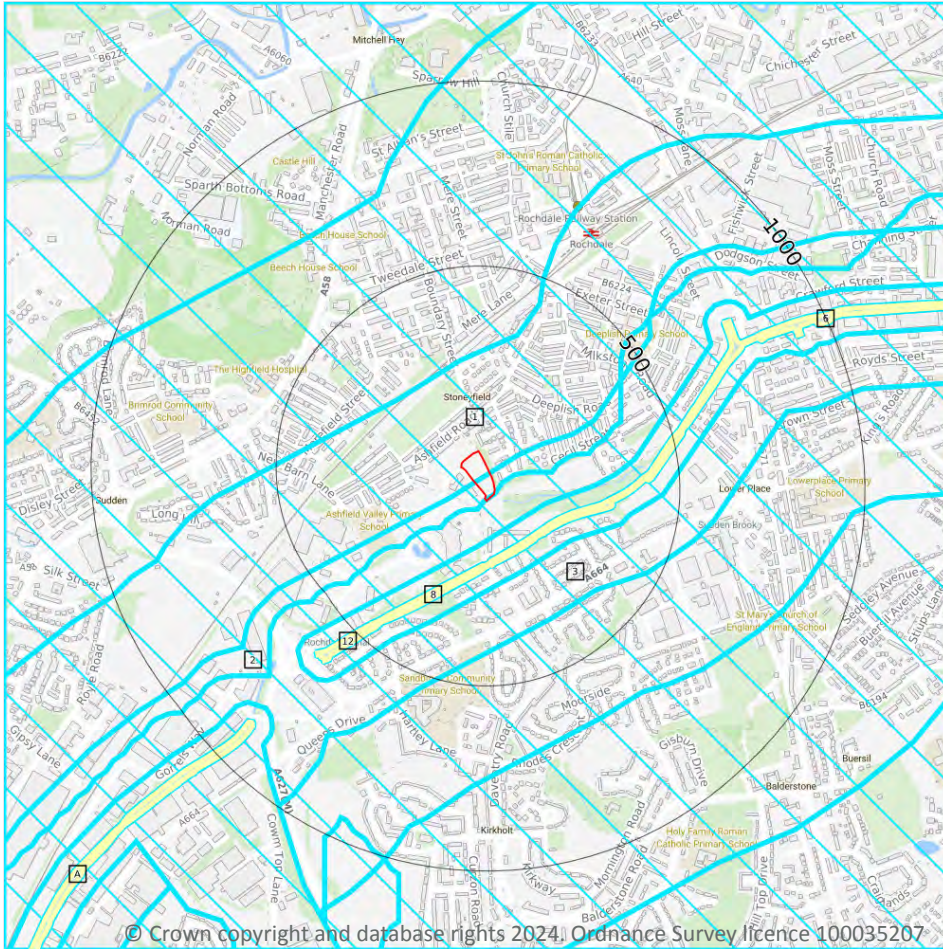
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
1326m S	River Irk (Moston Brook to River Irwell) NVZ	Surface Water	638	Existing

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

3

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on [page 77](#) >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Residential - Residential development of 100 units or more. Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas. Air pollution - Any development that could cause AIR POLLUTION (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores). Combustion - All general combustion processes. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management. Composting - Any composting proposal. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .
2	On site	Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Residential - Residential development of 50 units or more. Rural residential - Any residential development of 10 or more houses outside existing settlements/urban areas. Air pollution - Any development that could cause AIR POLLUTION or DUST either in its construction or operation (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores). Combustion - All general combustion processes. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management. Composting - Any composting proposal. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .



ID	Location	Type of developments requiring consultation
3	On site	Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha. Residential - Residential development of 50 units or more. Rural residential - Any residential development of 10 or more houses outside existing settlements/urban areas. Air pollution - Any development that could cause AIR POLLUTION or DUST either in its construction or operation (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores). Combustion - All general combustion processes. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management. Composting - Any composting proposal. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

5

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on [page 77 >](#)

ID: 6
 Location: 147m SE
 SSSI name: Rochdale Canal
 Unit name: Failsworth
 Broad habitat: Standing Open Water And Canals
 Condition: Unfavourable - Recovering
 Reportable features:



Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010

ID: 8
Location: 174m S
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010

ID: 12
Location: 431m SW
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010

ID: A
Location: 872m SW
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010



ID: -
Location: 1921m SW
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.



This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

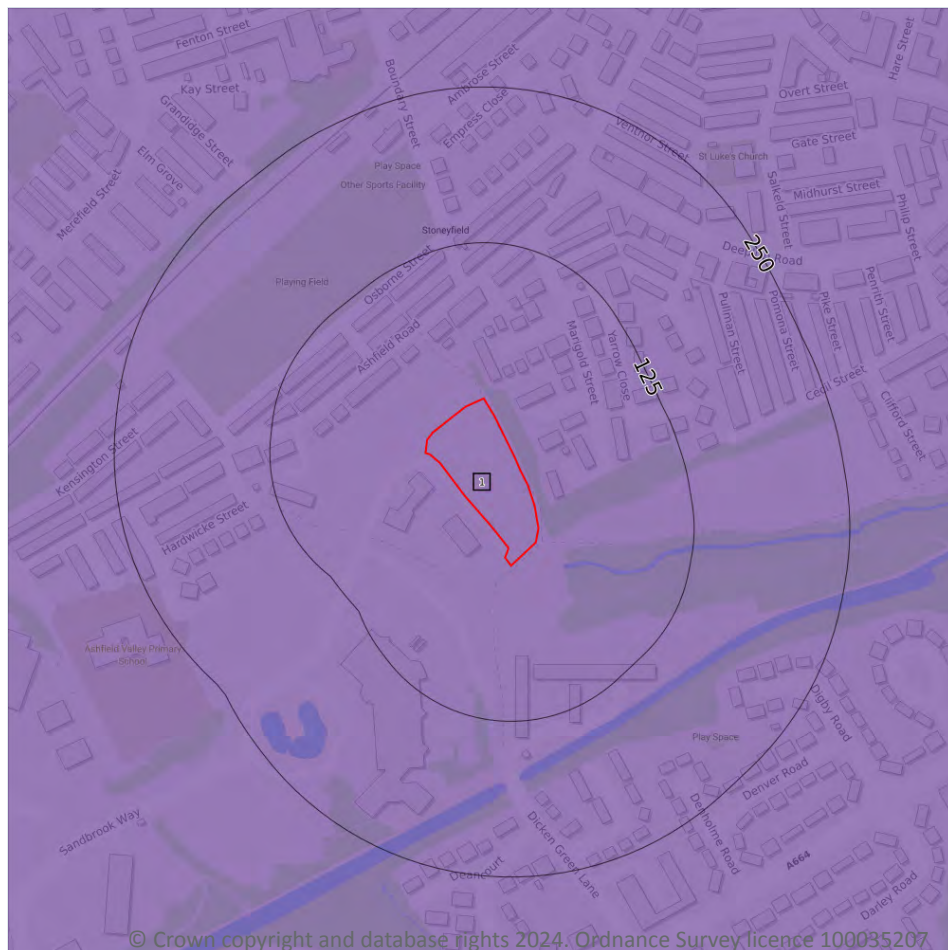
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on [page 84](#) >

ID	Location	Classification	Description
1	On site	Urban	-

This data is sourced from Natural England.



12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

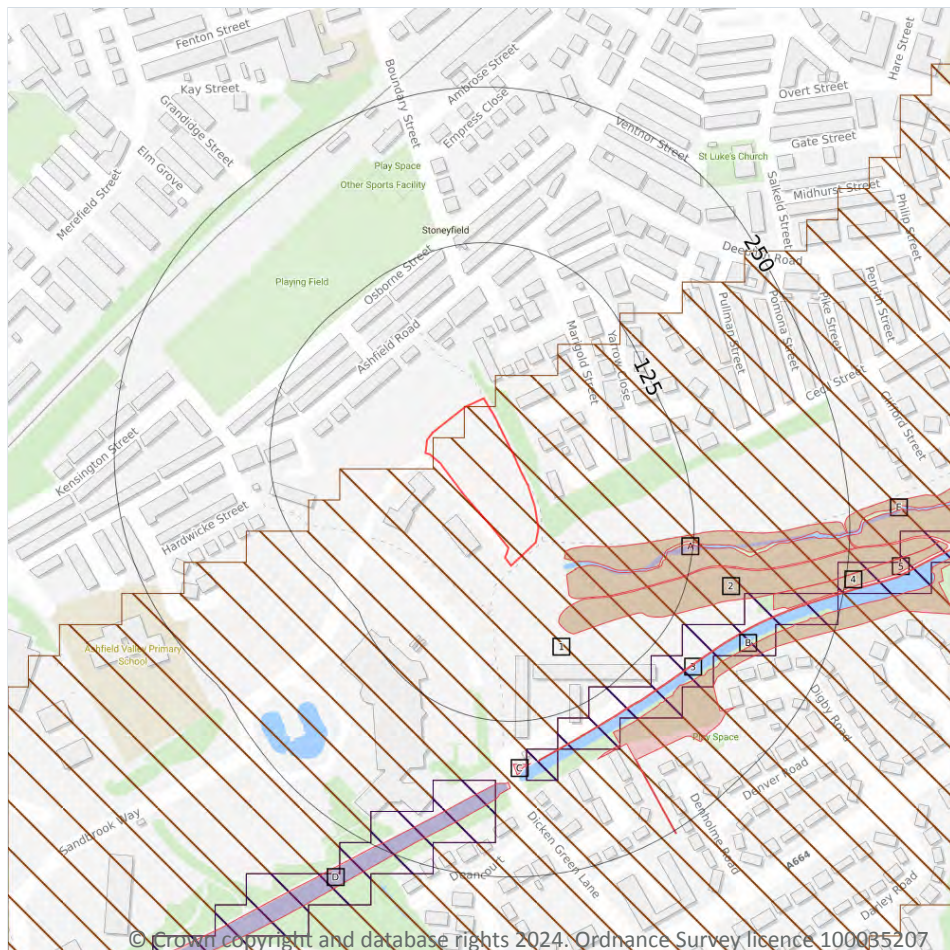
Records within 250m

0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
- Primary Habitat
- Restorable Habitat
- Associated Habitats
- Habitat Restoration-Creation
- Network Enhancement Zone 1
- Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

10

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on [page 86](#) >

ID	Location	Main Habitat	Other habitats
A	25m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	36m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	55m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	146m SE	Lowland fens	Main habitat: LFENS (INV > 50%)



ID	Location	Main Habitat	Other habitats
B	157m SE	No main habitat but additional habitats present	Additional: DWOOD (INV 50%)
C	159m S	Lowland fens	Main habitat: LFENS (INV > 50%)
D	174m S	Lowland fens	Main habitat: LFENS (INV > 50%)
4	195m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
E	246m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
E	249m E	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

5

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

Features are displayed on the Habitat designations map on [page 86](#) >

ID	Location	Type	Habitat
1	On site	Network Enhancement Zone 2	Not specified
3	116m SE	Primary Habitat	Lowland fens
C	148m S	Primary Habitat	Lowland fens
D	173m S	Primary Habitat	Lowland fens
5	242m E	Primary Habitat	Lowland fens

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.



13.4 Limestone Pavement Orders

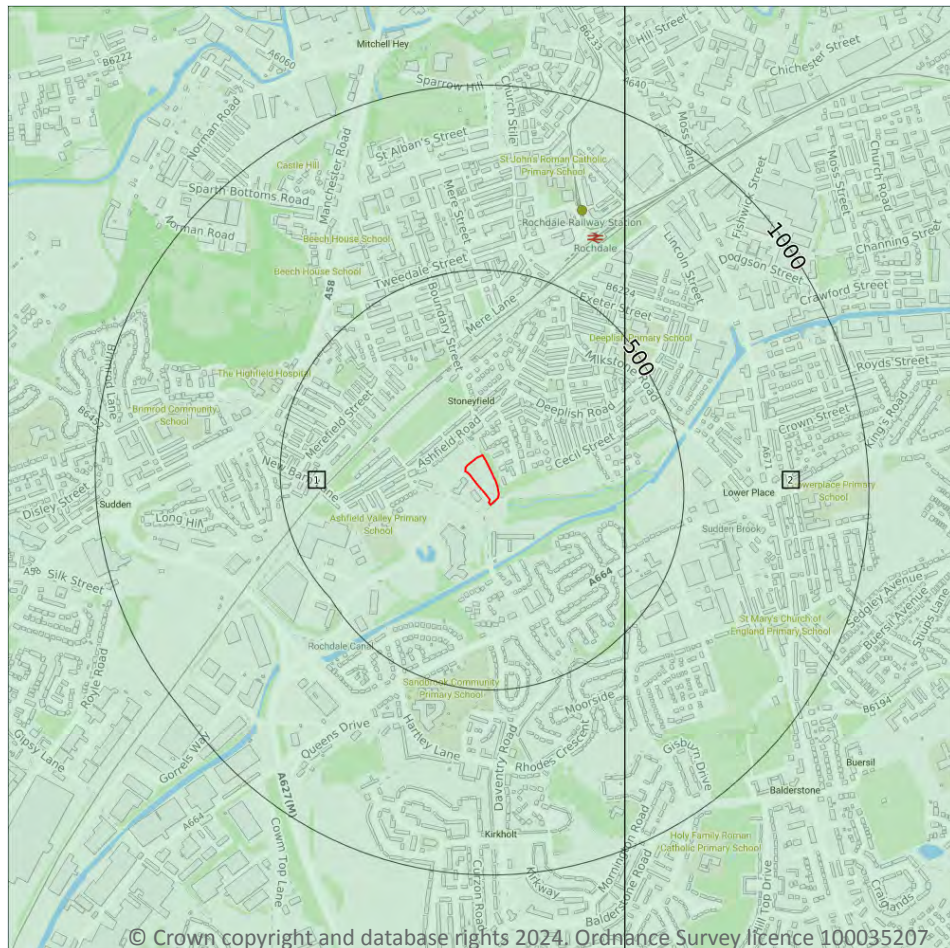
Records within 250m**0**

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

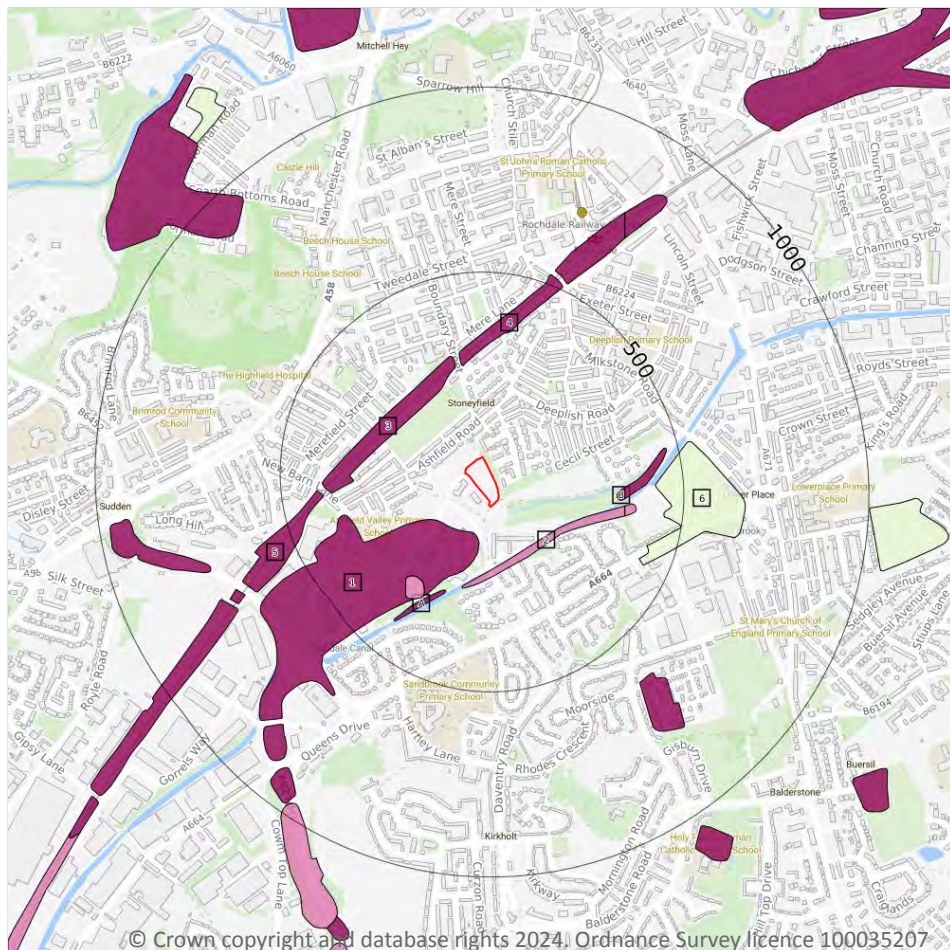
Features are displayed on the Geology 1:10,000 scale - Availability map on [page 89](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SD81SE
2	341m E	Full	Full	Full	Full	SD91SW

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground



- Site Outline**
- Search buffers in metres (m)**
- Reclaimed ground
 - Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

11

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on [page 90](#) >

ID	Location	LEX Code	Description	Rock description
1	84m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	146m SE	WGR-VOID	Worked Ground (Undivided)	Void
3	202m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	253m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

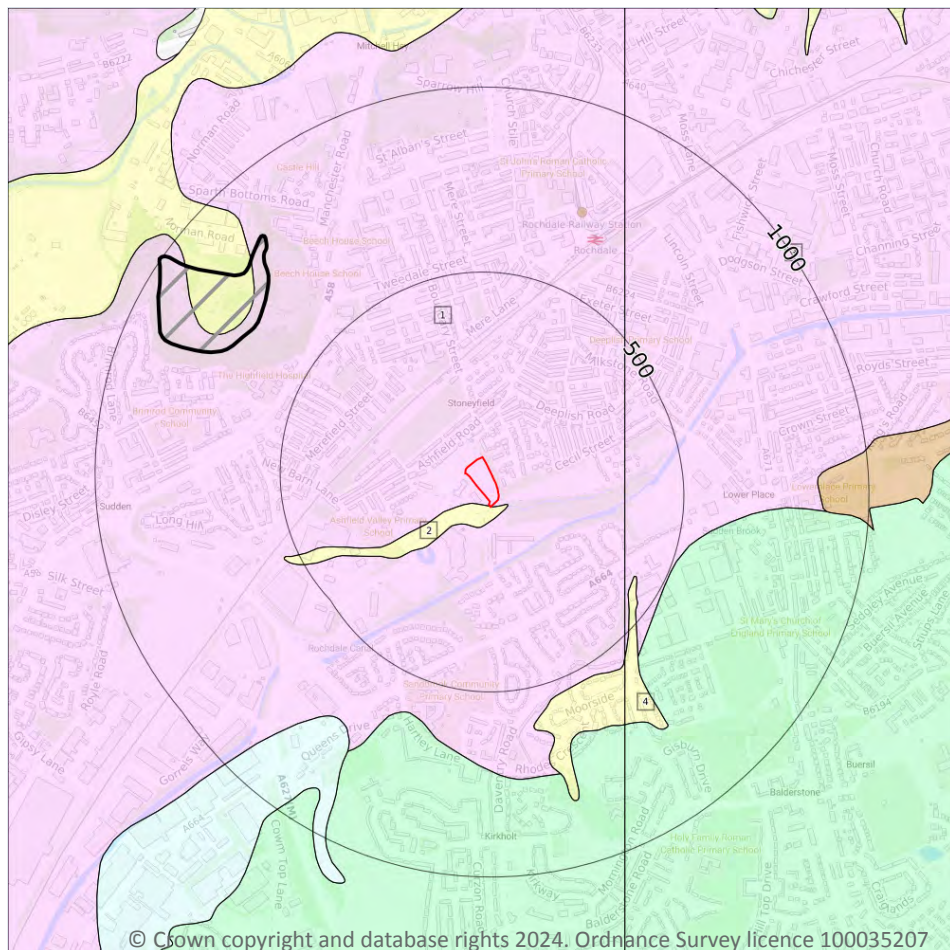


ID	Location	LEX Code	Description	Rock description
A	257m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	273m SW	WGR-VOID	Worked Ground (Undivided)	Void
B	319m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	341m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	342m E	WGR-VOID	Worked Ground (Undivided)	Void
5	387m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	413m SE	WMGR-ARTDP	Infilled Ground	Artificial Deposit

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

4

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 92](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
2	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	341m E	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
4	422m SE	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel



This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

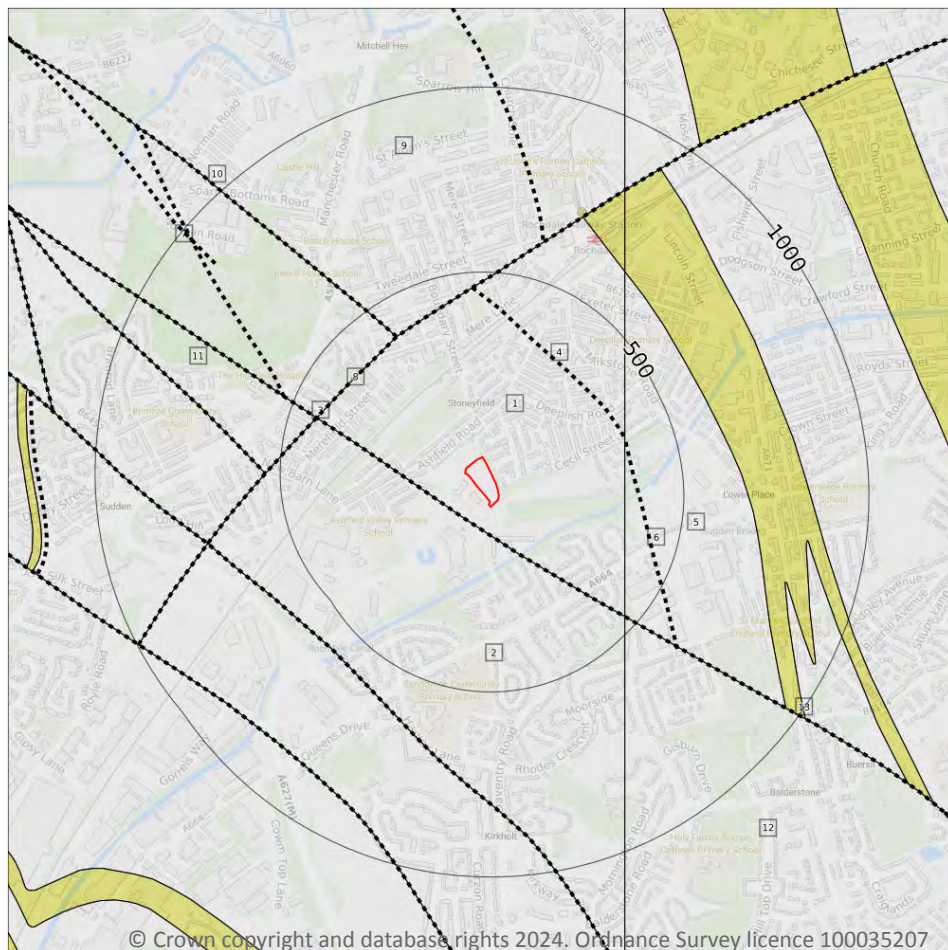
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

7

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 94](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
2	65m S	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age

ID	Location	LEX Code	Description	Rock age
5	341m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
7	385m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
9	397m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
11	426m W	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
12	465m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	6
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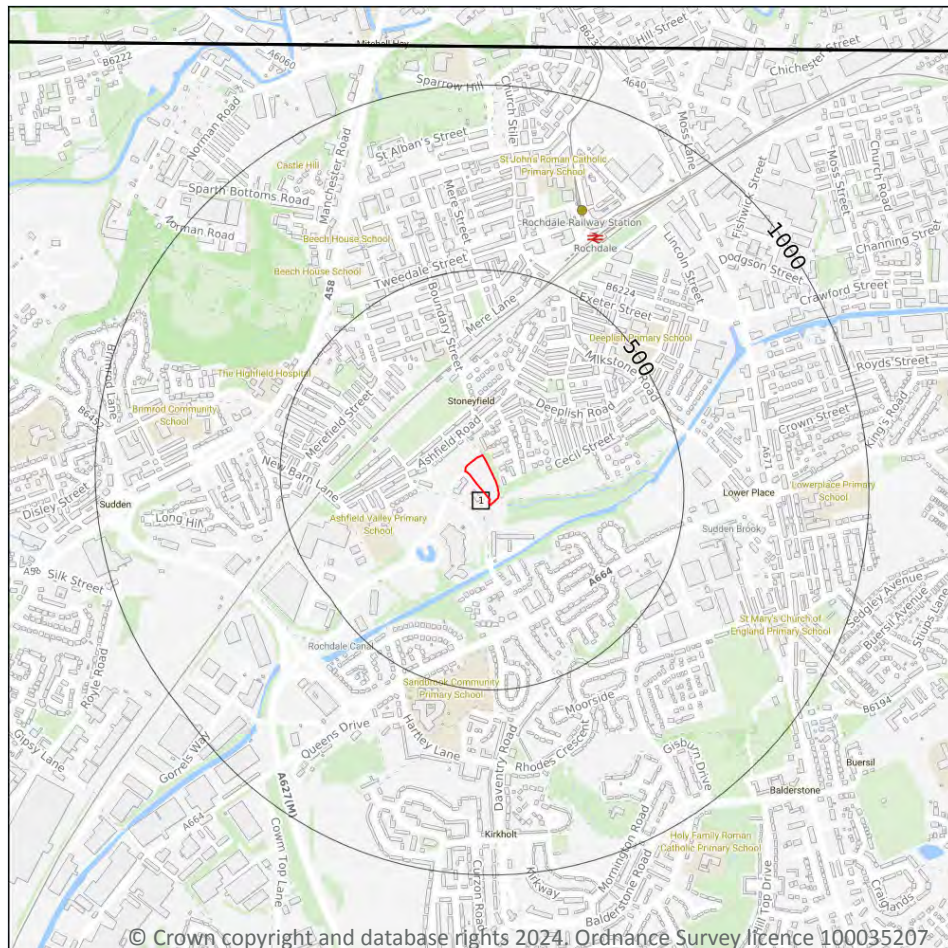
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 94](#) >

ID	Location	Category	Description
3	65m S	FAULT	Normal fault, inferred; crossmarks on downthrow side
4	327m NE	ROCK	Coal seam, inferred
6	366m E	ROCK	Coal seam, inferred
8	385m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
10	397m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
13	465m SE	FAULT	Normal fault, inferred; crossmarks on downthrow side

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



— Site Outline
Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

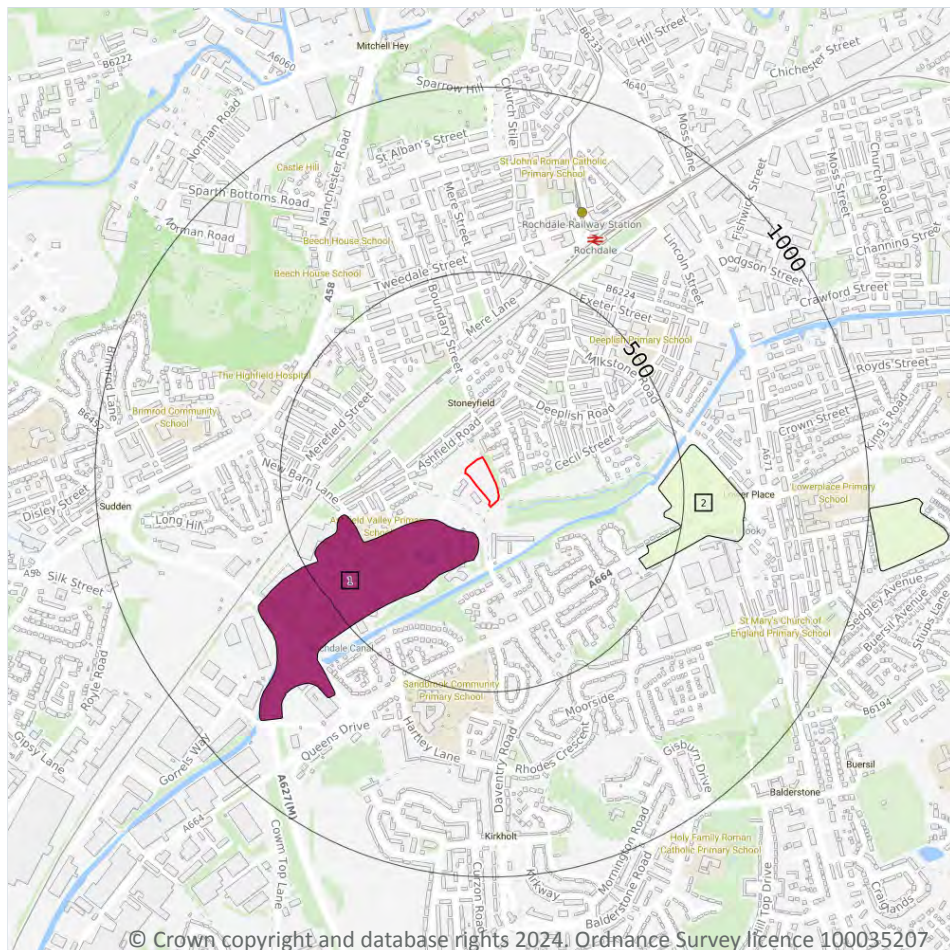
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 96](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW085_manchester_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



- Site Outline
- Search buffers in metres (m)
- Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

2

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on [page 97](#) >

ID	Location	LEX Code	Description	Rock description
1	85m S	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	413m SE	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.



15.3 Artificial ground permeability (50k)

Records within 50m

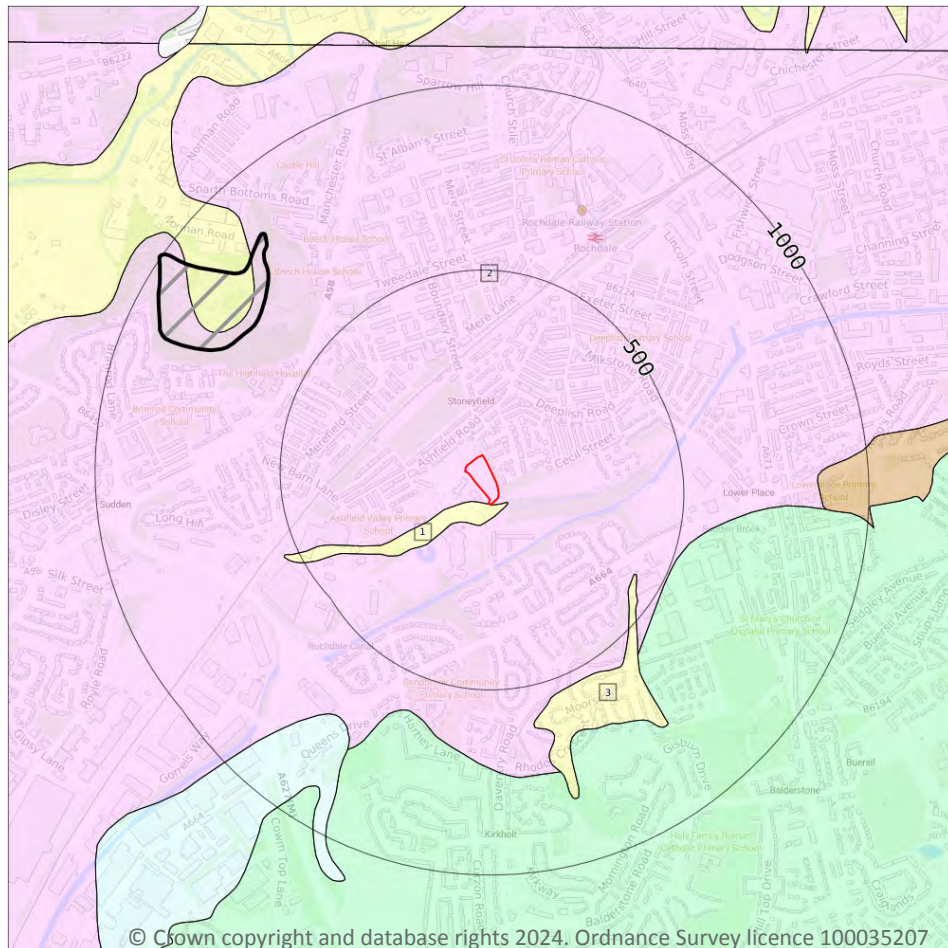
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

3

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 99](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
2	On site	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
3	422m SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Intergranular	High	Very Low
On site	Intergranular	Very High	High

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m**0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

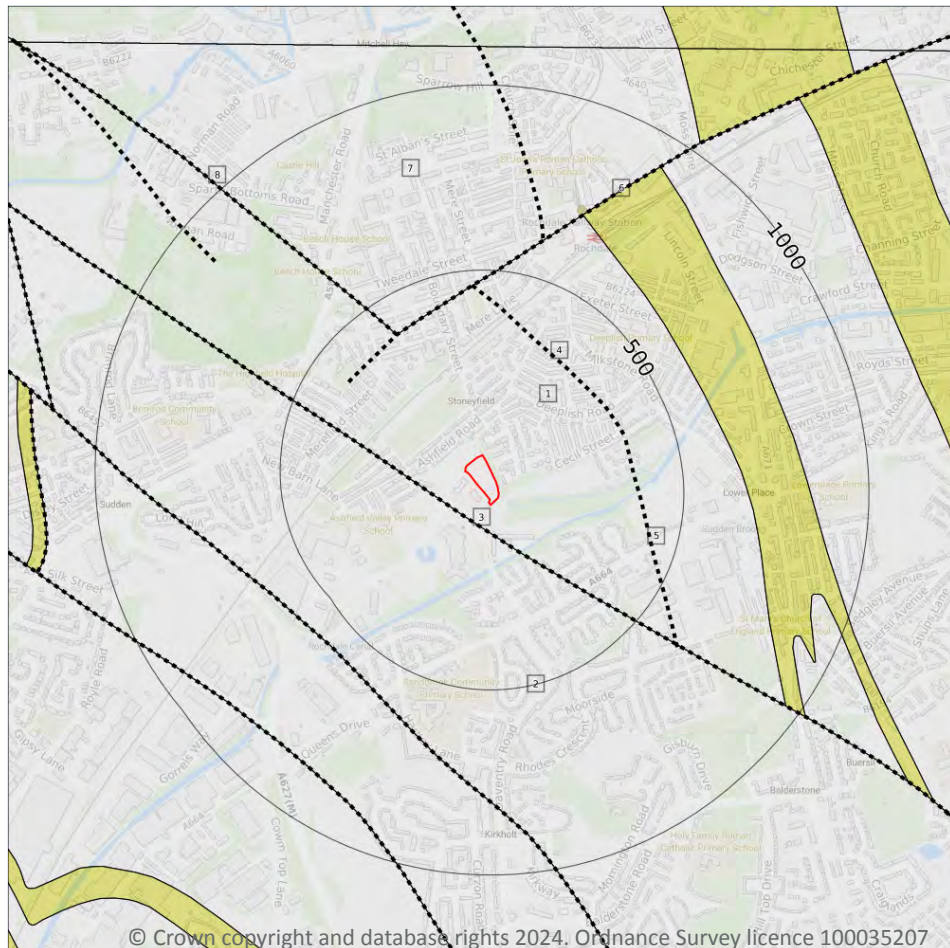
Records within 50m**0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

..... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

3

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 101](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
2	65m S	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
7	397m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	1
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	5
----------------------------	----------

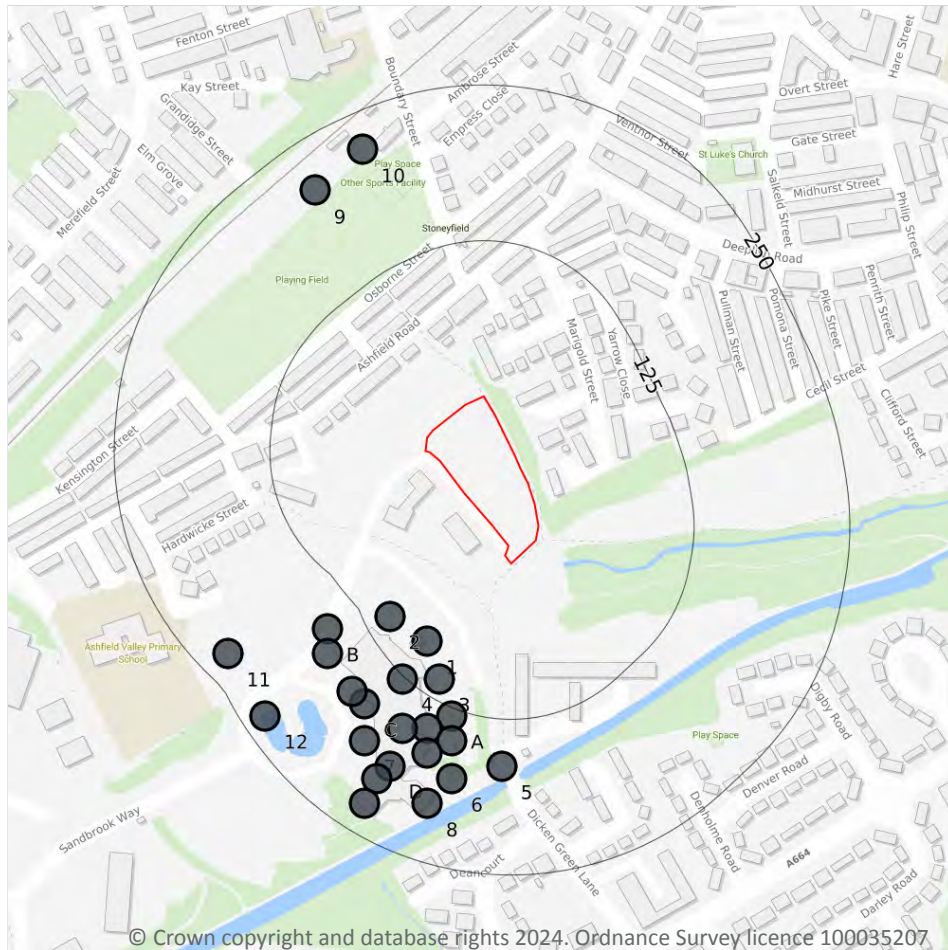
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 101](#) >

ID	Location	Category	Description
3	65m S	FAULT	Fault, inferred
4	327m NE	ROCK	Coal seam, inferred
5	366m E	ROCK	Coal seam, inferred
6	386m NW	FAULT	Fault, inferred
8	397m NW	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



- Site Outline**
- Search buffers in metres (m)**
- Confidential
 - 0 - 10m
 - 10 - 30m
 - 30m+
 - Unknown

16.1 BGS Boreholes

Records within 250m

24

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

Features are displayed on the Boreholes map on [page 103](#) >

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	92m S	389570 411860	ASHFIELD VALLEY ROCHDALE 10	-	Y	N/A
2	105m SW	389540 411880	ASHFIELD VALLEY ROCHDALE 12	-	Y	N/A
3	109m S	389580 411830	ASHFIELD VALLEY ROCHDALE 9	-	Y	N/A

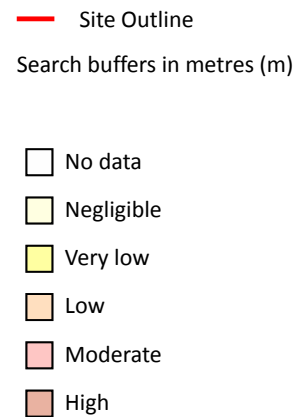
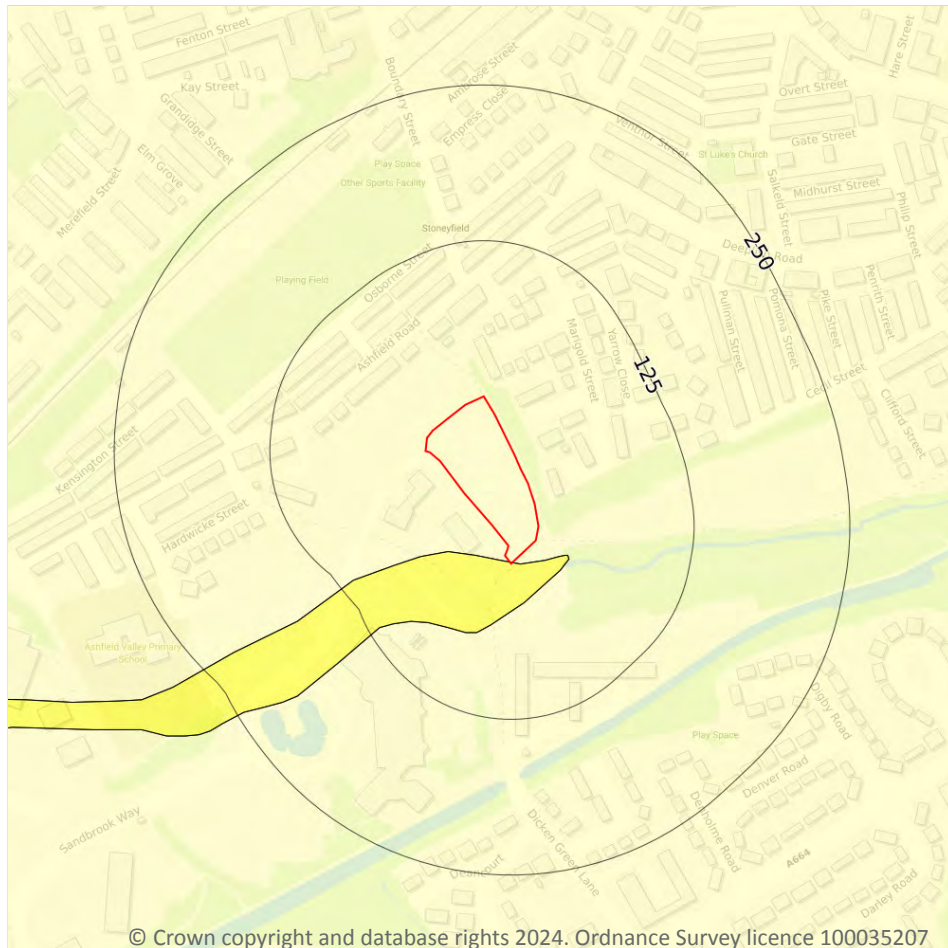


ID	Location	Grid reference	Name	Length	Confidential	Web link
4	127m SW	389550 411830	ASHFIELD VALLEY ROCHDALE 11	-	Y	N/A
A	131m S	389590 411800	ASHFIELD VALLEY ROCHDALE TP 37	-	Y	N/A
A	149m S	389570 411790	ASHFIELD VALLEY ROCHDALE 8	-	Y	N/A
A	150m S	389590 411780	ASHFIELD VALLEY ROCHDALE TP 35	-	Y	N/A
B	154m SW	389490 411870	ASHFIELD VALLEY ROCHDALE TP 38	-	Y	N/A
A	159m S	389550 411790	ASHFIELD VALLEY ROCHDALE TP 33	-	Y	N/A
5	163m S	389630 411760	ASHFIELD VALLEY ROCHDALE TP 36	-	Y	N/A
C	163m SW	389520 411810	ASHFIELD VALLEY ROCHDALE TP 32	-	Y	N/A
B	163m SW	389490 411850	ASHFIELD VALLEY ROCHDALE 13	-	Y	N/A
C	164m SW	389510 411820	ASHFIELD VALLEY ROCHDALE 1	-	Y	N/A
A	167m S	389570 411770	ASHFIELD VALLEY ROCHDALE 7	-	Y	N/A
6	179m S	389590 411750	ASHFIELD VALLEY ROCHDALE TP 34	-	Y	N/A
7	185m SW	389520 411780	ASHFIELD VALLEY ROCHDALE 4	-	Y	N/A
D	189m S	389540 411760	ASHFIELD VALLEY ROCHDALE 3	-	Y	N/A
D	203m S	389530 411750	ASHFIELD VALLEY ROCHDALE TP 31	-	Y	N/A
8	204m S	389570 411730	ASHFIELD VALLEY ROCHDALE 6	-	Y	N/A
9	210m NW	389480 412222	W CENTRAL DIST ROCHDALE 2	-	Y	N/A
10	221m N	389518 412255	W CENTRAL DIST ROCHDALE 3	-	Y	N/A
D	225m S	389520 411730	ASHFIELD VALLEY ROCHDALE 5	-	Y	N/A
11	227m SW	389410 411850	ASHFIELD VALLEY ROCHDALE 14	-	Y	N/A
12	232m SW	389440 411800	ASHFIELD VALLEY ROCHDALE 2	-	Y	N/A

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

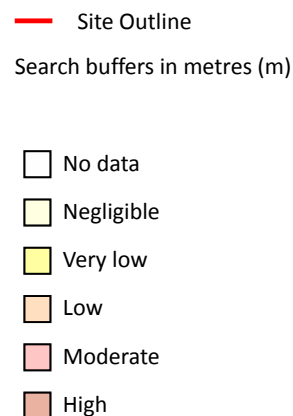
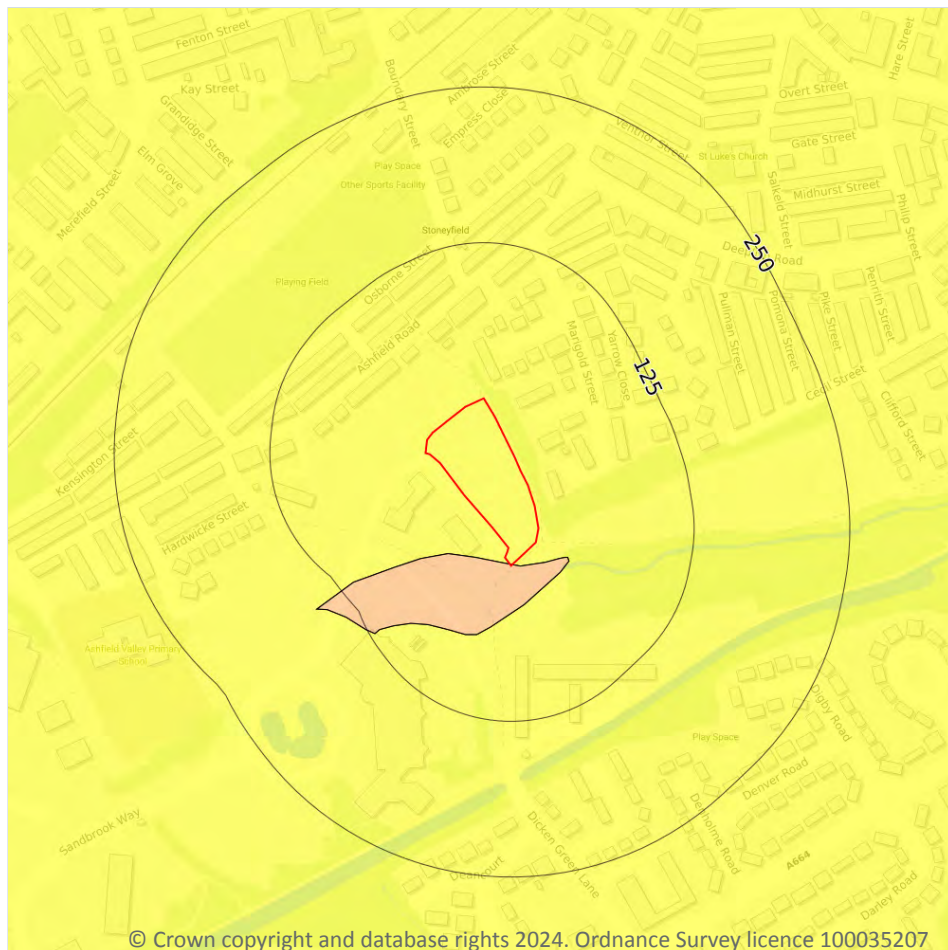
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 105 >](#)

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m

2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on [page 106 >](#)

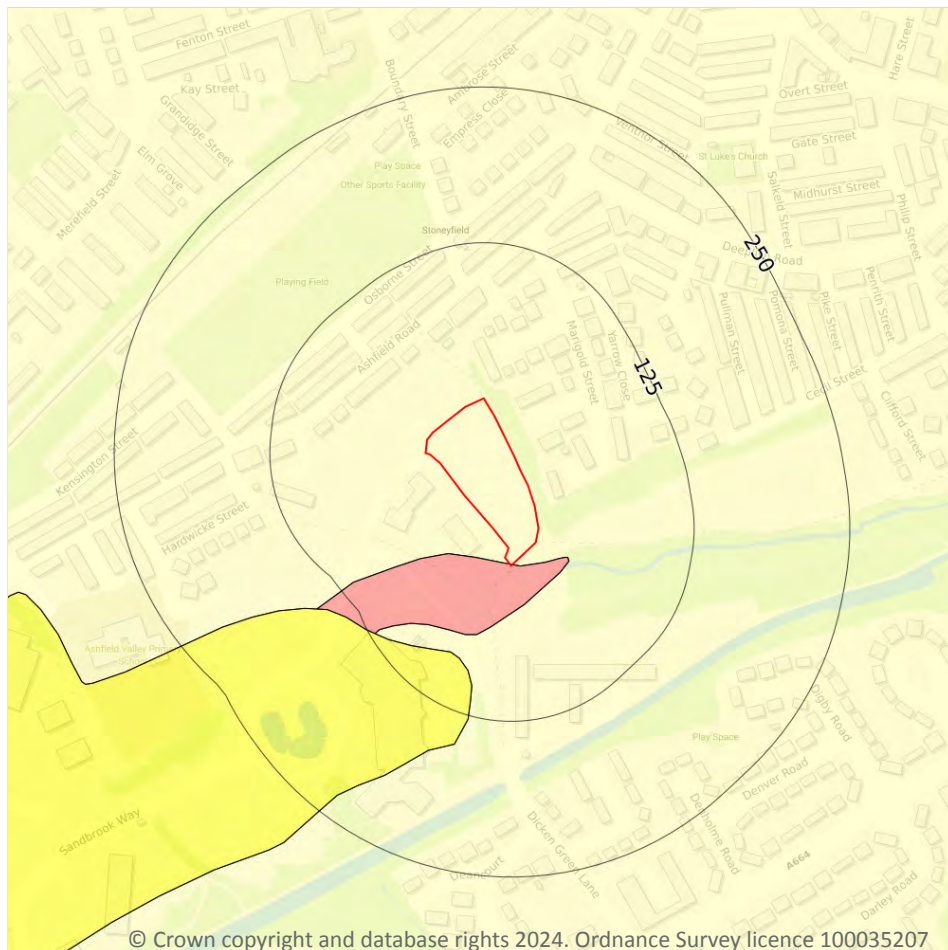
Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

Location	Hazard rating	Details
On site	Low	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

2

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 108](#) >

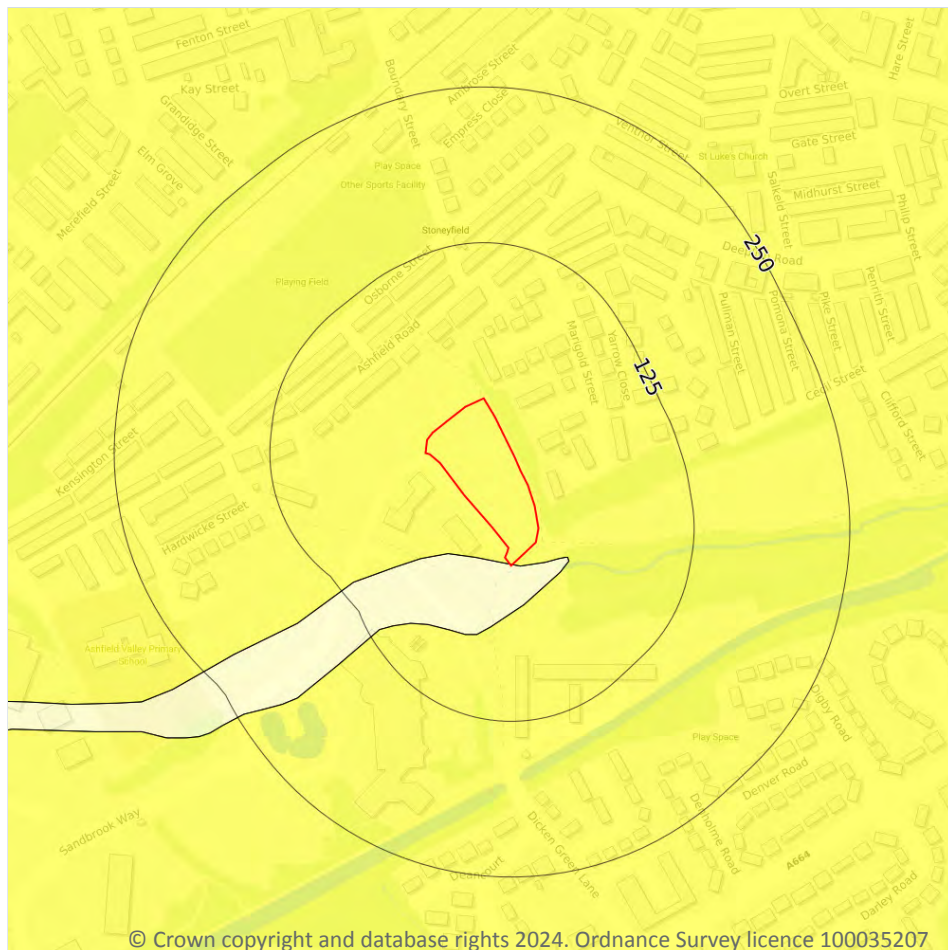
Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.
On site	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.



This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 Collapsible deposits

Records within 50m

2

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 110](#) >

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

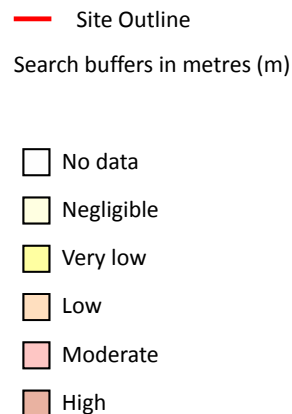
Features are displayed on the Natural ground subsidence - Landslides map on [page 111](#) >

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 112](#) >

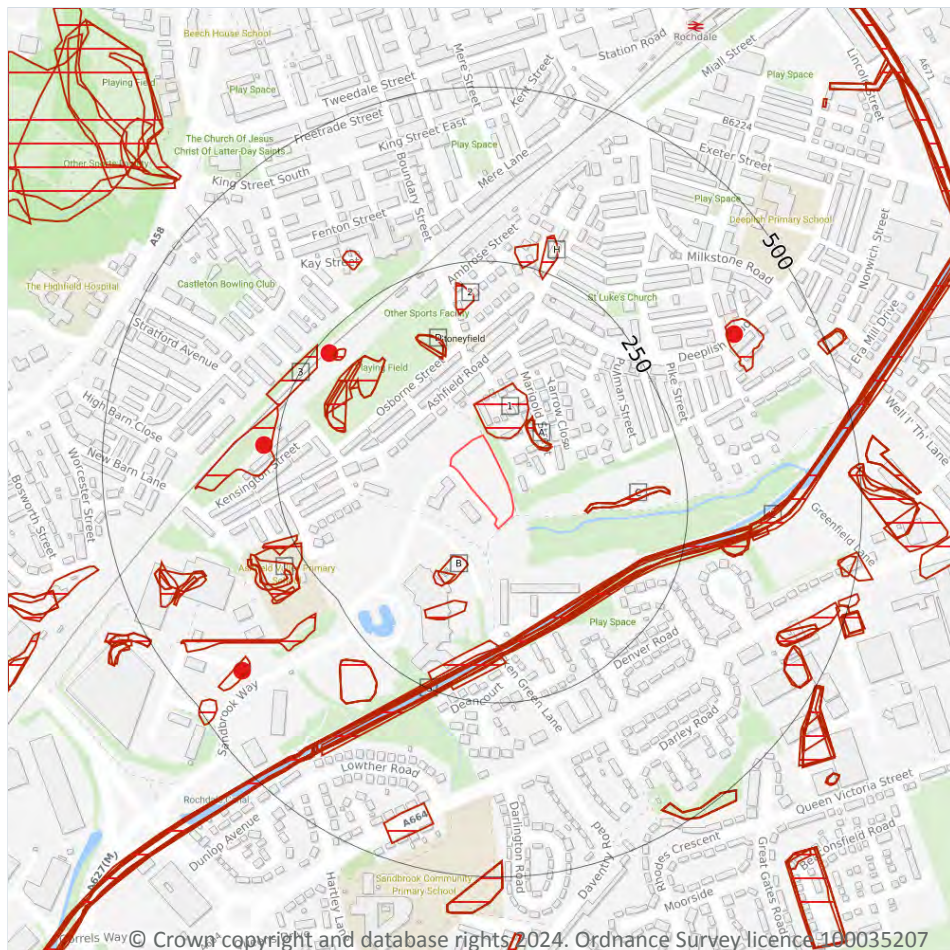
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



This data is sourced from the British Geological Survey.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining
- Non Coal Mining
 - Sporadic underground mining of restricted extent possible
 - Localised small scale underground mining possible
 - Small scale mining possible
 - Underground mining known or likely within or in close proximity
 - Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m

4

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining and ground workings map on [page 114](#) >

ID	Location	Details	Description
F	231m NW	Name: Nookfield Gravel Pit Address: Kirkholt, ROCHDALE, Lancashire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	269m W	Name: Castleton Hall Gravel Pit Address: Mitchell Hey, ROCHDALE, Lancashire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
N	385m NE	Name: Deeplish Hall Gravel Pit Address: ROCHDALE, Lancashire Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
P	418m SW	Name: Castleton Gales Sand Pit Address: Mitchell Hey, ROCHDALE, Lancashire Commodity: Sand Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	35
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Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on [page 114 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
1	8m N	Refuse Heap	1908	1:10560
A	58m NE	Refuse Heap	1949	1:10560
A	58m NE	Refuse Heap	1938	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
A	58m NE	Refuse Heap	1928	1:10560
B	66m S	Pond	1891	1:10560
B	90m S	Unspecified Pit	1949	1:10560
C	103m E	Unspecified Ground Workings	1987	1:10000
C	103m E	Unspecified Ground Workings	1975	1:10000
C	103m E	Unspecified Ground Workings	1949	1:10560
C	103m E	Unspecified Ground Workings	1968	1:10560
B	115m S	Unspecified Pit	1992	1:10000
D	124m N	Unspecified Pit	1949	1:10560
D	126m N	Unspecified Pit	1938	1:10560
D	126m N	Unspecified Pit	1928	1:10560
E	145m SE	Canal	1938	1:10560
F	147m NW	Pond	1938	1:10560
F	147m NW	Pond	1928	1:10560
G	148m SE	Disused Canal	1992	1:10000
G	148m SE	Disused Canal	1987	1:10000
G	148m SE	Disused Canal	1975	1:10000
G	148m SE	Canal	1949	1:10560
G	148m SE	Canal	1968	1:10560
E	154m SE	Canal	1851	1:10560
E	154m SE	Canal	1928	1:10560
E	154m SE	Canal	1908	1:10560
E	154m SE	Canal	1891	1:10560
F	157m W	Unspecified Ground Workings	1928	1:10560
F	158m W	Unspecified Pit	1949	1:10560
2	177m N	Unspecified Ground Workings	1949	1:10560
F	212m NW	Gravel Pit	1851	1:10560
3	233m NW	Cuttings	1851	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
H	240m N	Unspecified Pit	1968	1:10560
I	241m W	Unspecified Ground Workings	1968	1:10560
I	242m W	Unspecified Heap	1949	1:10560
H	246m N	Cuttings	1968	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m **0**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m **0**

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m **0**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m **0**

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).



This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m

0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m

0

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m

0

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.



18.11 BGS mine plans

Records within 500m**0**

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 Coal mining

Records on site**1**

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site**0**

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site**0**

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site**0**

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.



18.16 Clay mining

Records on site	0
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Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).



19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

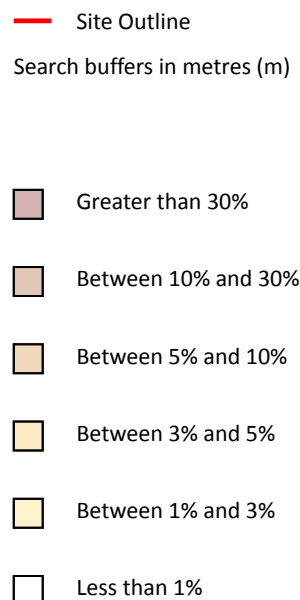
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 Radon



20.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on [page 123](#) >

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



This data is sourced from the British Geological Survey and UK Health Security Agency.



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

3

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	300 - 600 mg/kg	240 - 360 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)**
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

22.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.



This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m

21

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on [page 126 >](#)

Location	Land Use	Year of mapping	Mapping scale
On site	Railway Sidings	1892	-
196m NW	Railway Sidings	1928	10560
198m NW	Railway Sidings	1949	10560
198m NW	Railway Sidings	1968	10560
199m NW	Railway Sidings	1908	10560
207m NW	Railway Sidings	1957	2500
214m N	Railway Sidings	1938	10560
214m N	Railway Sidings	1891	10560
215m NW	Railway Sidings	1938	10560
215m NW	Railway Sidings	1928	10560
216m NW	Railway Sidings	1910	2500
216m NW	Railway Sidings	1930	2500
222m NW	Railway Sidings	1957	1250
233m W	Railway Sidings	1908	10560
237m W	Railway Sidings	1910	2500
237m W	Railway Sidings	1930	2500
238m NW	Railway Sidings	1973	1250



Location	Land Use	Year of mapping	Mapping scale
241m NW	Railway Sidings	1957	1250
242m NW	Railway Sidings	1957	2500
242m NW	Railway Sidings	1910	2500
243m NW	Railway Sidings	1930	2500

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0
----------------------------	----------

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m	0
----------------------------	----------

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	4
----------------------------	----------

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways. Features are displayed on the Railway infrastructure and projects map on [page 126 >](#)

Location	Name	Type
232m NW	Caldervale Line	rail
233m NW	Not given	Multi Track
234m NW	Not given	Multi Track
237m NW	Caldervale Line	rail

This data is sourced from Ordnance Survey and OpenStreetMap.



22.8 Crossrail 1

Records within 500m**0**

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

22.9 Crossrail 2

Records within 500m**0**

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m**0**

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference> ↗.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: www.groundsure.com/terms-and-conditions-april-2023/ ↗.



APPENDIX M: COAL MINE REPORT



The Coal
Authority

Consultants Coal Mining Report

Sandbrook Park
Sandbrook Park, Sandbrook Way
Rochdale
OL11 1RY

Date of enquiry:	24 July 2019
Date enquiry received:	24 July 2019
Issue date:	24 July 2019

Our reference:	51002152148001
Your reference:	13586/32761/nd



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

E3P

Enquiry address

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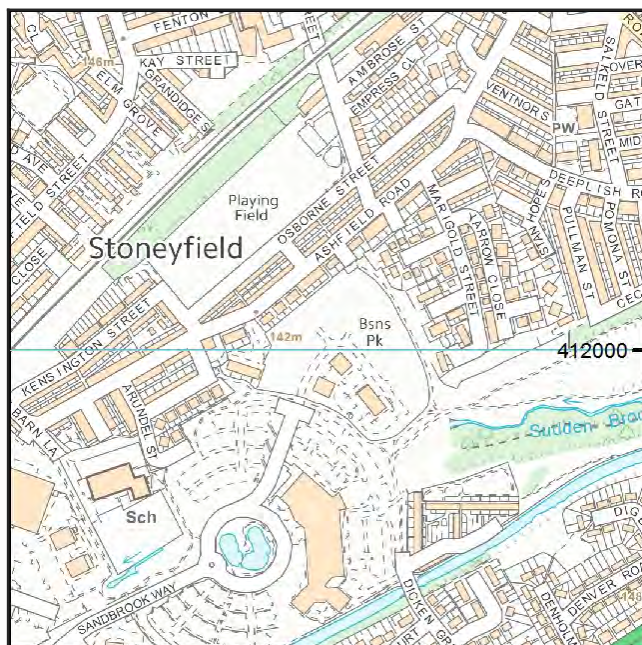
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

None available.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

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 31 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.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

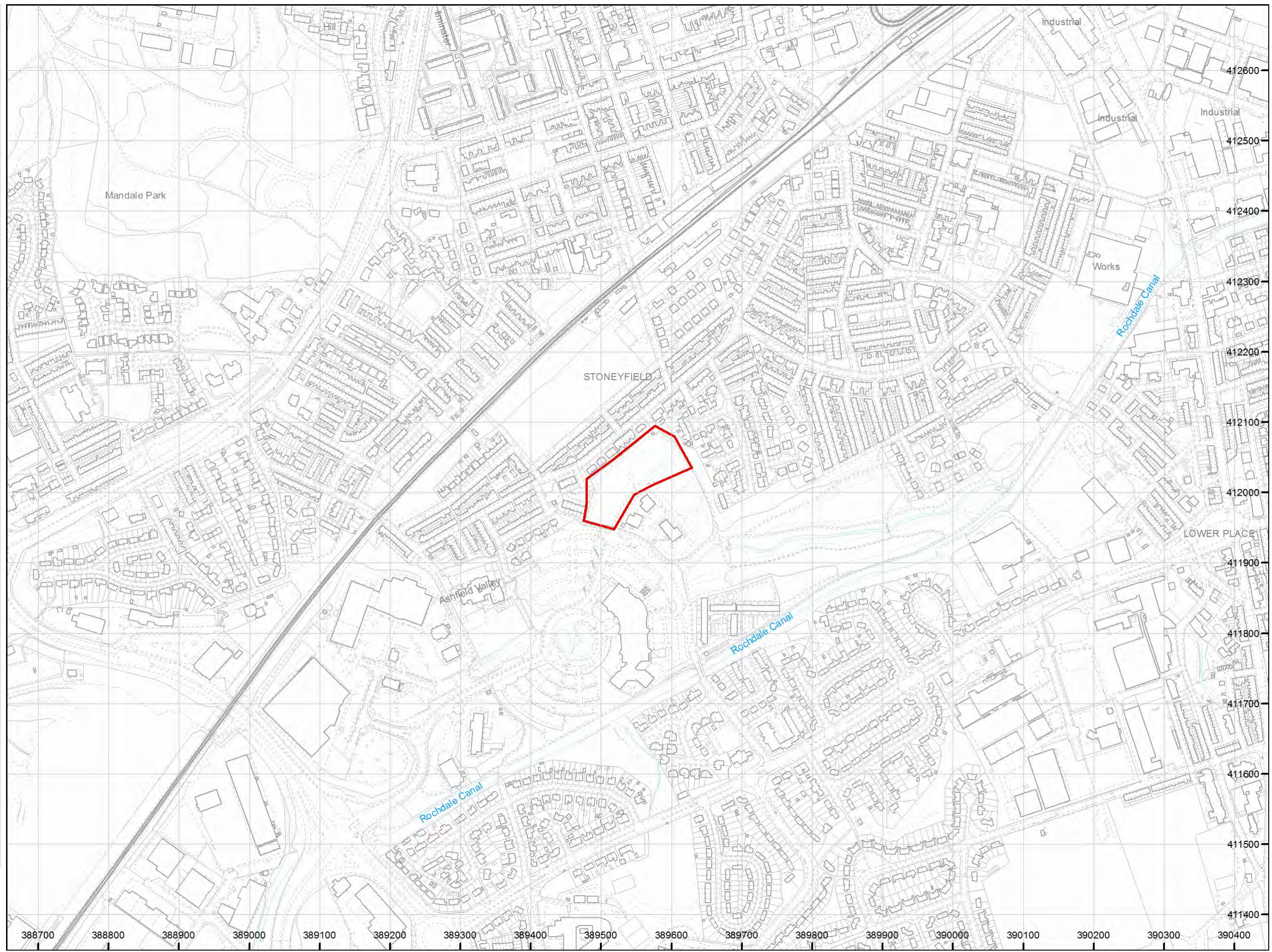
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

Approximate position of the enquiry boundary shown 

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APPENDIX N: CURRENT GUIDANCE & LEGISLATIONS

CURRENT CONTAMINATED LAND LEGISLATION / GUIDANCE & ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY

LEGISLATION OVERVIEW

This report includes hazard identification and risk assessment in line with the risk-based methods referred to in relevant UK legislation and guidance. Government environmental policy is based upon a "suitable for use approach". When considering the current use of land, Part IIA of the Environment Protection Act 1990 (EPA 1990) provides the regulatory regime, which was introduced by Section 57 of the Environment Act 1995, which came into force in England on 1 April 2000. The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment given the current use and circumstances of the land.

Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

"any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that:

- (a) Significant harm is being caused or there is a significant possibility of such harm being caused;
- or
- (b) Pollution of controlled waters is being, or is likely to be, caused."

Part IIA provides a statutory definition of the pollution of controlled waters under Section 78A(9) as:

"the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter".

In order to assist in establishing if there is a "significant possibility of significant harm" there must be a "significant pollutant linkage" for potential harm to exist. That means there must be a source(s) of contamination, sensitive receptors present and a connection or pathway between the two. This combination of source-pathway-receptor is termed a "pollutant linkage or SPR linkage."

Part IIA of The Environmental Protection Act 1990 is supported by a substantial quantity of guidance and other Regulations, especially DEFRA Circular 01/2006 Contaminated Land (this replaces DETR Circular 02/2000). Part IIA defines the duties of Local Authorities in dealing with it. With the exception of situations of very high pollution risk, Part IIA places contaminated land responsibility on the planning and redevelopment process. In situations where there is very high pollution risk direct action from the Local Authority is usually necessary. Planning Policy Statement 23 (PPS23) provides guidance on the planning process and requires that sites which have been developed shall not be capable of being determined "contaminated land" under Part IIA.

The criteria for assessing levels of pollutants and hence determining whether a site represents a hazard are based on a range of techniques, models and guidance. Within this context it is relevant to note that Government objectives are:

- (a) to identify and remove unacceptable risks to human health and the environment;
- (b) to seek to bring damaged land back into beneficial use;
- (c) to seek to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These three objectives underlie the "suitable for use" approach to remediation of contaminated land. The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore should be assessed on a site-by-site basis.

The "suitable for use" approach then consists of three elements:

- (a) ensuring that land is suitable for its current use - in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise; the contaminated land regime provides the regulatory mechanisms to achieve this;
- (b) ensuring that land is made suitable for any new use, as planning permission is given for that new use - in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risks to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and
- (c) limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought - in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby running the risk of distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

The mere presence of pollutants does not therefore necessarily warrant action, and consideration must be given to the scale of risk involved for the current and proposed end use of the site.

RISK ASSESSMENT METHODOLOGY

Current practice recommends that the determination of potential liabilities that could arise from land contamination be carried out using the process of risk assessment, whereby "risk" is defined as:

- "(a) The probability, or frequency, or occurrence of a defined hazard; and
- (b) The magnitude (including the seriousness) of the consequences."

The UK's approach to the assessment of environmental risk is set out in by the Department of the Environment (2000) publication "A Guide to Risk Assessment and Risk Management for Environmental Protection." This established an iterative, systematic staged process which comprises:

- (a) Hazard identification
- (b) Hazard assessment
- (c) Risk estimation
- (d) Risk evaluation
- (e) Risk Assessment

At each stage during the investigation process the above steps are repeated as more detailed information becomes available for the site.

Land contamination risk management' (LCRM) (2020)), a document published by the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) outlines a tiered approach to the assessment of risks posed by contaminated land, as summarised hereunder:

Tier 1: Preliminary Risk Assessment

A Preliminary Risk Assessment is usually undertaken as part of a desk study, outlines potential risks posed by potential contamination to all receptors by defining plausible "pollution linkages" and developing a preliminary conceptual model (PCM). The purpose of this model is to define all possible complete pollution linkages, where the requisite source – pathway – target elements are present, and these elements being defined as:

- a contaminant (source) is a hazardous substance or agent, present at levels that have the potential to cause harm or damage a receptor
- a pathway is the means by or through which a contaminant comes into contact with, or otherwise affects, the receptor
- a receptor (target) is an entity (human being, aquatic environment, flora and fauna etc) that is vulnerable to the adverse effects of the contaminant

This relationship is termed a "pollution linkage". It should be recognised that for a health or environmental risk to exist, all three elements of the relationship or linkage must be present, i.e.

- if there is no contaminant, or contaminant present at levels below those considered to be harmful or damaging to a receptor, then there can be no adverse effect on a receptor
- if there is no receptor present that can be adversely affected by a contaminant, no harm or damage can arise
- even where both a contaminant and a receptor are present, no harm or damage will occur if there is no pathway by or through which a linkage between the two can be established

The absence of one or more of each component (source, pathway, receptor) would prevent a pollutant linkage being established and there would be no significant environmental risk.

The PCM is subject to continual refinement as additional data becomes available. As part of a Phase I Investigation (Desk Study and site walk over) a PCM is formed. Based on the PCM, potential pollutant linkages can be assessed. If the PCM and hazard assessment indicate that a pollution linkage is not of significance then no further assessment or action is required due to this linkage. For each significant and possible linkage a risk assessment is carried out. The linkages which potentially pose significant risks may require a variety of responses ranging from immediate remedial action or risk management or, more commonly, further investigation and risk assessment. This next stage is usually termed a Phase II Main Site Investigation and should provide additional data to allow refinement of the PCM and assess the level of risk from each pollutant linkage. Risk assessment will usually include Tier 2 Generic Quantitative Risk Assessment and / or, if necessary, a Tier 3 Detailed Quantitative Risk Assessment.

Tier 2: Generic Quantitative Risk Assessment (GQRA)

GQRA requires an intrusive investigation in order to characterise the site assisting in the re-assessment of the source-pathway receptor linkage. The conceptual model should be refined accordingly.

Upon completion of an intrusive investigation it must be decided whether Generic Assessment Criteria (GAC) are suitable for assessing the risk posed by observed contamination at the site. If GAC are deemed unacceptable for risk assessment purposes or cannot be developed, a Tier 3 Detailed Quantitative Risk Assessment (DQRA) is required.

If GQRA reveals that unacceptable risks are not present then no further action is required. If GQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope nature of further risk assessment must be decided – it is possible that a Tier 3 DQRA will be undertaken in this scenario.

Where the Environment Agency have published an SGV for a contaminant, this will be used in the GQRA. For contaminants where an SGV has not been published and an S4UL has been published by LQM/CIEH S4UL's, then this S4UL will be used.

Where an SGV or an S4UL is not available, and a DEFRA C4SL is available, then this C4SL will be used. In house derived GAC's will only be used for contaminants where there is no SGV or LQM S4UL or DEFRA C4SL.

Tier 3: Detailed Quantitative Risk Assessment (DQRA)

DQRA is used when pollutant linkages require further assessment. DQRA is often undertaken for pollutant linkages where GAC are unavailable or inappropriate for or more conservative than the actual circumstances of the site. Site specific data is used to create Site Specific Assessment Criteria (SSAC) and enable a more accurate assessment of the risks. Further investigation may or may not be required to formulate SSAC depending on the site specific conditions and information already obtained.

If DQRA reveals that unacceptable risks are not present then no further action is required. If DQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope and nature of further risk assessment must be decided at this point.

NOTE: A Tier 1 Preliminary Risk Assessment is undertaken as part of a Desk Study Report and a Preliminary Conceptual Model is developed for all pollutant linkages. However, the methodologies for assessing the risks to human health, risks to controlled waters and risk posed by ground gas using quantitative techniques vary considerably, therefore GQRA and DQRA for human health, controlled waters and ground gas must be undertaken separately. The risk assessment methodologies where quantitative assessment is used for risks to human health, risks to controlled waters and risks posed by ground gas, if relevant, are described hereunder.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO HUMAN HEALTH

Background

In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the EA published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. These reports (CLR7-10) together with associated "SGV" documents have since been withdrawn (August 2008) and the following documents have been published as revised guidance to the CLEA assessment:

- Environment Agency : 2008: Updated Technical Background to the CLEA model Science Report SC050021/SR3
- Environment Agency : 2008: Human Health Toxicological Assessment of Contaminants in Soil SC050021/SR2

Additional guidance on statistical assessment replacing CLR 7 is provided in:

- CL:AIRE :2008 Guidance on Comparing Data With a Critical Concentration

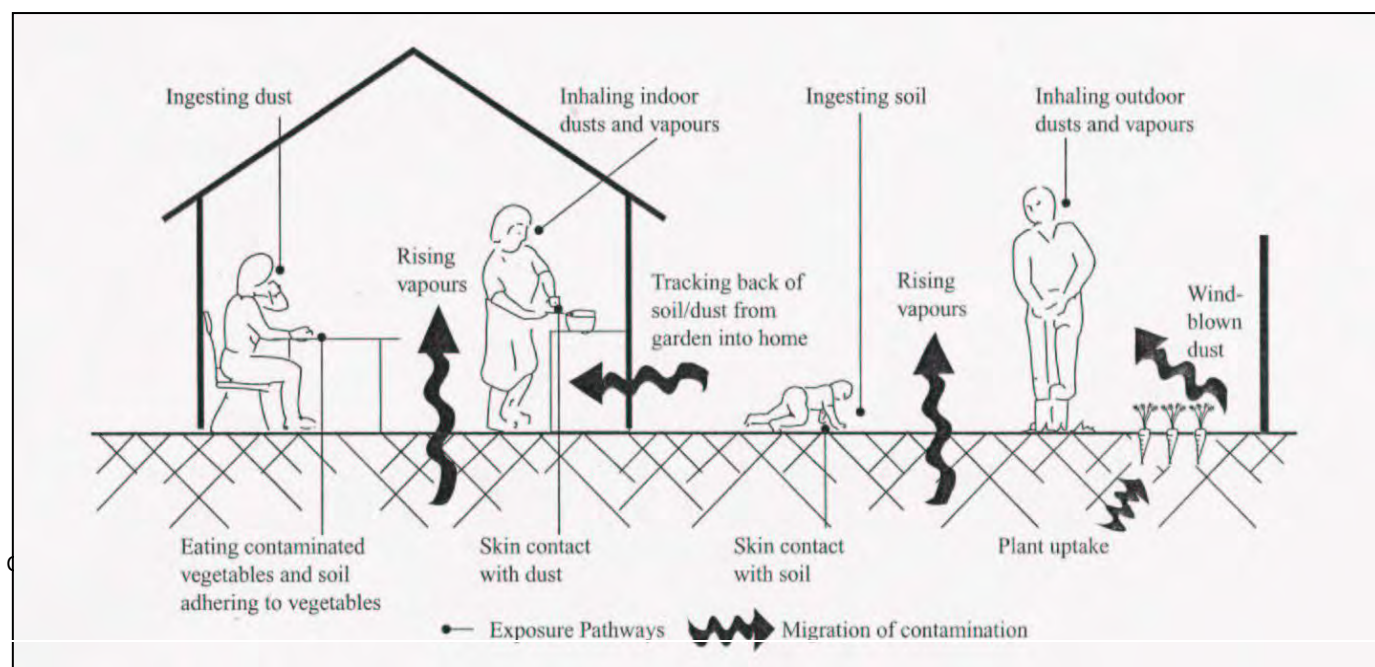
Other guidance/software used in spatial / statistical assessment is provided in:

- USEPA 2006: Data Quality Assessment: Statistical Methods for Practitioners
- Spatial Analysis and Decision Assistance (SADA) – The University of Tennessee

A different approach to the statistical appraisal of data is required depending on whether the assessment of risk is to assess whether land is Contaminated Land in accordance with regulations, or whether the assessment is to determine whether the site is suitable for new development in accordance with Planning guidance. This is discussed further in CL:AIRE :2008 "Guidance on Comparing Data With a Critical Concentration".

A program for the derivation of GAC's based on the above guidance is provided by the Environment Agency and is entitled "CLEA Software Version 1.06".

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set 'default' exposure pathways. Ten human exposure pathways are covered in the CLEA model as presented below:



(
Ingestion

- ingestion of outdoor soil
- ingestion of indoor dust
- ingestion of home grown produce
- ingestion of soil attached to home grown produce

Dermal Contact

- dermal contact with outdoor soil
- dermal contact with indoor dust

Inhalation

- inhalation of outdoor dust
- inhalation of indoor dust
- inhalation of outdoor soil vapour
- inhalation of indoor soil vapour

It should be noted that there are other potential exposure pathways on some sites not included in the CLEA model e.g. certain organic compounds can pass through plastic water pipes into drinking water supply.

Where contaminated water is present at a depth less than 2mbgl and there is a potential risk of inhalation of vapours (only when volatile compounds are present) the risk from inhalation of vapours from soil water will be assessed using a UK compliant version of BP Risc v4.02.

The presence and/or significance of each of the above exposure pathways are dependent on the type of land use being considered and the nature of the contaminant under scrutiny. Accordingly, the CLEA model considers for principle 'default' land use types and makes a series of 'default' assumptions with regard to human exposure frequency, duration and critical human target groups for each land use considered:

- residential
- allotments
- commercial / industrial land use

The above land use categories defined in the CLEA are detailed below:

Residential: This generic scenario assumes a typical residential property consisting of a two-storey house built on a ground-bearing slab with a private garden consisting of lawn, flowerbeds, and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden area.

Allotments: This generic scenario assumes a plot of open space (about 250 m2), commonly made available by the local authority to tenants to grow fruit and vegetables for their own consumption. There are usually several plots to a site and the overall site area may cover more than a hectare. The tenants are assumed to be parents or grandparents and that young children make occasional accompanied visits to the plot.

Commercial/Industrial: There are many different kinds of workplace and work-related activities. This generic scenario assumes a typical commercial or light industrial property consisting of a threestorey building at which employees spend most time indoors and are involved in officebased or relatively light physical work.

Human Health Risk Assessment Methodolgy

Assessment of risk for the protection of human health is undertaken using the methodology as outlined previously, and summarised hereunder:

- Tier 1 Preliminary Risk Assessment
- Tier 2 Generic Quantitative Risk Assessment
- Tier 3 Detailed Quantitative Risk Assessment

The Tier 1 Preliminary Risk Assessment is undertaken as part of the desk study report and includes the development of a Preliminary Conceptual Model. Tier 2 and Tier 3 Quantitative Risk Assessments are undertaken in order to develop and refine the Preliminary Conceptual Model aiding a more detailed assessment of the risk posed by contaminants revealed by site investigation and soil / soil water chemical analyses.

The methods used by *CC GEOTECHNICAL LTD* to derive assessment criteria, to statistically analyse chemical data and to compare chemical data to the derived assessment criteria are discussed herunder.

Derivation of Generic Assessment Criteria (GAC) and Site Specific Assessment Criteria (SSAC)

GAC's are derived on the basis of the proposed land use and the associated applicable exposure pathways. It should be noted that there are difficulties in establishing soil concentrations of contaminants beyond which risks from exposure to these contaminants would be 'unacceptable' and the GAC value does not necessarily equate to the level for "significant possibility of significant harm" as defined in Part IIA of The Environmental Protection Act (1990) to determine whether land is "contaminated." This ultimately requires detailed 'toxicological' information of the health effects of individual contaminants and also a scientific judgement on what constitutes an 'unacceptable' risk. The primary purpose of the CLEA derived GAC's are as 'minimal risk thresholds' for the assessment of human health risks in relation to land use.

Minimal risk thresholds calculated using generic input parameters for each of the above land uses are termed Generic Assessment Criteria (GAC) and are used for Generic Quantitative Risk Assessment (GQRA). However, further assessment may be required taking into consideration site specific factors such as the way the land is used, the soil type, the building

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characteristics and the exact nature of the receptor, to determine whether there is a significant possibility of risk to human health to site users. Such an assessment is known as a Detailed Quantitative Risk Assessment (DQRA) and the resultant threshold concentrations are known as Site Specific Assessment Criteria (SSAC). Such assessments should be conducted with the agreement of the local authority (or the Environment Agency) since it is the authority that determines whether land is Contaminated Land or whether Planning Permission for a new development may be granted.

For the purposes of this report, assessment criteria have been derived in accordance with current guidance based on the conceptual model for the proposed land use using the CLEA v1.06 software. These criteria are not intended to indicate whether the site may be contaminated land nor do they replace any published soil guideline values. However, the values are intended to provide guidance for the local authority on whether the site may be considered uncontaminated. If, based on the site's proposed future use, the site would be considered by the local authority to be uncontaminated and therefore, on the basis of soil concentrations, fit for purpose, then no further risk assessment based on soil concentrations and the risk to human health would be necessary. However, should these criteria be exceeded or the conceptual site model vary from the model used in the risk assessment to derive these values then the risk assessment should be updated accordingly.

For contaminants routinely analysed where inhalation is a significant pathway (naphthalene, phenanthrene, Aromatic EC5-EC7, Aromatic EC7-EC8, Aromatic EC8-EC10, Aromatic EC10-EC12, Aromatic EC12-EC16, Aliphatic EC5-EC6, Aliphatic EC8-EC10, Aliphatic EC10-EC12, Aliphatic EC12-EC16), plots of the GAC as a function of Soil Organic Matter (SOM) are used to determine if they pose a potential risk to human health, which are presented hereunder. Where there is an exceedance further assessment may be undertaken.

Statistical Assessment of Soil Contamination Data & Comparison of Contamination Data to Threshold Values

In any site investigation only a small fraction of the soil on the site is analysed. Therefore the mean derived from the contamination data for a contaminant may not be the same as the true mean for the contaminant distribution on the site. To improve the reliability of any assessment a statistical analysis is undertaken in line with the CL:AIRE document "Guidance on Comparing Soil Contamination Data with a Critical Concentration".

Statistical assessment of soil data is undertaken using programs based on the guidance in the CL:AIRE document or the USEPA software ProUCL v4.0.

Where the number of results in a dataset is less than four, a statistical assessment is not undertaken, and the assessment is performed by comparison of the maximum value(s) with a Health Criteria Value (HCV), such as Generic Assessment Criteria value(s).

For the Planning situation, the regulator needs to check whether the concentration of contaminants is low compared to the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is lower than the HCV.

For the Part IIA scenario the regulator needs to determine whether the concentration of contaminants is greater than the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is higher than the HCV. However, the regulator may proceed with determination if there is just a 51% probability, "on the balance of probabilities".

The Outlier Test used in the statistical assessment may not be able to identify separate populations if numerous populations are present. In order to ensure that this is not the case a spatial assessment of the data will be undertaken using SADA.

If the screening levels are exceeded then more sophisticated quantitative risk assessment or remedial action may be undertaken. The benefits of undertaking a quantitative risk assessment must be weighed against the likelihood that it will bring about cost savings in the proposed remediation.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO CONTROLLED WATER

Definition of Controlled Waters

The term 'controlled waters' is defined in Section 104 of the Water Resources Act 1991 as:

"Territorial Waters...which extend seawards for three miles..., coastal waters..., inland freshwaters, waters in any relevant lake or pond or of so much of any relevant river or watercourse as is above the freshwater limit, and ground waters, that is to say, any waters contained in underground strata."

Note that the definition of groundwater under the Water Resources Act 1991 includes all water within underground strata (including soil / pore water in the unsaturated zone). The definition of groundwater under the Groundwater Directive however is limited to water in the saturated zone. For the purposes of Part IIA of the Environmental Protection Act 1990, the Environment Agency recommends that the groundwater within the saturated zone only is considered as the receptor (rather than soil / pore water).

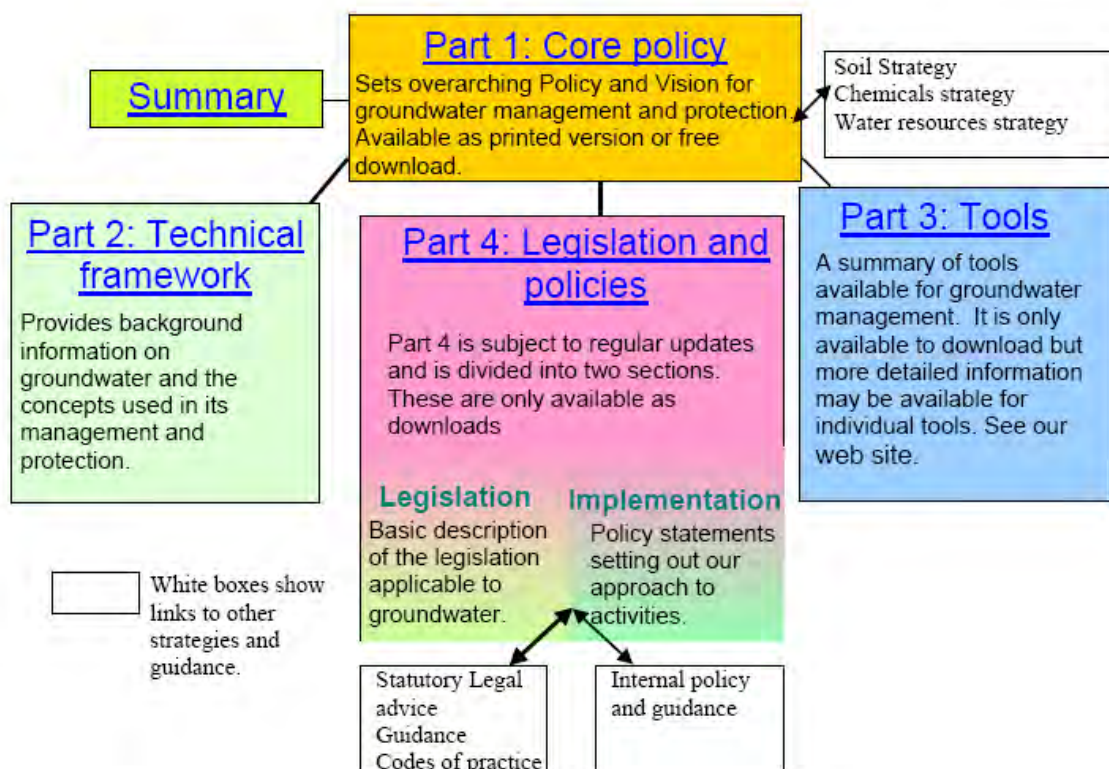
Environment Agency Guidance

Legislation and guidance surrounding the protection of controlled waters in the UK is abundant and can be complex. The Environment Agency's overall position on groundwater is *"To protect and manage groundwater resources for present and future generation in ways that are appropriate for the risks that we identify"* (Groundwater Protection : Policy and Practice GP3, 2006). In brief, the core objectives of the existing legislation serve to enforce this position.

In 1992, the National Rivers Authority published their Policy and Practice for the Protection of Groundwater (PPPG), this document was influential as it provided a focus for key developments such as Source Protection Zones (SPZs) and

Groundwater Vulnerability Maps. The Policy was then revised in 1998, since which there have been substantial changes in legislation, driven by Europe. Key European Directives relating to groundwater include the Groundwater Directive (80/68/EEC) and the Water Framework Directive (2000/60/EC). Aspects of these directives are controlled by primary UK legislation such as the Water Resources Act 1991. Further to legislative changes, gaps identified in the 1998 PPPG required addressing. These changes are reflected in the forthcoming Environment Agency Policy document entitled *Groundwater Protection : Policy and Practice (GP3)*, a draft version of which was available for public consultation (Parts 1 to 3) ending July 2006 with Part 4 issued in March 2008. Part 4 includes a section on key groundwater legislation and the Environment Agency's interpretation of it.

The following gives a breakdown of the structure of the document (taken from the Environment Agency GP3 draft consultation document, 2006)



Controlled Water Risk Assessment Methodology

The risk posed to controlled water is assessed by CC GEOTECHNICAL in accordance with current guidance as outlined hereunder.

In order for a developer of a potentially contaminated site to fulfil their obligations under the legislation, a site assessment would be required to be undertaken in order to identify any potential risks to controlled waters and to derive suitable clean-up criteria if necessary to ensure the protection of controlled waters. The general approach for Groundwater Protection is detailed further in Part 3 of GP3.

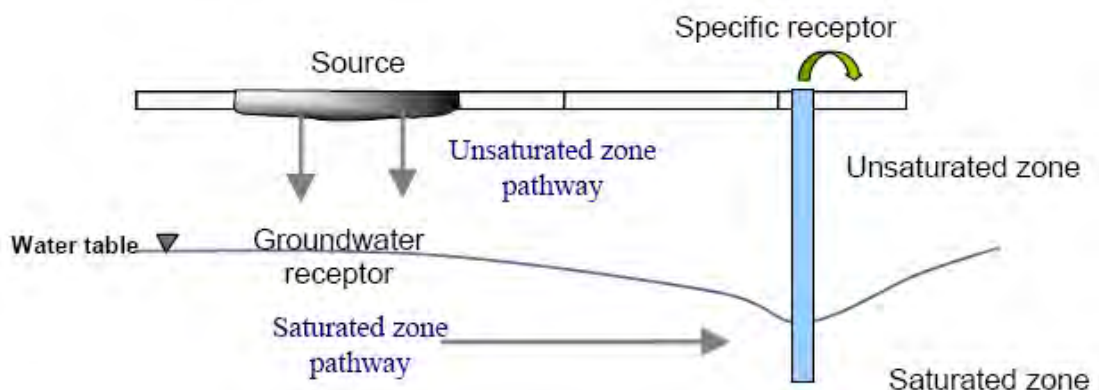
When assessing groundwater impact the Environment Agency advocate the application of their framework methodology "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" Environment Agency (2006). The methodology has four levels of assessment as described below:

- Level 1 considers whether contaminant concentrations in "pore water" in contaminated soil are sufficient to impact on the receptor, ignoring dilution, dispersion and attenuation along the pathway. The "pore water" concentration is determined from:
 - i) measured "pore water" concentrations or perched water quality
 - ii) soil leaching tests
 - iii) theoretical calculations based on soil/water partitioning equations
- Level 2 considers dilution by the receiving groundwater or surface water body and whether this is sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as the target concentration multiplied by a dilution factor (DF).
- Levels 3 and 4 consider whether natural attenuation (including dispersion, retardation and degradation) of the contaminant as it moves through the unsaturated and saturated zones to the receptor are sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as target concentration multiplied by a dilution factor (DF) and attenuation factor (AF). In Level 3 simple analytical models are used to calculate the significance of attenuation. The Environment Agency has released a "Remedial targets worksheet v3.1" to carry out basic calculations using a conservative approach up to Level 3 using basic principles assuming a simple migration of contaminants from the

source zone into the aquifer receptor. Level 4 assessment uses more sophisticated numerical models, and allows for the introduction of additional geological horizons and is used mainly to determine whether soil contaminants will reach their target within a specified timeframe. Use of such software should only be used once agreement has been obtained from the Environment Agency.

Three main stages apply to any risk assessment of controlled waters, these are:

1. Risk Screening (Tier 1 Preliminary Risk Assessment): The understanding of the Conceptual Site Model (CSM) is the key to assessing any site. Using a robust CSM, potential pathways or receptors may be screened out from any further assessment at an early stage. For example if the pathway through the unsaturated zone is blocked by the presence of a significant thickness of low permeability clay. A greater understanding of the CSM is achieved with each tier of risk assessment. An example of a basic CSM is given below (taken from the Environment Agency GP3 draft consultation document, 2006):



2. Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Level 1): When undertaking the Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Tier 1), comparison of chemical analytical results is made with screening criteria. Published values of screening criteria with which chemical test results can be compared are published in the following guidance:

- Water Supply (Water Quality) Regulations 2000
- The Private Water Supplies Regulations 1991
- Environmental Quality Standards for surface waters based on The EC Dangerous Substances Directive (76/464/EEC and Daughter Directives)
- The Surface Waters (Abstraction for Drinking Water Classification) Regulations 1996
- World Health Organisation Drinking Water Standards 2004

Should the Level 1 assessment indicate threshold levels to be exceeded, then there are three alternative ways in which to proceed:

- To devise suitable remedial solutions
- To carry out more investigation, sampling and analysis
- To conduct a site specific Detailed Quantitative Risk Assessment (DQRA) to determine if the materials are suitable for their proposed use, or devise site specific clean-up level

3. Detailed Quantitative Risk Assessment (EA Remedial Targets Methodology Levels 2 to 4): The decision to carry out a DQRA will be dependant on the extent and implications of the initial qualitative and generic assessment. The scope of any such assessment will be accurately defined by the outcomes of the previous levels of assessment. The conceptual model will be sufficiently refined by this stage that only certain contaminants of concern, certain pathways and certain receptors will require further assessment, the remainder having been screened out.

Additional site specific data is normally required for this stage of assessment, as explained above, more processes that are capable of affecting contaminant concentrations are considered (such as dilution and attenuation).

Remediation criteria, if derived, will therefore be specific to each site and will be based on a detailed assessment of the potential impact at the identified receptor or *compliance point*. A greater level of confidence can be placed on the predicted impact on the compliance point following a DQRA.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED BY GROUND GAS

Background

Origin of Ground and Landfill Gases

When carrying out a ground gas risk assessment, the origin or source of the gases is important as potential risks will vary depending on the source. This Appendix relates to the risk of the two main ground gases of concern; methane and carbon dioxide, and does not apply to other ground gases (e.g. radon or vapours from hydrocarbon spills). Methane and carbon dioxide are major constituents of landfill gas but can also occur from a variety of anthropogenic and natural sources, as summarised in Table 5 below:

Gas	Source	Comments
Landfill Gas	Anaerobic decomposition of degradable waste within landfill sites. Typically 60% methane and 40% carbon dioxide during methanogenic phase.	Composition varies over time, particularly in early stages. Contains a range of minor constituents (particularly carbon monoxide and hydrogen sulphide).
Landfill Associated Gases	- Anaerobic degradation of leachate external to the site; - Degassing of dissolved gases in groundwater; - Evolution of gases following interaction between leachate and groundwater	Can result in secondary (external) production of methane or carbon dioxide.
Made Ground	Anaerobic degradation of organic components	Very variable depending on source
Sewer Gas, Cess Pits	Anaerobic degradation of organic components of sewage producing methane and carbon dioxide.	Often characterised by hydrogen sulphide odour.
Mains Gas	Leakage from underground pipework or storage tanks. Mainly methane but often contains higher alkanes.	An odouriser is added to permit detection of leaks. Typically 90% CH ₄ , but 1 to 27% C ₂ -C ₄ alkanes, May also contain other trace gases e.g. CO, helium and CO ₂ (from degradation of CH ₄ in the ground).
Other Anthropogenic Sources	- Degradation of leaked or spilled hydrocarbons or other industrial chemicals; - Anaerobic degradation of organic contaminants in groundwaters (e.g. silage liquor); - Reactions between monitoring well construction components and environment; - Burial grounds/cemeteries.	Hydrocarbon spillages often have an 'oily' odour. Fuel spillages common – Petrol or Diesel and can contain a wide range of VOC's. Can degrade to produce methane / carbon dioxide.
Alluvium / Marsh / Peat Gas	Anaerobic microbial degradation of organic material (usually waterlogged vegetation / peat). Often associated with the presence of alluvial deposits or dredgings.	
Geogenic Gas	Natural seepages of carbon dioxide and hydrocarbon gases derived from geologic sources such as coal seams and deep oil / gas source formations. Can be present in solution in groundwaters.	Methane most common but can contain carbon dioxide and higher alkanes.
Mine Gases	Various types. Most common is "fire damp" with high methane, produced by the desorption of gas trapped in coal. "Black damp" (Stythe gas) with high carbon dioxide and denser than air. "White damp" is high in carbon monoxide.	Methane most common. Can contain higher alkanes, carbon dioxide and carbon monoxide. Often low in oxygen.
Natural Shallow Ground Gas	Various types - high carbon dioxide formed by subsurface aerobic activity leading to depleted oxygen and elevated carbon dioxide; - chemical degradation of rocks (e.g. carbonates) producing carbon dioxide; - carbon dioxide production in root zone of soils by plants.	Gases can be emitted from ground under falling barometric pressure conditions.

Table 5. Potential Sources of Ground Gases

This Appendix does not provide guidance for the assessment of risk when other gases are present due to 'Other Sources' from the above table (particularly organic compounds such as BTEX and VOC's or for the risk from radon or hydrogen sulphide).

To determine the origin of the gas a range of factors must be considered together, including;

1. Proximity of likely sources
2. Ground conditions (geology, hydrogeology, anthropogenic pathways etc)
3. Properties of gases present including:
 - Chemical composition
 - Physical properties
 - Ratios of components e.g. methane : carbon dioxide
4. Timeframe of activities such as infilling periods, capping works, installation of gas control systems etc

Identification of the originating source may be problematic given that there may be more than one source present and trace gas analysis may be required. Identification of the sources of the gases encountered during monitoring is usually carried out through a process of eliminating the most unlikely potential sources (given the site setting) and selecting those which are most likely.

Hazards Associated with Presence of Methane

Methane gas is combustible and potentially explosive. When the concentration of methane in air is between the limits of 5.0%v/v and 15.0%v/v an explosive mixture is formed. The Lower Explosive Limit (LEL) of methane is 5.0%v/v, which is equivalent to 100% LEL. The 15.0%v/v limit is known as the Upper Explosive Limit (UEL), but concentrations above this level cannot be assumed to represent safe concentrations. Further, the LEL and UEL will vary (up and down) depending upon the proportion of other gases (including oxygen). However, the fact that methane is a colourless, odourless gas means that there

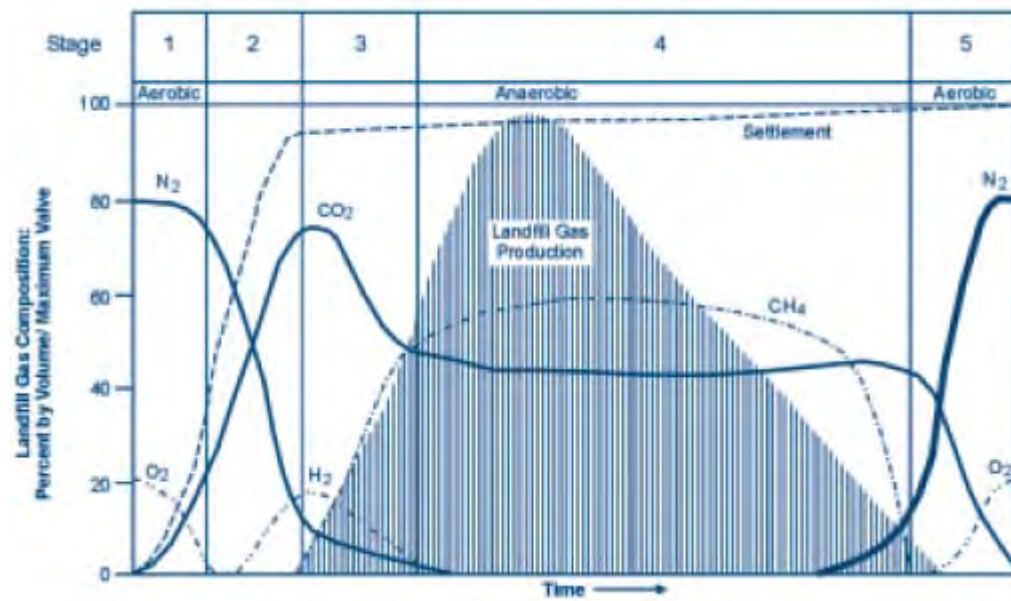
is no simple indicator of the presence of the gas until such a time as explosive limits are reached and an incident occurs. Methane is lighter than air and has a low toxicity. However, at high concentrations it can result in asphyxiation due to oxygen displacement.

Hazards Associated with Presence of Carbon Dioxide

Carbon dioxide is a colourless, odourless gas, which, although non-flammable, is both toxic and an asphyxiant. As carbon dioxide is denser than air, it will collect in low points and depressions. The UK Health & Safety Executive (HSE) has published information relating to concentrations of carbon dioxide that humans may be exposed to, which uses concentrations contained in the Control of Substances Hazardous to Health Regulations 2002 (as amended). These are the Long Term Occupational Exposure Limit (LTOEL, 8 hour period) and the Short Term Occupational Exposure Limit (STOEL, 15 minute period), which are 0.5% and 1.5% carbon dioxide, respectively.

Parameters Influencing the Rate of Ground Gas Production

The figure below is taken from EA guidance document LFTGN 03 illustrates typical ground gas generation curves from biodegradable materials:



The production of methane and carbon dioxide at a landfill site may be expected to be considerable and ongoing. Concentrations of methane will eventually decrease, followed by concentrations of carbon dioxide, but the duration and rate of gas production can vary markedly between sites. Five distinct phases of gas production occur during the process which are, in order of event as marked above, as follows:

1. An aerobic phase involving oxygen depletion and temperature increase through aerobic respiration;
2. The establishment of anaerobic conditions and the evolution of carbon dioxide and hydrogen through acidogenic activity;
3. Commencement of methanogenic activity; the establishment of populations of methanogenic bacteria;
4. A phase of stable methanogenic activity, which may go on for many tens of years;
5. A phase of decreasing methanogenic activity, representing depletion of the organic material and a return to aerobic conditions.

The time scale for the return to the normal ground gas concentrations will be highly variable, depending upon the types and quantities of materials present. In addition, the optimum parameters influencing the rate of decomposition and ground gas production within the ground at a site are as follows:

- High water content with adequate rainfall and water infiltration to provide moisture content between approximately 20 to 26%;
- Conditions that either are or are very close to anaerobic;
- High proportion of biodegradable materials;
- A pH between 6.5 and 8.5, ideally verging slightly on the acidic between pH 6 to 7;
- Temperature between 25°C and 55°C;
- The ratio of the biochemical and chemical oxygen demands (BOD:COD);
- High permeability;
- Small particle size, as finer subsurface materials possess a greater surface area to provide a growing 'face' for the micro-organisms but high fines levels reduces permeability and reduces decomposition rate.

For this reason, it is vital that sources of methane and carbon dioxide are identified prior to the commencement of any work on a construction site, and that the ground gas regime is characterised at the worst temporal conditions a site may experience. From this, a risk assessment is carried out to identify the risk at the site from ground gases so that suitable protection measures can be designed and incorporated into a development to prevent a dangerous build-up of gas occurring.

Factors Influencing the Migration and Behaviour of Ground Gases

There are many factors that influence the migration of ground gases which can effect the risk from a gassing source:

- driving force – pressure differential along a pathway, diffusion and dissolved in solution;
- meteorological conditions – short term and seasonal conditions including atmospheric pressure changes (e.g. rapidly falling pressure causes gas to expand increasing emission rates), rainfall, frozen ground and thawing, temperature;
- geological and groundwater conditions – these can have the over riding influence on the direction/pathways and quantity of migrating gas;
- anthropogenic influences – man-made pathways include mine shafts, service runs/drains, foundation piles, underground voids/pits/basements, foundation/building design/construction

Current Guidance

Previous versions of Building Regulations Approved Document C provided statutory guidance stating that consideration should be given to appropriate action and / or specific solutions in situations where methane concentration exceeded 1%v/v or carbon dioxide concentrations exceeded 5%v/v. The latest Building Regulations Approved Document C (DoE 2004) no longer endorses this approach and recommends the use of a risk based approach to interpreting a gas monitoring survey. This is in line with current EA guidance for landfill gas (LFTGN 03, 2004) which recommends the use of a structured risk based approach similar to that outlined in CLR 11. On this basis, recent guidance has been produced in 2006 and 2007 with the aim of providing up to date advice in relation to residential and commercial development. The guidance does not address issues associated with gas derived from landfills, for this refer to *"Guidance on the Management of Landfill Gas"* (Environment Agency 2004) for an overview.

Recent guidance relevant to gas assessments for residential and commercial development includes;

- Wilson *et al.* (CIRIA C665, December 2007) ***"Assessing Risks Posed by Hazardous Ground Gases for Buildings."***
This document provides up to date advice on all aspects of ground gas risk assessment such as investigation, monitoring programmes, data collection and interpretation. The guidance presents separate methodologies for the characterisation of:
 - All development types except low rise housing with gardens (Situation A)
 - Low rise housing with gardens (Situation B)
- Boyle and Witherington (NHBC / RSK Group, Report 10627-R01(04) January 2007) ***"Guidance on the Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present."***
This document presents the "Traffic Lights System" detailed below and is relevant only for low rise properties (e.g. bungalows and town houses) that have a ventilated sub-floor void (i.e. Situation B as described in CIRIA C665).
- British Standard (BS 8485 2015 +A1 2019) ***"Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings"***
This document provides an overview of gas characterisation and assessment. The Standard is intended to be used by designers of gas protection measures and regulators involved in the assessment of design solutions.

Further guidance, Wilson and Card (CIEH) ***"Ground Gas Handbook for Designers and Regulators"*** providing practical guidance on ground gas assessments and the design and evaluation of protection measures, is expected to be published in March 2009.

Each of these documents continues to highlight the importance of, and give further guidance towards, carrying out a tiered risk-based decision-making process in accord with government policy on dealing with contamination from historic or natural sources and highlight the importance of the Conceptual Model in site characterisation.

Ground Gas Risk Assessment Methodology

Assessment of risk posed by ground gas is undertaken using the methodology as outlined previously, and summarised hereunder:

- Tier 1 Preliminary Risk Assessment
- Tier 2 Generic Quantitative Risk Assessment
- Tier 3 Detailed Quantitative Risk Assessment

The methodology used in each of the above assessments with concern to ground gas is discussed hereunder.

Tier 1 Preliminary Risk Assessment

All potential sources of methane and carbon dioxide are identified in the Preliminary Conceptual Model and the generation potential determined. The background information discussed earlier is referred to in order to determine the potential for a source to generate ground gas.

CIRIA C665 provides idealised monitoring frequency / period dependant upon generation potential of gas source and sensitivity of the proposed land use as below:

Idealised Frequency and Period of Monitoring (after Table 5.5a and 5.5b, CIRIA C665)

		Generation Potential of Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4/1	6/2	6/3	12/6	12/12
	Moderate (Flats)	6/2	6/3	9/6	12/12	24/24
	High (Residential with Gardens)	6/3	9/6	12/6	24/12	24/24

Notes

1. First number is the number of readings and the second is the minimum period in months (e.g. 6/2 – six sets of readings over two months).
2. At least two sets of readings must be at low (preferably under 1,000 mb) and falling pressure.

The monitoring programme is decided using the above table prior to the intrusive site investigation. However, if the intrusive investigation reveals that a the potential source is better or worse than anticipated the monitoring programme should be modified accordingly. For example, if the made ground contains no evidence of organic material and comprises entirely granular brick fill, the potential for that made ground to generate ground gas is reduced considerably.

Tier 2 Generic Quantitative Risk Assessment

Generic Quantitative Risk Assessment is undertaken upon completion of the required gas monitoring period.

All three current guidance documents propose that both ground gas concentrations and flow rates are used to calculate the limiting gas well gas volume flow rates for methane and carbon dioxide, based on the ground gas conditions monitored for during the worse-case temporal conditions. This limiting gas well volume flow rate is termed the Gas Screening Value (GSV, note that this was termed borehole gas volume flow), and is calculated as follows:

$$GSV (l/hr) = \frac{[gas\ well\ gas\ concentration\ (\%v/v)] \times [gas\ well\ flow\ rate\ (l/hr)]}{100}$$

GSV's are compared to typical max concentrations and limiting gas screening values derived for either Situation A - All development except low rise housing with gardens, or Situation B low rise housing with gardens (NHBC Traffic Light System). Table 8.5 from CIRIA C665 is used for comparison of gas screening values for "Situation A Developments" and is presented hereunder:

Characteristic Situation (CIRIA R149)	Comparable Partners in Technology gas Regime (see Box 8.2)	Risk Classification	Gas Screening Value (CH ₄ or CO ₂) (l/hr) ¹	Additional Factors	Typical Source of Generation
1	A	Very low risk	<0.07	Typically methane ≤ 1% and/or carbon dioxide ≤ 5%. Otherwise consider increase to Situation 2	Natural soils with low organic content "Typical" made ground
2	B	Low risk	<0.7	Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to characteristic Situation 3	Natural soil, high peat/organic content. "Typical" made ground
3	C	Moderate risk	<3.5		Old landfill, inert waste, mineworking flooded
4	D	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures.	Mineworking susceptible to flooding, completed landfill (WMP 26B criteria)
5	E	High risk	<70		Mineworking unflooded inactive with shallow workings near surface
6	F	Very high risk	>70		Recent landfill site

Table 8.5 from CIRIA C665 Modified Wilson and Card Classification

Table 8.7 is used for comparison of gas screening values for "Situation B Developments" and is presented herunder:

Traffic Light	Methane ¹		Carbon Dioxide ²	
	Typical max concentration ³ (% by volume)	Gas screening value ^{2,4} (litres/hour)	Typical max concentration ³ (% by volume)	Gas screening value ^{2,4} (litres/hour)
Green				
Amber 1	1	0.13	5	0.78
Amber 2	5	0.63	10	1.60
Red	20	1.60	30	3.10

Notes:

1. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter will be the decoder as to what Traffic Light is allocated;
2. Borehole Gas Volume Flow Rate, in litres per hour as defined in Wilson and Card (1999), is the borehole flow rate multiplied by the concentration in the air stream of the particular gas being considered;
3. The Typical Maximum Concentration can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

Table 8.7 from CIRIA C665 - NHBC Traffic light system for 150 mm void

Dependant on the outcome of the assessment of risk posed by ground gas it is determined whether gas protection measures are required for the proposed development, and or whether a detailed quantitative risk assessment is required for the site.

Selection & Design of Protective Measures

Table 8.6 and Box 8.4 of CIRIA C665 contain information on the detailed design of protection measures and were initially intended for the purposes of determining then level of protection measures a development requires. These tables and related text include some useful information on the design of gas protection measures, however BS8485:2007, which supersedes the guidance included within CIRIA C665, is used for selection of gas protection measures.

BS8485:2015 +A1 2019 uses a scoring system dependant on the Characteristic Situation / NHBC Traffic Light and proposed end use of the site. The scoring system is summarised in BS8485:2015 + A1 2019 Table 2 as presented hereunder:

Characteristic gas situation, CS	NHBC traffic light	Required gas protection			
		Non-managed property e.g. private housing	Public building (a)	Commercial buildings	Industrial buildings (b)
1	Green	0	0	0	0
2	Amber 1	3	3	2	1 (c)
3	Amber 2	4	3	2	2
4	Red	6 (d)	5(d)	4	3
5			6(e)	5	4
6				7	6

NOTE Traffic light indications are taken from NHBC Report no.:10627-RO1 (04) and are mainly applicable to low-rise residential housing¹. These are for comparative purposes but the boundaries between the traffic light indications and CS values do not coincide.

a) Public buildings include, for example, managed apartments, schools and hospitals.
b) Industrial buildings are generally open and well ventilated. However, areas such as office pods might require a separate assessment and may be classified as commercial buildings and require a different scope of gas protection to the main building.
c) Maximum methane concentration 20% otherwise consider and increase to CS3.
d) Residential building on higher traffic light/CS sites is not recommended unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.
e) Consideration of issues such as ease of evacuation and how false alarms will be handled are needed when completing the design specification of any gas protection scheme

¹ The NHBC guidance and CIRIA C665 guidance refers to low rise housing (which is up to three storeys without lifts) that is constructed with a 150mm ventilated sub-floor void.

BS8485:2015 A1 +2019 Table 2 Required gas protection by characteristic gas situation and type of building

Once a score is assigned, a combination of protection systems / elements is chosen from BS8485:2015 +A1 2019 Table 3 shown below:

PROTECTION ELEMENT /SYSTEM		SCORE	COMMENTS
a) Venting / dilution (See Annex A BS8485)			
Passive sub floor ventilation (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) ^A	Very good performance	2.5	<i>Ventilation performance in accordance with Annex A (BS8485)</i> <i>If passive ventilation is poor this is generally unacceptable and some form of active system will be required.</i> <i>There have to be robust management systems in place to ensure the continued maintenance of any ventilation system.</i> <i>Active ventilation can always be designed to meet good performance.</i> <i>Mechanically assisted systems come in two forms: extraction and positive pressurization.</i>
	Good performance	1	
Subfloor ventilation with active abstraction/pressurization (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) ^A		2.5	
Ventilated car park (basement or undercroft)		4	
b) Barriers			
Floor slabs			<i>It is good practice to install ventilation in all foundation systems to effect pressure relief as a minimum.</i> <i>Breaches in floor slabs such as joints have to be effectively sealed against gas ingress in order to maintain these performances.</i>
Block and beam floor slab		0	
Reinforced concrete ground bearing slab		0.5	
Reinforced concrete ground bearing foundation raft with limited service penetrations that are cast into slab		1.5	
Reinforced concrete cast in situ suspended floor slab with minimal service penetrations and water bars around all slab penetrations and at joints		1.5	
Fully tanked basement		2	
c) Membranes			
Taped and sealed membrane to reasonable levels of workmanship/in line with current good practice with validation ^{B,C}		0.5	<i>The performance of membranes is heavily dependent on the quality of design of the installation, resistance to damage after installation, and the integrity of joints.</i>
Proprietary gas resistant membrane to reasonable levels of workmanship /in line with good practice under independent inspection (CQA) ^{B,C}		1	
Proprietary gas resistant membrane installed to reasonable levels of workmanship/in line with current good practice under CQA with integrity testing and independent validation		2	
d) Monitoring and detection (not applicable to non-managed property, or in isolation)			
Intermittent monitoring using hand held equipment		0.5	<i>Where fitted, permanent monitoring systems ought to be installed in the underfloor venting/dilution system in the first instance but can also be provided within the occupied space as a fail safe.</i>
Permanent monitoring and alarm system ^A	Installed in the underfloor venting/dilution system	2	
	Installed in the building	1	
e) Pathway Intervention			
Pathway intervention		-	<i>This can consist of site protection measures for off-site or on-site sources (see Annex A, BS8485)</i>
NOTE In practice the choice of materials might well rely on factors such as construction method and the risk of damage after installation. It is important to ensure that the chosen combination gives an appropriate level of protection			
A) It is possible to test ventilation systems by installing monitoring probes for post installation validation.			
B) If a 1 200g DPM material is to function as a gas barrier it should be installed according to BRE 212 /BRE 414 being taped and sealed to all penetrations			
C) Polymeric Materials> 1200 g (proportional to thickness) but their physical properties mean that they are more robust and resistant to damage.			

BS8485:2015 + A1 2019 Table 3 Solution Scores

Where the gas situation is 4 or more (and for NHBC Red situations) the site requires a comprehensive risk assessment to confirm the scope of protection measures. These are higher risk sites and reliance on Table 2 and 3 alone is not sufficient.

For a site which is impacted by migratory gases from an off site source, the development may be protected by imposing pathway intervention methods, which if successfully validated, could also remove the need for further analysis. It is essential that the gas regime in these circumstances has been fully characterised and that the only source impacting the site is located off site and that the pathway is clearly defined and its interception equally proven before construction commences. Pathway intervention methods may include vertical membrane installations, venting trenches, rows of stone columns, activated trenches and various proprietary systems. These systems are particularly relevant to domestic housing where there is limited scope for foundation type solutions.

CURRENT GUIDANCE ON REMEDIATION

When risk assessment of the site has been completed and it indicates that remedial works are required, the main guidance in managing this process is set out in the DEFRA/EA publication LCRM (2020)) "*Model Procedures for the Management of Land Contamination.*" The stages of managing remediation are as follows:

- (a) Options Appraisal and develop Remediation Strategy;
- (b) Develop Implementation Plan and Verification Plan;
- (c) Remediation, Verification and Monitoring.

The Remediation Strategy sets out the remediation targets, identifies technically feasible remedial solutions and presents an evaluation of the options so that these can be assessed enabling that the most suitable solution is adopted. An outline of the proposed remedial method should be presented. Agreement should be sought of the appropriate statutory bodies for the Remediation Strategy before proceeding to the next stage.

The Implementation Plan is a detailed method statement setting out how the remediation is to be carried out including stating how the site will be managed, welfare procedures, health and safety considerations together with practical measures such as details of temporary works, programme of works, waste management licences and regulatory consents required. Agreement should again be sought of the appropriate statutory bodies for this Plan.

The Verification Plan sets out the requirements for gathering data to demonstrate that the remediation has met the required remediation objectives and criteria. The Verification Plan presents the requirements for a wide range of issues including the level of supervision, sampling and testing regimes for treated materials, waste and imported materials, required monitoring works during and post remediation, how compliance with all licenses and consents will be checked etc. Agreement should again be sought of the appropriate statutory bodies for the Verification Plan. On completion of the remediation a Verification Report should be produced to provide a complete record of all remediation activities on site and the data collected as required in the Verification Plan. The Verification Report should demonstrate that the remediation has met the remedial targets to show that the site is suitable for the proposed use.

APPENDIX O: NOTES ON LIMITATIONS

Notes on Limitations For Geoenvironmental and Geotechnical Consultancy Services

General

This document has been prepared by CC GEOTECHNICAL LTD within the terms of the contract, scope of work, and resources agreed in writing with the client. The limitations of liability of CC GEOTECHNICAL LTD for the contents of this document have been agreed with the Client, as set out in the terms and conditions of offer and related contract documentation.

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The findings and opinions provided in this document are made in good faith and are subject to the limitations imposed by employing site assessment methods and techniques, appropriate to the time of investigation and within the limitations and constraints defined in this document.

The findings and opinions are relevant to the dates when the assessment was undertaken, but should not necessarily be relied upon to represent conditions at a substantially later date. In particular, seasonal groundwater levels, with the effects of precipitation, may affect the conditions found during the investigation. The report should be read in conjunction with the further Notes on Limitations included in Appendix A.

Where opinions expressed in this report are based on current available guidance and legislation, no liability can be accepted by CC GEOTECHNICAL LTD for the effects of any future changes to such guidelines and legislation. Additional information, improved practices, new guidance, changes in legislation, or amendments to design proposals, may necessitate this report having to be reviewed in whole or in part after that date. Opinions and interpretations are not accredited by UKAS.

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1. the consequences of this document being used for any purpose or project other than for which it was commissioned
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2. the consequences of use of this document by any party with whom an agreement has not been executed.

Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Factual Ground Investigations

The investigation of the site has been carried out in accordance with the scope and specification instructed by the Client. No interpretations of the data generated by the investigation have been provided or implied. The exploratory holes undertaken in this commission, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. Conditions may exist on the site which have not been detected by the works undertaken. Furthermore, the number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" or more widespread contamination where concentrations may be significantly higher than those actually encountered.

Interpretative Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by factors including inter alia the Clients budget, the available timescale, access to all parts of the site, the existence of buried services etc., and where this is the case, a more comprehensive investigation may be required if the site is to be redeveloped, since a number of important engineering and environmental issues may need further assessment.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

It must be borne in mind, that the exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" or more widespread contamination where concentrations may be significantly higher than those actually encountered. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out within the constraints of Client budget, available timeframe, access to all parts of the site, the existence of buried services and a more comprehensive investigation may be required to provide sufficient information regarding the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to formulate a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations and no liability can be accepted for the retrospective effects of any future changes or amendments to these values.