BURO HAPPOLD

Project North Stand Manchester

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Executive Summary

Objectives

The purpose of this Study is to establish the environmental, geological, hydrological and hydrogeological conditions present at the site that may result in potential contamination risks for the proposed future use.

Site Setting

The Site covers some 3.5 ha north of Manchester City Football Club Stadium, located off Joe Mercer Way, Manchester. The Site is centred on National Grid Reference SJ 86777 98642 within the remit of Manchester City Council. The Stadium, City Shop and surrounding infrastructure currently occupy the Site. To the north are Ashton Canal, Joe Mercer Way with the new Co-Op Live arena to the east and the Manchester Tennis and Football Centre to the west. Beyond these is Sportcity Way. To the south is the remainder of the Manchester City Football Club Stadium.

Geological Setting

The natural geology beneath the Site comprises Carboniferous Pennine Upper Coal Measures, overlain by Glacial Till. Owing to the significant industrial past of the Site area and the nature of redevelopments and various earthworks, Made Ground will be present. This is likely to comprise a range of material types from manufactured asphalt and sub-base to re-used natural superficial materials containing anthropogenic fragments of brick, concrete, metal, ash and occasional clinker and slag.

History

From the 1840s the Site was shown as fields with several tracks passing through, these all led to a structure (use unknown) in the northeast. Part of the Site (southwest) was occupied by Manchester and Salford Water Works Reservoir. By the 1890s, significant industrial development had taken place across the Site, including the Bradford Iron Works and associated infrastructure (rail lines). By 1905 the gas works was developed to the north. Between the 1930s and 1950s there were no significant changes to the Site but some redevelopment occurred in the 1960s from residential to industrial (works). In the 1980s the northern area was cleared of buildings and the Iron Works closed in 1986. The Site was almost completely cleared by the 1990s and the stadium constructed (for the Commonwealth Games) in the early 2000s with subsequent re-purposing for Manchester City FC.

Geotechnical Considerations

Due to the size and type of envisaged structures it is anticipated that piled foundations will be required. The following geotechnical risks have been identified:

- Coal measures including several coal seams run beneath the Site, some of which have previously been worked, some of which have potentially been partially grouted, and some of which are likely to remain intact. Associated risk from these materials includes voids or broken ground and soft compressible layers all of which will impact foundation design and capacity,
- Due to the nature and scale of the structure it is assumed that the foundations will be piled and these features will likely be a major constraint to the pile design. In general it is considered necessary to found piles a minimum distance above any coal seam, or to penetrate through them. At this stage it is assumed that piles will be bored cast in situ, designed in shaft friction alone
- Should any easement zones be present around existing services, the foundation layout will need to be designed to accommodate these.

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- The variation in ground across the Site (significant Made Ground) may lead to differential settlement issues.
- It is understood that previous works were undertaken to remove obstructions and replaced with fill as part of the original stadium works, but only locally where this was previously required. As such, and due to the rich industrial history of the site, buried obstructions remain a residual risk and may impact the type of pile being installed and impact the programme.
- Limited groundwater data is available and so further monitoring is required to derive a design groundwater level.

Geoenvironmental Considerations

A number of potential sources of contamination have been identified mainly associated with the Site's industrial past, construction and demolition history over more than 150 years. These potential sources do present potential risks (ranging from Moderate/Low to Low) to people and the environment associated with the proposed development. These risks are capable of mitigation by a recommended programme of investigation and assessment.

Conclusions and Recommendations

An intrusive ground investigation that combines geoenvironmental and geotechnical objectives is recommended. The geoenvironmental objectives will target the Made Ground (location, extent, depth, physical and chemical nature) as well the definition of the ground gas and shallow groundwater regimes. The geotechnical aspects of the investigation will provide information to develop the preliminary ground model and mitigate design risks where practicable. The data obtained would be collated, assessed and presented in a report suitable for submission to the Local Planning Authority to address standard planning conditions. The report would include recommendations on the need for and scope of any remedial design or action.

The preliminary UXO risk assessment for the Site is Moderate. Therefore, a detailed risk assessment has been commissioned by 6 Alpha, the conclusion of which classified the site to be at Low risk from UXO.

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1 Introduction

1.1 General

This report presents the results of a Ground Engineering Desk Study for the Etihad Campus North Stand Project prepared by Buro Happold on behalf of Manchester City Football Club. The purpose of this study is to establish the environmental, geological, hydrological and hydrogeological conditions present at the Site that may result in potential contamination risks for the proposed development.

The Site covers some 3.5 ha, north of Manchester City Football Club Stadium located off Joe Mercer Way. It is centred on National Grid Reference SJ 86777 98676 within the remit of Manchester City Council. The Stadium, City Shop and surrounding infrastructure currently occupy the Site. To the north are Ashton Canal, Joe Mercer Way with the new Co-Op Live arena to the north east, Alan Turing Way to the east and the Manchester Tennis and Football Centre to the west. Beyond these is Sportcity Way. To the south is the Manchester City Football Club Stadium.

The Site boundary for planning purposes changed following the initial instruction for the work. Accordingly, this current report (Version P03) is an updated version of the report and incorporates revisions to reflect the extended site area. A review of the additional land has been undertaken and the changes are not significant with respect to the risk assessment and conclusions, therefore the Groundsure report (included within the appendices) has not been amended.

The extent of the Site is shown below in Figure 1-1.

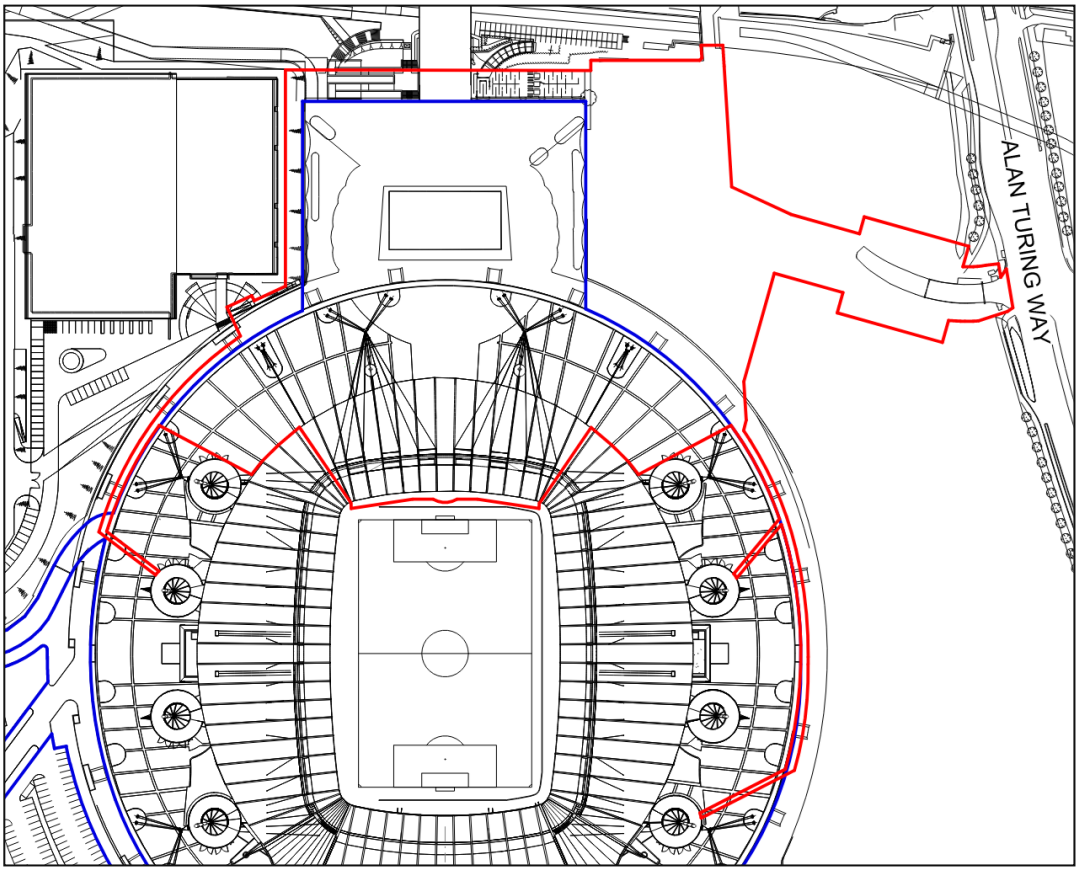


Figure 1-1 Extent of Site (red line)

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1.2 Study Aims and Objectives

The overall aim of this study was to carry out a geoenvironmental and geotechnical assessment of the Site in order to inform the Client's understanding of potential ground-related risks associated with the proposed development.

This report will provide information relevant to redevelopment in accordance with the requirements of the National Planning Policy Framework (NPPF) [1]. The work was carried out in general accordance with the Environment Agency Land Contamination Risk Management (EA LCRM) [2], the relevant British Standard [3], the Environment Agency Guiding Principles [4] and other current good practice guidance. The particular objectives were:

- To determine the historical and current use of the Site and its surroundings;
- To determine the nature of the ground conditions and the environmental sensitivity of the Site;
- To assess the potential location, nature and extent of any ground and groundwater contamination;
- To identify any geotechnical potential constraints;
- To assess the potential risks to people and the environment (natural and built) associated with ground contamination (solid, liquid or gas) both in the Site's existing condition and for the proposed future works;
- To construct an initial Conceptual site Model and carry out a preliminary contaminated land risk assessment, in general accordance with the EA LCRM [2];
- To prepare a report based upon all of the above suitable to inform the Client about potential risks related to ground conditions and also suitable to support a planning application in accordance with NPPF [1] and to provide baseline information suitable to enable Environmental Impact Assessment
- To evaluate the potential need for and scope of any subsequent site investigations and/or remedial action or design.

1.3 Information Sources

The principal sources of information for this desk study report include: historical and current topographic maps, public register information (Appendix B); existing site investigation and remediation information and information available from the Environment Agency website and other online sources. This report is therefore based upon information obtained from third party sources, together with observations from the Site walkover survey. The third party data has been accepted as face value and has not been independently verified. Buro Happold can therefore give no warranty, representation or assurance as to the accuracy or completeness of such information.

1.4 Competence

This work reported here was carried out by geoenvironmental scientists and engineering geologists from Buro Happold. Buro Happold is a consulting engineering company that manages its work under various Quality Management Systems that are certified to ISO 9001. The work itself was carried out by the staff with relevant qualifications, training and experience. This overall technical responsibility for the work was held by a Technical Director with substantial experience in the assessment of land affected by contamination who is a Chartered Geologist and registered SiLC (Specialist is Land Contamination) and SQP (Suitably Qualified Person). The review of the geotechnical elements was undertaken by a suitably qualified and experienced Associate Director who is a chartered geologist with the Geological Society.

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2 Current Land Use and Proposed Development

2.1 Site Location and Topography

The Site is centred on grid reference SJ 86777 98642 located at Manchester City Football Club, Ashton New Road, Bradford, Manchester M11 3HY. It is located to the northeast of Manchester City centre, approximately 2km northeast of Manchester Piccadilly Rail Station. The ground level is approximately +59mOD, rising slightly to the east toward Gibon Street and Alan Turing Way (to around +61mOD). The Site occupies approximately 3.5 ha and is located within the Etihad Campus. It is bound to the north by the tramline and station (with Ashton Canal beyond), to the east by Alan Turing Way (A6010), to the west are the National Squash Centre and the Manchester Regional Arena, and to the south is the Manchester City Football Club Stadium.

2.2 Current Activities on Site

The Site was visited by Buro Happold on the 20th July 2022. The area is predominantly covered by hardstanding associated with services to the Stadium. There are localised areas of gravel hardstanding typically around the ground anchors for the Stadium roof. The Stadium itself occupies the southern portion of the Site, approximately 50m north is Manchester City Store. Surrounding the store are numerous shipping containers that are used as food stalls during event days. On the eastern side of the Store are seven gas canisters (Calor 47kg propane) being stored and to the west of the Store is an electricity substation (located within the Store building). Beyond the Store, further north are covered areas (canopies) with bars and public toilets. These areas also include seating, tables and raised planters.



Figure 2-1 View looking southwest. Manchester City Store with temporary shipping containers used for food stalls. Note gas canister storage.

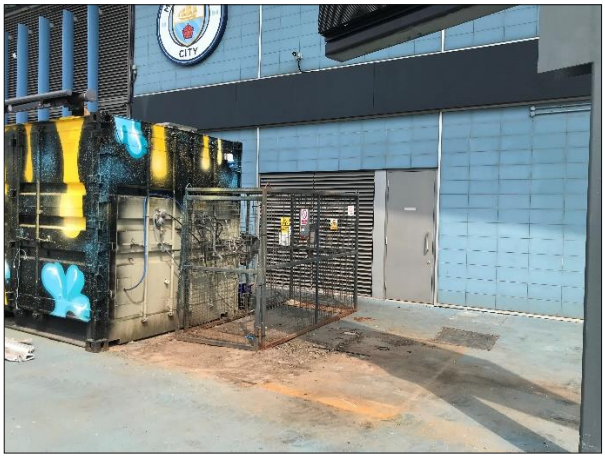


Figure 2-2 Electricity substation located on the western side of the Manchester City Store building.

2.3 Current Activities in the Surrounding Area

The surrounding area includes various developments associated with the Etihad Campus, these are all described below. A number of adjacent and nearby sites are currently undergoing redevelopment.

North: To the north of the Site is the Metrolink tramline and associated Etihad Campus station. These are within a cutting accessed by steps from the Site. North of this is Ashton Canal. Centrally, Joe Mercer Way (bridge) extends

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northward up to Sportcity Way over the Metrolink and the Canal. To the northeast is the new arena site, currently still under construction. To the northwest is the Manchester Tennis and Football Club, Excel House and car parking areas.



Figure 2-3 View looking SE from Joe Mercer Way onto the Metrolink.



Figure 2-4 View looking west across Ashton Canal and the Co-Op Live arena construction. Note, Forge Lane Bridge can be seen to the left of the image.

East: To the east is a large open area currently cordoned off with wooden fencing, the area is used by the Contractors associated with the arena development and as a car parking facility. The Contractors work from container style offices – mostly multi-storey containers. The ground cover is generally gravelly with few areas of soft vegetation along the fence line (appears to be uncontrolled shrubbery growth including Buddleia and grass cover). A manhole cover was identified within the vegetation to the northeast. There are some construction materials being stored behind the wooden fencing including concrete blocks, Chapter 8 metal fencing, signage, plastic cones etc. Beyond this area is Alan Turing Way.

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Figure 2-5 View looking NE across area used by Contractors for the arena construction. Note gravelly ground cover.



Figure 2-6 View looking N behind the wooden fencing. Note the vegetation growth and temporary storage of construction materials.

South: The Stadium occupies the area to the south.

West: To the west of the Site the ground levels fall away (occupied by a maintained vegetated bank), dropping down to a large building occupied by the National Squash Centre and Manchester Football Association. Beyond this is the Manchester Regional Arena (athletic track) and associated car parking facilities. There are areas of soft landscaping amongst the buildings and facilities to the west. Between the Metrolink and the National Squash Centre / Manchester Football Association buildings is Citylink, a tarmacked footpath surrounded by soft landscaping. A waste storage facility for the overall Etihad Campus is located here.

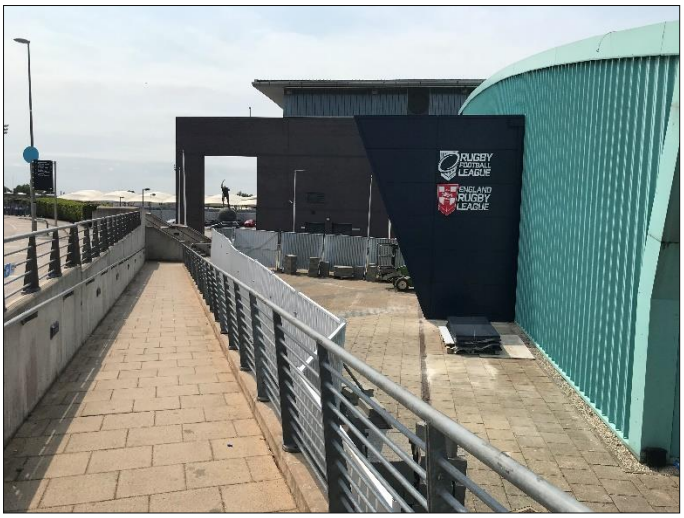


Figure 2-7 View looking W down to the National Squash Centre / Manchester Football Association buildings



Figure 2-8 Vegetated bank alongside to the west of the site (view looking N).

2.4 Proposed Development

The proposals include alterations to the Etihad Stadium, increasing the overall capacity of the north stand. North of the Stadium, two new buildings will be constructed, one to be a hotel, and the other a workspace with a football museum and enhanced City Shop. A covered fan zone area referred to as City Square will also be provided as part of the proposals.

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The formal description of the proposed development and further detail on the proposals can be found in the planning statement and planning application form, both of which accompany the planning application.

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3 Environmental Setting

3.1 Geology

The 1:50,000 and 1:10,000 geological maps [5] and [6] together with borehole logs available from several Site historical investigations indicate the geology to be the Carboniferous Pennine Upper Coal Measures, overlain by superficial deposits namely, Glacial Till. The historical investigations utilised include in chronological order:

- ESG and Buro Happold in 2014 [7] [8],
- May Gurney in 2010 [9],
- Norwest Holst in 1998 [10]
- and Northern Foundations in 1995 [11]and 1991 [12])

Owing to the significant industrial past of the Site area (including Bradford Ironworks and Bradford Road Gas Works) and the nature of redevelopments, Made Ground will be present.

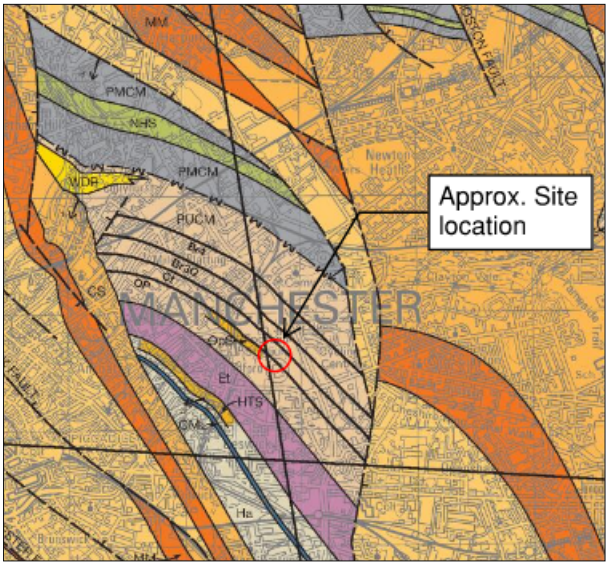


Figure 3-1 Extract of 1:50,000 BGS map (Sheet 85)

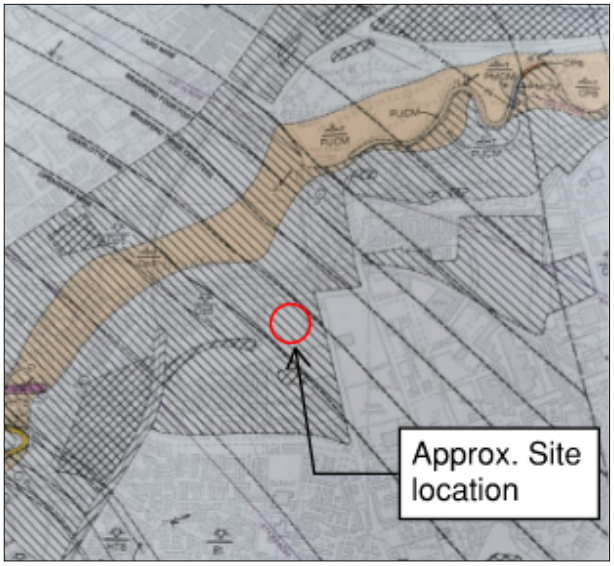


Figure 3-2 Extract of 1:10,000 BGS map (SJ89NE)

The Coal Measures have been thrown up by faulting and are surrounded by Permo-Triassic rocks. The Bradford Fault forms the eastern boundary of the Coal Measures, this has a total throw of about 1000m to the east. The Ardwick Fault system forms the western boundary of the workings. The BGS geological maps indicate two coal seams sub-crop on the Site, the Openshaw and the Charlotte. Further northeast are the Bradford Three Quarter and the Bradford Four Foot seams, owing to the dip direction of the seam (SW) there is a potential that these seams contain workings within the Site area. The maps indicate that the strata dips between 20° and 25° southwest.

During previous ground investigations (ESG, May Gurney, Norwest Holst) rockhead has generally been found between 15m and 21m depth (+47.0 to +41.3mOD). The Coal Measures at rockhead are highly weathered and were typically recorded as very stiff clay, often fissures. In some boreholes rockhead was recorded as weak to moderately weak sandstone or siltstone which was moderately to highly weathered.

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Table 3-1 Summary of geology (ESG and May Gurney)

Strata	Top of Deposit		Approx. thickness
	Approx. depth (mbgl)	Approx. elevation (mOD)	
Made Ground Comprises a range of material types from manufactured asphalt and sub-base to re-used natural superficial materials containing anthropogenic fragments of brick, concrete, metal, ash and occasional clinker and slag.	0	~60.9	0.7 to 5.3
Glacial Till (Clay) Firm becoming firm to stiff and locally stiff to very stiff, brown and grey, thinly laminated fissured, CLAY with fine to coarse gravel. Occasionally described as slightly sandy and slightly silty.	3.2	57.8	11.1 to 14.3
Coal Measures Very weak becoming weak (from approx.. 18mbgl) and becoming moderately weak (from approx.. 25mbgl) grey thinly laminated very silty MUDSTONE. Weathering is variable throughout the deposit and is expected to be completely weathered around coal workings.	15.7	45.4	Depth not proven
Coal Seams			
Coal encountered at (May Gurney BH15/09):		43.6	0.24m
Coal encountered at (ESG BHNS3):		41.6	0.31m
Coal encountered at (May Gurney BH13/09):		36.1	0.15m
Coal encountered at (ESG BHNS1E):		34.8	0.25m
Coal encountered at (ESG BHNS1E):		34.0	0.15m

3.2 Hydrogeology

The Coal Measures are classified as Secondary (A) Aquifer defined as 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. Direction of groundwater flow is considered to be generally west / southwest, following the direction of the River Medlock.

There are five groundwater abstractions located within 1km of the Site. The Site is not within a groundwater source protection zone. The abstractions are related to the following:

- Borehole at premises at Clayton, Manchester. Ciba Specialty Chemicals Plc (>900m southeast)

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- Two boreholes at Openshaw, West Ashton, Manchester. One associated with Evonik Chemicals Ltd and the other associated with Manchester City Football Club (>900 southeast)
- Two boreholes at premises at Croft Street, Clayton, Manchester (>900m east)

3.3 Hydrology and Drainage

Ashton Canal is located to the north of the Site, beyond the Metrolink (35m north). The Canal climbs for 10.8km through 18 locks toward Ashton-under-Lyne. Lock No. 9 is located nearest to the Site, resulting in a 3.5m ground level change.

The River Medlock is located about 176m northwest of the Site and flows south and west toward the River Irwell in Manchester City Centre. The course of the River Medlock once meandered through the land north of the Site (within the Co-Op Live arena development site). By the early 1890s it had been diverted and realigned northwards. Then by 1905, the River was contained within a 600m-long culvert below the former Bradford Road Gas Works site. There is an entrance opposite Philips Park (>300m north) and another entrance to the west of the Site by Ashton Canal Park (>300m west).

The stage datum for the River Medlock is +35.832m AOD, data obtained by the Environment Agency (presented on River Levels website [13]) describes the typical recent levels of the river at Gurney Street (approximately 700m southwest of the Site) as between 0.11m and 0.36m (+35.942m and +36.192m AOD). The highest recorded level (since data collection began) is 3.37m (+39.202m AOD).



Figure 3-3 Extract from the Groundsure Report, showing the location of the River Medlock and Ashton Canal (blue dashed lines) relative to the site.

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3.4 Flood Risk

The Site is not located within an area at risk from flooding from rivers and the sea, nor is it in an area at risk from groundwater flooding (highest risk on site: low). There are localised areas within the Site at risk of surface water flooding (i.e. surface water ponding) from extreme rainfall events (highest risk on site: 1 in 30 year, 0.1 to 0.3m).

3.5 Natural Hazards

Regulatory data relating to ground stability for the Site is summarised in Table 3-2 below with the full information presented in full in Table 3-2.

Table 3-2 Potential natural hazards based on BGS Geosure data

Potential Hazard	Hazard Rating
Shrink swell clays	Very low
Running sands	Very low
Compressible deposits	Very low
Collapsible deposits	Very low
Landslides	Very low
Ground dissolution of soluble rocks	Negligible

3.6 Radon

The Indicative Atlas of Radon for England and Wales [14] and the Groundsure report indicates that the Site is not a Radon Affected Area, as less than 1% of properties are above the Action Level. Therefore, no radon protective measures are necessary.

3.7 Archaeology

Oxford Archaeology North undertook an archaeological survey in 2011 across the area east of the Stadium [15]. In 2010, MCFC signed an agreement with Manchester City Council to allow a £1 billion redevelopment of approximately 7 ha of brownfield land immediately east of the Stadium. As an initial stage, it was proposed that remediation and site servicing works was carried out to treat soils contaminated by the site's former industrial use, and to decommission and remove associated buried structures.

The area is of considerable archaeological interest, as it incorporated a moated hall site during the medieval period and, from the 19th century onwards, emerged as an important centre of industrial activity. In particular, the site was occupied by Bradford Colliery, one of the largest coal mines in the Manchester Coalfield. In the early 1850s, the famous Bradford Ironworks of Richard Johnson and Nephew was established adjacent to Bradford Colliery, and promptly developed an international reputation for revolutionising the wire-manufacturing industry. By the end of the 19th century, the colliery and iron works were surrounded by a range of textile mills, rubber works, chemical factories and brick works, interspersed with streets of terrace housing.

In order to secure archaeological interests, the County Archaeologists for Greater Manchester, recommended that a programme of investigation was undertaken, this included excavation of 12 targeted evaluation trenches. Oxford Archaeology North were commissioned by the Council to carry out this work. The evaluation trenches confirmed presence of buried structures pertaining to the former Bradford Colliery, Bradford ironworks, and elements of two textile

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factories, Park Mills and Bradford Mill. This warranted further investigation, with an additional trench also excavated across the 19th century pit head and canal arm.

Features from the industrial buildings were uncovered during the investigative works. For specific details about the findings refer to the full report [15].

3.8 Unexploded Ordnance

A Preliminary UXO Risk Assessment has been carried out by Buro Happold in accordance with CIRIA C681 [16] included here as Appendix A. In addition to the consideration of the potential for aerial delivered UXO, consideration has also been given to mitigation factors, namely: (i) the extent of post-war development); and (ii) the extent of proposed intrusive works. The assessment concluded that the risks associated with UXO are Moderate.

As the proposed development will include extensive below ground works (including a ground investigation) a detailed UXO risk assessment has been completed by the specialist UXO consultant 6 Alpha Associates [17], the conclusions of which advise the Site to be at Low risk from UXO, see Appendix C.

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4 Coal Mining

4.1 Overview

A Coal Mining Risk Assessment has been completed for the Site [18], appropriate reference should be made to this report for details on the coal mining risks.

4.2 History

The Site is located within the Central Manchester Coalfield (CMC) and has a long history of coal mining. Early mine workings date as far back as the 1590s, where shallow coal was extracted from thin seams via a method known as 'bell pits'. This methodology requires a shaft to be sunk to the seam and coal extracted by miners, a winch was used to carry coal to the surface. As coal extraction proceeded the bottom of the shaft was enlarged and a sloping roof created, resembling a bell shape. When these pits were considered too dangerous to work, they were abandoned and a second shaft sunk nearby. Between the 1700s and 1800s it was likely the coal within the top 100m of the ground surface was mined using 'pillar and stall' techniques.

Clayton Colliery was located on the south side of Ashton New Road, and it was served by Clayton Branch of the Ashton Canal. Clayton Colliery is understood to have opened in 1798, owing to its close proximity to Bradford Colliery (southeast of the Site) these were merged around the 1870s. Coal was worked by deep mining from Bradford Colliery in the Roger, Crombouke, Parker and Four-foot seams from these deep shafts. These deep workings are present beneath the Site.

In 1948, Bradford Colliery became the first pit in Britain to adopt 'longwall' mining techniques. However, there were many reports of subsidence in the overlying and surrounding areas including the tilting of the gas holder north of the Canal. Consequently, the National Coal Board decided they had to close Bradford Colliery down in 1968.

4.3 Coal Seams

The cluster of productive seams that sub-crop across the wider Sportcity area include: Openshaw Mine, Charlotte Mine, Three Quarters Mine and Bradford Four-foot Mine. The seams in this group were separated by bands of shale and fireclay. Situated at a depth of about 509 yards (465m) the Bradford Four-foot Mine is the deepest and thickest of these seams (depth assumed to be from Bradford Colliery, seam sub-crops to the north and east of the Site). Below the Bradford Group are the Parker Mine, Crombouke Mine and Roger Mine. The insets to the Parker and Roger Mines are at depths of about 543 yards (496m) and 946 yards (865m) respectively. The Crombouke Mine is 26 yards (24m) above the Roger Mine.

In the early 1870s fireclay (used to manufacture bricks) was exploited from some of the shallow workings, including the Openshaw, fireclay workings were abandoned in 1903. The shallow / outcropping seams from the Bradford sequence were apparently worked at a very early date from a series of shafts accessing the coals close to sub-crop. Shallow mine workings of similar (early) date were also present within the Charlotte Mine, and it is these workings along with the Openshaw seam that sub-crop at the Site. In addition to the main seams recorded (as detailed above) a series of thinner seams have also been recorded by Arup [19]. These thinner seams are recorded to sub crop between the Charlotte seams and the Bradford Three Quarter and are named as Thin Coal A, Thin Coal B and Thin Coal C.

Using information from existing ground investigations (summarised by Arup [19]), the following sequence of the Coal Measures has been inferred:

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Table 4-1 Likely sequence of coal measure strata beneath the site

Sequence	Approximate thickness	Description
Openshaw	~0.4m	Sub-crop located in the southwest of the site.
Measures between the Openshaw the Charlotte Coals	>9m	Mainly mudstone with sandstone in the upper part.
Charlotte Coals	~10m	Sub-crop located within the central part of the site. Partial collapse reported. Sequence of weak seatearth mudstones with up to three separate coals: 0.8-1.1m Coal (worked) 2-3m Seatearth 0.3-0.4m Coal 4-5m Seatearth 0.5-1m Coal (often parted)
Measures between Charlotte Coals and Thin Coal A	~23-25	Variable strata sequence, often with thick sandstone in the lower part. Several thin impersistent coal seams 6m, 8m, and 13m above Thin Coal A. The horizon 13m above the Thin Coal A has been locally worked as the Charlotte Coal.
Thin Coal A	-	Sub-crop located within the east of the site. Thin, but persistent coal.
Measures between Thin Coal A and B	~21m	Mainly mudstone, often dark at top & base of sequence.
Thin Coal B	-	Sub-crop located within far northeast of the site. Thin, but very persistent coal.
Measures between Thin Coal B and C	~16m	Often dark mudstone with ironstone bands.
Thin Coal C	-	Thin, but persistent coal.
Measures between Thin Coal C and Bradford ¾ Coal	~20m	Mainly mudstone, some sandstone bands. Thin Coal sometimes present ~6m below Thin Coal C.
Bradford ¾ Coal	~0.8m	Often worked horizon. Occasionally absent.
Measures between Bradford ¾ Coal and Bradford Four-foot	~16m	Mainly mudstone, thick sandstone horizon in places.
Bradford Four-foot Coal	~2-2.5m (coal and parting)	Complex horizon. Extensively worked. General sequence: 1-1.5m Coal 1m Seatearth 0.1m Coal

Additional seams are located beneath the Bradford Four-foot seam however, these are unlikely to impact the design owing to their depth down dip. The coal seams are presented with a cross-section, refer to drawing NSE-BHE-XX-XX-DR-CG-001002.

4.3.1 Treatment works to the Charlotte Seam and Openshaw Seam

Significant grout treatment and validation works have taken place across the wider Site area, these are presented within drawing NSE-BHE-XX-XX-DR-CG-001003.

2000 Stadium grout works (assumptions based on grout plan, no information on grout takes)

As part of the Stadium development, it would appear that grout works were concentrated around the Charlotte Coals and the Openshaw. No grout records have been made available for review in respect of the main works undertaken

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below and in the immediate vicinity of the stadium. However a plan showing the grouting grid has been located, and this appears to show a 6m grout grid pattern reducing locally to 3m in areas. It is assumed that the grid pattern was locally reduced to 3m as a result of increased grout take suggesting the potential for voids having been encountered in these areas.

2001 Metrolink Area 6 and Area 7 (IMC Northern) [20]

In addition to the main grouting work undertaken below and in the immediate vicinity of the Stadium, in 2001, Drilltec Northern Ltd also carried out grout treatment work within a number of areas along the Metrolink tramline alignment. The area's most relevant to the Site include Area 6 and Area 7.

Area 6: Proving holes were initially drilled on a 12m grid to prove the presence and extent of any workable coal seam, holes were drilled to a depth of some 30m. The drilling proved a band of coal up to 1m thick in the centre of the area. The coal was shown to dip northeast to southwest. Rock head was found at 11m. The drilling pattern was reduced to a 6m grid in this area and coal was found to be solid with no evidence of mine workings or broken ground. Grout was injected under pressure in a PFA / cement ratio of 10/1 into each drill hole. The average grout take per hole was some 0.24 tonne (approximately equivalent to the amount required to fill the drill holes).

Area 7: Proving holes were initially drilled on a 12m grid to prove the presence and extent of any workable coal seam, holes were drilled to a depth of some 30m. The drilling proved a band of coal up to 0.8m thick in the eastern/central part of the area. The coal was shown to dip northeast to southwest. Rock head was found at 10m. The drilling pattern was reduced to a 6m grid in this area and coal was found to be solid with no evidence of mine workings or broken ground. Grout was injected under pressure in a PFA / cement ratio of 10/1 into each drill hole. The average grout take per hole was some 0.21 tonne (approximately equivalent to the amount required to fill the drill holes).

2002 Van Elle (southeast of the stadium) [21]

Van Elle completed grout treatment works to the southeast of the Stadium, targeting the Charlotte lower leaf and Charlotte upper leaf. Drill holes appear to be in a 6m grid, reducing to 3m grid in areas of coal and broken ground and reduced again to a 1.5m grid in localised areas. There are drill records with accompanying grout records however the grout takes are not clear (no total volumes provided).

2010 Buckinghams / BWB [22], [23], [24]

Validation Area D: This was completed to validate the area covered by Van Elle, an area of approximately 900m^2 located to the southeast of the Stadium, targeting the Charlotte seams. A seam of grey mudstone / coal consistently identified at depths of between 16.8m and 24.1m BGL. The seam thickness was recorded between 0.4 and 1.3m. This was assumed to be the upper charlotte seam. A second seam of coal, 0.6m in thickness, was identified in borehole I55 at a depth of 27.3mbgl, assumed to be the charlotte lower seam. No soft drilling or loss of flush was recorded during drilling in either of the seams. There were a total of 9 holes on a 12m grid to depths of 30mbgl. Each hole was backfilled with grout upon completion of drilling, with all holes taking between 0.15 tonne and 0.2 tonne. The total volume of grout taken in all 9 holes was 1.5 tonne. Due to the low grout takes, it was concluded that no voids remain in Validation Area D and the area has been sufficiently treated.

Treatment Area D: Covering an area of approximately 5,000m2, located to the southeast of the Stadium, targeting the Charlotte seams. A total of 174 holes primarily on a 6m grid to depths of 30m to 33m BGL. Majority of holes took no more than 0.15 tonne. Twelve holes within primary grid took in excess of 0.15 tonne with the highest taking 0.9tonne and the lowest being 0.2 tonne. The total grout take of the primary grid was 32.8tonne which equates to an average of 0.19tonne per hole.

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Treatment Area E: Covering an area of approximately 3,500m2, located to the south of the Stadium, targeting the Openshaw Coal seam. The work involved drilling and grouting 140 holes on a primary 6m grid to a depth of 30m to 33m BGL. There were two seams associated with the Openshaw Coal, the lower seam (labelled as Openshaw B) was encountered across the majority of the working area at approximate depths of 13m BGL in the north of the area and 25m BGL in the south. The seam appeared to dip at an angle of between 7° and 17° SW and was approximately 0.3m thick. The upper seam (labelled as Openshaw A) was identified in the south western portion of the area, dipping at an angle of approximately 20°, also about 0.3m thick. Grout takes did not exceed 0.3tonne, with the majority being recorded at about 0.15tonne. The average take was 0.17tonne per hole. The low grout take indicated no voided or broken ground was present within this area targeting the Openshaw Coal.

4.4 Mine Shafts

There are a number of mine shafts located in the surrounding areas, although none specifically identified on Site. This said, unrecorded mine shafts cannot be discounted.

Four shafts were sunk at Bradford Colliery over the years, the Colliery is located some 200m southeast of the Site. The two earliest were Forge Pit and Little Pit, the latter being an air shaft to ventilate the workings. The first modern shaft was Deep Pit (No. 1) *[later referred to as Shaft U by Arup and Buckinghams]*, this was sunk in 1854 and had a diameter of 18 feet (5.5m). The second modern shaft was the Parker Shaft (No. 2) *[later referred to as Shaft T by Arup and Buckinghams]*, which was sunk in 1902. See Coal Mining Risk Assessment [18] for more detail.

The nearest shafts located to the Site are those to the north and northeast, Shaft F, Shaft G, Shaft I and Shaft H. A summary of the shaft details is tabulated below

Table 4-2 Mine shafts located within the vicinity of the site

Shaft Ref	National Grid Ref	Location	Shaft description	Treatment details
F	386797, 398757	Located south of the Metrolink Corridor, north of the Site.	2.4m diameter with two courses of brick lining and covered by a concrete slab. Proved to 80m, close to expected depth of Bradford Four-foot Coal.	Coal Authority (CA) record the shaft was pressure grouted to a depth of 40m with 25.5tonnes of grout by contractors on behalf of Amec Capitol Projects Ltd. Shaft backfill pressure grouted as part of Metrolink Advance Works Contract. Grout injected under pressure until constant pressure was maintained indicating limit of grout take, process repeated until casing was at 20m and grout at the surface. Total grout take was 23 tonnes. No cap constructed.
G	386847, 398773	Located south of the Metrolink Corridor, northeast of the Site.	-	Shaft backfill pressure grouted as part of the Metrolink Advance Works Contract. Borehole drilled, 75mm casing installed to 40m depth. In total 23 tonnes of grout injected under pressure at 40m depth. Process repeated in stages until 10m depth. Total grout take for shaft was 25.5 tonnes.
H	386882, 398758 BH1: 386891.7, 398742.3	No primary source other than CA to show the shaft at this location.	Shaft location investigated during Metrolink and Stadium enabling works and not located. In 2010 a total of 150 probe holes were drilled in a spiral pattern at 1.5m	No details, investigated but not located, based on historic plans conjectured position is NE of Shaft I, as Shaft I was identified this would suggest Shaft H is beneath the Metrolink land; however, if the 42m of made ground encountered by CCG in 2020 is in fact the

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Shaft Ref	National Grid Ref	Location	Shaft description	Treatment details
			centres to explore the position of the shaft. Shaft potentially located during the 2020 CCG ground investigation whereby 42m of Made Ground (with low SPT results) was encountered within the BH1 location (some 20m south).	location of Shaft H, it would place it approximately 10m east of the Site (refer to the CMRA [18]).
I	386919, 398782	Located to the south of the Metrolink, northeast of the Site.	Shaft located, 2.3m diameter with two courses of brick lining. Proven to 51m, close to the expected depth of the Bradford Four-foot seam	Shaft was pressure grouted in October 3001 for Amec Capitol Projects Ltd. Borehole drilled, 75mm casing installed to 40m depth. 20 tonnes of grout injected under pressure at 40m depth. Doesn't confirm the depth of the shaft. Total grout take was 31 tonnes.

4.5 CON29 Report

A CON29 report has been obtained, within which the following comments are made:

1. Area of past underground coal mining

A record of mine entry or entries has been identified within 20m of the Site. Additionally, the zone of influence of a mine entry has been calculated to encroach into the site (see Figure 4-1). The Coal Authority believe the mine entry itself is likely to be outside of the Site boundary and a Site investigation to clarify its exact condition and location is unlikely to be a viable option and that no further remote searches would be of value. The Site lies within the potential zone of influence of recorded workings in 7 seams of coal. The most recent underground working in the area was 1961. These workings lie between 40m and 985m. Any ground movement due to this mining activity should have stopped. The Site is also indicated to lie within an area where coal deposits have been worked at shallow depth in the past but for which no plans exist. A coal outcrop is recorded to pass through the Site boundary. There is a possibility of unrecorded mining features associated with this coal outcrop within the Site boundary.

2. Shafts and adits (mine entries)

A potential risk due to past underground coal mining has been identified within the boundary of the Site. Whilst no further searches are required, it should be noted that in the event of coal mining settlement or subsidence occurring, the property will benefit from the protection of the Coal mining Subsidence Acts of 1991 and as amended in 1994.

3. Withdrawal of support

The Site lies within an area where a notice of entitlement to withdraw support has been published. This notice was issued in 1955.

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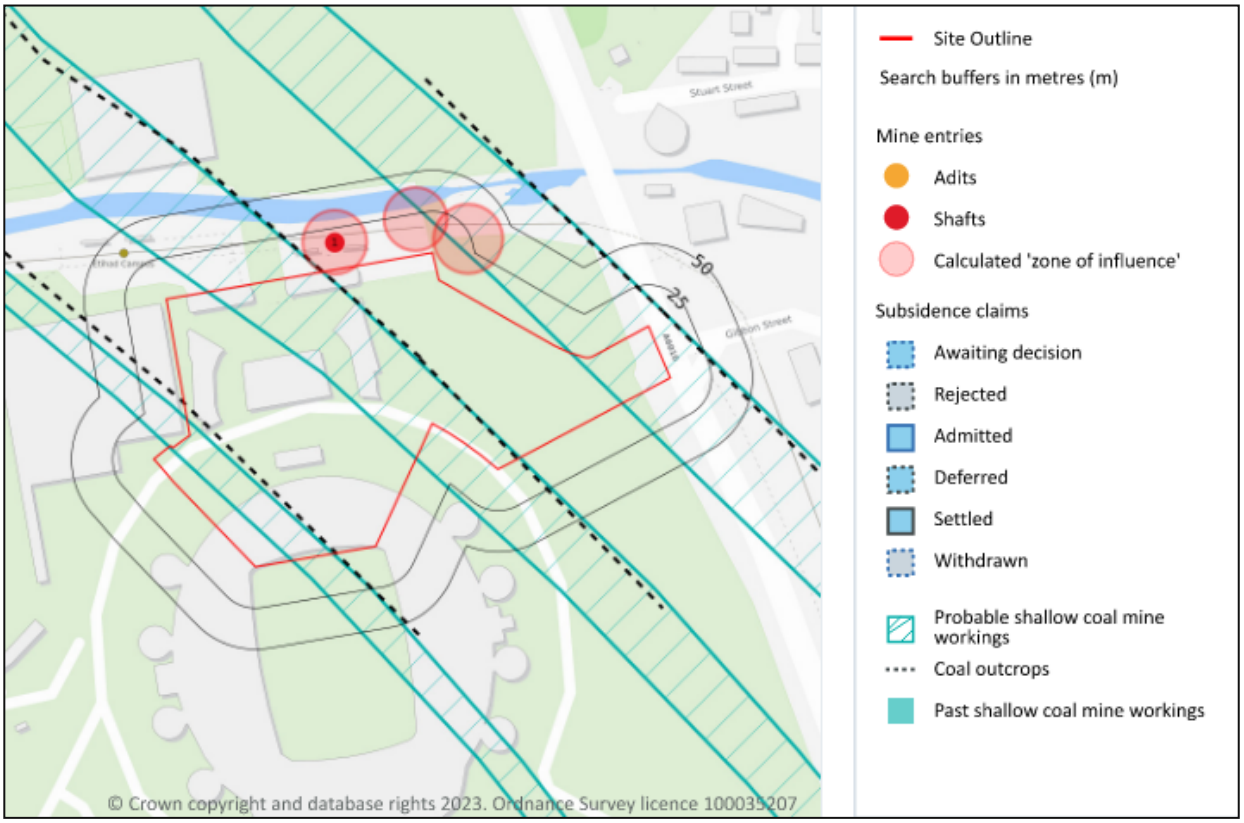


Figure 4-1 Extract from the Groundsure Report, coal mining seams and shafts located within the vicinity of the site

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5 Site Setting

5.1 Site History

The Site history and that for the surrounding area has been completed using historic maps from 1848 to 2023. This history is summarised in Table 5-1 below. The maps are presented in Appendix B.

Table 5-1 - Summary of site history and history of the surrounding area

Date	On site	Off site
1848	The Site was occupied by fields with several tracks passing through. These all led to a rectangular building in the centre of the Site which included four no. smaller square structures at the periphery and a large rectangular feature (possible water feature?) to the west of it. A small section of the Site to the SW extends onto the Manchester and Salford Water Works Reservoir. The Ashton Canal arm passes through the eastern most extent of the Site.	**North** – Ashton Canal, Lock No. 5 to the northwest and Lock No. 6 to the northeast. Coal Pits to the northeast (south of the canal, opposite Lock No. 6 and west of the canal arm). **East** - An arm off the canal extends southward alongside the east of the Site. Beyond this was Bradford Mill (small wares) and Oxley Place. To the southeast are several additional Coal Pits and Bradford Colliery. **South** – A large water feature adjacent to the Water Works reservoir. Bradford Colliery. **West** –Manchester and Salford Water Works Reservoir SW, Coal Pits (approx. 4 no.) beyond. Another water feature NW with Fustian Mill beyond. A Pottery, Coal Pits, Engine House and Brick Kiln, Brick Field all located beyond the reservoir.
1890s	Site shown as developed: residential buildings to the north (off Eldon St, Wood St and Bailey St). Benson St cuts through the centre of the Site (east-west), south of this is Bewisk Good Station and associated rail land. Philips Park Road also cut through the north of the Site (east-west, north of the residential developments), beyond this is Gratrix's Mills (Lead). Some of the Site to the east and south extend onto Bradford Iron Works. The area surrounding the canal arm (which the Site passes through) was also heavily developed with industry.	**North** – Albion Colour Works (dye works) and Gatrix's Mills (lead mill) located between the Canal and Philips Park Road. Beyond the Canal, Bradford Road Gas Works developed. **East** – Industrial development all around the Canal arm extension, including Park Mills (cotton) and African Mills (cotton). **South** – Colliery still present, extension of Bradford Iron Works and associated rail/tram lines. Chapel and significant residential development. **West** – Engineers and Iron Founders Works (includes a chimney). Water Works Reservoir no longer present, presumed infilled, replaced by rail / tram lines connecting to a main line (L.Y.R. Ardwick Branch). Fustian Mill labelled as Reservoir Mill. Brick Field replaced by residential development. Pottery replaced by Cotton Works
1905 - 1908	Further residential development within north of the Site, between Ashfield St and Middlewood St. Public House in northeast corner. SW of the site extends into Beswick Mineral Yard. Canal arm labelled as Colliery Arm.	**North** – Albion Works cleared. Gas works to the north expanded. **East** – Park Mill replaced with residential development. **South** – Slight expansion to the Iron Works south. Beswick Mineral Yard and Goods Shed developed to the SW. **West** – Reservoir Mill no longer labelled Some additional residential development generally observed (south and west)

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Date	On site	Off site
1923	The Archaeological Report [15] explains that *c.*1914 the Bradford Iron Works was expanded including the addition of a new wire rod mill. No other significant changes recorded on map.	Slight expansion of Iron Works further south. Alterations observed within the Colliery. Additional building constructed (assumed industrial) to the NW, near Gratrix's Mill. No other significant changes recorded on maps.
1930s	No significant changes recorded on map other than the expansion of the Iron Work to the east and canal arm partly developed over by the Iron Works.	**North** – New building to the NW expanded and labelled as Progress Bakery. Additional buildings constructed between Progress Bakery and Gratrix's Mill. Large expansion of Gas Works further north. **East** – Some of the residential developments replaced by the Iron Works. African Mill now labelled as Philips Park Printing Works. **South** –Further expansion/alterations to the Iron Works. **West** – Construction of a larger Goods Shed within the former Beswick Mineral Yard. Engineering Works shown south of the Mineral Yard. Iron Works labelled as Iron Foundry.
1940s	No significant changes recorded on map.	No significant changes recorded on map. Bradford Colliery buildings partly cleared.
1950s	Approximately a third of the residential buildings cleared on Site (between Middlewood St and Eldon St, Eldon St and Beswick Place and Woolton St and Thronbury St).	Bradford Colliery buildings redeveloped, although buildings still connected via tram / rail lines to the main line.
1968	Residential development north of Benson Street entirely redeveloped and labelled as Works. Works covering more of the Canal arm, presumed partially infilled.	**West** – Further development around the Goods Shed, presumed industrial development.
1970s	Travelling Crane occupying north of Site. Large building to the south. Few tram/rail lines remain (3 no. total in the south of the Site). Travel Crane also present to the east.	Much of the residential development cleared. Electrical substations shown adjacent north.
1980	No significant changes recorded on map.	**West** – Clearance of several buildings. **South** – Colliery cleared, only shafts remain shown. Large areas of residential redevelopment further south beyond the Iron Works, including development of a school.
Late 1980s	Clearance of buildings to the north, Benson Street and the majority of the tram / rail lines. Travelling crane shown and a new large building within the northern area. Some rail lines remain as do the works to the south, although no longer shown to be Iron Works. Online sources suggest Bradford Iron Works closed in 1986. Canal Arm entirely gone (presumed infilled).	**North** – Bradford Road Gas Works cleared. Gratirx's Mill cleared, other adjacent works still shown. **East** – Works include a travelling crane adjacent to Forge Lane. **South** – Shafts shown as disused. Development of a depot. **West** – Goods Sheds cleared, much of the rail land cleared. The former Cotton Mill shown as a Factory.
1990s	The Site largely shown as cleared.	Works to the east largely cleared. Foundry to the west still present. All tram/rail land cleared.
2000 (Satellite image)	Aerial satellite image shows lagoon located on Site (central).	Surrounding areas shown as cleared with construction activities taking place.

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Date	On site	Off site
2002	The Site entirely redeveloped to include part of The City of Manchester Stadium (Commonwealth Games). Rectangular building shown north of the Stadium.	Entire area surrounding the Site cleared and replaced with some new developments, namely an athletic track (now known as Manchester Regional Arena) to the west and a large building to the north west (now known as the National Squash Courts). Aland Turing Way labelled to the east and Ashton New Road to the south.
2009 (Satellite image)	Aerial satellite image shows the Stadium and Joe Mercer Way as constructed. Stockpile appears to be located within the eastern part of the Site.	Athletics Track, Tennis Centre and National Squash Centre all shown as constructed.. BMX track can be seen on land north of Ashton Canal.
2010	Stadium now labelled as Manchester City FC. Manchester FC Shop constructed.	Joe Mercer Way shown to the north. Athletics track to the west labelled as Regional Athletics Arena.
2022	Additional smaller developments shown in the north around the Manchester FC Shop. Road shown to loop around the Stadium connected to Ashton New Road in the south.	**North** – Tramline and Station shown in the north (south of the canal). No other significant changes recorded on map. Co-Op Live Arena under construction north of the Canal (not shown on maps). **East** – Area used as temporary offices for contractors working on the arena development.

5.2 Regulatory Data

Regulatory data relating to potentially contaminative uses is summarised in Table 5-2 below. This information was obtained from the Groundsure report, presented in full in Appendix B.

Table 5-2 - Summary of Regulatory Data

Item	Location [on/off Site]	Information	Potential to Impact
Environmental Permits, Incidents and Registers			
Control of Major Accident Hazards (COMAH)	3 within 500m, >350m	Rhodia Ltd, Ashton New Road – historical NIHHS site British Gas, Bradford Road Holder Station, Bradford Road – Historical COMAH site. Ciba Speciality Chemicals, Ashton Road – Historical COMAH site.	No
Hazardous substance storage / usage	3 within 500m, >450m	Land bound by Alan Turing Way and New Viaduct St – continuation of hazardous substances consent for storage of gas. Dated 2000. National Grid Gas PLC, Bradford Road Holder Station (East) – storage of low pressure gas. Dated 1992.	No
Historical licensed industrial activities (IPC)	9 within 500m, >450m	Ciba Speciality Chemicals Plc – Combustion processes, manufacture and use of organic chemicals.	No
Licensed pollutant release (Part A (2)/B)	1 within 250m, >150m 3 within 500m, >300m	Asda Eastlands – unloading petrol into storage service stations (Part B) J and F Brooks Ltd – timber manufacture (Part B) West and Musgrave – non-ferrous metal foundry processes	No
Radioactive substance authorisations	1 within 500m, >450m	Salford Royal NHS Foundation (revoked)	No
Licensed discharges to controlled waters	1 within 250m, >150m 2 within 500m, >300m	Bradford Road Gas Works – sewage discharge (storm water overflow) into River Medlock. Revocation date: 1998. Mill Street Park Inn – sewer discharge (storm water overflow) into River Medlock. Revocation date: 1995.	No

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Item	Location [on/off Site]	Information	Potential to Impact
List 1 dangerous substances	4 within 500m, >250m	Rhodia Industrial Specialists Ltd – active – Manchester Ship Canal – Cadmium.	No
List 2 dangerous substances,	1 within 500m, >	Ciba Geigy Plc, Clayton – not active.	No
Pollution incidents (EA / NRW)	8 within 500m, >400m	Pollution date: May 2003, minor impact to water (Category 3). Pollutant: acids. Pollution date: July 2001, minor impact to air (Category 3). Pollutant: smoke. Pollution date: June 2001, minor impact to land and minor impact to air (Category 3). Pollutant: commercial waste.	No
None of the following were recorded within 500m of the Site: sites determined as Contaminated Land, regulated explosive sites, licensed industrial activities (Part A (1)), pollutant release to surface waters (red list), pollutant release to public sewer, pollution inventory substances, pollution inventory waste transfers, pollution inventory radioactive waste.			
Landfill and Other Waste sites			
Historical landfill (EA / NRW records)	1 within 50m 3 within 500m, >300m	Bradford Road Works, Bradeley Hall Road, Haslington, Crewe – Inert, industrial special waste. License holder: North West Gas. Surrendered 1983. Bradford Road – Cambrian St Depot – Inert waste. License holder: Regional Surveyor (North West Gas). Surrendered: 1993.	**Yes** No
Historical waste sites	1 within 250m, >150m 11 within 500m, >250m	Scrap yard – 1988 Corporation Refuse Destructor – 1948 Refuse Destructor – 1958	No
Licensed waste sites	2 within 500m, >450m	P Mc Guiness & Co Ltd – Special Waste Transfer Station surrendered 2002.	No
Waste exemptions	3 within 250m, >100m 6 within 500m, >450m	Use of waste on a construction site. Use of mulch – BAM Project Office Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising – BAM Project Office	No
None of the following were recorded within 500m of the Site: Active or recent landfill, historical landfill (BGS records), historical landfill (LA/mapping records).			
Historical and Current Industrial Land Use			
Historical tanks	5 within 50m 48 within 250m, >50m 176 within 500m, >250m	Tanks located to the east and west. Gas works to the north	No
Historical energy features	4 within 50m 15 within 250m, >50m 38 within 500m, >250m	<u>Within 50m:</u> Electrical substations (from 1955), Gas Works (1948-1970) <u>Within 100m:</u> Electricity substations (from 1948)	**Yes** No

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Item	Location [on/off Site]	Information	Potential to Impact
Historical garages	2 within 250m, >200m 3 within 500m, >300m	Historical garages to the south, south west, and west (from 1983)	No
Current or recent petrol stations	1 within 250m, >50m	Asda – Alan Turing Way	No
None of the following were recorded within 500m of the Site: Historical petrol stations, historical military land, electricity cables, gas pipelines.			
Points of Interest (Environmentally Sensitive sites)			
None of the following were recorded within 500m of the Site: sites of Special Scientific Interest (SSSI), conserved wetland sites (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves (NNR), Local Nature Reserves (LNR), Designated Ancient Woodland, Biosphere Reserves, Forest Parks, Marine Conservation Zones, Green Belt, Proposed Ramsar sites, possible Special Areas of Conservation (pSAC), potential Special Protection Areas (pSPA), nitrate sensitive areas, nitrate vulnerable zones.			

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6 Previous Site Investigations and Remedial Works

6.1 Available Reports

There have been several ground investigations and remedial works completed across the wider Sportcity area. Those relevant to the Site have been reviewed and summarised within this report (listed in Table 6-1).

Table 6-1 Summary of ground investigation / remediation reports reviewed within this report

Date	Author	Title	Location
1991	Northern Foundations Ltd	Various documents (S.I. 5400): Appendix A and Appendix B, borehole logs, drawings, groundwater and ground gas data	Eastlands (Etihad Campus area) excludes gas works site.
1995	Northern Foundations Ltd	Reports on Phase 2 site Investigations at Eastlands, Manchester Plot 16-19 and Plot 23	Across the Stadium area
1998	Norwest Holst	Report on Ground Investigation at Manchester Stadium Area S. Volume 1 to 4.	Across the Stadium area
2000	Alfred McAlpine Civil Engineering Ltd	Site Remediation Completion Report	Across the Stadium area
2010	May Gurney	Site Investigation Report No SI565 Final	Across the Etihad Campus area, information relevant to the site includes Area A Central
2011	Buckingham Group Contracting Ltd	Remediation Validation Report, Area A Central	Across the Etihad Campus area, information relevant to the site includes Area A Central (covers eastern part of the Site only)
2014	ESG	Report No A3174-13 Factual and Ground Conditions Report - Expansion of North and South Stands	Across the northern and southern Stadium expansion areas

6.2 Summary of Information

6.2.1 1991 Northern Foundations Ltd [12]

In October 1991 the Environmental Advisory Unit Ltd was commissioned by Northern Foundations Ltd to carry out a site investigation and advise on reclamation strategies at the site of former industrial land in the Eastlands area of north-east Manchester. A 50m trial pit grid was used to excavate through the Fill material and into the natural ground. Concrete and slag obstructions were broken out. The trial pits were excavated to depths between 2m and 5.5m. A total of 17 No. soil and 15 No. water samples were recovered from 70 No. trial pits. Northern Foundations Ltd also completed a borehole survey for geotechnical purposes, a total of 51 boreholes were drilled across the site. The boreholes extended to between 10.4m and 65.8m. Environmental Advisory Unit Ltd took a further 12 No. samples from the boreholes for chemical analysis. A generalised cross section showing the coal seams was produced.

In addition to the above information, the following was also made available for review:

- Coal mining Report (site at Bradford Colliery)
- Section for Parker Shaft (at Bradford Colliery)
- Section for Deep Shaft (at Bradford Colliery)
- Recommendations for the treatment of disused mine shafts by surface developers (National Coal Board)

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6.2.2 1995 Northern Foundations Ltd [11]

The investigation in 1995 included numerous plots of land, those that were applicable to this Site include Plot 16, 17, 18, 19 and 23. This investigation included trial pitting and boreholes. In total there were six boreholes across these plots reaching depths of between 11.2m and 65.5m BGL.

Within Plot 16 and 17, BH1/16 encountered the Coal Measures at 10.6m BGL (+45.89mOD). A groundwater well was installed between 12m and 27m BGL, groundwater was monitored on five occasions and was recorded at about 16.7m BGL. Ground gas was also monitored on five occasions from the one borehole, no elevated readings of carbon dioxide or methane were recorded. The installation would have been targeting the Coal Measures. Shear strength testing was carried out on five samples between 2m and 9m. Some contamination testing was also undertaken, though these results are considered too old to be representative of current conditions and are therefore discounted.

Within Plot 18, BH1/18 encountered the Coal Measures at 10.7m BGL (+45.56mOD). Shear strength testing was carried out on six samples between 3m and 10.5m. Some contamination testing was also undertaken, though these results are considered too old to be representative of current conditions and are therefore discounted.

Within Plot 19, BH1/19 encountered the Coal Measures at 12.3m BGL (+45.1mOD). A groundwater well was installed between 13m and 25m BGL, groundwater was monitored on five occasions and was recorded between 17.2 and 18.55m BGL. Ground gas was also monitored on four occasions from the one borehole, no elevated readings of carbon dioxide or methane were recorded. The installation would have been targeting the Coal Measures. Shear strength testing was carried out on eight samples between 1m and 10.5m. Some contamination testing was also undertaken, though these results are considered too old to be representative of current conditions and are therefore discounted.

Within Plot 23, BH1/23 encountered the Coal Measures at 15m BGL (+45.27mOD). A groundwater well was installed between 16m and 25m BGL, monitoring took place on two occasions, both occasions the wells were recorded as dry.

6.2.3 1998 Norwest Holst Soil Engineering Ltd [10]

Norwest Holst carried out a ground investigation across two areas, Area S where the Stadium was to be constructed (south of Ashton Canal) and the Gas Works area (north of the canal). This was part of Manchester City's preparation for the 2002 Commonwealth Games.

A total of 35 boreholes (A2 to A38) were formed to depths of between 1.4m and 18.2m BGL using cable percussive techniques. Thirteen boreholes were then extended to depths between 35.1m and 84.1m BGL using rotary coring methods to obtain core samples of the Coal Measure strata. A total of 82 trial pits were excavated to depths between 1.2m and 4.8m BGL. The investigation also explored a number of mine shafts, these were initially investigated via geophysical measures, then trial trenching and rotary percussive methods. A programme of groundwater and ground gas monitoring was carried out. Methane readings up to 1.4%, carbon dioxide up to 14.5% and reduced oxygen were all recorded. It is not clear which strata these readings were taken from. Groundwater monitoring data was not located within the report.

6.2.4 2000 Alfred McAlpine Civil Engineering Ltd [25]

McAlpine's produced a Remediation Completion Report for the Stadium enabling works in March 2000. Prior to enabling works, the Site levels ranged from about +61.6mOD in the southeast to +54.5mOD in the northwest (adjacent to Ashton Canal). Groundwater was generally encountered in the form of perched water sitting on natural clay. The depth and nature of Made Ground varied greatly across the site. Clinker, slag, ash reworked clay, bricks and metal were all encountered as well as some areas of domestic refuse. Elevated concentrations of some heavy metals, phenols, PAHs

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TPHs, cyanide, thiocyanite, pH, ammonia and sulphate were all recorded. McAlpine's completed a trial pit exercise (20m grid) at the beginning of their enabling works to characterise the materials. Approximately 30,000m3 of 'contaminated material' was disposed off site to a licensed landfill site as part of their remedial works. All imported materials were subject to chemical testing (including asbestos testing).

6.2.5 2009-2010 May Gurney [9]

May Gurney were commissioned by Ove Arup & Partners Ltd on behalf of Manchester City Council to undertake a ground investigation with the following objectives:

- Determine the physical and chemical properties of the natural and man-made materials present beneath the site
- Determine the thickness of Made Ground and depth of rock head
- Determine the thickness and extent of obstructions left from previous phases of development
- Investigation of the Coal Measure strata and identify the location and extent of any shallow mine workings
- Installation and monitoring of standpipes to confirm groundwater and ground gas regimes
- Collection of appropriate samples for geotechnical and chemical laboratory analysis.

The investigation took place between December 2009 and January 2010 and comprised a series of cable percussion boreholes, twenty with rotary core follow on, rotary percussive probing, machine excavated trial pits and window sample holes. The rotary percussive probe holes were drilled in order to ascertain the location, nature and thickness of any obstructions in the ground associated with the former structures on site. These holes were drilled at 5m centres along 27 probe lines

6.2.6 2011 Buckinghams Group Contracting [26]

Buckingham Group Contracting Ltd (BGCL) were the principal contractors working with Arup on constraint removal, remediation, mine treatment and service diversions and reinforcements for the Sportcity site. The remediation completed within Area A Central (south of Ashton Canal) covers the eastern part of the site being discussed within this report. The area was divided into panels, 14-51 covering Area A Central. The area was remediated to proposed general development levels and standards suitable for commercial use. The remedial work (including mine work treatment) started in November 2010 and was completed in March 2011.

A soil quarantine area was constructed within the northern part of Area A Central. This area covered approximately 2,000m2 and was constructed to receive soils that appeared contaminated. The construction comprised a 2mm geomembrane liner overlain with a 300mm thick sand blinding layer for protection. A 1m high bund was constructed around the edges. This quarantine area was located within the site being discussed herein.

BGCL based their information on the May Gurney ground investigation from 2010 and additional trial pits excavated in October 2010. The additional trial pits were to complete the required testing frequency prior to excavation and compaction of materials. These trial pits included six within the former canal arm (numbered C1/10 to C6/10). Gross hydrocarbon contaminated materials were encountered during the excavation of the canal arm. The contaminated material was found at the interface between the Made Ground and natural ground. Approximately 3,500m3 of material was removed to a soil quarantine area.

The bulk excavation across Area A Central entailed breaking out and removal of extensive reinforced concrete foundations and brick walls (including the wall to the canal arm) and bases associated with former site uses. Oversize materials (comprising concrete, brick and rock boulders) were excavated and removed off site for crushing, a total volume of 6,000m3 crushed material was generated within Area A Central. All unsuitable materials such as metal, tyres,

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plastic and wood were separated out and disposed off site. Asbestos was not encountered in the Made Ground materials that were excavated and recompacted. The recompacted material was treated with lime. Approximately 38,700m3 of material was excavated across Area A Central. It should be noted that lead and hydrocarbon impacted materials from other areas within the Sportcity site were brought into and deposited within Area A Central. The treatment and validation of these materials was covered in a separate report by BGCL (however this has not been made available for review). Approximately 3,770m3 of materials containing potential contaminants from hotspots in Area A Central were segregated in a soil quarantine area. Soil remediation was achieved by a combination of systematic excavation, separation and screening of soils for re-use, separation of unsuitable material and separation of hotspot material for treatment by chemical oxidation. A total of 15,000m3 of site won material classified as Class 6F2 was placed in a 300mm thick layer across Area A Central to form the capping layer. Sampling frequency to validate the capping material was taken at 1 sample per 250m3 across Area A Central. This testing confirmed the material was within classes 1A, 1B and 2C with less than 35% clay content.

An underground cylindrical metal tank was encountered within Panel 15, this was empty and there were no evidence of visual contamination in the surrounding soils. The tank and surrounding soils were removed and placed in the quarantine area.

Pre-validation assessment of analytical results for samples from Area A Central obtained during May Gurney investigation recorded semi-volatile compound (SVOC) exceedances within the former canal arm. Three of the pre-validation samples taken by BGCL showed SVOC exceedances. These hotspot locations were removed, all samples for the surrounding soils met the re-use quality criteria for TPH and benzo(a)pyrene and therefore no further treatment was required. All natural materials below the canal arm also met the soil re-use criteria.

sitewide 6F2 capping material included elevated petroleum hydrocarbons (namely aromatic C21-C35 range), typical of sources such as ash, coal and tarmacadam. The maximum measured concentration was 6300mg/kg and the mean calculated as 1060mg/kg. The target criteria was 500mg/kg, however owing to the composition of the material (mostly brick and concrete) and the difficulty with of obtaining representative samples to assess. It was concluded that the hydrocarbons did not present a significant risk and the 6F2 capping material was accepted for use as proposed. Test results for site-won and imported capping material across Area A Central were in compliance with the re-use quality criterion for asbestos. Analytical results of the validation sampling for soils remaining in Area A Central demonstrated compliance with the agreed remediation criteria.

Zones with localised perched groundwater in the Made Ground were encountered during the earthworks, mainly associated with the substructures and the former canal arm extension. This exhibited strong odours and some floating free phase hydrocarbon products. This groundwater was removed and passed through a treatment system before being discharged to foul sewer. Samples of deep groundwater were obtained at the start of the contract. No significant changes in the water quality were recorded during the monitoring period.

Final surveyed post remediation levels for Area A Central were generally around +62.6m OD along the eastern boundary and fell to around +60.4m OD to the west.

To satisfy the Remediation Strategy (completed by Arup, [27]) eleven gas and groundwater monitoring boreholes were constructed in March 2011 following completion of the remedial works. The status of these monitoring wells is not currently known.

6.2.7 2014 ESG [7]

In 2013 ESG were commissioned by Buro Happold Ltd on behalf of Manchester City Football Club to carry out a ground investigation at the Etihad Stadium, Manchester. The scope of the investigation was specified by Buro Happold and

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comprised four cable percussion boreholes with rotary follow on, six cable percussion boreholes with rotary follow on for mine stability verification, nine dynamic sample holes and four trial trenches. The investigation was spread across both the north and south side Stadium as was to facilitate the design for the extension at both sides.

Made Ground was encountered down to a maximum of 4.9m BGL, though typically around 2.5m. This was underlain by 9.6-14.5m of Glacial Till deposits followed by rockhead of the Coal Measures around 15-16m BGL . The Made Ground materials occasionally included ash, clinker and slag. With the exception of one sample the maximum concentrations of all inorganic determinands were below the commercial industrial thresholds. Asbestos was recorded within 3 of the 33 samples (14%) but was only located within the southwest of the site area. All samples were quantified and recorded concentrations of <0.01% asbestos by volume.

Groundwater monitoring standpipes were installed within the Made Ground and Glacial Till in four boreholes. Monitoring took place on five occasions and recorded water between 0.8m and 5.6m BGL. These water levels were not considered to represent a continuous body of groundwater capable of significant groundwater flow. Analysis of the groundwater samples indicated that it was not significantly impacted by contamination.

Ground gas monitoring was carried out within seven of the dynamic sample holes. Carbon dioxide and methane were not detected during the six rounds of monitoring (i.e. concentrations recorded were always <0.1% v/v on the field equipment). Oxygen concentrations were always recorded around 21% v/v and flow rates were typically <0.1l/hr. Characteristic Situation 1 was considered appropriate for the new stand extensions.

6.2.8 2020 CC Geotechnical Ltd [28]

Geotechnical Ltd (CCG) completed some ground investigation in an area adjacent to the east of the Site in 2020. These works were to provide geotechnical and geoenvironmental information relevant to the design and construction of the proposed UU shaft (for access to the deep sewer). The investigation comprised four boreholes (BH1-BH4) excavated using cable percussion methods with BH2 being further advanced by rotary coring.

The conditions encountered within BH2-BH4 comprised Tarmac over approximately 3m of Made Ground (brown sandy gravel with brick, sandstone and mudstone) followed by about 12m of Glacial Till then bedrock encountered at 15.6-16.7m BGL. Where BH2 extended further into the Coal Measures, rock core recovery was relatively poor, particularly between 17m and 19m BGL.

BH1 was drilled to 42m BGL, Made Ground (recovered as slightly sandy, gravelly silty clay) was recorded down to 20.3m BGL. Thereafter the material was still recorded as Made Ground described as mudstone with inclusions of wood fragments and pockets of clay (likely to be reworked/backfill material). SPT N Values throughout these materials were very low, not exceeding 10 but generally recorded between 3 and 6. CCG recognised this borehole had anomalous conditions and assumed the position may have been carried out over a former mine shaft position. This is discussed further within the Coal Mining Risk Assessment [18].

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7 Preliminary Geotechnical Assessment

7.1 General

As previously mentioned, the proposals include alterations to the Etihad Stadium, increasing the overall capacity of the north stand. North of the Stadium, two new buildings will be constructed, one to be a hotel, and the other a workspace with a football museum and enhanced City Shop. The formal description of the proposed development and further detail on the proposals can be found in the planning statement and planning application form.

7.1.1 Preliminary Ground Model

The ground level across the Site is approximately +59mOD, rising slightly to the east toward Gibbon Street and Alan Turing Way (to around +61mOD). The geological sequence across the Site can be generalised as:

- Made Ground overlying,
- Glacial Till overlying,
- Carboniferous Pennine Upper Coal Measures

There have been several ground investigations completed across the wider Sportcity area. Those relevant to the Site have been reviewed and summarised within this report (listed in Table 6-1). An indicative geological cross section based on the historical ground investigation data is provided in drawing NSE-BHE-XX-XX-DR-CG-001002, this provides an approximation of the coal seam sub-crop locations and possible depth beneath the Site (see Section 3 and 0 for detail).

During previous ground investigations rockhead has generally been found between 15m and 21m depth (+47 to +41.3mOD). The Coal Measures at rockhead are highly weathered and were typically recorded as very stiff clay, often fissured. In some boreholes rockhead was recorded as weak to moderately weak sandstone or siltstone which was moderately to highly weathered.

Due to the risk from worked seams, significant grout treatment and validation works have taken place across the wider Site area, these are presented within drawing NSE-BHE-XX-XX-DR-CG-001003 (see Section 4.3 for detail). However, there are areas that have not been previously grouted and as such a residual risk remains.

Due to the rich industrial Site history and remedial works that have taken place, varying depths of Made Ground are envisaged. As part of the remedial works carried out by BCGL in 2011, extensive reinforced concrete foundations and brick walls were broken out and removed, however these works only cover the eastern portion of the Site (refer to drawing NSE-BHE-XX-XX-DR-CG-001004). There is a potential risk that relic substructure/obstructions may remain in the ground.

Additionally, there are potential impacts from contamination. These are discussed further in Section 8 herein. The variable nature of Made Ground deposits (in both chemical and geotechnical composition) are likely to impact the suitability and acceptability of such material for reuse as part of any earthworks assessments.

7.1.1.1 Groundwater

Groundwater monitoring wells were installed and monitored as part of the previous ground investigations at the Site. Monitoring data from the Coal Measures recorded groundwater levels between ~16.7m BGL and 18.55m BGL.

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Monitoring data from the Made Ground and underlying Glacial Till recorded water levels between 0.8m BGL and 5.6m BGL. These water levels were not considered to represent a continuous body of groundwater capable of significant groundwater flow.

7.2 Geotechnical Risks

From a review of the available information, a number of geotechnical risks and constraints have been identified that may impact the geotechnical design aspects of the proposed development.

7.2.1 Coal Measures

As has been discussed previously there are several coal seams running beneath the Site, some of which have previously been worked. Grout treatment works have been carried out within the Charlotte Mine and Openshaw Mine (which sub crop beneath the Site) though the grout records do not cover the entire Site footprint. There are other seams (thinner seams) that have been recorded during ground investigations that may potentially remain intact. Associated risk from these materials includes voids or broken ground and soft compressible layers, all of which are likely to impact foundation design and capacity. Due to the nature of the envisaged ground conditions and scale of any likely future structures, it is assumed that any foundations will be piled and these mining related features will likely be a major constraint to the pile design. In general, it is considered necessary to found piles a minimum distance above any coal seam, or to penetrate through them. At this stage it is assumed that any piles will be bored cast in situ, designed in shaft friction alone.

7.2.2 Obstructions

Ground improvement works were carried out by BGCL in 2011, removing concrete and brick obstructions in the eastern part of the site. There is a potential that ground obstructions in the form of relic substructure from historic site uses may still remain. Any such relic structures may inhibit piling operations and it would be desirable to remove them as part of an enabling works package.

7.2.3 Utilities

A number of existing services are present on the site and research is ongoing to establish the exact locations and any associated easements and constraints that these may impose.

7.2.4 Groundwater

Monitoring data from the Made Ground and Glacial Till recorded water levels between 0.8m BGL and 5.6m BGL. These water levels were not considered to represent a continuous body of groundwater capable of significant groundwater flow. There is a potential risk that perched water within any Made Ground may be present on Site and a residual risk of dewatering currently remains.

7.3 Made Ground

The Made Ground strata will likely vary with depth and position and be an unsuitable founding strata. As such its capacity should be discounted from any foundation design. The variation in ground across the Site (i.e. significant Made Ground) may also lead to differential settlement issues between column locations and possibly negative skin friction on piles. As such, further investigation to the extent and composition of any such material should be undertaken to establish the geotechnical properties.

7.4 Geotechnical Design Options

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7.4.1 Foundations

Due to the magnitude of the load applied and the ground conditions on Site, piled foundations will be required. Penetration into the mudstones of the Coal Measures will be required and therefore driven piles are not suitable. For bored piles either Contiguous Flight Auger (CFA) or bored cast in situ techniques would be appropriate, with CFA offering programme and therefore cost advantages. It should be noted that there are limitations to the CFA technique which may mean that they are not the preferred choice for the proposed development. It is not possible to inspect the base of the pile or to look specifically at the material at the toe of the pile when installing using CFA and this presents a risk that piles may terminate on seat earth or a coal seam. It is recommended that if CFA piles are utilised that base capacity is discounted. CFA piling rigs are limited in terms of pile length to around 28m in favourable ground conditions and this can be less in more challenging materials such as rock. Pile lengths are likely to vary due to the dip of the coal seams and it is recommended that, if CFA piling is proposed, trial bores are undertaken to prove the required lengths can be achieved.

Rotary bored piles do not have the issues described above for CFA piling, however they take longer to install. An assessment shall be undertaken of the relative advantages of CFA pile versus installing fewer rotary bored piles as base capacity can be accounted for. It should be noted that depending on the results of the ground investigation and success of the grouting operations, to mitigate the risks associated with the presence of coal seams, it may be necessary to discount base capacity from the pile design whichever installation technique is selected.

A review of the historic design undertaken by Arup (Manchester Stadium Calculation Sheet [29]) has been undertaken and the following noted as relevant to the design of the proposed development:

- Local to structural foundations the Made Ground was removed and replaced with Class 1 or 2 fill.
- During these excavation works a large number of deep obstructions were encountered which resulted in deeper fill being placed.
- 6no. preliminary pile test were undertaken for diameters ranging from 450mm to 900mm in both tension and compression.
- Lateral load tests were undertaken with inclinometers installed and monitored during the test.
- Negative skin friction was applied to the pile design to account for creep in the placed fill. This was based on the assumption that fill was placed to +56m OD in all locations.
- The stress from pile groups at the level of the coal seams was limited to 75kPa to prevent excessive settlements arising from compression of material infilling the seams.
- A review of heave pressures was undertaken in areas of ground beams and suspended slabs. Through a variety of calculations Arup shoes that no additional heave protection measures were required. This will require a review for the specifics of the currently proposed works.

As well as being loaded in tension and compression, some of the piles will attract high lateral forces due to the circumferential loading around the structure.

7.4.2 Earthworks

A detailed earthworks assessment has not currently been undertaken for the proposed development, however, the Site is reasonably level and the proposed works are unlikely to significantly influence the existing and proposed levels. As outlined above, due to the rich industrial Site history, there is potential for variability in the near surface materials. The variable nature of Made Ground deposits (in both chemical and geotechnical composition) along with the geotechnical properties of the Glacial deposits are likely to negatively impact and influence the suitability and acceptability of such material for reuse as part of any earthworks assessments.

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Likewise, due to the minimal changes between existing and proposed levels, it is currently not envisaged that there will be a need for significant sloping ground or retaining walls.

7.4.3 Grouting

It is assumed that additional grouting works will be required as part of the enabling works for the proposed development, however this requirement will be reviewed once the results of the ground investigation have been received.

Based on the available information, and previous works undertaken report, a 6m grout grid is proposed to cover the area of the proposed development where there are no previous grout treatment works. It is anticipated that this will then be reduced to a 3m grid where the grout takes exceeds 1tonne / per location. The approximate locations of the anticipated grout grids is presented within NSE-BHE-XX-XX-DR-CG-001003.

There is also an area to the east that has been identified as 'AT RISK'. Further investigation is needed in this area to further understand the nature and extent of the 'Thin' coal seams.

The Openshaw seam, which passes through the southwest corner of the Site has not been considered to pose a significant risk to the development at this stage. This is due to the location of the seam and the dip direction, and the nature of the grout works undertaken for the Stadium which appears to be a 12m grid for this seam. BGCL also carried out some treatment works to the seam – grout takes did not exceed well volumes and there was no evidence of any broken ground.

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8 Preliminary Geoenvironmental Risk Assessment

8.1 General Approach

In the UK, the assessment of risk from contamination is based on consideration of the conceptual site model and follows the "source-pathway-receptor" approach. If one of these three elements (source, pathway or receptor) is absent, it is considered that there is no risk of harm. If, however, there is considered to be a linkage between any given source and any given receptor, then a risk-based approach is used to assess the significance or impact of the linkage. Risks are defined as the probability of an event occurring combined with the severity of the consequence of that event. Particularly, to assess the risks to site end users posed by any given source, the sensitivity of each receptor is considered. For example, the concentration of contamination acceptable at a site to be developed as a residential property with a garden used to grow vegetables and accessible to young children is set lower than that for a commercial site where soil is exposed only in minor areas of landscaping and the only long-term users of the site are adults. Similarly, a site overlying a Principal Aquifer supplying potable water will be considered more stringently than a site overlying an impermeable geology with only minor seepages of groundwater.

8.2 Climate Change

It is accepted that the climate is changing and that this will affect future weather patterns. The Environment Agency [30] requires factoring climate change into risk assessments and remedial solutions. The British Standard, 'Adaptation to Climate Change – Principles, Requirements and Guidelines' [31] states that 'climate change impacts shall be assessed comprehensively…including…contamination' and should focus 'upon understanding the implications of future climate change trends and climate events over the full lifespan of a decision'. The National Planning Policy Framework [32] requires new development to contribute to 'mitigating and adapting to climate change' and to 'minimise vulnerability and increase resilience' to the range of impacts arising from climate change.

The changes to weather patterns in the UK may include: an increase in warmer weather; an increase in the frequency and intensity of rainfall events; and an increase in the duration or frequency of dry spells in the summer. Such events are also likely to become more extreme. There is the potential for these scenarios to impact upon potential contaminant migration pathways in particular with respect to both hazardous ground gas and contaminated groundwater via permeable strata, during both construction and operation of the proposed development. As ground conditions at the proposed development may be vulnerable to extreme weather events due to climate change during the demolition, construction and operation phases, these potential impacts have been considered in the risk assessment.

8.3 Conceptual Site Model

The potential risks posed to human health and the environment by ground contamination at this site have been evaluated by a generic quantitative risk assessment which incorporates the 'source-pathway-receptor' identification and assessment methodology in accordance with the Land Contamination Risk Management [2]. The risk assessment process therefore involves the identification of each source based on the information in this report, including any available existing ground investigation results together with the identification of relevant exposure pathway(s) and receptors. The potential risks to the receptors have been assessed by considering the potential effect of the source on the receptor as well as the likelihood of a pathway linking the two, i.e. a contaminant linkage as discussed above.

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8.4 Sources

The potential contamination sources at the Site have been identified from the review of regulatory data, historical maps and previous ground investigations and are summarised in Table 8-1. The 'Contaminants of Concern' in this risk assessment are based primarily on information from this review of historical information and by reference to relevant Industry Profile reports ([33], [34], [35]).

Table 8-1 Summary of potential sources of contamination

Potential Source	Location	Likely Age	Potential Contaminants of Concern
Made Ground on site: Historical uses included Bradford Ironworks, various mills and factories, railway land, canal arm. Lagoon located on site during Stadium construction. Construction and demolition debris associated with various phases of development. Remedial works to the east of the Site in 2010 included lime stabilisation, soil quarantine area. Works also included remediation of materials associated with the former canal arm and hotspot remediation.	On Site	<1840s – 1980s	Asbestos, heavy metals, organic and inorganic compounds, acids / alkalis, PAHs, TPHs, creosote, PCBs, ash, metal fines, sulphate, glycols, fuels and oils.
Made Ground within the surrounding areas: Historical uses included Bradford Road Gas Works, Bradford Colliery, coal pits, Beswick Mineral Yard, other various work. Electrical substations. Construction and demolition debris associated with various phases of development.	Off Site	<1840s – 1990s	Asbestos, heavy metals, organic and inorganic compounds, acids / alkalis, PAHs, TPHs, oils, coal products, thiocyanite, PCBs, fuels and oils.
Infilled land: Salford Water Works (large reservoir and smaller body of water partly located on site, to the southwest and south), body of water between Fustian Mill and the site, arm to Ashton Canal.	On and off Site	<1840s	Ground gases. Leachate.
Coal Measure Strata Potential for unknown coal mining entrances (shafts / adits) located within the Site – preferential pathways for ground gas migration	On Site	-	Ground gases

8.5 Pathways and Receptors

The presence of contamination (in soils, liquids or gases) has the potential to impact upon human and environmental receptors both in the short term (during construction) and in the long term (during use and occupation). Those receptors and the pathways that could link them to the sources identified in Table 8-1 are summarised below.

Ashton Canal is not considered further within this assessment as there is no plausible pathway that could impact this sensitive receptor. The Metrolink is located within a large cutting which is between the Site and the Canal.

Table 8-2 Summary table of receptors and potential pathways

Receptor		Sensitivity *Justification*	Pathway
Human Health	Investigation and construction workers	Moderate	Direct/ dermal contact. Ingestion/ inhalation of soils. Inhalation of gas / vapour.

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Receptor		Sensitivity *Justification*	Pathway
		Construction/investigation workers likely to be engaged in moderate enabling works that will require excavation of some Made Ground.	
	Future Site users / visitors (guests, workers)	Moderate *Future Site users will be visitors to the land (i.e. no long-term residents habiting the buildings).*	Direct/dermal contact. Inhalation of contaminated dusts, gas & vapour.
	Off site occupiers / visitors of neighbouring land	Moderate *Surrounding land generally commercial in nature. Residential areas are predominantly east of Alan Turing Way and south of Ashton New Road.*	Inhalation of contaminated dusts.
Controlled Waters	Secondary Aquifers (Coal Measures)	Moderate *Secondary (A) Aquifer within the Coal Measures – permeable layers capable of supporting water supplies at a local scale. Aquifer is overlain by Glacial Till. Nearest groundwater abstraction is over 900m from the Site.*	Migration via permeable strata and preferential pathways (e.g. piling)
	River Medlock	Moderate *There is a possibility the River Medlock is in hydraulic continuity with the Secondary Aquifer. However the River is located within a culvert at its nearest point (which is >100m NW).*	Migration via permeable strata and preferential pathways (e.g. piling)
Building/Services	Buried concrete foundations. Potable water supply pipework	Low *Damage or pollution to new below ground infrastructure around the developments.*	Direct contact / aggressive attack

8.6 Assessment of Risk

The assessment of the level of risk for each of the potential contaminant linkages identified above is summarised in Table 8-3. The table lists the potential sources identified above. For each source, an assessment is made, receptor by receptor as to the magnitude of the potential consequence (reflecting the potential severity of the hazard associated with that source and the sensitivity of the receptor).

Consideration has also been given to the level of uncertainty associated with each of these potential sources. For example, much of the information is based upon historical records which are likely to be partial and will not be complete, together with the limited nature of the existing site investigation data. Because of this uncertainty, the identification of the sources is based upon a conservative assessment of the potential location, nature and extent of the source. The probability or likelihood of the hazard being realised is then assessed by consideration of the directness / integrity of the exposure pathway that could link the receptor to the source. The assigned level of risk is determined by the terms of consequence and probability in accordance with C552 [36]. The final column describes all of the factors considered in the assessment and presents the justification for the assessed level of risk.

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Table 8-3 - Preliminary Risk Assessment

Source		**Receptor**/ Pathway *[Sensitivity]*	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
Made Ground across the site and within the surrounding area.	Asbestos, heavy metals, organic and inorganic compounds, acids / alkalis, PAHs, TPHs, creosote, PCBs, ash, metal fines, sulphate, glycols, fuels and oils.	**Description of the Source:** A rectangular building and associated feature (possibly a water feature) present on Site in the 1840s, remainder of the site occupied by fields. To the southwest was the Manchester and Salford Water Works Reservoir with several other water features and a Pottery and Fustian Mill. To the south was Bradford Colliery and associated coal pits. To the east the Colliery Arm (an extension of the canal) and Bradford Mill. To the north was Ashton Canal. By the 1890s the Site (and area) significantly developed by industry, including Bradford Iron works, Albion Works and various other mills and rail land. The site itself included Beswick Goods Station and associated rail lines, and residential housing. The reservoir and various other water features were all presumed infilled. The Bradford Road Gas Works were developed in the early 1900s. These works continued to expand or be developed until they were cleared in the 1980/90s. The early 2000s saw the development of the Stadium for the Commonwealth Games. The areas surrounding the Stadium have been subject to some remediation over more recent years (2000 and 2010), including lime stabilisation in the eastern part. site investigations from 2013-2014 confirmed the presence of up to approx. 5m of Made Ground with various anthropogenic inclusions (brick, concrete, ash and coal etc.) with chemical analytical data recording some slightly elevated contaminant concentrations including asbestos containing materials (at trace levels).				
		Future Site users / visitors (guests and maintenance) *[Moderate]* Direct / dermal contact. Inhalation of soils / dusts. Ingestion of contaminated water supplies.	Medium	Unlikely	**Low**	Proposed future use will comprise mostly hard landscaping (and soft landscaping likely to be raised within planters). Limited potential for dust generation, direct contact and ingestion in any areas of soft landscaping and exposure time likely to be limited. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of remediation / mitigation measures including encapsulation.
		Investigation and construction workers *[Moderate]* Direct / dermal contact. Ingestion / inhalation of contaminated soils.	Medium	Low likelihood	**Moderate / Low**	Potential for exposure during investigations/ earthworks. Period of exposure dependent on construction timescales but not long term (i.e. relevant to acute rather than chronic exposure). Standard Health and Safety precautions likely to be used by workers. Mitigation of potential risks can be achieved by appropriate investigation and adoption of standard good construction practice.
		Off Site occupiers / visitors of neighbouring land *[Moderate]* Inhalation of contaminated dusts.	Medium	Unlikely	**Low**	Enabling works have the potential to impact surrounding users by dust generation. Increased potential during any earthworks and short distance to nearest neighbours. Mitigation of potential risks can be achieved by appropriate investigation and adoption of standard good construction practice.
		Degradation of Water quality - Secondary A aquifer *[Moderate]* Migration via permeable strata	Mild	Low likelihood	**Low**	Potential for increased infiltration and promotion of leaching during enabling works. Secondary Aquifer present within the Coal Measures, beneath a substantial thickness (>10m) of low permeability Glacial Till. Deep piling could create preferential migration pathways. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.

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Source		**Receptor**/ Pathway *[Sensitivity]*	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
		Degradation of Water quality - River Medlock *[Moderate]* Migration via permeable strata	Medium	Unlikely	**Low**	Potential for increased infiltration and promotion of leaching during enabling works. River Medlock located 176m northwest of the Site, however located within a culvert. Nearest entrance to the Medlock is >300m west. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.
		Buildings/services - permeation of water supply pipework, degradation of concrete *[Low]* Direct contact/ aggressive attack/ below ground structures	Medium	Low likelihood	**Moderate / Low**	Potential for direct contact on development Site. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of appropriate design.
Made Ground, infilled land and Coal Measures	Ground gases. Leachate.	**Description of source:** Manchester and Salford Water Works Reservoir occupied a large area to the southwest of the Site (and partially covers the Site) in early 1800s but no longer recorded by 1890s (presumably infilled). In addition, Colliery Canal Arm located to the east, was largely developed over by the Bradford Iron Works, and no longer shown by the late 1960s (presumably infilled). Remediation of the canal arm took place in 2010, removing hydrocarbon impacted material. The Site is also underlain by Coal Measure strata, which has been heavily mined. There are numerous shafts within the vicinity of the Site, most of which have been located and capped. There is a potential for unrecorded shafts / workings that could form preferential migration pathways of mine gas.				
		Future Site users / visitors (residents, guests and maintenance) *[Moderate]* Asphyxiation from hazardous ground gases	Severe	Unlikely	**Moderate / Low**	Proposed future use will comprise mostly hard landscaping (and soft landscaping likely to be raised within planters). Potential for inhalation of hazardous gases generated from surrounding areas of infilled land, underlying Made Ground and /or preferential pathways (i.e. shafts) from the underlying Coal Measures. Exposure time relatively limited. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of remediation / mitigation measures.
		Investigation and construction workers *[Moderate]* Asphyxiation from hazardous ground gases	Severe	Unlikely	**Moderate / Low**	Potential for inhalation of hazardous gases generated from surrounding areas of infilled land, underlying Made Ground and /or preferential pathways (i.e. shafts) from the underlying Coal Measures. Exposure time relatively limited and poorly ventilated spaces unlikely to be encountered. Mitigation of potential risks can be achieved by appropriate investigation and adoption of standard good construction practice.

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9 Conclusions and Recommendations

9.1 Geotechnical considerations

A preliminary review of the ground model has been undertaken and associate geotechnical risks identified. At this stage of the project the main geotechnical risks identified include Coal Measures bedrock (risks include potential voids or broken ground, historic grouting and compressible material), below ground relic substructure / obstructions, potential for perched water within any Made Ground and sources of potential contamination / geotechnical properties of near surface materials for reuse on Site.

It is assumed that the foundation solution will be rotary bored piles due to the Site constraints highlighted, however there is potential for some of the piling to be undertaken using CFA techniques. No significant earthworks are anticipated and it should be noted that shallow Site won materials are likely to have limited value in terms of reuse. A preliminary assessment of grouting requirements has been undertaken and this will be reviewed on receipt of the ground investigation results.

9.2 Summary of Contamination Risks

An Initial Conceptual Site Model has been determined and a Preliminary Risk Assessment with respect to ground contamination has been carried out for the Site on the basis of desk based data. At this preliminary stage of this project the main sources of potential contamination have been identified and the potential risks have been qualitatively assessed. The assessment is based upon the Site in its current condition, but it also includes consideration of the potential risks associated with any below ground works (e.g. ground investigation or future foundation works etc.) and the potential future use. A summary of the potentially significant risks (i.e. greater than Low) is presented below.

Table 9-1 Summary of potential risks

Receptor	Source	Potential risk
Investigation and construction workers	Made Ground on site and within the surrounding area	Moderate/ Low
	Infilled land / Coal Measures / Made Ground [Hazardous ground gas and mine gas]	
Future Site users / visitors (guests and maintenance)	Infilled land / Coal Measures / Made Ground [Hazardous ground gas and mine gas]	
Buildings/services - permeation of water supply pipework, degradation of concrete	Made Ground on Site and within the surrounding area	

9.3 UXO

The risks associated with UXO for the development had initially been assessed as Moderate. Accordingly, a detailed UXO assessment has been completed by 6 Alpha Associates, the conclusion of which reports the Site is at Low risk from UXO.

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9.4 Recommendations

There are potentially significant risks associated with the Site due to geology and the former site and surrounding use. Therefore, it is recommended that a ground investigation is completed. The aims and objectives of the investigation should combine geotechnical and geoenvironmental objectives.

The geoenvironmental aims will be to gain an understanding of:

- The extent and nature of the Made Ground / fill materials,
- The ground gas regime,
- The shallow groundwater regime.

The investigation should identify the potential pathways and allow assessment of risk to sensitive receptors. This data will also inform any remediation/ mitigation requirements associated with the proposed development. To meet the aims and objectives above, the scope of the site investigation should include the following:

- Boreholes of suitable frequency and depth. Boreholes should include monitoring installations to intercept ground gas and shallow groundwater,
- Trial pitting across the Site with sampling of near surface soils,
- Chemical testing of representative soil and groundwater samples; and
- A gas and groundwater monitoring programme.

The geotechnical objectives will be to:

- Verify the stratigraphy beneath and across the Site, including depths and thickness of both the Made Ground, Glacial Deposits and depth to Rock Head.
- Confirm the location, dip, thickness and competence of the coal seams
- Undertake groundwater monitoring
- Verify the treatment works carried out through the previous grouting works undertaken locally across the Site and identify and shallow untreated mine workings.
- Provide in situ and laboratory test results in order to derive geotechnical design parameters.

The data obtained from this investigation would be collated, assessed and presented in a report suitable for submission in support of a planning application. The report would include recommendations on the need for and scope of any remediation.

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References

[1] Ministry of Housing, Communities and Local Government, "National Planning Policy Framework," Ministry of Housing, Communities and Local Government, 2021.

[2] Environment Agency, "Land Contamination Risk Management (LCRM)," Environment Agency, 2021.

[3] British Standards Institute, "BS10175:2011 +A2:2017 Investigation of Potentially Contaminated Sites - Code of Practice," British Standards Institute, 2011.

[4] Environment Agency, "GPLC1 - Guiding principles for land contamination," Environment Agency, 2010.

[5] British Geological Survey, "1:50,000 Geological Map Series, Sheet 85 (Manchester)," 2010.

[6] British Geological Survey, "1:10 000 BGS Map Sheet SJ89NE (Gorton)," 2004.

[7] ESG, "Etihad Stadium, Manchester. Extension of North and South Stands. Factual and Ground COnditions Report. [No. A3174-13]," 2014.

[8] Buro Happold Ltd, "Etihad Stadium - Preliminary Risk Assessment [No. 031608]," 2014.

[9] May Gurney, "Manchester Sportcity Remediation and Servicing Contract - Site Investigation FInal Factual Report [No. SI1565]," 2010.

[10] Norwest Holst Soil Engineering Ltd, "Report on a ground invesitgation at Manchester Stadium (Area S)," 1999.

[11] Northern Foundations Ltd, "Precis Reports on Phase 2 Site Invesitgations at Eastlands, Manchester (S.I.5700/P2)," 1995.

[12] Northern Foundations Ltd, "Various documents (S.I. 5400): Appendix A and Appendix B, borehole logs, drawings, groundwater and ground gas data," 1991.

[13] "River Levels at Gurney Street," [Online]. Available: https://riverlevels.uk/medlock-ancouts-gurney-street#google_vignette. [Accessed 30th January 2023].

[14] B. G. S. Health Protection Agency, Indicative Atlas of Radon in England and Wales, 2007.

[15] Oxford Archaeology North, "Sportycity, Bradford, Manchester - Final Excavation Report," 2011.

[16] CIRIA, "Unexploded Ordnance (UXO). A Guide for the Construction Industry (C681)," CIRIA, 2009.

[17] 6 Alpha Associates, "Detailed Unexploded Ordnance (UXO) Threat & Risk Assessment," 2022.

[18] Buro Happold Ltd, "Etihad Campus, Coal Mining Risk Assessment [NSE-BHE-XX-XX-RP-CG-000002]," 2023.

[19] Ove Arup & Partners Ltd, "Sportcity Remedaition and Servicing Works - Geotechnical Interpretative Report," 2010.

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[20] IMC Consulting Engineers, "Manchester Metrolink Phase 3 - Ground stabilisation grouting report," 2002.

[21] Van Elle Specialist Geotechnical Engineering Contractors, "Site records and grout location plans (SE stadium)," 2002.

[22] Buckingham Group Contracting Ltd, "Sportcity Remediation and Site Servicing - Master Mine Stabilisation Works Validation Report," 2011.

[23] Buckingham Group Contracting Ltd, "Area A Mine Stabilisation Works Validation Report," 2011.

[24] Buckinghams Group Contracting Ltd, "Area B Mine Stabilisation Works Validation Report," 2011.

[25] Alfred McAlpine Civil Engineering Ltd, "Manchester Stadium Enabling Works - Site Remediation Completion Report," 2000.

[26] Buckinghams Group Contracting, "Remediation Validation Report," 2011.

[27] Ove Arup & Partners Ltd, "Sportcity Remediation and Servicing Works - Outline Remedation Strategy," 2010.

[28] CC Geotechnical Ltd, "Bradford Project: Ground Investigation for Proposed Shaft - Factual Report," 2020.

[29] Ove Arup & Partners Ltd, "Manchester Stadium Calculation Sheet," 1999.

[30] Environment Agency, "GPLC2 - Guiding Principles for Land Contamination," 2010.

[31] British Standards Institute, "Adaptation to Climate Change - Principles, Requirements and Guidelines (BS EN ISO 14090:2019)," 2019.

[32] Ministry of Housing, Communities and Local Government, "National Planning Policy Framework," Ministry of Housing, Communities and Local Government, 2021.

[33] Department of the Environment Industry Profile, "Metal Manufacturing, refining and finishing works - iron and steelworks," 1995.

[34] Department of the Environment Industry Profile, "Metal manufacturing, refining and finishing works - lead works," 1995.

[35] Department of the Environment Industry Profile, "Railway land," 1995.

[36] CIRIA, "Contaminated Land Risk Assessment. A guide to good practice. C552," CIRIA, 2001.

[37] P Whitehead, "The Industrial Heritage of Britain," October 2022. [Online]. Available: http://www.pittdixon.go-plus.net/bradford-colliery/bradford-colliery.htm. [Accessed 7 November 2022].

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Relevant Drawings

NSE-BHE-XX-XX-DR-CG-001001 – Previous site investigation

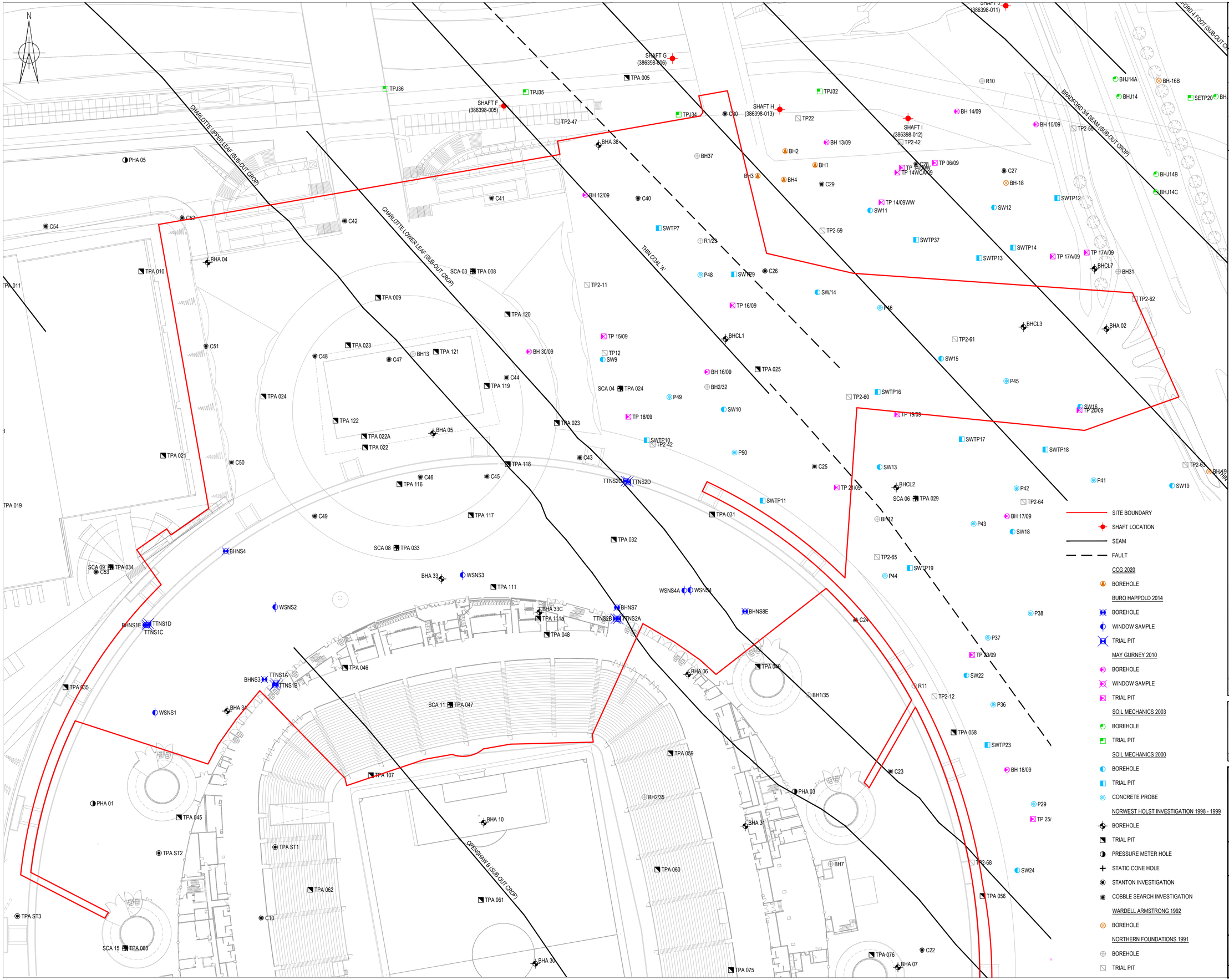
NSE-BHE-XX-XX-DR-CG-001002- Geological cross section

NSE-BHE-XX-XX-DR-CG-001003 – Mining treatment areas

NSE-BHE-XX-XX-DR-CG-001004 - Site constraints plan

NSE-BHE-XX-XX-DR-CG-001005 – Proposed ground investigation

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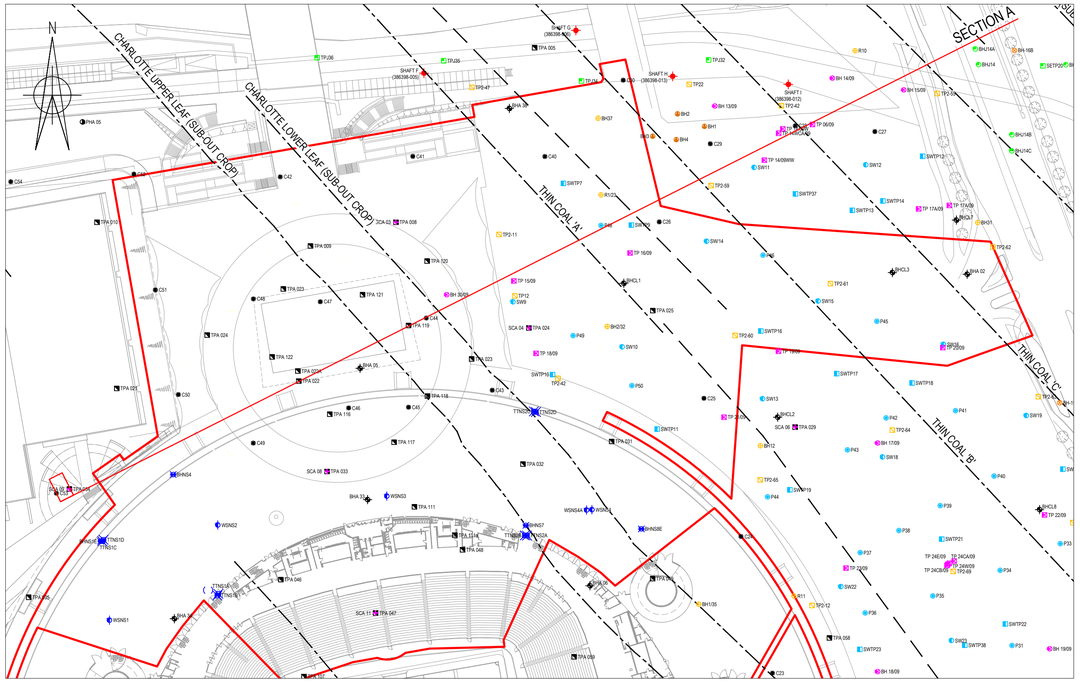
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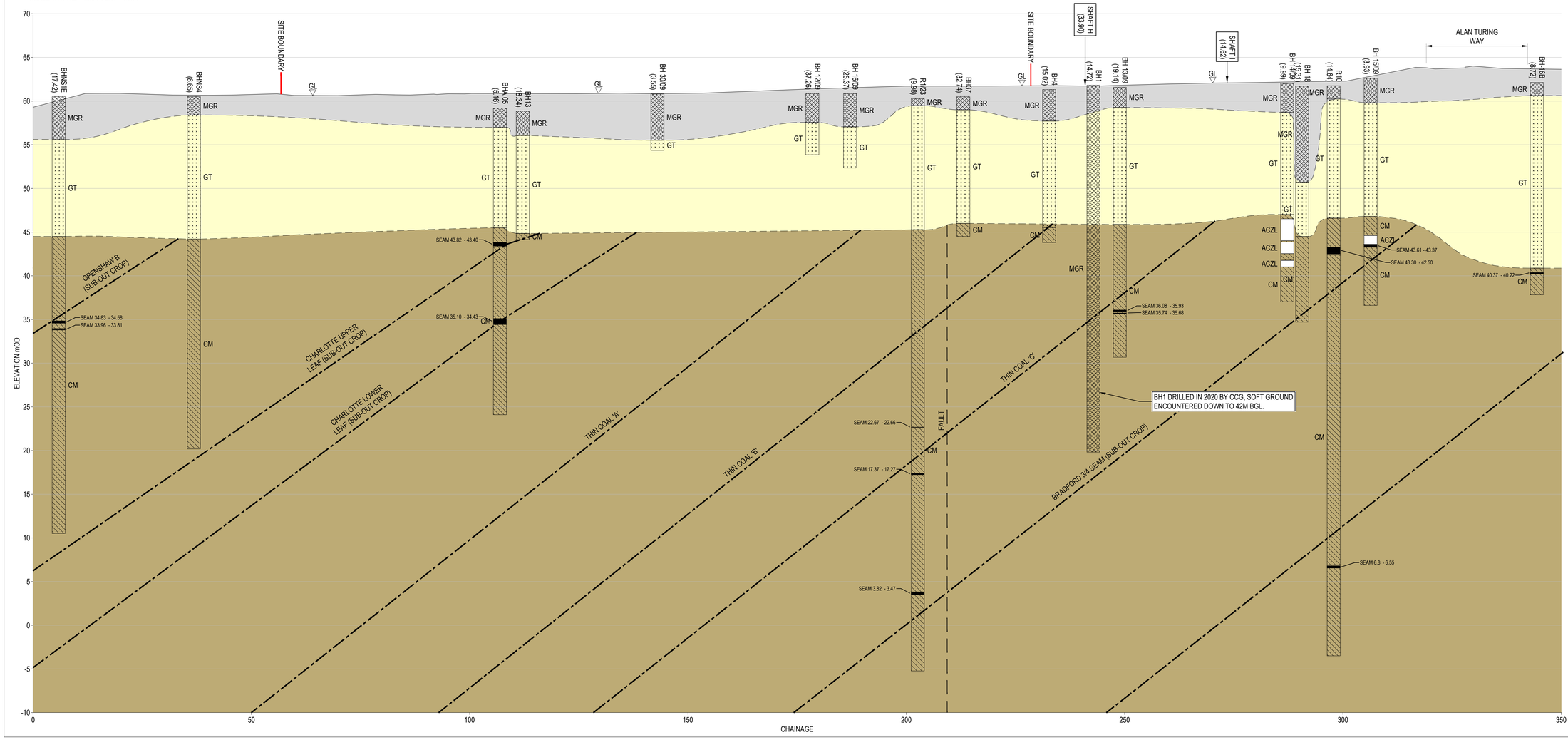
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SECTION A

SCALES: HORIZ - 1:500 VERT - 1:250



- SITE BOUNDARY
- INDICATIVE SEAM
- POSSIBLE FAULT LOCATION
- GL — GROUND LEVEL FROM TOPOGRAPHICAL SURVEY DATA
- (8.65) — BOREHOLE OFFSET FROM SECTION LINE
- MGR — MADE GROUND
- GT — GLACIAL TILL
- CM — COAL MEASURES
- AZCL — ZONE OF CORE LOSS

INFERRED GEOLOGY

- MADE GROUND
- GLACIAL TILL
- COAL MEASURES

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N

SHAFT A (386398-004)
SHAFT B (386398-003)
SHAFT C (386398-002)
SHAFT D (386398-010)
SHAFT E (386398-001)
SHAFT F (386398-005)
SHAFT G (386398-006)
SHAFT H (386398-013)
SHAFT I (386398-012)
SHAFT J (386398-011)
SHAFT P (386398-011)
(386398-019)
(386398-020)

CHARLOTTE UPPER LEAF (SUB-OUT CROP)
CHARLOTTE LOWER LEAF (SUB-OUT CROP)
OPENSHAW B (SUB-OUT CROP)
YARD (SUB-OUT CROP)
18 INCH SEAM
THIN COAL 'A'
THIN COAL 'B'
THIN COAL 'C'
THIN COAL
BRADFORD 4 FOOT (SUB-OUT CROP)
BRADFORD 3/4 SEAM (SUB-OUT CROP)
BRADFORD UPPER 3/4 SEAM (SUB-OUT CROP)

SHAFT EE (387398-033)
(387398-011)
(387398-012)
SHAFT Q (387398-016)
(387398-015)
(387398-030)
SHAFT S (387398-017)
SHAFT R (387398-018)
(387398-019)
SHAFT T (387398-020)
SHAFT U (387398-021)
(387398-77)
SHAFT Z (387398-028)
SHAFT FF (386398-019)

AREA AT RISK (SUBJECT TO FURTHER REVIEW AND ADDITIONAL GI)

PROPOSED FURTHER GROUTING WORKS

PROPOSED FURTHER GROUTING - 3M GRID TO 30M DEPTH (ASSUMED). MIN. 140 DRILL HOLES.

PROPOSED FURTHER GROUTING - 6M GRID TO 30M DEPTH (ASSUMED). MIN. 180 DRILL HOLES.

SITE BOUNDARY

GROUT TREATMENT ZONE (SEE BELOW FOR DATA AVAILABILITY & SOURCE)

GROUT TREATMENT LOCATION

SHAFT LOCATION

AREA OF SHAFT PROBING INVESTIGAITON

SEAM

FAULT

GROUTING DATA AVAILABILITY

1. 2001 IMC DRILLTEC NORTHERN LTD: DRILL AND GROUT DATA RECEIVED - AREA 6 (CHT), AREA 7 (OPS
2. NO GROUT DATA AVAILABLE
3. 2010 BWB: DRILL AND GROUT DATA RECEIVED - TREATMENT AREA E (OPS)
4. 2010 BWB: DRILL AND GROUT DATA RECEIVED - TREATMENT AREA D (CHT)
5. 1993 WARDELL ARMSTRONG: DRILL AND GROUT DATA RECEIVED - ZONE 4 (CHT)
6. 2010 BWB: DRILL AND GROUT DATA RECEIVED - VALIDATION AREA D (CHT)
7. 2001 VAN ELLE: DRILL AND GROUT DATA RECEIVED (CHT) & 2010 BWB: DRILL AND GROUT DATA RECEIVED - VALIDATION AREA C (CHT
8. 1993 WARDELL ARMSTRONG: DRILL AND GROUT DATA RECEIVED - ZONE 3 (BR)
9. SPORTCITY ENABLING WORKS VALIDATION REPORT,JAN 2004
10. 2010 BWB: DRILL AND GROUT DATA RECEIVED - TREATMENT AREA C (BR)
11. 2010 BWB: DRILL AND GROUT DATA RECEIVED - VALIDATION AREA B (BR)
12. 2001 IMC DRILLTEC NORTHERN LTD: DRILL AND GROUT DATA RECEIVED - AREA 3 (BR)
13. SPORTCITY ENABLING WORKS VALIDATION REPORT,JAN 2004
14. 1993 WARDELL ARMSTRONG, INTERMEDIATE RING ROAD

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BWB CONSULTING, SCOPE OF WORKS FOR MINE WORKINGS TREATMENT AND VALIDATION, DRAWING NO. NTH/185/211, REVISION P2, 14.10.2010.

BWB CONSULTING, FIGURE 5 VALIDATION AREA B MINE STABILISATION WORKS, DRAWING NO. NTH 185/03/AREAA/F5, 02.2011.

BWB CONSULTING, FIGURE 6 VALIDATION AREA C MINE STABILISATION WORKS, DRAWING NO. NTH 185/03/AREAB/F6, 02.2011.

BWB CONSULTING, FIGURE 7 VALIDATION AREA C MINE STABILISATION WORKS, DRAWING NO. NTH 185/03/AREAA/F7, 02.2011.

BWB CONSULTING, SCOPE OF WORKS FOR MINE WORKINGS TREATMENT AND VALIDATION SHEET 1, DRAWING NO. NTH/185/210, REVISION P2, 14.10.2010.

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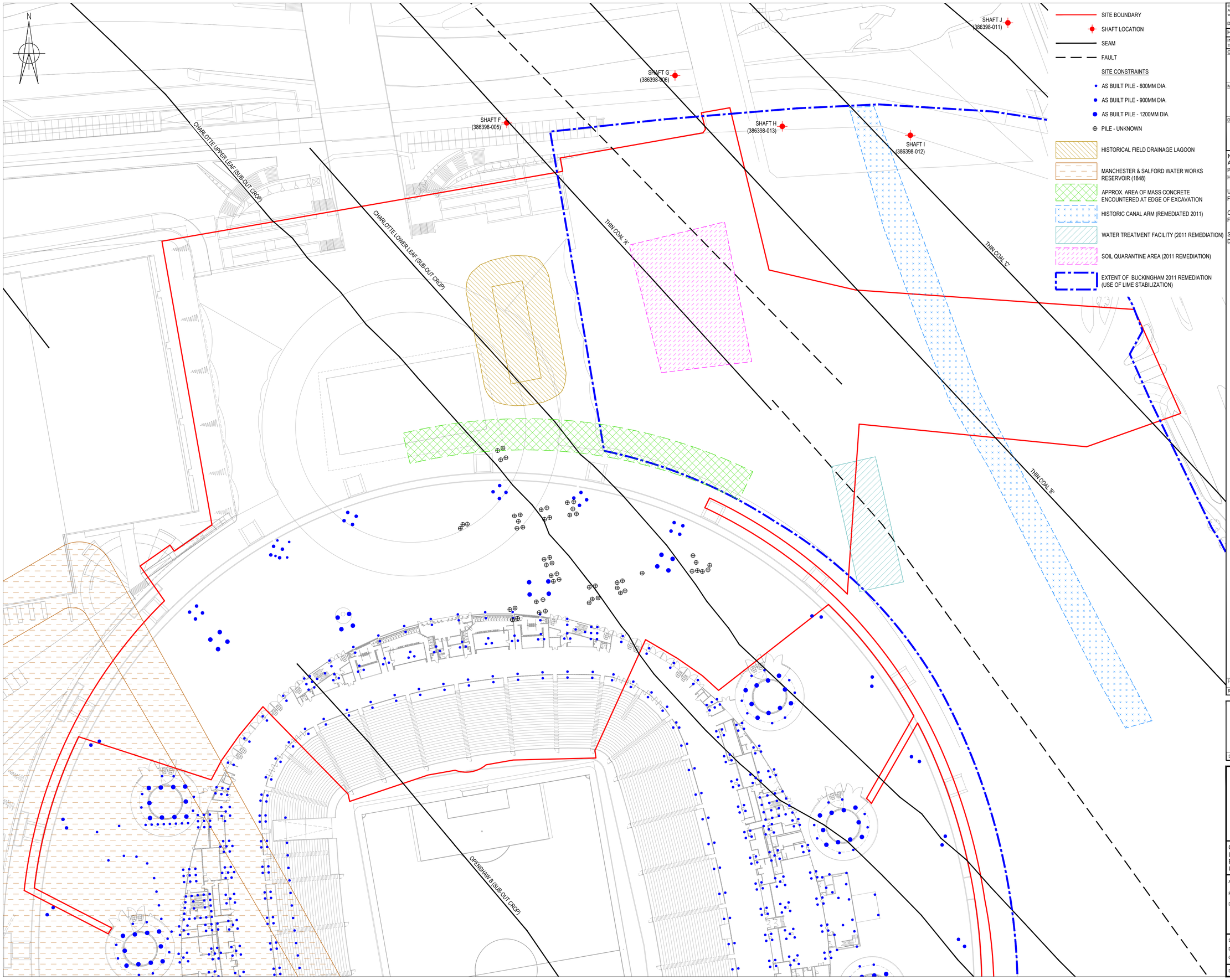
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UNKNOWN PILES & LAGOON, REF. McALPINE, LOCATION OF BURIED FEATURES, DRAWING NO. STAD/LSS/211A, AUGUST 2011.

CANAL ARM, REF. ARUP, POTENTIAL RESIDUAL CONTAMINATION, FIGURE 16, 15.10.2008.

SOIL QUARANTINE AREA, REF. BUCKINGHAM, SITE LAYOUT PLAN DURING REMEDIAL WORKS, DRAWING NO. RM14, 24.02.2011.

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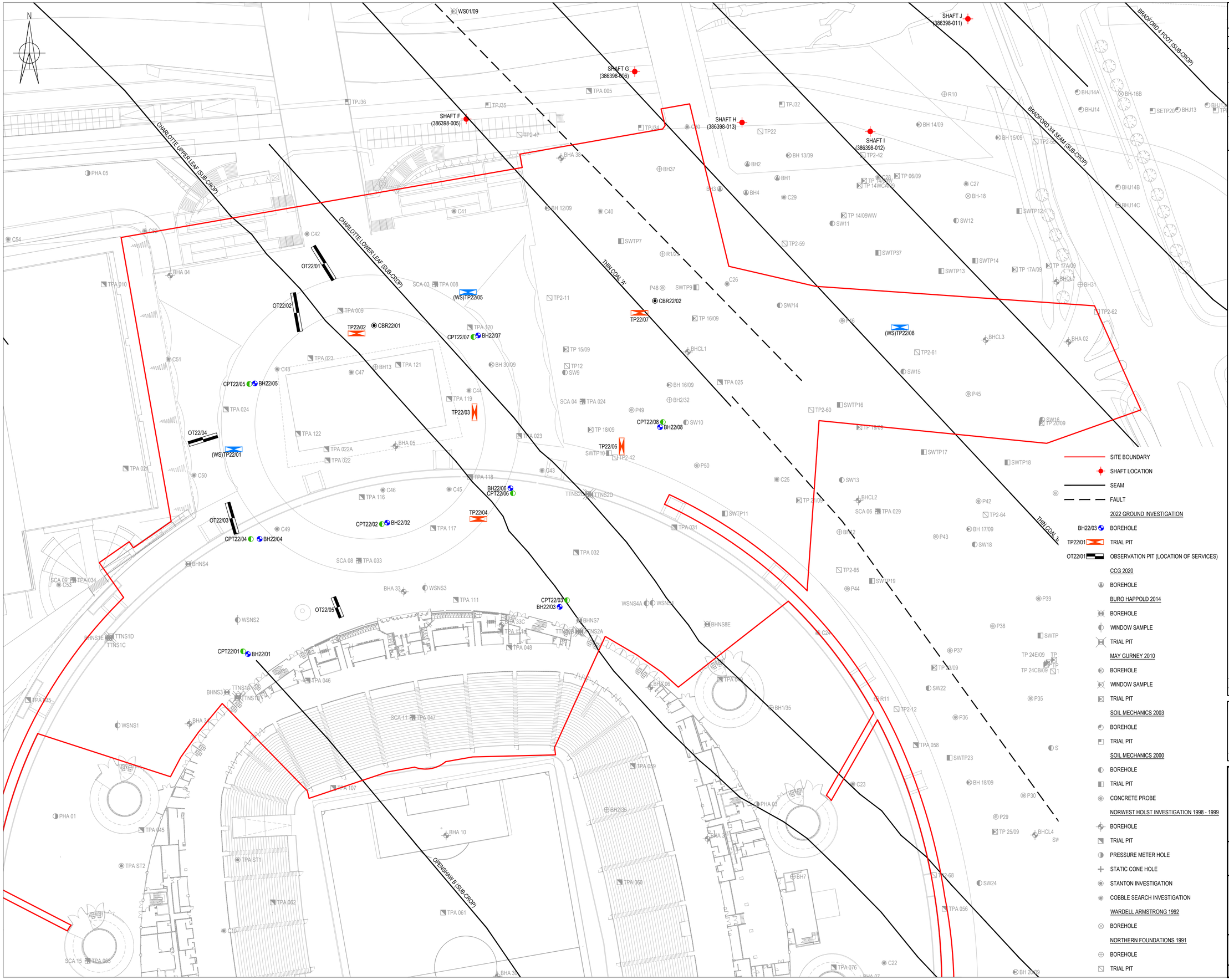
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SOAKAWAY TO BE INCLUDED WITHIN TP22/02.

IN SITU CBR TO BE INCLUDED WITHIN TP22/02 AND TP22/07.

DOWNHOLE GEOPHYSICS TO BE INCLUDED WITHIN BH22/04 AND BH22/06.

GROUND GAS AND GROUNDWATER INSTALLATIONS TO BE INCLUDED IN ALL BOREHOLES (2X INSTALLATIONS PER LOCATION).

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Appendix A Preliminary UXO Risk Assessment

This Preliminary UXO Risk Assessment has been carried out by Buro Happold in accordance with CIRIA C681 [16]. The purpose of the preliminary risk assessment is a qualitative screening exercise to assess the likelihood of finding UXO at the Site. This can then be used to make an informed decision if further UXO specific risk management is required.

The assessment is based on data obtained from a desktop review of information, including Site location, bombing records, historical uses, historical development and proposed development. A UXO risk map from Zetica was also obtained for this assessment. (Attachment 3).

Item	Comments	Score
Site Setting	The Site covers some 3.5 ha at Manchester City Football Club located off Joe Mercer Way, Manchester. The Site is centred on National Grid Reference SJ 86777 98642 and located within the remit of Manchester City Council. The Stadium, City Shop and surrounding infrastructure currently occupy the site. To the north are Ashton Canal, Joe Mercer Way with the new Co-Op Live arena to the east and the Manchester Tennis and Football Centre to the west. Beyond these is Sportcity Way. To the south is the Manchester City Football Club Stadium.	4
Site description and historical land usage	From the 1840s the Site was shown as fields with several tracks passing through, these all led to a structure in the northeast. Part of the site (southwest) was occupied by Manchester and Salford Water Works Reservoir. By the 1890s, significant industrial development took place across the site, including Bradford Iron Works and associated infrastructure (rail lines). By 1905 the gas works was developed to the north. Between the 1930s and 1950s there were no significant changes to the site. Some redevelopment in the 1960s from residential to industrial (works). Complete redevelopment of the site in the 1980s. Clearance of the Site in 1990s and then construction of the Stadium in the early 2000s.	8
Record of bombing	Zetica: Area highlighted as a moderate area of bomb risk. Northwest and east include Luftwaffe target markers. The Site is within an area of known WWII bombing.	8
Level of post war development	Significant post war development (>80% of the Site)	-6
Level of proposed intrusive works	Significant proposed development (80% of Site)	0
Assessed Risk	Moderate	20, -7
Recommendations	The preliminary UXO risk assessment for the Site is Moderate, therefore a detailed risk assessment is recommended prior to commencement of any intrusive works.	
Attachments	**Table 0-1 -** Potential aerial delivered UXO hazards	

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	Table 0-2 - Mitigation factors **Table 0-3 -** Final score summary **Attachment 1 –** Pre- WWII Historical Map **Attachment 2 –** Post – WWII Historical Map **Attachment 3 –** Zetica map

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Table 0-1 Scoring process for indicators of potential aerial delivered UXO hazards

Data Item	**Increasing Potential for aerial delivered UXO Hazards** →			
	1	**2**	**4**	**8**
A - site Setting	Rural	Small towns	Cities Large Towns	
B - site description and historical land usage	Greenfield site only Agricultural land only	Residential only Within 10 mile radius of site of previous military use Within 5 mile radius of wartime[1] for following: Railway marshalling yard Power station Gas works Port Industrial centre	Within 5 mile radius of site of previous military use Within 1 mile radius of wartime[1] for following: Railway marshalling yard Power station Gas works Port Industrial centre On wartime[1] flight paths	Within 1 mile radius of site of previous military use Former wartime[1]: Railway marshalling yard Power station Gas works Port Industrial centre
C – Record of bombing	No history of WWII bombing	Within 10 mile radius of area of known WWII bombing	Within 5 mile radius of area of known WWII bombing	Area of known WWII bombing

[1]Wartime refers to the site being in use at the time of WWI and WWII when its significance may have caused it to be the target of an enemy attack.

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Table 0-2 Scoring process for considering mitigation factors

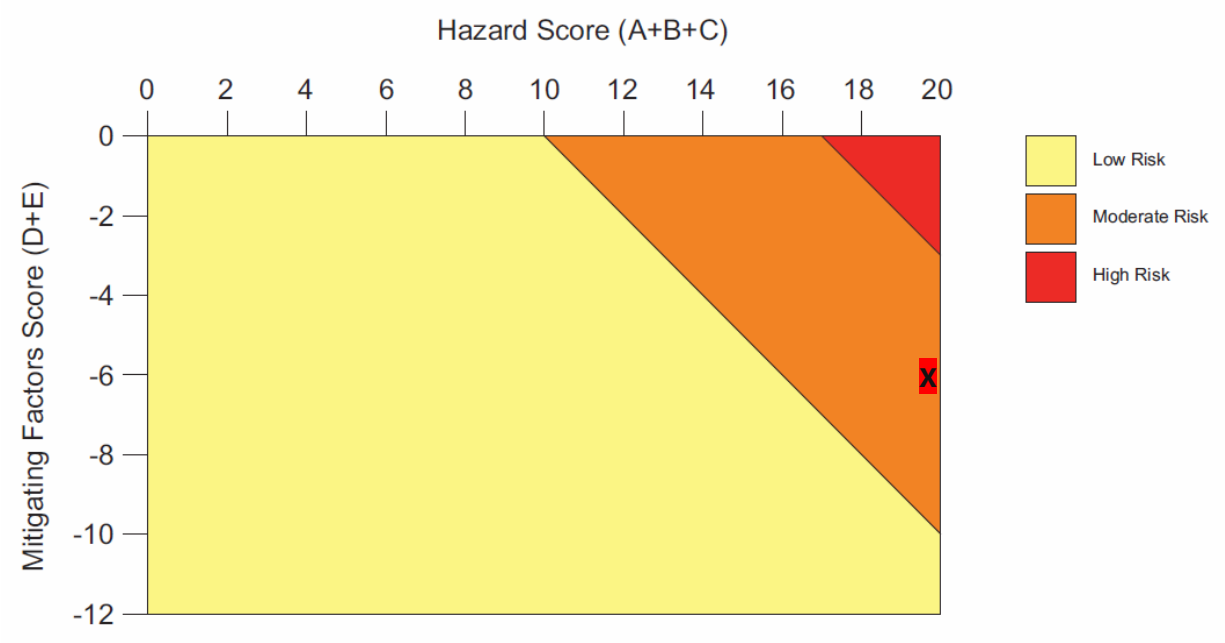
Data Item	**Decreasing Potential for aerial delivered UXO Hazards** ←				
	-6	**-5**	**-3**	**-1**	**0**
D - Level of post war development	Whole site redevelopment (100% of the site)	Significant post war development (>80% of the site)	Moderate level of post war development (<80% and ≥45% of the site)	Some post war development (<45% and ≥10% of the site)	Minimal post war development (<10% of the site)
E - Level of proposed intrusive works in areas not subject to post war development[1]	Very Small (<5%)	Small (<10%)	Some (<45% and ≥10%)	Moderate (<80% and ≥45%)	Significant (>80%)

[1]Only if the level of post-war development is known and can be quantified in terms of site area and an approximation of depth should a mitigation factor be applied.

Table 0-3 Final score is based on the sum of rows A, B, C, D and E in Table 0-1and Table 0-2

Final Hazard Score	**Risk of encountering an Aerial dropped UXO**	**Implication**
-9 - 9	Low Risk	No further UXO risk assessment likely to be required
10 - 17	Moderate Risk	Detailed UXO Risk Assessment required
17 - 20	High Risk	Detailed UXO Risk Assessment required.

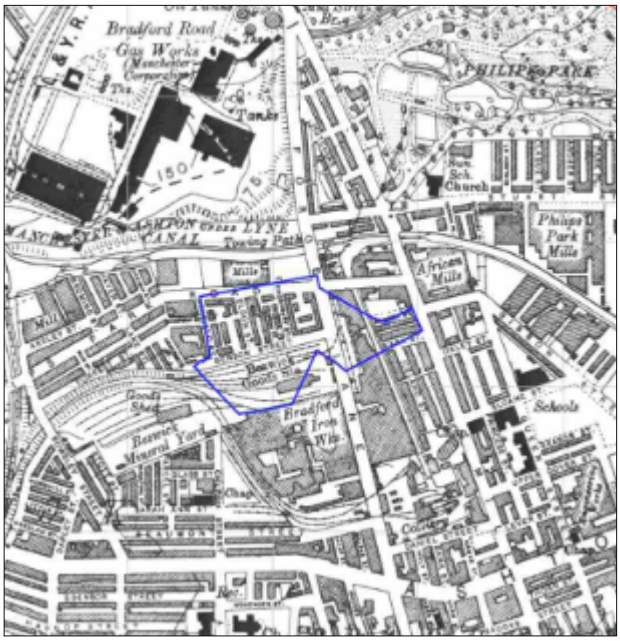
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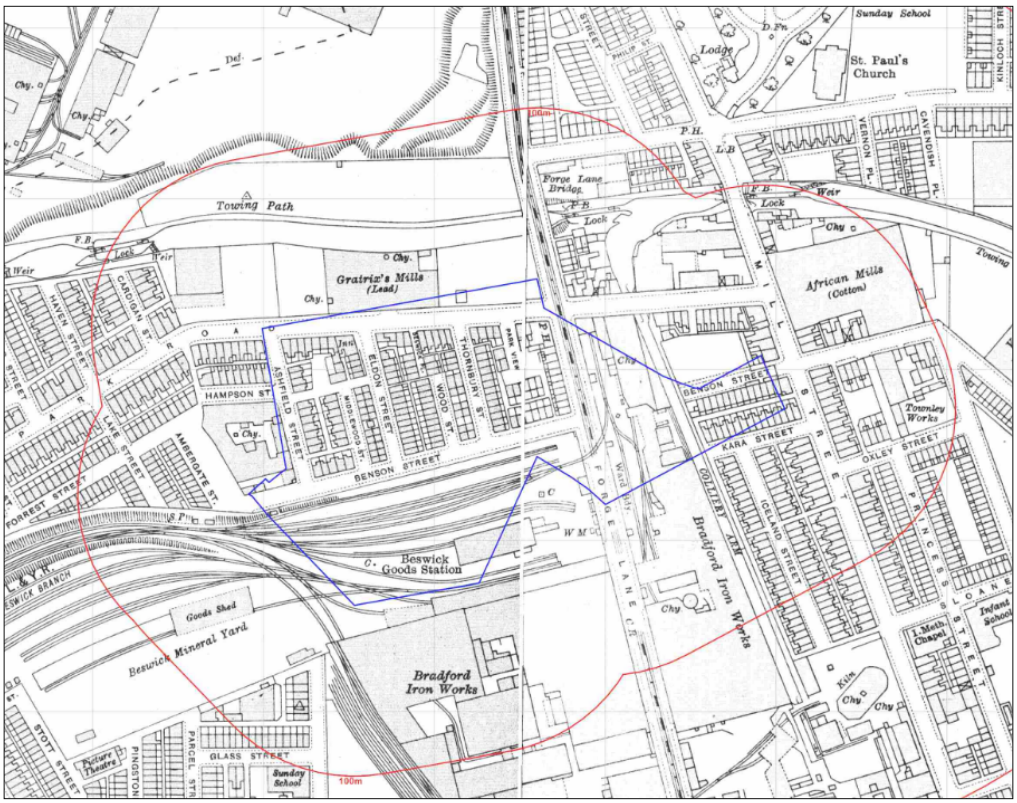


This risk assessment methodology is intended as a generic tool. A small number of sites with unusual site-specific conditions may require additional consideration of the hazard scoring.

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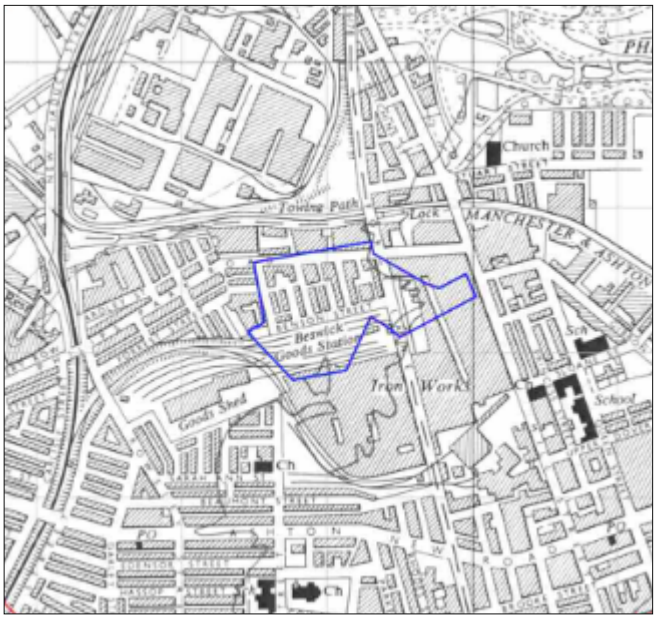
Attachment 1. Pre-WWII Historical Map, 1920s, extracts from the Groundsure Report

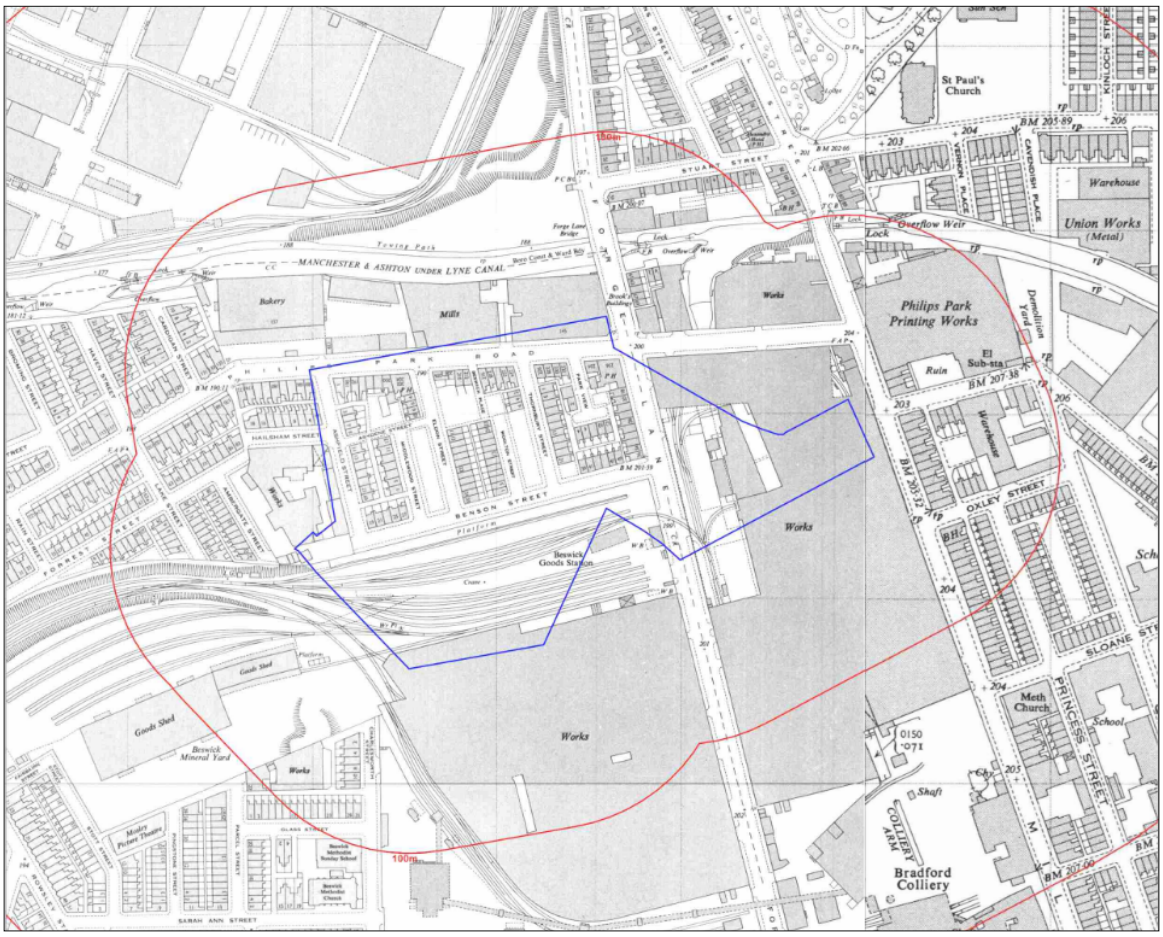




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Attachment 2. Post-WWII Historical Map, 1950s, extracts from the Groundsure Report





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Attachment 3. Zetica UXO

UNEXPLODED BOMB RISK MAP

zeticauxo

SITE LOCATION

Map Centre: 386779,398663



LEGEND

- **High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- **Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- **Low:** Areas indicated as having 15 bombs per 1000acre or less.

miltary **industry** **UXO find**
transport **dock** **Luftwaffe targets**
utilities **Bombing decoy** **other**

How to use your Unexploded Bomb (UXB) risk map?
The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?
Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?
If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: **(https://zeticauxo.com/downloads-and-resources/risk-maps/)**

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

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Appendix B Groundsure Report

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Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

386784 398665,

Order Details

Date: 30/01/2023

Your ref: 0053810_2006_FG_Main_Application

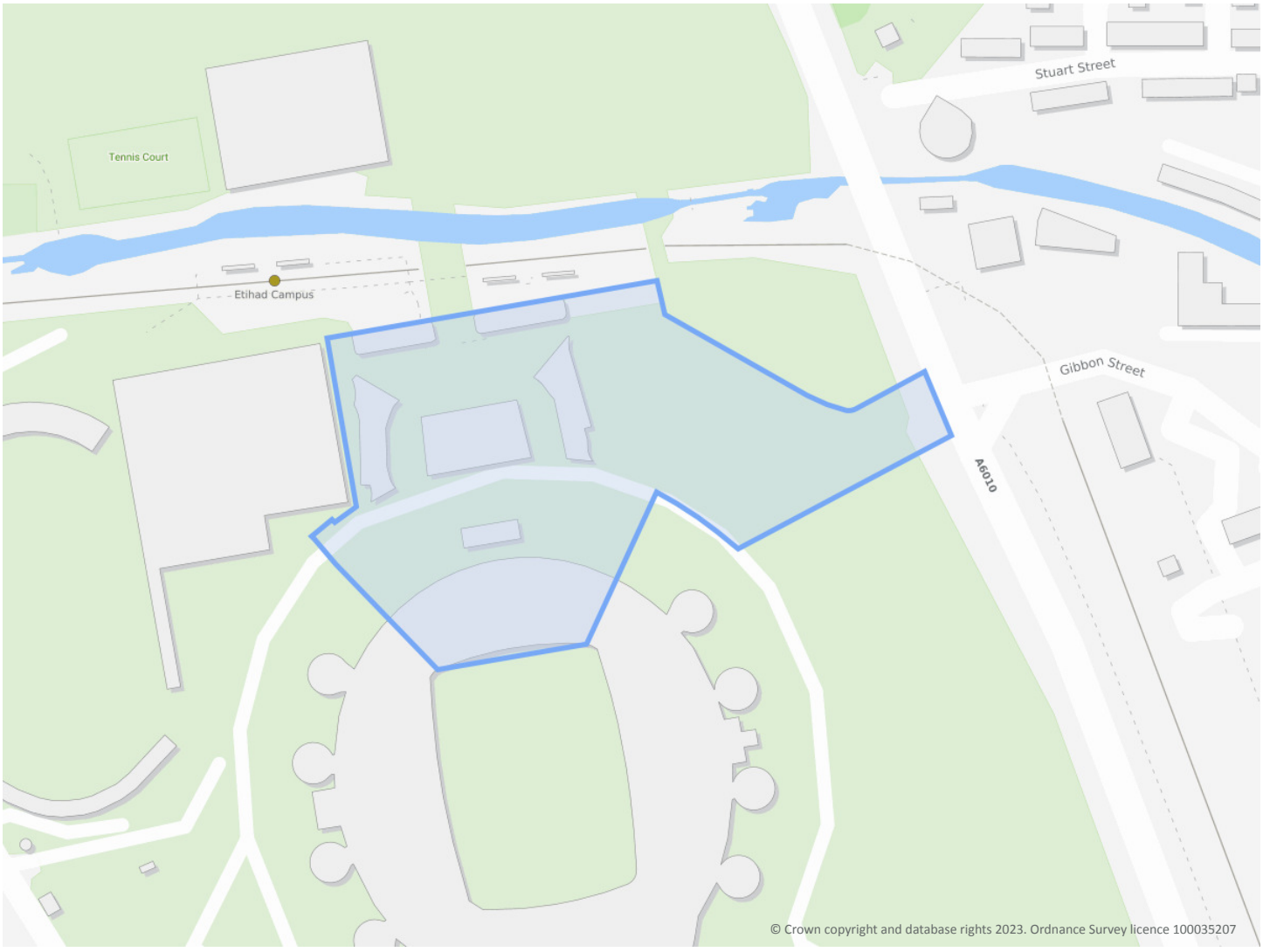
Our Ref: GS-9323378

Site Details

Location: 386795 398677

Area: 3.3 ha

Authority: Manchester City Council



Summary of findings p. 2

OS MasterMap site plan p.12

Aerial image p. 8

groundsure.com/insightuserguide

Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
13	1.1	Historical industrial land uses	34	25	60	192	-
25	1.2	Historical tanks	0	5	48	176	-
33	1.3	Historical energy features	0	4	15	38	-
36	1.4	Historical petrol stations	0	0	0	0	-
36	1.5	Historical garages	0	0	2	3	-
36	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
37	2.1	Historical industrial land uses	43	36	87	282	-
54	2.2	Historical tanks	0	7	65	262	-
66	2.3	Historical energy features	0	7	34	68	-
70	2.4	Historical petrol stations	0	0	0	0	-
70	2.5	Historical garages	0	0	2	4	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
72	3.1	Active or recent landfill	0	0	0	0	-
72	3.2	Historical landfill (BGS records)	0	0	0	0	-
73	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
73	3.4	Historical landfill (EA/NRW records)	0	1	0	3	-
74	3.5	Historical waste sites	0	0	1	11	-
76	3.6	Licensed waste sites	0	0	0	2	-
76	3.7	Waste exemptions	0	0	3	6	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
78	4.1	Recent industrial land uses	0	1	9	-	-
79	4.2	Current or recent petrol stations	0	0	1	0	-
79	4.3	Electricity cables	0	0	0	0	-
80	4.4	Gas pipelines	0	0	0	0	-
80	4.5	Sites determined as Contaminated Land	0	0	0	0	-

80	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	3	-
80	4.7	Regulated explosive sites	0	0	0	0	-
81	4.8	Hazardous substance storage/usage	0	0	0	6	-
82	4.9	Historical licensed industrial activities (IPC)	0	0	0	9	-
83	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
83	4.11	Licensed pollutant release (Part A(2)/B)	0	0	1	3	-
84	4.12	Radioactive Substance Authorisations	0	0	0	1	-
84	4.13	Licensed Discharges to controlled waters	0	0	1	2	-
85	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
85	4.15	Pollutant release to public sewer	0	0	0	0	-
85	4.16	List 1 Dangerous Substances	0	0	0	4	-
86	4.17	List 2 Dangerous Substances	0	0	0	1	-
86	4.18	Pollution Incidents (EA/NRW)	0	0	0	8	-
87	4.19	Pollution inventory substances	0	0	0	0	-
88	4.20	Pollution inventory waste transfers	0	0	0	0	-
88	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
89	5.1	Superficial aquifer	Identified (within 500m)				
90	5.2	Bedrock aquifer	Identified (within 500m)				
91	5.3	Groundwater vulnerability	Identified (within 50m)				
92	5.4	Groundwater vulnerability- soluble rock risk	Identified (within 0m)				
92	5.5	Groundwater vulnerability- local information	None (within 0m)				
93	5.6	Groundwater abstractions	0	0	0	0	25
100	5.7	Surface water abstractions	0	0	0	0	6
101	5.8	Potable abstractions	0	0	0	0	0
102	5.9	Source Protection Zones	0	0	0	0	-
102	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
103	6.1	Water Network (OS MasterMap)	0	3	3	-	-

104	**6.2**	**Surface water features**	0	1	2	-	-
104	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
105	**6.4**	**WFD Surface water bodies**	0	1	1	-	-
105	**6.5**	**WFD Groundwater bodies**	1	-	-	-	-

Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
107	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
107	7.2	Historical Flood Events	0	0	0	-	-
107	7.3	Flood Defences	0	0	0	-	-
108	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
108	7.5	Flood Storage Areas	0	0	0	-	-
109	7.6	Flood Zone 2	None (within 50m)				
109	7.7	Flood Zone 3	None (within 50m)				

Page	Section	Surface water flooding	
110	**8.1**	**Surface water flooding**	1 in 30 year, 0.3m - 1.0m (within 50m)

Page	Section	Groundwater flooding	
112	**9.1**	**Groundwater flooding**	Low (within 50m)

Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
113	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
114	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
114	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
114	10.4	Special Protection Areas (SPA)	0	0	0	0	0
114	10.5	National Nature Reserves (NNR)	0	0	0	0	0
115	**10.6**	**Local Nature Reserves (LNR)**	0	0	0	0	1
115	10.7	Designated Ancient Woodland	0	0	0	0	0
115	10.8	Biosphere Reserves	0	0	0	0	0
115	10.9	Forest Parks	0	0	0	0	0
116	10.10	Marine Conservation Zones	0	0	0	0	0
116	**10.11**	**Green Belt**	0	0	0	0	1
116	10.12	Proposed Ramsar sites	0	0	0	0	0

116	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
117	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
117	10.15	Nitrate Sensitive Areas	0	0	0	0	0
117	**10.16**	**Nitrate Vulnerable Zones**	0	0	0	0	1
118	**10.17**	**SSSI Impact Risk Zones**	1	-	-	-	-
119	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
120	11.1	World Heritage Sites	0	0	0	-	-
121	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
121	11.3	National Parks	0	0	0	-	-
121	**11.4**	**Listed Buildings**	0	0	4	-	-
122	11.5	Conservation Areas	0	0	0	-	-
122	11.6	Scheduled Ancient Monuments	0	0	0	-	-
122	**11.7**	**Registered Parks and Gardens**	0	0	1	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
124	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
125	12.2	Open Access Land	0	0	0	-	-
125	12.3	Tree Felling Licences	0	0	0	-	-
125	12.4	Environmental Stewardship Schemes	0	0	0	-	-
125	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
126	**13.1**	**Priority Habitat Inventory**	0	0	1	-	-
127	13.2	Habitat Networks	0	0	0	-	-
127	**13.3**	**Open Mosaic Habitat**	0	2	0	-	-
127	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
128	**14.1**	**10k Availability**	Identified (within 500m)				
129	**14.2**	**Artificial and made ground (10k)**	2	1	2	5	-
131	**14.3**	**Superficial geology (10k)**	1	0	1	1	-

132	14.4	Landslip (10k)	0	0	0	0	-
133	14.5	Bedrock geology (10k)	1	1	1	1	-
134	14.6	Bedrock faults and other linear features (10k)	3	0	2	2	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
135	15.1	50k Availability	Identified (within 500m)				
136	15.2	Artificial and made ground (50k)	1	0	0	0	-
137	15.3	Artificial ground permeability (50k)	1	0	-	-	-
138	15.4	Superficial geology (50k)	1	0	1	0	-
139	15.5	Superficial permeability (50k)	Identified (within 50m)				
139	15.6	Landslip (50k)	0	0	0	0	-
139	15.7	Landslip permeability (50k)	None (within 50m)				
140	15.8	Bedrock geology (50k)	1	1	1	1	-
141	15.9	Bedrock permeability (50k)	Identified (within 50m)				
141	15.10	Bedrock faults and other linear features (50k)	3	1	1	1	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
142	16.1	BGS Boreholes	39	65	296	-	-
Page	Section	Natural ground subsidence					
158	17.1	Shrink swell clays	Very low (within 50m)				
159	17.2	Running sands	Very low (within 50m)				
160	17.3	Compressible deposits	Very low (within 50m)				
162	17.4	Collapsible deposits	Very low (within 50m)				
163	17.5	Landslides	Very low (within 50m)				
164	17.6	Ground dissolution of soluble rocks	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
166	18.1	Natural cavities	0	0	0	0	-
167	18.2	BritPits	0	0	1	1	-
167	18.3	Surface ground workings	3	15	35	-	-
169	18.4	Underground workings	0	0	7	0	0
170	18.5	Historical Mineral Planning Areas	0	0	0	0	-

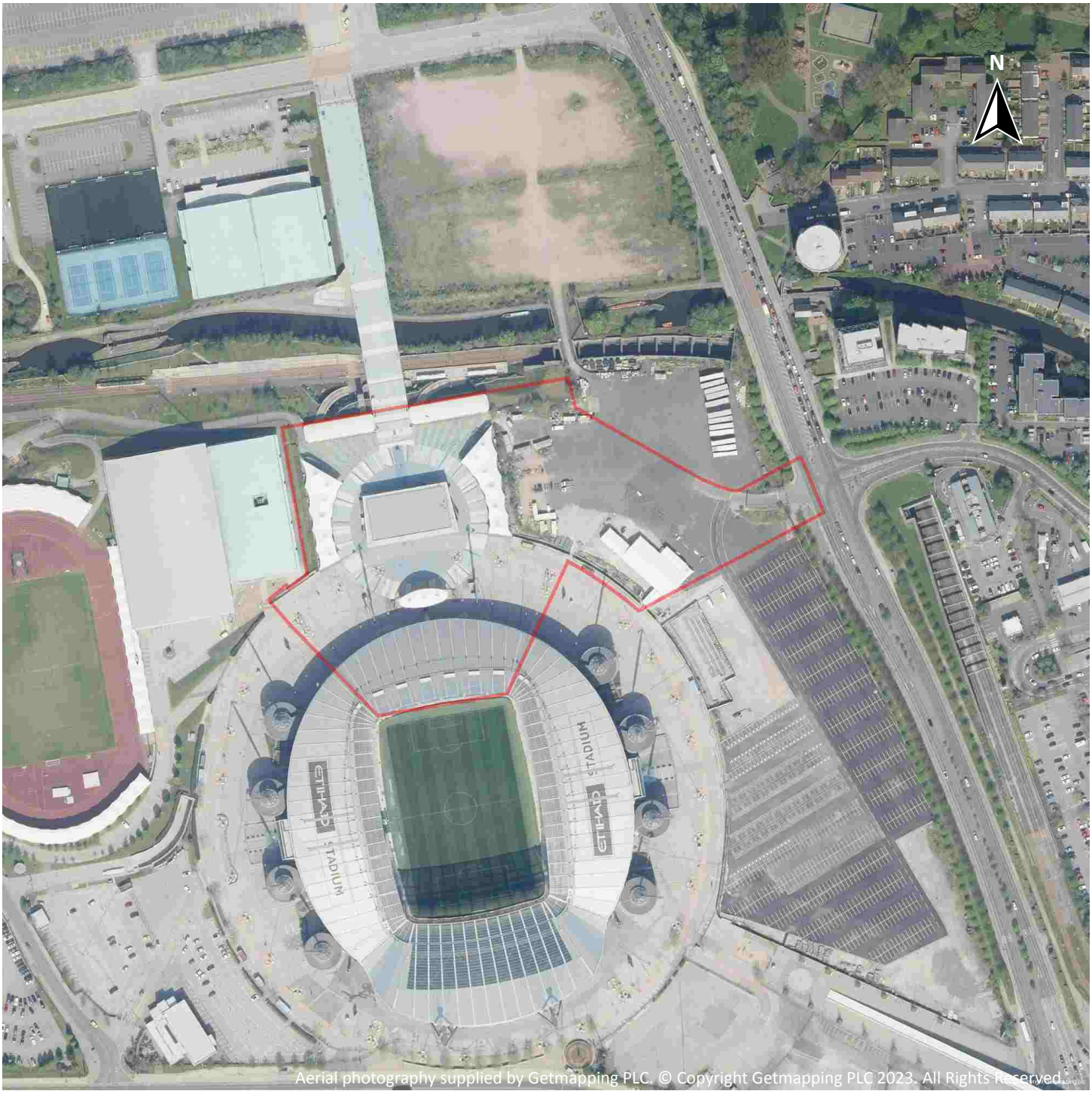
170	18.6	Non-coal mining	0	0	1	0	1
171	18.7	Mining cavities	0	0	0	1	1
171	18.8	JPB mining areas	Identified (within 0m)				
171	18.9	Coal mining	Identified (within 0m)				
172	18.10	Brine areas	None (within 0m)				
172	18.11	Gypsum areas	None (within 0m)				
172	18.12	Tin mining	None (within 0m)				
172	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
173	19.1	Radon	Less than 1% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
175	20.1	BGS Estimated Background Soil Chemistry	3	0	-	-	-
175	20.2	BGS Estimated Urban Soil Chemistry	11	4	-	-	-
176	20.3	BGS Measured Urban Soil Chemistry	1	0	-	-	-

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
177	21.1	Underground railways (London)	0	0	0	-	-
177	21.2	Underground railways (Non-London)	0	0	0	-	-
178	21.3	Railway tunnels	0	1	0	-	-
178	21.4	Historical railway and tunnel features	26	12	49	-	-
181	21.5	Royal Mail tunnels	0	0	0	-	-
182	21.6	Historical railways	1	0	0	-	-
182	21.7	Railways	0	8	11	-	-
183	21.8	Crossrail 1	0	0	0	0	-
183	21.9	Crossrail 2	0	0	0	0	-
183	21.10	HS2	0	0	0	0	-

Recent aerial photograph

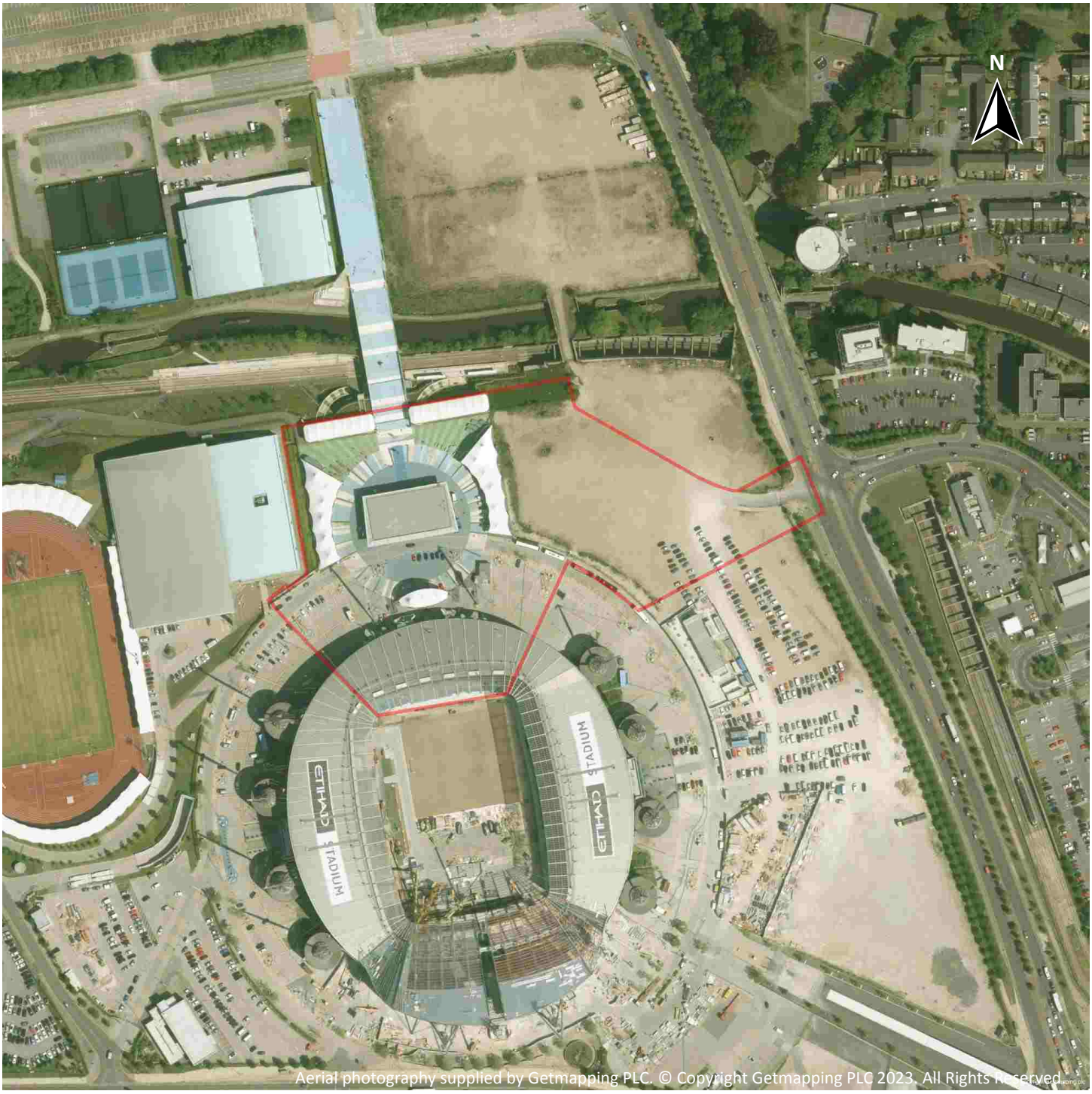


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Capture Date: 22/04/2019

Site Area: 3.3ha

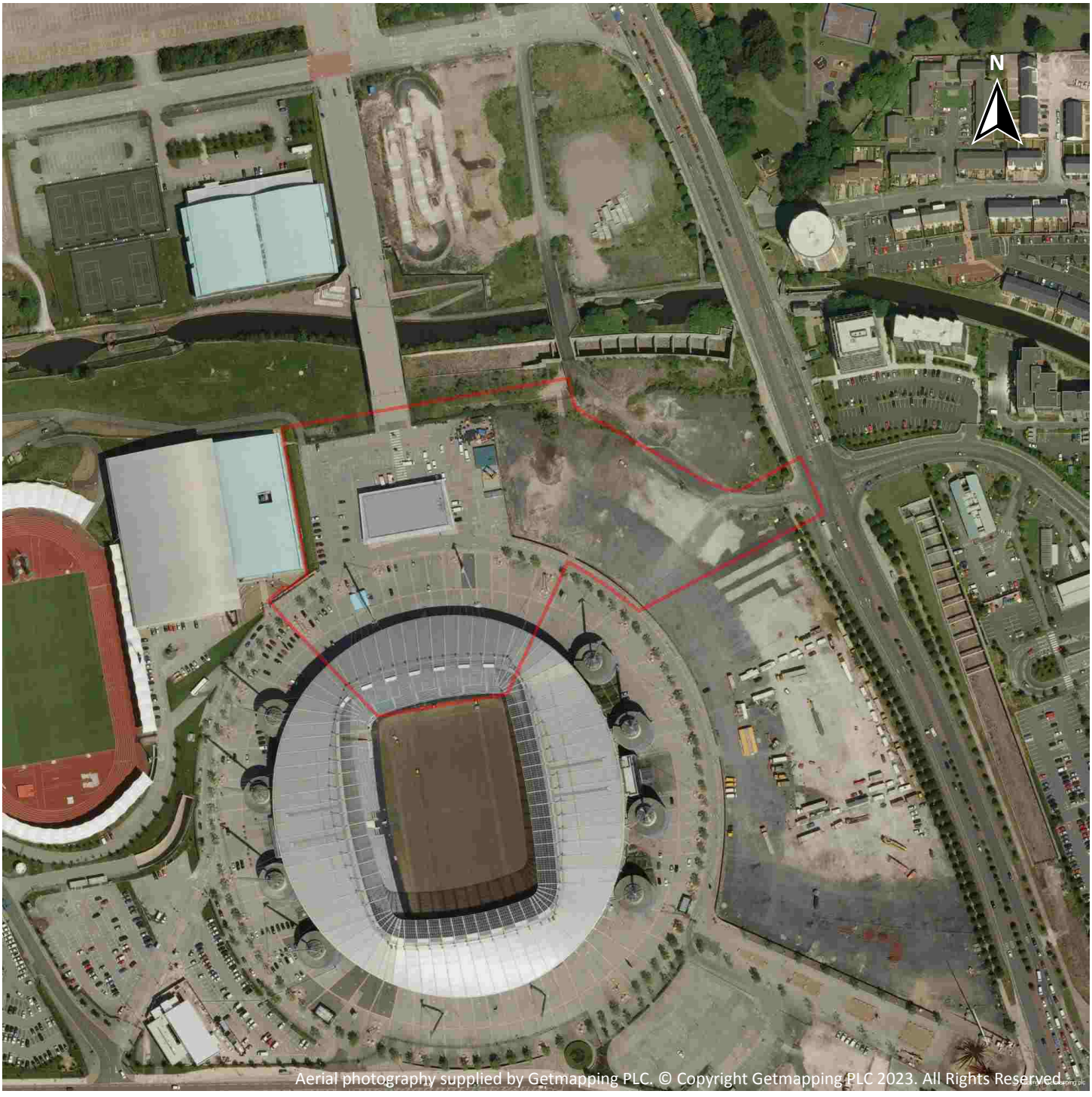
Recent site history - 2015 aerial photograph



Capture Date: 11/06/2015

Site Area: 3.3ha

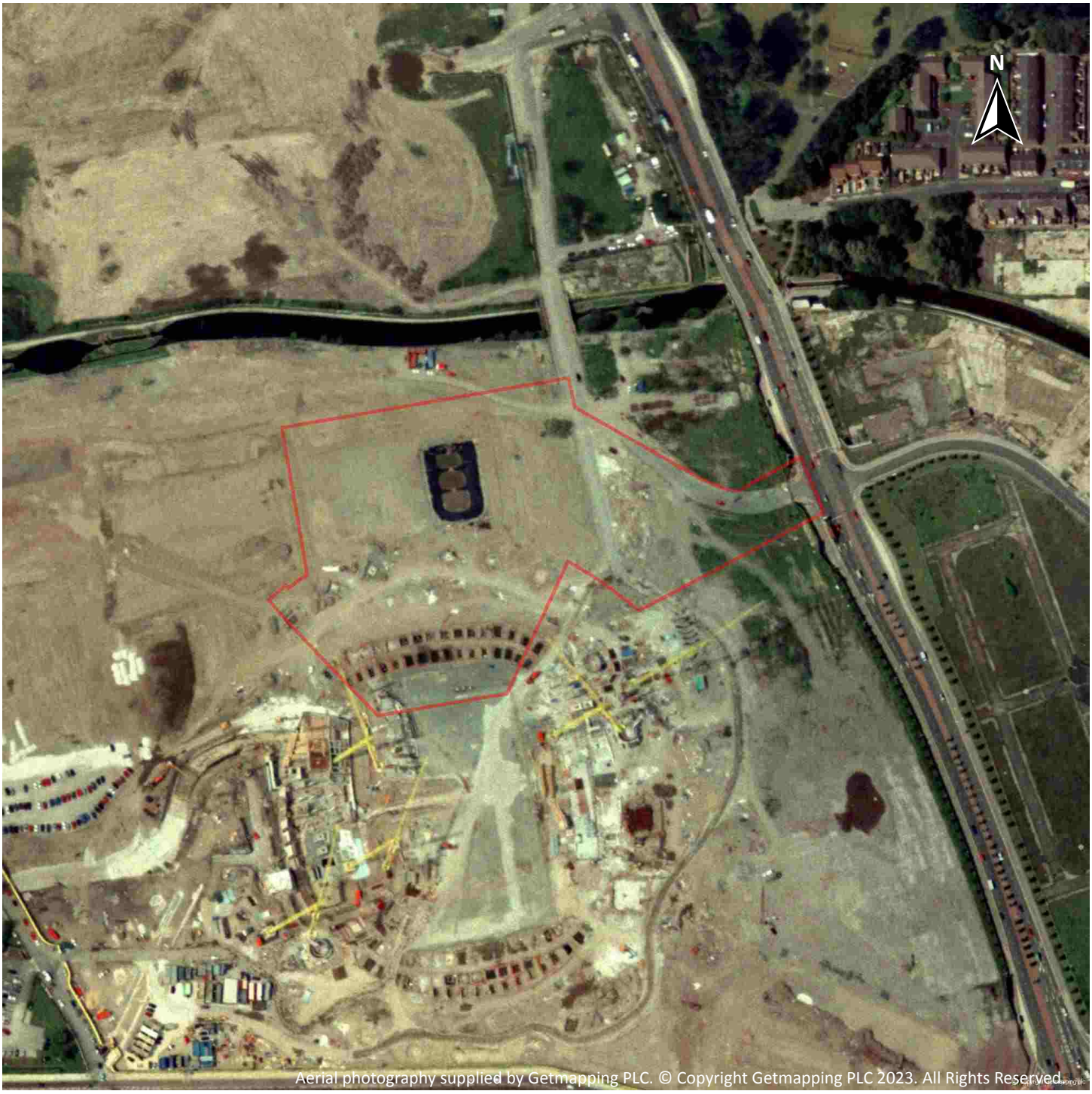
Recent site history - 2009 aerial photograph



Capture Date: 02/06/2009

Site Area: 3.3ha

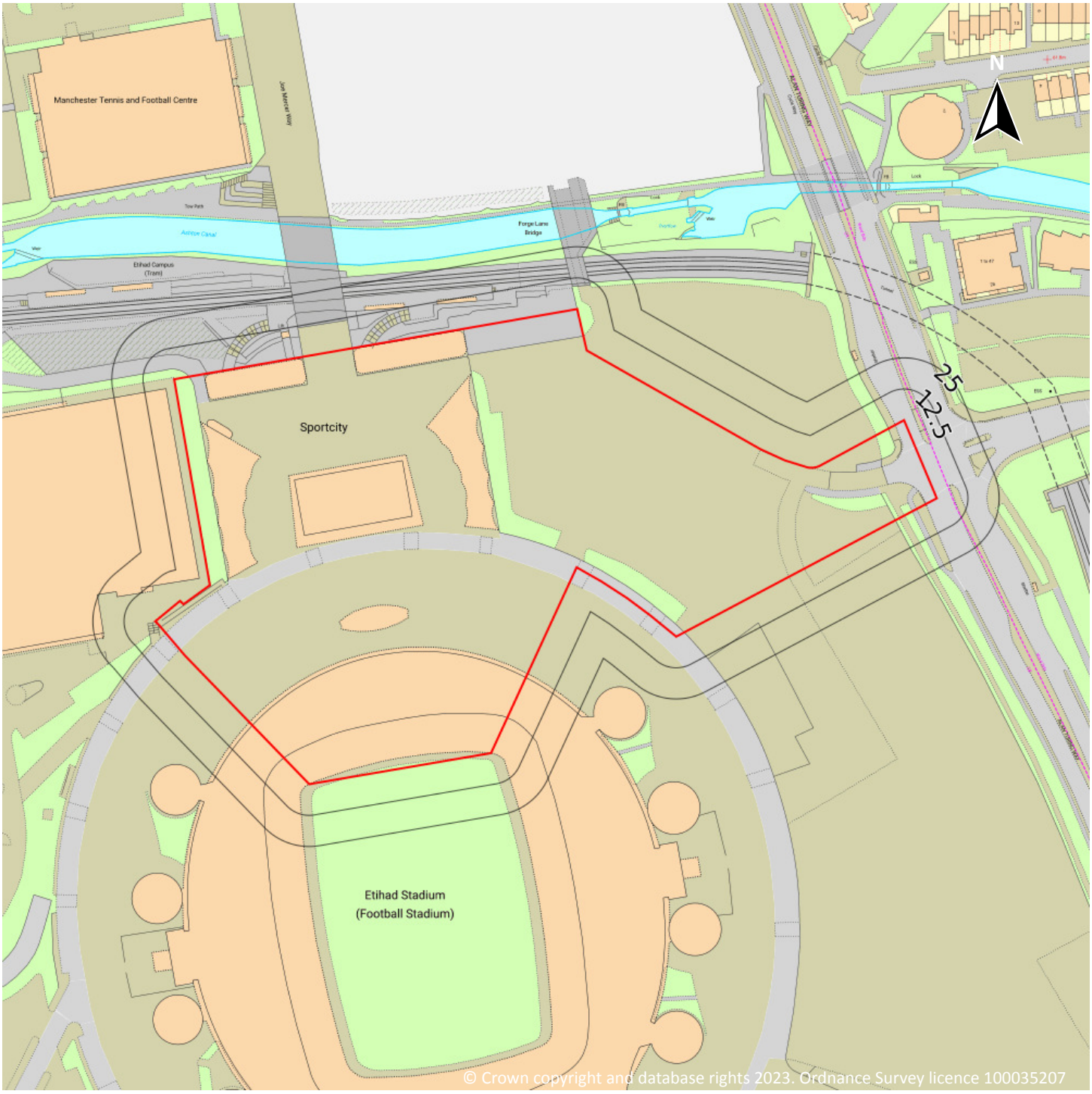
Recent site history - 2000 aerial photograph



Capture Date: 19/06/2000

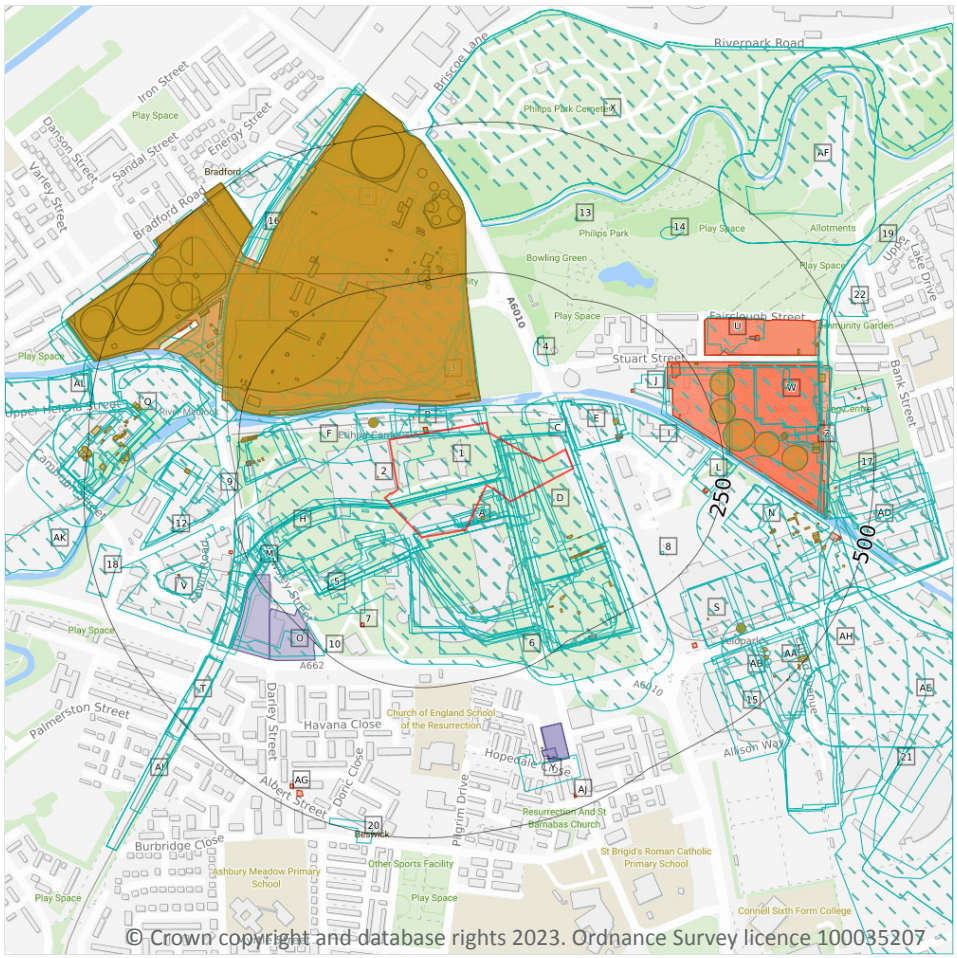
Site Area: 3.3ha

OS MasterMap site plan



Site Area: 3.3ha

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	311

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 13**

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Unspecified Works**	**1968 - 1978**	**979111**

ID	Location	Land use	Dates present	Group ID
A	On site	Railway Building	1891	820481
A	On site	Railway Building	1968	820497
A	On site	Goods Station	1956	821665
A	On site	Railway Sidings	1906	845027
A	On site	Railway Sidings	1921 - 1923	872908
A	On site	Goods Station	1921	883795
A	On site	Colliery	1968	890493
A	On site	Goods Station	1956 - 1968	896579
A	On site	Unspecified Works	1985	912707
A	On site	Railway Sidings	1891	916978
A	On site	Railway Sidings	1933 - 1938	923517
A	On site	Mineral Yard	1906 - 1921	924612
A	On site	Railway Sidings	1956	930832
A	On site	Unspecified Works	1968 - 1978	935747
A	On site	Unspecified Works	1968	937236
A	On site	Goods Station	1933 - 1938	948277
A	On site	Goods Station	1923	957584
A	On site	Railway Sidings	1978	963771
A	On site	Unspecified Works	1991	964432
A	On site	Railway Sidings	1968	976581
B	On site	Unspecified Mill	1968	810300
B	On site	Unspecified Works	1891	830469
B	On site	Unspecified Mills	1921	903508
B	On site	Unspecified Mills	1923	915992
B	On site	Unspecified Mills	1933	971458
B	On site	Unspecified Mills	1938	983499
C	On site	Smallwares Mill	1851	834636
D	On site	Unspecified Works	1968	868023

ID	Location	Land use	Dates present	Group ID
D	**On site**	**Unspecified Commercial/Industrial**	**1933 - 1938**	**879239**
D	**On site**	**Unspecified Commercial/Industrial**	**1891 - 1978**	**895595**
D	**On site**	**Unspecified Commercial/Industrial**	**1923**	**967281**
D	**On site**	**Iron Works**	**1956**	**988439**
D	**On site**	**Unspecified Works**	**1985**	**988793**
A	1m SE	Railway Building	1938	820482
A	5m S	Iron Works	1933 - 1938	850007
A	5m S	Iron Works	1921 - 1923	859582
A	5m S	Iron Works	1891 - 1906	914404
A	5m SE	Railway Buildings	1923	833670
A	16m SW	Unspecified Works	1985 - 1991	930707
A	18m SW	Mineral Yard	1923	925426
E	18m E	Unspecified Commercial/Industrial	1933	796765
E	18m E	Unspecified Mills	1923	940389
E	18m E	Unspecified Mills	1921	949445
E	18m E	Unspecified Mills	1906	950300
B	19m N	Coal Pits	1851	802165
B	20m N	Coal Pits	1851	802164
A	21m SW	Railway Building	1968	820480
E	25m E	Unspecified Works	1968	990901
A	34m W	Railway Building	1923	820484
F	35m W	Fustian Mills	1851	806840
A	37m SW	Goods Shed	1933 - 1968	937712
G	38m N	Unspecified Commercial/Industrial	1956	951490
C	39m NE	Unspecified Works	1968	830468
G	39m N	Unspecified Commercial/Industrial	1933 - 1938	894722
G	39m N	Railway Sidings	1933 - 1938	898707
G	39m N	Gas Works	1906 - 1923	932486

ID	Location	Land use	Dates present	Group ID
A	42m SW	Railway Building	1938	820483
A	44m SW	Goods Shed	1921 - 1923	961127
H	58m W	Cuttings	1923 - 1985	845908
G	63m N	Railway Sidings	1956 - 1968	982092
3	63m N	Unspecified Ground Workings	1906 - 1923	968041
D	71m SE	Unspecified Tank	1923	825296
G	75m NW	Unspecified Commercial/Industrial	1968 - 1978	974281
G	79m NW	Railway Sidings	1978	974171
H	85m W	Cuttings	1968 - 1978	927360
H	87m W	Cuttings	1906 - 1921	886067
I	95m E	Unspecified Works	1985 - 1991	927491
D	97m SE	Colliery	1851	887196
D	100m SE	Colliery	1891	971185
G	101m NW	Gas Works	1891	874852
G	104m NW	Railway Sidings	1906 - 1921	881262
G	107m NW	Railway Sidings	1923	973770
I	110m E	Unspecified Works	1968	848975
F	129m W	Unspecified Factory	1985 - 1991	955182
D	130m SE	Unspecified Depot	1985 - 1991	983795
4	132m NE	Refuse Heap	1851	829126
D	136m SE	Colliery	1906 - 1923	878194
J	149m NE	Unspecified Works	1968	830467
F	150m W	Unspecified Mill	1968	968050
D	152m SE	Coal Pits	1851	802162
F	158m W	Unspecified Mill	1891	929965
F	158m W	Unspecified Mill	1933 - 1938	984374
F	160m W	Unspecified Mill	1923	953219
5	161m SW	Railway Building	1891	820479

ID	Location	Land use	Dates present	Group ID
6	162m S	Unspecified Works	1978	830479
D	166m SE	Unspecified Disused Shafts	1991	958517
I	170m E	Unspecified Mills	1906 - 1923	981518
H	170m W	Engine House	1851	827951
D	175m SE	Coal Pit	1851	808492
I	178m E	Unspecified Mills	1891	917092
G	179m NW	Railway Sidings	1891	925215
L	196m E	Unspecified Mill	1985	976402
L	198m E	Unspecified Mill	1968	853462
D	200m SE	Coal Pits	1851	802163
8	202m E	Coal Pit	1851	808493
M	216m SW	Cuttings	1991	986749
D	217m SE	Unspecified Shafts	1978	809313
M	217m SW	Cuttings	1891	966918
M	222m W	Cuttings	1968	867964
N	222m E	Brick Field	1891	817951
M	223m SW	Cuttings	1956	923604
D	227m SE	Unspecified Disused Shafts	1985	849285
M	227m SW	Cuttings	1923 - 1938	901809
M	227m SW	Cuttings	1906	981496
M	227m W	Cuttings	1956	850032
P	234m N	Unspecified Pit	1906 - 1923	895806
O	236m SW	Unspecified Works	1978	830478
9	238m W	Pottery	1851	818634
D	240m SE	Unspecified Shafts	1978	809312
P	241m N	Unspecified Tank	1933 - 1938	919997
P	241m N	Unspecified Tanks	1921	939998
P	241m N	Unspecified Tanks	1923	938396

ID	Location	Land use	Dates present	Group ID
10	244m SW	Coal Pit	1851	808490
P	246m N	Unspecified Tank	1933 - 1938	963475
P	246m N	Unspecified Tanks	1906 - 1923	989875
I	248m E	Unspecified Tanks	1968	815392
D	249m SE	Unspecified Disused Shafts	1985	877729
P	250m N	Unspecified Tanks	1968 - 1978	869704
P	252m N	Unspecified Tank	1933 - 1938	903443
P	252m N	Unspecified Tanks	1906 - 1923	959046
M	252m SW	Cuttings	1933	887381
M	252m SW	Cuttings	1921	982064
P	256m N	Gas Work	1968 - 1978	945176
I	256m E	Unspecified Commercial/Industrial	1933 - 1938	943603
I	256m E	Electricity Generating Station	1906 - 1923	989056
Q	256m W	Sanitary Works	1933	888668
Q	256m W	Sanitary Works	1921	963542
M	260m W	Cotton Works	1891 - 1938	923167
F	264m W	Railway Building	1923	820486
M	265m SW	Railway Building	1923	820485
N	266m E	Chemical Works	1906 - 1933	885077
N	270m E	Unspecified Ground Workings	1906	800643
R	271m NW	Refuse Heap	1891	829115
M	272m W	Coal Pit	1851	808496
S	274m SE	Engineering Works	1921 - 1923	917015
T	275m SW	Cuttings	1956	874289
M	275m W	Unspecified Works	1968	830457
S	276m SE	Unspecified Works	1968	865836
S	277m SE	Unspecified Works	1985 - 1991	979935
Q	277m W	Sanitary Works	1956	876771

ID	Location	Land use	Dates present	Group ID
V	287m W	Brick Field	1851	817947
P	288m N	Gasometer	1923	809784
N	290m E	Unspecified Pit	1938	840552
U	294m NE	Electric Substation	1985 - 1991	982245
G	300m NW	Unspecified Tanks	1921 - 1923	981777
N	303m E	Unspecified Works	1978	871981
N	303m E	Unspecified Works	1985 - 1991	881370
M	305m W	Unspecified Factory	1968	821378
Q	306m W	Sanitary Works	1938	846336
Q	306m W	Sanitary Works	1891 - 1906	971025
M	307m W	Unspecified Works	1985 - 1991	987383
Q	309m W	Sanitary Works	1923	954361
W	312m E	Electric Generating Station	1968	842028
W	312m E	Unspecified Works	1978	990122
V	316m W	Unspecified Works	1991	854233
W	317m E	Unspecified Works	1985	923303
M	319m W	Unspecified Works	1978	979217
P	320m N	Unspecified Tanks	1923	815395
S	321m E	Unspecified Works	1968	934878
N	323m E	Unspecified Works	1968	866157
V	324m W	Unspecified Works	1985	853079
V	324m W	Unspecified Works	1978	954698
X	326m N	Cemetery	1891 - 1938	882873
P	334m N	Unspecified Tank	1933 - 1938	928492
P	334m N	Oil Tanks	1906 - 1921	931133
P	334m N	Oil Tanks	1923	889887
11	335m N	Cemetery	1991	951637
X	335m N	Cemetery	1956 - 1978	926290

ID	Location	Land use	Dates present	Group ID
X	335m N	Cemetery	1985	944161
P	335m N	Unspecified Tank	1933 - 1938	847909
P	335m N	Oil Tanks	1906 - 1921	899956
P	336m N	Unspecified Tanks	1956	815394
P	336m N	Gasometer	1968 - 1978	908225
P	339m N	Gasometer	1968 - 1978	884458
I	346m E	Unspecified Tank	1933 - 1938	936093
I	353m E	Unspecified Tank	1968	924537
12	354m W	Brick Kiln	1851	811032
P	358m N	Oil Tanks	1906 - 1921	857954
P	358m N	Unspecified Tank	1933 - 1938	954554
I	358m E	Railway Sidings	1921 - 1923	984262
Z	358m E	Mineral Railway Sidings	1906	981108
P	360m N	Unspecified Pit	1906	840537
K	365m NW	Gas Works	1985 - 1991	895751
13	368m NE	Coal Pit	1851	808494
K	370m NW	Raising Works	1906	806704
K	370m NW	Gas Stove Works	1921 - 1923	899437
K	370m NW	Unspecified Commercial/Industrial	1933 - 1938	909305
K	370m NW	Unspecified Commercial/Industrial	1891	917862
AA	370m SE	Unspecified Commercial/Industrial	1905 - 1906	934228
K	371m NW	Unspecified Tank	1891	972082
P	373m N	Unspecified Tank	1933 - 1938	924790
P	373m N	Oil Tanks	1906 - 1921	932969
W	373m E	Unspecified Tanks	1978	815393
W	373m E	Chimneys	1968	844028
I	373m E	Mineral Railway Sidings	1933 - 1938	884558
K	375m NW	Gasometer	1923	809785

ID	Location	Land use	Dates present	Group ID
K	375m NW	Unspecified Tank	1906 - 1921	850837
T	382m SW	Cuttings	1891	884725
T	382m SW	Cuttings	1906 - 1938	928101
Q	382m W	Unspecified Works	1968	878038
T	385m SW	Cuttings	1923	902699
K	385m NW	Unspecified Tank	1891	927485
P	387m N	Gasometer	1968 - 1978	944402
14	388m NE	Unspecified Heap	1906 - 1938	972092
Y	388m S	Tannery	1851	842302
K	390m NW	Gasometer	1923	809782
K	390m NW	Unspecified Tank	1906 - 1921	909386
K	390m NW	Unspecified Tank	1933 - 1938	927958
AB	390m SE	Unspecified Works	1968	830472
K	391m NW	Gas Work	1978	814479
15	391m SE	Unspecified Commercial/Industrial	1923	976598
Q	392m W	Unspecified Commercial/Industrial	1923	796759
P	392m N	Refuse Heap	1906	829125
Q	393m W	Unspecified Works	1991	905493
Q	393m W	Unspecified Works	1985	987762
AB	395m SE	Unspecified Depot	1985	818423
K	396m NW	Unspecified Works	1968	830458
K	396m NW	Unspecified Commercial/Industrial	1956	916012
AC	396m N	Gas Works	1985 - 1991	991680
K	396m NW	Unspecified Pit	1933 - 1938	883057
K	399m NW	Brick Works	1891	818774
Q	403m W	Unspecified Works	1978	890255
Q	404m W	Oil Works	1921 - 1923	952223
16	406m NW	Coal Pit	1851	808495

ID	Location	Land use	Dates present	Group ID
K	408m NW	Unspecified Works	1968	830459
AB	408m SE	Coal Pit	1851	808491
Q	417m W	Unspecified Ground Workings	1968	800627
AD	418m E	Oil Works	1921 - 1923	864827
AB	419m SE	Unspecified Commercial/Industrial	1923	976599
K	421m NW	Gasometers	1991	983680
K	421m NW	Unspecified Tank	1891	940326
AB	422m SE	Unspecified Works	1968	830473
17	423m E	Unspecified Ground Workings	1923	800633
K	424m NW	Unspecified Pit	1933 - 1938	988822
K	424m NW	Gasometer	1985	979918
AC	425m N	Gasometer	1991	887941
AC	425m N	Gasometer	1921	848231
AC	425m N	Unspecified Tank	1933 - 1938	965896
K	427m NW	Gasometer	1923	809781
K	427m NW	Unspecified Tank	1906 - 1921	854180
AB	427m SE	Unspecified Commercial/Industrial	1891	898012
AC	427m N	Gasometer	1923	905212
Z	427m E	Unspecified Heap	1923	804178
AD	428m E	Brick Kiln	1851	811031
AC	430m N	Unspecified Tank	1956 - 1978	914907
K	431m NW	Unspecified Tank	1906	918029
K	431m NW	Unspecified Tank	1933 - 1938	938620
K	431m NW	Gasometer	1921 - 1923	941154
AE	432m E	Steel Works	1956	810023
AC	432m N	Gasometer	1985	920187
AB	432m SE	Unspecified Tank	1906	825297
K	434m NW	Gasometers	1978	916494

ID	Location	Land use	Dates present	Group ID
K	434m NW	Unspecified Tanks	1956 - 1968	922346
K	435m NW	Unspecified Tank	1891	916313
Q	435m W	Unspecified Tank	1938	937017
Q	435m W	Unspecified Tank	1906	940002
Q	436m W	Unspecified Tank	1923	910877
K	438m NW	Brick Field	1851	817949
K	438m NW	Gasometer	1923	809783
K	438m NW	Unspecified Tank	1906 - 1921	974232
AB	441m SE	Unspecified Tank	1891	825298
AD	441m E	Chemical Works	1891	834550
AD	443m E	Unspecified Works	1978	847531
AD	444m E	Unspecified Works	1985 - 1991	898710
AB	444m SE	Unspecified Tank	1891 - 1906	852618
18	446m W	Unspecified Works	1985 - 1991	975823
N	447m E	Unspecified Works	1921 - 1923	848942
K	448m NW	Unspecified Commercial/Industrial	1851	881841
Z	450m E	Chemicals Works	1891	795013
AF	451m NE	Tanneries	1906	807266
AF	451m NE	Unspecified Disused Works	1891	813357
AF	451m NE	Unspecified Commercial/Industrial	1933 - 1938	927935
AF	451m NE	Unspecified Works	1921	986458
AD	455m E	Unspecified Commercial/Industrial	1933	796764
N	456m E	Unspecified Works	1968	912430
K	457m NW	Unspecified Pit	1906	840536
AA	459m SE	Chemical Works	1923	883999
AH	463m SE	Unspecified Works	1985 - 1991	909589
T	465m SW	Cuttings	1905	856912
AB	465m SE	Unspecified Tank	1906	825295

ID	Location	Land use	Dates present	Group ID
AI	467m SW	Cuttings	1938	923593
AI	467m SW	Cuttings	1915	907527
Q	469m W	Unspecified Heap	1956 - 1968	875105
Q	470m W	Unspecified Ground Workings	1891	971049
AD	470m E	Unspecified Works	1968	918867
19	471m NE	Railway Sidings	1956 - 1968	911076
AB	474m SE	Unspecified Tank	1906	825294
AK	477m W	Cotton Mills	1851	862251
Q	480m W	Unspecified Ground Workings	1906 - 1933	923784
Q	480m W	Unspecified Ground Workings	1938	951822
AE	480m E	Chemical Works	1934	888408
AE	480m E	Chemical Works	1921	974713
AH	480m E	Chemical Works	1906 - 1915	950978
AH	480m E	Unspecified Commercial/Industrial	1933 - 1934	990094
K	481m NW	Coal Pit	1851	808504
20	481m S	Disused Brewery	1890	823239
AD	481m E	Unspecified Works	1991	926651
K	482m NW	Gasometer	1985	850148
AK	488m W	Unspecified Works	1968	830456
21	488m E	Unspecified Commercial/Industrial	1956	853511
Q	494m W	Unspecified Tank	1906 - 1938	973359
AL	495m W	Unspecified Mills	1985 - 1991	922374
AL	495m W	Unspecified Mills	1968 - 1978	912751
AB	497m SE	Unspecified Tank	1923	942989
K	497m W	Unspecified Tank	1933 - 1938	889468
AF	497m NE	Unspecified Works	1923	934733
AL	497m W	Unspecified Mills	1956	914363
22	499m NE	Unspecified Works	1891	830466

ID	Location	Land use	Dates present	Group ID
AL	500m W	Unspecified Mills	1938	963506
AL	500m W	Unspecified Mills	1921	966437

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**229**

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 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 13**

ID	Location	Land use	Dates present	Group ID
A	14m SE	Tanks	1955 - 1987	143448
2	28m W	Tanks	1891	106807
B	28m NW	Unspecified Tank	1891	116112
G	38m N	Gas Works	1908 - 1922	144191
G	44m N	Gas Works	1948 - 1949	140627
B	50m N	Tanks	1979	106922
E	91m E	Tanks	1989 - 1994	136201
D	96m SE	Tanks	1893	106920
D	105m SE	Tanks	1893	106921
D	115m SE	Unspecified Tank	1893	116136
A	129m S	Tank or Trough	1908	121467
D	129m SE	Tanks	1953 - 1985	133891
D	131m SE	Unspecified Tank	1989	116135
D	136m SE	Tanks	1953 - 1985	138315
D	150m SE	Unspecified Tank	1893	116139
G	152m NW	Gas Works	1891	135095

ID	Location	Land use	Dates present	Group ID
K	153m NW	Gas Works	1893	123389
G	160m NW	Unspecified Tank	1891	116097
G	160m NW	Unspecified Tank	1891	116098
D	179m SE	Tanks	1893	106919
G	180m NW	Unspecified Tank	1948	116113
D	186m SE	Unspecified Tank	1893	116140
G	188m NW	Unspecified Tank	1891	116096
I	194m E	Tanks	1893	106923
D	195m SE	Unspecified Tank	1893	116134
G	195m NW	Unspecified Tank	1948	116095
I	196m E	Tanks	1893	106924
D	197m SE	Unspecified Tank	1949	116141
G	200m NW	Unspecified Tank	1931	116099
G	201m NW	Tanks	1948	106898
G	205m NW	Unspecified Tank	1891	116115
F	210m W	Unspecified Tank	1931	116127
G	213m NW	Unspecified Tank	1948	125740
D	214m SE	Unspecified Tank	1949	116133
F	215m W	Tank or Trough	1908	121466
G	218m NW	Unspecified Tank	1979	141260
G	218m NW	Unspecified Tank	1955 - 1958	140162
F	219m W	Tanks	1948 - 1955	136522
F	220m W	Tanks	1931	140274
G	222m NW	Tanks	1948	106896
G	223m W	Tanks	1931 - 1948	132624
F	224m W	Unspecified Tank	1908	116129
P	234m N	Tanks	1948	132522
G	236m NW	Unspecified Tank	1891	147647

ID	Location	Land use	Dates present	Group ID
P	241m N	Tanks	1922 - 1931	148520
G	241m NW	Unspecified Tank	1948 - 1979	122403
P	244m N	Tanks	1908 - 1931	147035
I	245m E	Unspecified Tank	1953	116110
P	249m N	Unspecified Tank	1955	116102
P	249m N	Tanks	1948	137971
P	249m N	Tanks	1948 - 1958	130892
G	249m NW	Tanks	1979	106890
P	250m N	Gas Works	1968 - 1970	130205
G	252m NW	Overhead Tanks	1948	120513
I	255m E	Unspecified Tank	1953	116109
G	256m NW	Tanks	1931	106897
G	256m NW	Tanks	1955 - 1979	143974
P	256m N	Tanks	1949	106930
J	257m NE	Unspecified Tank	1949 - 1953	125977
P	260m N	Unspecified Tank	1968	116101
P	261m N	Tanks	1949	106925
G	261m NW	Tanks	1948	106895
I	263m E	Unspecified Tank	1953	116111
G	264m NW	Tanks	1979	106893
P	266m N	Tanks	1922 - 1931	135092
P	269m N	Tanks	1949	106926
P	272m N	Tanks	1949	106927
G	278m NW	Tanks	1948	106894
P	281m N	Unspecified Tank	1931	116100
G	282m NW	Unspecified Tank	1948	116052
M	285m SW	Unspecified Tank	1979	116137
P	290m N	Unspecified Tank	1908 - 1922	144275

ID	Location	Land use	Dates present	Group ID
P	294m N	Unspecified Tank	1968 - 1970	133963
P	297m N	Unspecified Tank	1931	116091
G	298m NW	Tanks	1922 - 1931	141453
I	304m E	Unspecified Tank	1953	116107
P	307m N	Unspecified Tank	1968 - 1970	125026
G	317m NW	Unspecified Tank	1949	116094
P	324m N	Tanks	1908 - 1931	136314
M	327m W	Tanks	1992	106808
M	327m W	Unspecified Tank	1989	116128
P	329m N	Tanks	1949	106929
P	332m N	Oil Tanks	1922 - 1931	139394
K	332m NW	Unspecified Tank	1948	116053
P	333m N	Oil Tanks	1908	132831
S	334m SE	Tank or Trough	1893	121465
K	335m NW	Unspecified Tank	1948	116051
K	335m NW	Tanks	1948	106892
K	337m NW	Unspecified Tank	1908 - 1922	147259
P	339m N	Unspecified Tank	1949	116092
P	339m N	Unspecified Tank	1949 - 1970	132990
P	343m N	Tanks	1970	123034
P	344m N	Tanks	1968	131109
N	344m E	Unspecified Tank	1949 - 1953	135773
N	344m E	Unspecified Tank	1949	124488
K	345m NW	Tanks	1922 - 1931	142950
I	348m E	Unspecified Tank	1953	116108
P	349m N	Unspecified Tank	1970	116093
K	350m NW	Tanks	1948	106891
I	350m E	Tanks	1932	106940

ID	Location	Land use	Dates present	Group ID
I	351m E	Unspecified Tank	1949	124118
P	359m N	Unspecified Tank	1968 - 1970	139876
P	362m N	Unspecified Tank	1949	122692
N	363m E	Unspecified Tank	1949 - 1953	137561
V	364m W	Unspecified Tank	1979	126647
V	364m W	Unspecified Tank	1983	132385
V	364m W	Unspecified Tank	1979	116138
V	365m W	Unspecified Tank	1980	142018
N	366m E	Unspecified Tank	1949	116106
K	368m NW	Tanks	1908	124443
N	368m E	Unspecified Tank	1949 - 1953	141153
P	370m N	Tanks	1970	141692
K	372m NW	Gas Works	1979	124342
N	375m E	Unspecified Tank	1949 - 1953	132611
P	375m N	Tanks	1970	136413
N	375m E	Unspecified Tank	1949	128199
P	379m N	Unspecified Tank	1949	116090
K	379m NW	Gasometers	1893 - 1922	146932
P	380m N	Tanks	1949	106928
N	381m E	Unspecified Tank	1932	116130
K	382m NW	Gas Holder Station	1991 - 1995	128430
Y	383m S	Unspecified Tank	1893	115900
N	384m E	Unspecified Tank	1949	129924
K	384m NW	Gas Holder Station	1986 - 1989	143674
K	384m NW	Gas Holder Station	1992	124051
K	388m NW	Unspecified Tank	1948	116054
K	390m NW	Unspecified Tank	1931	116055
N	393m E	Unspecified Tank	1908 - 1932	136376

ID	Location	Land use	Dates present	Group ID
K	393m NW	Gas Works	1949	130918
R	393m NW	Unspecified Tank	1968 - 1970	129294
K	394m NW	Gasometer	1891	108529
P	394m N	Unspecified Tank	1968 - 1970	128581
N	397m E	Unspecified Tank	1949 - 1953	134719
I	399m E	Unspecified Tank	1949	137467
I	400m E	Unspecified Tank	1949	140973
K	403m NW	Overhead Tanks	1948	120512
AC	403m N	Gas Works	1984	126853
K	404m NW	Gas Works	1948 - 1952	141387
K	404m NW	Gas Works	1968 - 1970	146054
K	404m NW	Gas Works	1984	140774
N	412m E	Tanks	1949 - 1953	144825
N	413m E	Tanks	1932	123263
Q	415m W	Unspecified Tank	1891	116114
N	416m E	Unspecified Tank	1949	142735
N	416m E	Unspecified Tank	1949	146177
N	416m E	Unspecified Tank	1953	127483
K	417m NW	Tanks	1986 - 1992	136167
K	417m NW	Tanks	1989	138546
W	417m E	Unspecified Tank	1949	132231
N	419m E	Tanks	1932 - 1949	126372
Q	419m W	Unspecified Tank	1891	116116
N	419m E	Unspecified Tank	1953	116148
P	420m N	Unspecified Tank	1968 - 1970	130437
Q	420m W	Unspecified Tank	1948 - 1979	140187
K	422m NW	Unspecified Tank	1994 - 1995	143443
K	423m NW	Unspecified Tank	1991	137585

ID	Location	Land use	Dates present	Group ID
Q	423m W	Unspecified Tank	1891	116117
Q	424m W	Unspecified Tank	1931	116118
AC	425m N	Unspecified Tank	1931 - 1970	142901
AC	425m N	Gasometer	1922	148952
K	428m NW	Unspecified Tank	1931	128987
K	428m NW	Gasometer	1908 - 1922	144489
AC	429m N	Gas Holder	1995	137733
AC	429m N	Gas Holder	1984	125049
AC	430m N	Gasometer	1949	122835
K	430m NW	Gasometers	1979	108903
K	430m NW	Gasholder	1992	120428
Q	430m W	Unspecified Tank	1908 - 1931	127771
AC	430m N	Gasometer	1968	141629
N	430m E	Unspecified Tank	1932	116104
K	431m NW	Gas Holder	1986 - 1989	149177
Q	431m W	Tanks	1908 - 1922	145285
K	431m NW	Unspecified Tank	1958	145921
K	432m NW	Unspecified Tank	1948 - 1955	139971
N	433m E	Tanks	1949 - 1953	133368
Z	433m E	Tanks	1949	126621
AB	435m SE	Unspecified Tank	1908	116132
Q	435m W	Tanks	1931	106806
Q	435m W	Unspecified Tank	1979	122787
N	436m E	Unspecified Tank	1932	116103
Q	436m W	Unspecified Tank	1948 - 1955	125105
Q	437m W	Unspecified Tank	1986 - 1989	127783
K	437m NW	Gasometer	1891	108531
Q	438m W	Unspecified Tank	1931	116119

ID	Location	Land use	Dates present	Group ID
Q	438m W	Tanks	1979	129820
Q	438m W	Unspecified Tank	1891	116124
Q	439m W	Tanks	1955	127968
Q	439m W	Tanks	1948	128195
Q	439m W	Tanks	1931	127904
K	440m NW	Gasometer	1891	108530
Q	441m W	Unspecified Tank	1908	116125
Q	442m W	Tanks	1979	139173
Q	443m W	Unspecified Tank	1908	116126
Q	443m W	Tanks	1948 - 1979	134652
Q	444m W	Tanks	1948 - 1955	134210
Q	446m W	Tanks	1979 - 1986	140447
AB	446m SE	Unspecified Tank	1908	116131
Q	447m W	Unspecified Tank	1908	116120
Q	448m W	Unspecified Tank	1891	116123
Q	450m W	Tanks	1948 - 1989	125836
W	451m E	Tanks	1953	106939
N	461m E	Unspecified Tank	1908	116149
Q	462m W	Unspecified Tank	1948 - 1979	144042
Q	466m W	Tanks	1948 - 1955	130116
N	468m E	Unspecified Tank	1908	116151
Q	474m W	Unspecified Tank	1979	142816
Q	475m W	Unspecified Tank	1955	141710
Q	475m W	Unspecified Tank	1948	147680
N	476m E	Unspecified Tank	1908	116150
Q	477m W	Unspecified Tank	1931	116121
K	477m W	Tanks	1986 - 1992	144183
AB	479m SE	Unspecified Tank	1893	116144

ID	Location	Land use	Dates present	Group ID
Q	480m W	Tanks	1948	106809
Z	486m E	Unspecified Tank	1949	125746
Z	486m E	Unspecified Tank	1953	140757
Z	486m E	Unspecified Tank	1949	147068
Z	487m E	Unspecified Tank	1949 - 1953	137913
AB	489m SE	Tanks	1980 - 1996	135435
Q	492m W	Tanks	1922 - 1931	134829
Q	493m W	Tanks	1908	143683
K	494m NW	Gasholder	1992	120429
K	494m NW	Gas Holder	1986 - 1989	140988
K	495m NW	Unspecified Tank	1958	123472
AB	496m SE	Tanks	1893	106918
K	496m W	Unspecified Tank	1931	148893
K	496m NW	Unspecified Tank	1948 - 1955	147701
Q	499m W	Unspecified Tank	1908	122777
Q	499m W	Unspecified Tank	1922 - 1931	138312
AB	499m SE	Unspecified Tank	1932	116143

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	**57**

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 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 13**

ID	Location	Land use	Dates present	Group ID
B	0m NW	Electricity Sub-Station	1979 - 1991	77947

ID	Location	Land use	Dates present	Group ID
B	0m NW	Electricity Substation	1955 - 1995	84614
G	38m N	Gas Works	1908 - 1922	77534
G	44m N	Gas Works	1948 - 1970	85321
B	65m N	Electricity Substation	1979	62200
B	70m N	Electricity Substation	1948 - 1955	69850
E	85m E	Electricity Substation	1949 - 1985	83776
E	86m E	Electricity Substation	1989 - 1994	75310
J	145m NE	Electricity Substation	1989 - 1994	73389
G	152m NW	Gas Works	1891	73418
K	153m NW	Gas Works	1893	80210
7	172m SW	Electricity Substation	1979 - 1995	66724
I	187m E	Electricity Generating Station	1949	67122
I	187m E	Electricity Generating Station	1949	75559
J	214m NE	Electricity Substation	1994	62203
L	218m E	Electricity Substation	1949 - 1989	69908
L	220m E	Electricity Substation	1985	66511
F	229m W	Electricity Substation	1955 - 1992	65320
F	229m W	Electricity Substation	1989	83931
D	259m SE	Electricity Substation	1949 - 1953	82552
I	261m E	Electricity Generating Station	1908 - 1922	69584
M	268m W	Electricity Substation	1979 - 1992	67641
U	279m NE	Electricity Substation	1994	66021
U	280m NE	Electricity Transformer Station	1985	63378
S	352m SE	Electricity Substation	1991 - 1996	65964
U	358m NE	Electricity Substation	1989	81063
U	363m NE	Electricity Substation	1985	85433
K	372m NW	Gas Works	1979	64728
K	379m NW	Gasometers	1893 - 1922	78993

ID	Location	Land use	Dates present	Group ID
K	381m NW	Corporation Gas Works	1891	79203
K	382m NW	Gas Holder Station	1991 - 1995	83257
K	384m NW	Gas Holder Station	1986 - 1989	65294
K	384m NW	Gas Holder Station	1992	79718
K	393m NW	Gas Works	1949	66752
K	394m NW	Gasometer	1891	59722
AC	403m N	Gas Works	1984	71747
K	404m NW	Gas Works	1948 - 1970	74752
K	404m NW	Gas Works	1984	71264
AC	425m N	Gasometer	1922 - 1949	76542
K	428m NW	Gasometer	1908 - 1922	70420
AC	429m N	Gas Holder	1995	72614
AC	429m N	Gas Holder	1984	68164
K	430m NW	Gasometers	1979	63338
K	430m NW	Gasholder	1992	63416
AC	430m N	Gasometer	1968	75789
K	431m NW	Gas Holder	1986 - 1989	77108
K	437m NW	Gasometer	1891	59724
K	440m NW	Gasometer	1891	59723
N	440m E	Electricity Substation	1985	75460
N	455m E	Electricity Substation	1989	69601
AG	463m SW	Electricity Substation	1979 - 1995	78935
AG	467m SW	Electricity Substation	1949 - 1956	78984
AJ	476m S	Electricity Substation	1994 - 1996	73117
AJ	477m S	Electricity Substation	1991	81745
AJ	478m S	Electricity Substation	1980	70702
K	494m NW	Gasholder	1992	63417
K	494m NW	Gas Holder	1986 - 1989	74103

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 un-grouped 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	5

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 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 13**

ID	Location	Land use	Dates present	Group ID
M	230m SW	Garage	1986	20751
O	232m SW	Garage	1983	24112
Y	352m S	Garage	1983	20860
Y	352m S	Garage	1956 - 1979	27080
Y	389m S	Garage	1958	21217

This data is sourced from Ordnance Survey / Groundsure.

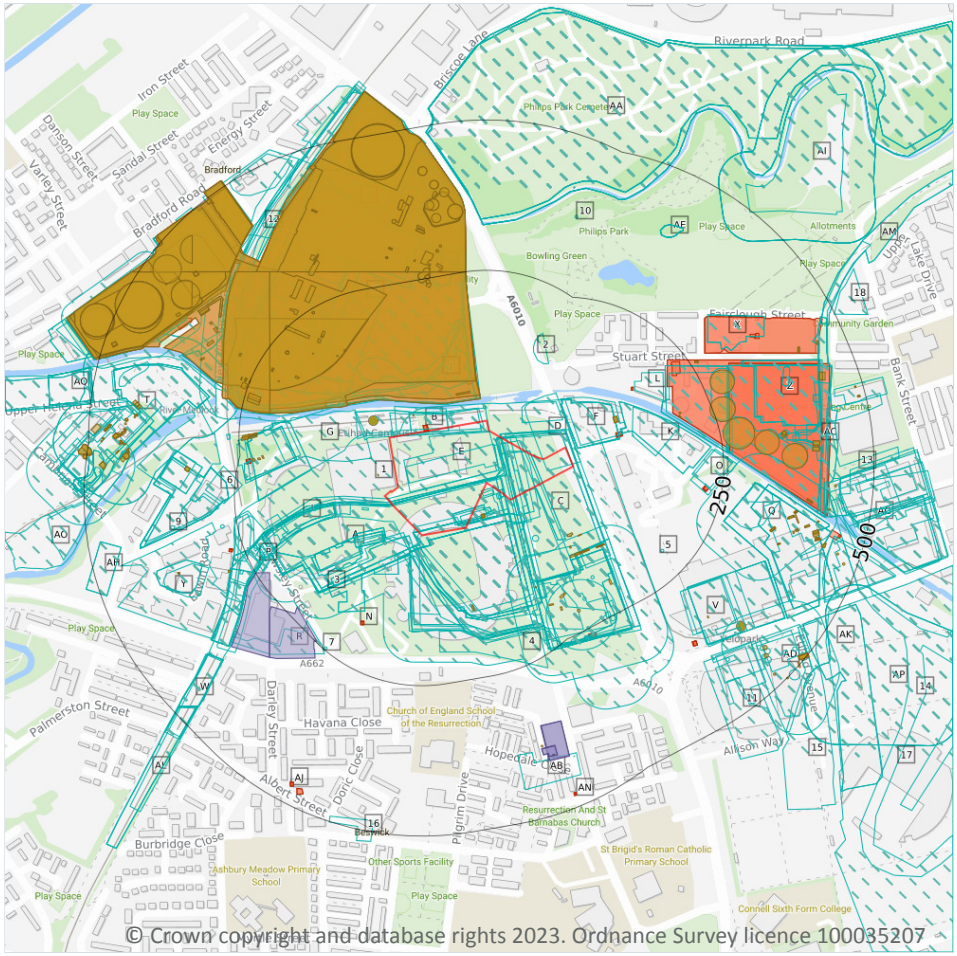
1.6 Historical military land

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



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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	448

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 37**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Railway Sidings**	**1921**	**872908**
A	**On site**	**Mineral Yard**	**1921**	**924612**
A	**On site**	**Goods Station**	**1921**	**883795**

ID	Location	Land Use	Date	Group ID
A	On site	Railway Sidings	1906	845027
A	On site	Mineral Yard	1906	924612
A	On site	Railway Sidings	1891	916978
A	On site	Railway Building	1891	820481
A	On site	Goods Station	1938	948277
A	On site	Railway Sidings	1938	923517
A	On site	Goods Station	1933	948277
A	On site	Railway Sidings	1933	923517
A	On site	Colliery	1968	890493
A	On site	Goods Station	1956	896579
A	On site	Railway Sidings	1956	930832
A	On site	Goods Station	1956	821665
A	On site	Unspecified Works	1985	912707
A	On site	Unspecified Works	1978	935747
A	On site	Railway Sidings	1978	963771
A	On site	Unspecified Works	1991	964432
A	On site	Unspecified Works	1968	935747
A	On site	Goods Station	1968	896579
A	On site	Unspecified Works	1968	937236
A	On site	Railway Building	1968	820497
A	On site	Railway Sidings	1968	976581
A	On site	Railway Sidings	1923	872908
A	On site	Goods Station	1923	957584
B	On site	Unspecified Mills	1921	903508
B	On site	Unspecified Works	1891	830469
B	On site	Unspecified Mills	1938	983499
B	On site	Unspecified Mills	1933	971458
B	On site	Unspecified Mill	1968	810300

ID	Location	Land Use	Date	Group ID
B	**On site**	**Unspecified Mills**	**1923**	**915992**
C	**On site**	**Unspecified Commercial/Industrial**	**1891**	**895595**
C	**On site**	**Unspecified Commercial/Industrial**	**1938**	**879239**
C	**On site**	**Unspecified Commercial/Industrial**	**1933**	**879239**
C	**On site**	**Iron Works**	**1956**	**988439**
C	**On site**	**Unspecified Works**	**1985**	**988793**
C	**On site**	**Unspecified Commercial/Industrial**	**1978**	**895595**
C	**On site**	**Unspecified Works**	**1968**	**868023**
C	**On site**	**Unspecified Commercial/Industrial**	**1923**	**967281**
D	**On site**	**Smallwares Mill**	**1851**	**834636**
E	**On site**	**Unspecified Works**	**1978**	**979111**
E	**On site**	**Unspecified Works**	**1968**	**979111**
A	1m SE	Railway Building	1938	820482
A	5m S	Iron Works	1921	859582
A	5m S	Iron Works	1906	914404
A	5m S	Iron Works	1891	914404
A	5m S	Iron Works	1938	850007
A	5m S	Iron Works	1933	850007
A	5m S	Iron Works	1923	859582
A	5m SE	Railway Buildings	1923	833670
A	16m SW	Unspecified Works	1985	930707
A	16m SW	Unspecified Works	1991	930707
A	18m SW	Mineral Yard	1923	925426
F	18m E	Unspecified Mills	1921	949445
F	18m E	Unspecified Mills	1906	950300
F	18m E	Unspecified Commercial/Industrial	1933	796765
F	18m E	Unspecified Mills	1923	940389
B	19m N	Coal Pits	1851	802165

ID	Location	Land Use	Date	Group ID
B	20m N	Coal Pits	1851	802164
A	21m SW	Railway Building	1968	820480
F	25m E	Unspecified Works	1968	990901
A	34m W	Railway Building	1923	820484
G	35m W	Fustian Mills	1851	806840
A	37m SW	Goods Shed	1956	937712
A	37m SW	Goods Shed	1968	937712
H	38m N	Unspecified Commercial/Industrial	1956	951490
D	39m NE	Unspecified Works	1968	830468
H	39m N	Gas Works	1921	932486
H	39m N	Gas Works	1906	932486
H	39m N	Unspecified Commercial/Industrial	1938	894722
H	39m N	Railway Sidings	1938	898707
H	39m N	Railway Sidings	1933	898707
H	39m N	Unspecified Commercial/Industrial	1933	894722
A	42m SW	Railway Building	1938	820483
A	42m SW	Goods Shed	1938	937712
A	42m SW	Goods Shed	1933	937712
A	44m SW	Goods Shed	1921	961127
A	47m SW	Goods Shed	1923	961127
I	58m W	Cuttings	1956	845908
H	63m N	Railway Sidings	1956	982092
J	63m N	Unspecified Ground Workings	1921	968041
J	63m N	Unspecified Ground Workings	1906	968041
J	63m N	Unspecified Ground Workings	1923	968041
C	71m SE	Unspecified Tank	1923	825296
H	72m N	Gas Works	1923	932486
H	75m NW	Unspecified Commercial/Industrial	1968	974281

ID	Location	Land Use	Date	Group ID
H	75m NW	Railway Sidings	1968	982092
I	77m W	Cuttings	1985	845908
H	79m NW	Railway Sidings	1978	974171
H	79m NW	Unspecified Commercial/Industrial	1978	974281
I	85m W	Cuttings	1978	927360
I	85m W	Cuttings	1968	927360
I	87m W	Cuttings	1938	845908
I	87m W	Cuttings	1933	845908
I	87m W	Cuttings	1921	886067
I	87m W	Cuttings	1923	845908
I	87m W	Cuttings	1906	886067
K	95m E	Unspecified Works	1985	927491
K	95m E	Unspecified Works	1991	927491
C	97m SE	Colliery	1851	887196
C	100m SE	Colliery	1891	971185
H	101m NW	Gas Works	1891	874852
H	104m NW	Railway Sidings	1921	881262
H	107m NW	Railway Sidings	1923	973770
K	110m E	Unspecified Works	1968	848975
G	129m W	Unspecified Factory	1985	955182
G	129m W	Unspecified Factory	1991	955182
C	130m SE	Unspecified Depot	1985	983795
C	130m SE	Unspecified Depot	1991	983795
2	132m NE	Refuse Heap	1851	829126
C	136m SE	Colliery	1921	878194
C	136m SE	Colliery	1906	878194
C	136m SE	Colliery	1923	878194
L	149m NE	Unspecified Works	1968	830467

ID	Location	Land Use	Date	Group ID
G	150m W	Unspecified Mill	1968	968050
C	152m SE	Coal Pits	1851	802162
G	158m W	Unspecified Mill	1891	929965
G	158m W	Unspecified Mill	1938	984374
G	158m W	Unspecified Mill	1933	984374
G	160m W	Unspecified Mill	1923	953219
H	160m NW	Railway Sidings	1906	881262
3	161m SW	Railway Building	1891	820479
4	162m S	Unspecified Works	1978	830479
C	166m SE	Unspecified Disused Shafts	1991	958517
K	170m E	Unspecified Mills	1921	981518
K	170m E	Unspecified Mills	1906	981518
K	170m E	Unspecified Mills	1923	981518
I	170m W	Engine House	1851	827951
C	175m SE	Coal Pit	1851	808492
K	178m E	Unspecified Mills	1891	917092
H	179m NW	Railway Sidings	1891	925215
O	196m E	Unspecified Mill	1985	976402
O	198m E	Unspecified Mill	1968	853462
C	200m SE	Coal Pits	1851	802163
5	202m E	Coal Pit	1851	808493
P	216m SW	Cuttings	1991	986749
C	217m SE	Unspecified Shafts	1978	809313
P	217m SW	Cuttings	1891	966918
P	222m W	Cuttings	1968	867964
Q	222m E	Brick Field	1891	817951
P	223m SW	Cuttings	1956	923604
C	227m SE	Unspecified Disused Shafts	1985	849285

ID	Location	Land Use	Date	Group ID
P	227m SW	Cuttings	1923	901809
P	227m SW	Cuttings	1938	901809
P	227m SW	Cuttings	1906	981496
P	227m W	Cuttings	1956	850032
S	234m N	Unspecified Pit	1921	895806
S	234m N	Unspecified Pit	1906	895806
S	234m N	Unspecified Pit	1923	895806
R	236m SW	Unspecified Works	1978	830478
6	238m W	Pottery	1851	818634
C	240m SE	Unspecified Shafts	1978	809312
S	241m N	Unspecified Tanks	1921	939998
S	241m N	Unspecified Tank	1938	919997
S	241m N	Unspecified Tank	1933	919997
S	241m N	Unspecified Tanks	1923	938396
7	244m SW	Coal Pit	1851	808490
S	246m N	Unspecified Tanks	1921	989875
S	246m N	Unspecified Tanks	1906	989875
S	246m N	Unspecified Tank	1938	963475
S	246m N	Unspecified Tank	1933	963475
S	246m N	Unspecified Tanks	1923	989875
K	248m E	Unspecified Tanks	1968	815392
C	249m SE	Unspecified Disused Shafts	1985	877729
S	250m N	Unspecified Tanks	1968	869704
S	252m N	Unspecified Tanks	1921	959046
S	252m N	Unspecified Tanks	1906	959046
S	252m N	Unspecified Tank	1938	903443
S	252m N	Unspecified Tank	1933	903443
S	252m N	Unspecified Tanks	1923	959046

ID	Location	Land Use	Date	Group ID
S	252m N	Unspecified Tanks	1978	869704
P	252m SW	Cuttings	1933	887381
P	252m SW	Cuttings	1921	982064
S	256m N	Gas Work	1978	945176
S	256m N	Gas Work	1968	945176
K	256m E	Electricity Generating Station	1921	989056
K	256m E	Electricity Generating Station	1906	989056
K	256m E	Unspecified Commercial/Industrial	1938	943603
K	256m E	Unspecified Commercial/Industrial	1933	943603
K	256m E	Electricity Generating Station	1923	989056
T	256m W	Sanitary Works	1933	888668
T	256m W	Sanitary Works	1921	963542
P	260m W	Cotton Works	1921	923167
P	260m W	Cotton Works	1906	923167
P	260m W	Cotton Works	1891	923167
P	260m W	Cotton Works	1938	923167
P	260m W	Cotton Works	1933	923167
P	260m W	Cotton Works	1923	923167
G	264m W	Railway Building	1923	820486
P	265m SW	Railway Building	1923	820485
Q	266m E	Chemical Works	1921	885077
Q	266m E	Chemical Works	1906	885077
Q	266m E	Chemical Works	1933	885077
Q	266m E	Chemical Works	1923	885077
Q	270m E	Unspecified Ground Workings	1906	800643
U	271m NW	Refuse Heap	1891	829115
P	272m W	Coal Pit	1851	808496
V	274m SE	Engineering Works	1923	917015

ID	Location	Land Use	Date	Group ID
W	275m SW	Cuttings	1956	874289
V	275m SE	Engineering Works	1921	917015
P	275m W	Unspecified Works	1968	830457
V	276m SE	Unspecified Works	1968	865836
V	277m SE	Unspecified Works	1985	979935
V	277m SE	Unspecified Works	1991	979935
T	277m W	Sanitary Works	1956	876771
Y	287m W	Brick Field	1851	817947
S	288m N	Gasometer	1923	809784
Q	290m E	Unspecified Pit	1938	840552
X	294m NE	Electric Substation	1985	982245
X	294m NE	Electric Substation	1991	982245
H	300m NW	Unspecified Tanks	1921	981777
H	301m NW	Unspecified Tanks	1923	981777
Q	303m E	Unspecified Works	1985	881370
Q	303m E	Unspecified Works	1978	871981
Q	303m E	Unspecified Works	1991	881370
P	305m W	Unspecified Factory	1968	821378
T	306m W	Sanitary Works	1906	971025
T	306m W	Sanitary Works	1891	971025
T	306m W	Sanitary Works	1938	846336
P	307m W	Unspecified Works	1985	987383
P	307m W	Unspecified Works	1991	987383
T	309m W	Sanitary Works	1923	954361
Z	312m E	Unspecified Works	1978	990122
Z	312m E	Electric Generating Station	1968	842028
Y	316m W	Unspecified Works	1991	854233
Z	317m E	Unspecified Works	1985	923303

ID	Location	Land Use	Date	Group ID
P	319m W	Unspecified Works	1978	979217
S	320m N	Unspecified Tanks	1923	815395
V	321m E	Unspecified Works	1968	934878
Q	323m E	Unspecified Works	1968	866157
Y	324m W	Unspecified Works	1985	853079
Y	324m W	Unspecified Works	1978	954698
AA	326m N	Cemetery	1923	882873
AA	326m N	Cemetery	1938	882873
AA	326m N	Cemetery	1933	882873
AA	326m N	Cemetery	1921	882873
AA	326m N	Cemetery	1906	882873
AA	326m N	Cemetery	1891	882873
S	334m N	Oil Tanks	1921	931133
S	334m N	Oil Tanks	1906	931133
S	334m N	Unspecified Tank	1938	928492
S	334m N	Unspecified Tank	1933	928492
S	334m N	Oil Tanks	1923	889887
8	335m N	Cemetery	1991	951637
AA	335m N	Cemetery	1956	926290
AA	335m N	Cemetery	1985	944161
AA	335m N	Cemetery	1978	926290
AA	335m N	Cemetery	1968	926290
S	335m N	Oil Tanks	1921	899956
S	335m N	Oil Tanks	1906	899956
S	335m N	Unspecified Tank	1938	847909
S	335m N	Unspecified Tank	1933	847909
S	336m N	Unspecified Tanks	1956	815394
S	336m N	Gasometer	1978	908225

ID	Location	Land Use	Date	Group ID
S	336m N	Gasometer	1968	908225
S	339m N	Gasometer	1968	884458
S	344m N	Gasometer	1978	884458
K	346m E	Unspecified Tank	1938	936093
K	347m E	Unspecified Tank	1933	936093
K	353m E	Unspecified Tank	1968	924537
9	354m W	Brick Kiln	1851	811032
S	358m N	Oil Tanks	1921	857954
S	358m N	Oil Tanks	1906	857954
S	358m N	Unspecified Tank	1938	954554
S	358m N	Unspecified Tank	1933	954554
K	358m E	Railway Sidings	1921	984262
AC	358m E	Mineral Railway Sidings	1906	981108
S	360m N	Unspecified Pit	1906	840537
M	365m NW	Gas Works	1985	895751
K	367m E	Railway Sidings	1923	984262
10	368m NE	Coal Pit	1851	808494
M	370m NW	Gas Stove Works	1921	899437
M	370m NW	Raising Works	1906	806704
M	370m NW	Unspecified Commercial/Industrial	1891	917862
M	370m NW	Unspecified Commercial/Industrial	1938	909305
M	370m NW	Unspecified Commercial/Industrial	1933	909305
M	370m NW	Gas Stove Works	1923	899437
AD	370m SE	Unspecified Commercial/Industrial	1906	934228
M	371m NW	Unspecified Tank	1891	972082
S	373m N	Oil Tanks	1921	932969
S	373m N	Oil Tanks	1906	932969
S	373m N	Unspecified Tank	1938	924790

ID	Location	Land Use	Date	Group ID
S	373m N	Unspecified Tank	1933	924790
Z	373m E	Unspecified Tanks	1978	815393
Z	373m E	Chimneys	1968	844028
K	373m E	Mineral Railway Sidings	1938	884558
K	373m E	Mineral Railway Sidings	1933	884558
M	375m NW	Unspecified Tank	1921	850837
M	375m NW	Unspecified Tank	1906	850837
M	375m NW	Gasometer	1923	809785
W	382m SW	Cuttings	1938	928101
W	382m SW	Cuttings	1933	928101
W	382m SW	Cuttings	1921	928101
W	382m SW	Cuttings	1906	928101
W	382m SW	Cuttings	1891	884725
T	382m W	Unspecified Works	1968	878038
W	385m SW	Cuttings	1923	902699
M	385m NW	Unspecified Tank	1891	927485
S	387m N	Gasometer	1978	944402
S	387m N	Gasometer	1968	944402
AB	388m S	Tannery	1851	842302
AE	388m NE	Unspecified Heap	1938	972092
AE	388m NE	Unspecified Heap	1933	972092
AE	388m NE	Unspecified Heap	1921	972092
AE	388m NE	Unspecified Heap	1906	972092
AE	388m NE	Unspecified Heap	1923	972092
M	390m NW	Unspecified Tank	1921	909386
M	390m NW	Unspecified Tank	1906	909386
M	390m NW	Unspecified Tank	1938	927958
M	390m NW	Unspecified Tank	1933	927958

ID	Location	Land Use	Date	Group ID
M	390m NW	Gasometer	1923	809782
AD	390m SE	Unspecified Works	1968	830472
M	390m NW	Gas Works	1991	895751
M	391m NW	Gas Work	1978	814479
11	391m SE	Unspecified Commercial/Industrial	1923	976598
T	392m W	Unspecified Commercial/Industrial	1923	796759
S	392m N	Refuse Heap	1906	829125
T	393m W	Unspecified Works	1985	987762
T	393m W	Unspecified Works	1991	905493
AD	395m SE	Unspecified Depot	1985	818423
M	396m NW	Unspecified Commercial/Industrial	1956	916012
M	396m NW	Unspecified Works	1968	830458
AF	396m N	Gas Works	1991	991680
M	396m NW	Unspecified Pit	1938	883057
M	396m NW	Unspecified Pit	1933	883057
AF	398m N	Gas Works	1985	991680
M	399m NW	Brick Works	1891	818774
T	403m W	Unspecified Works	1978	890255
T	404m W	Oil Works	1923	952223
12	406m NW	Coal Pit	1851	808495
M	408m NW	Unspecified Works	1968	830459
AD	408m SE	Coal Pit	1851	808491
T	417m W	Unspecified Ground Workings	1968	800627
T	418m W	Oil Works	1921	952223
AG	418m E	Oil Works	1923	864827
AD	419m SE	Unspecified Commercial/Industrial	1923	976599
M	421m NW	Gasometers	1991	983680
M	421m NW	Unspecified Tank	1891	940326

ID	Location	Land Use	Date	Group ID
AD	422m SE	Unspecified Works	1968	830473
13	423m E	Unspecified Ground Workings	1923	800633
M	424m NW	Unspecified Pit	1938	988822
M	424m NW	Unspecified Pit	1933	988822
M	424m NW	Gasometer	1985	979918
AF	425m N	Gasometer	1991	887941
AF	425m N	Gasometer	1921	848231
AF	425m N	Unspecified Tank	1938	965896
AF	425m N	Unspecified Tank	1933	965896
M	427m NW	Unspecified Tank	1921	854180
M	427m NW	Unspecified Tank	1906	854180
M	427m NW	Gasometer	1923	809781
AD	427m SE	Unspecified Commercial/Industrial	1891	898012
AF	427m N	Gasometer	1923	905212
AC	427m E	Unspecified Heap	1923	804178
AG	428m E	Brick Kiln	1851	811031
AF	430m N	Unspecified Tank	1956	914907
AF	430m N	Unspecified Tank	1978	914907
AF	430m N	Unspecified Tank	1968	914907
M	431m NW	Gasometer	1921	941154
M	431m NW	Unspecified Tank	1906	918029
M	431m NW	Unspecified Tank	1938	938620
M	431m NW	Unspecified Tank	1933	938620
M	431m NW	Gasometer	1923	941154
14	432m E	Steel Works	1956	810023
AF	432m N	Gasometer	1985	920187
AD	432m SE	Unspecified Tank	1906	825297
M	434m NW	Unspecified Tanks	1956	922346

ID	Location	Land Use	Date	Group ID
M	434m NW	Gasometers	1978	916494
M	434m NW	Unspecified Tanks	1968	922346
M	435m NW	Unspecified Tank	1891	916313
T	435m W	Unspecified Tank	1906	940002
T	435m W	Unspecified Tank	1938	937017
T	436m W	Unspecified Tank	1923	910877
M	438m NW	Brick Field	1851	817949
M	438m NW	Unspecified Tank	1921	974232
M	438m NW	Unspecified Tank	1906	974232
M	438m NW	Gasometer	1923	809783
AD	441m SE	Unspecified Tank	1891	825298
AG	441m E	Chemical Works	1891	834550
AG	443m E	Unspecified Works	1978	847531
AG	444m E	Unspecified Works	1985	898710
AD	444m SE	Unspecified Tank	1906	852618
AG	445m E	Unspecified Works	1991	898710
AH	446m W	Unspecified Works	1985	975823
AH	446m W	Unspecified Works	1991	975823
Q	447m E	Unspecified Works	1923	848942
Q	448m E	Unspecified Works	1921	848942
M	448m NW	Unspecified Commercial/Industrial	1851	881841
AC	450m E	Chemicals Works	1891	795013
AD	451m SE	Unspecified Tank	1891	852618
AI	451m NE	Unspecified Commercial/Industrial	1938	927935
AI	451m NE	Unspecified Commercial/Industrial	1933	927935
AI	451m NE	Unspecified Works	1921	986458
AI	451m NE	Tanneries	1906	807266
AI	451m NE	Unspecified Disused Works	1891	813357

ID	Location	Land Use	Date	Group ID
AG	455m E	Unspecified Commercial/Industrial	1933	796764
Q	456m E	Unspecified Works	1968	912430
M	457m NW	Unspecified Pit	1906	840536
15	459m SE	Chemical Works	1923	883999
AK	463m SE	Unspecified Works	1985	909589
AK	463m SE	Unspecified Works	1991	909589
W	465m SW	Cuttings	1905	856912
AD	465m SE	Unspecified Tank	1906	825295
AL	467m SW	Cuttings	1938	923593
AL	467m SW	Cuttings	1934	928101
AL	467m SW	Cuttings	1915	907527
AG	469m E	Oil Works	1921	864827
T	469m W	Unspecified Heap	1956	875105
T	469m W	Unspecified Heap	1968	875105
AG	470m E	Unspecified Works	1978	847531
T	470m W	Unspecified Ground Workings	1891	971049
AG	470m E	Unspecified Works	1968	918867
AM	471m NE	Railway Sidings	1956	911076
AM	471m NE	Railway Sidings	1968	911076
AD	474m SE	Unspecified Tank	1906	825294
AO	477m W	Cotton Mills	1851	862251
AG	479m E	Unspecified Works	1985	898710
T	480m W	Unspecified Ground Workings	1938	951822
T	480m W	Unspecified Ground Workings	1933	923784
T	480m W	Unspecified Ground Workings	1921	923784
T	480m W	Unspecified Ground Workings	1906	923784
T	480m W	Unspecified Ground Workings	1923	923784
AP	480m E	Unspecified Commercial/Industrial	1933	990094

ID	Location	Land Use	Date	Group ID
AP	480m E	Chemical Works	1921	974713
AP	480m E	Chemical Works	1906	950978
M	481m NW	Coal Pit	1851	808504
16	481m S	Disused Brewery	1890	823239
AG	481m E	Unspecified Works	1991	926651
M	482m NW	Gasometer	1985	850148
AO	488m W	Unspecified Works	1968	830456
17	488m E	Unspecified Commercial/Industrial	1956	853511
T	494m W	Unspecified Tank	1921	973359
T	494m W	Unspecified Tank	1906	973359
T	494m W	Unspecified Tank	1938	973359
T	494m W	Unspecified Tank	1933	973359
AQ	495m W	Unspecified Mills	1985	922374
AQ	495m W	Unspecified Mills	1978	912751
AQ	495m W	Unspecified Mills	1991	922374
AQ	495m W	Unspecified Mills	1968	912751
T	497m W	Unspecified Tank	1923	973359
AD	497m SE	Unspecified Tank	1923	942989
M	497m W	Unspecified Tank	1938	889468
M	497m W	Unspecified Tank	1933	889468
AI	497m NE	Unspecified Works	1923	934733
AQ	497m W	Unspecified Mills	1956	914363
18	499m NE	Unspecified Works	1891	830466
AQ	500m W	Unspecified Mills	1921	966437
AQ	500m W	Unspecified Mills	1938	963506

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	334

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 37**

ID	Location	Land Use	Date	Group ID
A	14m SE	Tanks	1955	143448
A	15m SE	Tanks	1979	143448
A	15m SE	Tanks	1987	143448
1	28m W	Tanks	1891	106807
B	28m NW	Unspecified Tank	1891	116112
H	38m N	Gas Works	1908	144191
H	44m N	Gas Works	1948	140627
B	50m N	Tanks	1979	106922
H	68m N	Gas Works	1922	144191
F	91m E	Tanks	1989	136201
F	92m E	Tanks	1994	136201
C	96m SE	Tanks	1893	106920
C	105m SE	Tanks	1893	106921
C	115m SE	Unspecified Tank	1893	116136
A	129m S	Tank or Trough	1908	121467
C	129m SE	Tanks	1985	133891
C	130m SE	Tanks	1953	133891
C	131m SE	Unspecified Tank	1989	116135
C	136m SE	Tanks	1985	138315
C	136m SE	Tanks	1953	138315
C	150m SE	Unspecified Tank	1893	116139
H	152m NW	Gas Works	1891	135095
M	153m NW	Gas Works	1893	123389

ID	Location	Land Use	Date	Group ID
H	160m NW	Unspecified Tank	1891	116097
H	160m NW	Unspecified Tank	1891	116098
C	179m SE	Tanks	1893	106919
H	180m NW	Unspecified Tank	1948	116113
C	186m SE	Unspecified Tank	1893	116140
H	188m NW	Unspecified Tank	1891	116096
K	194m E	Tanks	1893	106923
C	195m SE	Unspecified Tank	1893	116134
H	195m NW	Unspecified Tank	1948	116095
K	196m E	Tanks	1893	106924
C	197m SE	Unspecified Tank	1949	116141
H	200m NW	Unspecified Tank	1931	116099
H	201m NW	Tanks	1948	106898
H	203m W	Gas Works	1948	140627
H	205m NW	Unspecified Tank	1891	116115
G	210m W	Unspecified Tank	1931	116127
H	213m NW	Unspecified Tank	1948	125740
C	214m SE	Unspecified Tank	1949	116133
G	215m W	Tank or Trough	1908	121466
H	218m NW	Unspecified Tank	1979	141260
H	218m NW	Unspecified Tank	1955	140162
H	218m NW	Unspecified Tank	1958	140162
G	219m W	Tanks	1948	136522
G	219m W	Tanks	1955	136522
G	220m W	Tanks	1931	140274
H	222m NW	Tanks	1948	106896
H	223m W	Tanks	1931	132624
H	224m W	Tanks	1948	132624

ID	Location	Land Use	Date	Group ID
G	224m W	Unspecified Tank	1908	116129
S	234m N	Tanks	1948	132522
H	236m NW	Unspecified Tank	1891	147647
S	241m N	Tanks	1922	148520
S	241m N	Tanks	1931	148520
H	241m NW	Unspecified Tank	1948	122403
H	241m NW	Unspecified Tank	1955	122403
H	241m NW	Unspecified Tank	1979	122403
S	244m N	Tanks	1908	147035
S	244m N	Tanks	1922	147035
S	244m N	Tanks	1931	147035
K	245m E	Unspecified Tank	1953	116110
S	249m N	Tanks	1948	137971
S	249m N	Unspecified Tank	1955	116102
S	249m N	Tanks	1958	130892
H	249m NW	Tanks	1979	106890
S	250m N	Gas Works	1949	140627
S	250m N	Gas Works	1970	130205
S	250m N	Tanks	1948	130892
S	250m N	Tanks	1955	130892
S	250m N	Gas Works	1968	130205
H	252m NW	Overhead Tanks	1948	120513
K	255m E	Unspecified Tank	1953	116109
H	256m NW	Tanks	1931	106897
H	256m NW	Tanks	1958	143974
S	256m N	Tanks	1949	106930
H	256m NW	Tanks	1955	143974
H	256m NW	Tanks	1979	143974

ID	Location	Land Use	Date	Group ID
L	257m NE	Unspecified Tank	1949	125977
L	258m NE	Unspecified Tank	1953	125977
L	258m NE	Unspecified Tank	1949	125977
S	260m N	Tanks	1949	130892
S	260m N	Unspecified Tank	1968	116101
S	261m N	Tanks	1949	106925
H	261m NW	Tanks	1948	106895
K	263m E	Unspecified Tank	1953	116111
H	264m NW	Tanks	1979	106893
S	266m N	Tanks	1922	135092
S	266m N	Tanks	1931	135092
S	269m N	Tanks	1949	106926
S	272m N	Tanks	1949	106927
H	278m NW	Tanks	1948	106894
S	281m N	Unspecified Tank	1931	116100
H	282m NW	Unspecified Tank	1948	116052
P	285m SW	Unspecified Tank	1979	116137
S	290m N	Unspecified Tank	1908	144275
S	290m N	Unspecified Tank	1922	144275
S	294m N	Unspecified Tank	1970	133963
S	294m N	Unspecified Tank	1968	133963
S	297m N	Unspecified Tank	1931	116091
H	298m NW	Tanks	1922	141453
K	304m E	Unspecified Tank	1953	116107
S	307m N	Unspecified Tank	1970	125026
S	307m N	Unspecified Tank	1968	125026
H	314m NW	Tanks	1931	141453
H	317m NW	Unspecified Tank	1949	116094

ID	Location	Land Use	Date	Group ID
S	324m N	Tanks	1908	136314
S	324m N	Tanks	1922	136314
S	324m N	Tanks	1931	136314
P	327m W	Tanks	1992	106808
P	327m W	Unspecified Tank	1989	116128
S	329m N	Tanks	1949	106929
S	332m N	Oil Tanks	1931	139394
M	332m NW	Unspecified Tank	1948	116053
S	332m N	Oil Tanks	1922	139394
S	333m N	Oil Tanks	1908	132831
V	334m SE	Tank or Trough	1893	121465
M	335m NW	Unspecified Tank	1948	116051
M	335m NW	Tanks	1948	106892
M	337m NW	Unspecified Tank	1908	147259
M	337m NW	Unspecified Tank	1922	147259
S	339m N	Unspecified Tank	1949	116092
S	339m N	Unspecified Tank	1949	132990
S	339m N	Unspecified Tank	1970	132990
S	340m N	Unspecified Tank	1968	132990
S	343m N	Tanks	1970	123034
S	344m N	Tanks	1968	131109
Q	344m E	Unspecified Tank	1953	135773
Q	344m E	Unspecified Tank	1949	135773
Q	344m E	Unspecified Tank	1949	124488
M	345m NW	Tanks	1922	142950
M	345m NW	Tanks	1931	142950
K	348m E	Unspecified Tank	1953	116108
S	349m N	Unspecified Tank	1970	116093

ID	Location	Land Use	Date	Group ID
M	350m NW	Tanks	1948	106891
K	350m E	Tanks	1932	106940
K	351m E	Unspecified Tank	1949	124118
K	352m E	Unspecified Tank	1949	124118
S	359m N	Unspecified Tank	1968	139876
S	359m N	Unspecified Tank	1970	139876
S	362m N	Unspecified Tank	1949	122692
Q	363m E	Unspecified Tank	1953	137561
Q	363m E	Unspecified Tank	1949	137561
Q	363m E	Unspecified Tank	1949	137561
Y	364m W	Unspecified Tank	1979	126647
Y	364m W	Unspecified Tank	1983	132385
Y	364m W	Unspecified Tank	1979	116138
Y	365m W	Unspecified Tank	1980	142018
Q	366m E	Unspecified Tank	1949	116106
M	368m NW	Tanks	1908	124443
Q	368m E	Unspecified Tank	1953	141153
Q	368m E	Unspecified Tank	1949	141153
S	370m N	Tanks	1970	141692
M	372m NW	Gas Works	1979	124342
Q	375m E	Unspecified Tank	1949	132611
S	375m N	Tanks	1970	136413
Q	375m E	Unspecified Tank	1953	132611
Q	375m E	Unspecified Tank	1949	132611
Q	375m E	Unspecified Tank	1949	128199
Q	377m E	Unspecified Tank	1953	132611
Q	377m E	Unspecified Tank	1949	132611
S	379m N	Unspecified Tank	1949	116090

ID	Location	Land Use	Date	Group ID
M	379m NW	Gasometers	1893	146932
M	379m NW	Gasometers	1908	146932
M	379m NW	Gasometers	1922	146932
S	380m N	Tanks	1949	106928
Q	381m E	Unspecified Tank	1932	116130
M	382m NW	Gas Holder Station	1995	128430
M	382m NW	Gas Holder Station	1994	128430
M	383m NW	Gas Holder Station	1991	128430
AB	383m S	Unspecified Tank	1893	115900
Q	384m E	Unspecified Tank	1949	129924
M	384m NW	Gas Holder Station	1986	143674
Q	384m E	Unspecified Tank	1949	129924
M	384m NW	Gas Holder Station	1992	124051
M	385m NW	Gas Holder Station	1989	143674
M	388m NW	Unspecified Tank	1948	116054
M	390m NW	Unspecified Tank	1931	116055
Q	393m E	Unspecified Tank	1908	136376
Q	393m E	Unspecified Tank	1922	136376
Q	393m E	Unspecified Tank	1932	136376
M	393m NW	Gas Works	1949	130918
U	393m NW	Unspecified Tank	1970	129294
U	393m NW	Unspecified Tank	1968	129294
M	394m NW	Gasometer	1891	108529
S	394m N	Unspecified Tank	1970	128581
S	394m N	Unspecified Tank	1968	128581
Q	397m E	Unspecified Tank	1953	134719
Q	397m E	Unspecified Tank	1949	134719
K	399m E	Unspecified Tank	1949	137467

ID	Location	Land Use	Date	Group ID
K	399m E	Unspecified Tank	1949	137467
K	400m E	Unspecified Tank	1949	140973
K	400m E	Unspecified Tank	1949	140973
M	403m NW	Overhead Tanks	1948	120512
AF	403m N	Gas Works	1984	126853
M	404m NW	Gas Works	1968	146054
M	404m NW	Gas Works	1952	141387
M	404m NW	Gas Works	1948	141387
M	404m NW	Gas Works	1970	146054
M	404m NW	Gas Works	1984	140774
Q	412m E	Tanks	1949	144825
Q	413m E	Tanks	1953	144825
Q	413m E	Tanks	1949	144825
Q	413m E	Tanks	1932	123263
T	415m W	Unspecified Tank	1891	116114
Q	416m E	Unspecified Tank	1949	142735
Q	416m E	Unspecified Tank	1953	127483
Q	416m E	Unspecified Tank	1949	146177
M	417m NW	Tanks	1992	136167
M	417m NW	Tanks	1986	136167
M	417m NW	Tanks	1989	138546
Z	417m E	Unspecified Tank	1949	132231
Z	418m E	Unspecified Tank	1949	132231
Q	419m E	Tanks	1949	126372
T	419m W	Unspecified Tank	1891	116116
Q	419m E	Tanks	1949	126372
Q	419m E	Unspecified Tank	1953	116148
S	420m N	Unspecified Tank	1970	130437

ID	Location	Land Use	Date	Group ID
S	420m N	Unspecified Tank	1968	130437
T	420m W	Unspecified Tank	1979	140187
Q	420m E	Tanks	1932	126372
T	421m W	Unspecified Tank	1948	140187
T	421m W	Unspecified Tank	1955	140187
M	422m NW	Unspecified Tank	1995	143443
M	422m NW	Unspecified Tank	1994	143443
M	423m NW	Unspecified Tank	1991	137585
T	423m W	Unspecified Tank	1891	116117
T	424m W	Unspecified Tank	1931	116118
AF	425m N	Gasometer	1922	148952
AF	425m N	Unspecified Tank	1931	142901
M	428m NW	Gasometer	1908	144489
M	428m NW	Gasometer	1922	144489
M	428m NW	Unspecified Tank	1931	128987
AF	429m N	Gas Holder	1995	137733
AF	429m N	Gas Holder	1995	137733
AF	429m N	Gas Holder	1984	125049
AF	430m N	Gasometer	1949	122835
AF	430m N	Unspecified Tank	1970	142901
M	430m NW	Gasometers	1979	108903
M	430m NW	Gasholder	1992	120428
T	430m W	Unspecified Tank	1908	127771
T	430m W	Unspecified Tank	1922	127771
T	430m W	Unspecified Tank	1931	127771
AF	430m N	Gasometer	1968	141629
Q	430m E	Unspecified Tank	1932	116104
M	431m NW	Gas Holder	1986	149177

ID	Location	Land Use	Date	Group ID
T	431m W	Tanks	1908	145285
T	431m W	Tanks	1922	145285
M	431m NW	Unspecified Tank	1958	145921
M	432m NW	Unspecified Tank	1948	139971
M	432m NW	Gas Holder	1989	149177
M	432m NW	Unspecified Tank	1955	139971
Q	433m E	Tanks	1953	133368
Q	433m E	Tanks	1949	133368
AC	433m E	Tanks	1949	126621
AC	434m E	Tanks	1949	126621
AD	435m SE	Unspecified Tank	1908	116132
T	435m W	Tanks	1931	106806
T	435m W	Unspecified Tank	1979	122787
Q	436m E	Unspecified Tank	1932	116103
T	436m W	Unspecified Tank	1948	125105
T	436m W	Unspecified Tank	1955	125105
T	437m W	Unspecified Tank	1986	127783
M	437m NW	Gasometer	1891	108531
T	438m W	Unspecified Tank	1931	116119
T	438m W	Unspecified Tank	1989	127783
T	438m W	Tanks	1979	129820
T	438m W	Unspecified Tank	1891	116124
T	439m W	Tanks	1948	128195
T	439m W	Tanks	1955	127968
T	439m W	Tanks	1931	127904
M	440m NW	Gasometer	1891	108530
T	441m W	Unspecified Tank	1908	116125
T	442m W	Tanks	1979	139173

ID	Location	Land Use	Date	Group ID
T	443m W	Unspecified Tank	1908	116126
T	443m W	Tanks	1979	134652
T	444m W	Tanks	1948	134210
T	444m W	Tanks	1955	134210
T	444m W	Tanks	1948	134652
T	444m W	Tanks	1955	134652
T	446m W	Tanks	1979	140447
T	446m W	Tanks	1986	140447
AD	446m SE	Unspecified Tank	1908	116131
T	447m W	Unspecified Tank	1908	116120
T	448m W	Unspecified Tank	1891	116123
T	450m W	Tanks	1948	125836
T	450m W	Tanks	1989	125836
T	450m W	Tanks	1955	125836
Z	451m E	Tanks	1953	106939
Q	461m E	Unspecified Tank	1908	116149
T	462m W	Unspecified Tank	1979	144042
T	463m W	Unspecified Tank	1948	144042
T	463m W	Unspecified Tank	1955	144042
T	466m W	Tanks	1948	130116
T	466m W	Tanks	1955	130116
Q	468m E	Unspecified Tank	1908	116151
T	474m W	Unspecified Tank	1979	142816
T	475m W	Unspecified Tank	1948	147680
T	475m W	Unspecified Tank	1955	141710
Q	476m E	Unspecified Tank	1908	116150
T	477m W	Unspecified Tank	1931	116121
M	477m W	Tanks	1986	144183

ID	Location	Land Use	Date	Group ID
M	478m W	Tanks	1992	144183
M	479m W	Tanks	1989	144183
AD	479m SE	Unspecified Tank	1893	116144
T	480m W	Tanks	1948	106809
AC	486m E	Unspecified Tank	1949	125746
AC	486m E	Unspecified Tank	1953	140757
AC	486m E	Unspecified Tank	1949	147068
AC	487m E	Unspecified Tank	1949	137913
AC	487m E	Unspecified Tank	1953	137913
AC	487m E	Unspecified Tank	1949	137913
AD	489m SE	Tanks	1991	135435
AD	490m SE	Tanks	1996	135435
AD	490m SE	Tanks	1996	135435
AD	490m SE	Tanks	1995	135435
AD	490m SE	Tanks	1994	135435
AD	490m SE	Tanks	1980	135435
T	492m W	Tanks	1922	134829
T	492m W	Tanks	1931	134829
T	493m W	Tanks	1908	143683
M	494m NW	Gasholder	1992	120429
M	494m NW	Gas Holder	1986	140988
M	495m NW	Unspecified Tank	1958	123472
AD	496m SE	Tanks	1893	106918
M	496m W	Unspecified Tank	1931	148893
M	496m NW	Unspecified Tank	1948	147701
M	496m NW	Gas Holder	1989	140988
M	496m NW	Unspecified Tank	1955	147701
T	499m W	Unspecified Tank	1908	122777

ID	Location	Land Use	Date	Group ID
T	499m W	Unspecified Tank	1922	138312
T	499m W	Unspecified Tank	1931	138312
AD	499m SE	Unspecified Tank	1932	116143

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	**109**

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 37**

ID	Location	Land Use	Date	Group ID
B	0m NW	Electricity Sub-Station	1979	77947
B	0m NW	Electricity Sub-Station	1987	77947
B	0m NW	Electricity Sub-Station	1991	77947
B	0m NW	Electricity Substation	1955	84614
B	1m NW	Electricity Substation	1995	84614
H	38m N	Gas Works	1908	77534
H	44m N	Gas Works	1948	85321
B	65m N	Electricity Substation	1979	62200
H	68m N	Gas Works	1922	77534
B	70m N	Electricity Substation	1948	69850
B	70m N	Electricity Substation	1955	69850
F	85m E	Electricity Substation	1953	83776
F	85m E	Electricity Substation	1949	83776
F	85m E	Electricity Substation	1949	83776
F	86m E	Electricity Substation	1985	83776
F	86m E	Electricity Substation	1989	75310
F	86m E	Electricity Substation	1994	75310

ID	Location	Land Use	Date	Group ID
L	145m NE	Electricity Substation	1989	73389
L	146m NE	Electricity Substation	1994	73389
H	152m NW	Gas Works	1891	73418
M	153m NW	Gas Works	1893	80210
N	172m SW	Electricity Substation	1995	66724
N	173m SW	Electricity Substation	1979	66724
N	174m SW	Electricity Substation	1983	66724
K	187m E	Electricity Generating Station	1949	67122
K	187m E	Electricity Generating Station	1949	75559
H	203m W	Gas Works	1948	85321
L	214m NE	Electricity Substation	1994	62203
O	218m E	Electricity Substation	1949	69908
O	218m E	Electricity Substation	1989	69908
O	218m E	Electricity Substation	1953	69908
O	218m E	Electricity Substation	1949	69908
O	220m E	Electricity Substation	1985	66511
G	229m W	Electricity Substation	1992	65320
G	229m W	Electricity Substation	1989	83931
G	229m W	Electricity Substation	1979	65320
G	229m W	Electricity Substation	1986	65320
G	230m W	Electricity Substation	1955	65320
S	250m N	Gas Works	1949	85321
S	250m N	Gas Works	1970	85321
S	250m N	Gas Works	1968	85321
C	259m SE	Electricity Substation	1949	82552
C	259m SE	Electricity Substation	1953	82552
C	259m SE	Electricity Substation	1949	82552
K	261m E	Electricity Generating Station	1908	69584

ID	Location	Land Use	Date	Group ID
K	261m E	Electricity Generating Station	1922	69584
P	268m W	Electricity Substation	1979	67641
P	268m W	Electricity Substation	1986	67641
P	269m W	Electricity Substation	1989	67641
P	269m W	Electricity Substation	1992	67641
X	279m NE	Electricity Substation	1994	66021
X	280m NE	Electricity Transformer Station	1985	63378
V	352m SE	Electricity Substation	1991	65964
V	353m SE	Electricity Substation	1996	65964
V	353m SE	Electricity Substation	1996	65964
V	353m SE	Electricity Substation	1995	65964
V	353m SE	Electricity Substation	1994	65964
X	358m NE	Electricity Substation	1989	81063
X	363m NE	Electricity Substation	1985	85433
M	372m NW	Gas Works	1979	64728
M	379m NW	Gasometers	1893	78993
M	379m NW	Gasometers	1908	78993
M	379m NW	Gasometers	1922	78993
M	381m NW	Corporation Gas Works	1891	79203
M	382m NW	Gas Holder Station	1995	83257
M	382m NW	Gas Holder Station	1994	83257
M	383m NW	Gas Holder Station	1991	83257
M	384m NW	Gas Holder Station	1986	65294
M	384m NW	Gas Holder Station	1992	79718
M	385m NW	Gas Holder Station	1989	65294
M	390m NW	Corporation Gas Works	1891	79203
M	393m NW	Gas Works	1949	66752
M	394m NW	Gasometer	1891	59722

ID	Location	Land Use	Date	Group ID
AF	403m N	Gas Works	1984	71747
M	404m NW	Gas Works	1968	74752
M	404m NW	Gas Works	1952	74752
M	404m NW	Gas Works	1948	74752
M	404m NW	Gas Works	1970	74752
M	404m NW	Gas Works	1984	71264
AF	425m N	Gasometer	1922	76542
M	428m NW	Gasometer	1908	70420
M	428m NW	Gasometer	1922	70420
AF	429m N	Gas Holder	1995	72614
AF	429m N	Gas Holder	1995	72614
AF	429m N	Gas Holder	1984	68164
AF	430m N	Gasometer	1949	76542
M	430m NW	Gasometers	1979	63338
M	430m NW	Gasholder	1992	63416
AF	430m N	Gasometer	1968	75789
M	431m NW	Gas Holder	1986	77108
M	432m NW	Gas Holder	1989	77108
M	437m NW	Gasometer	1891	59724
M	440m NW	Gasometer	1891	59723
Q	440m E	Electricity Substation	1985	75460
Q	455m E	Electricity Substation	1989	69601
AJ	463m SW	Electricity Substation	1983	78935
AJ	463m SW	Electricity Substation	1995	78935
AJ	463m SW	Electricity Substation	1979	78935
AJ	467m SW	Electricity Substation	1956	78984
AJ	467m SW	Electricity Substation	1949	78984
AN	476m S	Electricity Substation	1996	73117

ID	Location	Land Use	Date	Group ID
AN	476m S	Electricity Substation	1996	73117
AN	476m S	Electricity Substation	1995	73117
AN	476m S	Electricity Substation	1994	73117
AN	477m S	Electricity Substation	1991	81745
AN	478m S	Electricity Substation	1980	70702
M	494m NW	Gasholder	1992	63417
M	494m NW	Gas Holder	1986	74103
M	496m NW	Gas Holder	1989	74103

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	**6**

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'.

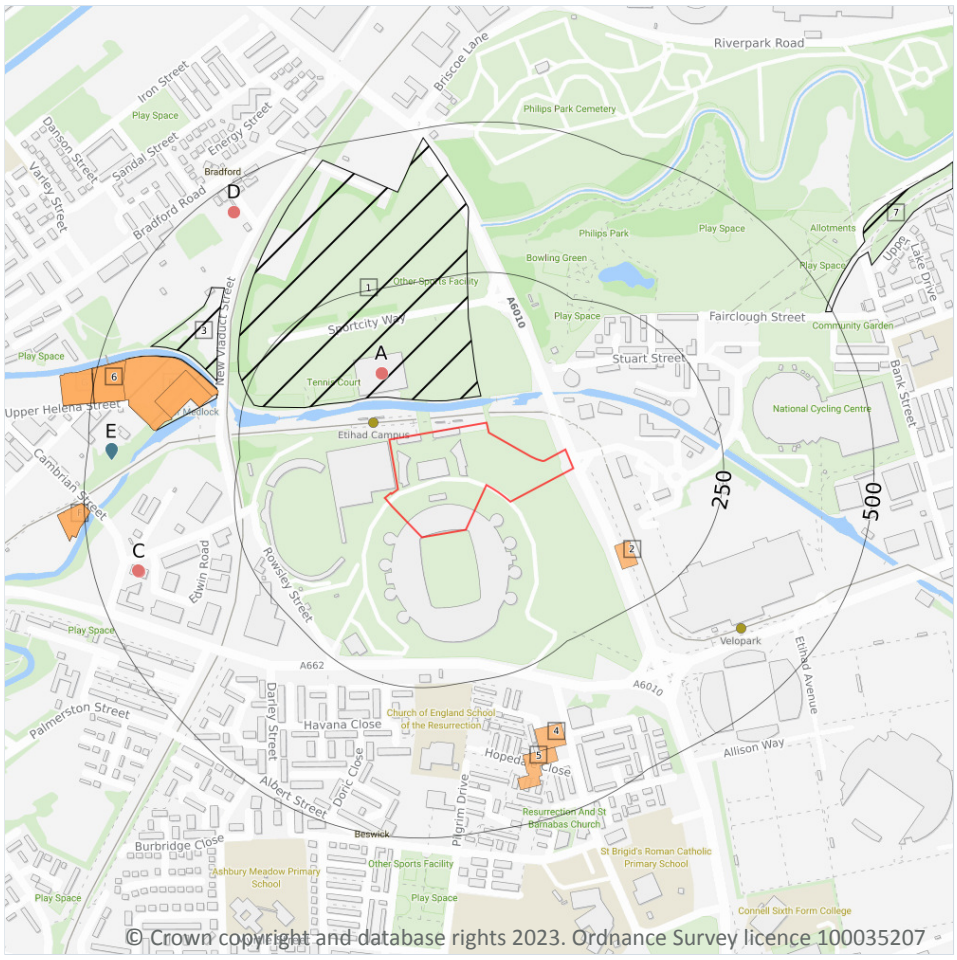
Features are displayed on the Past land use - un-grouped map on **page 37**

ID	Location	Land Use	Date	Group ID
P	230m SW	Garage	1986	20751
R	232m SW	Garage	1983	24112
AB	352m S	Garage	1983	20860
AB	352m S	Garage	1979	27080
AB	388m S	Garage	1956	27080

ID	Location	Land Use	Date	Group ID
AB	389m S	Garage	1958	21217

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

Historical landfill (EA/NRW)

Historical waste sites

Licensed waste sites

Waste exemptions

3.1 Active or recent landfill

Records within 500m	0

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

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

3.2 Historical landfill (BGS records)

Records within 500m	0

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	4

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 72**

ID	Location	Details		
1	45m N	Site Address: Bradford Road Works, Bradeley Hall Road, Haslington, Crewe, Cheshire Licence Holder Address: Welman House, Altrincham, Cheshire	Waste Licence: Yes Site Reference: RD/LIC/180/79, GDO F058, 0381 Waste Type: Inert, Industrial, Special Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 07/12/1979 Licence Surrender: 14/12/1983	Operator: - Licence Holder: North West Gas First Recorded 07/12/1979 Last Recorded: 01/12/1983
B	295m W	Site Address: Bradford Road - Cambrian Street Depot, Greater Manchester Licence Holder Address: -	Waste Licence: Yes Site Reference: F044, RD/LIC/381/84 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 10/10/1985 Licence Surrender: 09/03/1993	Operator: - Licence Holder: Regional Surveyore (North West Gas) First Recorded 31/12/1985 Last Recorded: 31/12/1990
3	302m W	Site Address: New Viaduct Street, Greater Manchester Licence Holder Address: -	Waste Licence: - Site Reference: F045 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded - Last Recorded: -

ID	Location	Details		
7	489m NE	Site Address: Clayton Vale Power Station, Bank Bridge Road, Manchester Licence Holder Address: Europa House, Birdhall Lane, Cheadle Heath, Stockport	Waste Licence: Yes Site Reference: RD/LIC/045/76,GDO F001 Waste Type: Inert, Industrial, Commercial, Household, Special, Liquid sludge Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 01/01/1974 Licence Surrender: -	Operator: - Licence Holder: Central Electricity Generating Board First Recorded 31/12/1965 Last Recorded: 31/12/1968

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

3.5 Historical waste sites

Records within 500m **12**

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

Features are displayed on the Waste and landfill map on **page 72**

ID	Location	Address	Further Details	Date
2	146m SE	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1988
B	294m W	Site Address: N/A	Type of Site: Corporation Refuse Destructor Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1948
B	294m W	Site Address: N/A	Type of Site: Refuse Destructor Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1955
B	303m W	Site Address: N/A	Type of Site: Refuse Destructor Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1958

ID	Location	Address	Further Details	Date
4	351m S	Site Address: N/A	Type of Site: Scrap Metal Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1956
5	386m S	Site Address: N/A	Type of Site: Scrap Metal Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1956
6	443m W	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1986
F	489m W	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1992
F	490m W	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1988
G	494m W	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1986
G	494m W	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1992
G	495m W	Site Address: N/A	Type of Site: Scrap Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1988

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 72**

ID	Location	Details		
E	461m W	Site Name: P Mc Guiness & Co Ltd Site Address: Holt Town Ind Est, Holt Town, Manchester, M40 7FQ Correspondence Address: -	Type of Site: Special Waste Transfer Station Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MPC001 EPR reference: EA/EPR/JP3892CY/S002 Operator: Mc Guinness & Co Ltd Waste Management licence No: 53629 Annual Tonnage: 50000	Issue Date: 03/11/1995 Effective Date: - Modified: - Surrendered Date: Jun 26 2002 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered
E	461m W	Site Name: P Mc Guiness & Co Ltd Site Address: Holt Town Ind Est, Holt Town, Manchester, M40 7FQ Correspondence Address: -	Type of Site: Special Waste Transfer Station Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MPC001 EPR reference: EA/EPR/JP3892CY/S002 Operator: Mc Guinness & Co Ltd Waste Management licence No: 53629 Annual Tonnage: 50000	Issue Date: 03/11/1995 Effective Date: - Modified: - Surrendered Date: Jun 26 2002 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered

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

3.7 Waste exemptions

Records within 500m	9

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 72**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	110m NW	-	WEX269478	Using waste exemption	Not on a farm	Use of waste in construction
A	110m NW	BAM Project Office, CFG Campus, Off Gibbon Street / Alan Turing Way, Manchester, M11 3DU	WEX253830	Using waste exemption	Not on a farm	Use of mulch
A	110m NW	BAM Project Office, CFG Campus, Off Gibbon Street / Alan Turing Way, Manchester, M11 3DU	WEX253830	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	427m W	30, PHILIPS PARK ROAD, MANCHESTER, M11 3FX	WEX243791	Treating waste exemption	Not on a farm	Aerobic composting and associated prior treatment
C	427m W	30, PHILIPS PARK ROAD, MANCHESTER, M11 3FX	WEX278736	Treating waste exemption	Not on a farm	Aerobic composting and associated prior treatment
C	427m W	30, PHILIPS PARK ROAD, MANCHESTER, M11 3FX	WEX137238	Treating waste exemption	Not on a farm	Aerobic composting and associated prior treatment
C	428m W	30 Philips Park Road MANCHESTER M11 3FX	EPR/RE5746ZT/A001	Treating waste exemption	Non-Agricultural Waste Only	Aerobic composting and associated prior treatment
D	458m NW	Apartment 10 7 Stillwater Drive Manchester Manchester M11 4TG	EPR/QF0301VL/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in secure containers
D	458m NW	Apartment 10 7 Stillwater Drive Manchester Manchester M11 4TG	EPR/QF0301VL/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place

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
- Control of Major Accident Hazards
- Hazardous substance storage/usage
- Historical licensed industrial activities
- Licensed pollutant release (Part A(2)/B)
- Radioactive Substance Authorisations
- Licensed Discharges to controlled waters
- List 1 Dangerous Substances
- List 2 Dangerous Substances
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	10

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Company	Address	Activity	Category
1	28m NW	Etihad Campus (Mancheste r Metrolink)	Greater Manchester, M11	Tram, Metro and Light Railway Stations and Stops	Public Transport, Stations and Infrastructure
2	52m E	Electricity Sub Station	Greater Manchester, M11	Electrical Features	Infrastructure and Facilities

ID	Location	Company	Address	Activity	Category
3	62m NE	Electricity Sub Station	Greater Manchester, M11	Electrical Features	Infrastructure and Facilities
4	109m E	Electricity Sub Station	Greater Manchester, M11	Electrical Features	Infrastructure and Facilities
A	130m E	Asda Eastlands	Alan Turing Way, Bradford, Manchester, Greater Manchester, M11 4BD	Vehicle Cleaning Services	Personal, Consumer and Other Services
A	150m E	Asda Eastlands	Alan Turing Way, Bradford, Manchester, Greater Manchester, M11 4BD	Petrol and Fuel Stations	Road and Rail
B	181m NW	Electricity Sub Station	Greater Manchester, M11	Electrical Features	Infrastructure and Facilities
5	215m S	Mast (Telecommunication)	Greater Manchester, M11	Telecommunications Features	Infrastructure and Facilities
6	219m NE	Electricity Sub Station	Greater Manchester, M11	Electrical Features	Infrastructure and Facilities
7	230m W	Electricity Sub Station	Greater Manchester, M11	Electrical Features	Infrastructure and Facilities

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 78**

ID	Location	Company	Address	LPG	Status
A	174m E	ASDA	Alan Turing Way, Bradford, Manchester, Greater Manchester, M11 4BD	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	3

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.

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Company	Address	Operational status	Tier
D	374m SE	Rhodia Ltd	Rhodia Ltd, Ashton New Road, Manchester, M11 4AT	Historical NIHHS Site	-
11	416m N	British Gas	British Gas, Bradford Road Holder Station, Bradford Road, Miles Platting, M10 7BL	Historical COMAH Site	-
13	453m SE	Ciba Speciality Chemicals	Ciba Speciality Chemicals, Ashton New Road, Clayton, M11 4AP	Historical COMAH Site	-

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	**6**

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.

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Details	
12	427m NW	Application reference number: 059226/HSC/NORTH2/00 Application status: Historical Consent Application date: 11/07/2000 Address: Land Bounded By Alan Turing Way & New Viaduct Street, Bradford	Details: Continuation Of Hazardous Substances Consent For Storage Of Gas Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
14	461m NW	Application reference number: 059225/HSC/NORTH2/00 Application status: Historical Consent Application date: 11/05/2000 Address: Land At Gleden Street, Bradford, WF17 6HY	Details: Continuation Of Hazardous Substances Consent For Storage Of Gas Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
15	465m N	Application reference number: 000001/HSC/NORTH2/92 Application status: Historical Consent Application date: 01/10/1992 Address: National Grid Gas PLC, Bradford Road Holder Station (East), Bradford Road, Miles Platting, Manchester, Greater Manchester, England, M40 7BN	Details: Storage of low pressure gas. Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
G	485m E	Application reference number: 094262/HSC/2010/N2 Application status: Historical Consent Application date: 15/09/2010 Address: Ashton New Road, Clayton, Manchester, M11 4AP	Details: Revocation of hazardous substances consents granted under refs: 000002/HSC/NORTH2/92 and 057477/HSC/NORTH2/99 Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
G	485m E	Application reference number: 057477/HSC/NORTH2/99 Application status: Historical Consent Application date: 02/09/1999 Address: CIBA Speciality Chemicals PLC, Ashton New Road, Clayton, Manchester, M11 4AP	Details: Hazardous Substances Deemed Consent - Manufacture of dyestuffs and related chemicals Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
G	485m E	Application reference number: 000002/HSC/NORTH2/92 Application status: Historical Consent Application date: 12/11/1992 Address: Clayton Aniline Co. Ltd., Ashton New Road, Clayton, Manchester, M11 4AP	Details: Storage of sulphur trioxide (as Oleum) and chlorine. Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	9

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.

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Details	
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: Ashton New Road, Clayton, Manchester, M11 4AP Process: Combustion Processes Permit Number: AA2330	Original Permit Number: IPCAPP Date Approved: 28-8-1992 Effective Date: 28-8-1992 Status: Superseded By Variation
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: Ashton New Road, Clayton, Manchester, M11 4AP Process: Combustion Processes Permit Number: AI2996	Original Permit Number: IPCMINVAR Date Approved: 16-9-1993 Effective Date: 16-9-1993 Status: Revoked
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: AK3579	Original Permit Number: IPCAIRAPP Date Approved: 23-2-1994 Effective Date: 23-2-1994 Status: Superseded By Variation
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: AO5042	Original Permit Number: IPCMINVAR Date Approved: 3-10-1994 Effective Date: 3-10-1994 Status: Superseded By Variation
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: AP3614	Original Permit Number: IPCMINVAR Date Approved: 28-2-1995 Effective Date: 1-3-1995 Status: Superseded By Variation
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: AV8879	Original Permit Number: IPCMINVAR Date Approved: 2-12-1996 Effective Date: 9-12-1996 Status: Superseded By Variation
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: BD6263	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation

ID	Location	Details	
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: BT9046	Original Permit Number: IPCMINVAR Date Approved: 12-2-2003 Effective Date: 17-2-2003 Status: Superseded By Variation
F	482m SE	Operator: Ciba Specialty Chemicals Plc Address: PO Box 2, Ashton New Road, Clayton, Manchester, M11 4AP Process: Manufacture And Use Of Organic Chemicals Permit Number: BY0577	Original Permit Number: IPCMINVAR Date Approved: 25-6-2004 Effective Date: 1-7-2004 Status: Revoked

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	**4**

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 78**

ID	Location	Address	Details	
A	156m E	Asda Eastlands, Ashton New Road, Bradford, M11 4BD	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
8	304m W	J And F Brooks Ltd, Philips Park Road, Beswick, M11 3EJ	Process: Timber Manufacture Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
9	326m W	West & Musgrave, Edwin Rd, M11 3ER	Process: Non-ferrous Metal Foundry Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

ID	Location	Address	Details	
16	471m SE	Frances Shaw And Co, Corbett Street, Clayton, M11 4BB	Process: Rubber Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	**1**

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

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Address	Details	
F	482m SE	Salford Royal Nhs Foundation Trust, Ashton New Road, Clayton, Manchester, M11 4AP	Operator: Salford Royal Nhs Foundation Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AB9798 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled

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 78**

ID	Location	Address	Details	
B	177m NW	BRADFORD RD GAS WORKS, OPPOSITE ELM STREET, BRADFORD, MANCHESTER, GREATER MANCHESTER	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016982626 Permit Version: 1 Receiving Water: RIVER MEDLOCK	Status: CONSENT REVOKED - DISCHARGE CEASED (WRA 91, SCHED 10 & 6) Issue date: - Effective Date: 30/09/1994 Revocation Date: 02/10/1998

ID	Location	Address	Details	
C	317m N	MILL ST AT PARK INN, MANCHESTER, GREATER MANCHESTER	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0100 Permit Version: 1 Receiving Water: RIVER MEDLOCK	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 01/01/1995 Revocation Date: 18/07/1995
C	328m N	MILL ST/FORGE LANE, MANCHESTER, GREATER MANCHESTER	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0099 Permit Version: 1 Receiving Water: RIVER MEDLOCK	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: - Effective Date: 01/01/1995 Revocation Date: 26/08/1999

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	**4**

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.

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Name	Status	Receiving Water	Authorised Substances
D	424m SE	Rhodia Industrial Specialities Ltd,	Active	Manchester Ship Canal	Cadmium

ID	Location	Name	Status	Receiving Water	Authorised Substances
D	424m SE	Rhodia Industrial Specialities Ltd,	Active	Manchester Ship Canal	Cadmium
F	483m SE	Clayton Aniline	Not Active	Manchester Ship Canal	Mercury (other), Cadmium
F	483m SE	Ciba Geigy Plc Outlets S1/s2(clayton Aniline)	Not Active	Manchester Ship Canal	Mercury (other), Cadmium

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

4.17 List 2 Dangerous Substances

Records within 500m **1**

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.

Features are displayed on the Current industrial land use map on **page 78**

ID	Location	Name	Status	Receiving Water	Authorised Substances
F	483m SE	Ciba Geigy Plc, Clayton, Manchester	Not Active	River MerseyManchester Ship Canal	Chromium, Copper, Zinc, Toluene

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m **8**

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 78**

ID	Location	Details	
10	373m E	Incident Date: 07/05/2003 Incident Identification: 173905 Pollutant: Inorganic Chemicals/Products Pollutant Description: Acids	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
E	463m W	Incident Date: 18/07/2001 Incident Identification: 17447 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

ID	Location	Details	
E	473m W	Incident Date: 27/06/2001 Incident Identification: 11933 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
E	474m W	Incident Date: 25/06/2001 Incident Identification: 11433 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
E	474m W	Incident Date: 03/08/2001 Incident Identification: 21821 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
E	477m W	Incident Date: 28/06/2001 Incident Identification: 12020 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
E	479m W	Incident Date: 04/07/2001 Incident Identification: 13774 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
17	498m W	Incident Date: 29/07/2002 Incident Identification: 95435 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)

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.

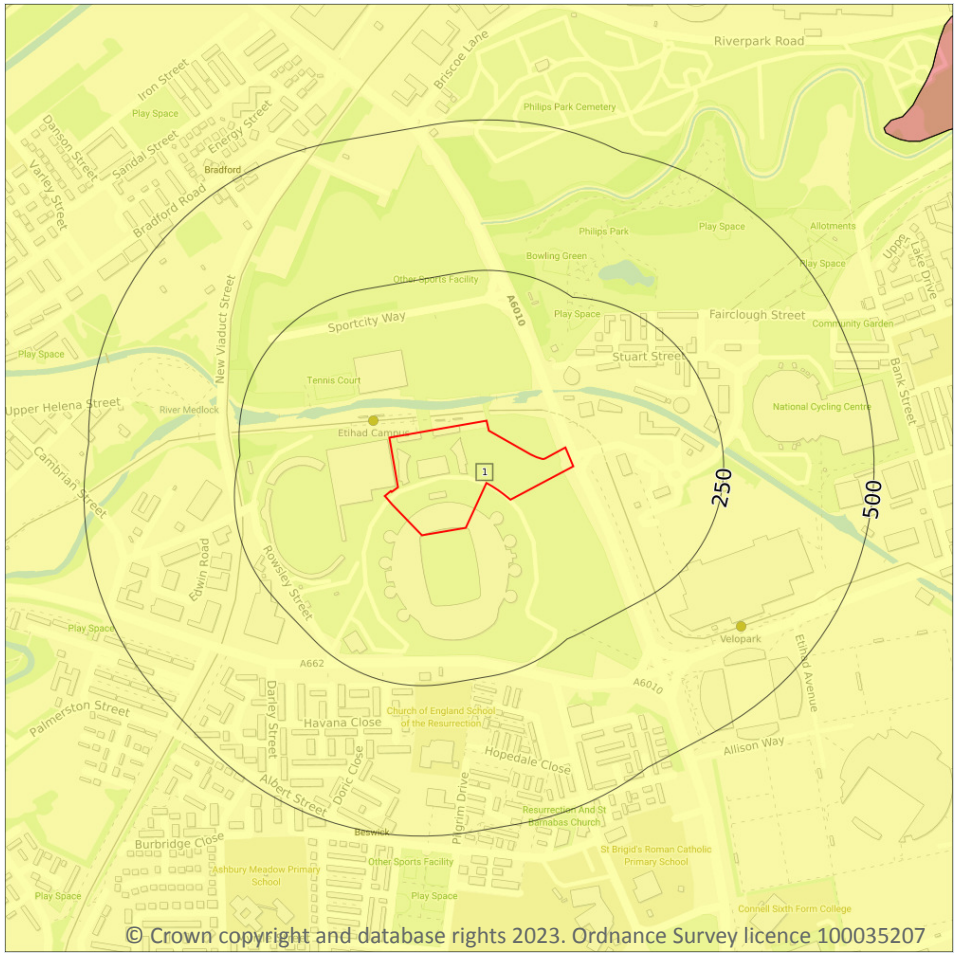
4.21 Pollution inventory radioactive waste

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	1

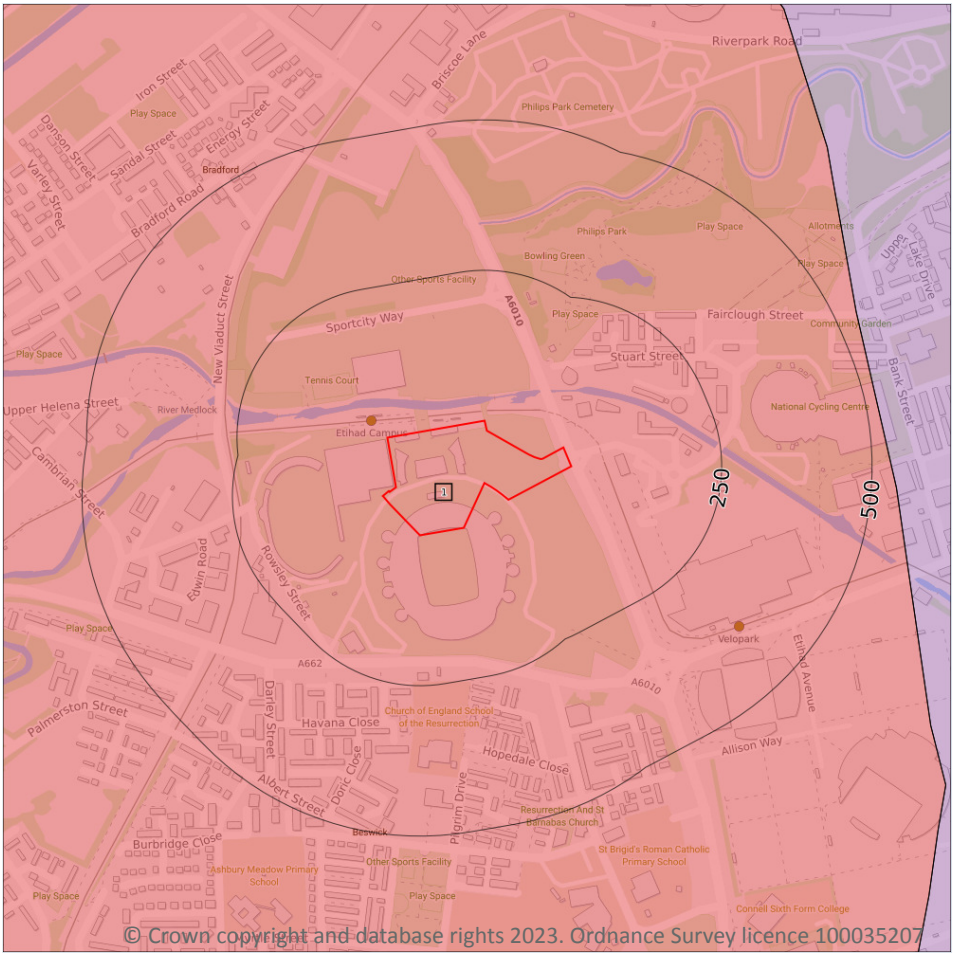
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 89**

ID	Location	Designation	Description
1	**On site**	**Secondary Undifferentiated**	**Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type**

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	1

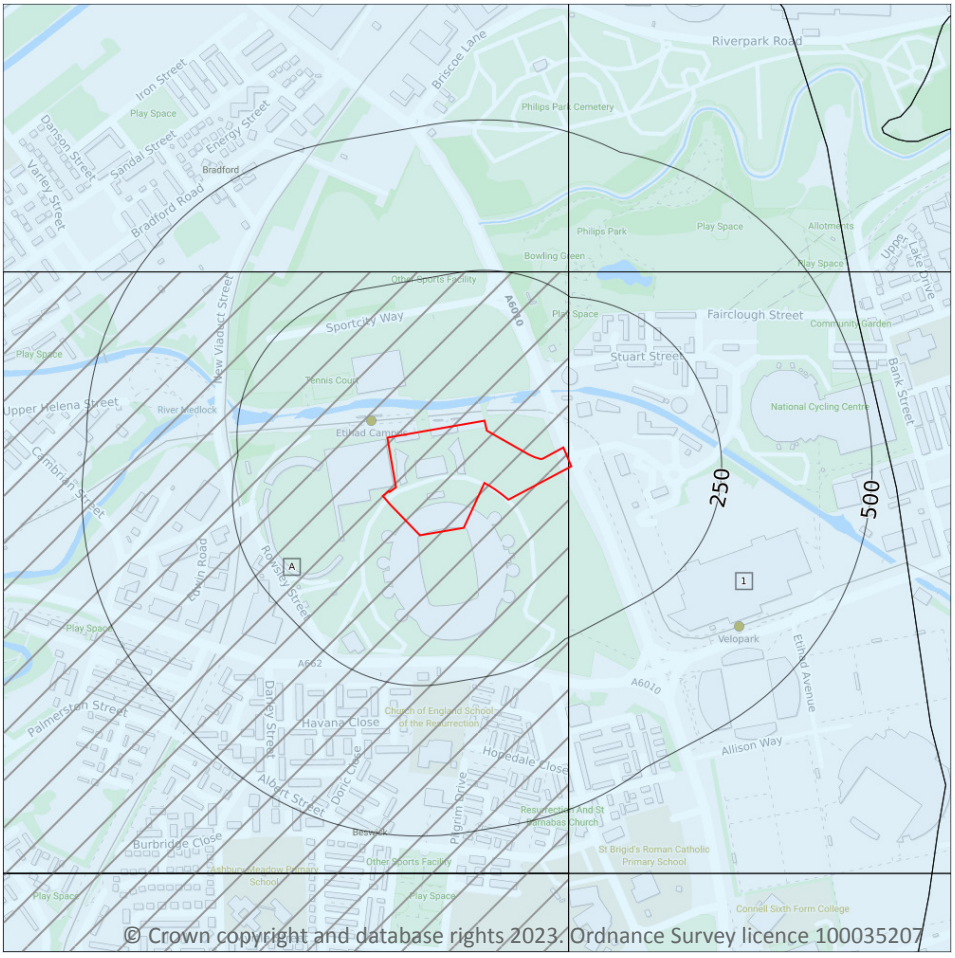
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 90**

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**

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

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

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 91**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
A	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Medium	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	1

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

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
A	**Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.**	**1.0%**

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



Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	25

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 93**

ID	Location	Details	
-	903m SE	Status: Historical Licence No: 2569006026 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, CLAYTON, MANCHESTER" Data Type: Point Name: CIBA SPECIALTY CHEMICALS PLC Easting: 387700 Northing: 398100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/07/2000 Version End Date: -
-	903m SE	Status: Historical Licence No: 2569006026 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, CLAYTON, MANCHESTER" Data Type: Point Name: CIBA SPECIALTY CHEMICALS PLC Easting: 387700 Northing: 398100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/07/2000 Version End Date: -
-	903m SE	Status: Historical Licence No: 2569006026 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, CLAYTON, MANCHESTER Data Type: Point Name: CIBA SPECIALTY CHEMICALS PLC Easting: 387700 Northing: 398100	Annual Volume (m^3): 633962 Max Daily Volume (m^3): 2837 Original Application No: - Original Start Date: 24/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/07/2000 Version End Date: -
-	903m SE	Status: Historical Licence No: 2569006026 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, CLAYTON, MANCHESTER Data Type: Point Name: CIBA SPECIALTY CHEMICALS PLC Easting: 387700 Northing: 398100	Annual Volume (m^3): 633962 Max Daily Volume (m^3): 2837 Original Application No: - Original Start Date: 24/03/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/07/2000 Version End Date: -

ID	Location	Details	
-	905m E	Status: Active Licence No: 2569006037 Details: Non-Evaporative Cooling Direct Source: Ground Water - North West Region Point: BOREHOLE 1 ON PREMISES AT CROFT STREET, CLAYTON, MANCHESTER Data Type: Point Name: Evonik Chemicals Ltd Easting: 387860 Northing: 398379	Annual Volume (m^3): 111,831.60 Max Daily Volume (m^3): 654.62 Original Application No: NPS/WR/035267 Original Start Date: 21/05/1985 Expiry Date: - Issue No: 104 Version Start Date: 19/04/2021 Version End Date: -
-	906m E	Status: Active Licence No: 2569006037 Details: Non-Evaporative Cooling Direct Source: Ground Water - North West Region Point: BOREHOLE 2 ON PREMISES AT CROFT STREET, CLAYTON, MANCHESTER Data Type: Point Name: Evonik Chemicals Ltd Easting: 387859 Northing: 398375	Annual Volume (m^3): 111,831.60 Max Daily Volume (m^3): 654.62 Original Application No: NPS/WR/035267 Original Start Date: 21/05/1985 Expiry Date: - Issue No: 104 Version Start Date: 19/04/2021 Version End Date: -
-	934m SE	Status: Historical Licence No: NW/069/0006/005 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT OPENSHAW, WEST ASHTON Data Type: Point Name: MANCHESTER CITY FOOTBALL CLUB LIMITED Easting: 387681 Northing: 398032	Annual Volume (m^3): 266113 Max Daily Volume (m^3): 1000 Original Application No: - Original Start Date: 14/11/2012 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 14/11/2012 Version End Date: -
-	934m SE	Status: Historical Licence No: NW/069/0006/005 Details: Horticultural Watering Direct Source: Ground Water - North West Region Point: BOREHOLE AT OPENSHAW, WEST ASHTON Data Type: Point Name: MANCHESTER CITY FOOTBALL CLUB LIMITED Easting: 387681 Northing: 398032	Annual Volume (m^3): 266113 Max Daily Volume (m^3): 1000 Original Application No: - Original Start Date: 14/11/2012 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 14/11/2012 Version End Date: -
-	934m SE	Status: Historical Licence No: NW/069/0006/005 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT OPENSHAW, WEST ASHTON Data Type: Point Name: MANCHESTER CITY FOOTBALL CLUB LIMITED Easting: 387681 Northing: 398032	Annual Volume (m^3): 266113 Max Daily Volume (m^3): 1000 Original Application No: - Original Start Date: 14/11/2012 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 14/11/2012 Version End Date: -

ID	Location	Details	
-	934m SE	Status: Active Licence No: NW/069/0006/005/R01 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT OPENSHAW, WEST ASHTON Data Type: Point Name: MANCHESTER CITY FOOTBALL CLUB LIMITED Easting: 387681 Northing: 398032	Annual Volume (m^3): 221,650 Max Daily Volume (m^3): 1,000 Original Application No: NPS/WR/024168 Original Start Date: 01/04/2018 Expiry Date: 31/03/2024 Issue No: 1 Version Start Date: 01/04/2018 Version End Date: -
-	934m SE	Status: Active Licence No: NW/069/0006/005/R01 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT OPENSHAW, WEST ASHTON Data Type: Point Name: MANCHESTER CITY FOOTBALL CLUB LIMITED Easting: 387681 Northing: 398032	Annual Volume (m^3): 221,650 Max Daily Volume (m^3): 1,000 Original Application No: NPS/WR/024168 Original Start Date: 01/04/2018 Expiry Date: 31/03/2024 Issue No: 1 Version Start Date: 01/04/2018 Version End Date: -
-	937m E	Status: Historical Licence No: 2569006037 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLES (2) ON PREMISES AT CROFT ST, CLAYTON, MANCHESTER" Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 387900 Northing: 398400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	937m E	Status: Historical Licence No: 2569006037 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLES (2) ON PREMISES AT CROFT ST, CLAYTON, MANCHESTER Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 387900 Northing: 398400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -

ID	Location	Details	
-	937m E	Status: Historical Licence No: 2569006037 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLES X 2 ON PREMISES AT CROFT STREET CLAYTON MANCHESTER Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 387900 Northing: 398400	Annual Volume (m^3): 111832 Max Daily Volume (m^3): 654.624 Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	1075m N	Status: Historical Licence No: 2569005061 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT NORTON STREET, MILES PLATTING, MANCHESTER" Data Type: Point Name: HANSON QUARRY PRODUCTS EUROPE LTD Easting: 386550 Northing: 399790	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 08/02/2000 Expiry Date: - Issue No: 2 Version Start Date: 01/07/2000 Version End Date: -
-	1075m N	Status: Active Licence No: 2569005061 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT NORTON STREET, MILES PLATTING, MANCHESTER Data Type: Point Name: HANSON QUARRY PRODUCTS EUROPE LIMITED Easting: 386550 Northing: 399790	Annual Volume (m^3): 33,000 Max Daily Volume (m^3): 125 Original Application No: NPS/WR/011609 Original Start Date: 08/02/2000 Expiry Date: - Issue No: 3 Version Start Date: 13/08/2012 Version End Date: -
-	1097m E	Status: Active Licence No: 2569006036 Details: Non-Evaporative Cooling Direct Source: Ground Water - North West Region Point: BOREHOLE ON PREMISES AT CLAYTON, MANCHESTER Data Type: Point Name: Evonik Chemicals Ltd Easting: 388027 Northing: 398277	Annual Volume (m^3): 372,772 Max Daily Volume (m^3): 3,600.50 Original Application No: NPS/WR/035265 Original Start Date: 21/05/1985 Expiry Date: - Issue No: 104 Version Start Date: 19/04/2021 Version End Date: -

ID	Location	Details	
-	1103m E	Status: Historical Licence No: 2569006036 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLE ON PREMISES AT CLAYTON, MANCHESTER" Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 388000 Northing: 398200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	1103m E	Status: Historical Licence No: 2569006036 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE ON PREMISES AT CLAYTON, MANCHESTER" Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 388000 Northing: 398200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	1103m E	Status: Historical Licence No: 2569006036 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE ON PREMISES AT CLAYTON, MANCHESTER Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 388000 Northing: 398200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	1103m E	Status: Historical Licence No: 2569006036 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLE ON PREMISES AT CLAYTON, MANCHESTER Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 388000 Northing: 398200	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -

ID	Location	Details	
-	1103m E	Status: Historical Licence No: 2569006036 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE ON PREMISES AT CLAYTON MANCHESTER Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 388000 Northing: 398200	Annual Volume (m^3): 372772 Max Daily Volume (m^3): 3600.5 Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	1103m E	Status: Historical Licence No: 2569006036 Details: Process Water Direct Source: Ground Water - North West Region Point: BOREHOLE ON PREMISES AT CLAYTON MANCHESTER Data Type: Point Name: AIR PRODUCTS CHEMICALS LTD Easting: 388000 Northing: 398200	Annual Volume (m^3): 372772 Max Daily Volume (m^3): 3600.5 Original Application No: - Original Start Date: 21/05/1985 Expiry Date: - Issue No: 100 Version Start Date: 01/07/1996 Version End Date: -
-	1813m SW	Status: Historical Licence No: 2569006001 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, BROADIE ST, ARDWICK, MANCHESTER" Data Type: Point Name: MOSELEY RUBBER CO LTD Easting: 385240 Northing: 397540	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 08/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 08/02/1966 Version End Date: -
-	1813m SW	Status: Historical Licence No: 2569006001 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, BROADIE ST, ARDWICK, MANCHESTER Data Type: Point Name: MOSELEY RUBBER CO LTD Easting: 385240 Northing: 397540	Annual Volume (m^3): 331858 Max Daily Volume (m^3): 909.2 Original Application No: - Original Start Date: 08/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 08/02/1966 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	6

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 93**

ID	Location	Details	
1	656m E	Status: Historical Licence No: 2569006996 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ASHTON CANAL, MANCHESTER [VITACOM] Data Type: Point Name: BRITISH WATERWAYS Easting: 387600 Northing: 398400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/04/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1969 Version End Date: -
-	842m E	Status: Historical Licence No: 2569006997 Details: Process water Direct Source: "Surface, Non-Tidal - North West Region" Point: "ASHTON CANAL, MANCHESTER [CLAYTON ANALINE]" Data Type: Point Name: BRITISH WATERWAYS Easting: 387800 Northing: 398400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/04/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1969 Version End Date: -
-	842m E	Status: Historical Licence No: 2569006997 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ASHTON CANAL, MANCHESTER [CLAYTON ANALINE] Data Type: Point Name: BRITISH WATERWAYS BOARD Easting: 387800 Northing: 398400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/04/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1969 Version End Date: -

ID	Location	Details	
-	842m E	Status: Active Licence No: 2569006997 Details: Process Water Direct Source: Surface, Non-Tidal - North West Region Point: ASHTON CANAL MANCHESTER CLAYTON ANALINE Data Type: Point Name: Canal and River Trust Easting: 387800 Northing: 398400	Annual Volume (m^3): 3,500,420 Max Daily Volume (m^3): 3,500,420 Original Application No: 1470 Original Start Date: 01/04/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1969 Version End Date: -
-	1158m E	Status: Historical Licence No: 2569006995 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: "Surface, Non-Tidal - North West Region" Point: "ASHTON CANAL, MANCHESTER" Data Type: Point Name: BRITISH WATERWAYS Easting: 388100 Northing: 398300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/04/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1969 Version End Date: -
-	1158m E	Status: Historical Licence No: 2569006995 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ASHTON CANAL, MANCHESTER Data Type: Point Name: Canal and River Trust Easting: 388100 Northing: 398300	Annual Volume (m^3): 68,190 Max Daily Volume (m^3): 68,190 Original Application No: - Original Start Date: 01/04/1969 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1969 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.

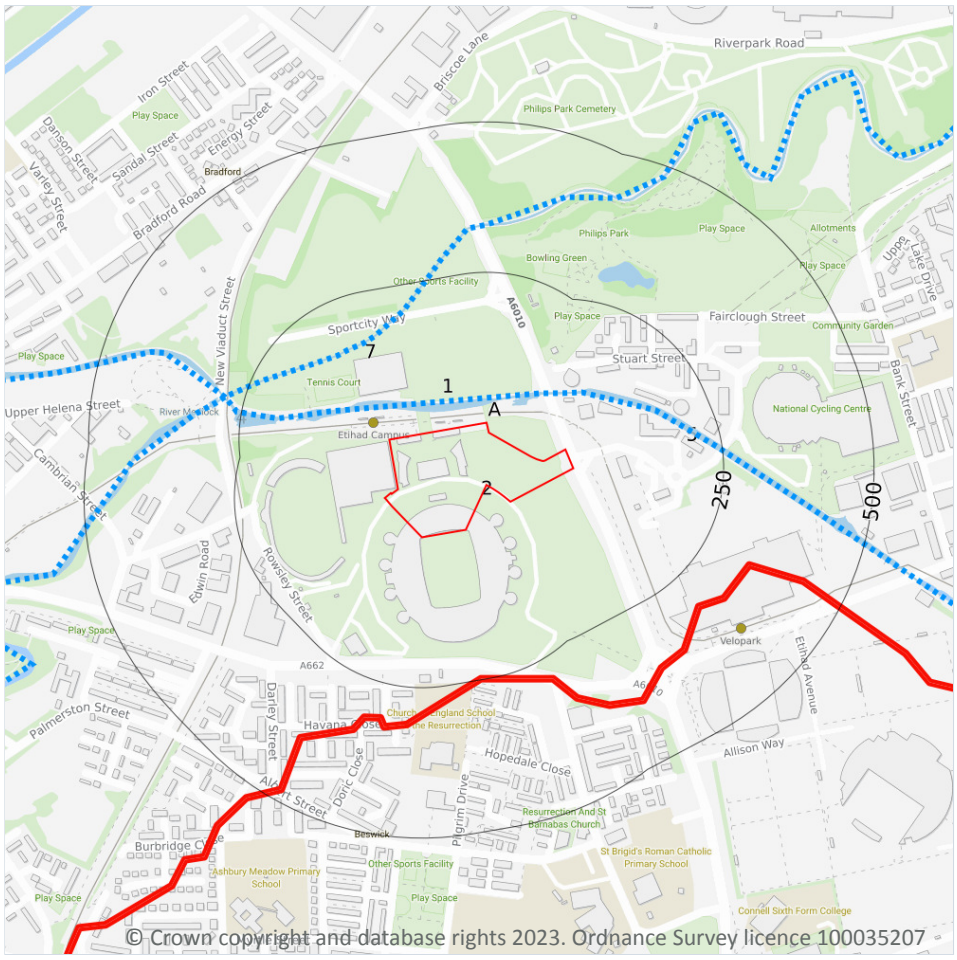
5.10 Source Protection Zones (confined aquifer)

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



Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	6

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 103**

ID	Location	Type of water feature	Ground level	Permanence	Name
4	35m N	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ashton Canal

ID	Location	Type of water feature	Ground level	Permanence	Name
A	35m N	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ashton Canal
A	37m N	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ashton Canal
A	52m NE	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
5	81m NE	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Ashton Canal
7	163m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	River Medlock

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 103**

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 103**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**Medlock (Lumb Brook to Irwell)**	**GB112069061152**	**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 103**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
A	41m N	Canal	Ashton Canal and Peak Forest Canal, lower section	GB71210219	Moderate	Fail	Moderate	2019
A	164m NW	River	Medlock (Lumb Brook to Irwell)	GB112069061152	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 103**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	**On site**	**Manchester and East Cheshire Permo-Triassic Sandstone Aquifers**	**GB41201G101100**	**Poor**	**Poor**	**Poor**	**2019**

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

7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

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

7.6 Flood Zone 2

Records within 50m	0

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.

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

7.7 Flood Zone 3

Records within 50m	0

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.

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

8 Surface water flooding



Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.3m - 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 110**

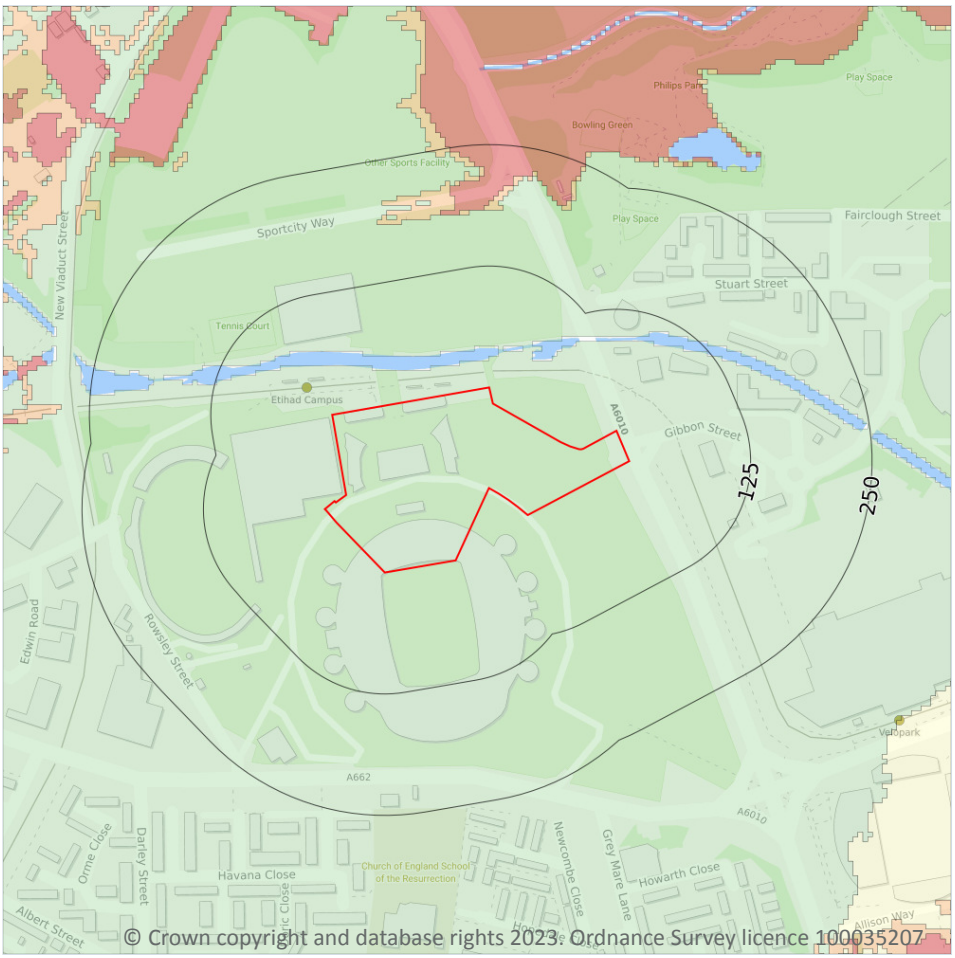
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on

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	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

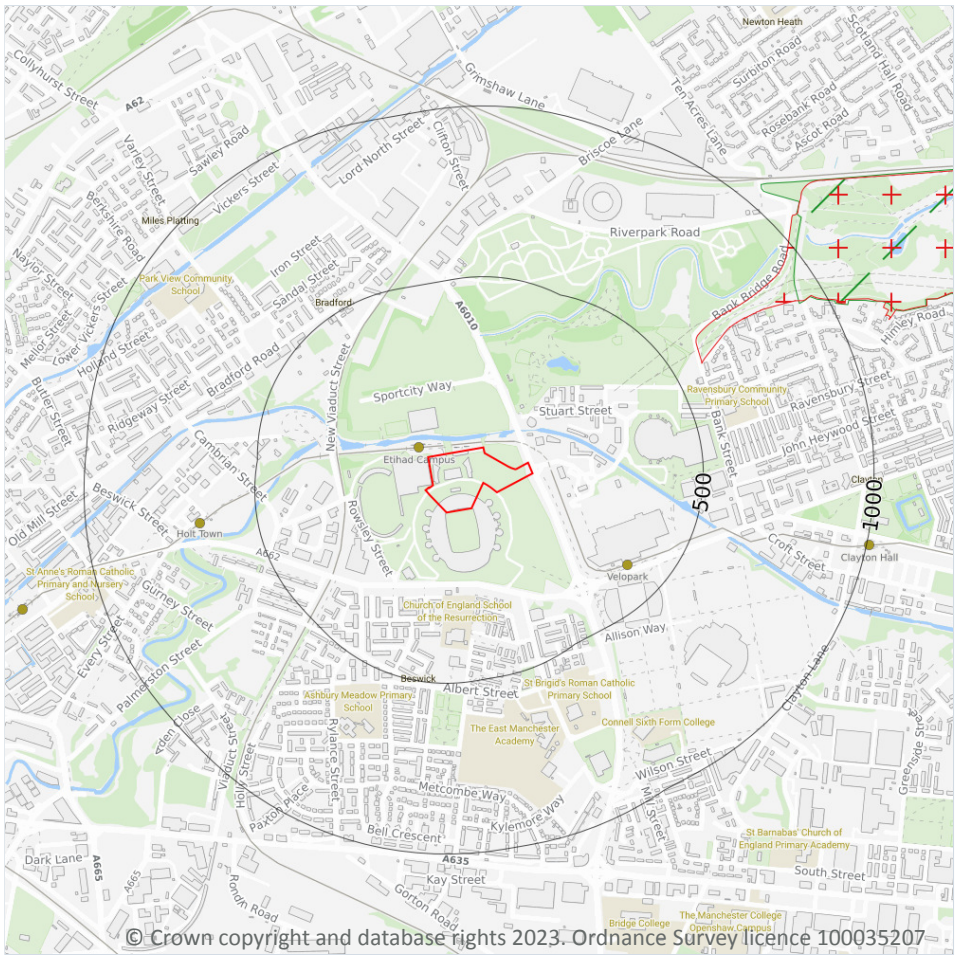
Highest risk on site	**Low**
Highest risk within 50m	**Low**

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 112**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



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10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

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.

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

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	0

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.

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	1

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.

Features are displayed on the Environmental designations map on **page 113**

ID	Location	Name	Data source
A	587m NE	Clayton Vale	Natural England

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	1

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 113**

ID	Location	Name	Local Authority name
A	921m NE	Merseyside and Greater Manchester	Manchester

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

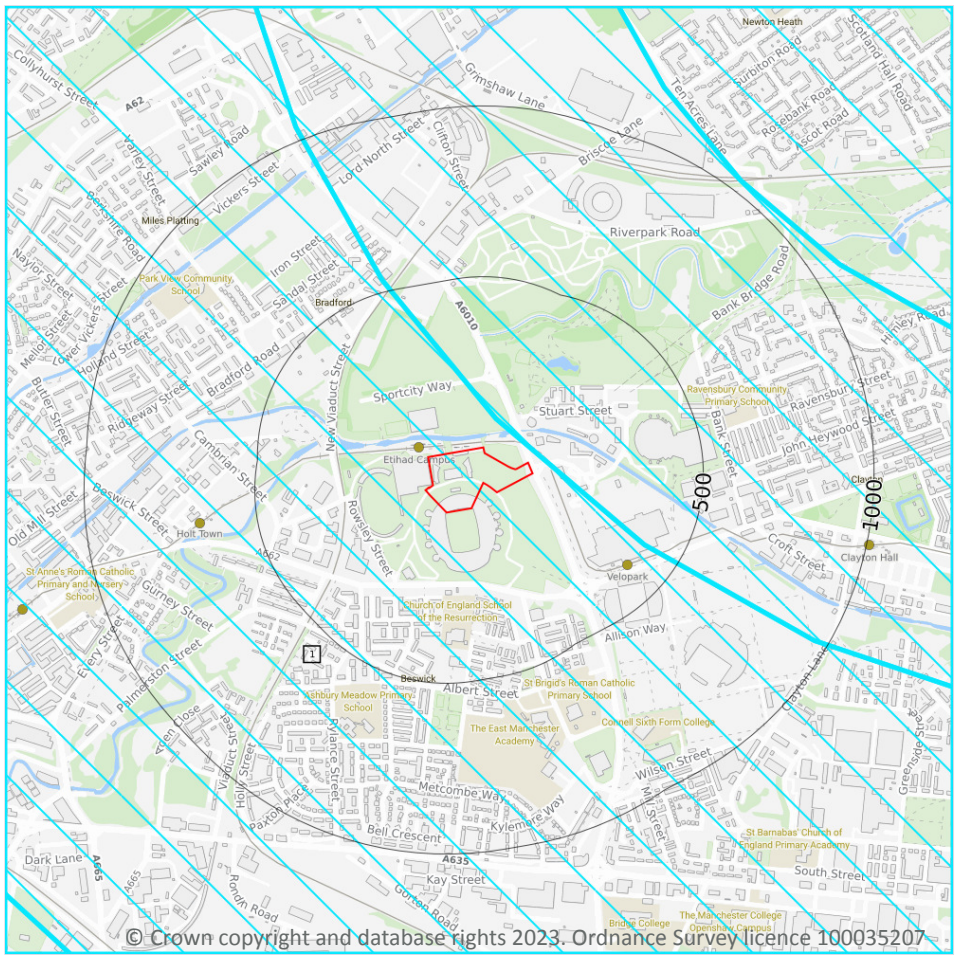
Records within 2000m	1

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
1255m NW	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	1

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 118**

ID	Location	Type of developments requiring consultation
1	**On site**	**Infrastructure - Airports, helipads and other aviation proposals.** **Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t).** **Combustion - General combustion processes >50mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	**0**

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.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



Site Outline

Search buffers in metres (m)

Listed buildings

Conservation areas

Conservation areas - no data

National Parks

Areas of Outstanding Natural Beauty

Registered parks and gardens

Scheduled Monuments

World Heritage Sites

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	4

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.

Features are displayed on the Visual and cultural designations map on **page 120**

ID	Location	Name	Grade	Reference Number	Listed date
1	51m NE	Ashton Canal Lock Number 6 Immediately East of Forge Lane, Ancoats and Beswick, Manchester, M11	II	1207666	06/06/1994
A	82m NE	Ashton Canal Lock Keepers Cottage On South Side of Lock Number 7 of Ashton Canal, Clayton and Openshaw, Manchester, M11	II	1283049	11/04/1991
A	94m NE	Ashton Canal Lock Number 7 With Roving Bridge Immediately East of Mill Street Bridge, Clayton and Openshaw, Manchester, M11	II	1197831	11/04/1991

ID	Location	Name	Grade	Reference Number	Listed date
A	96m NE	Ashton Canal Bridge Number 9 Over Ashton Canal (Mill Street Bridge) At West End of Lock Number 7, Clayton and Openshaw, Manchester, M11	II	1279613	11/04/1991

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	**1**

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.

Features are displayed on the Visual and cultural designations map on **page 120**

ID	Location	Name	Grade
2	138m NE	Philips Park	II

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



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 124**

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



13.1 Priority Habitat Inventory

Records within 250m	1

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 126**

ID	Location	Main Habitat	Other habitats
3	142m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

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.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	2

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.

Features are displayed on the Habitat designations map on **page 126**

ID	Location	Site reference	Identification confidence	Primary source	Secondary source	Tertiary source
1	26m N	NLUD Ref: 421501010	Low	National Land Use Database - Previously Developed Land	UK Perspectives Aerial Photography	-
2	44m N	NLUD Ref: 421501010	Low	National Land Use Database - Previously Developed Land	UK Perspectives Aerial Photography	-

This data is sourced from Natural England.

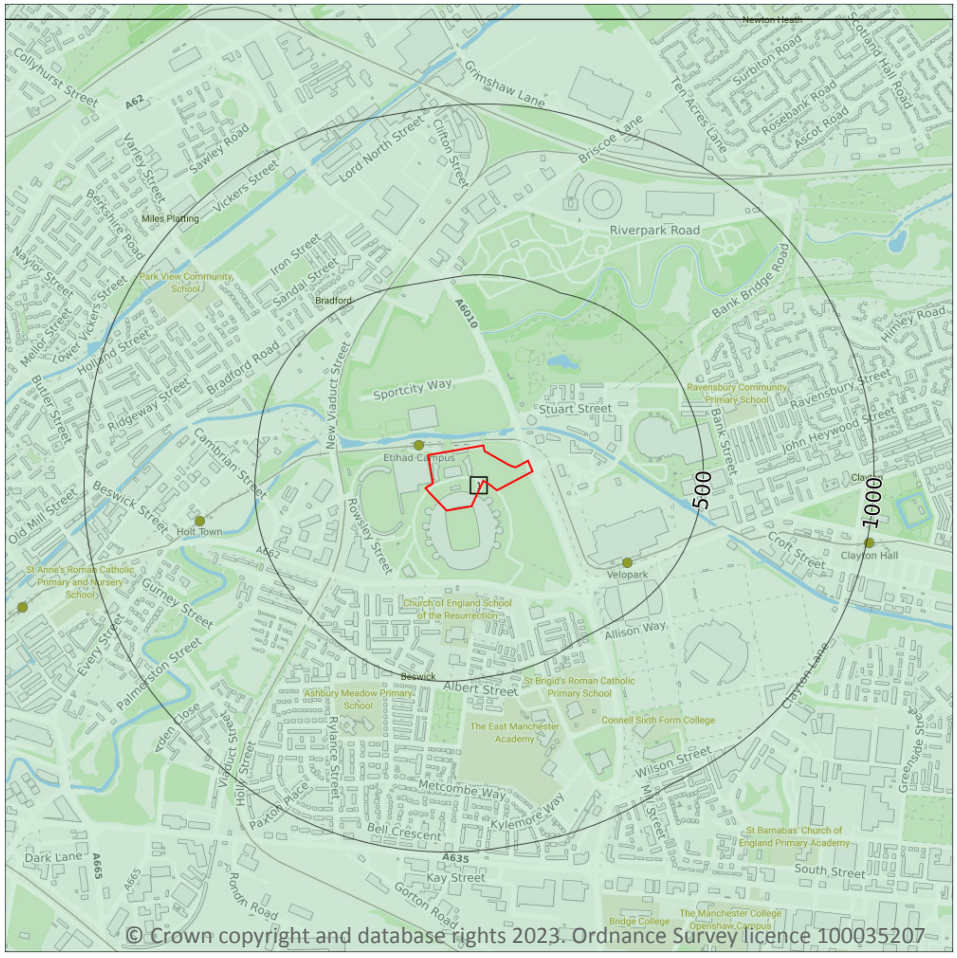
13.4 Limestone Pavement Orders

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



14.1 10k Availability

Records within 500m	1

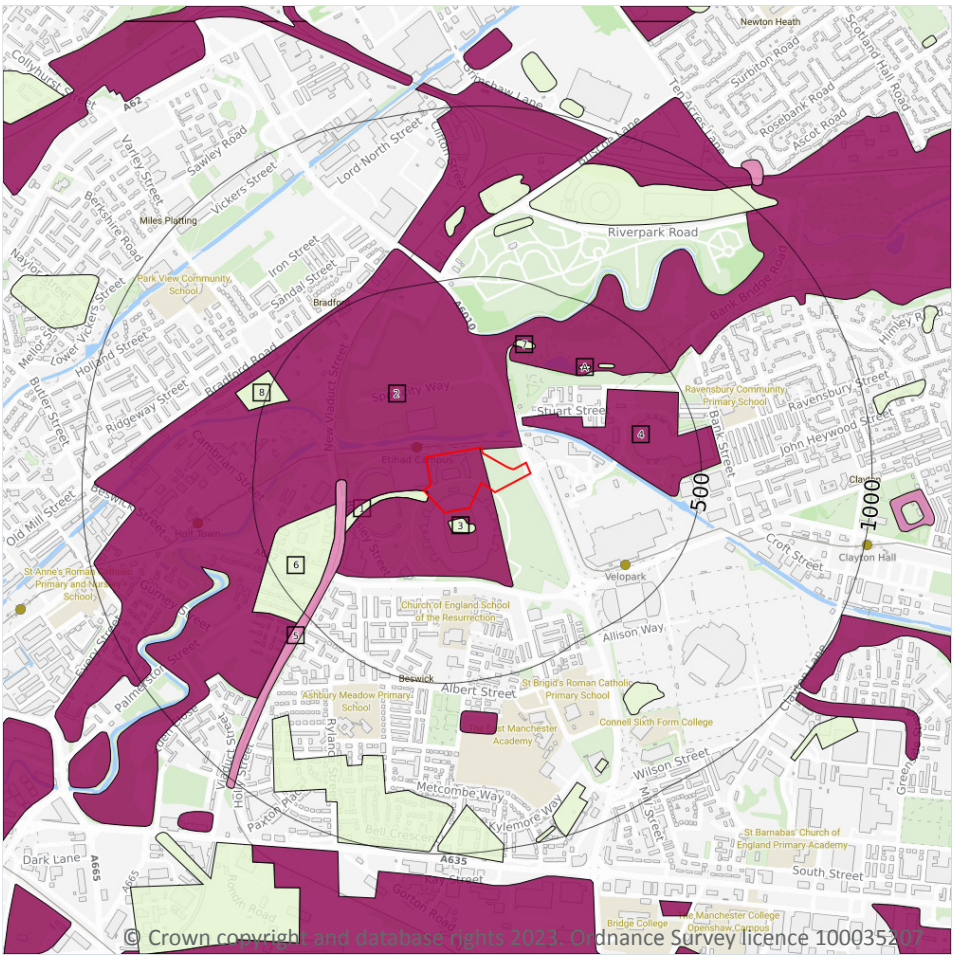
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 128**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**SJ89NE**

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



14.2 Artificial and made ground (10k)

Records within 500m	10

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.

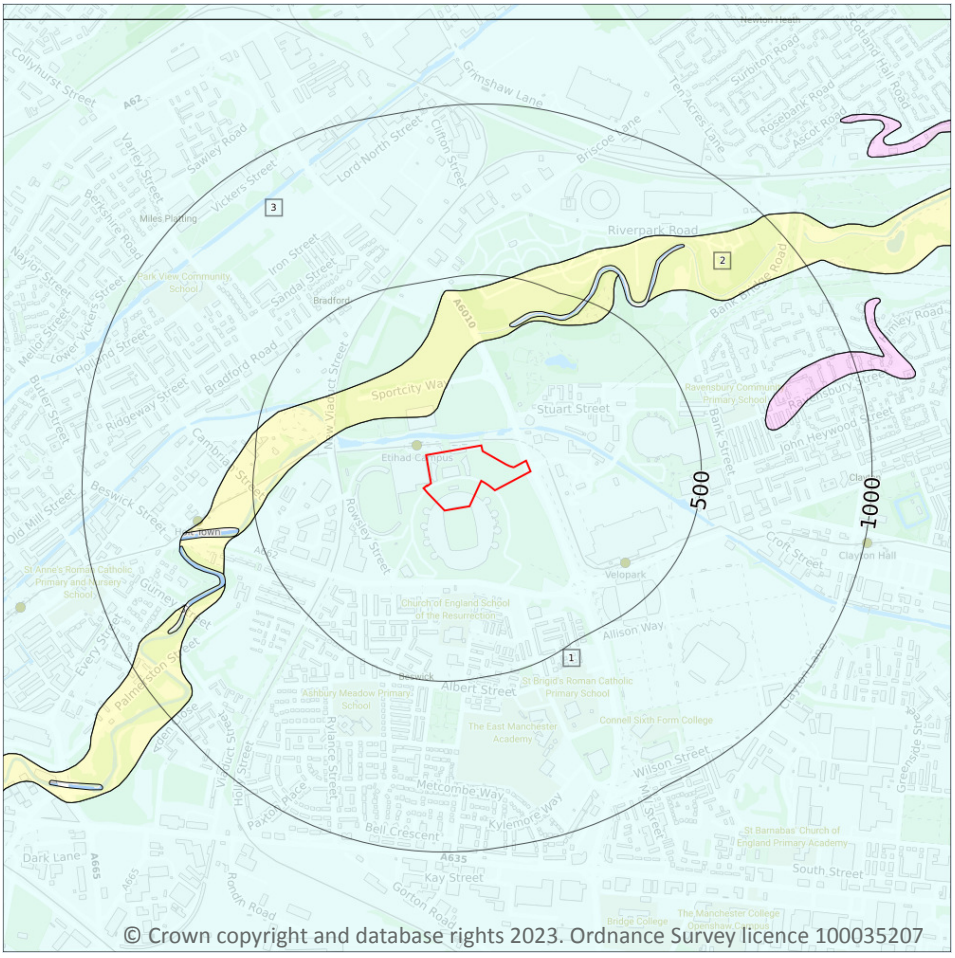
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 129**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**WMGR-ARTDP**	**Infilled Ground**	**Artificial Deposit**
2	**On site**	**MGR-ARTDP**	**Made Ground (Undivided)**	**Artificial Deposit**
3	25m S	WMGR-ARTDP	Infilled Ground	Artificial Deposit
4	108m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
5	226m W	WGR-VOID	Worked Ground (Undivided)	Void
6	260m W	WMGR-ARTDP	Infilled Ground	Artificial Deposit
7	314m N	WMGR-ARTDP	Infilled Ground	Artificial Deposit
A	316m NE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
A	352m NE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
8	433m NW	WMGR-ARTDP	Infilled Ground	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



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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 **3**

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 131**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TILLD-DMTN**	**Till, Devensian - Diamicton**	**Diamicton**
2	112m NW	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	266m NW	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton

This data is sourced from the British Geological Survey.

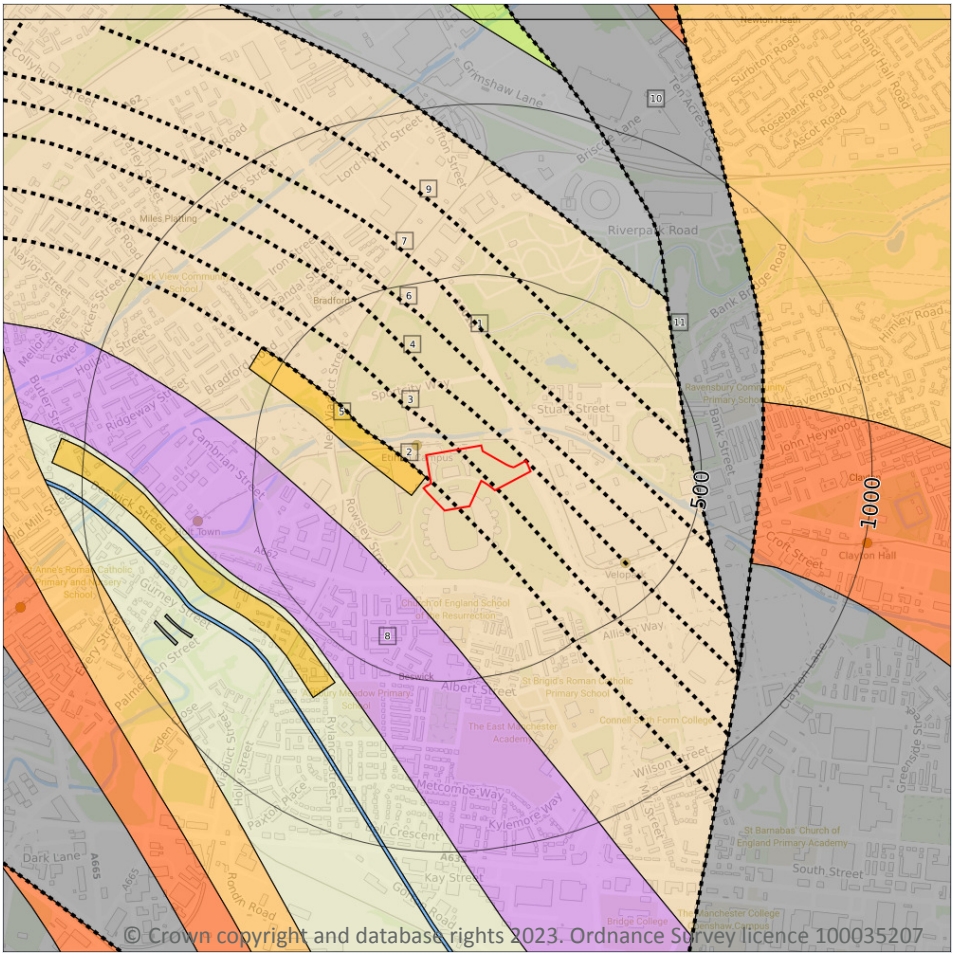
14.4 Landslip (10k)

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 **4**

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 133**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**PUCM-MDSS**	**Pennine Upper Coal Measures Formation - Mudstone, Siltstone And Sandstone**	**Westphalian D Sub-age - Bolsovian Sub-age**
5	12m W	OPS-SDST	Openshaw Sandstone - Sandstone	Bolsovian Sub-age
8	242m SW	ETM-STMD	Etruria Formation - Sandstone And Mudstone	Westphalian Age

ID	Location	LEX Code	Description	Rock age
10	468m E	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	**7**

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 133**

ID	Location	Category	Description
2	**On site**	**ROCK**	**Coal seam, inferred**
3	**On site**	**ROCK**	**Coal seam, inferred**
4	**On site**	**ROCK**	**Coal seam, inferred**
6	92m NE	ROCK	Coal seam, inferred
7	193m NE	ROCK	Coal seam, inferred
9	360m NE	ROCK	Coal seam, inferred
11	468m E	FAULT	Normal fault, inferred; crossmarks on downthrow side

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



15.1 50k Availability

Records within 500m	1

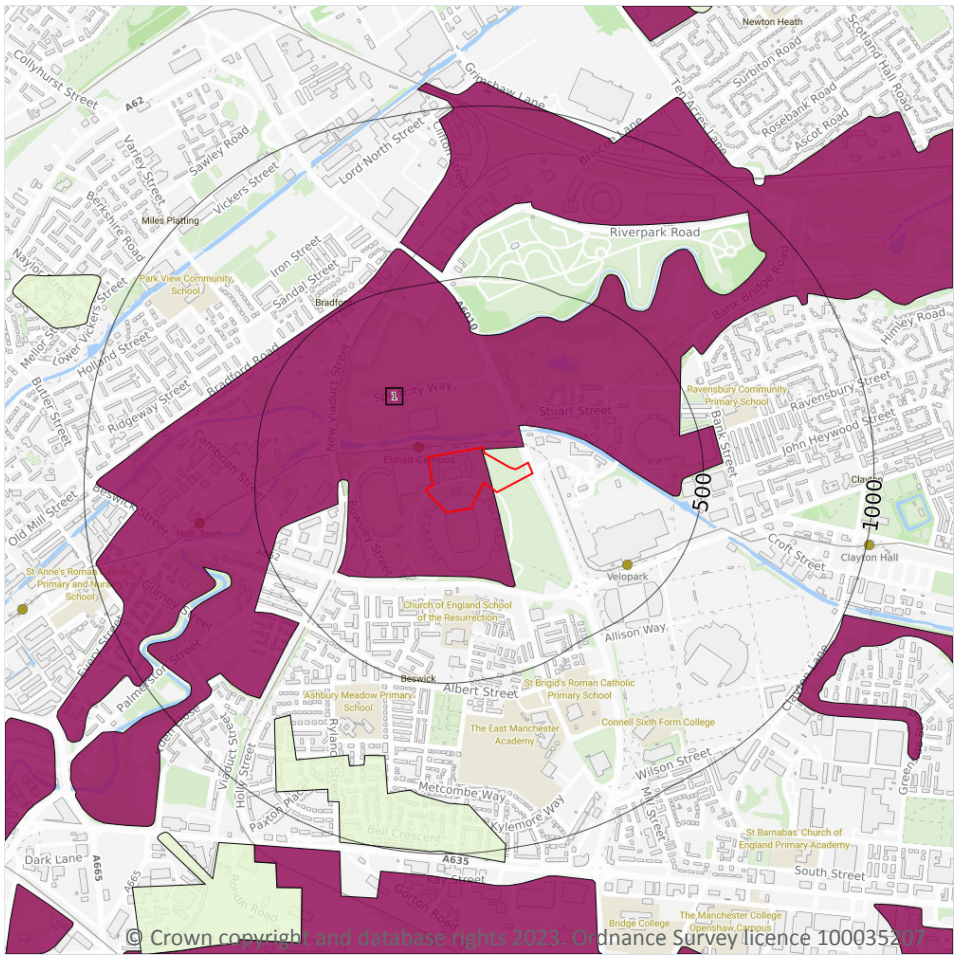
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 135**

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



15.2 Artificial and made ground (50k)

Records within 500m	1

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 136**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**MGR-ARTDP**	**MADE GROUND (UNDIVIDED)**	**ARTIFICIAL DEPOSIT**

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

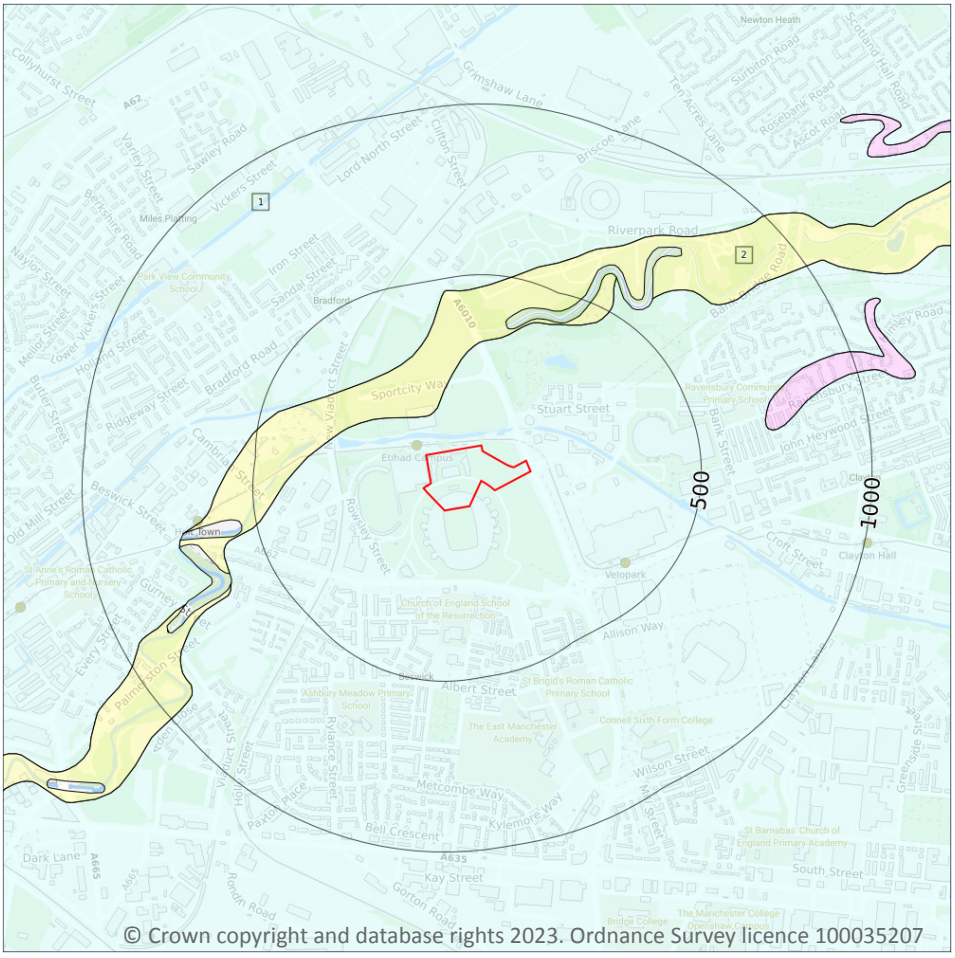
Records within 50m	1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Very High**	**Low**

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 **2**

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 138**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TILLD-DMTN**	**TILL, DEVENSIAN**	**DIAMICTON**
2	112m NW	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	1

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	**Mixed**	**High**	**Low**

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.

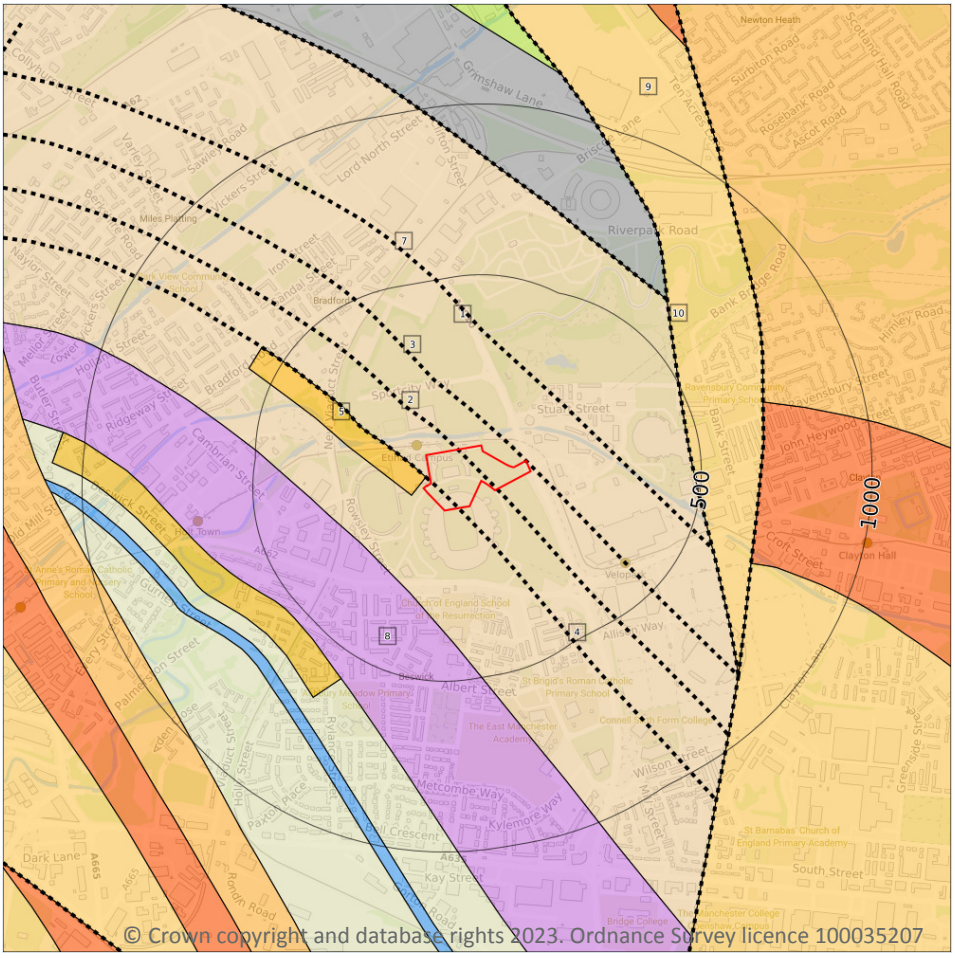
15.7 Landslip permeability (50k)

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 **4**

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 140**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**PUCM-MDSS**	**PENNINE UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE**	**WESTPHALIAN**
5	12m W	OPS-SDST	OPENSHAW SANDSTONE - SANDSTONE	WESTPHALIAN
8	242m SW	ETM-STMD	ETRURIA FORMATION - SANDSTONE AND MUDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
9	469m E	CHES-SDST	CHESTER FORMATION - SANDSTONE	OLENEKIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock 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 bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**Moderate**	**Low**
12m W	Fracture	High	Moderate

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m **6**

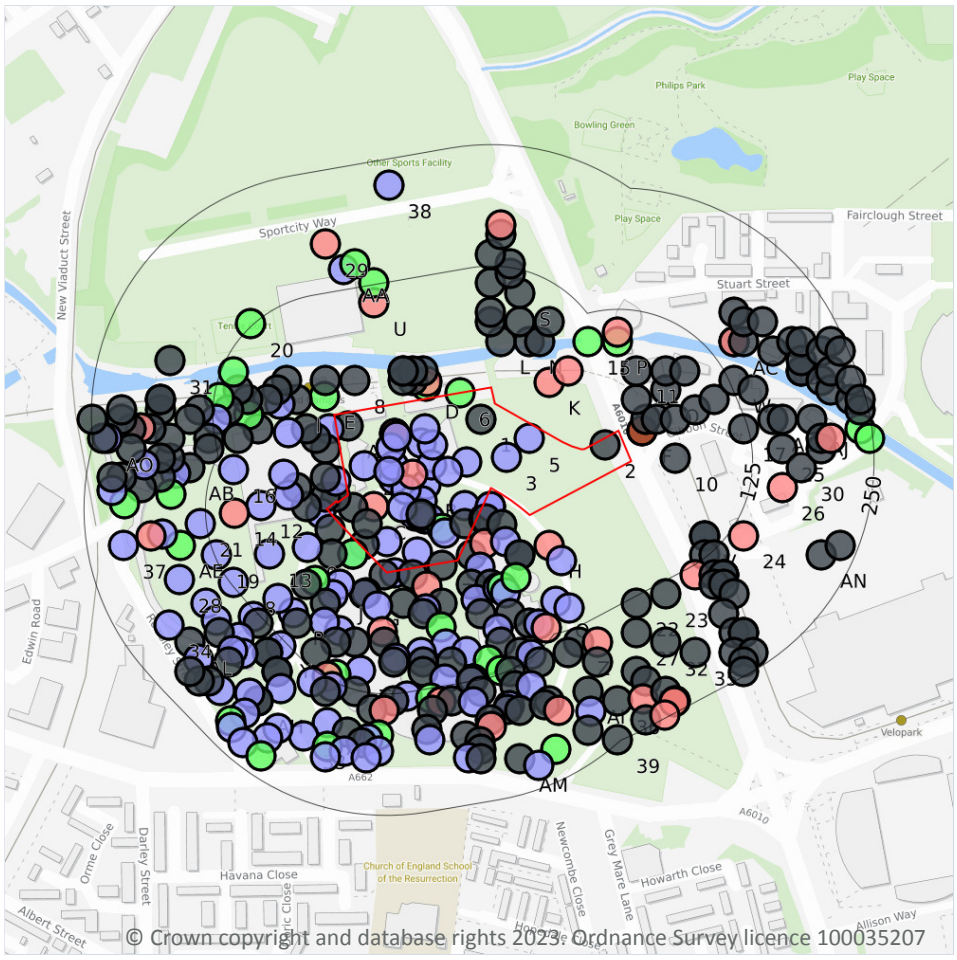
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 140**

ID	Location	Category	Description
2	**On site**	**ROCK**	**Coal seam, inferred**
3	**On site**	**ROCK**	**Coal seam, inferred**
4	**On site**	**ROCK**	**Coal seam, inferred**
6	12m W	ROCK	Coal seam, inferred
7	194m NE	ROCK	Coal seam, inferred
10	469m E	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



16.1 BGS Boreholes

Records within 250m	400

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 142**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	On site	386850 398720	EASTLANDS PLOT 23 R1/23	-	Y	N/A
2	On site	386978 398693	MANCHESTER STADIUM PHASE1 A02	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
3	On site	386876 398681	MANCHESTER STADIUM PHASE1 TPA25	4.5	N	12700768
4	On site	386730 398672	MANCHESTER STADIUM PHASE1 TPA124	3.0	N	12700954
5	On site	386900 398700	MANCHESTER STADIUM PHASE1 TPA29	4.5	N	12700769
6	On site	386828 398747	MANCHESTER STADIUM PHASE1 A38	14.9	N	12700637
A	On site	386713 398713	MANCHESTER STADIUM PHASE 1 A04	-	Y	N/A
B	On site	386793 398652	MANCHESTER STADIUM PHASE1 TPA118	3.0	N	12700948
B	On site	386788 398695	MANCHESTER STADIUM PHASE1 TPA121	3.3	N	12700951
B	On site	386789 398636	MANCHESTER STADIUM PHASE1 TPA117	3.0	N	12700947
B	On site	386792 398617	MANCHESTER STADIUM PHASE1 A33A	2.0	N	12700630
B	On site	386782 398620	MANCHESTER STADIUM PHASE1 A33B	2.0	N	12700631
B	On site	386797 398617	MANCHESTER STADIUM PHASE1 TPA111A	2.0	N	12700895
B	On site	386760 398658	MANCHESTER STADIUM PHASE1 TPA22	2.4	N	12700761
B	On site	386760 398672	MANCHESTER STADIUM PHASE1 TPA22A	3.2	N	12700763
B	On site	386773 398648	MANCHESTER STADIUM PHASE1 TPA116	3.0	N	12700946
B	On site	386761 398705	BORING AT BENSON STREET	-1.0	N	936546
B	On site	386787 398620	MANCHESTER STADIUM PHASE1 A33	1.4	N	12700629
B	On site	386810 398608	MANCHESTER STADIUM PHASE1 A33C	15.52	N	12700632
B	On site	386769 398629	MANCHESTER STADIUM PHASE1 TPA33	4.5	N	12700776
B	On site	386799 398673	MANCHESTER STADIUM PHASE1 TPA119	3.3	N	12700949
B	On site	386757 398691	MANCHESTER STADIUM PHASE1 TPA123	3.0	N	12700953
B	On site	386835 398676	MANCHESTER STADIUM PHASE1 TPA24	4.5	N	12700766
B	On site	386780 398663	MANCHESTER STADIUM PHASE 1 A05	35.1	N	12700549
B	On site	386800 398693	MANCHESTER STADIUM PHASE1 TPA120	3.0	N	12700950
B	On site	386763 398702	MANCHESTER STADIUM PHASE1 TPA09	3.3	N	12700743
B	On site	386833 398631	MANCHESTER STADIUM PHASE1 TPA32	3.0	N	12700775
B	On site	386755 398666	MANCHESTER STADIUM PHASE1 TPA122	3.0	N	12700952
B	On site	386792 398710	MANCHESTER STADIUM PHASE1 TPA08	4.5	N	12700741
B	On site	386813 398603	MANCHESTER STADIUM PHASE1 TPA48	1.2	N	12700798

ID	Location	Grid reference	Name	Length	Confidential	Web link
B	**On site**	**386816 398666**	**MANCHESTER STADIUM PHASE1 TPA23**	**1.8**	**N**	**12700764**
B	**On site**	**386784 398583**	**MANCHESTER STADIUM PHASE1 TPA47**	**4.5**	**N**	**12700797**
B	**On site**	**386833 398612**	**ETIHAD STADIUM BHNS7**	**-**	**Y**	**N/A**
B	**On site**	**386788 398622**	**ETIHAD STADIUM WSNS3**	**-**	**Y**	**N/A**
C	**On site**	**386740 398630**	**EASTLANDS R9**	**65.0**	**N**	**936632**
C	**On site**	**386753 398594**	**MANCHESTER STADIUM PHASE1 TPA46**	**3.1**	**N**	**12700795**
C	**On site**	**386730 398591**	**ETIHAD STADIUM BHNS3**	**-**	**Y**	**N/A**
C	**On site**	**386718 398629**	**ETIHAD STADIUM BHNS4**	**-**	**Y**	**N/A**
C	**On site**	**386733 398612**	**ETIHAD STADIUM WSNS2**	**-**	**Y**	**N/A**
B	1m SW	386761 398562	MANCHESTER STADIUM PHASE1 TPA107	3.5	N	12700887
7	2m S	386810 398570	EASTLANDS PLOTS 35C,35D & 36 TH3/35	-	Y	N/A
B	4m SW	386750 398560	EASTLANDS PLOTS 35C,35D & 36 TH5/35	-	Y	N/A
C	5m W	386700 398640	EASTLANDS PLOT 14 TH 6/14	-	Y	N/A
B	7m S	386780 398560	EASTLANDS PLOTS 35C,35D & 36 TH4/35	-	Y	N/A
B	7m SE	386853 398617	ETIHAD STADIUM WSNS4A	-	Y	N/A
A	7m W	386694 398710	MANCHESTER STADIUM PHASE1 TPA10	4.5	N	12700744
C	8m W	386685 398623	MANCHESTER STADIUM PHASE1 TPA34	4.5	N	12700778
B	8m SE	386860 398630	MANCHESTER STADIUM PHASE1 TPA31	3.0	N	12700770
B	8m SE	386860 398630	MANCHESTER STADIUM PHASE1 TPA31	3.0	N	12700772
B	9m SE	386855 398617	ETIHAD STADIUM WSNS4	-	Y	N/A
C	11m SW	386695 398607	ETIHAD STADIUM BHNS1E	-	Y	N/A
C	11m W	386690 398640	EASTLANDS PLOT 14 2/14	-	Y	N/A
C	11m W	386700 398656	MANCHESTER STADIUM PHASE1 TPA21	4.5	N	12700760
B	11m S	386840 398580	EASTLANDS PLOTS 35C,35D & 36 TH2/35	-	Y	N/A
C	12m SW	386718 398581	MANCHESTER STADIUM PHASE1 A30	1.5	N	12700623
C	12m SW	386718 398581	MANCHESTER STADIUM PHASE1 A34	12.56	N	12700633
D	13m N	386793 398754	MANCHESTER STADIUM PHASE1 SHF2	18.0	N	12700999
A	15m W	386690 398690	EASTLANDS PLOT 14 TH 2/14	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
D	18m N	386794 398759	MANCHESTER STADIUM PHASE1 SHF1	85.0	N	12700972
B	18m SE	386854 398592	MANCHESTER STADIUM PHASE 1 A06	37.1	N	12700559
C	20m W	386690 398660	EASTLANDS PLOT 14 TH 4/14	-	Y	N/A
B	21m S	386794 398548	MANCHESTER STADIUM PHASE1 A10	53.7	N	12700578
E	21m NW	386689 398743	MANCHESTER STADIUM PHASE1 PHA05	21.0	N	12700739
D	21m N	386780 398760	MANCHESTER METROLINK-ADDITIONAL WORKS TPA6	-	Y	N/A
C	21m W	386670 398630	EASTLANDS PLOT 14 TH 5/14	-	Y	N/A
A	23m W	386680 398700	EASTLANDS PLOT 14 1/14	-	Y	N/A
F	23m E	387016 398708	BORING AT AFRICA MILLS	-1.0	N	936547
D	23m NW	386770 398760	MANCHESTER METROLINK-ADDITIONAL WORKS TPA2	-	Y	N/A
B	24m S	386849 398568	MANCHESTER STADIUM PHASE1 TPA59	3.5	N	12700813
B	26m SE	386871 398611	ETIHAD STADIUM BHNS8E	-	Y	N/A
C	27m SW	386697 398581	ETIHAD STADIUM WSNS1	-	Y	N/A
B	28m S	386840 398550	EASTLANDS PLOTS 35C,35D & 36 BH2/35	-	Y	N/A
D	29m N	386790 398770	MANCHESTER METROLINK-ADDITIONAL WORKS TPA7	-	Y	N/A
G	30m SW	386732 398541	MANCHESTER STADIUM PHASE1 TPST1	1.3	N	12700964
A	31m W	386670 398710	EASTLANDS PLOT 14 TH 1/14	-	Y	N/A
D	31m N	386780 398770	MANCHESTER METROLINK-ADDITIONAL WORKS TPA5	-	Y	N/A
F	31m E	387020 398720	EASTLANDS PLOT 38 TH 2/38	-	Y	N/A
8	31m NW	386720 398760	MANCHESTER METROLINK-ADDITIONAL WORKS TPA1	-	Y	N/A
G	32m SW	386730 398540	EASTLANDS PLOT 1 - 10 TH 13/1	-	Y	N/A
D	33m NW	386770 398770	MANCHESTER METROLINK-ADDITIONAL WORKS TPA4	-	Y	N/A
D	33m NW	386770 398770	MANCHESTER METROLINK-ADDITIONAL WORKS TPA3	-	Y	N/A
B	35m S	386770 398530	EASTLANDS PLOTS 35C,35D & 36 TH6/35	-	Y	N/A
G	36m SW	386743 398528	MANCHESTER STADIUM PHASE1 TPA62	2.5	N	12700816

ID	Location	Grid reference	Name	Length	Confidential	Web link
B	37m SE	386875 398594	MANCHESTER STADIUM PHASE1 TPA49	4.5	N	12700799
E	37m NW	386690 398760	EASTLANDS PLOT 19 TH 1/19	-	Y	N/A
H	37m SE	386920 398590	EASTLANDS R11	65.0	N	936634
F	37m E	387010 398740	MANCHESTER METROLINK-ADDITIONAL WORKS TPA8	-	Y	N/A
C	39m W	386660 398650	EASTLANDS PLOT 14 TH 3/14	-	Y	N/A
F	40m E	387030 398720	MANCHESTER METROLINK-ADDITIONAL WORKS TPA9	-	Y	N/A
9	41m SW	386671 398588	MANCHESTER STADIUM PHASE1 TPA35	4.5	N	12700779
B	41m S	386810 398530	EASTLANDS PLOTS 35C,35D & 36 TH7/35	-	Y	N/A
C	42m W	386652 398642	MANCHESTER STADIUM PHASE1 TPA19	4.5	N	12700757
I	42m NW	386660 398740	EASTLANDS PLOT 19 TH 2/19	-	Y	N/A
B	42m S	386860 398550	EASTLANDS PLOTS 35C,35D & 36 TH8/35	-	Y	N/A
B	43m SE	386890 398580	EASTLANDS PLOTS 35C,35D & 36 TH1/35	-	Y	N/A
B	43m SE	386890 398580	EASTLANDS PLOTS 35C,35D & 36 BH1/35	-	Y	N/A
B	43m S	386793 398525	MANCHESTER STADIUM PHASE1 TPA61	4.5	N	12700815
J	44m SW	386704 398550	MANCHESTER STADIUM PHASE1 TPA45	4.5	N	12700794
B	45m S	386845 398534	MANCHESTER STADIUM PHASE1 TPA60	1.7	N	12700814
10	46m E	387050 398680	MANCHESTER METROLINK-ADDITIONAL WORKS TPA10	-	Y	N/A
K	47m NE	386920 398758	MANCHESTER STADIUM PHASE1 SH1	54.0	N	12701004
B	48m S	386790 398520	EASTLANDS PLOTS 35C,35D & 36 BH3/35	-	Y	N/A
L	48m N	386870 398800	EASTLANDS PLOT 29 TH1/29	-	Y	N/A
A	49m W	386652 398706	MANCHESTER STADIUM PHASE1 TPA11	4.5	N	12700745
B	50m S	386867 398546	MANCHESTER STADIUM PHASE1 A31	1.4	N	12700626
B	50m S	386867 398546	MANCHESTER STADIUM PHASE1 A31	1.4	N	12700625
B	53m SE	386871 398547	MANCHESTER STADIUM PHASE1 A31B	17.3	N	12700628
J	56m SW	386698 398539	MANCHESTER STADIUM PHASE1 TPST2	2.0	N	12700965
C	57m W	386647 398663	MANCHESTER STADIUM PHASE1 TPA18	4.2	N	12700755
I	57m W	386643 398735	MANCHESTER STADIUM PHASE1 TPA12	4.5	N	12700747

ID	Location	Grid reference	Name	Length	Confidential	Web link
H	57m SE	386933 398574	MANCHESTER STADIUM PHASE1 TPA58	2.6	N	12700812
F	59m E	387050 398720	EASTLANDS PLOT 38 2/38	-	Y	N/A
J	59m SW	386679 398554	MANCHESTER STADIUM PHASE1 PHA01	19.0	N	12700638
B	60m SE	386875 398541	MANCHESTER STADIUM PHASE1 A31A	1.5	N	12700627
B	60m S	386850 398520	EASTLANDS PLOTS 35C,35D & 36 TH10/35	-	Y	N/A
I	60m NW	386650 398760	EASTLANDS PLOT 19 R1/19	-	Y	N/A
M	61m SW	386748 398501	MANCHESTER STADIUM PHASE1 A14	41.2	N	12700589
N	62m NE	386900 398800	EASTLANDS PLOT 29 TH2/29	-	Y	N/A
B	62m SE	386886 398557	MANCHESTER STADIUM PHASE1 PHA03	24.0	N	12700737
I	64m NW	386640 398750	EASTLANDS PLOT 19 1/19	-	Y	N/A
O	64m E	387040 398750	EASTLANDS PLOT 38 TH 3/38	-	Y	N/A
11	65m NE	387010 398770	EASTLANDS PLOT 38 TH 1/38	-	Y	N/A
B	65m S	386809 398506	MANCHESTER STADIUM PHASE1 A30A	18.18	N	12700624
K	67m NE	386940 398770	EASTLANDS R10	65.25	N	936633
L	67m N	386860 398820	EASTLANDS PLOT 26 BH2/26	-	Y	N/A
J	68m SW	386690 398530	EASTLANDS PLOT 1 - 10 TH 12/1	-	Y	N/A
J	68m SW	386670 398550	EASTLANDS PLOT 1 - 10 R2/1	-	Y	N/A
12	68m W	386623 398631	MANCHESTER STADIUM PHASE1 TPA20	4.5	N	12700758
N	69m NE	386910 398800	EASTLANDS PLOT 29 BH1/29	-	Y	N/A
I	71m W	386630 398740	EASTLANDS PLOT 19 TH 3/19	-	Y	N/A
M	72m S	386750 398490	EASTLANDS PLOTS 35C,35D & 36 TH11/35	-	Y	N/A
N	74m NE	386890 398820	EASTLANDS PLOT 26 TH1/26	-	Y	N/A
13	75m SW	386632 398581	MANCHESTER STADIUM PHASE1 TPA36	4.5	N	12700780
B	77m SE	386880 398520	EASTLANDS PLOTS 35C,35D & 36 TH9/35	-	Y	N/A
L	77m N	386860 398830	EASTLANDS PLOT 26 TH2/26	-	Y	N/A
J	78m SW	386704 398502	MANCHESTER STADIUM PHASE1 TPA71	4.5	N	12700828
O	79m NE	387040 398770	EASTLANDS PLOT 38 1/38	-	Y	N/A
J	79m SW	386720 398490	EASTLANDS PLOT 1 - 10 TH 14/1	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
I	80m W	386620 398710	EASTLANDS PLOT 18 TH 1/18	-	Y	N/A
F	81m E	387070 398730	EASTLANDS PLOT 38 TH 5/38	-	Y	N/A
J	82m SW	386689 398511	MANCHESTER STADIUM PHASE1 TPA63	4.5	N	12700817
B	82m S	386867 398504	MANCHESTER STADIUM PHASE1 TPA75	4.5	N	12700833
B	82m S	386814 398489	MANCHESTER STADIUM PHASE1 TPA74	3.2	N	12700832
B	87m S	386788 398480	MANCHESTER STADIUM PHASE1 TPA73	4.5	N	12700831
I	88m W	386611 398725	MANCHESTER STADIUM PHASE1 A37	13.1	N	12700636
M	89m S	386762 398474	MANCHESTER STADIUM PHASE1 TPA72	3.3	N	12700830
J	89m SW	386700 398490	EASTLANDS PLOT 1 - 10 3/1	-	Y	N/A
N	90m NE	386920 398820	EASTLANDS PLOT 29 TH3/29	-	Y	N/A
I	90m W	386610 398740	MANCHESTER METROLINK-EAST OF ARDWICK VOL 1 BHZ2	-	Y	N/A
P	92m NE	386990 398800	INTERMEDIATE RING ROAD MC1	16.1	N	936928
M	92m S	386760 398470	EASTLANDS PLOTS 35C,35D & 36 TH12/35	-	Y	N/A
O	92m NE	387060 398770	EASTLANDS PLOT 38 TH 4/38	-	Y	N/A
Q	93m SE	386927 398532	MANCHESTER STADIUM PHASE1 TPGG	3.2	N	12701000
B	94m S	386835 398481	MANCHESTER STADIUM PHASE1 TPA106	4.5	N	12700885
14	95m W	386596 398623	MANCHESTER STADIUM PHASE1 A12	30.95	N	12700586
B	95m S	386870 398490	EASTLANDS PLOTS 35C,35D & 36 TH20/35	-	Y	N/A
B	97m S	386790 398470	EASTLANDS PLOTS 35C,35D & 36 BH4/35	-	Y	N/A
15	97m NE	386960 398800	INTERMEDIATE RING ROAD MC3	13.4	N	936930
R	98m SW	386657 398521	MANCHESTER STADIUM PHASE1 TPST3	2.5	N	12700966
B	98m SE	386900 398510	EASTLANDS PLOTS 35C,35D & 36 TH23/35	-	Y	N/A
R	99m SW	386641 398535	MANCHESTER STADIUM PHASE1 TPA44	4.5	N	12700792
I	102m W	386600 398700	EASTLANDS PLOT 18 1/18	-	Y	N/A
S	102m N	386890 398850	EASTLANDS PLOT 26 TH3/26	-	Y	N/A
P	102m NE	386990 398810	INTERMEDIATE RING ROAD MC2	30.36	N	936929
B	102m S	386820 398470	EASTLANDS PLOTS 35C,35D & 36 TH16/35	-	Y	N/A
I	102m W	386600 398750	EASTLANDS PLOT 18 TH 3/18	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
R	103m SW	386660 398510	EASTLANDS PLOT 1 - 10 TH 9/1	-	Y	N/A
F	103m E	387090 398740	EASTLANDS PLOT 38 TH 6/38	-	Y	N/A
Q	104m SE	386941 398526	MANCHESTER STADIUM PHASE1 TPA56	3.7	N	12700800
16	104m W	386595 398668	MANCHESTER STADIUM PHASE1 TPA17	4.5	N	12700753
T	105m SW	386726 398461	MANCHESTER STADIUM PHASE1 TPA70	2.2	N	12700826
B	106m SE	386909 398509	MANCHESTER STADIUM PHASE1 TPA76	3.2	N	12700834
U	107m NW	386740 398840	LOWER MEDLOCK UCSO 519	30.05	N	937043
B	107m S	386790 398460	EASTLANDS PLOTS 35C,35D & 36 TH13/35	-	Y	N/A
S	107m N	386860 398860	EASTLANDS PLOT 26 TH4/26	-	Y	N/A
B	108m S	386858 398472	MANCHESTER STADIUM PHASE1 A23	15.3	N	12700616
V	108m E	387080 398600	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM TP J23	-	Y	N/A
V	108m E	387080 398600	MANCHESTER METROLINK-ADDITIONAL WORKS TPA11	-	Y	N/A
I	109m W	386590 398730	EASTLANDS PLOT 18 TH 2/18	-	Y	N/A
J	110m SW	386680 398480	EASTLANDS PLOT 1 - 10 TH 10/1	-	Y	N/A
I	113m NW	386595 398769	MANCHESTER CORP. NEAR HAVEN STREET	17.98	N	936484
B	114m S	386890 398480	EASTLANDS PLOTS 35C,35D & 36 BH6/35	-	Y	N/A
B	115m SE	386917 398505	MANCHESTER STADIUM PHASE1 A07	30.4	N	12700560
T	118m SW	386700 398457	MANCHESTER STADIUM PHASE1 PHA02	20.0	N	12700639
B	119m S	386813 398452	MANCHESTER STADIUM PHASE1 TPA85	2.4	N	12700852
S	119m N	386880 398870	EASTLANDS PLOT 26 BH1/26	-	Y	N/A
I	120m W	386580 398742	MANCHESTER CORP. BRADFORD GAS WORKS	17.83	N	936477
17	120m E	387120 398710	EASTLANDS PLOT 38 TH 8/38	-	Y	N/A
I	121m W	386578 398720	MANCHESTER STADIUM PHASE1 TPA13	4.5	N	12700748
B	122m S	386870 398461	MANCHESTER STADIUM PHASE1 PHA04	18.0	N	12700738
18	122m SW	386595 398552	MANCHESTER STADIUM PHASE1 TPA40	2.0	N	12700785
19	123m W	386578 398580	MANCHESTER STADIUM PHASE1 TPA109	1.5	N	12700890

ID	Location	Grid reference	Name	Length	Confidential	Web link
V	123m E	387080 398580	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM BHJ8	-	Y	N/A
B	123m SE	386902 398478	MANCHESTER STADIUM PHASE1 TPA82	2.5	N	12700835
T	123m SW	386692 398455	MANCHESTER STADIUM PHASE1 A15	68.35	N	12700613
B	124m S	386842 398452	MANCHESTER STADIUM PHASE1 TPA84	2.2	N	12700851
B	125m S	386840 398450	EASTLANDS PLOTS 35C,35D & 36 BH5/35	-	Y	N/A
T	127m SW	386720 398440	EASTLANDS PLOT 1 - 10 TH 15/1	-	Y	N/A
U	127m N	386740 398860	LOWER MEDLOCK UCSO 519A	15.0	N	937044
B	127m S	386880 398460	EASTLANDS PLOTS 35C,35D & 36 TH21/35	-	Y	N/A
20	127m NW	386613 398818	MANCHESTER CORP. BRADFORD GAS WORKS	11.58	N	936478
B	129m S	386774 398435	MANCHESTER STADIUM PHASE1 TPA86	1.8	N	12700853
S	129m N	386880 398880	EASTLANDS PLOT 26 TH5/26	-	Y	N/A
V	129m E	387090 398580	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM TP J22	-	Y	N/A
W	130m E	387110 398760	EASTLANDS PLOT 38 3/38	-	Y	N/A
T	130m SW	386697 398445	MANCHESTER STADIUM PHASE1 TPSL9	0.7	N	12700963
X	130m SW	386616 398517	MANCHESTER STADIUM PHASE1 TPA43	4.5	N	12700790
Y	131m SW	386644 398487	MANCHESTER STADIUM PHASE1 TPA64	4.2	N	12700818
21	131m W	386561 398612	MANCHESTER STADIUM PHASE1 TPA37	4.5	N	12700782
I	131m W	386570 398700	EASTLANDS PLOTS 16 & 17 TP 2/16	-	Y	N/A
X	132m SW	386620 398510	EASTLANDS PLOT 1 - 10 TH 6/1	-	Y	N/A
22	132m SE	387010 398530	EASTLANDS PLOT 35B TH14	-	Y	N/A
B	132m S	386760 398430	EASTLANDS PLOTS 35C,35D & 36 TH14/35	-	Y	N/A
I	133m W	386570 398690	EASTLANDS PLOTS 16 & 17 R/16	-	Y	N/A
V	134m SE	387070 398560	EASTLANDS R8	63.0	N	936631
B	134m SE	386910 398470	EASTLANDS PLOTS 35C,35D & 36 TH24/35	-	Y	N/A
B	135m S	386798 398433	MANCHESTER STADIUM PHASE1 A24	15.6	N	12700617
B	137m S	386850 398440	EASTLANDS PLOTS 35C,35D & 36 TH18/35	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
T	137m SW	386676 398449	MANCHESTER STADIUM PHASE1 TPSL8	0.5	N	12700962
23	137m SE	387040 398540	EASTLANDS PLOT 35B TH15	-	Y	N/A
S	137m N	386860 398890	EASTLANDS PLOT 26 TH6/26	-	Y	N/A
T	137m SW	386690 398440	EASTLANDS PLOT 1 - 10 TH 11/1	-	Y	N/A
24	139m E	387120 398600	EASTLANDS R2	65.0	N	936625
I	139m W	386560 398730	EASTLANDS PLOTS 16 & 17 TP 1/16	-	Y	N/A
Z	140m SE	386950 398490	EASTLANDS PLOT 35B TH10	-	Y	N/A
B	141m S	386809 398429	MANCHESTER STADIUM PHASE1 A13	41.0	N	12700588
B	141m S	386809 398429	MANCHESTER STADIUM PHASE1 A13	41.0	N	12700587
B	142m S	386820 398430	EASTLANDS PLOTS 35C,35D & 36 TH17/35	-	Y	N/A
B	142m S	386885 398446	ETIHAD STADIUM BHSS6	-	Y	N/A
B	142m S	386738 398421	ETIHAD STADIUM BHSS1	-	Y	N/A
B	142m S	386750 398420	EASTLANDS R12	65.0	N	936635
W	144m E	387130 398750	EASTLANDS PLOT 38 TH 7/38	-	Y	N/A
V	145m E	387090 398560	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM BHJ8T1	-	Y	N/A
Y	146m SW	386630 398480	EASTLANDS PLOT 1 - 10 2/1	-	Y	N/A
Y	146m SW	386630 398480	EASTLANDS PLOT 6 TH 1	-	Y	N/A
AA	146m NW	386708 398874	MANCHESTER CORP. BRADFORD GAS WORKS	6.1	N	936479
B	146m S	386842 398429	MANCHESTER STADIUM PHASE1 TPA110	3.4	N	12700892
Z	147m SE	386940 398480	EASTLANDS PLOT 35B BH1	-	Y	N/A
AB	148m W	386550 398670	EASTLANDS PLOT 15 TH 1/15	-	Y	N/A
B	148m S	386800 398420	EASTLANDS PLOTS 35C,35D & 36 TH15/35	-	Y	N/A
Z	149m SE	386970 398490	EASTLANDS R4	65.0	N	936627
I	149m W	386550 398720	EASTLANDS PLOTS 16 & 17 1/16	-	Y	N/A
B	149m S	386902 398446	MANCHESTER STADIUM PHASE1 TPA83	4.8	N	12700836
AA	150m NW	386720 398880	LOWER MEDLOCK UCSO 518	20.27	N	937042
AC	150m NE	387110 398800	EASTLANDS PLOT 69 BHR1/69	-	Y	N/A

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AC	150m NE	387110 398800	EASTLANDS R1/69	65.0	N	936658
V	151m E	387100 398560	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM TP J21	-	Y	N/A
V	151m E	387100 398560	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM BHJ8T2	-	Y	N/A
V	151m E	387100 398560	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM BHJ8T3	-	Y	N/A
AD	152m E	387150 398720	EASTLANDS PLOT 38 4/38	-	Y	N/A
Y	152m SW	386640 398460	EASTLANDS PLOT 6 TH 2	-	Y	N/A
Y	152m SW	386640 398460	EASTLANDS PLOT 1 - 10 TH 8/1	-	Y	N/A
V	153m SE	387090 398550	EASTLANDS PLOTS 41 - 44 TH1/41	-	Y	N/A
AE	156m W	386540 398590	MANCHESTER STADIUM PHASE1 A35	12.2	N	12700634
X	156m SW	386601 398495	MANCHESTER STADIUM PHASE1 TPST4	2.4	N	12700967
25	156m E	387160 398690	EASTLANDS PLOT 38 TH 10/38	-	Y	N/A
26	158m E	387160 398650	EASTLANDS R1	65.0	N	936624
S	158m N	386870 398910	EASTLANDS PLOT 26 TH7/26	-	Y	N/A
X	158m SW	386567 398530	MANCHESTER STADIUM PHASE1 A29	9.2	N	12700622
AC	158m NE	387120 398800	EASTLANDS PLOT 69 TH3/69	-	Y	N/A
27	159m SE	387010 398500	EASTLANDS PLOT 35B TH11	-	Y	N/A
B	159m S	386879 398425	MANCHESTER STADIUM PHASE1 TPA95	4.5	N	12700870
V	159m E	387100 398550	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM BHJ8T4	-	Y	N/A
AB	160m W	386536 398664	MANCHESTER STADIUM PHASE1 TPA16	4.5	N	12700752
X	161m SW	386578 398513	MANCHESTER STADIUM PHASE1 TPA42	4.5	N	12700787
AB	161m W	386531 398643	MANCHESTER CORP. PHILLIPS PARK ROAD	19.2	N	936476
Y	161m SW	386644 398443	MANCHESTER STADIUM PHASE1 TPA69	4.1	N	12700824
AD	161m E	387160 398720	EASTLANDS PLOT 38 TH 9/38	-	Y	N/A
B	162m S	386877 398421	ETIHAD STADIUM WSSS4	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
X	164m SW	386605 398479	MANCHESTER STADIUM PHASE1 TPA65	4.5	N	12700819
B	166m S	386794 398401	ETIHAD STADIUM WSSS2	-	Y	N/A
AF	166m SW	386692 398408	MANCHESTER STADIUM PHASE1 TPA87	3.0	N	12700854
Z	167m SE	386970 398470	EASTLANDS PLOT 35B TH9	-	Y	N/A
B	167m S	386890 398420	EASTLANDS PLOTS 35C,35D & 36 TH22/35	-	Y	N/A
AF	167m S	386744 398395	MANCHESTER STADIUM PHASE1 A25	15.3	N	12700618
X	168m SW	386580 398500	EASTLANDS PLOT 1 - 10 TH 3/1	-	Y	N/A
S	168m N	386870 398920	EASTLANDS R5	65.0	N	936628
B	168m S	386860 398410	EASTLANDS PLOTS 35C,35D & 36 TH19/35	-	Y	N/A
28	169m W	386539 398555	MANCHESTER STADIUM PHASE1 TPA39	4.5	N	12700784
AF	169m S	386712 398398	ETIHAD STADIUM BHSS2E	-	Y	N/A
AB	170m W	386530 398680	EASTLANDS PLOT 15 1/15	-	Y	N/A
X	170m SW	386594 398482	MANCHESTER STADIUM PHASE1 TPST5	2.2	N	12700968
AC	170m NE	387110 398830	EASTLANDS PLOT 69 TH1/69	-	Y	N/A
AC	171m NE	387120 398820	EASTLANDS PLOT 69 BH1/69	-	Y	N/A
AB	171m W	386530 398700	EASTLANDS PLOT 15 TH 2/15	-	Y	N/A
AE	171m W	386522 398602	MANCHESTER STADIUM PHASE1 TPA108	3.6	N	12700889
AF	172m S	386734 398391	MANCHESTER STADIUM PHASE1 TPA91	4.5	N	12700862
B	173m SE	386920 398430	EASTLANDS PLOTS 35C,35D & 36 TH25/35	-	Y	N/A
V	173m SE	387110 398540	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM TP J20	-	Y	N/A
B	173m S	386915 398426	ETIHAD STADIUM BHSS8E	-	Y	N/A
B	174m S	386861 398404	MANCHESTER STADIUM PHASE1 A15	33.75	N	12700614
AB	174m W	386520 398660	EASTLANDS PLOT 15 R1/15	-	Y	N/A
29	174m NW	386690 398900	LOWER MEDLOCK UCSO 517	30.14	N	937041
30	176m E	387180 398670	EASTLANDS PLOT 38 5/38	-	Y	N/A
AF	177m S	386727 398387	ETIHAD STADIUM WSSS1	-	Y	N/A
B	177m S	386797 398390	MANCHESTER STADIUM PHASE1 TPA93	4.5	N	12700864

ID	Location	Grid reference	Name	Length	Confidential	Web link
31	178m W	386530 398780	ASHTON CANAL CORRIDOR TRANSCO PIPELINE BHT 2	-	Y	N/A
AG	179m E	387150 398790	EASTLANDS PLOT 69 TH4/69	-	Y	N/A
AB	179m W	386520 398730	EASTLANDS PLOT 15 TH 3/15	-	Y	N/A
AB	179m W	386520 398680	EASTLANDS PLOT 15 TH 4/15	-	Y	N/A
B	179m S	386834 398394	ETIHAD STADIUM BHSS5	-	Y	N/A
AB	180m W	386520 398740	EASTLANDS PLOT 15 2/15	-	Y	N/A
AB	180m W	386520 398740	ASHTON CANAL CORRIDOR TRANSCO PIPELINE BHT 1	-	Y	N/A
X	181m SW	386590 398470	EASTLANDS PLOT 1 - 10 TH 4/1	-	Y	N/A
32	182m SE	387040 398490	EASTLANDS PLOT 35B TH12	-	Y	N/A
AE	183m W	386510 398600	EASTLANDS R6	64.0	N	936629
V	184m SE	387100 398520	EASTLANDS PLOTS 41 - 44 TH2/41	-	Y	N/A
AF	184m S	386744 398378	MANCHESTER STADIUM PHASE1 TPSL1	0.5	N	12700955
AC	186m NE	387140 398820	EASTLANDS PLOT 69 TH2/69	-	Y	N/A
B	186m SE	386930 398420	EASTLANDS R3	65.0	N	936626
AH	187m SW	386620 398430	EASTLANDS PLOT 1 - 10 TH 5/1	-	Y	N/A
AH	187m SW	386620 398430	EASTLANDS PLOT 6 TH 3	-	Y	N/A
AH	188m SW	386612 398438	MANCHESTER STADIUM PHASE1 TPSL7	0.5	N	12700961
B	188m S	386849 398388	ETIHAD STADIUM WSSS3	-	Y	N/A
33	189m SW	386667 398394	MANCHESTER STADIUM PHASE1 TPSL3	0.7	N	12700957
AF	189m SW	386692 398383	MANCHESTER STADIUM PHASE1 A26	15.3	N	12700619
AF	189m S	386709 398378	MANCHESTER STADIUM PHASE1 TPSL2	0.5	N	12700956
AB	189m W	386510 398710	EASTLANDS PLOT 15 TH 5/15	-	Y	N/A
AI	190m SE	386960 398440	EASTLANDS PLOT 35B TH3	-	Y	N/A
AJ	190m E	387190 398720	EASTLANDS PLOT 38 TH 11/38	-	Y	N/A
AF	192m S	386732 398371	MANCHESTER STADIUM PHASE1 TPA92	4.5	N	12700863
AB	193m W	386500 398650	EASTLANDS PLOT 15 TH 6/15	-	Y	N/A
AB	194m W	386503 398673	MANCHESTER STADIUM PHASE1 TPA15	4.5	N	12700751

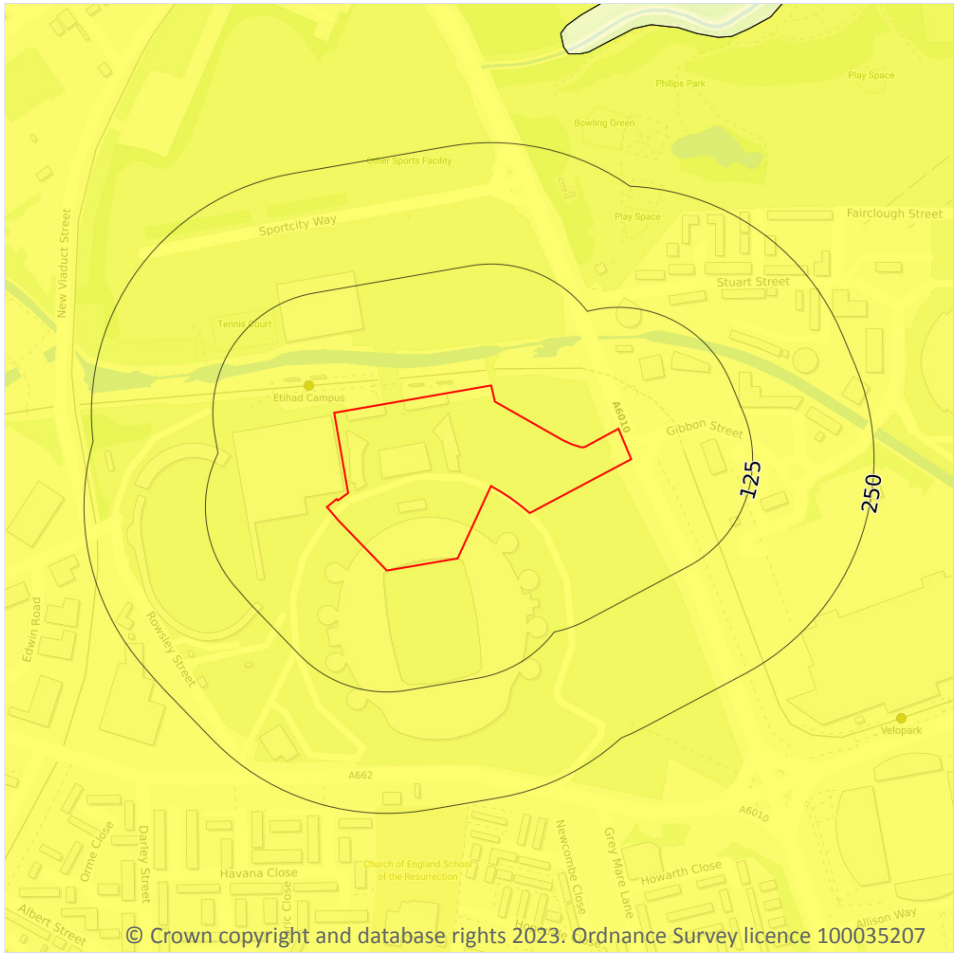
ID	Location	Grid reference	Name	Length	Confidential	Web link
AK	194m SE	387010 398460	EASTLANDS PLOT 35B TH8	-	Y	N/A
AH	195m SW	386641 398402	MANCHESTER STADIUM PHASE1 TPA88	2.8	N	12700856
B	196m S	386850 398380	EASTLANDS PLOT 63 TH2/63	-	Y	N/A
AJ	196m E	387200 398690	EASTLANDS PLOT 38 TH 12/38	-	Y	N/A
AL	197m SW	386550 398490	EASTLANDS PLOT 1 - 10 TH 1/1	-	Y	N/A
AJ	197m E	387200 398700	EASTLANDS PLOT 38 R1/38	-	Y	N/A
AG	198m E	387180 398770	EASTLANDS PLOT 59 BH4	-	Y	N/A
AG	198m E	387180 398770	EASTLANDS PLOT 59 TH2	-	Y	N/A
AF	200m SW	386690 398372	MANCHESTER STADIUM PHASE1 TPA90	3.3	N	12700860
AB	200m W	386499 398711	MANCHESTER STADIUM PHASE1 A11	38.0	N	12700579
AG	201m E	387170 398800	EASTLANDS PLOT 59 BH3	-	Y	N/A
34	201m SW	386529 398508	MANCHESTER STADIUM PHASE1 TPA41	4.5	N	12700786
AL	201m SW	386559 398473	MANCHESTER STADIUM PHASE1 TPA66	4.1	N	12700820
AG	202m E	387180 398780	EASTLANDS PLOT 59 BHR1	-	Y	N/A
B	203m S	386837 398371	MANCHESTER STADIUM PHASE1 TPA94	4.5	N	12700867
35	204m SE	387070 398480	EASTLANDS PLOT 35B TH13	-	Y	N/A
B	206m S	386850 398370	EASTLANDS PLOT 63 BH1/63	-	Y	N/A
V	206m SE	387110 398500	EASTLANDS PLOTS 41 - 44 BH1/41	-	Y	N/A
AH	206m SW	386607 398417	MANCHESTER STADIUM PHASE1 TPSL5	0.5	N	12700959
AJ	207m E	387210 398700	EASTLANDS PLOT 38 R1/38	65.7	N	936657
AI	207m SE	386963 398419	MANCHESTER STADIUM PHASE1 TPA96	3.7	N	12700872
AK	208m SE	387020 398450	EASTLANDS PLOT 35B BH2	-	Y	N/A
AL	208m SW	386581 398441	MANCHESTER STADIUM PHASE1 TPA67	3.5	N	12700823
AB	208m W	386483 398633	MANCHESTER STADIUM PHASE1 A36	11.8	N	12700635
AB	209m W	386490 398710	EASTLANDS PLOT 15 3/15	-	Y	N/A
AL	210m SW	386570 398450	EASTLANDS PLOT 1 - 10 TH 2/1	-	Y	N/A
AG	210m E	387180 398800	EASTLANDS PLOT 59 TH1	-	Y	N/A
AH	210m SW	386630 398392	MANCHESTER STADIUM PHASE1 TPSL4	0.5	N	12700958

ID	Location	Grid reference	Name	Length	Confidential	Web link
AB	211m W	386490 398690	EASTLANDS PLOT 15 TH 7/15	-	Y	N/A
V	211m SE	387120 398500	MANCHESTER METROLINK-ADDITIONAL WORKS TPA12	-	Y	N/A
V	211m SE	387120 398500	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM TP J19	-	Y	N/A
36	211m SE	386990 398430	EASTLANDS PLOT 35B TH4	-	Y	N/A
37	213m W	386482 398590	MANCHESTER STADIUM PHASE1 TPA38	4.5	N	12700783
AG	213m E	387200 398760	EASTLANDS PLOT 59 TH3	-	Y	N/A
AB	214m W	386480 398660	EASTLANDS PLOT 15 TH 9/15	-	Y	N/A
AM	214m S	386890 398370	EASTLANDS PLOT 63 TH1/63	-	Y	N/A
AL	217m SW	386560 398450	EASTLANDS PLOT 1 - 10 R1/1	-	Y	N/A
AL	217m SW	386550 398460	EASTLANDS PLOT 1 - 10 1/1	-	Y	N/A
AG	218m E	387210 398750	EASTLANDS PLOT 59 TH7	-	Y	N/A
AN	218m E	387200 398580	EASTLANDS PLOTS 48 & 51 BH1/48	-	Y	N/A
AB	219m W	386480 398720	MANCHESTER METROLINK-EAST OF ARDWICK VOL 1 BHZ1	-	Y	N/A
AB	219m W	386480 398730	EASTLANDS PLOT 15 TH 8/15	-	Y	N/A
AM	219m S	386927 398380	MANCHESTER STADIUM PHASE1 A17	13.42	N	12700615
AI	220m SE	386960 398400	EASTLANDS PLOT 35B TH2	-	Y	N/A
AK	222m SE	387017 398432	PARKER SHAFT BRADFORD COLLIERY	312.0	N	936502
AB	222m W	386470 398647	MANCHESTER STADIUM PHASE1 TPA104	4.5	N	12700883
AH	222m SW	386592 398409	MANCHESTER STADIUM PHASE1 A28	12.4	N	12700621
V	223m SE	387110 398480	EASTLANDS PLOTS 41 - 44 TH3/41	-	Y	N/A
38	223m N	386755 398961	MANCHESTER CORP. BRADFORD GAS WORKS	4.57	N	936480
AB	224m W	386470 398660	EASTLANDS PLOT 15 4/15	-	Y	N/A
AG	224m E	387200 398790	EASTLANDS PLOT 59 TH4	-	Y	N/A
AG	226m E	387210 398770	EASTLANDS PLOT 59 TH6	-	Y	N/A
AH	226m SW	386593 398403	MANCHESTER STADIUM PHASE1 TPSL6	0.7	N	12700960
AK	226m SE	387040 398440	EASTLANDS PLOT 35B TH7	-	Y	N/A

ID	Location	Grid reference	Name	Length	Confidential	Web link
AM	226m S	386909 398364	MANCHESTER STADIUM PHASE1 TPA97	4.5	N	12700874
AH	229m SW	386605 398387	MANCHESTER STADIUM PHASE1 TPA89	4.5	N	12700857
AH	229m SW	386623 398373	MANCHESTER STADIUM PHASE1 A27	15.4	N	12700620
AN	232m E	387220 398590	EASTLANDS PLOTS 48 & 51 TH1/48	-	Y	N/A
V	233m SE	387130 398480	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM BHJ7	-	Y	N/A
AG	234m E	387230 398740	EASTLANDS PLOT 59 TH8	-	Y	N/A
AO	235m W	386465 398700	MANCHESTER STADIUM PHASE1 TPA14	4.5	N	12700750
V	237m SE	387120 398470	MANCHESTER METRO PHASE 3 EXTENSION TO COMMONWEALTH WEALTH GAMES STADIUM TP J18	-	Y	N/A
AG	237m E	387210 398800	EASTLANDS PLOT 59 TH5	-	Y	N/A
AG	238m E	387240 398710	BRADFORD MILL BRIDGE BM4	19.7	N	936993
AK	239m SE	387050 398430	BRADFORD COLLIERY	-1.0	N	937335
AK	240m SE	387049 398429	PARKER SHAFT BRADFORD COLLIERY	646.61	N	936504
AO	240m W	386460 398700	EASTLANDS PLOT 15 TH 10/15	-	Y	N/A
AG	240m E	387230 398760	EASTLANDS PLOT 59 TH10	-	Y	N/A
AG	241m E	387240 398730	EASTLANDS PLOT 59 BH1	-	Y	N/A
AG	243m E	387220 398790	EASTLANDS PLOT 59 BH2	-	Y	N/A
AK	243m SE	387020 398410	EASTLANDS PLOT 35B TH5	-	Y	N/A
AG	244m E	387240 398740	EASTLANDS PLOT 59 TH9	-	Y	N/A
V	246m SE	387120 398460	EASTLANDS PLOTS 41 - 44 TH4/41	-	Y	N/A
AG	247m E	387250 398700	BRADFORD MILL BRIDGE BM3	18.0	N	936992
39	247m SE	386990 398390	EASTLANDS PLOT 35B TH1	-	Y	N/A
AK	247m SE	387039 398415	TOP OF DEEP SHAFT BRADFORD COLLIERY	105.53	N	936505
AO	249m W	386450 398720	EASTLANDS PLOT 15 5/15	-	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	1

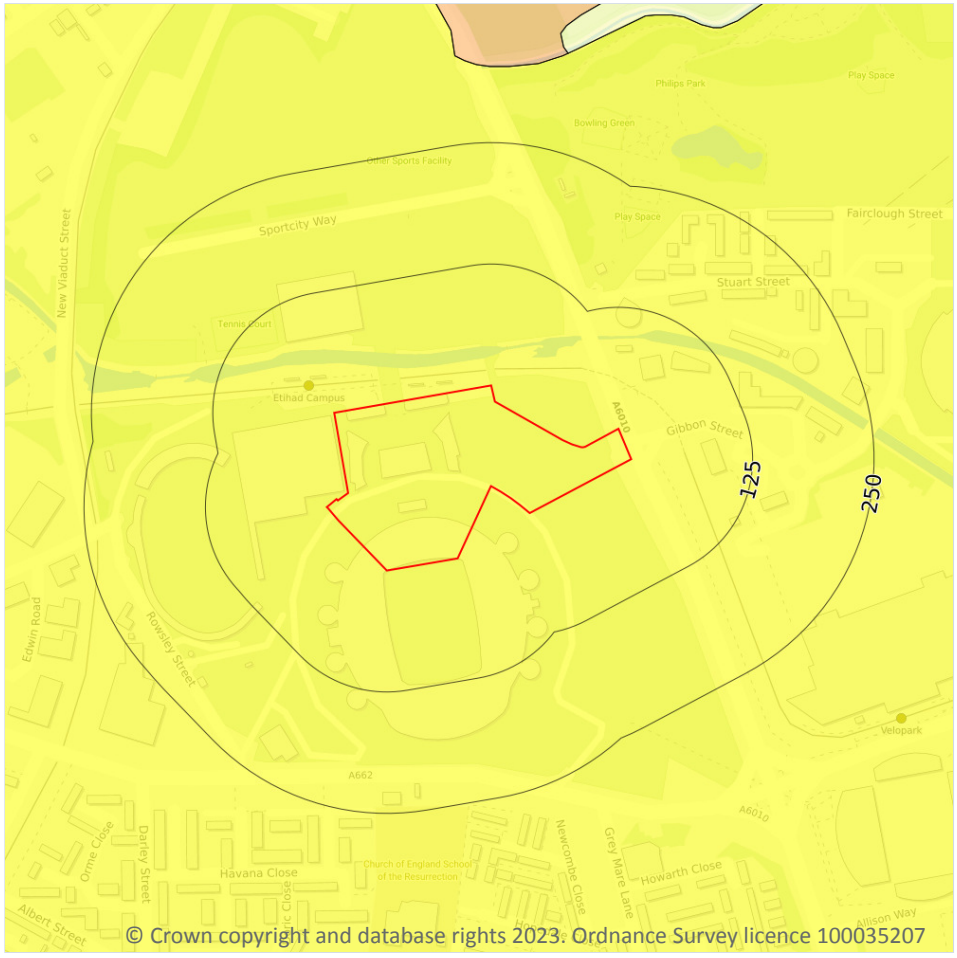
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 158**

Location	Hazard rating	Details
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	1

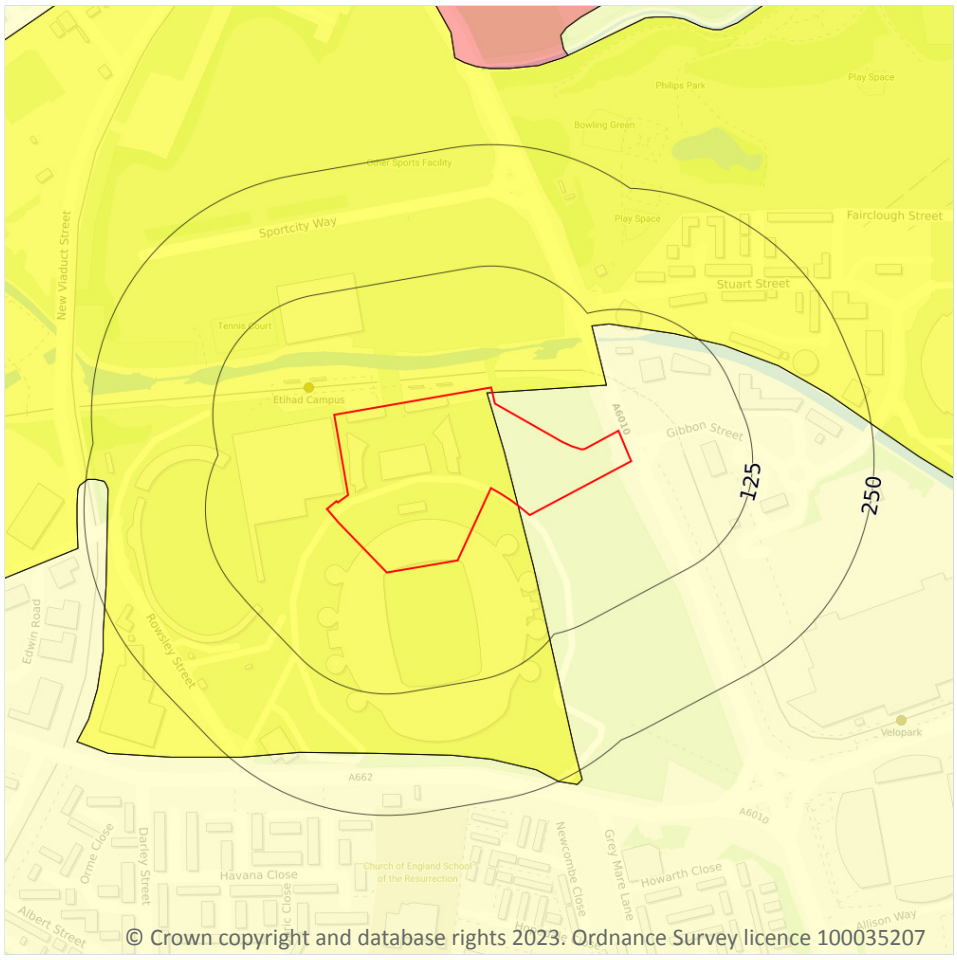
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 159**

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.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



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17.3 Compressible deposits

Records within 50m	2

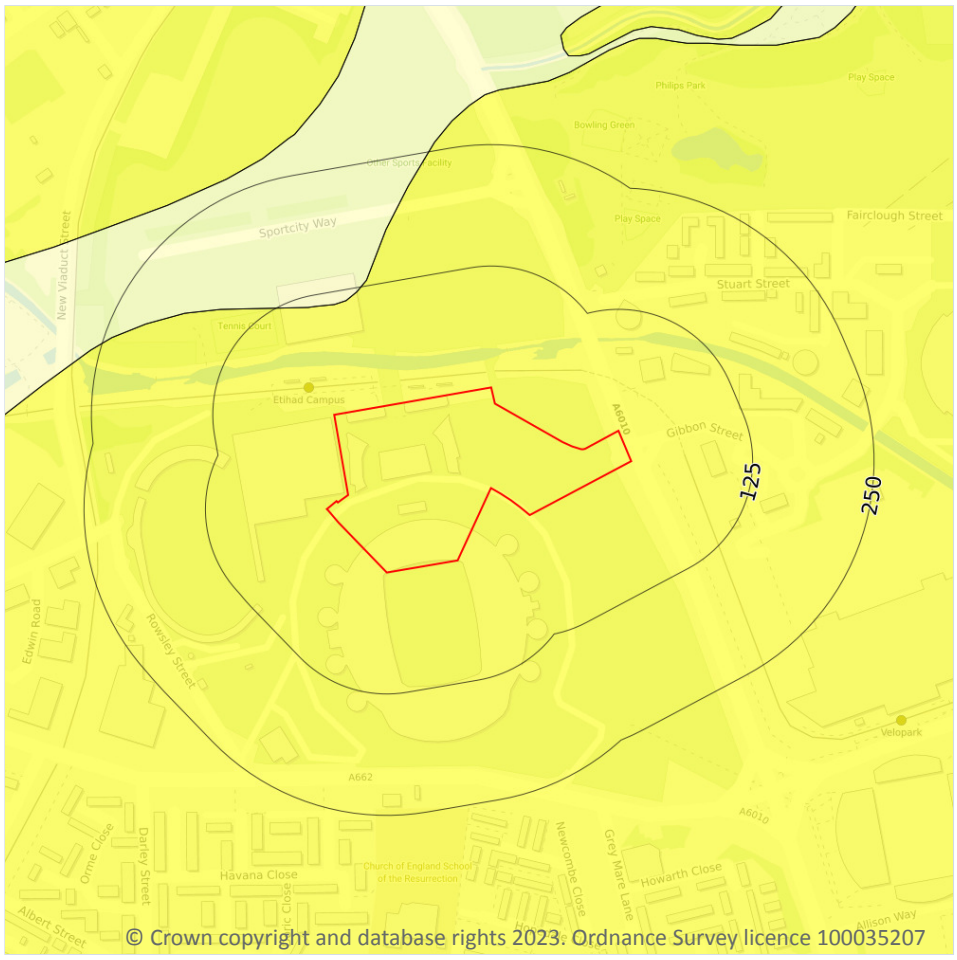
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 160**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
On site	**Very low**	**Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m	1

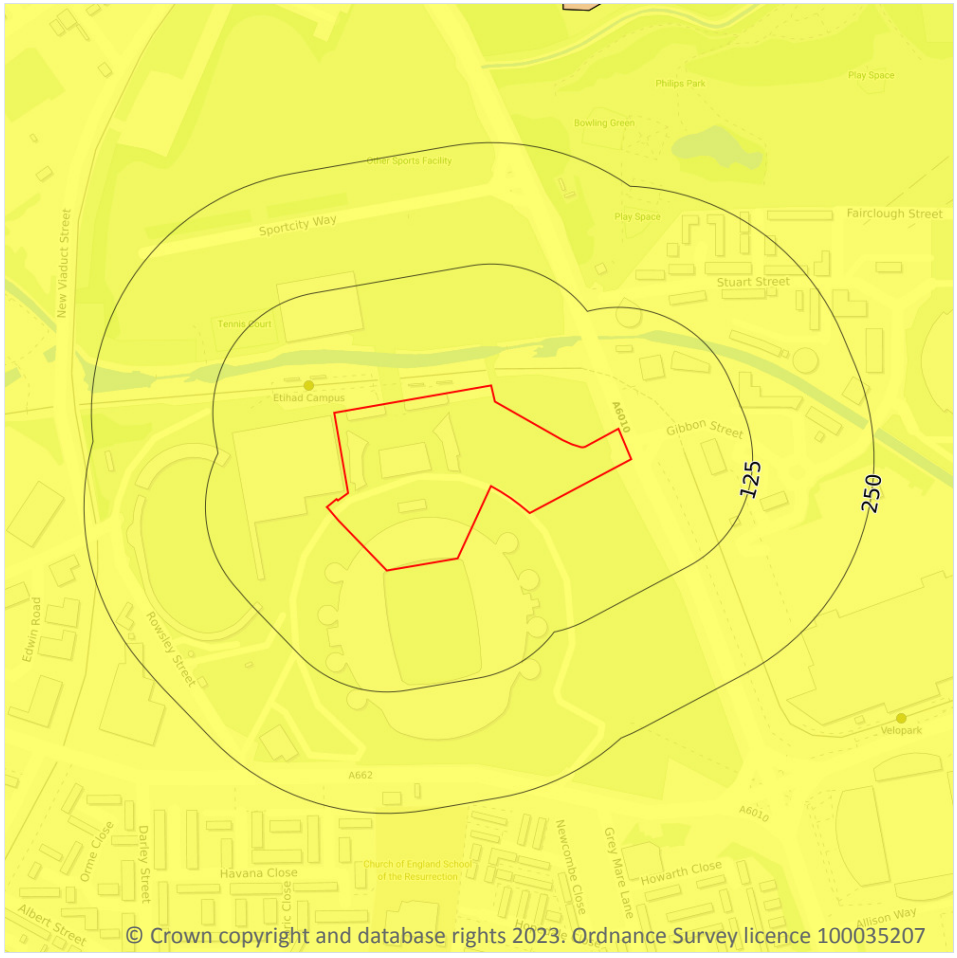
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 162**

Location	Hazard rating	Details
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



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 163**

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

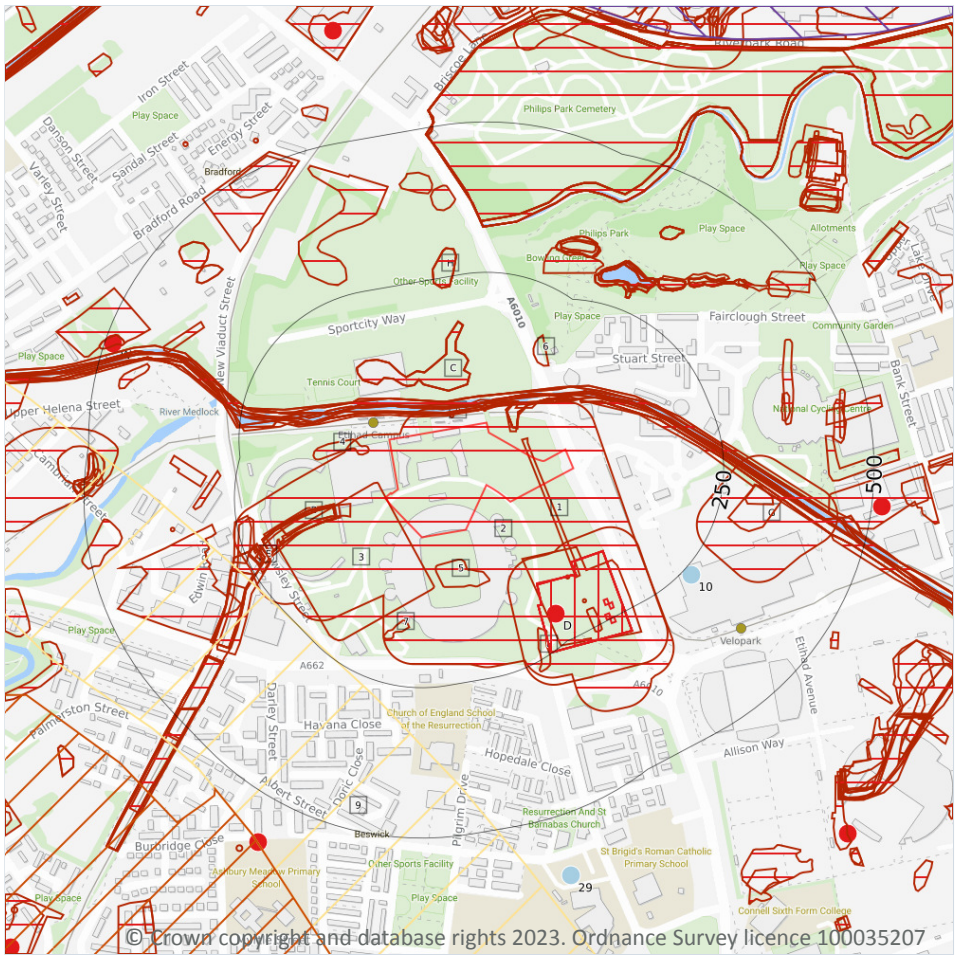
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 164**

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, ground workings and natural cavities



Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

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 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.

18.2 BritPits

Records within 500m	2

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, ground workings and natural cavities map on **page 166**

ID	Location	Details	Description
D	200m SE	Name: Bradford Colliery Address: Bradford, MANCHESTER, Lancashire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) 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
W	487m W	Name: Glenden Hall Brick Field Address: Miles Platting, MANCHESTER, Lancashire Commodity: Clay & Shale 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.

18.3 Surface ground workings

Records within 250m	53

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, ground workings and natural cavities map on **page 166**

ID	Location	Land Use	Year of mapping	Mapping scale
1	**On site**	**Canal**	**1891**	**1:10560**
2	**On site**	**Colliery**	**1968**	**1:10560**
3	**On site**	**Reservoir**	**1851**	**1:10560**
A	19m N	Coal Pits	1851	1:10560
A	20m NE	Canal	1923	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
A	20m N	Coal Pits	1851	1:10560
A	23m N	Canal	1991	1:10000
A	23m N	Canal	1938	1:10560
A	23m N	Canal	1933	1:10560
A	23m N	Canal	1921	1:10560
A	23m N	Canal	1906	1:10560
A	23m N	Canal	1891	1:10560
A	27m N	Canal	1968	1:10560
A	27m N	Canal	1956	1:10560
A	32m N	Canal	1985	1:10000
A	32m N	Canal	1978	1:10000
4	36m W	Pond	1851	1:10560
5	47m S	Pond	1851	1:10560
B	58m W	Cuttings	1956	1:10560
C	63m N	Unspecified Ground Workings	1923	1:10560
C	63m N	Unspecified Ground Workings	1921	1:10560
C	63m N	Unspecified Ground Workings	1906	1:10560
B	77m W	Cuttings	1985	1:10000
B	85m W	Cuttings	1968	1:10560
B	85m W	Cuttings	1978	1:10000
B	87m W	Cuttings	1938	1:10560
B	87m W	Cuttings	1933	1:10560
B	87m W	Cuttings	1921	1:10560
B	87m W	Cuttings	1906	1:10560
B	87m W	Cuttings	1923	1:10560
D	97m SE	Colliery	1851	1:10560
D	100m SE	Colliery	1891	1:10560
6	132m NE	Refuse Heap	1851	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
D	136m SE	Colliery	1923	1:10560
D	136m SE	Colliery	1921	1:10560
D	136m SE	Colliery	1906	1:10560
7	140m S	Pond	1851	1:10560
D	152m SE	Coal Pits	1851	1:10560
D	200m SE	Coal Pits	1851	1:10560
8	203m SE	Pond	1851	1:10560
E	216m SW	Cuttings	1991	1:10000
F	217m SW	Cuttings	1891	1:10560
D	219m SE	Pond	1851	1:10560
E	222m W	Cuttings	1968	1:10560
G	222m E	Brick Field	1891	1:10560
E	223m SW	Cuttings	1956	1:10560
F	227m SW	Cuttings	1938	1:10560
F	227m SW	Cuttings	1906	1:10560
F	227m SW	Cuttings	1923	1:10560
E	227m W	Cuttings	1956	1:10560
H	234m N	Unspecified Pit	1923	1:10560
H	234m N	Unspecified Pit	1921	1:10560
H	234m N	Unspecified Pit	1906	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	**7**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 166**

ID	Location	Land Use	Year of mapping	Mapping scale
D	136m SE	Colliery	1921	1:10560
D	136m SE	Colliery	1906	1:10560
D	136m SE	Colliery	1923	1:10560
D	217m SE	Unspecified Shafts	1978	1:10000
D	227m SE	Unspecified Disused Shafts	1985	1:10000
D	240m SE	Unspecified Shafts	1978	1:10000
D	249m SE	Unspecified Disused Shafts	1985	1:10000

This is data is sourced from Ordnance Survey/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	**2**

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).

Features are displayed on the Mining, ground workings and natural cavities map on **page 166**

ID	Location	Name	Commodity	Class	Likelihood
9	247m SW	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
23	541m SW	Ardwick	Limestone - Ardwick	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	2

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 166**

ID	Location	Mine Address	Mineral	Data source	Publisher
10	264m SE	Manchester, Greater Manchester	Fireclay	'Underground Manchester - Secrets of the city revealed'	Willow Publishing
29	600m S	Ardwick, Greater Manchester	Bath Stone, Cornstone, Limestone	CATALOGUE OF PLANS OF ABANDONED MINES (NON COAL)	-

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	1

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

Location	Details
On site	**In addition to being located inside an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property which may supplement this information. Please note, the plans held by JPB may also relate to non-mining records. Further details and a quote for services (if appropriate) can be obtained by emailing this report to enquiries.gs@jpb.co.uk.**

This data is sourced from Johnson Poole and Bloomer.

18.9 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.

18.10 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.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

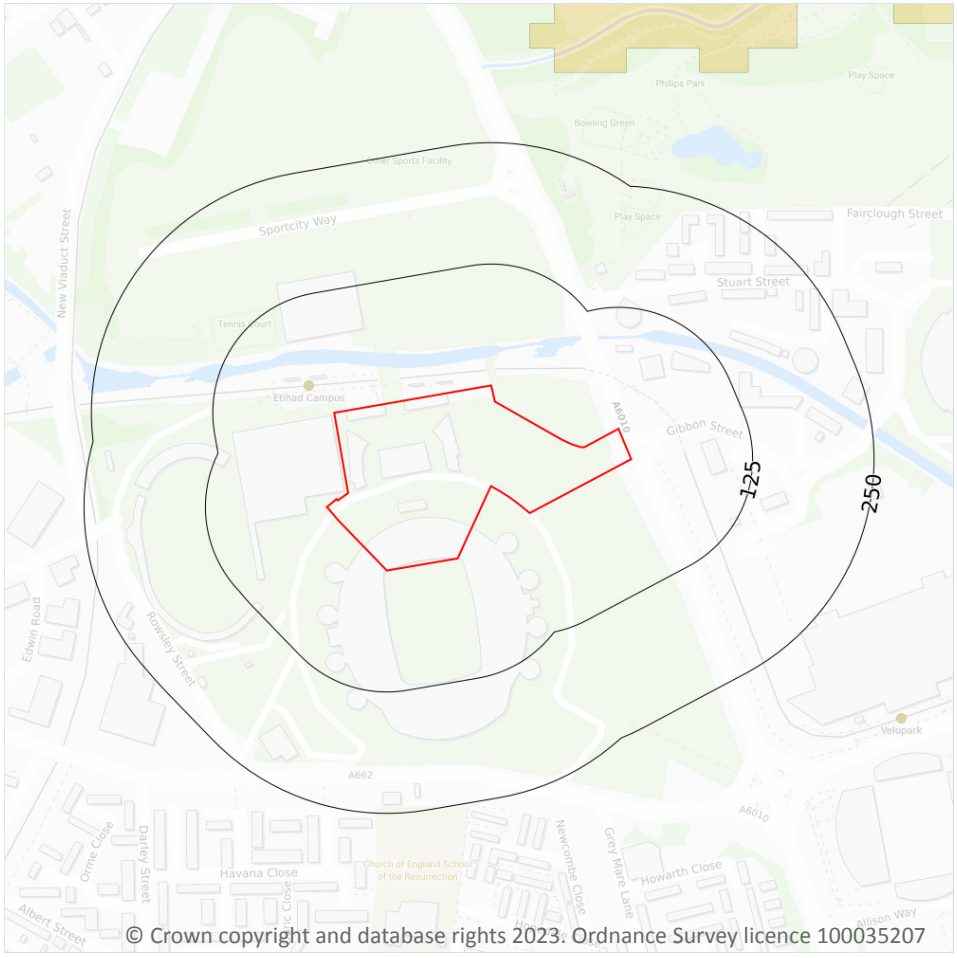
18.13 Clay mining

Records on site	0

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 Radon



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19.1 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 173**

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.

20 Soil chemistry

20.1 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 km^2. 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 km^2; 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**	**100 - 200 mg/kg**	**60 - 120 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 - 200 mg/kg**	**60 - 120 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 - 200 mg/kg**	**60 - 120 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m **15**

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 km^2).

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	**19**	**3.3**	**123**	**85**	**0.3**	**110**	**67**	**33**	**18**
On site	**20**	**3.5**	**71**	**49**	**0.3**	**127**	**22**	**38**	**4**
On site	**20**	**3.5**	**41**	**28**	**0.3**	**114**	**24**	**34**	**3**
On site	**20**	**3.5**	**41**	**28**	**0.3**	**131**	**23**	**39**	**3**

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	**20**	**3.5**	**54**	**37**	**0.3**	**135**	**23**	**40**	**9**
On site	**20**	**3.5**	**63**	**43**	**0.3**	**125**	**25**	**38**	**7**
On site	**20**	**3.5**	**66**	**45**	**0.3**	**129**	**25**	**39**	**6**
On site	**21**	**3.7**	**94**	**65**	**0.3**	**136**	**40**	**38**	**10**
On site	**21**	**3.7**	**80**	**55**	**0.3**	**107**	**27**	**35**	**6**
On site	**22**	**3.8**	**80**	**55**	**0.3**	**144**	**33**	**36**	**6**
On site	**22**	**3.8**	**68**	**47**	**0.3**	**145**	**31**	**36**	**5**
5m E	23	4	79	54	0.3	109	31	37	6
12m SW	21	3.7	105	72	0.3	134	38	33	6
21m SE	20	3.5	59	41	0.3	110	25	34	8
47m N	21	3.7	55	38	0.3	124	24	38	8

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

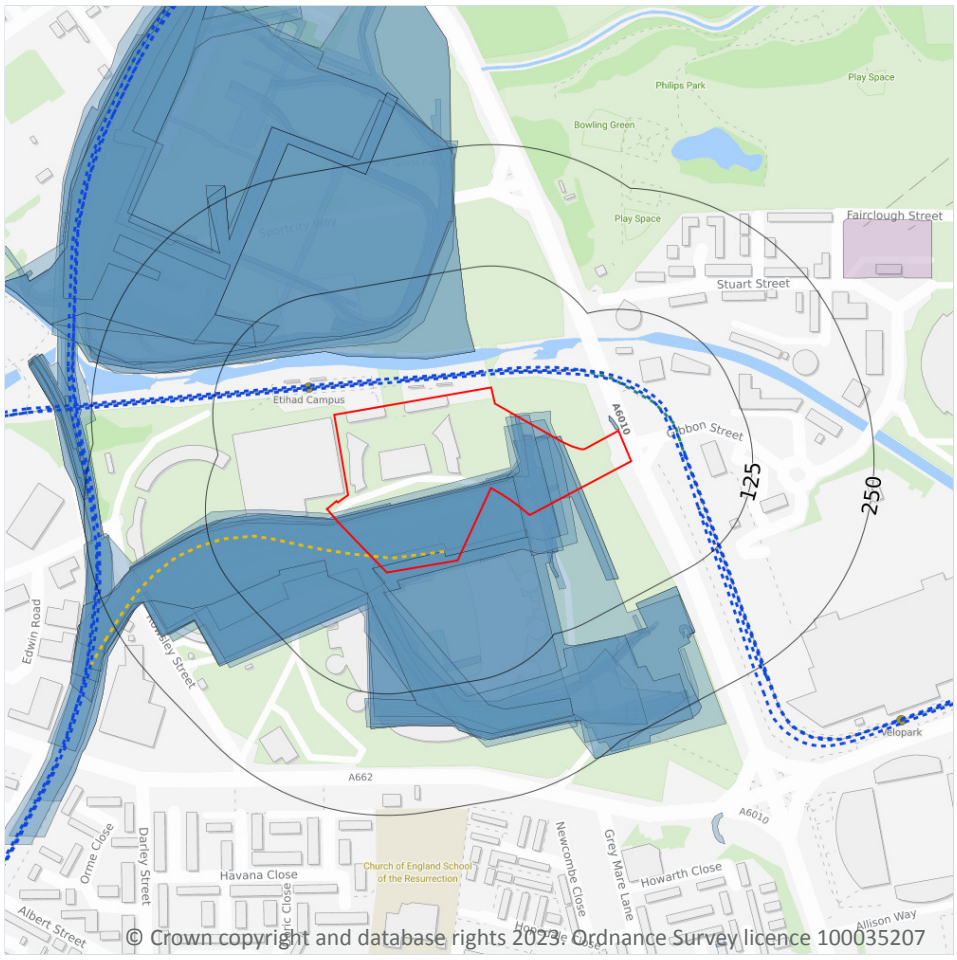
Records within 50m	**1**

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 km^2.

Location	Arsenic (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Tin (mg/kg)	Sample Type
On site	**20.0**	**1.2**	**136.0**	**112.7**	**40.2**	**307.9**	**28.8**	**Topsoil**

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects



Site Outline

Search buffers in metres (m)

- Crossrail 1 Stations
- Crossrail 1 Route
- 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

21.1 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.

21.2 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.

21.3 Railway tunnels

Records within 250m	1

Railway tunnels taken from contemporary Ordnance Survey mapping.

Features are displayed on the Railway infrastructure and projects map on **page 177**

Location	Type
44m NE	Railway Tunnel

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	87

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 177**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1893**	**2500**
On site	**Railway Sidings**	**1908**	**2500**
On site	**Railway Sidings**	**1922**	**2500**
On site	**Railway Sidings**	**1931**	**2500**
On site	**Railway Sidings**	**1948**	**1250**
On site	**Railway Sidings**	**1955**	**1250**
On site	**Railway Sidings**	**1958**	**2500**
On site	**Railway Sidings**	**1979**	**1250**
On site	**Railway Sidings**	**1987**	**1250**
On site	**Railway Sidings**	**1891**	**500**
On site	**Railway**	**1891**	**-**
On site	**Railway**	**1905**	**-**
On site	**Railways**	**1922**	**-**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway**	**1922**	**-**
On site	**Railway**	**1932**	**-**
On site	**Railway**	**1893**	**-**
On site	**Railway Sidings**	**1932**	**2500**
On site	**Railway Sidings**	**1938**	**10560**
On site	**Railway Sidings**	**1933**	**10560**
On site	**Railway Sidings**	**1921**	**10560**
On site	**Railway Sidings**	**1906**	**10560**
On site	**Railway Sidings**	**1891**	**10560**
On site	**Railway Sidings**	**1956**	**10560**
On site	**Railway Sidings**	**1978**	**10000**
On site	**Railway Sidings**	**1923**	**10560**
On site	**Railway Sidings**	**1968**	**10560**
1m E	Railway Sidings	1948	1250
1m E	Railway Sidings	1955	1250
3m SE	Railway Sidings	1893	2500
3m SE	Railway Sidings	1908	2500
3m SE	Railway Sidings	1922	2500
3m SE	Railway Sidings	1932	2500
18m S	Railway Sidings	1893	2500
18m S	Railway Sidings	1908	2500
18m S	Railway Sidings	1922	2500
18m S	Railway Sidings	1932	2500
39m N	Railway Sidings	1938	10560
39m N	Railway Sidings	1933	10560
62m S	Railway Sidings	1956	1250
62m S	Railway Sidings	1949	1250
63m N	Railway Sidings	1956	10560

Location	Land Use	Year of mapping	Mapping scale
68m S	Railway Sidings	1922	2500
68m NW	Railway Sidings	1931	2500
74m NW	Railway Sidings	1958	2500
75m NW	Railway Sidings	1955	1250
75m NW	Railway Sidings	1948	1250
75m NW	Railway Sidings	1968	10560
79m NW	Railway Sidings	1978	10000
101m S	Railway Sidings	1908	2500
101m W	Railway Sidings	1955	1250
102m NW	Tramway Sidings	1931	2500
104m NW	Railway Sidings	1921	10560
104m NW	Tramway Sidings	1922	2500
107m NW	Railway Sidings	1923	10560
142m SE	Railway Sidings	1908	2500
151m S	Railway Sidings	1908	2500
153m S	Railway Sidings	1893	2500
154m S	Railway	1922	-
156m S	Railway Sidings	1922	2500
156m N	Railway Sidings	1955	1250
157m NW	Overhead Tramway Sidings	1948	1250
158m SE	Railway Sidings	1949	1250
158m SE	Railway Sidings	1949	1250
160m NW	Railway Sidings	1906	10560
164m NW	Tramway Sidings	1908	2500
174m SE	Tramway Sidings	1953	1250
174m SE	Tramway Sidings	1949	1250
179m NW	Railway Sidings	1891	10560
181m SE	Tramway Sidings	1953	1250

Location	Land Use	Year of mapping	Mapping scale
181m SE	Tramway Sidings	1949	1250
182m NW	Railway Sidings	1922	2500
185m SE	Tramway Sidings	1953	1250
185m SE	Tramway Sidings	1949	1250
195m NW	Railway Sidings	1891	500
203m NW	Railway Sidings	1948	1250
205m W	Railway Sidings	1948	1250
205m W	Railway Sidings	1955	1250
216m N	Railway Sidings	1955	1250
217m SE	Railway Sidings	1949	2500
217m SE	Railway Sidings	1949	1250
219m SE	Railway Sidings	1953	1250
227m NW	Overhead Tramway Sidings	1948	1250
238m SW	Railway Sidings	1922	2500
242m SW	Railway Sidings	1891	500
244m SE	Railway Sidings	1949	1250
246m W	Railway Sidings	1922	2500
248m W	Railway Sidings	1891	500

This data is sourced from Ordnance Survey/Groundsure.

21.5 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.

21.6 Historical railways

Records within 250m	1

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

Features are displayed on the Railway infrastructure and projects map on **page 177**

Location	Description
On site	**Razed**

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	19

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 177**

Location	Name	Type
14m N		light_rail
16m N	Not given	Multi Track
18m N		light_rail
18m NE	Not given	Multi Track
22m NW		light_rail
26m NW	Not given	Multi Track
27m NW		light_rail
46m E		light_rail
50m NE		light_rail
52m E		light_rail
55m E	Not given	Multi Track
56m E		light_rail
84m E		light_rail
236m W	Philips Park and Ashburys Branch	rail

Location	Name	Type
238m W	Not given	Multi Track
239m W	Not given	Multi Track
240m W	Philips Park and Ashburys Branch	rail
243m W	Not given	Multi Track
245m W	Not given	Multi Track

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 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.

21.9 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.

21.10 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.

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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1848**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1845
Revised N/A
Edition 1848
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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1890-1891**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1891
Edition 1891
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Surveyed 1890
Revised 1890
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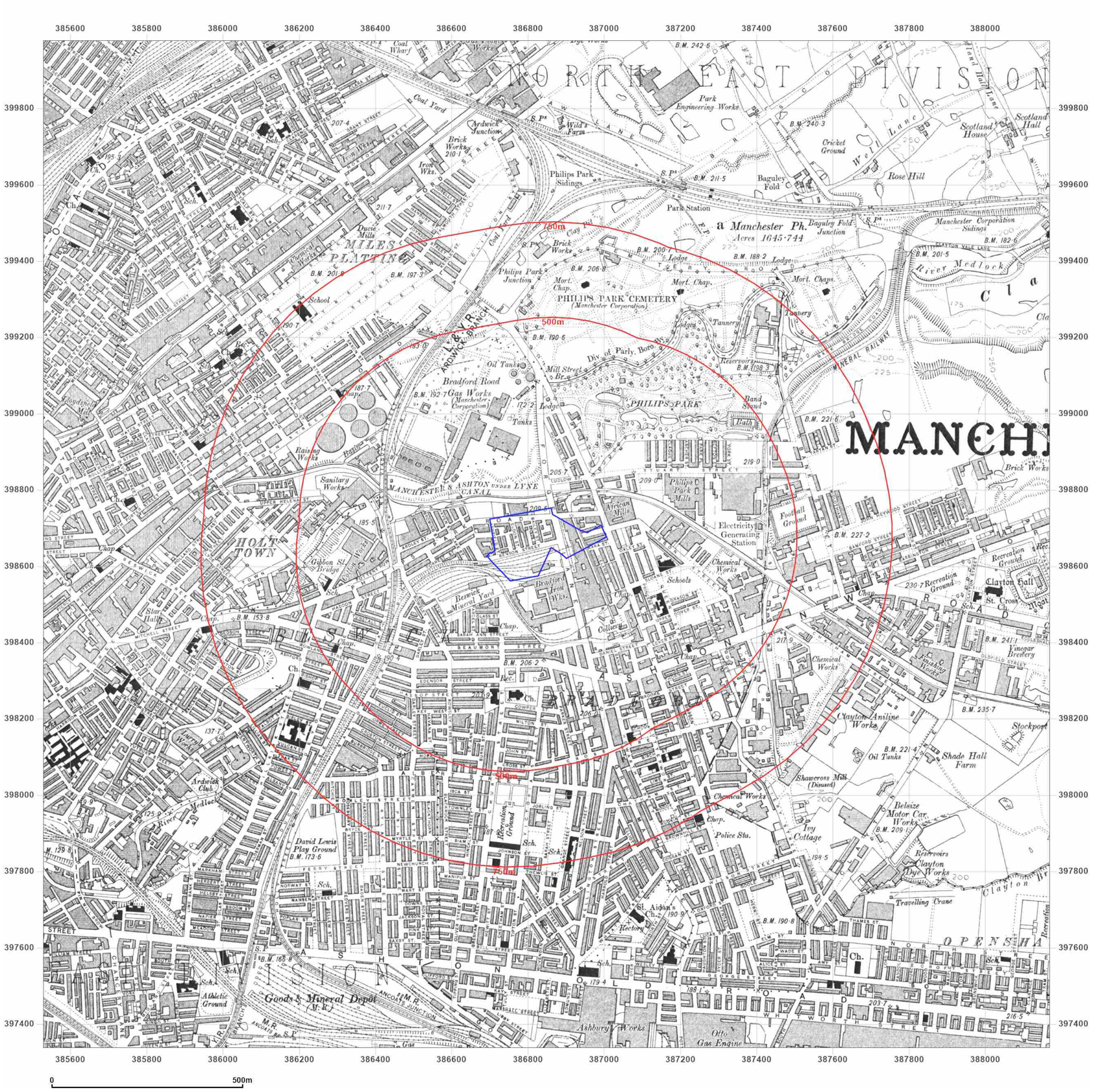
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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1905-1906**

Scale: 1:10,560

Printed at: 1:10,560

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

Surveyed 1844
Revised 1905
Edition 1905
Copyright N/A
Levelled N/A

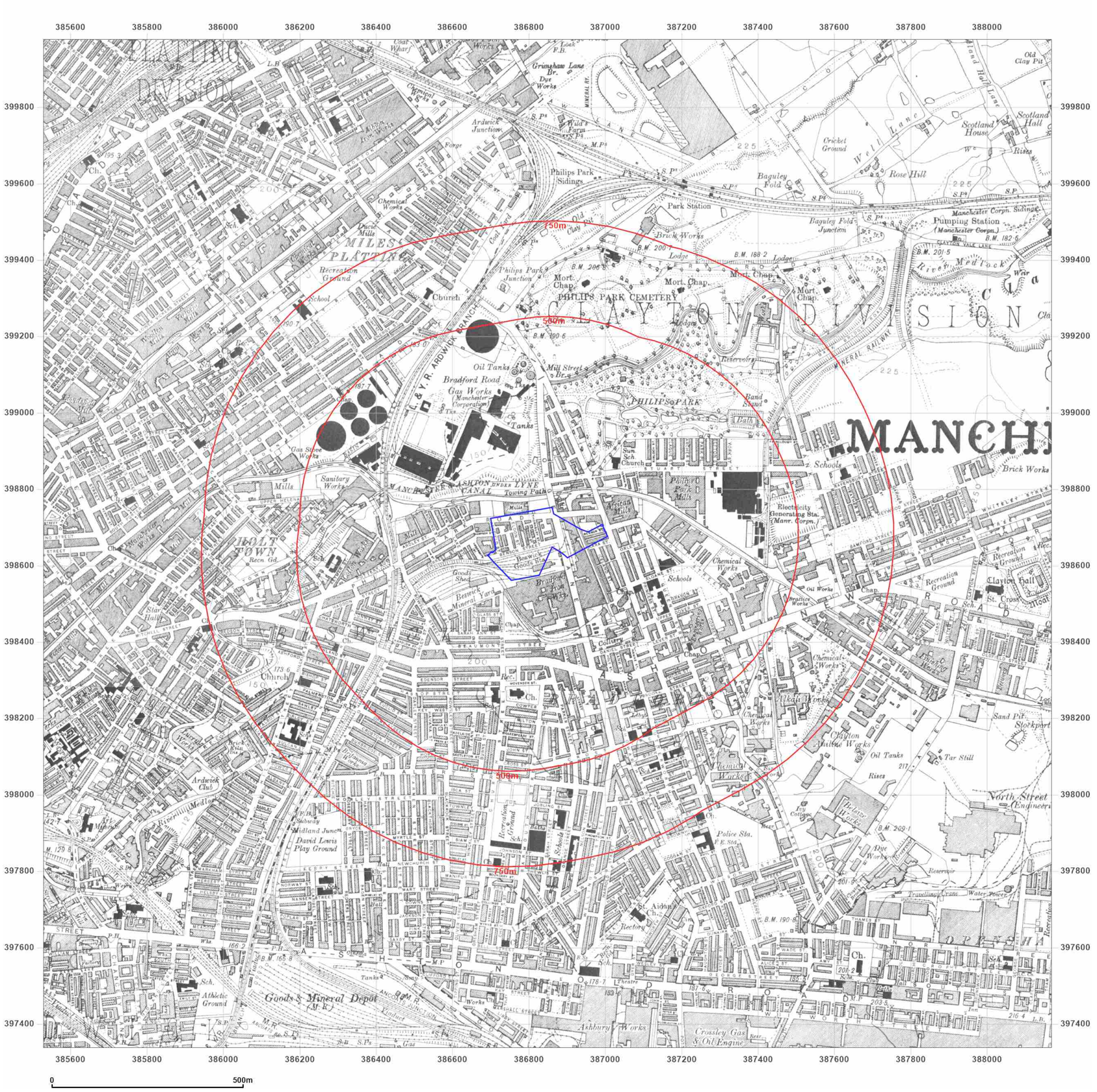
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Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

Printed at: 1:10,560

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Edition 1923
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Levelled 1906

Surveyed 1844
Revised 1915
Edition 1923
Copyright N/A
Levelled 1915

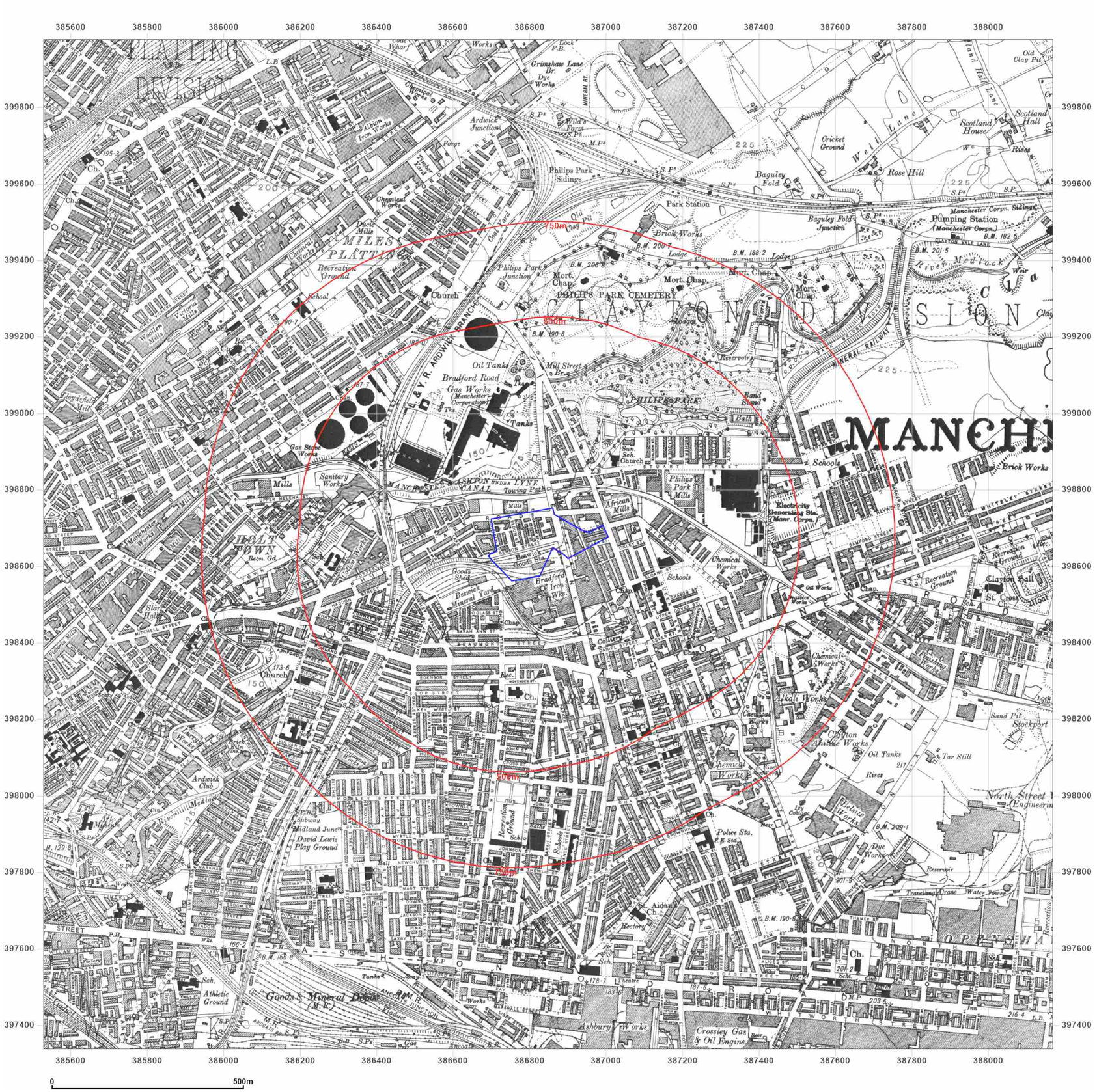
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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1923**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Production date: 30 January 2023

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1933-1934**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1844
Revised 1933
Edition 1933
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1934
Edition 1934
Copyright N/A
Levelled 1927

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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

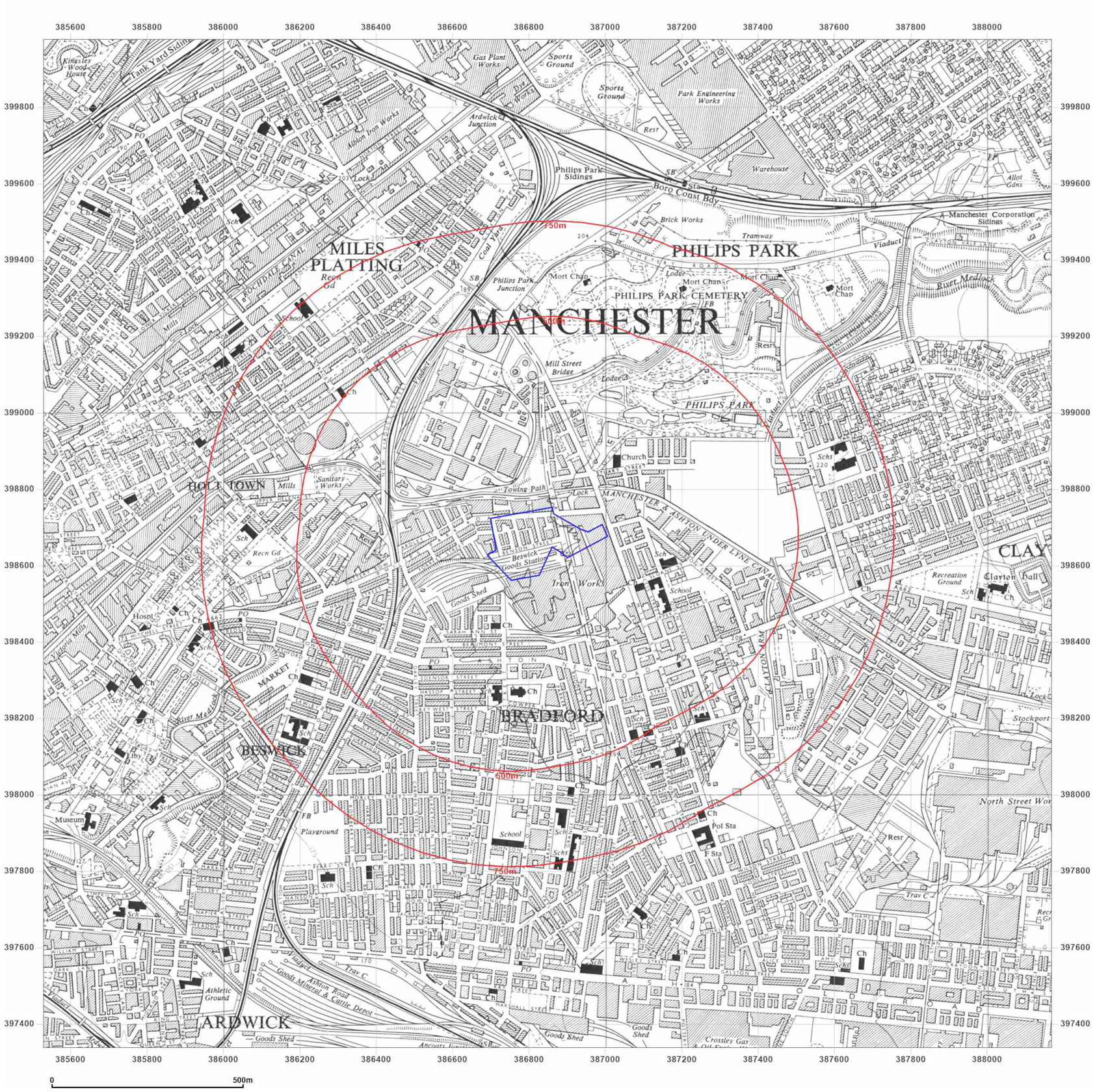
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: Provisional

Map date: **1956**

Scale: 1:10,560

Printed at: 1:10,560

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

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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: Provisional

Map date: **1968**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1968
Revised 1968
Edition N/A
Copyright 1968
Levelled N/A

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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: National Grid

Map date: **1981**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1976
Revised 1980
Edition N/A
Copyright 1981
~~Levelled 1976~~

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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: National Grid

Map date: **1985**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1985
Revised 1985
Edition N/A
Copyright 1985
Levelled 1981

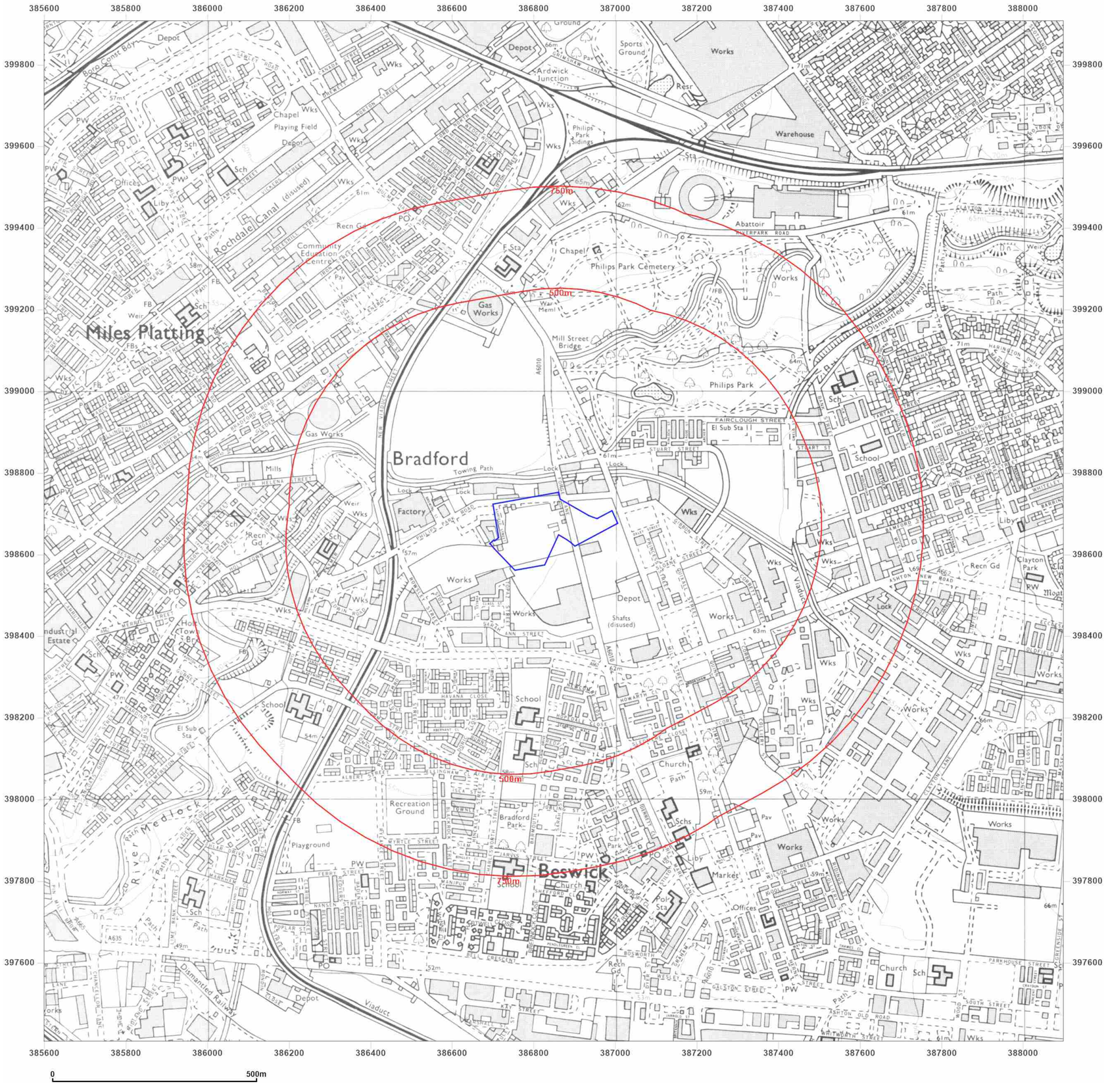
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: National Grid

Map date: **1991**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1985
Revised 1991
Edition N/A
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Groundsure INSIGHTS

Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

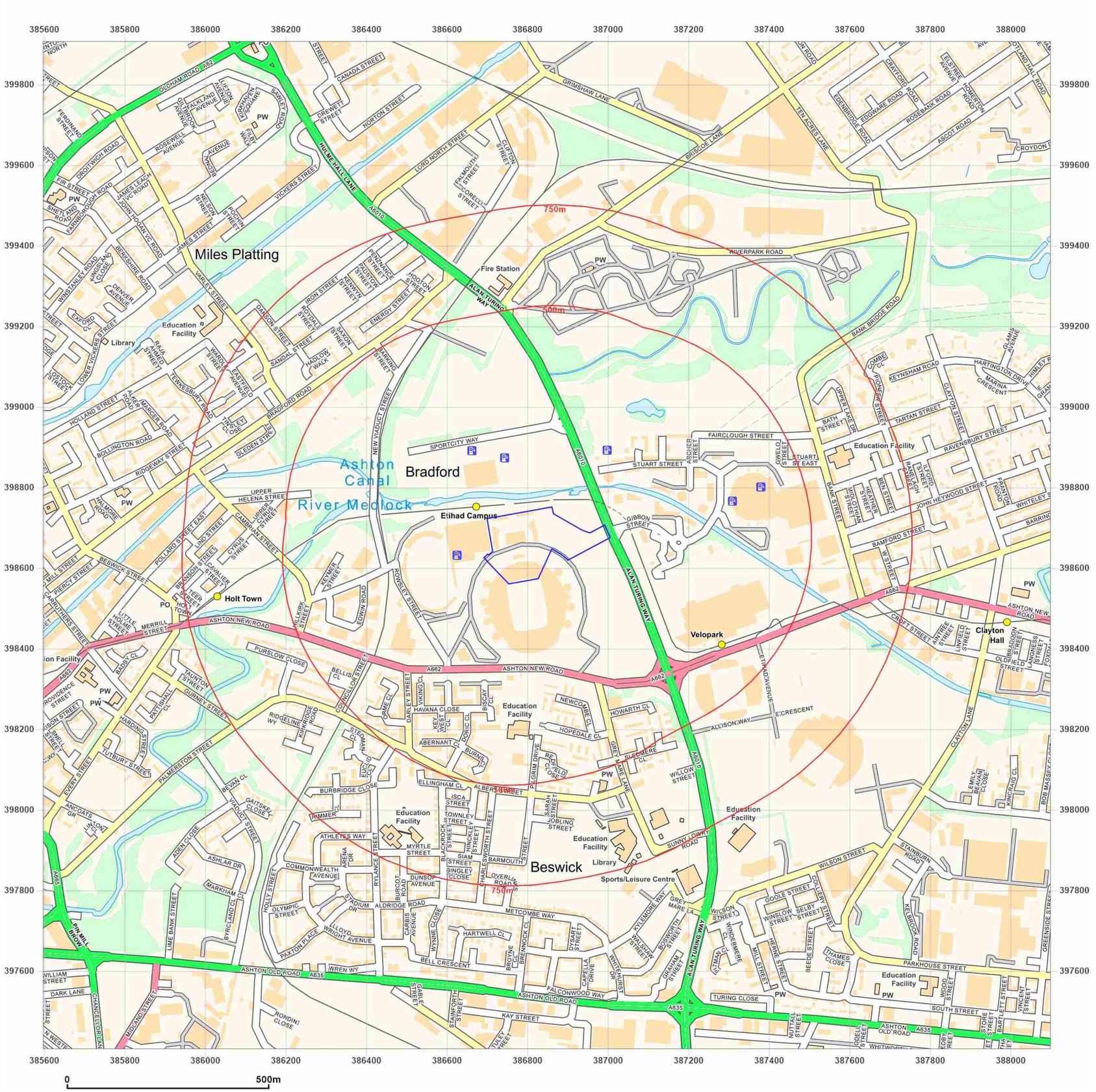
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376
Grid Ref: 386848, 398657

Map Name: National Grid

Map date: **2023**

Scale: 1:10,000

Printed at: 1:10,000

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2023

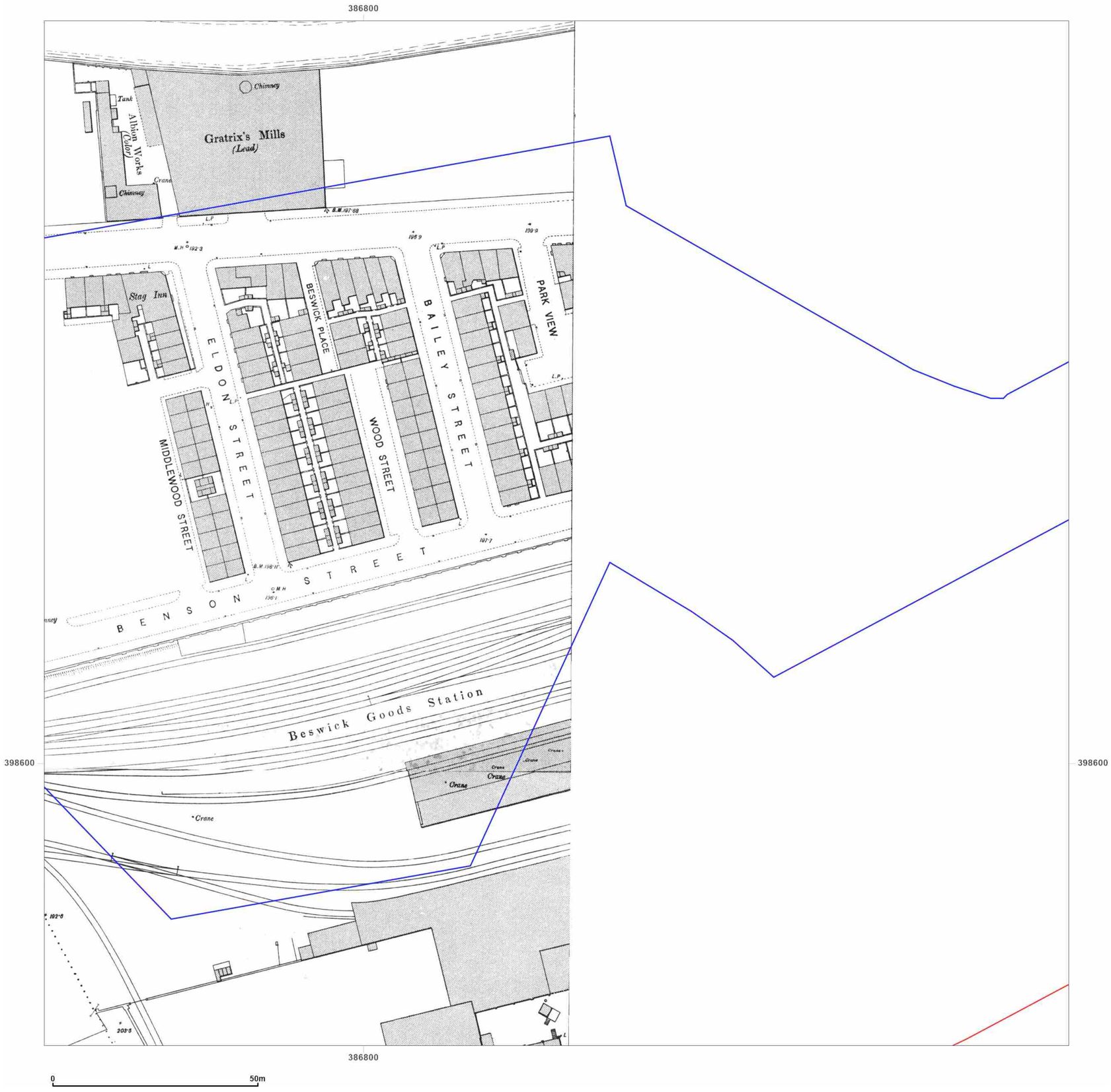
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: County Series Town Plan

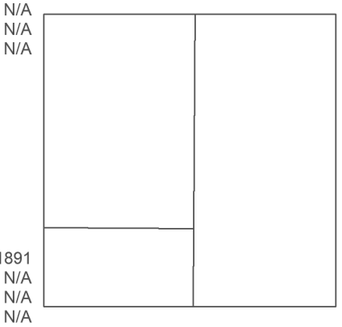
Map date: **1891**

Scale: 1:500

Printed at: 1:1,000

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



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

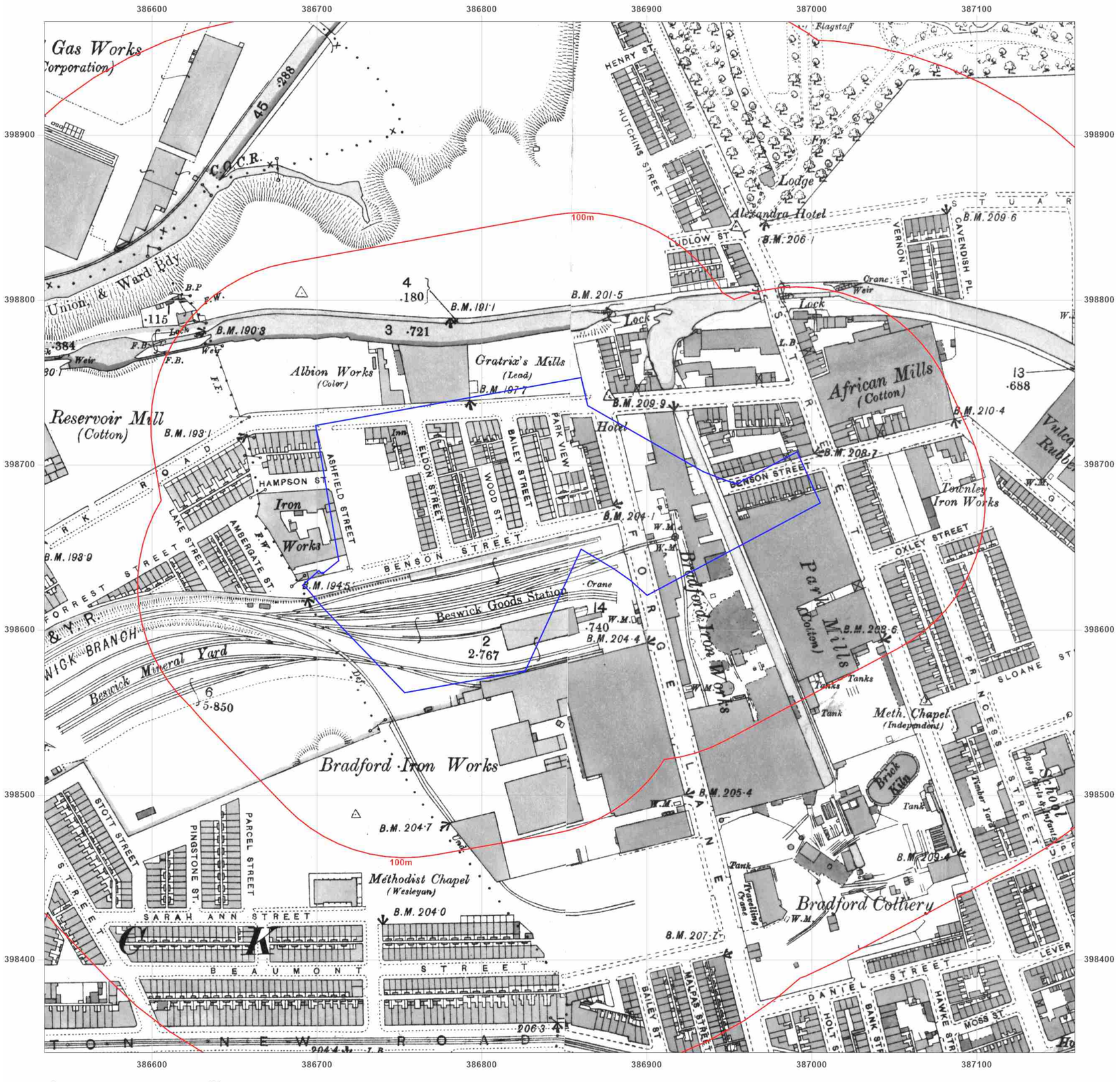
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: County Series

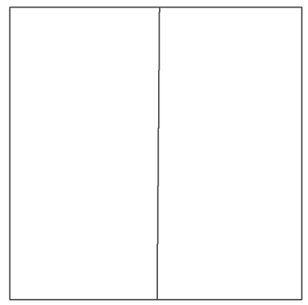
Map date: **1893**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1893
Revised N/A
Edition 1893
Copyright N/A
Levelled N/A



Surveyed 1893
Revised N/A
Edition 1893
Copyright N/A
Levelled N/A

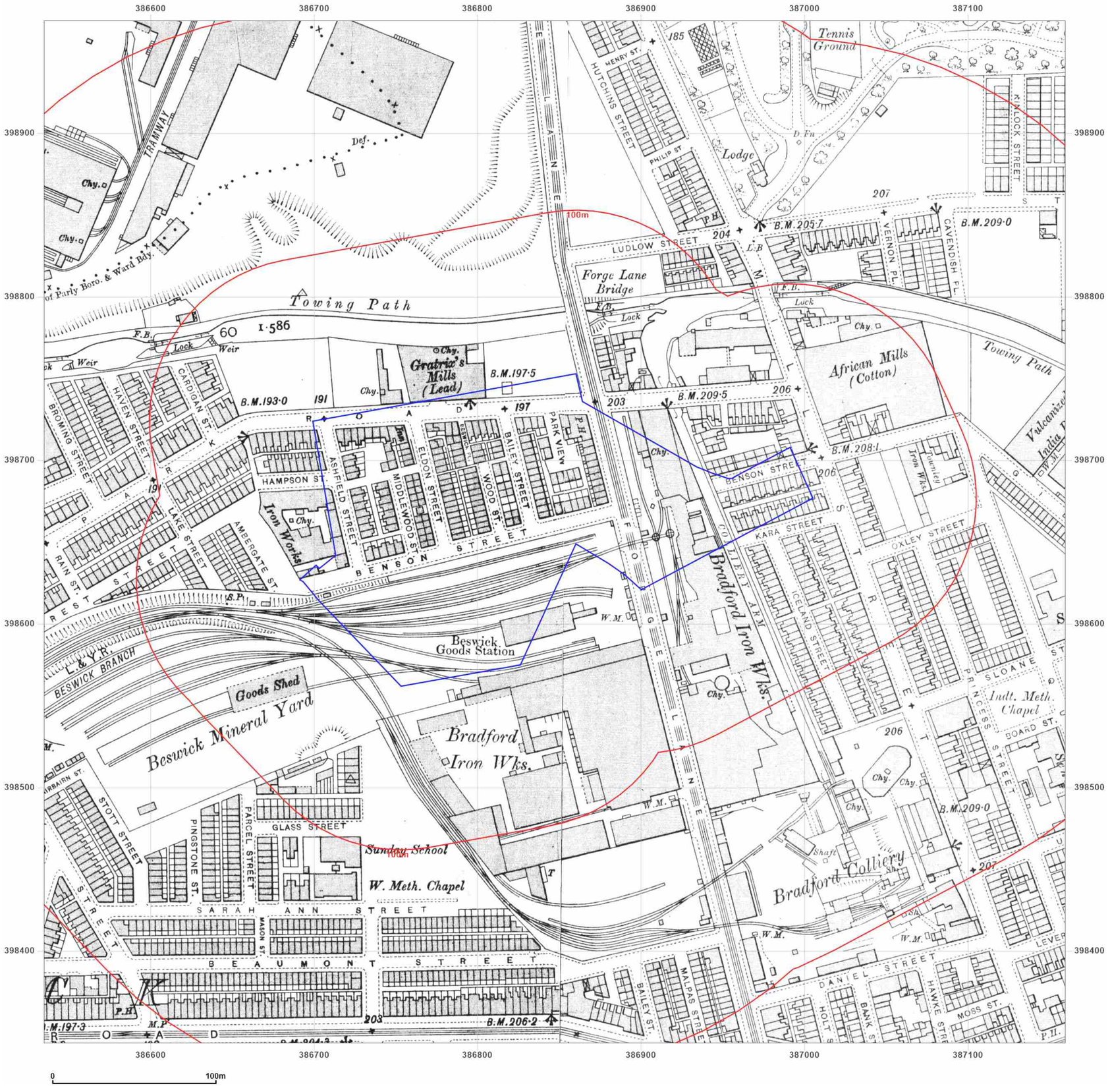
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: County Series

Map date: **1908**

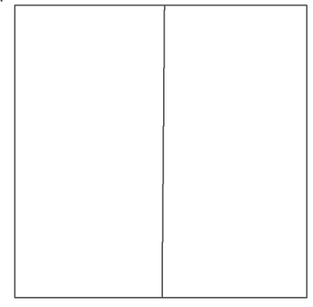
Scale: 1:2,500

Printed at: 1:2,500

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

Surveyed 1891
Revised 1905
Edition 1908
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: County Series

Map date: **1922**

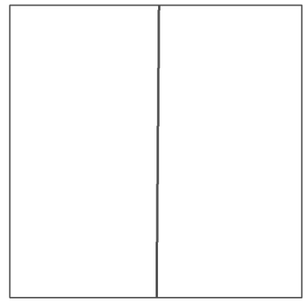
Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1922
Revised 1916
Edition 1922
Copyright N/A
Levelled 1915

Surveyed 1922
Revised 1916
Edition 1922
Copyright N/A
Levelled 1915



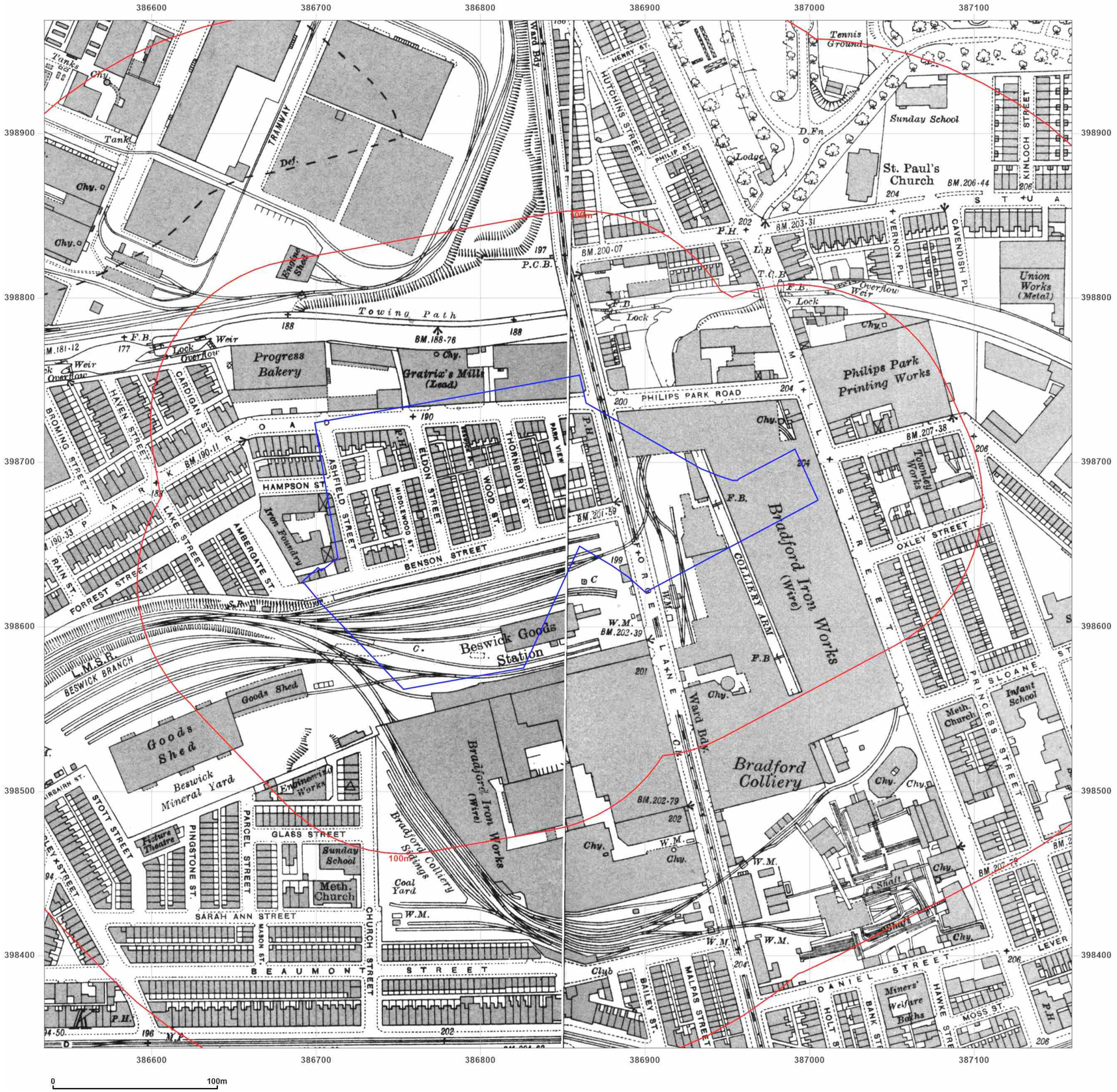
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: County Series

Map date: **1931-1932**

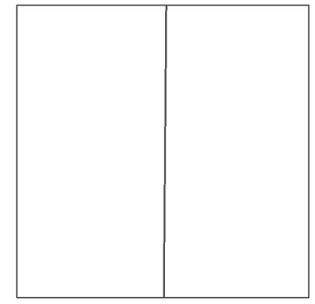
Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1873
Revised 1931
Edition N/A
Copyright N/A
Levelled 1927

Surveyed 1873
Revised 1932
Edition N/A
Copyright N/A
Levelled 1927



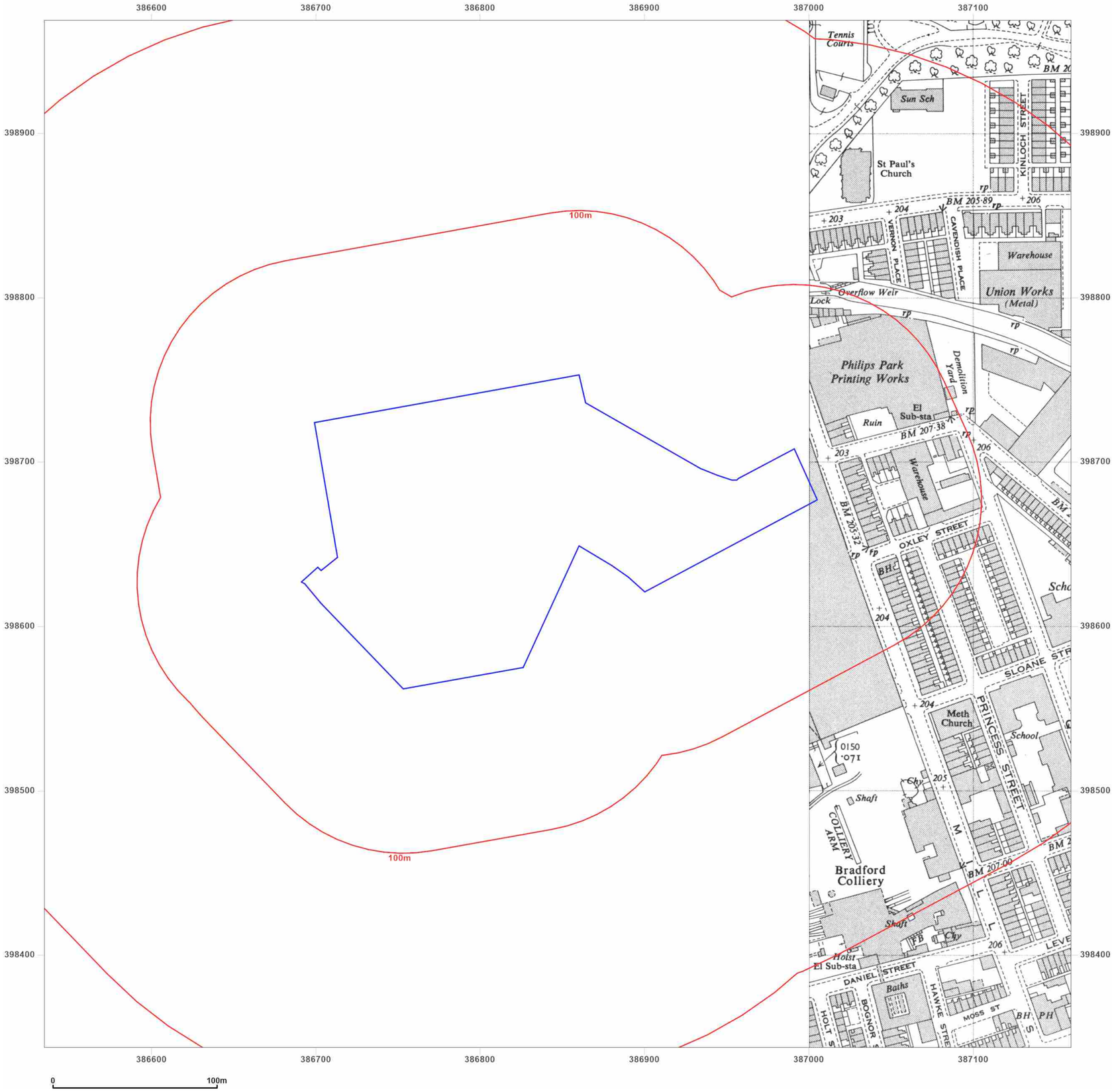
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: National Grid

Map date: **1950**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1949
Revised 1949
Edition N/A
Copyright 1950
Levelled 1949

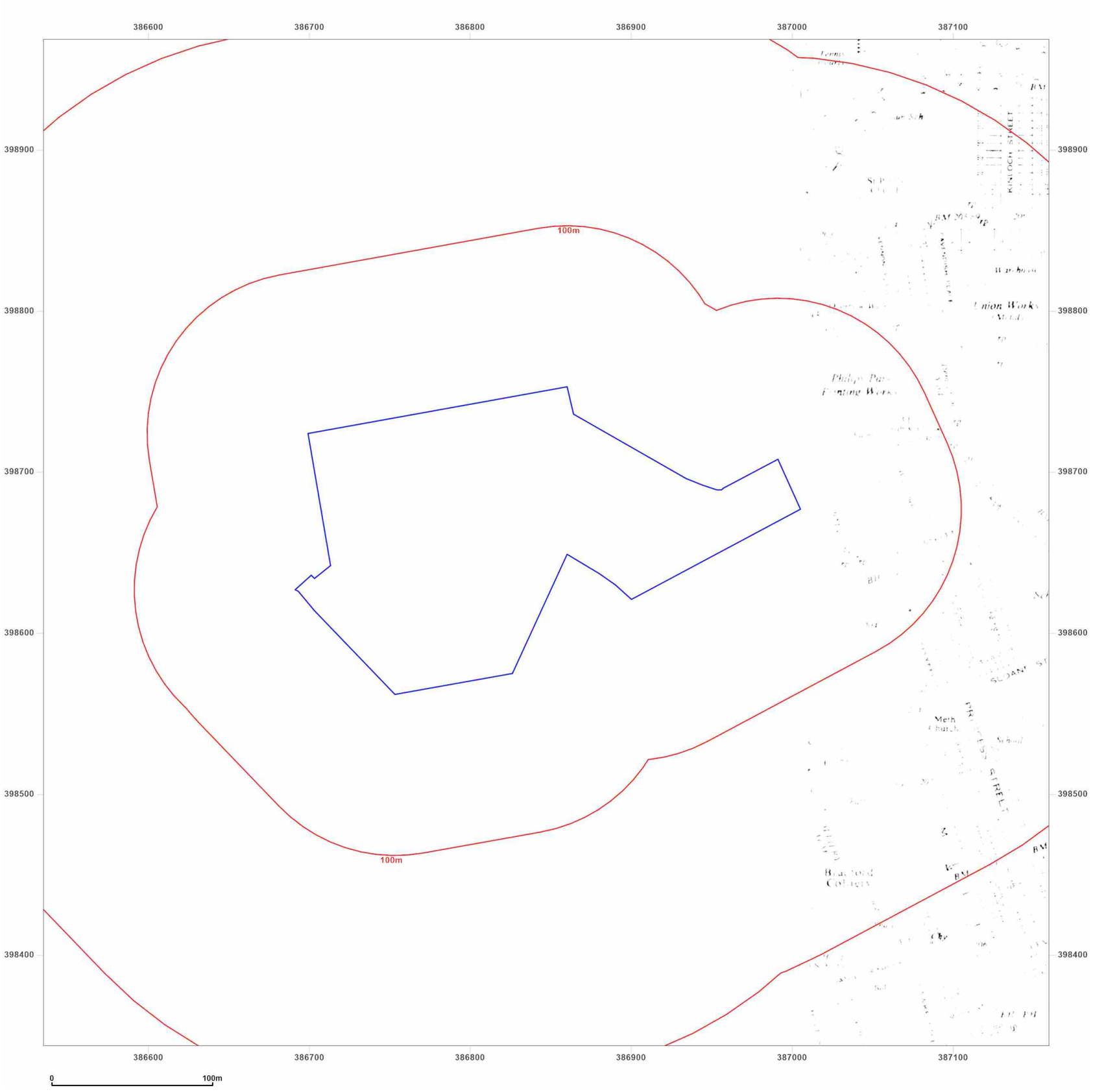
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: National Grid

Map date: **1951**

Scale: 1:2,500

Printed at: 1:2,500

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

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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_2500
Grid Ref: 386847, 398656

Map Name: National Grid

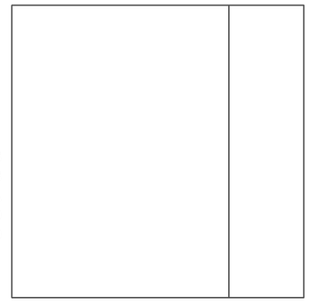
Map date: **1959**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1949



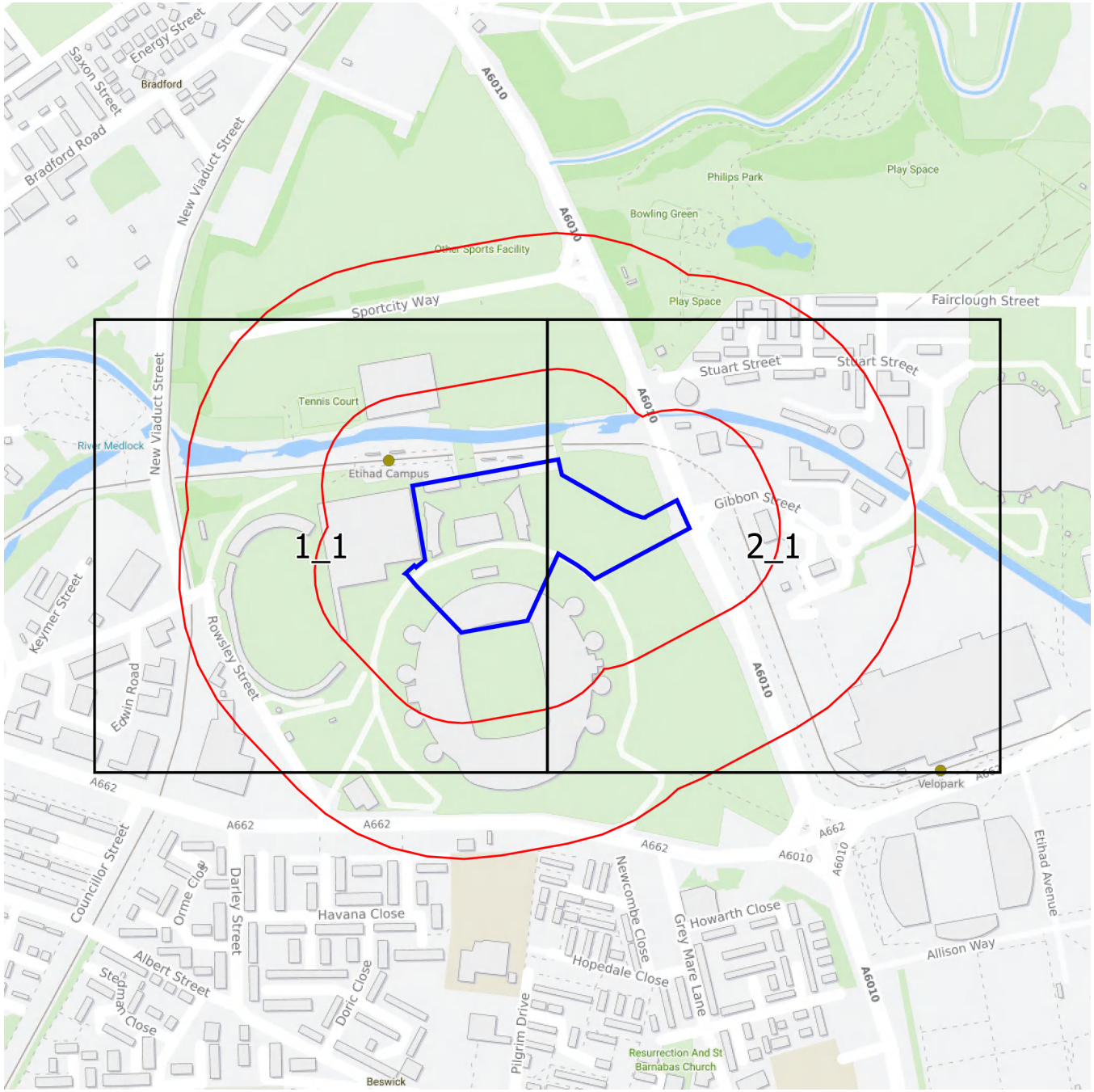
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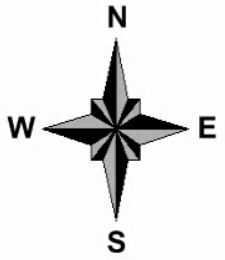
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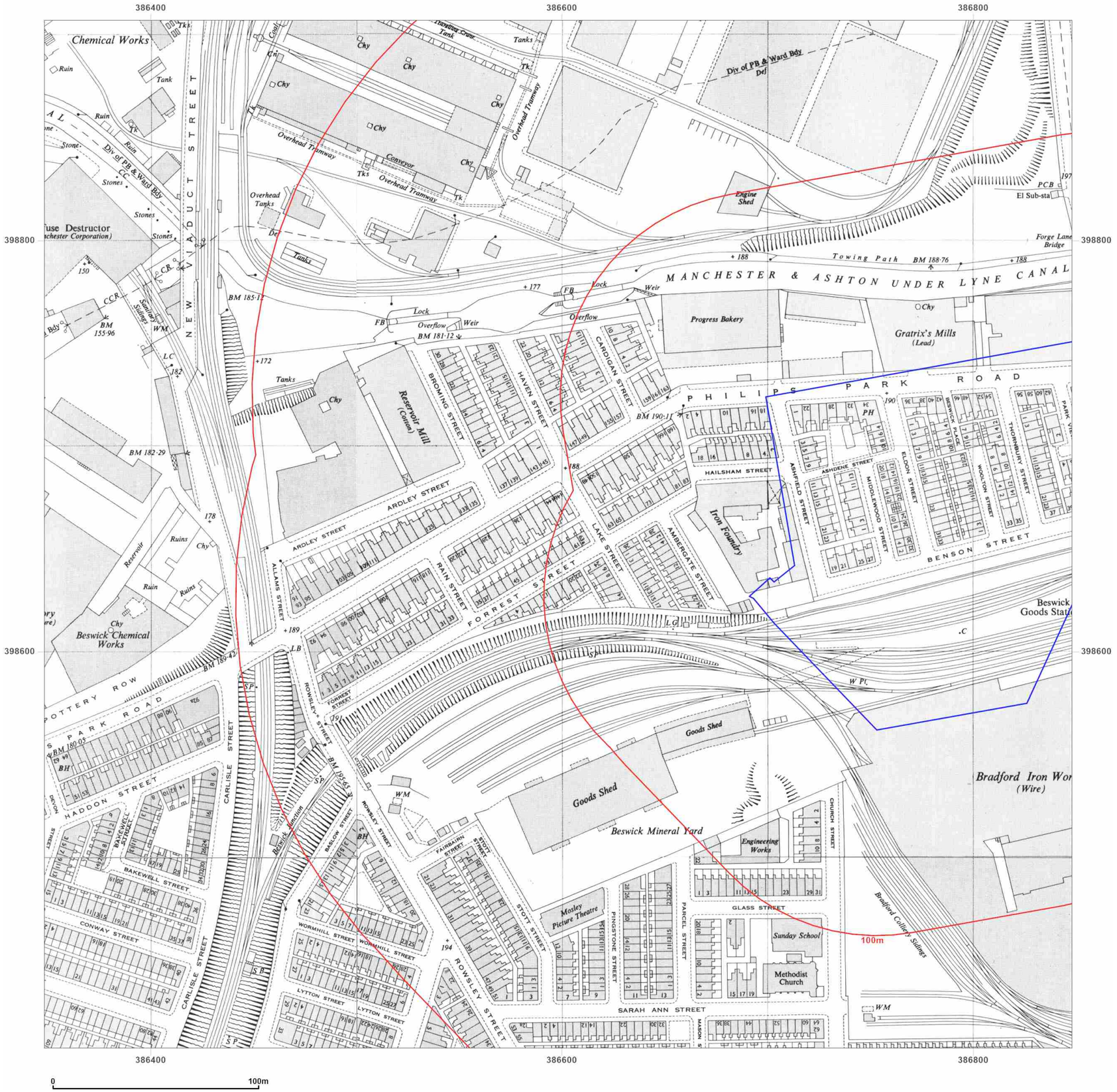
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Groundsure INSIGHTS

1:1,250 Scale Grid Index





Groundsure INSIGHTS

Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid
Map date: **1948-1949**
Scale: 1:1,250
Printed at: 1:2,000

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Surveyed 1948 Revised 1948 Edition N/A Copyright 1948 Levelled 1929		Surveyed 1948 Revised 1948 Edition N/A Copyright 1948 Levelled 1929
Surveyed 1948 Revised 1948 Edition N/A Copyright 1948 Levelled 1929		Surveyed 1949 Revised 1949 Edition N/A Copyright 1949 Levelled 1929

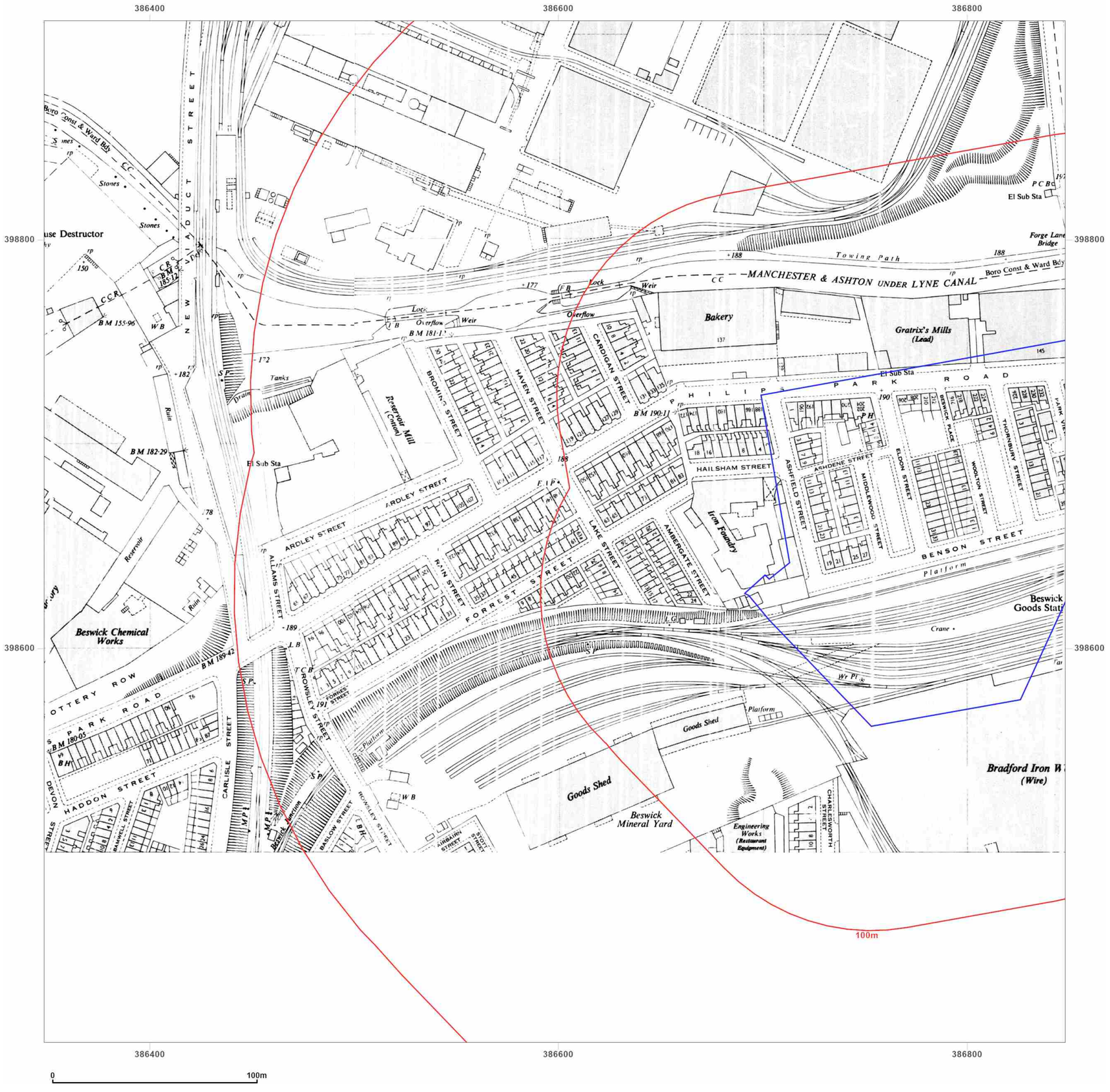
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1956**

Scale: 1:1,250

Printed at: 1:2,000

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

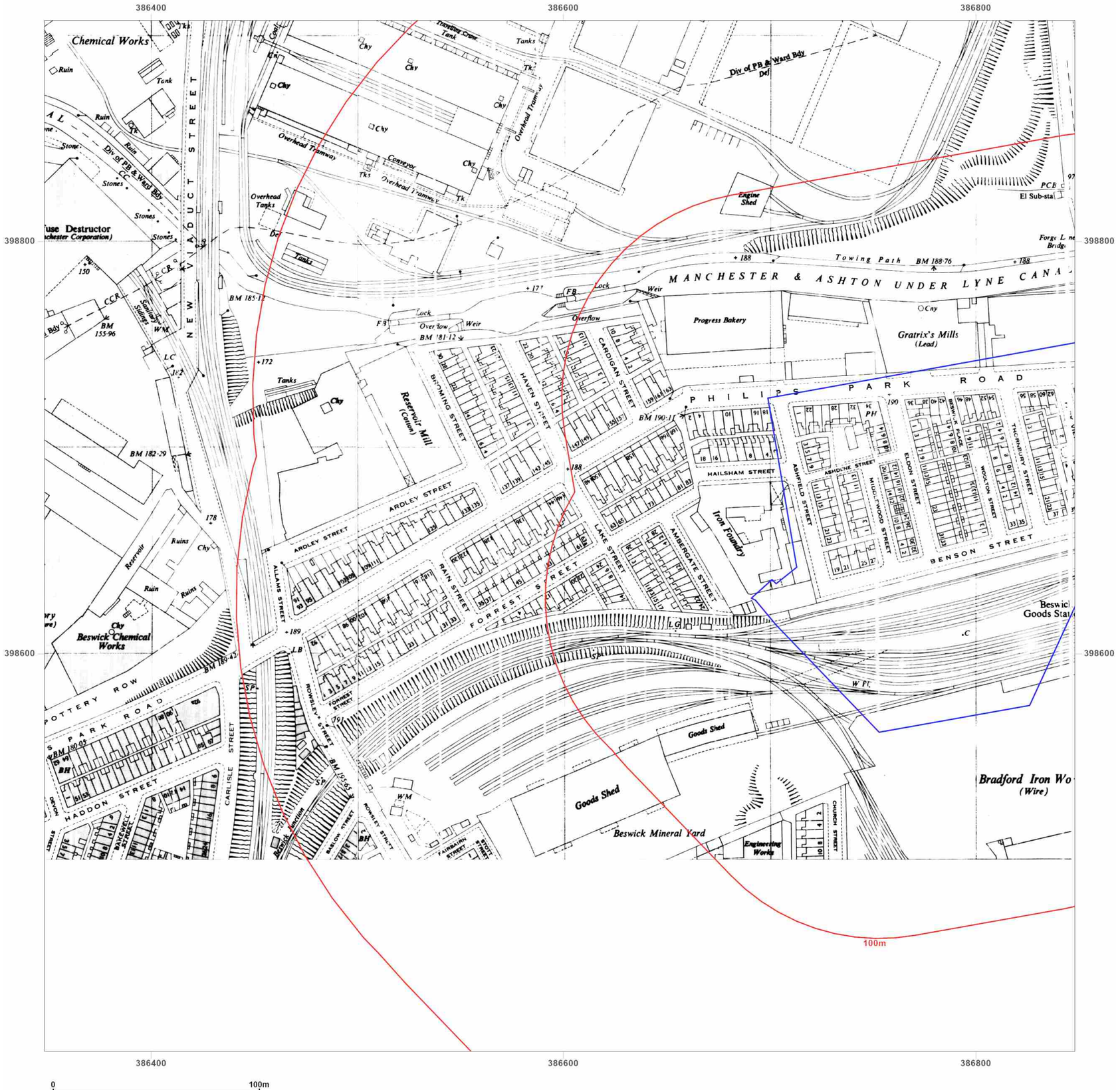
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1956**

Scale: 1:1,250

Printed at: 1:2,000

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

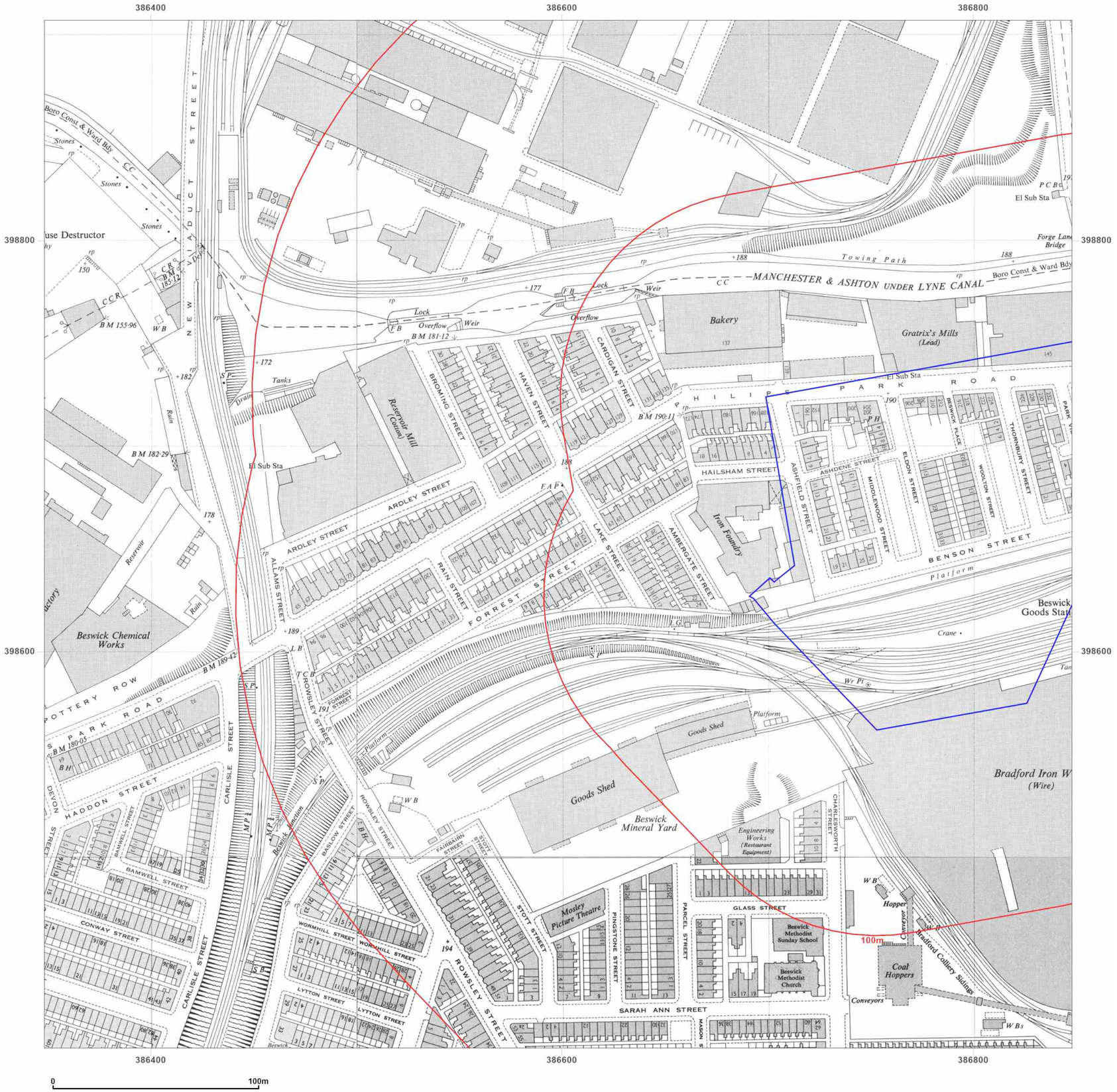
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1955-1958**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1955 Revised 1955 Edition N/A Copyright 1955 Levelled 1929		Surveyed 1955 Revised 1955 Edition N/A Copyright 1955 Levelled 1949
Surveyed 1948 Revised 1958 Edition N/A Copyright 1958 Levelled 1929		Surveyed 1956 Revised 1956 Edition N/A Copyright 1956 Levelled 1929

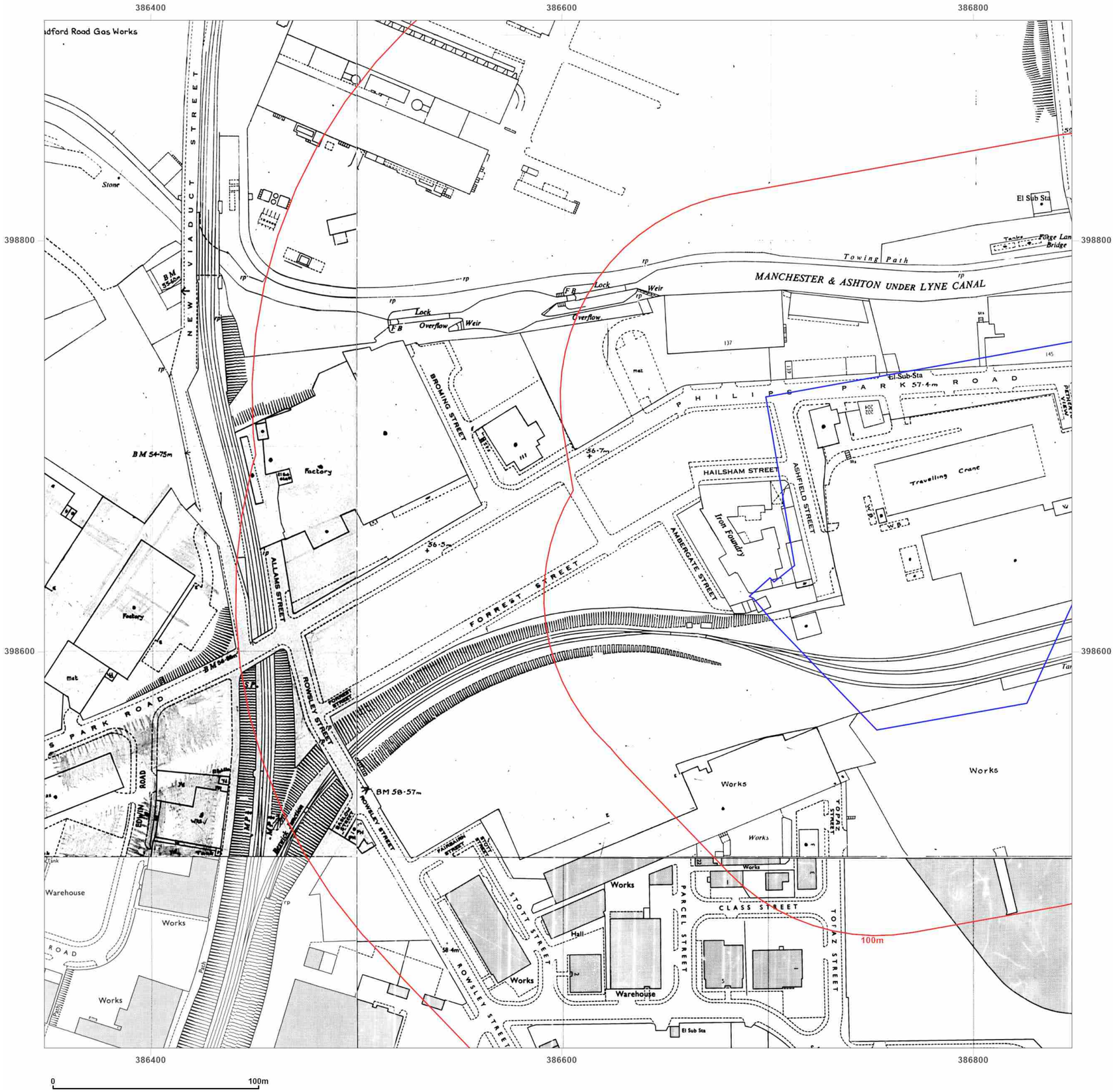
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid
Map date: **1978-1980**
Scale: 1:1,250
Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright 1979 Levelled 1964		Surveyed N/A Revised N/A Edition N/A Copyright 1979 Levelled 1964
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Site Details:

386784 398665

Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1983-1987**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1964 Revised 1986 Edition N/A Copyright 1986 Levelled 1964		Surveyed 1966 Revised 1987 Edition N/A Copyright 1987 Levelled 1966
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1987-1992**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1948 Revised 1988 Edition N/A Copyright 1989 Levelled 1964		Surveyed 1991 Revised 1991 Edition N/A Copyright 1991 Levelled N/A
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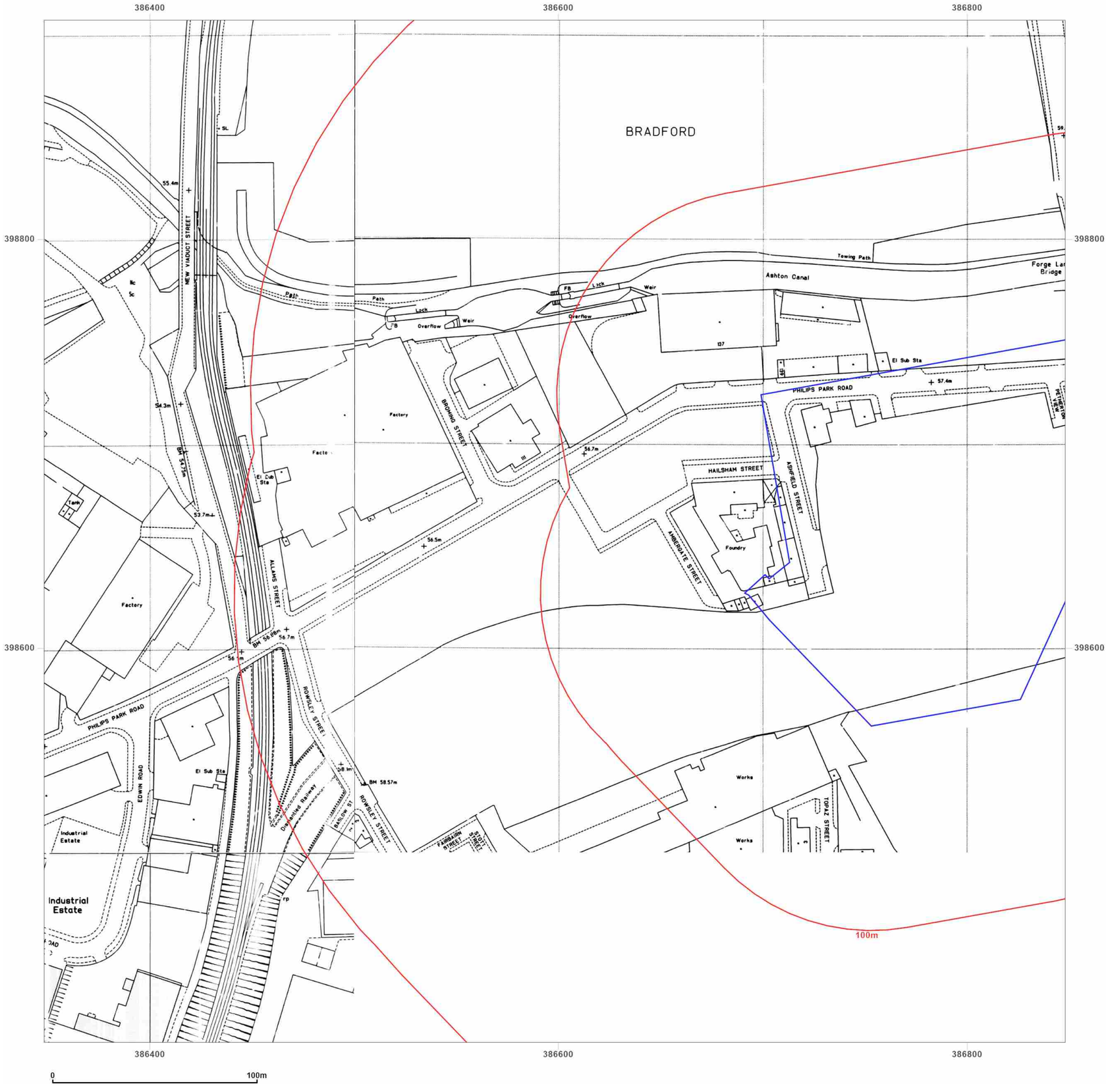
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1988-1992**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A		Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1993-1995**

Scale: 1:1,250

Printed at: 1:2,000

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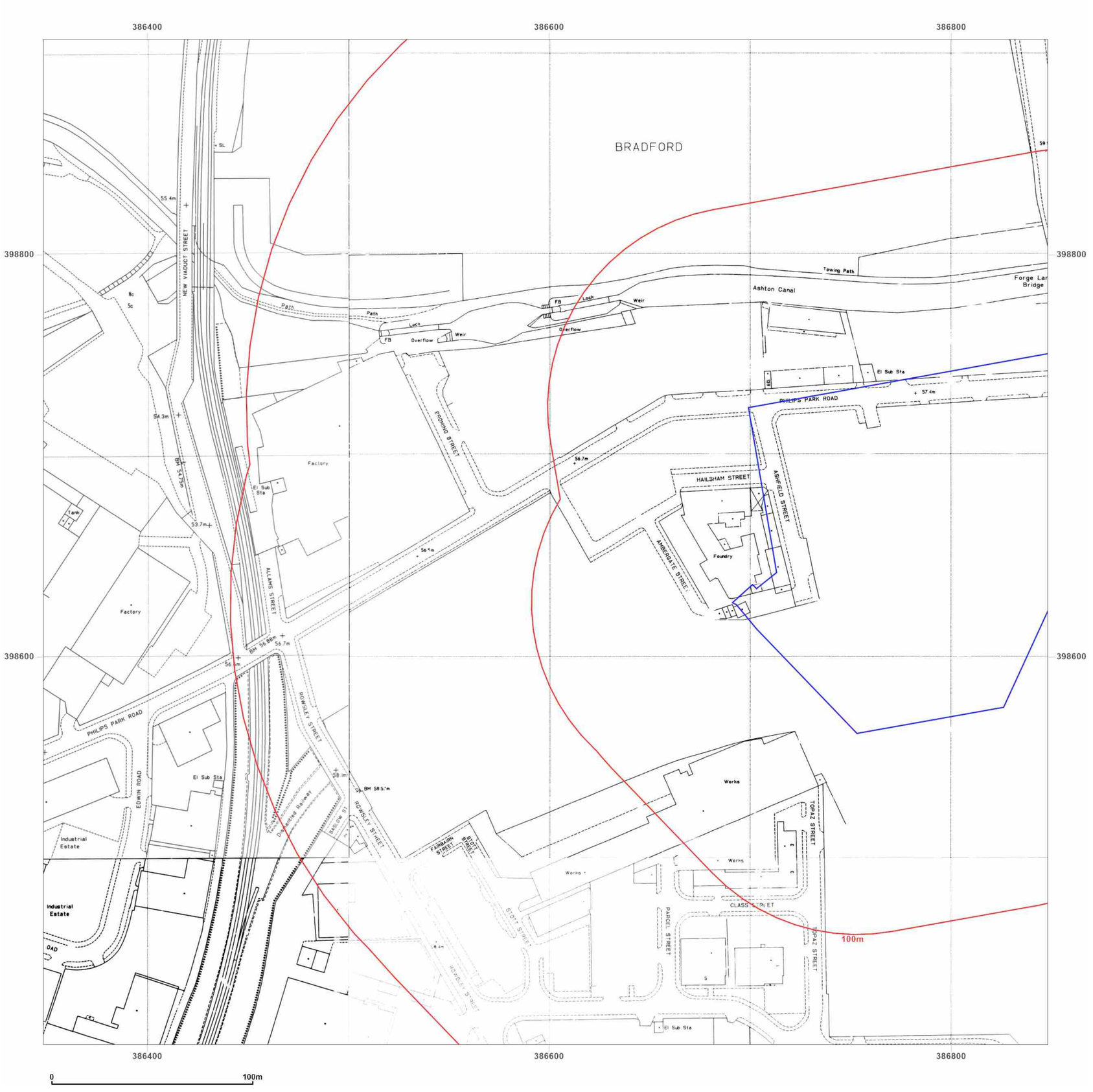
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_1_1
Grid Ref: 386598, 398657

Map Name: National Grid

Map date: **1992-1995**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A		Surveyed 1995 Revised 1995 Edition N/A Copyright 1995 Levelled N/A
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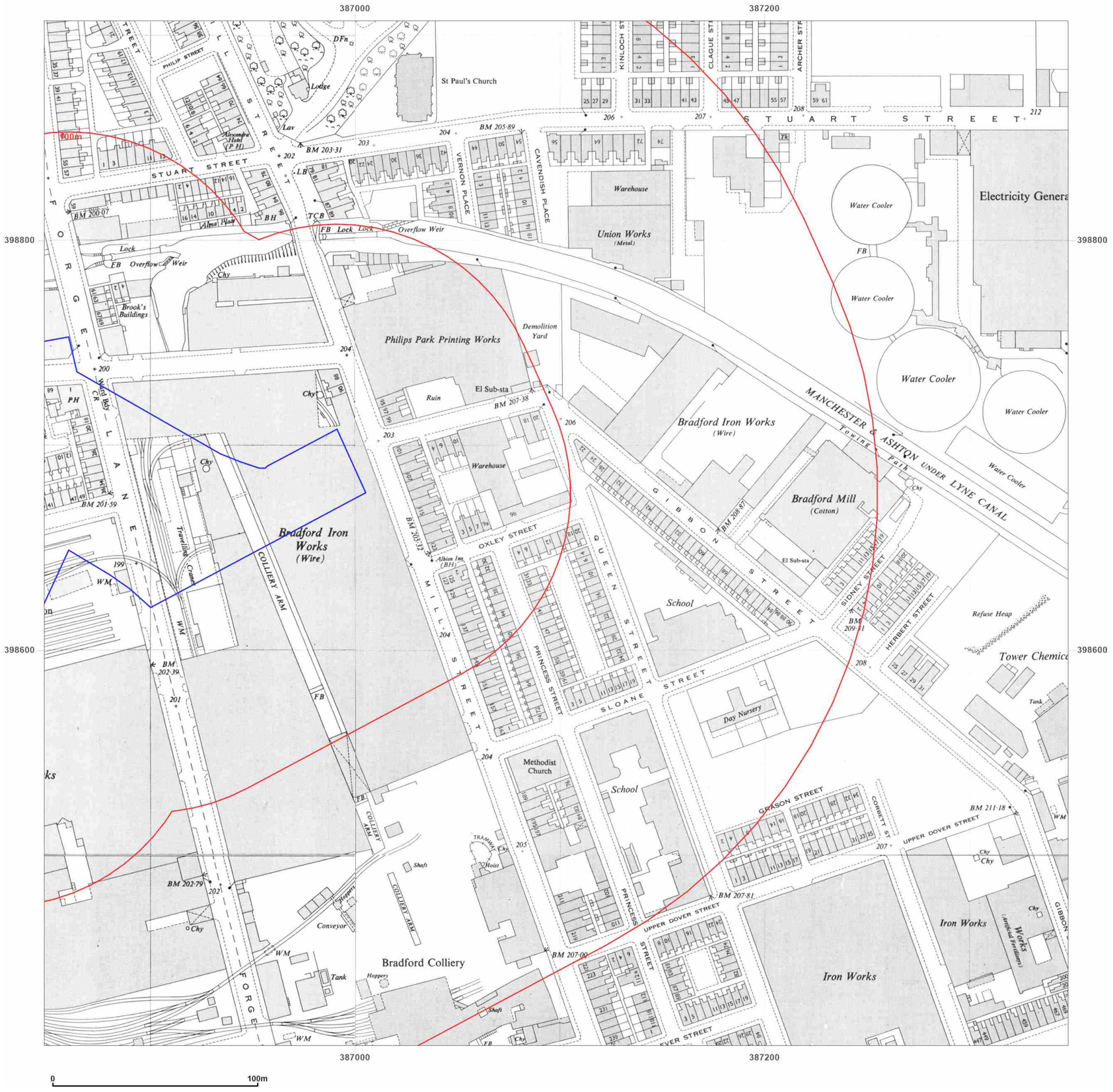
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1948-1949**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1948 Revised 1948 Edition N/A Copyright 1948 Levelled 1929		Surveyed 1949 Revised 1949 Edition N/A Copyright 1949 Levelled 1949
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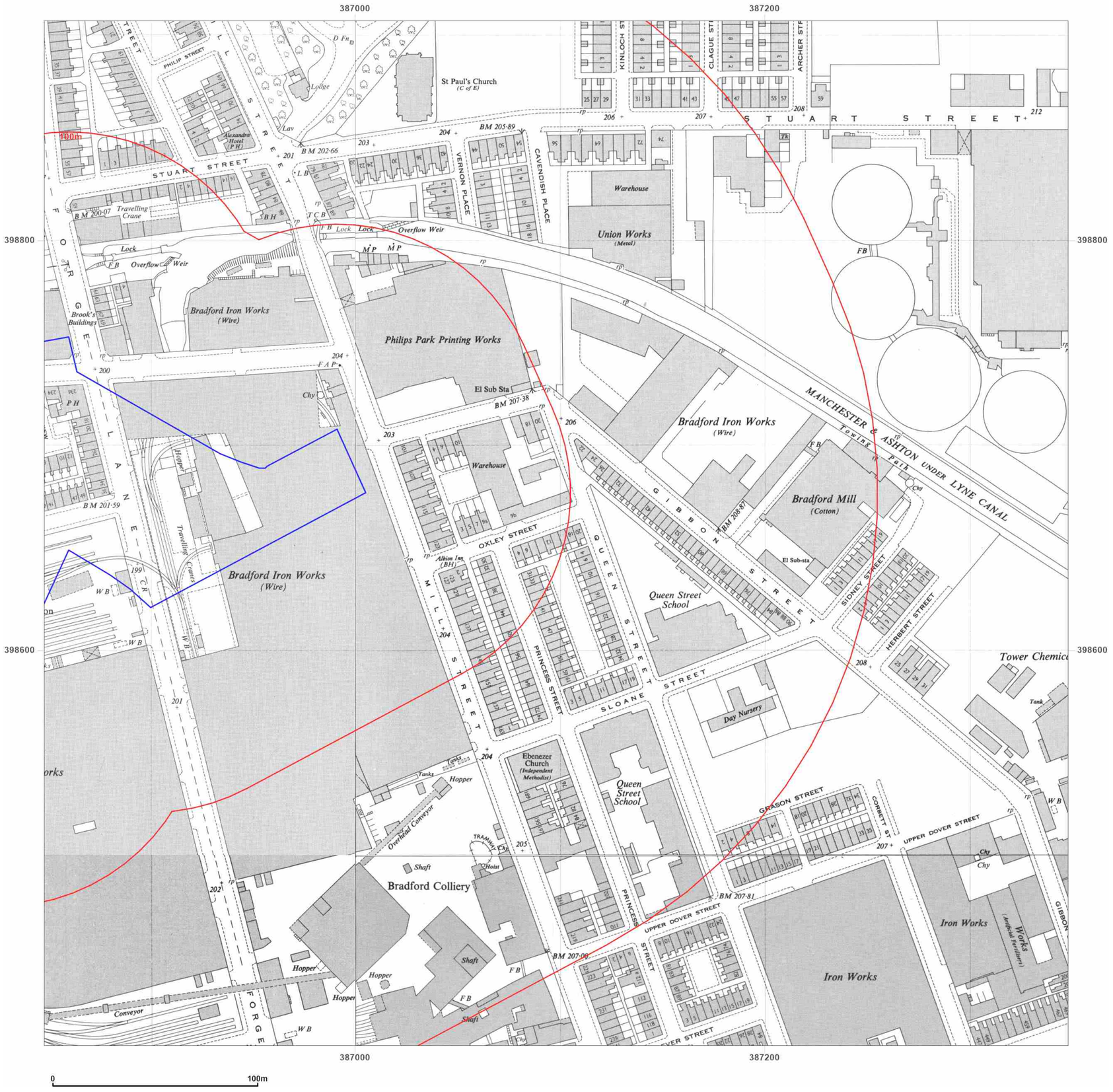
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1953-1956**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1955 Revised 1955 Edition N/A Copyright 1955 Levelled 1949		Surveyed 1948 Revised 1953 Edition N/A Copyright 1953 Levelled 1949
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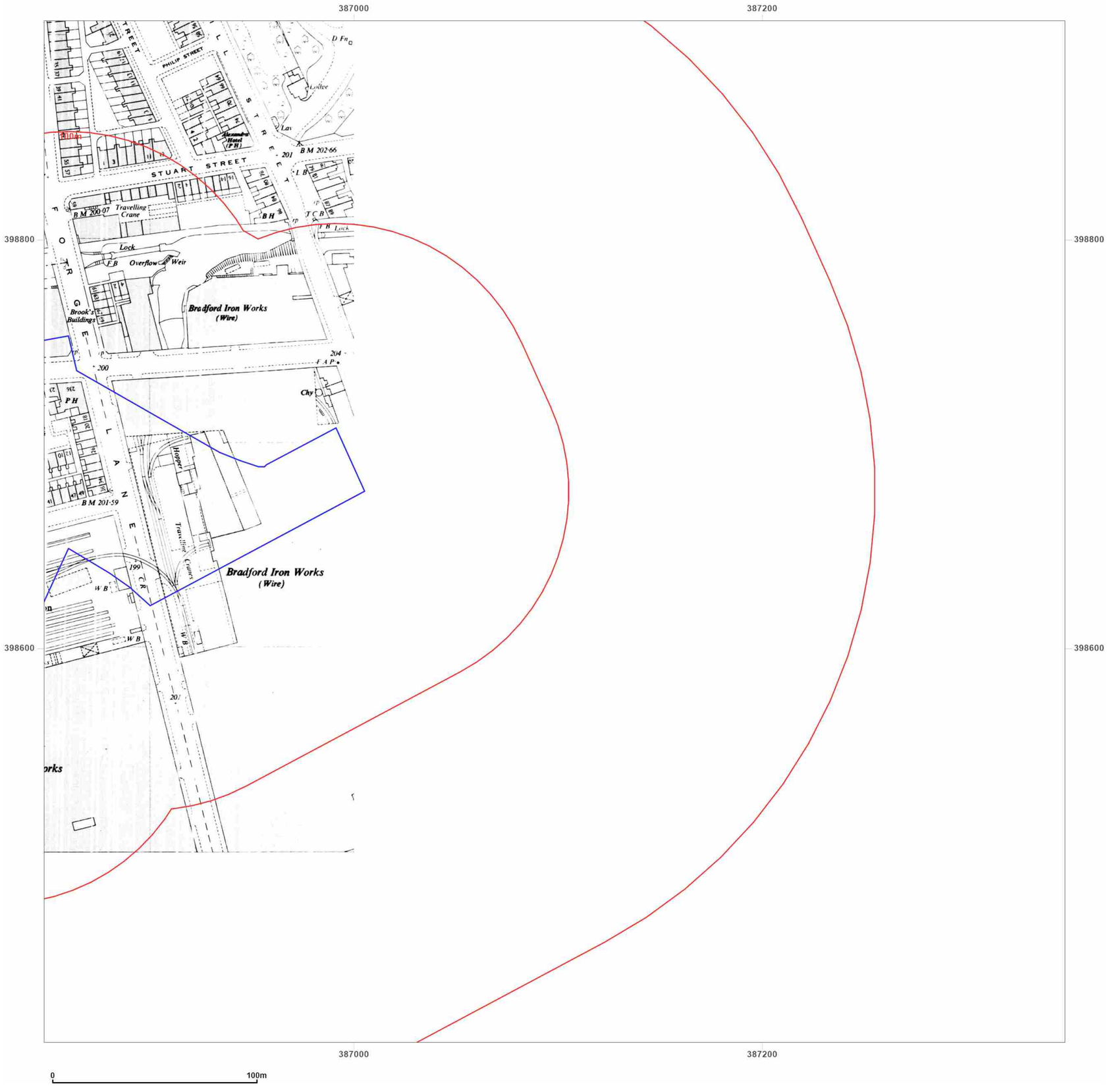
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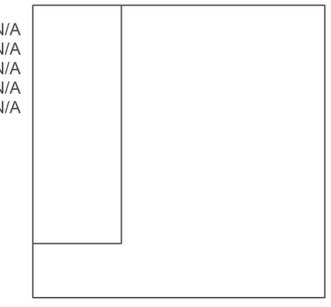
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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid
Map date: **1956**
Scale: 1:1,250
Printed at: 1:2,000

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



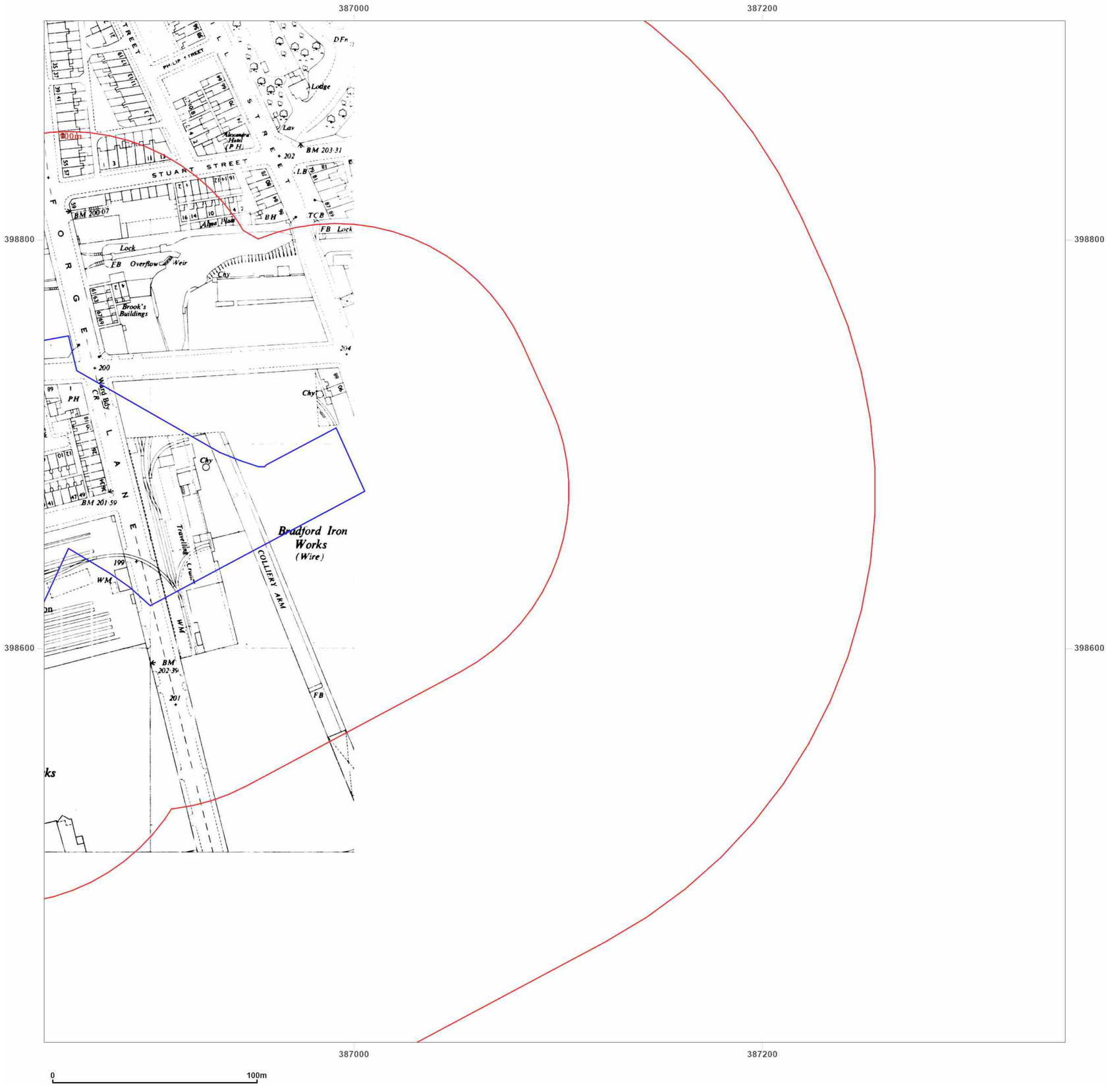
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Site Details:

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Report Ref: GS-9323376_1250_2_1
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Map Name: National Grid

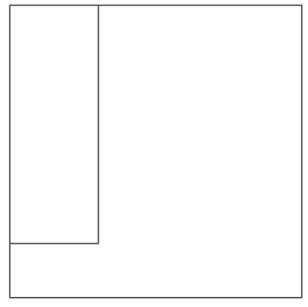
Map date: **1956**

Scale: 1:1,250

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



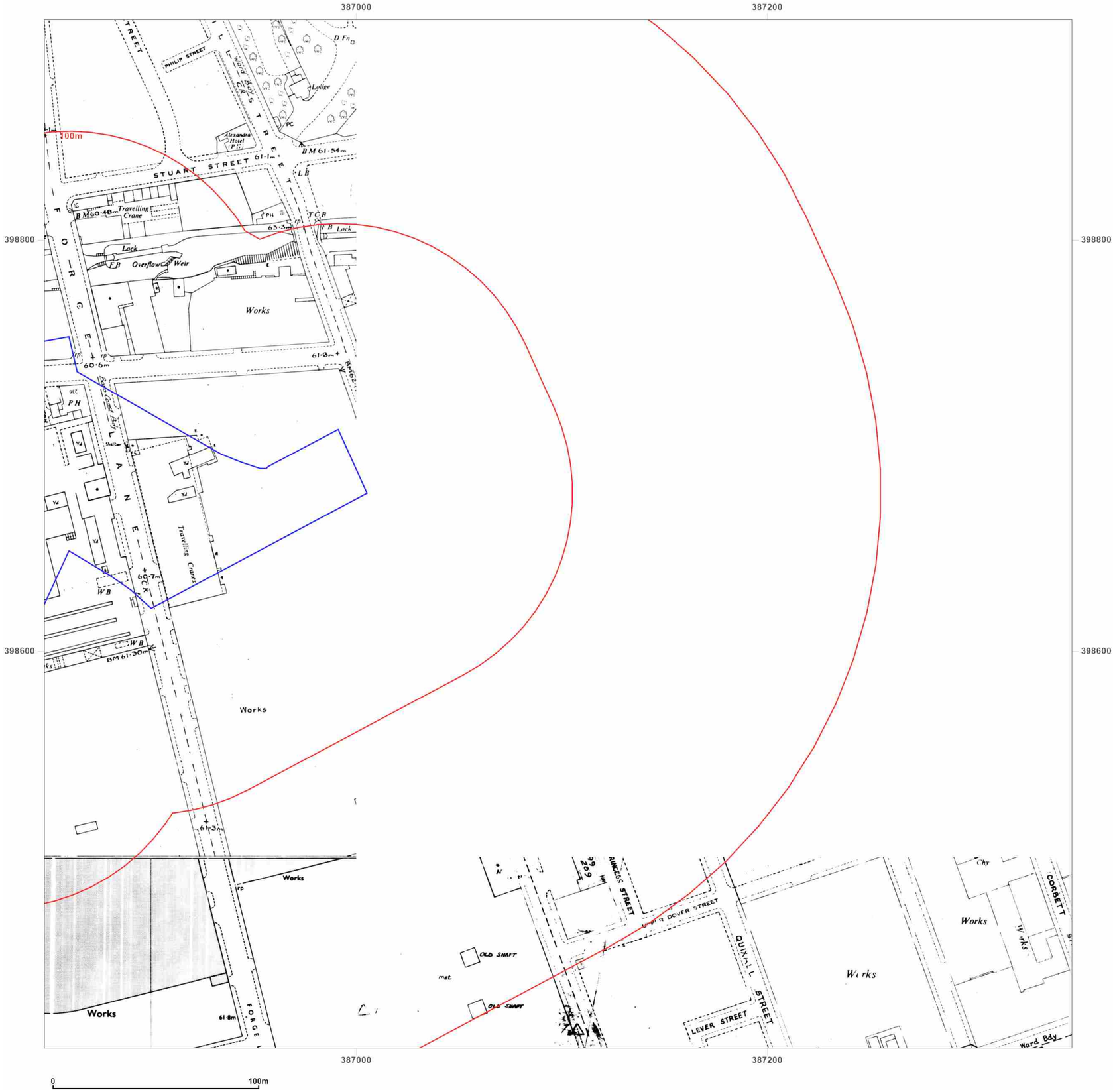
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1977-1979**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed N/A Revised N/A Edition N/A Copyright 1979 Levelled 1964		
Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A		Surveyed N/A Revised N/A Edition N/A Copyright N/A Levelled N/A

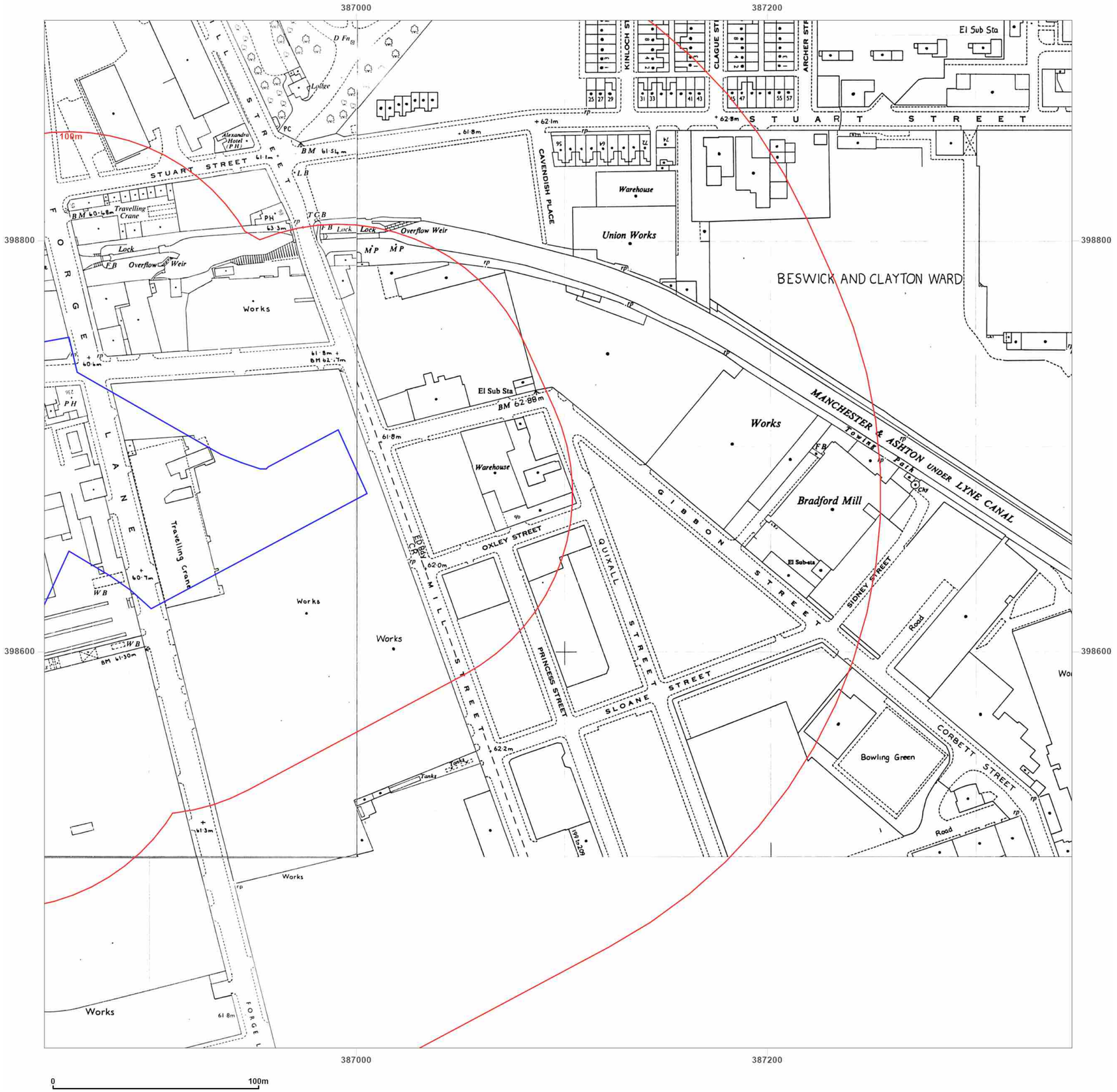
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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1983-1987**

Scale: 1:1,250

Printed at: 1:2,000

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Surveyed 1966 Revised 1987 Edition N/A Copyright 1987 Levelled 1966		Surveyed 1964 Revised 1985 Edition N/A Copyright 1985 Levelled 1964
Surveyed 1963 Revised 1983 Edition N/A Copyright 1983 Levelled 1963		

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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1989-1992**

Scale: 1:1,250

Printed at: 1:2,000

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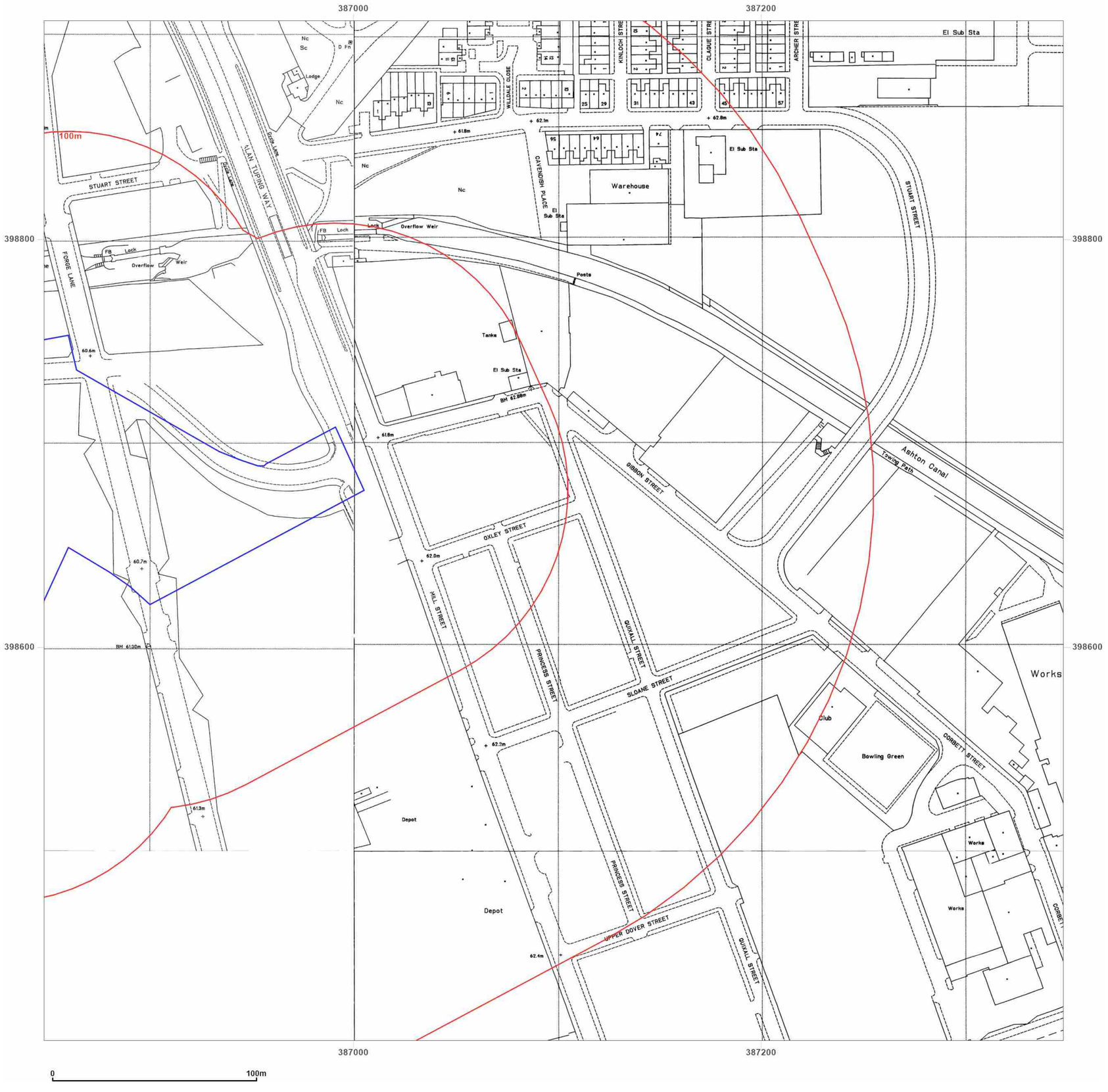
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1994-1995**

Scale: 1:1,250

Printed at: 1:2,000

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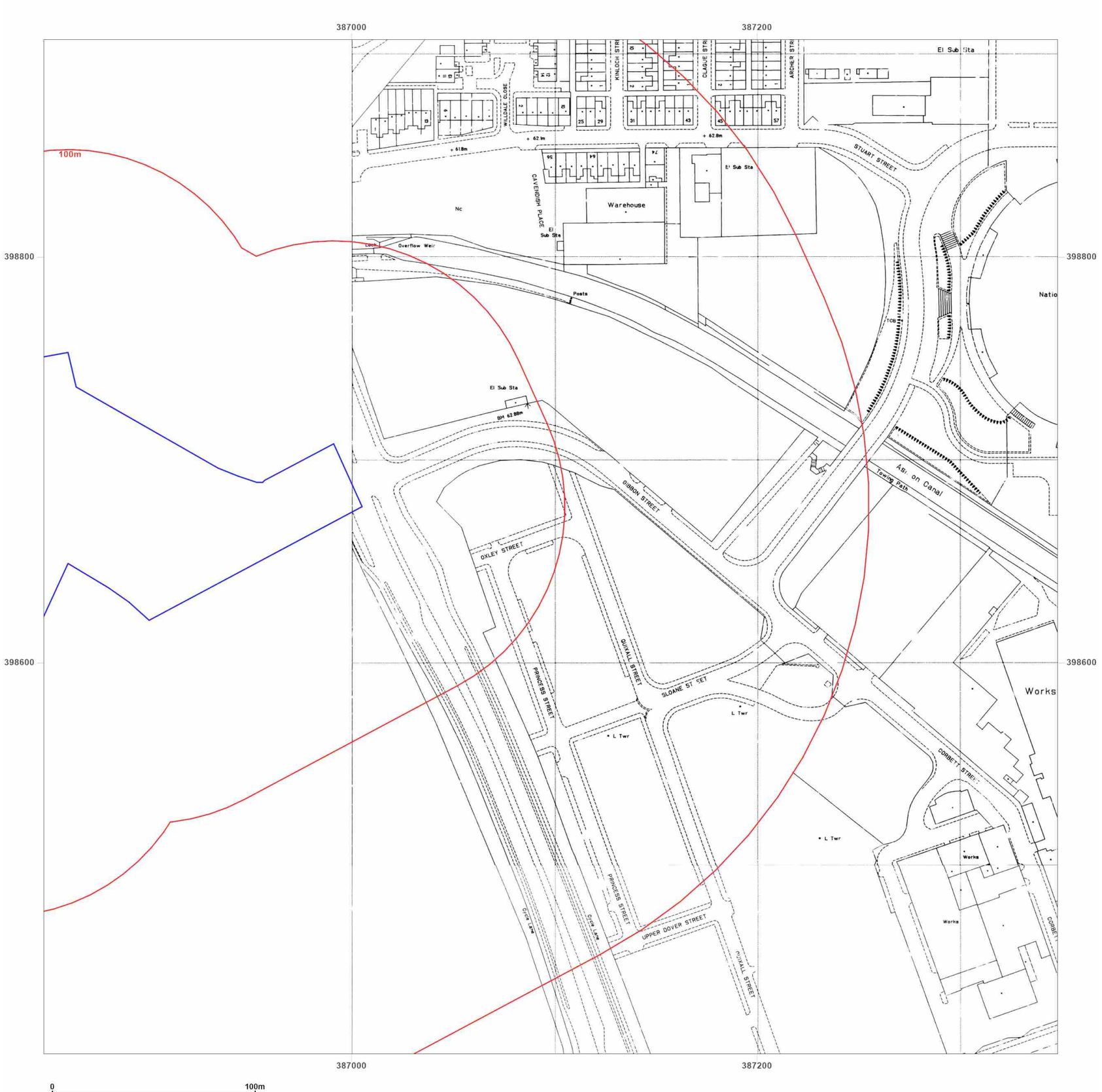
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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_1250_2_1
Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1995**

Scale: 1:1,250

Printed at: 1:2,000

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

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

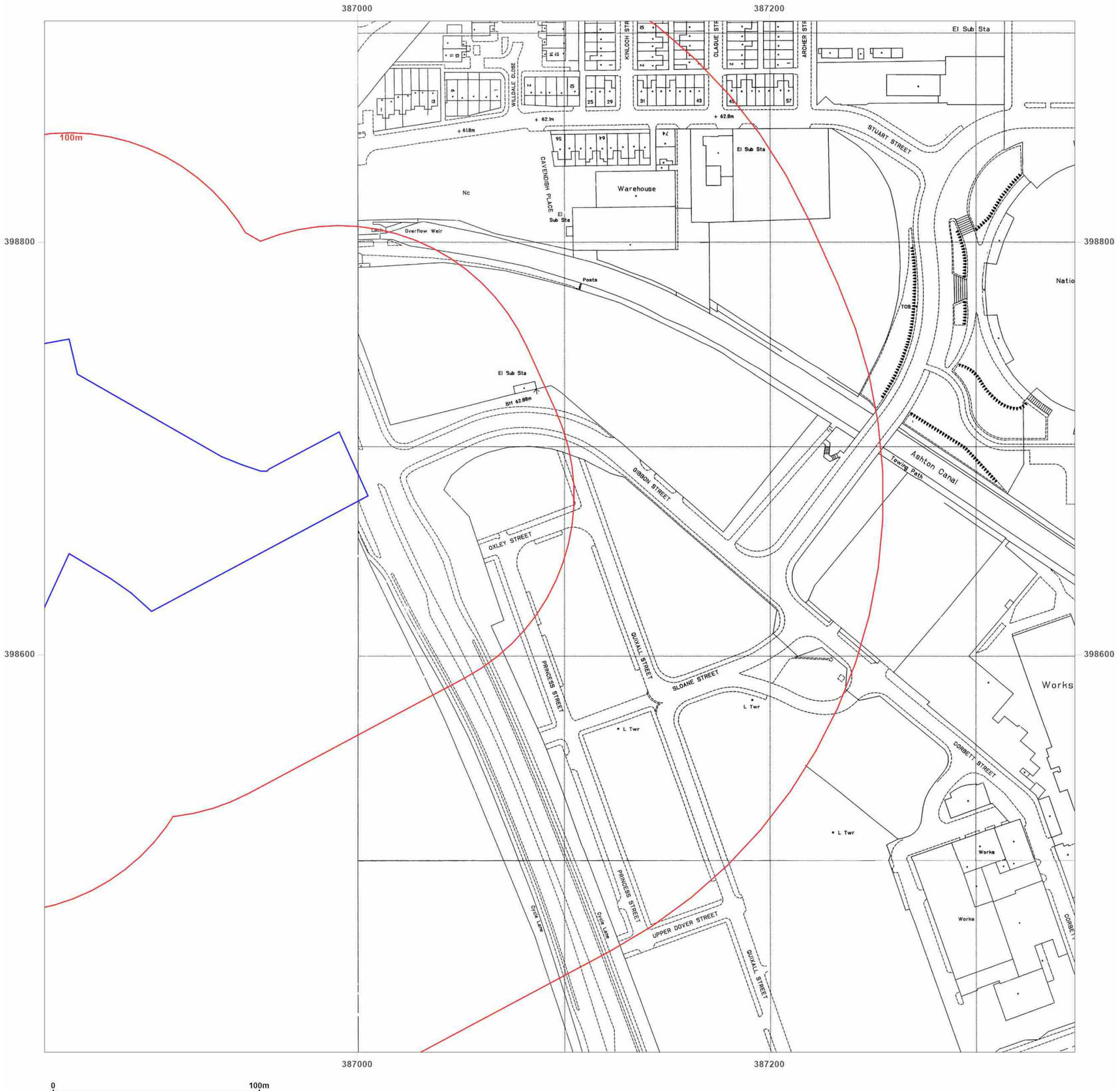
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Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1995**

Scale: 1:1,250

Printed at: 1:2,000

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Revised 1995
Edition N/A
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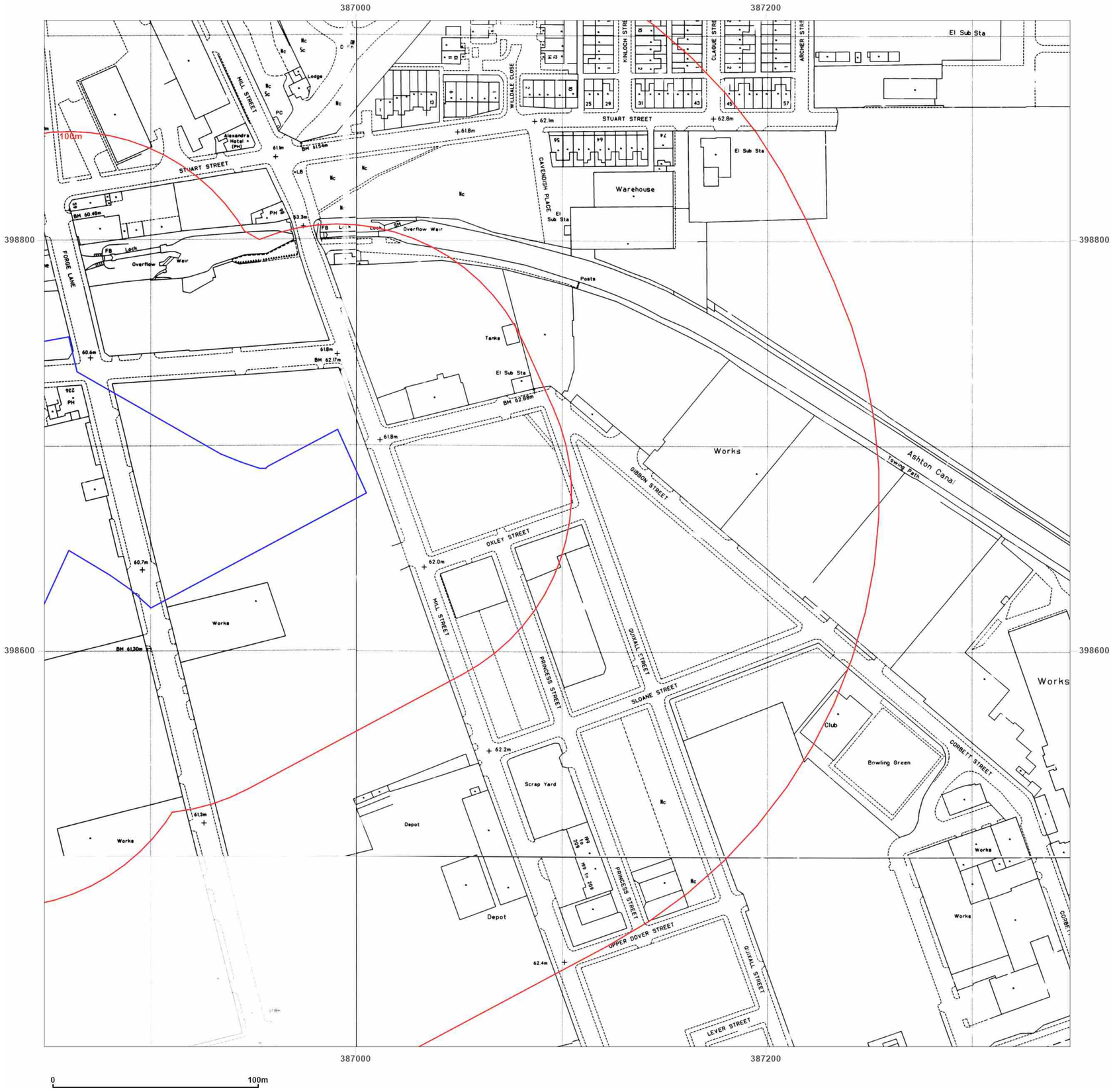
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Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1992-1995**

Scale: 1:1,250

Printed at: 1:2,000

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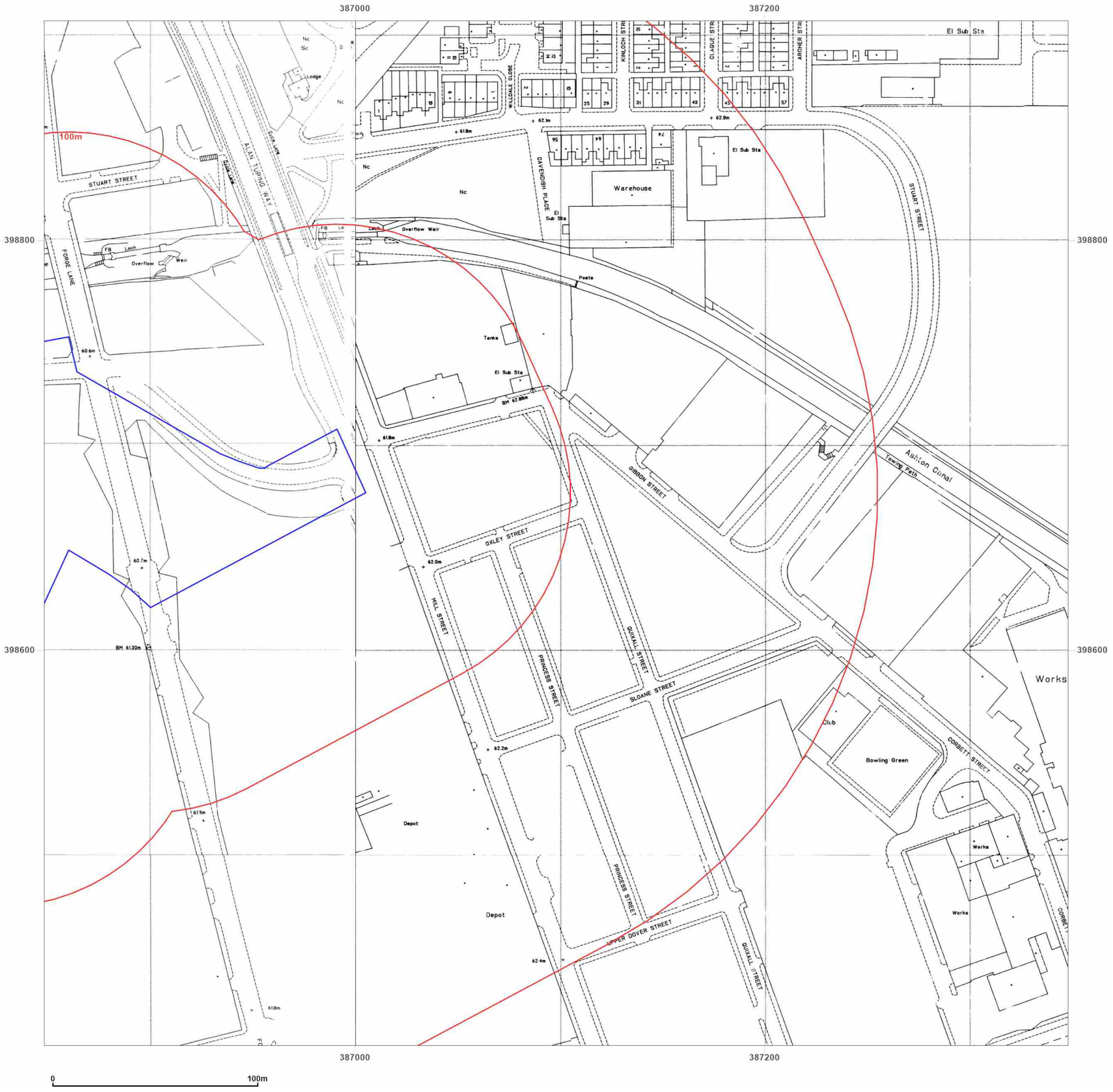
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Grid Ref: 387098, 398657

Map Name: National Grid

Map date: **1994-1995**

Scale: 1:1,250

Printed at: 1:2,000

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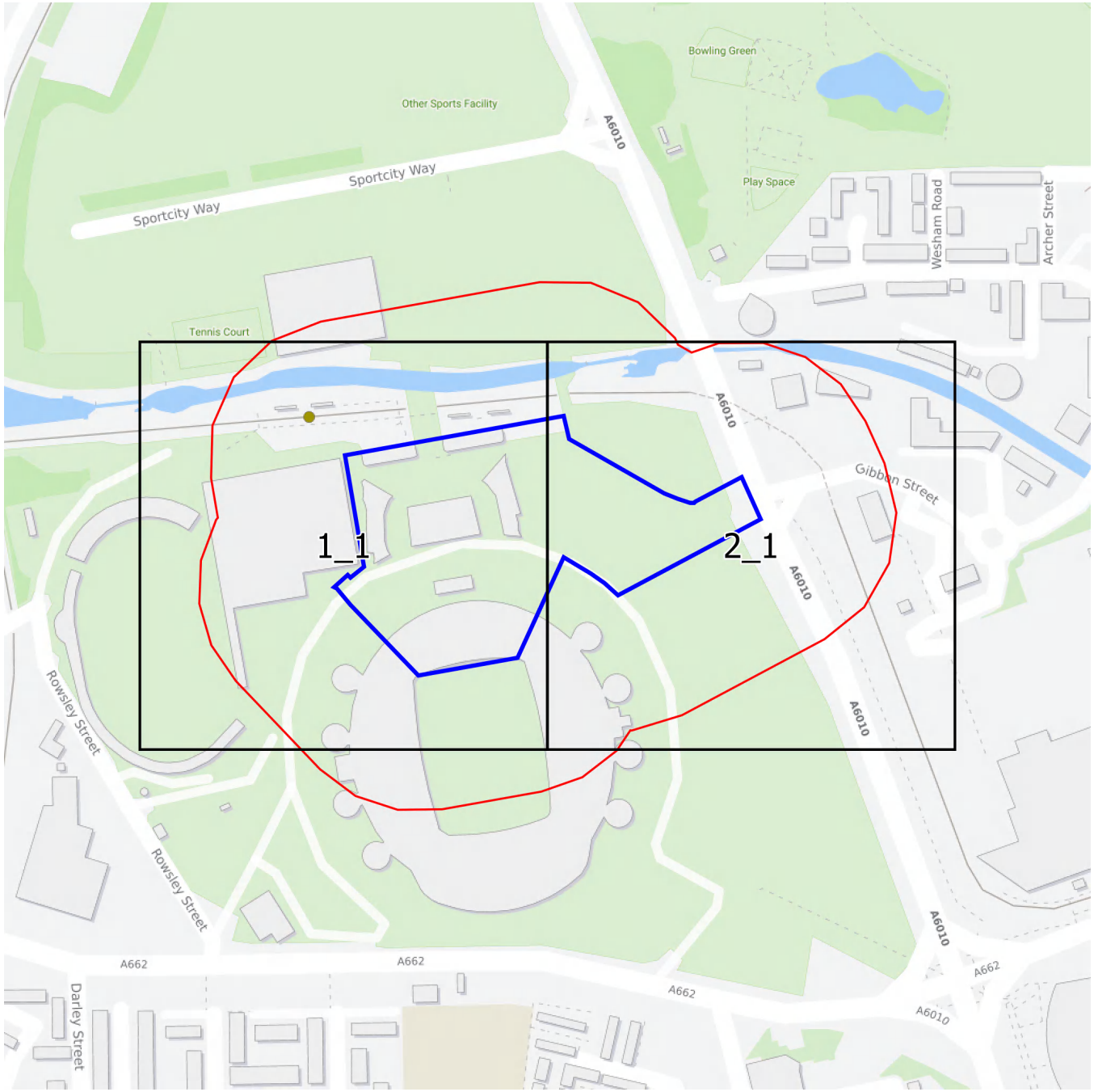
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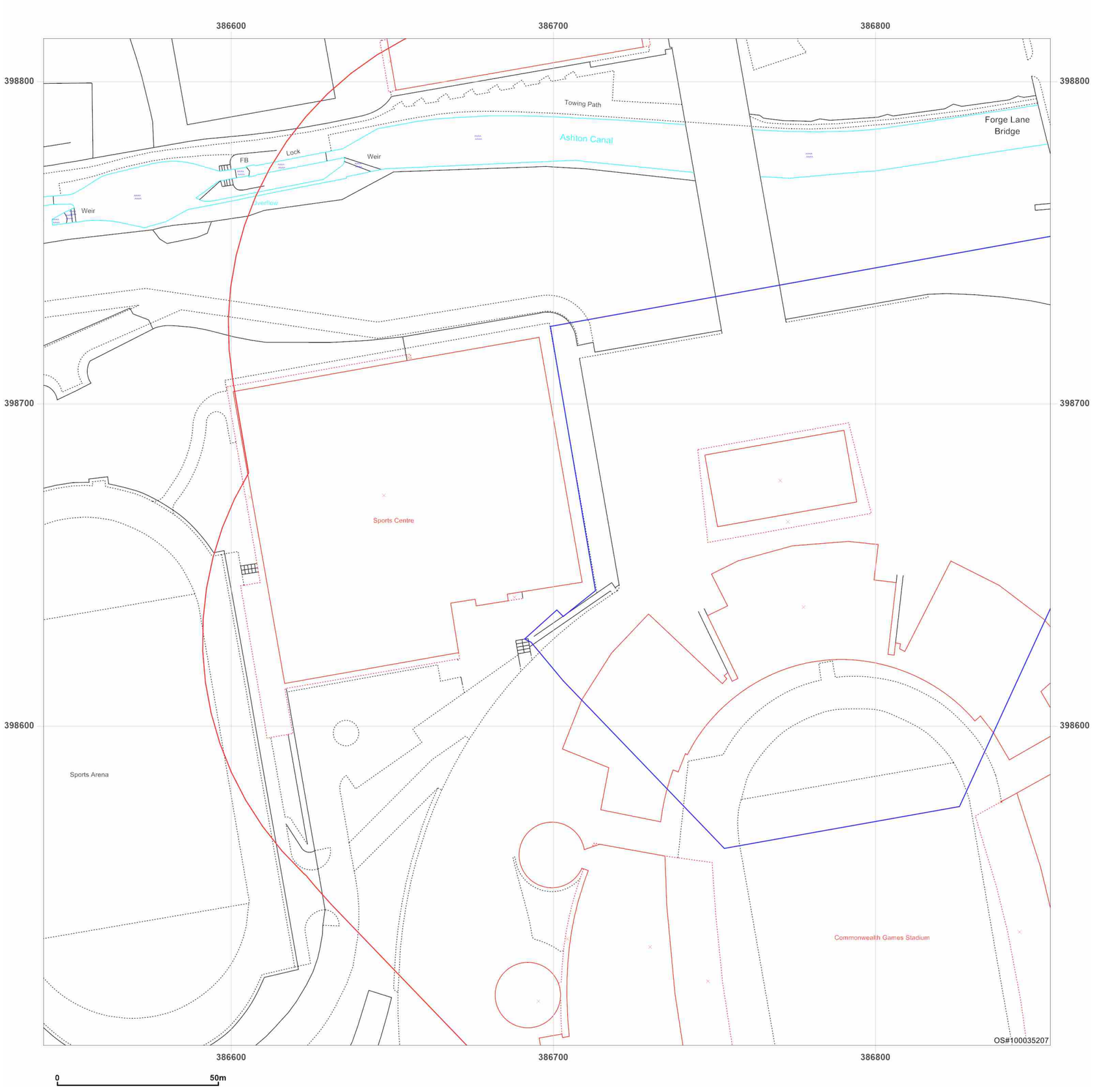
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Groundsure INSIGHTS

Landline Scale Grid Index





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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_Landline_1_1
Grid Ref: 386698, 398657

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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2003

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Site Details:

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Client Ref: 0053810_2006_FG_Main_Application
Report Ref: GS-9323376_Landline_2_1
Grid Ref: 386998, 398657

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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2003

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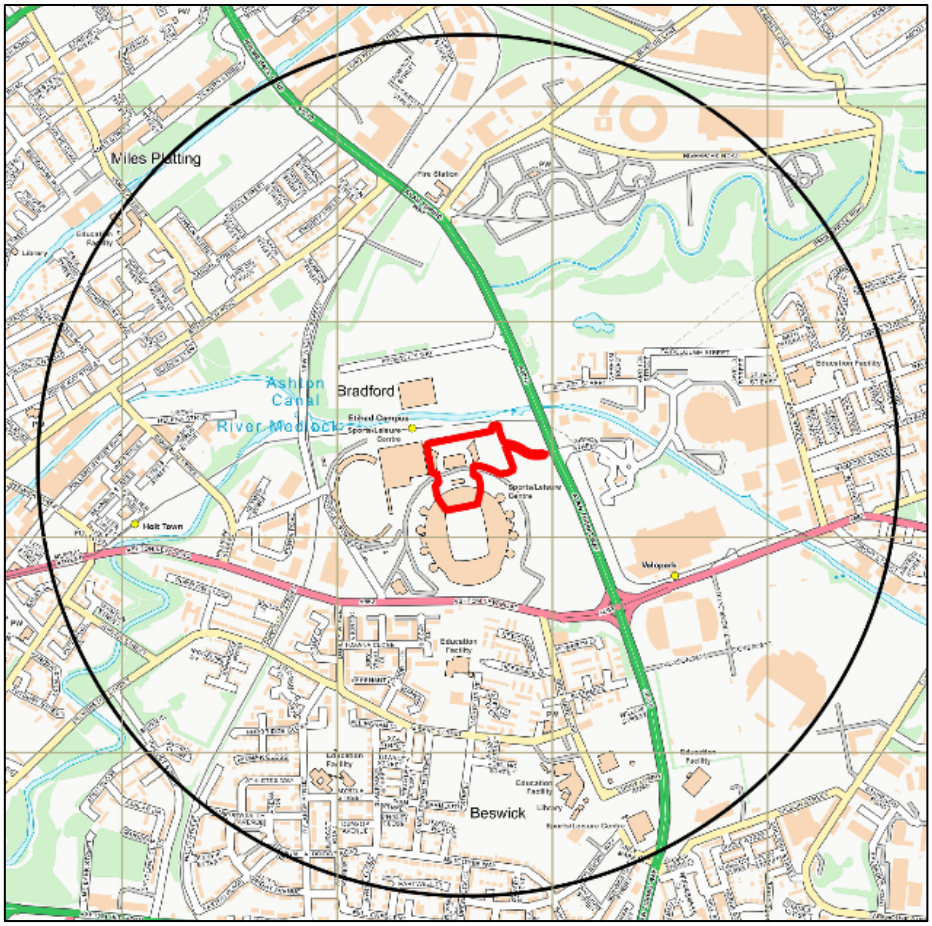
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Appendix C Detailed UXO Assessment (6 Alpha Associates)

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Detailed Unexploded Ordnance (UXO) Threat & Risk Assessment

Meeting the requirements of *CIRIA* C681 'Unexploded Ordnance (UXO) A Guide for the Construction Industry' Risk Management Framework



PROJECT NUMBER	10147	**ORIGINATOR**	R. Taylor
PROJECT	MCFC North Stand	**REVIEWED BY**	B. Wilkinson
CLIENT	City Football Group	**RELEASED BY**	L. Gregory
VERSION	1.0	**DATE**	25th October 2022
UXO RISK RATING	**LOW – This Study Site requires no further action.**		

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Acronyms and Abbreviations

AA	Anti-Aircraft
AAA	Anti-Aircraft Ammunition
ALARP	As Low As Reasonably Practicable
AOD	Above Ordnance Datum
ARP	Air Raid Precaution
AXO	Abandoned Explosive Ordnance
BD	Bomb Disposal
BDO	Bomb Disposal Officer
bgl	Below Ground Level
BGS	British Geological Survey
BH	Borehole
BPD	Bomb Penetration Depth
CDP	Cast Driven Piles
CFA	Continuous Flight Auger
CIRIA	Construction Industry Research and Information Association
CPT	Cone Penetration Testing
CS	County Series
EO	Explosive Ordnance
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
GI	Ground Investigation
GIS	Geographic Information Systems
GL	Ground Level
GP	General Purpose
GPS	Global Positioning Systems
HAA	Heavy Anti-Aircraft
HE	High Explosive
HO	Home Office
HSE	Health and Safety Executive
IB	Incendiary Bomb
kg	Kilograms
km	Kilometres
LAA	Light Anti-Aircraft
LCC	London County Council
LE	Low Explosive
LSA	Land Service Ammunition
m	Metres
MoD	Ministry of Defence
mm	Millimetres
NEQ	Net Explosive Quantity
NFF	National Filling Factory
NGR	National Grid Reference
OD	Ordnance Datum
OS	Ordnance Survey
PM	Parachute Mine
PoW	Prisoner of War
RADAR	Radio Detection And Ranging
RAF	Royal Air Force
RN	Royal Navy
RNAS	Royal Naval Air Service
ROF	Royal Ordnance Factory
SAA	Small Arms Ammunition
TA	Territorial Army
TNT	Trinitrotoluene
UK	United Kingdom
UN	United Nations
USAAF	United States Army Air Force
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
V Weapons	*Vergeltungswaffen* – Vengeance Weapons
WD	War Department
WWI	World War One
WWII	World War Two

EXECUTIVE SUMMARY

Study Site

The Client has defined the Study Site as "MCFC North Stand, Etihad Stadium, Manchester" and it is centred on NGR 386804, 398666.

Risk Level

LOW

Potential Threat Sources

Extensive research of relevant historical sources and records has not identified evidence of a direct UXO contamination threat at this Study Site. However, *German* aerially delivered ordnance and *British* AAA projectiles may pose a low-level background threat.

Risk Pathway

Whilst there is a residual UXO risk within this Study Site, *6 Alpha* do not believe that the proposed intrusive works will generate a significant risk pathway.

Key Findings

During WWII, the Study Site was situated within *Manchester County Borough,* which recorded six HE bomb strikes per 100ha, a "very low" level of bombing.

Luftwaffe aerial reconnaissance photography associated with the Study Site the *Bradford Iron Works* (located on-site) as a primary bombing target. Nine further bombing targets were recorded within 1,000m of the Site.

ARP records associated with the Study Site did not note any HE bomb strikes within it. Nonetheless, five were recorded within 870m; the closes being 590m to the north-east. Further research also identified that one parachute mine was dropped on *Phillips Park Road* (located 40m north of the Study Site boundary at its closest point) during WWII.

Official bomb damage mapping and written bomb damage records, combined with further supplementary research, did not identify any bomb damage on-site, nonetheless, bomb damage was recorded in the Study Site's wider area. Specifically, *"Demolished buildings"* were documented 200m to the west, 200m to the south-west and 350m to the south-west. In addition, structures *"Demolished by Bomb"* were recorded on and around *Hillkirk Street* and *Palmerstone Road,* located approximately 500m south-west of the Site at their closets point. Furthermore, a supplementary analysis of post-war mapping identified a *"Ruin"* 80m north-east of the Study Site, which is likely to be indicative of bomb damage given the parachute mine detonation documented in that area.

Pre-WWII mapping (1938) and post-WWII OS mapping (1949) shows that the Study Site was located within a densely developed urban/industrial area during WWII; the Study Site itself consisted of residential properties in the north and industrial facilities and railway lines in the south. Therefore, it is likely that footfall within the Study Site would have been relatively high and as a result, a resident or employee would have observed and reported any UXB entry holes within the Study Site, which would have been dealt with at the time.

The Site has undergone significant post-WWII development in some areas, especially pertaining to construction and subsequent demolition of structures associated with *Bradford Iron Works,* and the more recent construction of the *Etihad Stadium*. Consequently, it is considered likely that any UXO within post-war disturbed and developed ground would potentially have been discovered and removed. However, any UXO contamination present in previously undisturbed ground is likely to remain.

Given that there is no evidence to suggest that a UXO contamination threat is likely to have been generated at the Study Site, *6 Alpha* do not believe that a viable UXO risk pathway exists at this Study Site. Therefore, the UXO risk to the proposed intrusive operations at the Study Site is already considered to be reduced ALARP, without the need for further proactive and/or reactive UXO risk mitigation measures.

EXECUTIVE SUMMARY (…continued)

Recommended Risk Mitigation Measures Overview

No further action is recommended at this Study Site.

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ASSESSMENT METHODOLOGY

Approach

6 Alpha Associates (6 Alpha) is an independent, specialist risk management consultancy practice, which has assessed the prospective UXO risk at this Study Site by employing a process advocated by *CIRIA*. The *CIRIA* guide for managing UXO risks in the construction industry (C681) not only represents industry best practice but has also been endorsed by the *UK*'s *HSE*. *6 Alpha* were the lead technical author of the CIRIA C681 guide.

UXO hazards can be identified through the investigation of local and national archives associated with the Study Site, *MoD* archives, local historical sources, historical mapping as well as contemporary aerial photography (where it is available). The amalgamation of information is then assessed within a Semi-Quantitative Risk Assessment (as per industry best practice outlined in CIRIA C681) in order to form the basis of a proportional UXO risk mitigation strategy in circumstances where the SQRA evidences that further action is necessary in order to reduce the UXO risk at the Study Site.

The assessment of UXO risk is a measure of the probability of UXO encounter and initiation and the consequence of an inadvertent UXO initiation; the former being a function of the identified hazard and proposed development methodology and the latter being a function of the type of hazard and the proximity of personnel (and/or other 'sensitive receptors', such as equipment) to the hazard. UXO risk is thus calculated using the following formula:

Risk (R) = Probability (P) x Consequence (C)

If intolerable UXO risks are identified, the methods of mitigation we have recommended are considered reasonable and sufficiently robust to reduce them to ALARP. We advocate the adoption of the ALARP legal principle because it is a key factor in efficiently and effectively ameliorating UXO risks. It also provides a ready means for assessing the Client's tolerability of UXO risk. In essence, the principle states that if the cost of reducing a risk significantly outweighs the benefit, then the risk may be considered tolerable. This does not mean that there is never a requirement for UXO risk mitigation, but that any mitigation must demonstrate that it is beneficial. Any additional mitigation that delivers diminishing benefits and that consume disproportionate time, money and effort are considered *de minimis* and thus unnecessary. Because of this principle, UXO risks will rarely be reduced to zero (nor need they be).

Important Notes

Although this report is up to date and accurate at the time of writing, *6 Alpha's* UXO threat databases are continually being populated and updated as and when additional information becomes available. Nonetheless, *6 Alpha* have exercised all reasonable care, skill and due diligence in providing this service and producing this report.

The assessment levels are also based upon our professional opinion and have been supported by our interpretation of historical records and third-party data sources. Wherever possible, *6 Alpha* has sought to corroborate and to verify the accuracy of all data we have employed, but we are not accountable for any inherent errors that may be contained in third party data sets (e.g., *National Archive* or other library sources), and over which *6 Alpha* cannot exercise control.

STAGE ONE – STUDY SITE LOCATION AND DESCRIPTION

Study Site

The Client has defined the Study Site as "MCFC North Stand, Etihad Stadium, Manchester". The Study Site is centred at NGR 386804, 398666 as presented at *Figures 1* and *2,* respectively.

Location Description

The Study Site is situated within the *City of Manchester* and totals an area of 2.3ha. Furthermore, the Study Site is bounded by:

- North: areas of hard standing and undeveloped land*;*
- East: *Etihad Stadium, Alan Turning Way* and areas of hard standing*;*
- South: *Etihad Stadium;*
- West: *Etihad Stadium,* multiple structures and areas of hard standing.

Aerial Photography (2021) (*Figure 3*)

Current aerial photography corroborates the information above and shows that the Study Site is situated within a densely developed urban area. The Study Site itself consists of the north stand of the *Etihad Stadium* and structures associated with the club shop. Areas of hard standing are also present throughout areas of the Site.

Proposed Works

The Client has described the following design scheme:

"North stand extension which will include a piled foundation solution, 2x commercial buildings (hotel and office), no basements proposed."

Ground Conditions – General Overview

It is important to establish the specific ground conditions in order to determine the maximum *German* UXB penetration depth as well as the potential for other types of munitions to be buried. The Client has provided the document "GS-9076723.pdf" which described that the Site is underlain by made ground *comprised of "Artificial Deposits"*. It is important to establish the provenance of made ground, where this is recorded as being part of the ground make-up, in order to accurately determine the ground levels at the time when UXO contamination may have occurred so as to accurately determine the average/maximum bomb penetration depths and subsequently to make appropriate recommendations aimed at reducing the risk to ALARP.

Below the made ground, the site is underlain by superficial geological deposits of "*Till, Devensian (Diamicton)"* and a bedrock of*"Pennine Upper Coal Measures Formation – Mudstone, Siltstone and Sandstone".*

Ground Conditions – Site Specific *BGS* borehole log "SJ89NE1414 – Manchester Stadium Phase 1 AO5" (located in the Study Site's central sector), recorded the following strata:		
Depth bgl (m)	Strata	Description
0.00m to 2.20m	Made ground	Brown slightly clayey fine to coarse sand and fine to coarse gravel
2.20m to 4.95m	Clay	Firm brown and grey thinly laminated fissured slightly sandy clay with gravel
4.95m to 9.75m	Clay	Firm to stiff brown thinly laminated fissured sandy clay with gravel
9.75m to 13.70m	Clay	Firm to stiff brown thinly laminated fissured sandy clay with gravel
13.70m to 14.15m	Mudstone	Grey thinly laminated moderately weathered mudstone very weak
14.15m to 14.85m	Mudstone	Light grey to brown moderately weathered very silty mudstone
14.85m to 15.38m	Mudstone	Dark grey, black highly weathered silty mudstone, very weak with
15.38m to 15.80m	Coal	Black coal completely fractured with occasional black carbonaceous mudstone fragments
15.80m to 18.00m	Mudstone	Light grey to brown weathered silty mudstone

STAGE TWO – REVIEW OF HISTORICAL DATASETS

Sources of Information Consulted

The following information sources have been employed to establish the nature and scope of the UXO threat at this Study Site:

1. *6 Alpha*'s *Azimuth* Database;
2. *Home Office* WWII Bomb Census maps;
3. WWII and post-WWII aerial photography;
4. Official Abandoned Bomb Register;
5. Information gathered from the *National Archives* at *Kew*;
6. Historic UXO information provided by *33 Engineer Regiment* (Explosive Ordnance Disposal) at *Carver Barracks, Wimbish*.

Potential Sources of UXO Contamination - Overview

In general, there are several activities that might have contaminated a site with UXO, but the three most common ways are: legacy munitions from military training/exercises; deliberate or accidental dumping (AXO) and ordnance resulting from war fighting activities (also known as the Explosive Remnants of War (ERW)).

During WWII, the *Luftwaffe* undertook bombing campaigns all over the *UK* and although the *Luftwaffe* had designated primary bombing targets across the *UK*, their high-altitude night bombing was not highly accurate. There was also a period of indiscriminate bombing of civilian and industrial areas alike in *British* cities in an attempt to cripple the morale of the *British* people. As a result, thousands of buildings were damaged across industrial and residential areas and civilian fatalities were common. Bombs were also jettisoned over opportunistic targets and more rural locations were also attacked in this manner.

As the threat of invasion lingered over *Britain* during WWII, defensive actions were undertaken. The *British* and *Allied Forces* requisitioned large areas of land for military training and bomb storage (including HE bombs, naval shells, artillery and tank projectiles, explosives, LSA and SAA). Thousands of tonnes of these munitions were used for the *Allied Forces* weapon testing and military training alone. It has been estimated that at least 20 per cent of the *UK*'s land has been used for military training at some point.

The most common type of UXO discovered today in the *UK* is the aerially delivered high explosive (HE) bomb, which are comparatively thick-skinned and were dropped from *Luftwaffe* aircraft. If the bomb did not detonate when it was dropped, the force of impact enabled the UXO to penetrate the ground, often leaving behind it a UXB entry hole. These entry holes were not always apparent, and some went unreported, leaving the bomb buried and unrecorded. *British* AXO/LSA/SAA is also commonly encountered in areas that were formerly occupied by military forces (such as RAF airfields, military camps and/or military training areas). More rarely, additional forms of *German* UXO are occasionally discovered including *inter alia* Incendiary Bombs (IBs), and Anti-personnel (AP) bomblets and fragments of *V1* and *V2* rockets.

"The best practice guide for dealing with your UXO risks on land" (CIRIA publication C681) suggests that approximately 10 per cent of all munitions deployed during WWII failed to function as designed. ERW are therefore, still commonly encountered, especially whist undertaking construction and civil engineering groundwork.

Furthermore, in exceptional circumstances, UXO is discovered unexpectedly and without apparent rational explanation. There are several ways this might occur:

- When *Luftwaffe* aircraft wished to swiftly escape e.g., from an aerial attack, they would jettison some or all of their bombs and flee. This is commonly referred to as *tip and run* and it has resulted in bombs being found in unexpected locations;
- Transportation of aggregate containing munitions to an area that was previously free of UXO, usually related to construction activities employing material dredged from a contaminated offshore borrow site;
- *British* decoy sites were also constructed to deliberately cause incorrect targeting. For obvious reasons, such sites were often built in remote and uninhabited areas – few historical records concerning these sites are available.

WWII Bombing of *Manchester*

Manchester's importance to the *British* war economy as an inland port, industrial centre, and aircraft manufacturer, meant the city and surrounding area represented a significant bombing target for the *Luftwaffe*. The first air raids occurred during August 1940 and continued until 1942.

However, the *Luftwaffe* bombing campaign of *Manchester* peaked between the 22nd and the 24th December 1940 (colloquially known as the *Christmas Blitz*) and involved over 400 aircraft delivering more than 460 tons of HE bombs and 37,000 IBs. Following this raid, approximately 65 warehouses, 200 business premises and 150 offices were destroyed or damaged with the *Manchester Cathedral*, the *Royal Exchange,* and the *Free Trade Hall* among the significant buildings damaged. An estimated 684 people were killed, and a further 2,364 people were injured.

WWII HE Bomb Density (*Figure 4*)

The Study Site was located within *Manchester County Borough,* which recorded six HE bombs per 100 hectares, a "very low" level of bombing.

WWII Luftwaffe Bombing Targets (*Figure 5*)

Prior to WWII, the *Luftwaffe* conducted numerous aerial photographic reconnaissance missions over *Britain*, recording key military, industrial and commercial targets for attack, in the event of war. In addition, logistics infrastructure and public services, such as railways, canals, power stations, reservoirs, water and gas works were also considered viable bombing targets.

Luftwaffe aerial reconnaissance photography associated with the Study Site identified the *Bradford Iron Works* – which was partially located within the south of the Site – as a primary bombing target. A significant concentration of primary bombing targets were also documented in the vicinity of the site; specifically, the *Philips Park Gasworks* (located 35m to the north-north-west), *Stuart Street Power Station* (180m to the east-north-east), a *Textile Factory* (located 285m to the west), *Chemical Works* (located 290m south-east and 750m to the south-east), a *Railway Works* (650m to the north-north-west), an *Engineering Works* (located 685m to the west), *Factories* (855m to the north-west and 890m to the south-east), and *A.V. Roe & Co Aircraft manufacture* (located 910m to the north-east) were all documented as primary bombing targets.

WWII HE Bomb Strikes (*Figure 6*)

During WWII, ARP wardens compiled detailed logs of bomb strikes across their respective districts. ARP records associated with the Study Site did not note any HE bomb strikes on-site. Nonetheless, five were recorded within 870m of the Site; 590m to the north-east, 640m to the south-west, 670m to the north-west, 740m to the south-west and 870m to the south-west. Furthermore, whilst IBs may have fallen within the Study Site, they fell in such large numbers that accurate record keeping was either non-existent or perfunctory. Nonetheless, IB strikes were noted 335m to the east and 580m to the north-west. In addition, further research identified one parachute mine impacted on *Philips Park Road* located 30m north of the Study Site boundary at its closest point.

In addition to IBs and HE bomb strikes, during the latter part of the war when aerial bombing had significantly declined, the main threat came from *V* type weapons. *V1* and *V2* rockets were thin-skinned, unmanned and inaccurate weapons. Despite this, there is no evidence to suggest that the Study Site (or its immediate vicinity) was subjected to rockets strikes during WWII.

The potential penetration depth of an UXB was dependent on a number of factors including but not restricted to those prior to striking the ground e.g. velocity and orientation of the UXB which in turn will be influenced on factors such as the release altitude from the aircraft and encounters with infrastructure during its fall; those encountered at the point of impact i.e. was the impact on concrete, grass, water etc. and finally, the below ground level conditions which were encountered such as infrastructure e.g. services, basements, foundations, and geology e.g. made ground, clay, sand, etc. Further, as the UXB penetrated the ground, it's velocity naturally slowed where, it either came to an abrupt stop e.g., against foundations or would continue for 10's of feet along a route of least resistance which often resulted in a curving of the trajectory back towards the surface. This is known as the "J Curve" effect and often resulted in a considerable horizontal off-set from the point of entry. This is often the reason why UXBs have been discovered against or under the foundations of buildings, which were present during WWII, or many meters from the point of impact.

WWII Bomb Damage

Official bomb damage mapping and written bomb damage records, combined with further supplementary research, did not identify any bomb damage on-site, nonetheless, bomb damage was recorded in the Study Site's wider area. Specifically, *"Demolished buildings"* were documented 200m to the west, 200m to the south-west and 350m to the south-west. In addition, structures *"Demolished by Bomb"* were recorded on and around *Hillkirk Street* and *Palmerstone Road,* located approximately 500m south-west of the Site at their closets point.

Furthermore, a supplementary analysis of post-war mapping identified a *"Ruin"* 80m north-east of the Study Site, which is likely to be indicative of bomb damage given the bombing documented in the wider area.

Abandoned Bombs

An examination of the official abandoned bomb records did not identify any abandoned bombs on-site or within 1,000m of the Study Site boundary.

Records of WWII UXB Disposal Tasks

An examination of the civil defence records listing UXBs dealt with in the *Manchester County Borough* from 1940-45 did not identify any UXB disposal tasks within 1,000m of the Study Site boundary.

Military Activity

There is no firm evidence to suggest that the Study Site has previously been occupied by military personnel, despite military facilities and installations being recorded in the wider area. For example, further research identified evidence of "*Machine Gun Post"* located near *Philips Park Road,* approximately 45m north at its closest point and an anti-aircraft gun battery situated in *Philips Park,* located approximately 280m north-east of the Study Site boundary. These defences are likely to have been deployed against *Luftwaffe* bombing during WWII and may have been either occupied or maintained by military personnel.

However, there is no evidence to suggest that military activity has been undertaken on-site and it is therefore considered unlikely that a UXO contamination threat is likely to have been generated at the Site.

WWII Site Use

The CS mapping prior to WWII (1938) and OS mapping post-WWII (1949) shows that the Study Site was located within a densely developed urban/industrial area during WWII; the Study Site itself consisted of residential properties in the north and industrial facilities and railway lines in the south. Therefore, it is likely that footfall within the Study Site would have been relatively high and as a result, a resident or employee is likely to have observed and reported any UXB entry holes within the Study Site, which would have been dealt with at the time. It is also possible that local ARP or military personnel might have inspected the south of the Site for bomb damage and UXBs in order to ensure that the industrial facilities continued to operate following any air raids.

Post-WWII UXO Encounters

An examination of the post-WWII BDO tasks associated with the Study Site has not identified any BDO operations on-site or within 1,000m of the Study Site boundary.

Sources of UXO Contamination

Extensive research of relevant historical sources and records has not identified evidence of a direct UXO contamination threat at this Study Site. However, as primary bombing targets were identified on-site and nearby, with bombing and bomb damage recorded in the wider area, *German* HHE bombs may pose a low-level residual threat.

Post-WWII Study Site Development

Generally, the probability of encountering UXO in ground that has been disturbed since it may have been contaminated with UXO is considered to be remote (up to the depth below ground level previously disturbed by any intrusive works). Therefore, an understanding of the Study Site's previous development history is crucial when assessing the likelihood that UXO might be encountered at the Study Site.

Study Site Development History From an analysis of the CS and OS historical mapping associated with the Study Site, the following history can be deduced:	
Year	Analysis
1893 CS Map	The Study Site was located in a relatively industrial area. The Study Site consisted of residential houses in the northern and eastern sectors, and railway lines, areas of hard standing, and a large structure in the southern sector.
1908 CS Map	Multiple residential structures had been developed in north-western sector of the Site.
1938 CS Map	One large structure associated with *Bradford Iron Works* had been developed in the eastern sector of the Site.
1949 OS Map	Significant changes were not recorded at the Study Site.
1959 OS Map	Some residential structures in the northern sector of the Site had been removed.
1968 OS Map	The majority of the residential structures had been removed and were replaced by multiple structures associated with industrial works.
1981 OS Map	Significant changes were not recorded at the Study Site.
1992 OS Map	The majority of existing structures and railway lines had been removed, aside from some small structures along the northern and eastern borders of the Site.
2003 Aerial Photography	Structures associated with a *Stadium* and areas of hard standing had been developed throughout the Site
2013 Aerial Photography	Further structures associated with a *Stadium* had been developed in the centre of the Site.
2022 OS Map	Significant Changes were not recorded at the Study Site.

The Study Site history assessment is our best interpretation of the data available at the time of writing. Given that yearly revisions of neither CS and OS mapping, nor aerial photography, are available for analysis, there are gaps between the mapping revisions.

Consequently, it should not be assumed that any new structures and/or features that are labelled on a map revision were constructed, developed, installed or demolished in the exact year that the mapping illustrates the change. It is possible – and indeed likely – that the exact date of development occurred somewhere between the two closest mapping revisions. Specifically, this may be particularly relevant where there is a gap between pre and post-WWII mapping, as it may not be clear whether structures were present during WWII or if they were constructed in the post-WWII period.

STAGE THREE – DATA ANALYSIS

Variable	Result	Comment
Was the area considered to be a primary bombing target during WWII?	✔	Ten primary bombing targets were located within 1,000m, the closest being *Bradford Iron Works* (located on-site).
Was the Study Site or the immediate area bombed during WWII?	✘	Although ARP records identified five HE bomb strikes within 870m, the closest being 590m to the north-east.
Did the Study Site or the immediate area experience bomb damage?	✘	Although official bomb damage mapping recorded *"Demolished buildings"* 200m west, 200m south-west and 350m south-west.
Would munitions have been manufactured, stored and/or fired from the Study Site previously?	✘	There is no evidence to suggest munitions were located or fired from this Study Site.
Was the ground undeveloped during WWII?	✘	The Study Site consisted of residential and industrial structures and railway lines.
Would the footfall have been high in the area?	✔	Given that residential and industrial structures located on-site and in the immediate vicinity, it is likely that footfall would have been high.
Would a UXB entry hole have been observed during WWII?	✔	Given that footfall would have been high, it is likely UXB entry holes within the Study Site would have been observed and therefore dealt with at the time
Has UXO been encountered previously at the Study Site?	✘	There have been no documented UXO encounters in the immediate vicinity at the Site.
Have previous intrusive works removed the potential for UXO to be present?	✘	It is likely that any UXO within post-war disturbed and developed ground would potentially have been discovered and removed but any UXO contamination within previously undisturbed ground is likely to remain.
Are proposed intrusive works likely to extend into previously undisturbed ground?	✔	Areas of the Study Site have remained undeveloped since WWII and therefore the proposed works may extend into previously undisturbed ground.
Is there potential for an unplanned encounter with UXO to occur during proposed intrusive works?	✘	Given the low likelihood of UXO contamination at the Study Site, it is considered unlikely that UXO will be encountered by proposed intrusive operations.
Does the probability of a UXO encounter vary across the Study Site?	✘	It is considered unlikely for an unplanned encounter with UXO to occur across the Study Site

N.B. The ✔ / ✘ symbology is intended to act only as a succinct visual indicator as to whether the data analysis has returned a positive (i.e., ✔) or negative (✘) answer to each question concerning the potential for UXO contamination at the Study Site.

STAGE FOUR – RISK ASSESSMENT

Threat Items

Extensive research of relevant historical sources and records has not identified evidence of a direct UXO contamination threat at this Study Site. However *German* aerially delivered ordnance and *British* AAA projectiles may pose a low-level background threat given the identification of primary bombing targets on-site and nearby, and the bomb strikes and bomb damage recorded in the wider area.

Bomb Penetration Depth

Considering the ground conditions (highlighted in Stage 1), the average BPD for a 250kg *German* HE bomb is assessed to be approximately 7m bgl, with the maximum BPD considered to be approximately 16m bgl. Although it is possible that the *Luftwaffe* deployed larger bombs in the area, their deployment was infrequent, and to use such larger (or the largest) bombs for BPD calculations are not justifiable on either technical or risk management grounds.

WWII *German* bombs have a greater penetration depth when compared to IBs and AAA projectiles, which are unlikely to be encountered at depths greater than 1m bgl. However, due to the "J Curve" and the potential for structures to impede the penetration into the ground, HE bombs have been discovered at much shallower depths than the average.

Risk Pathway

Although there is a residual UXO risk within this Study Site, *6 Alpha* do not believe that the proposed intrusive works will generate a significant risk pathway. Whilst not all UXO encountered aggressively will initiate upon contact, such a discovery could lead to serious impact on the project especially in terms of critical injury to personnel, damage to equipment and project delay.

Prospective Consequences

Consequences of UXO initiation include:

1. Fatally injure personnel;
2. Severe damage to plant and equipment;
3. Deliver blast and fragmentation damage to nearby buildings;
4. Rupture and damage underground utilities/services.

Consequences of UXO discovery include:

1. Delay to the project and blight;
2. Disruption to local community/infrastructure;
3. The expenditure of additional risk mitigation resources and EOD clearance;
4. Incurring additional time and cost.

UXO RISK CALCULATION

Site Activities

Although there is some variation in the probability of encountering and initiating items of UXO when conducting different types of intrusive activities, a number of ground intrusive methodologies have been described for analysis at this Study Site. The consequences of initiating UXO vary greatly, depending upon, *inter alia* the mass of HE in the UXO and how aggressively it might be encountered. For this reason, *6 Alpha* has conducted separate risk rating calculations for each intrusive methodology that might be employed.

Risk Rating Calculation

6 Alpha's Semi-Quantitative Risk Assessment assesses and rates the risks posed by the most probable threat items when conducting a number of different activities on the site. UXO risk is determined by calculating the probability of encountering and initiating UXO and the consequences of an inadvertent UXO detonation.

UXO Risk Calculation Table – All Areas				
Activity	**UXO Threat Items**	**Probability (SH+EM=P)**	**Consequence (D+PSR=C)**	**UXO Risk (PxC=R)**
Trial Pits	HE Bombs	0+2=2	3+3=6	2x6=12
	AAA Projectiles	0+2=2	3+1=4	2x4=8
	IBs	0+2=2	3+1=4	2x4=8
Window Sampling	HE Bombs	0+3=3	3+2=5	3x5=15
	AAA Projectiles	0+3=3	3+1=4	3x4=12
	IBs	0+3=3	3+1=4	3x4=12
Boreholes	HE Bombs	0+3=3	3+2=5	3x5=15
	AAA Projectiles	0+3=3	3+1=4	3x4=12
	IBs	0+3=3	3+1=4	3x4=12
Excavations	HE Bombs	0+2=2	3+3=6	2x6=12
	AAA Projectiles	0+2=2	3+1=4	2x4=8
	IBs	0+2=2	3+1=4	2x4=8
Trenching	HE Bombs	0+2=2	3+3=6	2x6=12
	AAA Projectiles	0+2=2	3+1=4	2x4=8
	IBs	0+2=2	3+1=4	2x4=8
Piling	HE Bombs	0+3=3	3+2=5	3x5=15
	AAA Projectiles	0+3=3	3+1=4	3x4=12
	IBs	0+3=3	3+1=4	3x4=12
Abbreviations – Site History (SH), Engineering Methodology (EM), Probability (P), Depth (D), Consequence (C), Proximity to Sensitive Receptors (PSR) and Risk Rating (RR).				

STAGE FIVE – RECOMMENDED RISK MITIGATION MEASURES

Recommendations

The Study Site requires no further action in order to reduce the UXO risk to ALARP.

This assessment has been conducted partially based on the information provided by the Client, should the proposed works change then *6 Alpha* should be re-engaged to refine this risk assessment

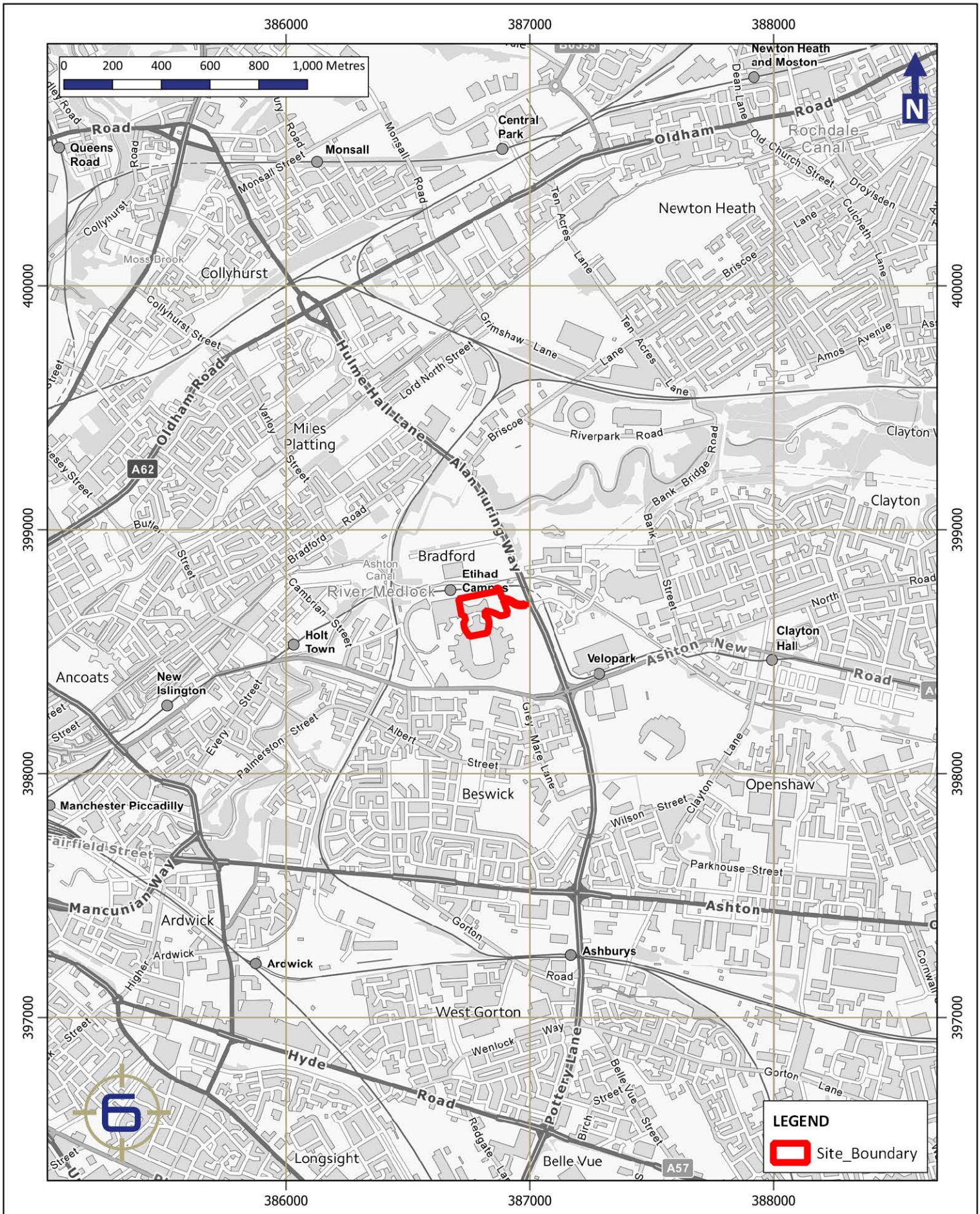
Report Figures

Figure One - Study Site Location

MCFC North Stand, Etihad Stadium, Manchester

Site Location

British National Grid



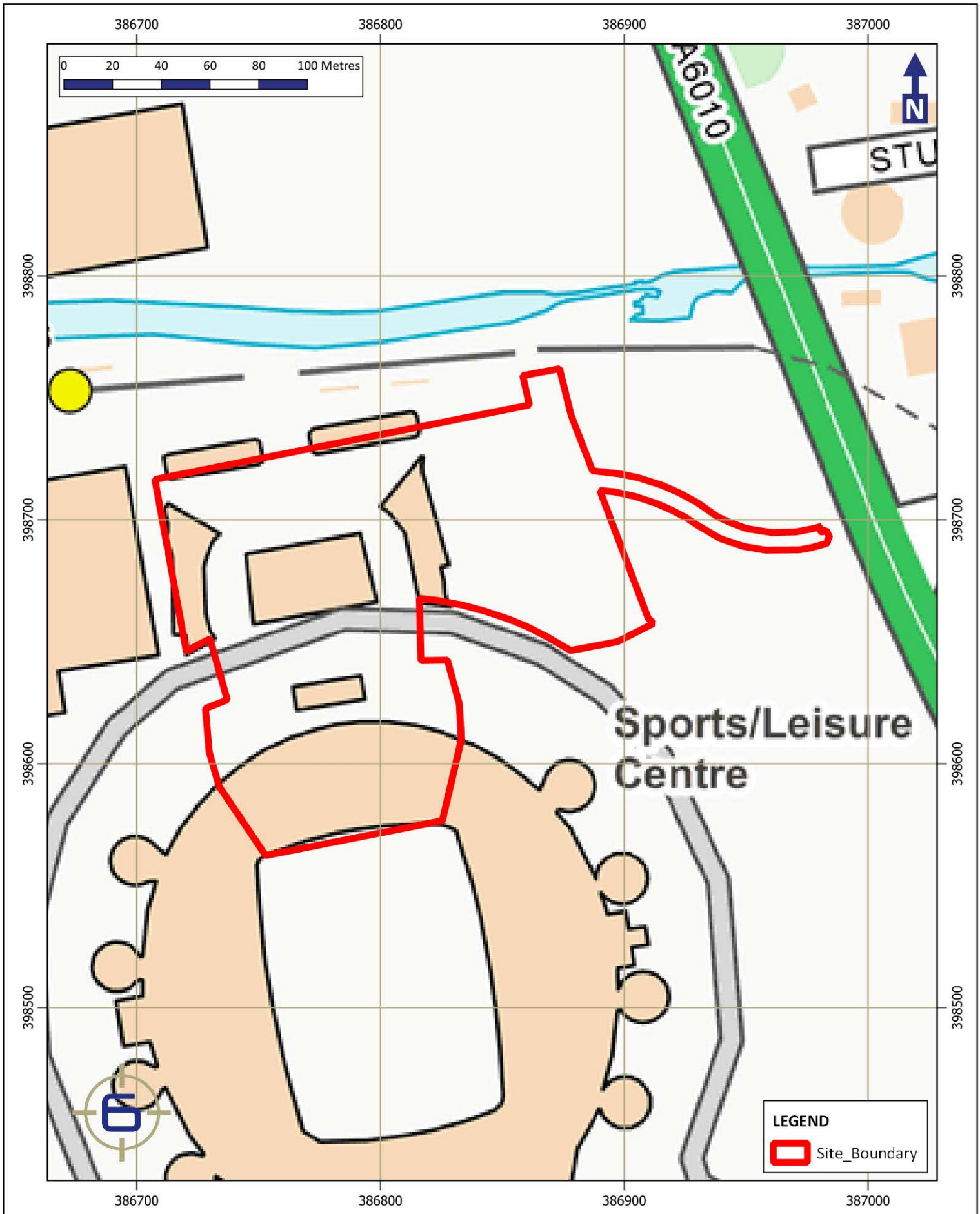
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10147	1	LH	LG	17/10/2022	Contains Ordnance Survey data © Crown copyright and database right 2017	Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha.	alpha ASSOCIATES

Figure Two - Study Site Boundary

MCFC North Stand, Etihad Stadium, Manchester

Site Boundary

British National Grid



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10147	2	LH	LG	17/10/2022

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Figure Three - Aerial Photography (2021)

MCFC North Stand, Etihad Stadium, Manchester

Aerial Photography (2021)

British National Grid



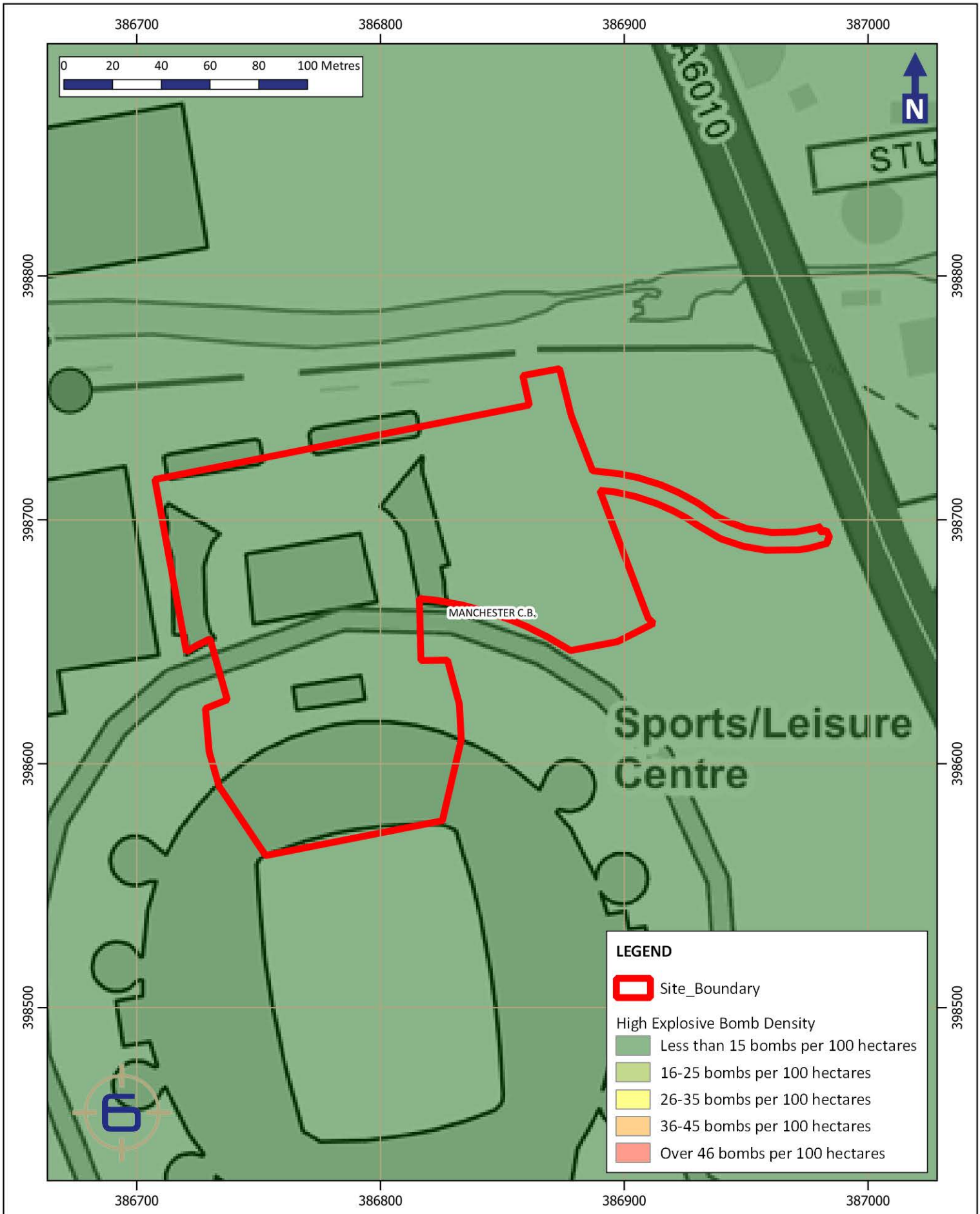
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Figure Four - WWII High Explosive Bomb Density

British National Grid

MCFC North Stand, Etihad Stadium, Manchester

WWII High Explosive Bomb Density



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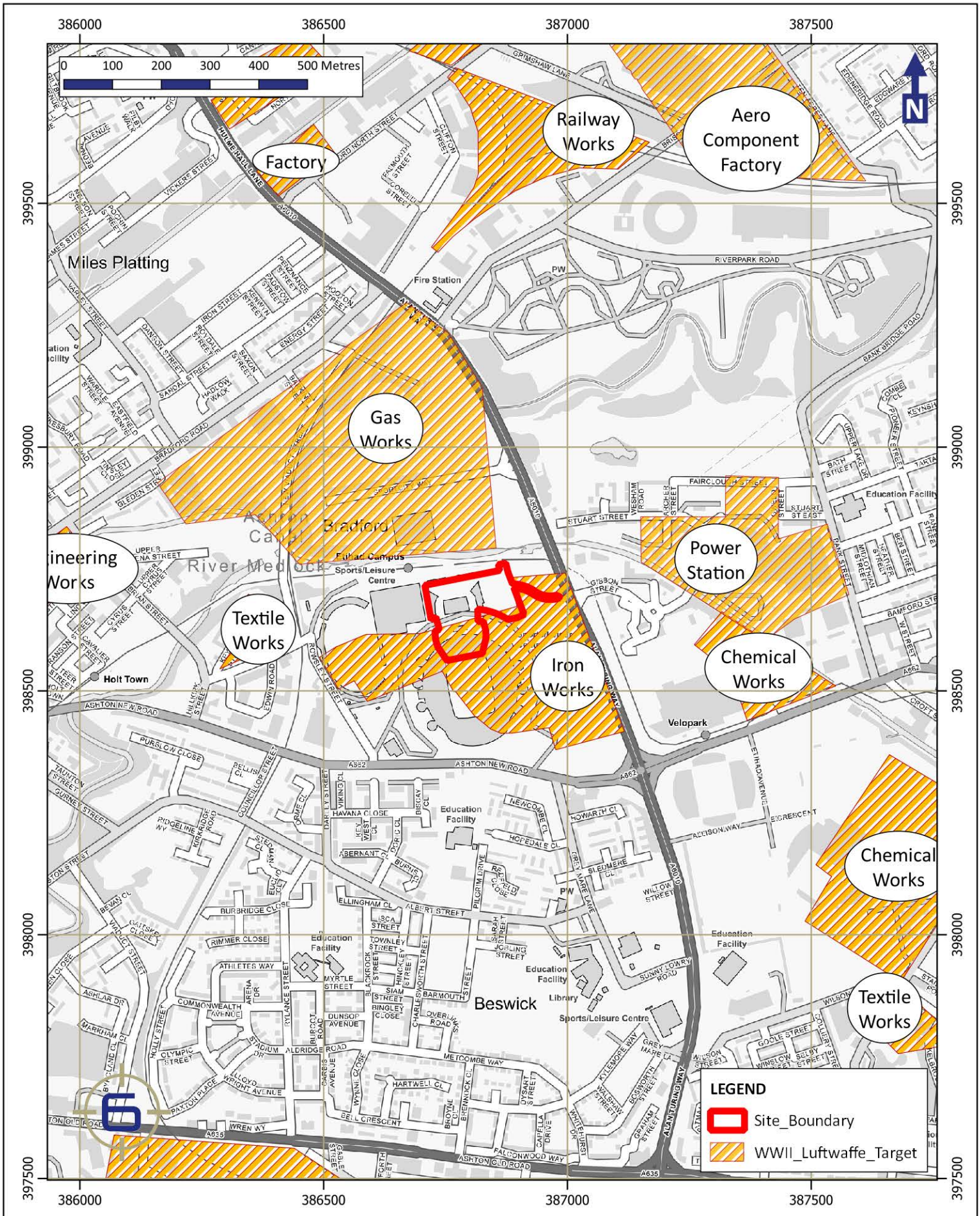
Figure Five - WWII Luftwaffe Bombing Targets

MCFC North Stand, Etihad Stadium, Manchester

WWII Luftwaffe Bombing Targets

British National Grid

BOMB SEARCH



PROJECT NO.	FIGURE	DRAWN	CHECKED	DATE			
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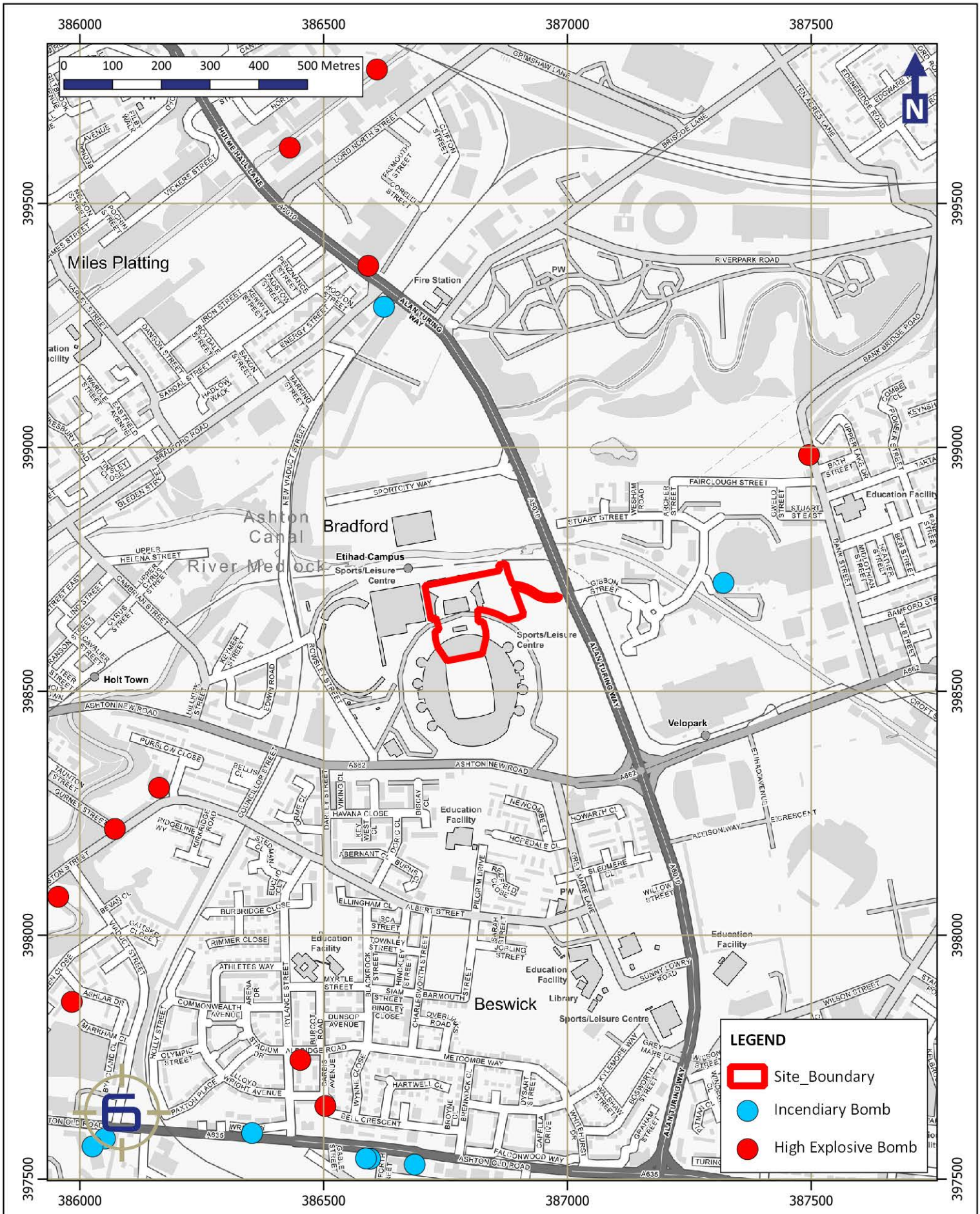
Figure Six - WWII High Explosive Bomb Strikes

MCFC North Stand, Etihad Stadium, Manchester

WWII Consolidated Bomb Strikes

British National Grid

BOMB SEARCH



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