MCFC Project Taverna

Coal Mining Risk Assessment

For: Manchester City Football Club

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1.0 INTRODUCTION

This Coal Mining Risk Assessment (CMRA) Report has been prepared at the request of Manchester City Football Club. Instruction to proceed was received in January 2026. Desk study work was undertaken by IGE Consulting Ltd in January and February 2026.

This report pertains to a c. 0.63 Ha site located to the east of the Etihad Stadium, Etihad Campus, Manchester, c. 3km northeast of Manchester City Centre, at the approximate post code M11 3FF. The Ordnance Survey Grid Reference for the centre of the site is 386925E, 398736N.

The site currently comprises an open area of hardstanding with Loverose Street crossing the site in the southwest. The site is currently partially used as a site compound for the north stand extension. The site is bound by a Metrolink cutting to the north with Ashton Canal and the Co-op Live Arena beyond to the North, Alan Turing Way to the east, Gibbon Street to the south and Loverose Street to the west. Access to the site is via Gibbon Street off Alan Turing Way. An aerial photo of the site is included below, and A site location plan is contained in Appendix 2.

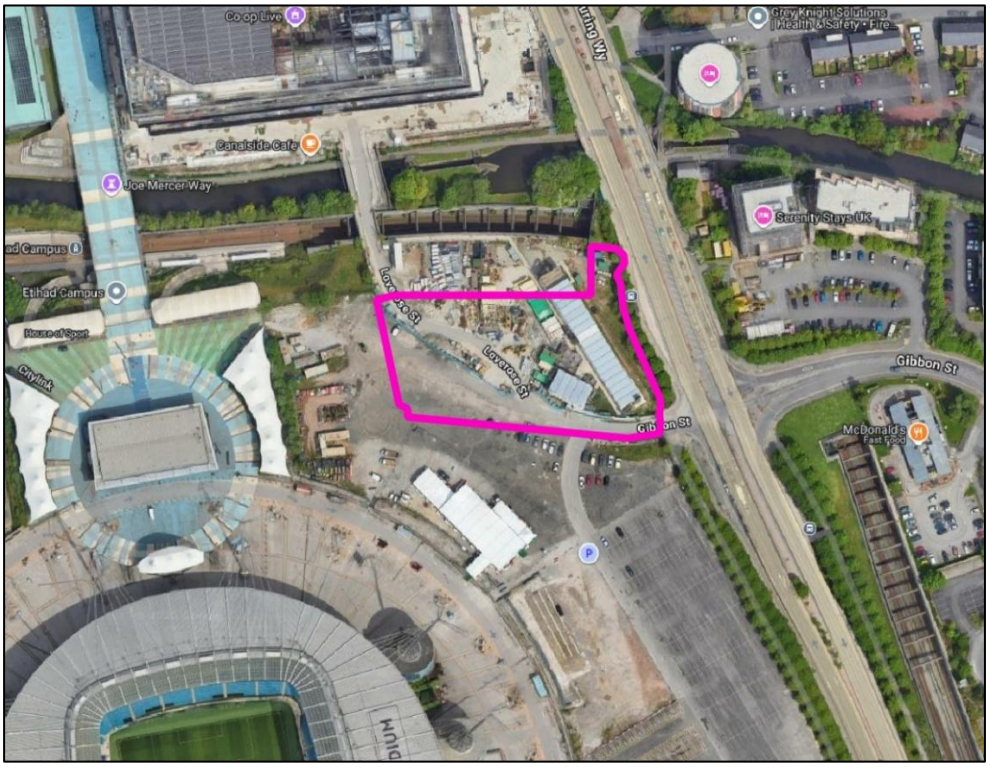


Figure 1: Aerial image of the site dated April 2023.

The CMRA has been undertaken for submission to the Local Authority given the site lies within a designated Mining Remediation Authority Development High Risk Area. It is the client's intention to develop the site into a immersive events space.

The proposed development plan is contained in Appendix 2 with an extract below:

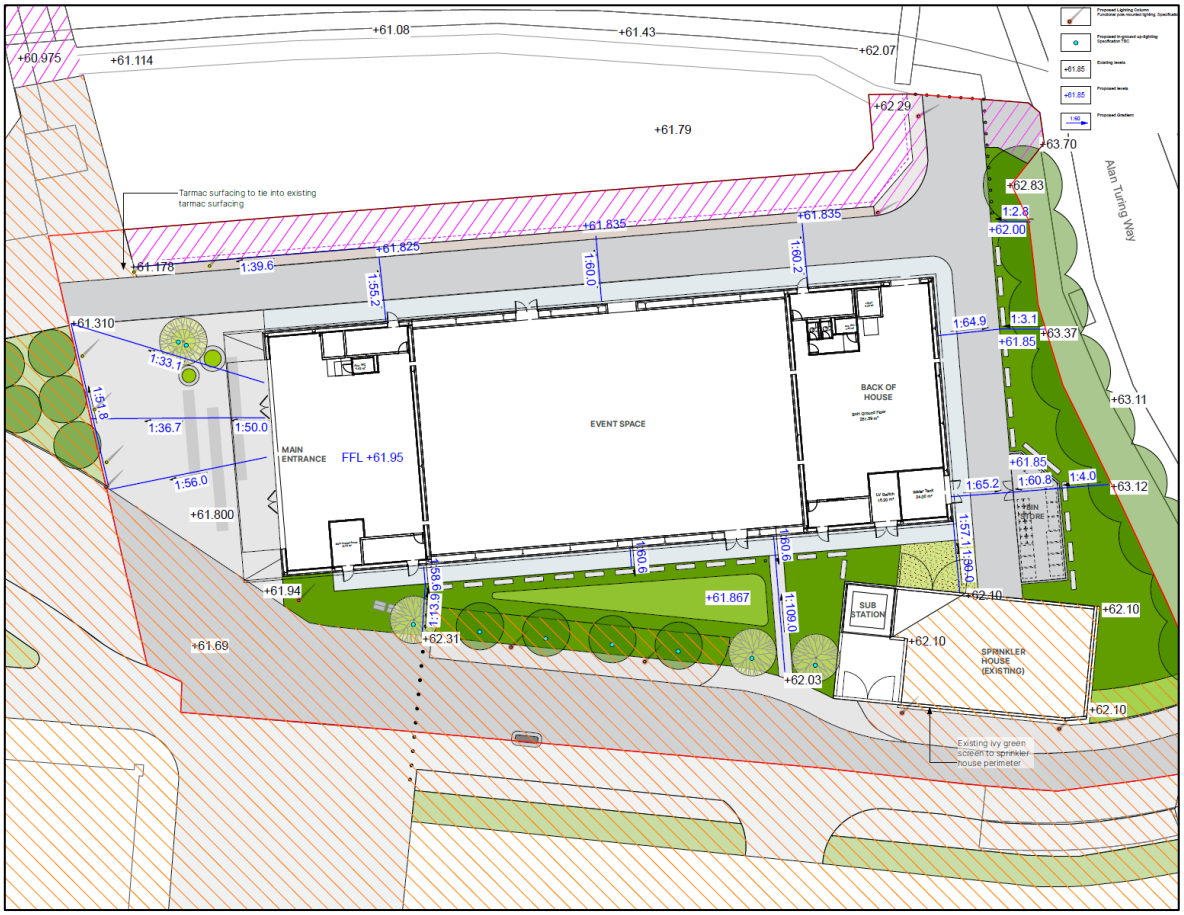


Figure 2: Extract of the proposed development plan

1.1 Brief

In accordance with the National Planning Policy Framework (NPPF), all sites located within Mining Remediation Authority (formerly referred to as the Coal Authority) Development High Risk Areas subject to planning applications require a Coal Mining Risk Assessment (CMRA). As areas of the site lie within a Mining Remediation Authority Development High Risk Area due to the presence of potentially shallow workings, a CMRA is required to support the planning application and to assess the risk posed by coal mining to the site.

The purpose of this Coal Mining Risk Assessment is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site;
- Use relevant information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and / or demonstrate how coal mining issues have influenced the proposed development in line with *C758 Abandoned Mine Workings Manual* (2019); and
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of the National Planning Policy Framework with regard to development on potentially unstable land.

2.0 DOCUMENTATION

Prior to undertaking this Coal Mining Risk Assessment, the following site-specific data was obtained:

a) The British Geological Survey (BGS) 1:50,000 bedrock and superficial geological map (reference: Sheet 85) dated 2011;

b) The BGS 1:10,000 solid and drift geological map (reference: SJ89NE) dated 2004;

c) The BGS Geological Memoir – Geology of the Manchester and the Southeast Lancashire coalfield dated 1931;

d) Mining Remediation Authority Consultants Coal Mining Report (reference 51003546900001). The report is contained within Appendix 4;

e) BGS Boreholes Ref: SJ89NE216, SJ89NE1450, SJ89NE1492 and SJ89NE1493. BGS borehole logs are contained in Appendix 5; and

f) Historical Ordnance Survey maps dated between 1848 and 2025, at scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560. The maps are contained within Appendix 3.

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3.0 COAL MINING RISK ASSESSMENT

A comprehensive review of relevant historical, geological and coal mining information sources was undertaken to assess the potential for shallow coal mining and associated ground instability beneath the site. The approach adopted, together with the findings of this desk-based assessment, is presented in the following sections.

3.1 Site History

The site development history has been researched by reference to historical maps and street plans. Pertinent information relating the coal mining history of the area is summarised below:

Date	Feature
Pre 1800s	The earliest available historical map is dated 1848, however, coal is thought to have been extracted commercially from the area from as early as the 1600s from Bradford Colliery, located c. 200m to the south of the site.
1848 – 1891	On the earliest available historical maps, the Ashton Canal is recorded to run through the centre of the site from north to south, serving Bradford Colliery. The north eastern site section is occupied by buildings associated with Bradford Mill. 2 No. coal pits are recorded c. 22m and c.60m north east of the site. Bradford Colliery is recorded to be located 200m south of the site with associated mine shafts.
1891	Coal mining abandonment plans suggest that mining of the **Bradford Four Feet Coal** seam occurred beneath the site and were abandoned by 17th October 1981.
1891 – 1948	The site is occupied by Bradford Iron Works with associated buildings. Phillips Park Road is recorded to run from west to east along the northern site boundary.
1948 - 1968	By the late 1950s, the on-site colliery leg of the Ashton canal is backfilled. Longwall mining of deep coal seams is undertaken at Bradford Colliery from 1948 until the closure of the colliery in 1968.
1968 - 1973	Mining operation ceases at the Bradford Colliery. The associated buildings remain standing until demolition begins in 1973.
1973 - 1992	Widescale demolition and site clearance of the suite and surrounding area is undertaken between 1973 and 1992 to prepare the area for the construction of the Manchester Stadium (now known as the Etihad Stadium) and the redevelopment of the Eastlands site.
1992 - 2003	Between 1992 and 2003, multiple stages of ground investigation, remediation and enabling works were carried out on site and within the surrounding area. Mine workings were treated by drilling and grouting immediately north of the site and within the within the footprint of the proposed Manchester Stadium. Mine shafts in the surrounding area and those associated with Bradford Colliery were treated by drilling and grouting and capped to facilitate future development.
2003 - 2011	Following the construction of the Manchester Stadium, further ground investigation, remediation and enabling works were carried out between 2008 and 2010 and subsequently validated in 2011. These works included the treatment of residual underground workings in the north eastern site section by drilling and grouting, as well as the validation of previously treated workings and mine entries in the surrounding area. The validation report concluded that treatment of workings and mine entries on site was completed successfully.

2011 - present	The site has been vacant since 2011 in preparation for future development.

The historical maps are included in Appendix 3.

3.2 BGS Geological Maps

Following a review of the BGS 1:50,000 bedrock and superficial geological map (sheet number: 85 dated 2011) and the BGS 1:10,000 solid and drift geological map (Ref: SJ89 dated 1976), the following natural geological conditions are recorded to be present on site:

Strata Type	Formation Name	Description
Superficial Geology	Glacial Till	Heterogenous mixture of clays, sands and gravels.
Bedrock Geology	Pennine Upper Coal Measures Formation	Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with coal seams, but no mudstones containing marine fossils are present.

Made Ground is recorded on the BGS maps to be present immediately north and west of the site. Given the historical land use on the site (including an infilled canal), it is anticipated that deep Made Ground will be present across the entirety of the site.

The 1:50,000 geological map records a **bedrock dip of 15° southwest**. Based on the Mining Remediation Authority information, a **bedrock dip of 17.4° to 19.4° (typically 18°)** has been recorded within underground workings beneath the site.

3.2.1 1:50,000 Scale Mapping

The BGS 1:50,000 bedrock geological map (Figure 3) records 4 No. coal seams subcropping within 500m of the site. Given the bedrock dip of approximately 18° to the southwest, the seams that subcrop on and to the northeast of the site are expected to dip beneath the site and therefore represent the primary seams of concern with respect to potential shallow underground workings.

In contrast, the seams subcropping to the southwest represent the youngest part of the sequence and, due to the dip direction, are not anticipated to be present beneath the site. These seams are identified on the BGS mapping as the **Openshaw Coal** (youngest), the **Charlotte Coal**, the **Bradford Three Quarter Coal** (which subcrops

on the site), and the **Bradford Four Foot Coal** (subcropping to the northeast and dipping beneath the site).

The BGS 1:50,000 scale map records the Bradford Fault approximately 500m east of the site, marking the boundary of the local fault block. Additional coal seams are expected to be present beneath the site; however, based on the geological sequence in this area, these are anticipated to occur at depths in excess of 100m below ground level and are therefore not considered a risk to the proposed development.

An extract of the 1:50,000 scale geological map and generalised vertical section are shown below:

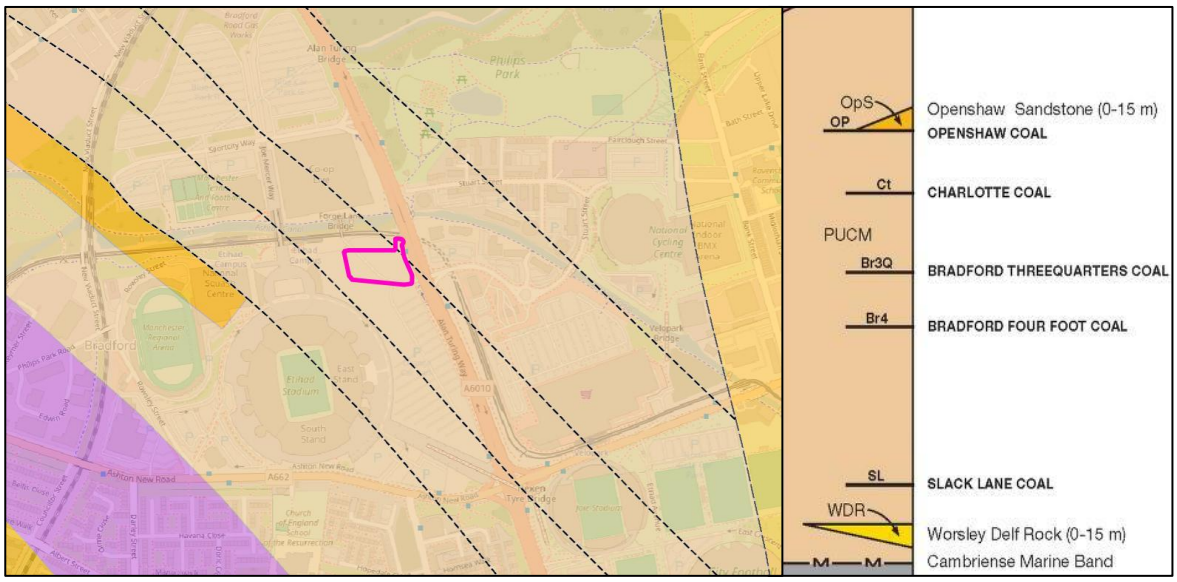


Figure 3: Extract of the BGS 1:50,000 solid geological map (Sheet 85 dated 2011) and associated GVS

To provide greater detail on the geological conditions and to more accurately determine the positions of the subcropping coal seams, the BGS 1:10,000 scale geological maps were also reviewed and compared

3.2.2 1:10,000 Scale Mapping

The 1:10,000 (2004) solid and drift geological map (Figure 4 below) provides more detail of the localised area and additional coal seams, not recorded on the 1:50,000 scale geological map.

The 1:10,000 scale maps confirm the subcrop positions of the **Openshaw** and **Charlotte** coal seams recorded on the 1:50,000 mapping. Both seams are shown to

subcrop to the southwest of the site and are therefore not anticipated to be present beneath the development area. The **Bradford Three Quarter** seam is recorded to subcrop in the northeastern part of the site, consistent with its position on the 1:50,000 scale mapping.

The subcrop position of the **Bradford Four Foot** coal seam is shown to be closer to the site than indicated on the BGS 1:50,000 scale mapping. An additional seam, identified as the **Yard Coal**, is recorded stratigraphically below the **Bradford Four Foot** seam and occupies the position where the 1:50,000 map locates the **Bradford Four Foot** seam.

The 1:10,000 scale map suggests that the **Bradford Three Quarters**, the **Bradford Four Foot** and **Yard Coal** all underly the site and could be at potentially shallow depths. The 1:10,000 scale geological map and general vertical section showing the sequence is shown below:

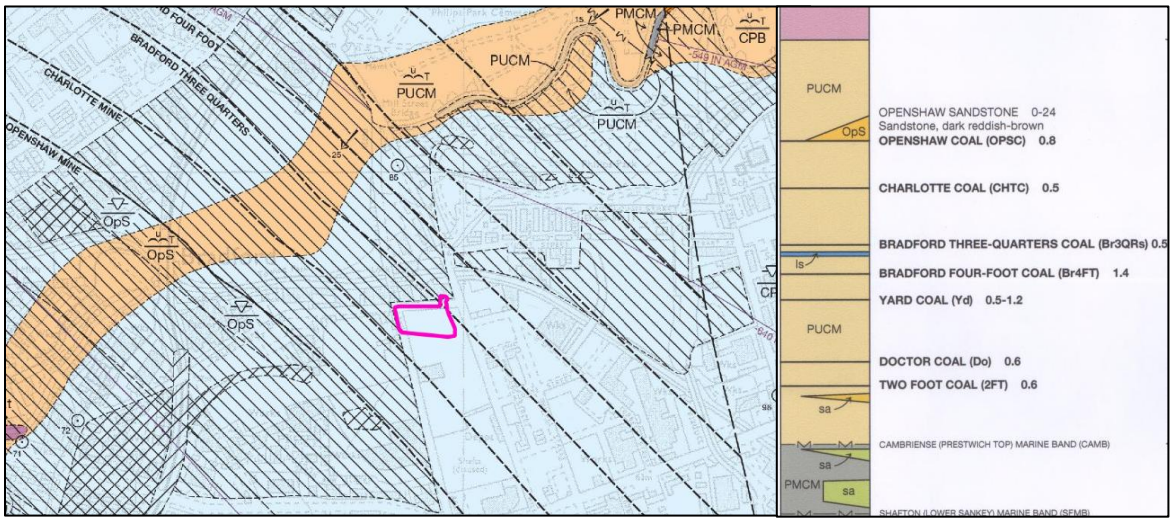


Figure 4: Extract of the BGS 1:10,560 solid geological map (ref: SJ89NE dated 2004) and associated GVS.

Based on an anticipated bedrock dip of 18° to the south west and the recorded subcrop positions of the seams, the following anticipated depths and thickness of relevant coal seams has been derived from the 1:10,000 scale geological map:

Coal Seam Name	Coal Seam thickness (m)	Anticipated Depth at shallowest point beneath the site (m below rockhead)
Openshaw	0.80	Not anticipated to be present beneath the site
Charlotte	0.50	

Bradford Three Quarters	0.50	0m to 29m (Seam subcrops in the north eastern site section)
Bradford Four Foot	1.40	24m to 60m
Yard Coal	0.50m – 1.20m	56m to 92m

3.2.3 Coal Seam Summary

Based on the information obtained from the 1:50,000 and 1:10,000 geological maps, it is anticipated that the **Bradford Three Quarter**, **Bradford Four Foot** and **Yard Mine** coal seams are present beneath the site at depths of less than 100m below rockhead. These seams form the primary focus of the coal mining risk assessment due to the potential for shallow underground workings and associated ground stability issues.

Additional, deeper coal seams are also present beneath the site; however, as these occur at depths greater than 100m, they are not considered to pose a geotechnical risk to the proposed development.

3.3 BGS Boreholes

There are numerous BGS boreholes available on and in close proximity to the site associated with the multiple phases of ground investigation carried out for the construction of the current Etihad Stadium and Eastlands redevelopment. These records summarise the ground conditions prior to the completion of earthworks or remediation in the area.

BGS Borehole Reference: SJ89NE1492 and SJ89NE1493

These boreholes are located within the southern part of the site and approximately 10 m south of the site boundary. Both were excavated in October 1998 to a depth of 4.50 m bgl (56.40 m to 56.10 m AOD). The logs recorded the following pertinent information:

- **Made Ground** of variable composition but primarily comprising black, slightly clayey, very sandy, fine to coarse, subrounded and subangular gravel of ash and clinker to a depth of between 2.30m and 3.10m bgl, underlain by:

- **Glacial Till** comprising soft to stiff, brown mottled bluish grey sandy clay with occasional fine to coarse rounded and subrounded gravel to a depth of at least 4.50m bgl (56.40m to 56.10m AOD).

BGS Borehole Reference: SJ89NE1597

This borehole targeted, and identified, mineshaft 386398-012 located c. 17m north of the site. This mine entry was treated in 2001 to a depth of 40m taking 31 tonnes of grout. Further drill & grout treatment was undertaken in 2010 from a depth of 54m bgl utilising a total of 29 tonnes of grout.

- **Made Ground** of undisclosed composition to a depth of 51.00m bgl (10.80m AOD), underlain by:
- **Pennine Upper Coal Measures** comprising silty mudstone to a depth of at least 54.00m bgl (7.80m AOD).

BGS Borehole Reference: SJ89NE216

This borehole is located approximately 16m north of the site and was excavated to a depth of 65.25m bgl (-3.50m AOD) in October 1991 and recorded the following pertinent information:

- **Made Ground** comprising concrete and cohesive engineered fill to a depth of 1.50m bgl (60.25m AOD), underlain by:
- **Glacial Till** comprising stiff boulder clay to a depth of 15.15m bgl (46.60m AOD), underlain by:
- **Pennine Upper Coal Measures** comprising very weak, brown and mid-grey mudstone.
    - Coal and Seatearth was encountered at a depth of 18.45m to 19.65m bgl (43.30m to 42.10m AOD).
    - Void attributed to workings was encountered from 34.55m to 36.35m bgl (27.20m to 25.40m AOD).

Based on the position of this BGS borehole, the intact coal seam encountered at 3.30m below rockhead is likely to be attributed to the **Bradford Three Quarters** coal seam. The void encountered is likely attributed to workings within the **Bradford Four Foot** coal seam.

Groundwater was either not encountered or was not recorded within the BGS borehole records.

3.4 Mining Remediation Authority Consultants Coal Mining Report

A Consultants Coal Mining Report was obtained from the Mining Remediation Authority (Ref: 51003546900001). The report provides information on the coal seams influencing the site, as well as the recorded mine entries in the surrounding area.

3.4.1 Mine Entries

The Consultants Coal Mining Report provides detail on 8 No. mine shafts recorded to the north, east and west of the site. The majority of the identified mine entries have been treated as summarised below:

Shaft Ref	Distance and direction from site	Treatment
386398-012	17m N	Pressure grouted to a depth of 40m with a total grout take of 31 tonnes. Probe holes used to validate treatment and capping. Further treatment in 2010 comprised pressure grouting upwards from a depth of 54m in 2m stages with a total grout take of 29 tonnes.
386398-013	20m N	Shaft was searched for in 2010 with 150 probe holes but was not located
386398-017	35m N	Treatment details unknown.
386398-011	31m NE	Treatment details unknown.
386398-006	39m NW	Pressure grouted to a depth of 40m with a total grout take of 25.5 tonnes.
386398-005	68m NW	Pressure grouted to a depth of 40m with a total grout take of 23 tonnes.
387398-032	72m E	Pressure grouted to a depth of 25m with a total grout take of 10 tonnes
387398-005	87m NE	Shaft was exposed in 2005 and found to have been treated. The fill material was drilled to the full depth of the shaft and consolidated by injecting 3.75 tonnes of cement grout.

The locations of the mineshafts in relation to the site area shown on the *'Mineshaft Location & Detail Plan'* included in Appendix 2 and an extract is shown below:

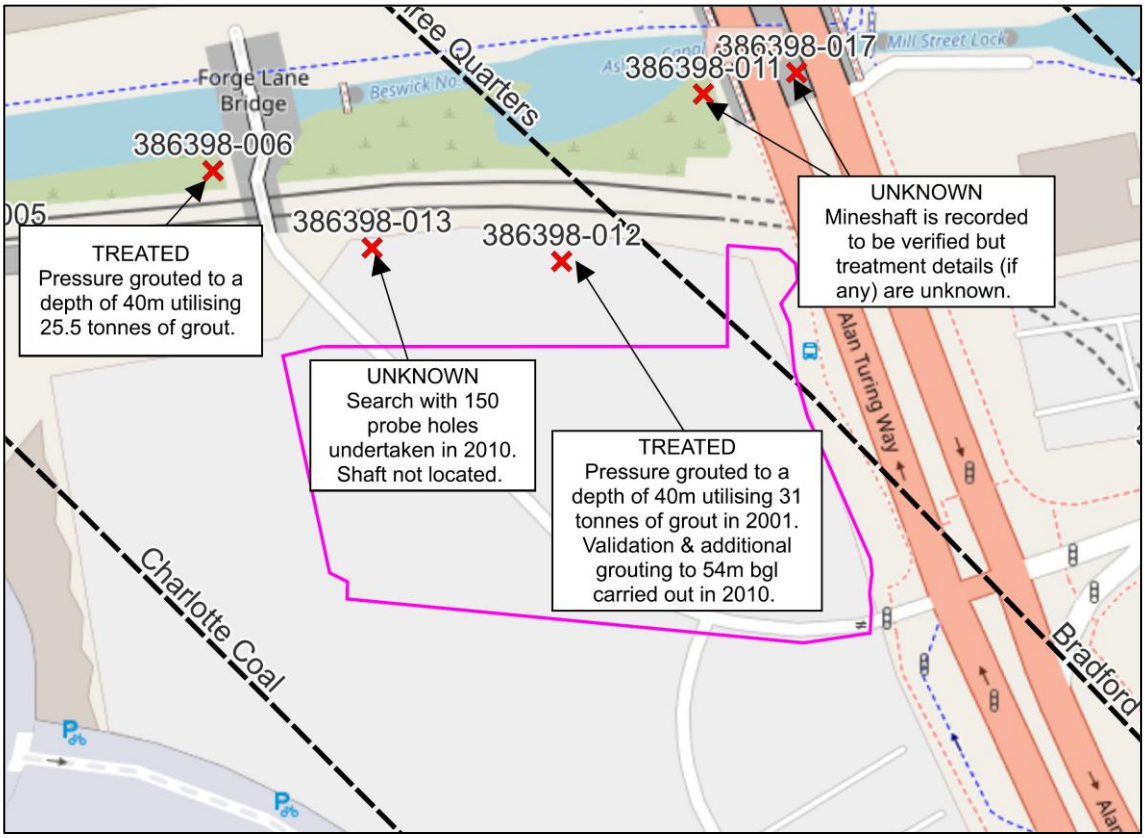


*Figure 5: Extract of the Mineshaft Location & Detail Plan map showing the **Bradford Three Quarter** coal seam subcrop (black dash) and mineshafts with detail on treatment and identification.*

The nearest 2 No. shafts are recorded c. 17m and 20m north of the site (Ref: 386938-012 and 386398-013). Given the relatively close distance of these mine entries from the site boundary, further consideration will be required as to whether they will have an impact on the proposed development.

3.4.2 Underground Workings

The Consultants Coal Mining Report report states that underground mining is recorded to have been undertaken in the following coal seams beneath the site or in close proximity to the site:

Seam	Depth (m)	Dip (degrees)	Dip Direction	Year Last Mined
Bradford Four Foot	47	18.4	Southwest	1760
	51			
Parker	471	18.0		1935

	518			
	531			
Crombouke	793	17.4		1913
	801	16.5		1932
Roger	797	19.4		1956

The Mining Remediation Authority (MRA) report also states that:

- No spine roadways are recorded at shallow depth;
- No faults, fissures or break lines are recorded on site;
- No open cast mines are recorded within 500m of the site;
- No MRA managed tips are recorded within 500m of the site;
- The MRA has not received a damage notice of claim for the subject property, or any property within 50m of the site since 31st October 1994;
- There are no current Stop Notices delaying the start of remedial works or repairs to the property;
- The MRA is not aware of any request having been made to carry out preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991;
- No mine gas is recorded within 500m of the site boundary;
- No mine water treatment schemes are recorded within 500m of the site boundary;
- No future underground mining licenses are recorded;
- No court orders are recorded; and
- No notices have been given that the land is at risk of subsidence.

The Mining Remediation Authority Consultants Coal Mining Report is included in Appendix 4.

3.5 BGS Geological Memoirs

The BGS geological memoir (‘*The Geology of Manchester and the Southeast Lancashire coal field’,* dated 1931*)* was examined in relation to the anticipated shallow coal measures strata beneath the site, with the pertinent information summarised below.

The geological memoir refers to the Bradford Group of Coals, which lie within the Pennine Upper Coal Measures. This group includes **Charlotte**, **Three Quarter** and the **Four Foot**, all recorded to have been worked from Bradford Colliery and the surrounding area.

The BGS memoir indicates that the **Bradford Three Quarter** seam was typically relatively thin (c. 0.30m to 0.50m) but was of sufficient quality to justify deep mining in the Bradford Colliery and local area.

The **Bradford Four Foot** seam was also mined in the Bradford area and considered an economically significant seam. Although the name suggests that the seam was four feet thick, recorded thicknesses would vary from locality varying from 0.60m to 1.40m.

3.6 Coal Mining Abandonment Plans

Given the Consultants Coal Mining Report identified workings within the **Bradford Four Foot** seam beneath the site at depths of 47m and 51m bgl, the coal mine abandonment plan was obtained to determine the extent of these workings.

The workings within the **Bradford Four Foot** coal seam extend beneath the majority of the site, with the up-dip limit reaching the northeastern site area. The abandonment plan records the seam thickness as varying between 3 and 6 feet (0.91 m to 1.83 m) and confirms that the workings originated from Bradford Colliery before being abandoned on 17 October 1891. Given the age of the workings, they were most likely created using pillar and stall methods, as modern longwall mining was not undertaken at Bradford Colliery until around 1948.

An extract of the **Bradford Four Foot** abandonment plan showing the site boundary and workings covering the majority of the site is shown below:

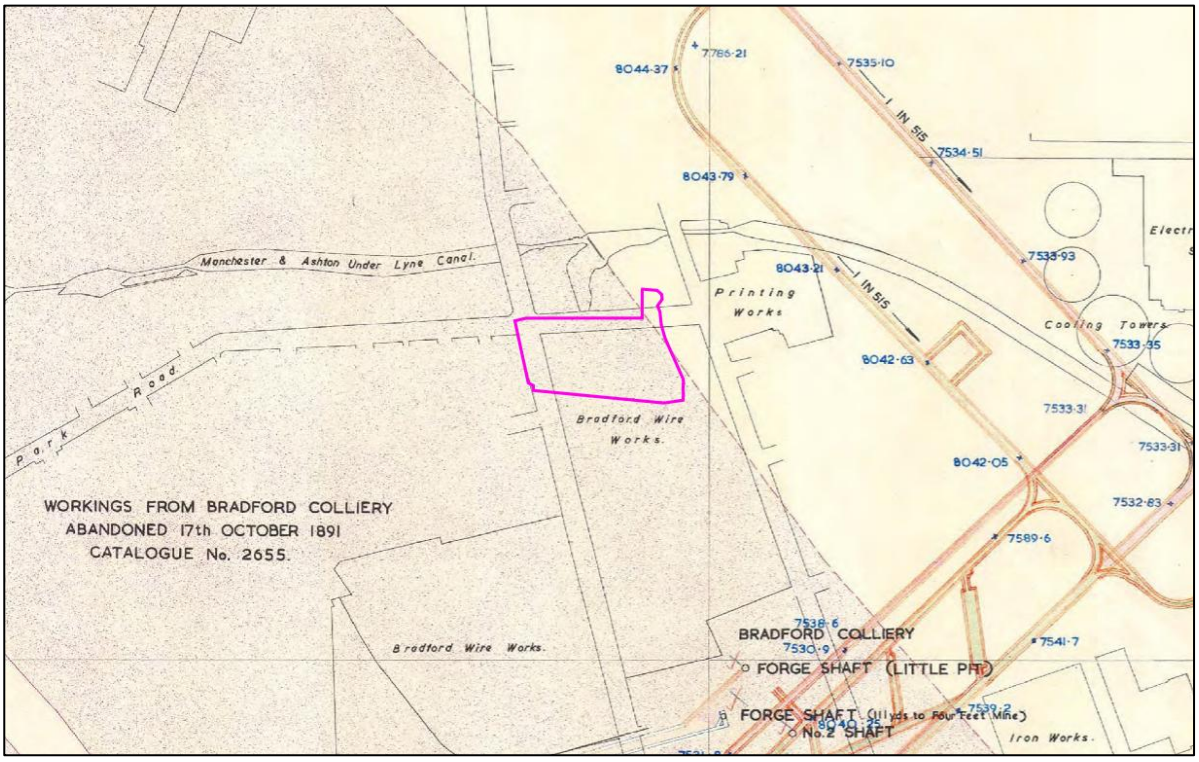


*Figure 6: Extract of the **Bradford Four Foot** abandonment plan in relation to the site.*

3.7 Previous Ground Investigation and Treatment

Coal seams are recorded to subcrop on the site and therefore are anticipated to be present at shallow depth across the site. Consequently, the site has been classified by the Mining Remediation Authority as a Development High Risk Area.

As part of the construction of the Etihad Stadium and the preparation of the adjacent Eastlands site for future development, multiple stages of enabling works, remediation and mine works treatment have been carried out on site and the surrounding area between 1991 and 2011.

Information detailing the previous ground investigations and enabling works have been acquired from the Manchester City Council planning portal. Although the reports acquired provide a general overview of works undertaken, some key information such as detailed ground investigation reports, logs and grout takes are missing and thus have not been included in the below summary.

3.7.1 Pre – 2003

The initial stage of ground investigations and enabling works were undertaken in the 1990s following the demolition of the historical buildings on site. The purpose of this investigation was for the construction of the City of Manchester Stadium (now the Etihad Stadium), in preparation for the 2002 Commonwealth games. Further ground investigation was undertaken by Soil Mechanics Ltd between 2000 and 2003 covering the area south of the Ashton Canal east of the Etihad Stadium.

Ground Conditions

The ground conditions across the site of the proposed stadium and surrounding Eastlands site were summarised as follows:

- **Made Ground** comprised both cohesive and granular fill of varying strength and density to depths of between 2.00m to 5.30m bgl, underlain by:
- **Glacial Till** comprising firm to stiff, brown, slightly gravelly, slightly sandy clay with occasional sand lenses to depths of between 7.00m and 20.00m bgl, underlain by:
- **Pennine Upper Coal Measures** typically encountered at a depth of c. 15.00m bgl in the site area. Bedrock comprised mudstones, siltstones, sandstones and coal seams with recorded workings encountered at a varied depth and location across the wider area.

Remediation works were to involve the treatment of underground workings by drilling and grouting in areas deemed most at risk of shallow workings. This was primarily undertaken beneath the footprint of the stadium, however, treatment also occurred immediately north of the site as part of the Metrolink development. This stage of works also saw the initial treatment and installation of a concrete cap of the mineshaft 17m north of the site (386398-012) and other mine entries in the surrounding area.

3.7.2 2008 – 2010

As part of a wider redevelopment objective for the Eastlands site, further ground investigation, mineshaft searches, treatment and validation was undertaken from

2008 to 2010 targeting parts of the site and the surrounding area. This work was undertaken by BWB Consulting Ltd.

Drill & Grout Treatment

Drill & grout treatment works were undertaken targeting potentially shallow mine workings in the north eastern site section adjacent to the Alan Turing Way. This targeted the **Bradford Three Quarter** seam which has the potential to be worked at a shallow depth in this area given it subcrops on the site. Treatment comprised drill & grout on a 6m primary grid.

Drill & grout works covering the north eastern site section encountered bedrock comprising mudstone at depths of 14.00m to 15.60m bgl. The **Bradford Three Quarter** coal seam was encountered at depths of 16.60m to 29.60m and was found to deepen towards the south west as anticipated based on recorded dips. The coal seam was recorded to be 0.40m to 0.90m thick.

The majority of the drill holes encountered intact coal. However, broken ground combined with a loss of flush was identified in two boreholes (F15 and F21) at depths of 24.60m to 26.00m and 23.70m to 26.30m bgl, respectively. The thickness of broken ground / lost flush on these holes is greater than the intact seam thickness recorded elsewhere. There is the potential for further broken ground west of these boreholes are they were located on the edge of the treatment area as shown in Figure 7, below.

Each hole was backfilled with grout upon completion of drilling, with the majority of holes taking no more than 0.3 to 0.4 tonnes, with the average grout take being recorded at 0.33 tonne per hole. The 2 No. boreholes with identified broken ground (F15 and F21) took 0.7 tonne and 0.4 tonne, respectively.

The location of the drill & grout boreholes carried out in 2001 and 2010 along with drill holes F15 and F21 in relation to the site boundary are shown below:

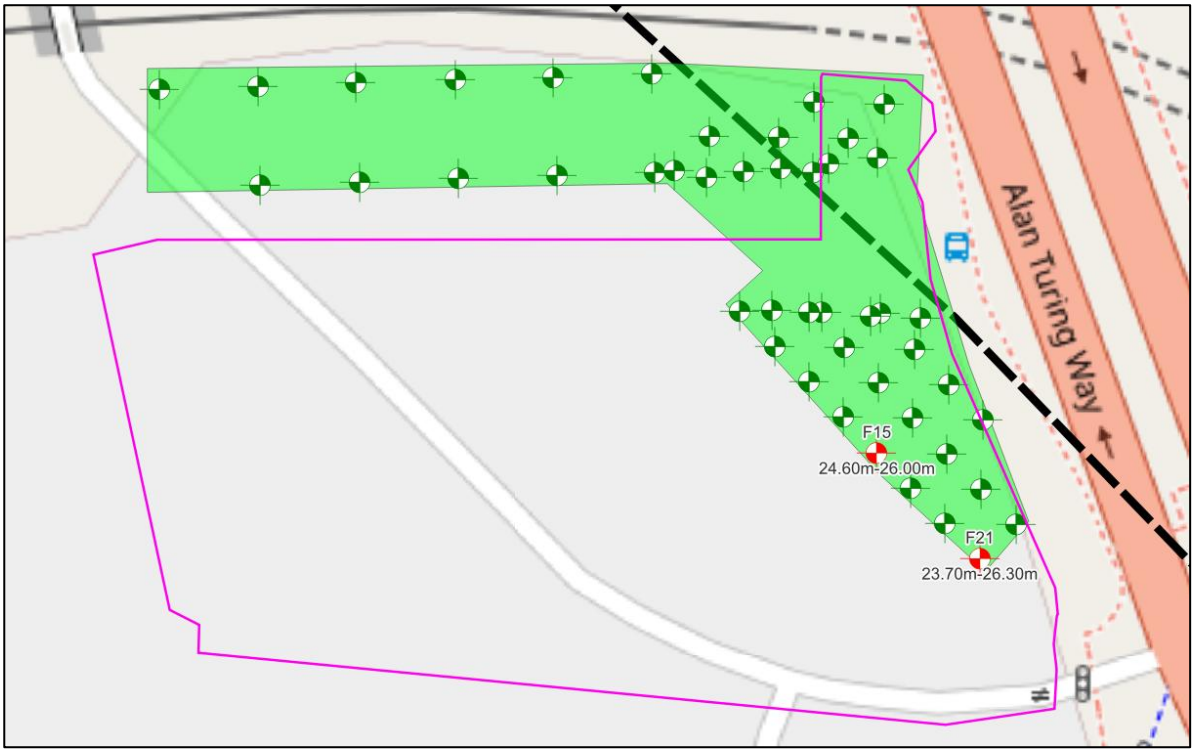


Figure 7: Location of historical drill & grout holes.

Mineshaft Search & Treatment

Mineshaft number 386398-013, anticipated to be located 20m north of the site was searched for with 150 probe holes carried out in this area. The probe holes were carried out in a spiral pattern radiating out from the anticipated location on 1.50m centres. The grid extended 10.50m south, east and west of the anticipated location and 3m north due to restrictions with access. All probe holes encountered bedrock at a depth of 14m bgl but no evidence of the mineshaft was recorded. Additionally, Made Ground was excavated in this area to inspect the underlying natural Glacial Till for any signs of disturbance. The report concluded that this mineshaft was likely located further north (away from site) or not present.

Additionally, there is a slight discrepancy between the MRA recorded position of mineshaft 386398-013 and the position that was investigated by BWB Consulting Ltd, with the MRA records, potentially showing the shaft further north and on the edge of the search area.

Mineshaft number 386398-012, which had previously been located and treated in 2001, had treatment works validated and a further 29 tonnes of grout injected to the full depth of the shaft.

The mine entry search probe locations (blue), approximate MRA recorded mineshaft positions (red) and drill & grout treatment areas (green) are shown in the figure below:

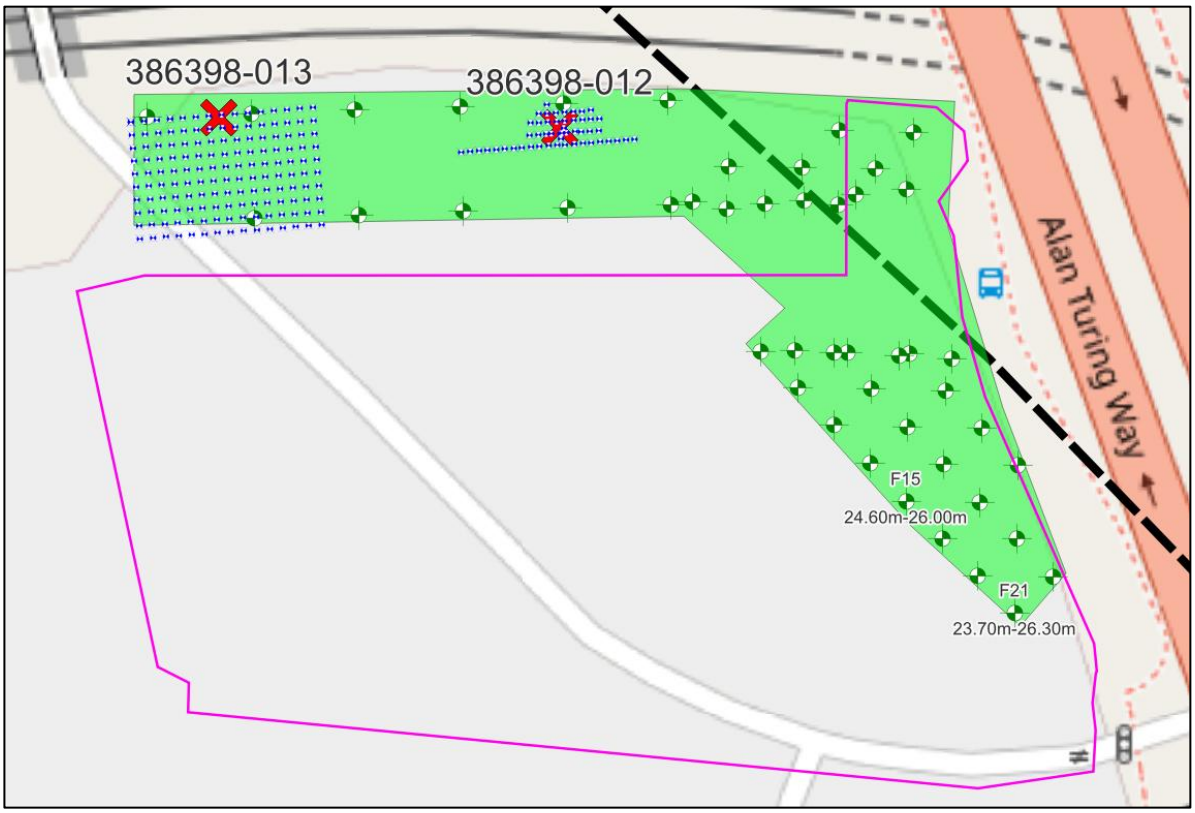


Figure 8: Mineshaft probing and drill & grout treatment areas in relation to the site (magenta).

3.8 Conceptual Ground Model

Based on the available desk-based information including BGS geological maps, memoirs, consultants coal mining report and abandonment plans, a conceptual ground model for the site has been produced and is included in Appendix 2. An extract of the conceptual ground model is shown below:

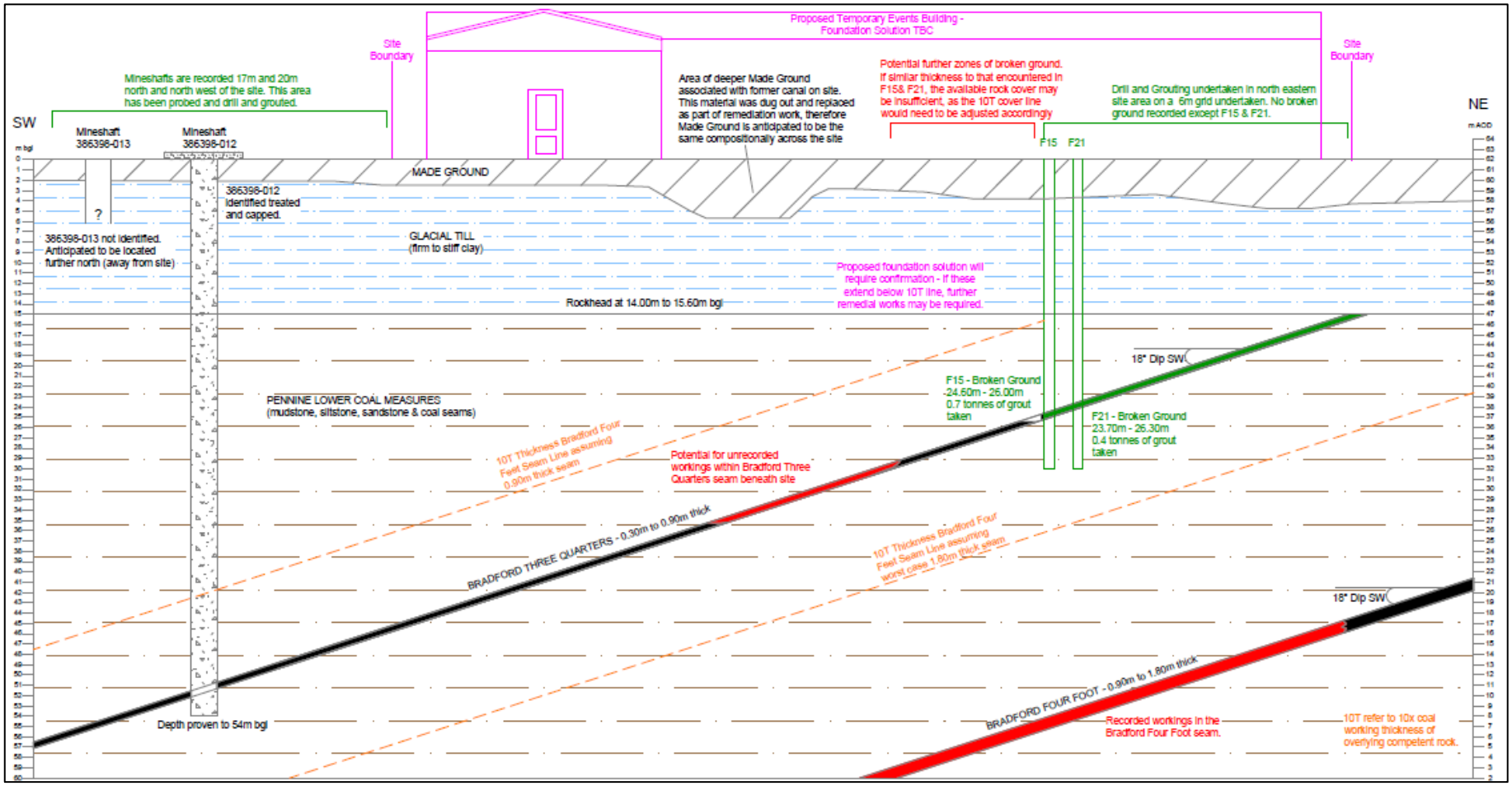


Figure 9: Extract of the conceptual ground model.

3.9 Discussion of Findings

The **Bradford Three Quarters** coal seam is recorded to subcrop in the north-eastern part of the site and to dip beneath the wider area. Previous drill & grout treatment undertaken in the north eastern section of the site targeted this seam, with the majority of the holes proving the coal to be intact, ranging in thickness from approximately 0.40 m to 0.90 m.

As the drilling & grouting did not encompass the full site area, it is anticipated that untreated sections of the seam remain present at depths of around 24m and greater beneath other parts of the site. Broken ground potentially attributed to workings was encountered in grout holes F15 and F21. Consequently, there is a residual risk of unrecorded historical workings within the **Bradford Three Quarters** seam outside the previously treated zone. In addition, recorded historical workings are present within the **Bradford Four Foot** seam at depths of approximately 47 m and greater beneath the site.

The workings in this area recorded to have been abandoned by 1891 and are likely to have been mined via early pillar and stall methods. Boreholes in the area do not record groundwater levels within the bedrock or workings, therefore no assessment on the effect of changing groundwater levels or climate change can be made on the stability of the workings.

Bedrock was encountered consistently across the site at depths ranging from approximately 14.00 m to 15.60 m bgl. As a result, initial consideration of potential stability risks associated with historical coal workings can be informed by the commonly applied 10:1 (10T) “rule of thumb”. This rule provides a preliminary indicator of whether sufficient rock cover exists above a coal working to reduce the likelihood of crown-hole collapse. Under the 10T principle, the thickness of competent overburden should exceed ten times the extracted coal thickness to be regarded as providing adequate cover.

However, the 10T rule is only an initial screening tool and should not be relied upon in isolation. A more detailed assessment must take account of the site-specific geological conditions, the nature and geometry of any workings, and relevant

engineering considerations. These factors should be evaluated in accordance with the guidance set out in CIRIA C758: Abandoned Mine Workings Manual (2019), as referenced below.

Factor	Circumstance for cover criterion to be decreased from 10T	Site specific consideration	Acceptability
Strata Dip	Greater than 20° dip of underlying strata.	Bedrock dips are recorded at 18˚ within workings of the **Bradford Four Foot** coal seam beneath the site.	10T applicable
Groundwater	Groundwater flow and changes in groundwater level. Where strong flows are recorded this could result in erosion or washing away of collapsed material	No significant groundwater was encountered during the ground investigation works. Perched water was noted within Made Ground deposits during previous ground investigation works but were not recorded to be significant. No records of groundwater levels are recorded in the underlying workings or available boreholes.	10T applicable
Multiple Seam extraction	Influence of lower seams, particularly if closely spaced.	Based on the conceptual ground model, the **Bradford Three Quarter** and **Bradford Four Foot** are separated by c. 29m of mudstone and therefore any workings are not anticipated to directly influence one another. The next recorded workings in the sequence below the **Bradford Four Foot** are at a depth of 268m bgl.	10T applicable
Ground Investigation information	Where uncertainty remains regarding gathered information e.g. blind openhole drilling due to loss of flush.	Soft drilling and lost flush was recorded in drill & grout holes from 23.70m to 26.00m bgl in drill holes F15 and F21 only. These drill holes were subsequently grouted with relatively low grout takes (0.4 and 0.7 tonnes).	10T applicable
Roof Strata	Where the overlying rock strata is not considered competent	The bedrock overlying the working was not recorded to be heavily fractured or worked. No loss of flush was recorded in the overburden. The **Bradford Three Quarters** seam has been grouted in the north eastern site section up to the subcrop.	10T applicable
Low residual voidage	Where seam collapse has already occurred, or workings have been backfilled which could present as a smaller working / void than in reality.	No evidence of seam collapse in previous boreholes. The **Bradford Three Quarters** seam was recorded as intact in the majority of drill holes. The underlying workings in the **Bradford Four Foot** was recorded as a void in off-site BGS boreholes.	10T applicable
Foundation depth and type	Depth of foundations and whether these cross the 10T line. Abnormally large loads should also be considered.	Loadings are not anticipated to be abnormal given it is for a low-rise temporary development. **Foundation solution is unknown at this stage**.	10T applicable

Upon consideration of the geological setting and factors that may affect the applicability of the 10T rule, it is deemed appropriate to use this rule for the **Bradford Three Quarters** and **Bradford Four Foot** seams beneath the site.

The **Bradford Four Foot** seam has a maximum recorded thickness of approximately 1.80m in the local area. Applying the 10:1 (10T) rule, a minimum of around 18m of competent overburden would be required to provide sufficient cover to prevent potential crown-hole development or upward void migration. The overlying **Bradford Three Quarters** seam is recorded to lie approximately 29m above the **Bradford Four Foot** seam, indicating that more than adequate rock cover is present above the recorded workings. On this basis, the likelihood of residual ground movement propagating to the surface from the **Bradford Four Foot** seam workings is considered to be low.

The **Bradford Three Quarters** seam was recorded with thicknesses of up to approximately 0.90m in the drill & grout boreholes in the north eastern part of the site. Applying the 10:1 rule, a minimum of 9m of competent rock cover would be required to prevent potential upward migration of any unrecorded voids in the seam. The depth at which 9m of cover is achieved broadly coincides with the extent of the historic drill & grout treatment undertaken on the site. As the seam dips towards the south west, any unrecorded workings in the central or western parts of the site are anticipated to be positioned at greater depths and therefore benefit from sufficient competent overburden to limit the risk of instability.

However, broken ground, loss of flush and elevated grout takes potentially attributed with workings were recorded in drill holes F15 and F21. In these locations, the broken ground was recorded to extend to a thickness of 1.40m and 2.60m in F15 and F21 respectively. Although these holes were grouted, they were on the edge of the previous treatment area and no further holes were undertaken to the west of them. If further broken ground is present to the west of a similar thickness, then there would not be sufficient bedrock cover based on the 10T rule in this localised area.

It is recommended that further investigative works are undertaken immediately west of the previously grouted area to confirm whether additional zones of broken ground, of similar thickness to those recorded in boreholes F15 and F21, are present. The findings will determine whether supplementary grouting is required in this localised area. The 10T (10:1) cover line above the **Bradford Three Quarters** seam based solely on a 0.90 m seam thickness (rather than the greater broken ground

thicknesses recorded in F15 and F21), is illustrated on the conceptual ground model presented in Appendix 2.

The proposed foundation solution should be confirmed as the design progresses, and consultation with a specialist piling contractor is recommended prior to development. This will enable proposed pile depths to be established, where piling is adopted, and ensure that any pile toe levels remain above the 10T line to avoid potential interaction with the seam or any unrecorded workings.

3.9.1 Mine Entries

2 No. mine entries are recorded approximately 17m and 20m north of the site. Mine entry 386398-012, located 17m to the north, has been identified on the ground, treated by grouting, and capped. The second entry, 386398-013, has been subject to a comprehensive probing investigation involving 150 probe holes. Although the shaft was not positively located, the investigation concluded that it is likely situated further to the north (away from the site), based on the probing coverage, which extended between the site boundary and the anticipated shaft position. On this basis, both mine entries are considered to be located off site.

Bedrock was encountered at approximately 15 m bgl across the site. As the two recorded mine entries are located 17m and more than 20m to the north of the site, they lie outside the notional 45° zone of influence projected from rockhead in accordance with CIRIA guidance. On this basis, the mine entries are not anticipated to influence the proposed development.

Additional mine entries are recorded in the surrounding area around the site. The majority of these mine entries were searched for and treated as part of the wider remediation works carried out between 2002 and 2010. For further details of the mineshaft locations and treatment, refer to the '*Mineshaft Location and Details Plan'* included in Appendix 2.

3.10 Mine Gas Risk Assessment

Possible shallow coal workings were identified as a potential mine gas source. Following the works detailed in this document, including an intrusive ground investigation, the conceptual site model with respect to mine gas emissions has been updated below:

The Mining Remediation Authority Coal Mining Consultants Report (Ref: 51003456832001) states that the shallowest recorded past underground mining is at 47m bgl beneath the site within the **Bradford Four Foot coal seam** with a recorded extraction thickness of 1.20m. Based on the thickness of the voids and flush loss encountered in off-site BGS boreholes, the workings are consistent with the **Bradford Four Foot coal seam**. There is also the potential for unrecorded workings within the shallow **Bradford Three Quarters** seam.

The information held by the Mining Remediation Authority indicate that the **Bradford Four Foot coal seam** was last worked beneath the site in 1760. The maximum risk associated with mine gas is immediately upon close of the mine as mine gas (primarily methane and carbon dioxide) is not generated from coal mines in the same way as landfill sites, instead methane is produced as part of the coal formation process and may also be present in the rocks surrounding the seam. Methane in coal is not generally mobile and is not emitted to the surface in sufficiently large quantities to pose a risk unless mining takes place. When coal is mined or a borehole is drilled into an intact seam, the coal is fractured and the stored gas desorbs into the borehole. The release of carbon dioxide also occurs due to oxidation of coal.

From the moment that coal is exposed to air, it is subject to low temperature oxidation by atmospheric oxygen. Therefore, based on the time since the coal was last worked (250+ years), methane and carbon dioxide generation is likely to be low. It is unknown whether the recorded workings are flooded as no groundwater information is available regarding the underground workings, however, if they are flooded the risk of mine gas emissions is further reduced.

Based on previous ground investigation undertaken, it is anticipated that there is c. 12m of Glacial Till present on the site comprising low permeability firm to stiff clay.

The presence of fine grained deposits reduces the potential for vertical migration as a viable pathway for mine gas from the underlying workings.

8 No mine shafts are recorded to the north, east and west of the site. The nearest 2 No. shafts are recorded c. 17m and 20m north of the site (Ref: 386938-012 and 386398-013). Faults and mine shafts are recognised as potential vertical pathways for the migration of mine gases from underlying workings. Although these off-site shafts remain potential pathway features, it is noted that Shaft 386938-012 has been identified, grouted, and capped as part of previous remediation works, which significantly reduces the likelihood of it acting as a viable gas pathway. Shaft 386398-013 has been subject to extensive probing but was not located, and therefore the residual mine gas pathway risk associated with this feature remains.

The foundation solution for the development is currently unknown; therefore, the mine gas risk assessment should be reviewed and updated once a final foundation strategy has been confirmed following intrusive ground investigation works. If a piled foundation solution is adopted, the piles themselves are not considered to represent a feasible gas-migration pathway, as they remain in intimate contact with the surrounding ground and do not create open vertical conduits.

Ground-improvement using vibro stone columns (VSC) may be feasible for the proposed development, subject to consultation with a specialist contractor and the project structural engineer. However, the introduction of stone columns would significantly increase the number of potential vertical pathways for gas migration. This should be carefully considered in any updated mine gas risk assessment.

If ground gas and groundwater monitoring wells are installed as part of future ground investigation, it is recommended that prior to development, the ground gas monitoring wells are appropriately decommissioned.

Based on the above findings and assessment, the site is deemed to be at moderate risk based on the CL:AIRE Good Practice for Risk Assessment of Coal Mine Gas Emissions (October 2021) Figure 13.1: Decision support tool for mine gas risk assessment.

Based on the conceptual site model, although shallow workings have been identified beneath the site, the risk of mine-gas migration is considered to be reduced due to several mitigating factors. These include the significant time elapsed since the workings were last active, the presence of low-permeability overlying deposits (clay and mudstone), and the previous grouting treatment undertaken both on-site and at nearby off-site mine shafts. Taking these factors into account, the mine gas risk is assessed as **moderate**. Accordingly, remedial measures in the form of appropriate ground gas protection systems will be required, subject to confirmation following detailed design and the results of ground gas monitoring undertaken during Phase 2 geo-environmental investigations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The desk study works indicated that recorded workings are present at a depth of 47m within the **Bradford Four Foot** seam beneath the site and there is a risk of further shallow unrecorded workings within the **Bradford Three Quarter** seam which subcrops on the site. The previous investigation and drill & grouting of the shallow **Bradford Three Quarter** seam in the north eastern site section has been considered in the assessment of risk from historical coal mining.

The north eastern part of the site has previously been treated through a drill & grout programme and is therefore not considered to be at significant risk from shallow historical workings. Given the dip of the bedrock and associated coal seams, the western section of the site is also considered to present a low risk, as the **Bradford Three Quarters** seam will occur at greater depths in this area.

The central part of the site and the eastern area immediately adjacent to the previously treated zone present a comparatively elevated risk, as this is where unrecorded shallow workings may be present. This assessment is supported by the presence of broken ground recorded during the drill & grout works, with thicknesses ranging from approximately 1.40m to 2.60m in boreholes F15 and F21. If this broken ground continues further westwards into untreated areas, the available rock cover may be insufficient to satisfy the 10T rule, indicating a potential need for further investigation or treatment.

It is recommended that rotary boreholes are undertaken targeting the central and eastern parts of the site to confirm whether additional zones of broken ground or unrecorded shallow workings are present. These should be carried out to a target depth of at least 30m bgl. The outcome of this investigation will determine whether further remediation (i.e. drill & grout treatment), is required to stabilise the site for the proposed development.

The foundation solution for the proposed structure is currently unknown. Further consultation with a specialist foundation contractor will be required to ensure that any foundation elements remain above the appropriate 10T (10:1) rock cover line and do not extend into zones where insufficient overburden may be present.

The off-site mine entries are not anticipated to be within influence of the proposed structure and therefore pose a low risk to the development. While there remains a possibility of unrecorded mine entries being present on site, this risk is considered low given the absence of supporting records and the significant site disturbance and turnover associated with previous remediation works.

Given the presence of shallow recorded coal workings and pathways in the form of mine entries, the site is deemed to be at a moderate risk of mine gas. Therefore, at this stage, ground gas protection measures are deemed necessary subject to further ground investigation works and the building design.

APPENDIX 1

LIMITATIONS OF INVESTIGATION WORK AND REPORT

LIMITATIONS OF REPORT

This consultancy report was compiled and carried out by IGE Consulting Limited ('IGE') for the client, as defined in the main report (the 'client'), on the basis of a defined programme and scope of works and the terms of a contract between IGE and the client. IGE undertook this with all reasonable skill and care, taking into account the limits of the scope of works required by the client, the prevailing site conditions, the time scale involved and the resources, including financial and manpower resources, agreed between IGE and the client. IGE cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outwith the agreed scope of works.

Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices. This report may not be relied upon, or transferred to, by any other party without the written agreement of its author. If a third party relies on this report, it does so wholly at its own and sole risk and IGE disclaims any liability to such parties.

It is IGE's understanding that this report is to be used for the purpose described in the 'Brief' section of this report. That purpose was a significant factor in determining the scope and the services to be provided. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without IGE's review and advice shall be at the client's sole and own risk.

The information contained in this report is protected by disclosure under Part 3 of the Environmental Information Regulations 2004 pursuant to the provisions of Regulation 12(5) without the consent in writing of a Director of IGE.

This report is a function of the date it was written and should be read in light of any subsequent changes in legislation, statutory requirements and industry practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of IGE. In the absence of such written advice of IGE, reliance on the report in the future shall be at the client's own and sole risk. Should IGE be requested to review the report in the future, IGE shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between IGE and the client.

The observations and conclusions described in this report are based solely upon the scope of works agreed between the client and IGE. IGE has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report. IGE is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the agreed scope of works. For the avoidance of doubt, this report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species (e.g. Japanese Knotweed). It is recommended that the client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification of asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace full and proper surveys.

LIMITATIONS OF INVESTIGATION WORK

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations, the potential exists for ground conditions to be encountered which are different to those considered in this report. The explored extent of the site area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried

out for a limited number of parameters, based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Exploratory Holes

Where exploratory holes have been carried out as part of this investigation, the spacing has been determined to provide a reasonable indication of the general ground conditions across the site, but the number has ultimately been limited by commercial constraints. The findings of the exploratory holes relate specifically to the exploratory hole locations and are no absolute guarantee of the ground conditions between such locations. Due allowance should be made for the possibility of variation in conditions between exploratory hole locations.

Extent of Contamination Testing

The extent of contaminated land testing carried out on samples obtained from the site has been determined in accordance with the latest legal guidance issued by the government to provide, with reasonable certainty, the probable general levels of contamination present on site that could pose a significant hazard to human health or waters. The extent of site investigation works including chemical testing has also been limited by reasonable commercial constraints. Although extensive testing of samples has been carried out, the volume of samples taken for testing are a minute fraction of the total volume of soils and groundwater present on site. Therefore, there is a residual risk that undetected pockets of contamination may be present on site, situated between testing locations.

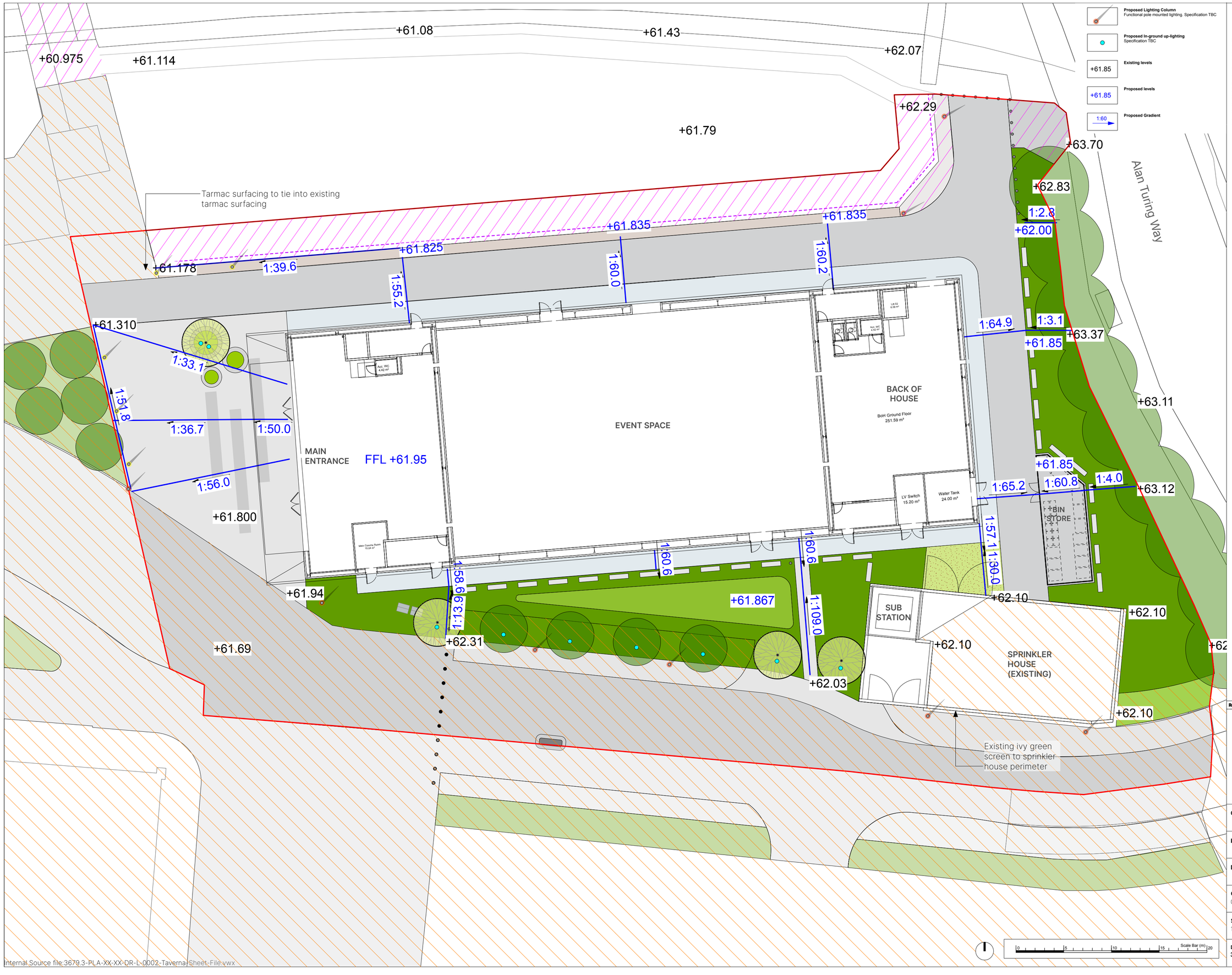
When investigating or developing potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and temporally. The absence of certain ground, ground gas, contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

Extent of Geo-Environmental Studies

This report is strictly limited to the nature of contamination contained within the ground and groundwater at the site. The report does not cover environmental aspects such as air or noise pollution and ground vibrations and the like. In addition, ecological matters relating to wildlife, flora and fauna have not been investigated as part of this report. In particular, the site has not been inspected for the presence or otherwise of invasive species e.g. Japanese Knotweed. It is recommended that the Client appoints a specialist in this subject to carry out a detailed inspection / survey of the site if its presence is suspected. Where mention has been made to the identification asbestos or asbestos-containing materials this is for indicative purposes only and does not constitute or replace a full and proper survey. If an Unexploded Ordnance (UXO) report has been obtained within the report, it has been so on the basis of Health and Safety concerns and no assessment has been made other than transcribing the recommendations of the sub-contractor contained within the report. In terms of a potential contaminative source, unless ordnance has been manufactured / stored on site, UXOs will only be determined as a contaminative source following a positive identification on site.

APPENDIX 2

FIGURES AND DRAWINGS



Proposed Lighting Column
Functional pole mounted lighting. Specification TBC

Proposed In-ground up-lighting
Specification TBC

Existing levels
+61.85

Proposed levels
+61.85

Proposed Gradient
1:60

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NOTES:
1. Do not scale from this drawing.
2. Always work to noted dimensions.
3. All dimensions are in millimetres unless otherwise stated.
4. All setting out, levels and dimensions to be agreed on site.
5. The dimensions of all materials must be checked on site before being laid out.
6. This drawing must be read with the relevant specification clauses and detail drawings.
7. Order of construction and setting out to be agreed on site.

Key

Ornamental Planting
Mixed shrub, herbaceous perennial and ornamental grass planting (plant species to tie into existing North Stand works)
Notes: 300mm topsoil oveer 400mm subsoil

Rain Garden Planting
Rain garden suitable planting mix
Notes: 300mm topsoil oveer 400mm subsoil

Climbers
Tensile wire system with climbing plants to soften and screen the new substation enclosure. Twining climber species - final extent to be coordinated with substation ventilation requirements

Proposed Street tree
Semi-mature tree
20-25cm girth
Notes: 300mm topsoil over 600mm subsoil

Existing Tree

Surface Type 1
Insitu concrete with large format precast concrete banding to arrival plaza

Surface Type 2
Concrete block paving to footpath around the perimiter of the building. Specification to be in keeping with the North Stand development

Surface Type 3
Tarmac to access road to match existing surfacing on North Stand development.

Surface Type 4
Filter Drain along northern edge of access road to form part of the drainage strategy

Surface Type 5
Reinforced grass to sprinkler house access point

Large pre cast concrete planters
Placed in the arrival plaza, the raised concrete planters help soften the entrance facade and allow people to perch on the planter edge

Fixed Bollard
To form HVM line. Specification TBC

Fixed Concrete Block
Fixed concrete block with gabion cladding / artwork to improve appearance. To form HVM line. Specification TBC

Timber Post and rail fence
1.2m high to the northern edge of the access road
Product TBC

Bin Store
Steel frame with timber uprights and lockable gates.
Product TBC

Proposed Lighting Column
Column mounted projectors. Specification TBC

Area to Remain as Existing

Emerging Context Under North Stand Public Realm Works

Revision	Date	Description	Drawn	Apprvd.
P05	02/03/26	Incorporating Architects Comments	CB	SC
P04	27/02/26	Planning	CB	SPL
P03	30/01/26	Review and comment	CB	SPL
P02	28/01/26	For Review and Comment	CB	SPL
P01	22/01/226	For Review and Comment	CB	SPL

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T: 0161 928 9281

Client Manchester City Football Club

Project Project Taverna

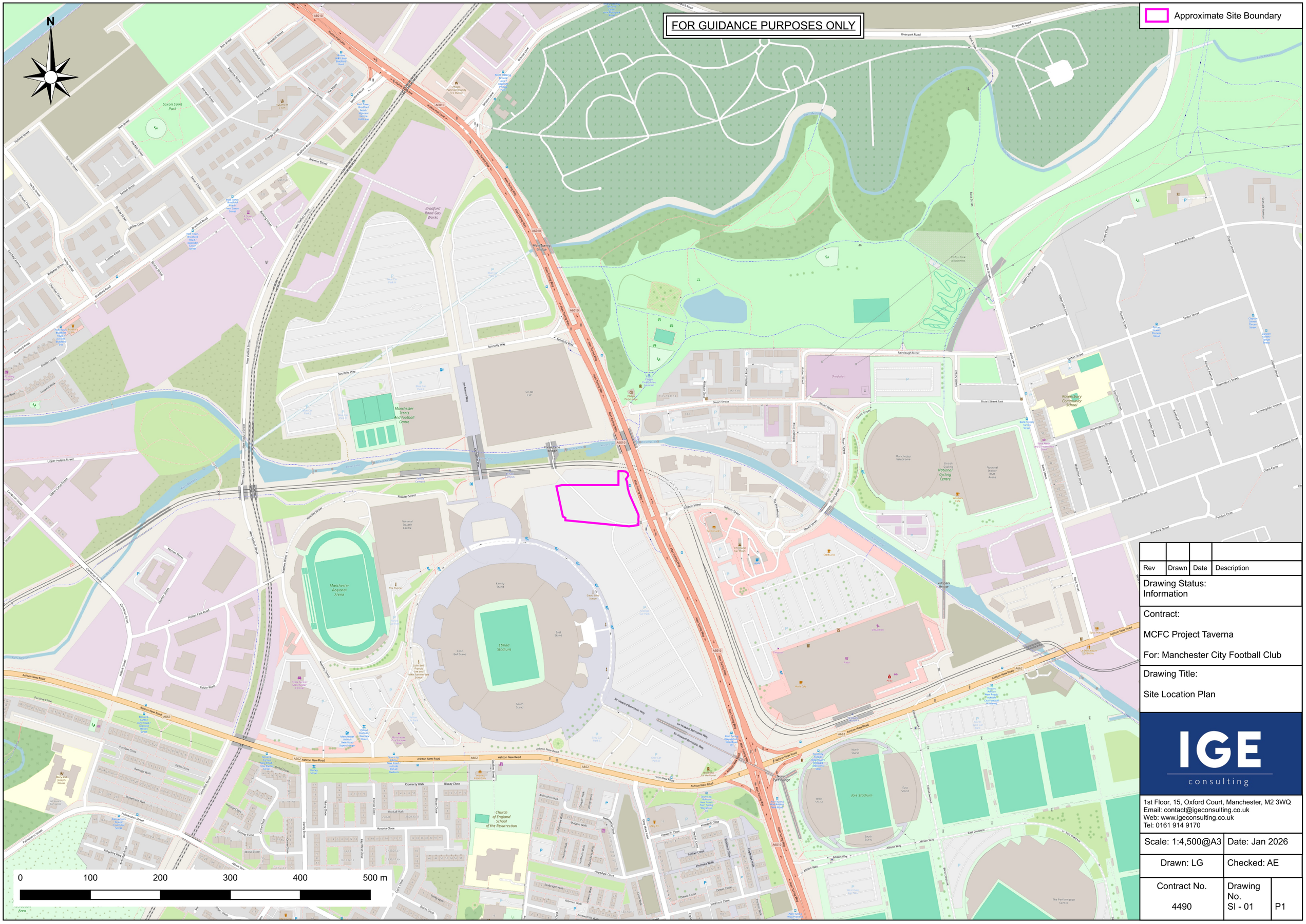
Drg Title Landscape General Arrangement

Created on	Created by	Approved by
09-01-26	CB	SPL

Scale	Size	Workstage
1:250	A2	Planning

Drg No. 3679.3-PLA-XX-XX-DR-L-0001
Suitability S2
Revision P05

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Rev	Drawn	Date	Description

Drawing Status:
Information

Contract:

MCFC Project Taverna

For: Manchester City Football Club

Drawing Title:

Site Location Plan

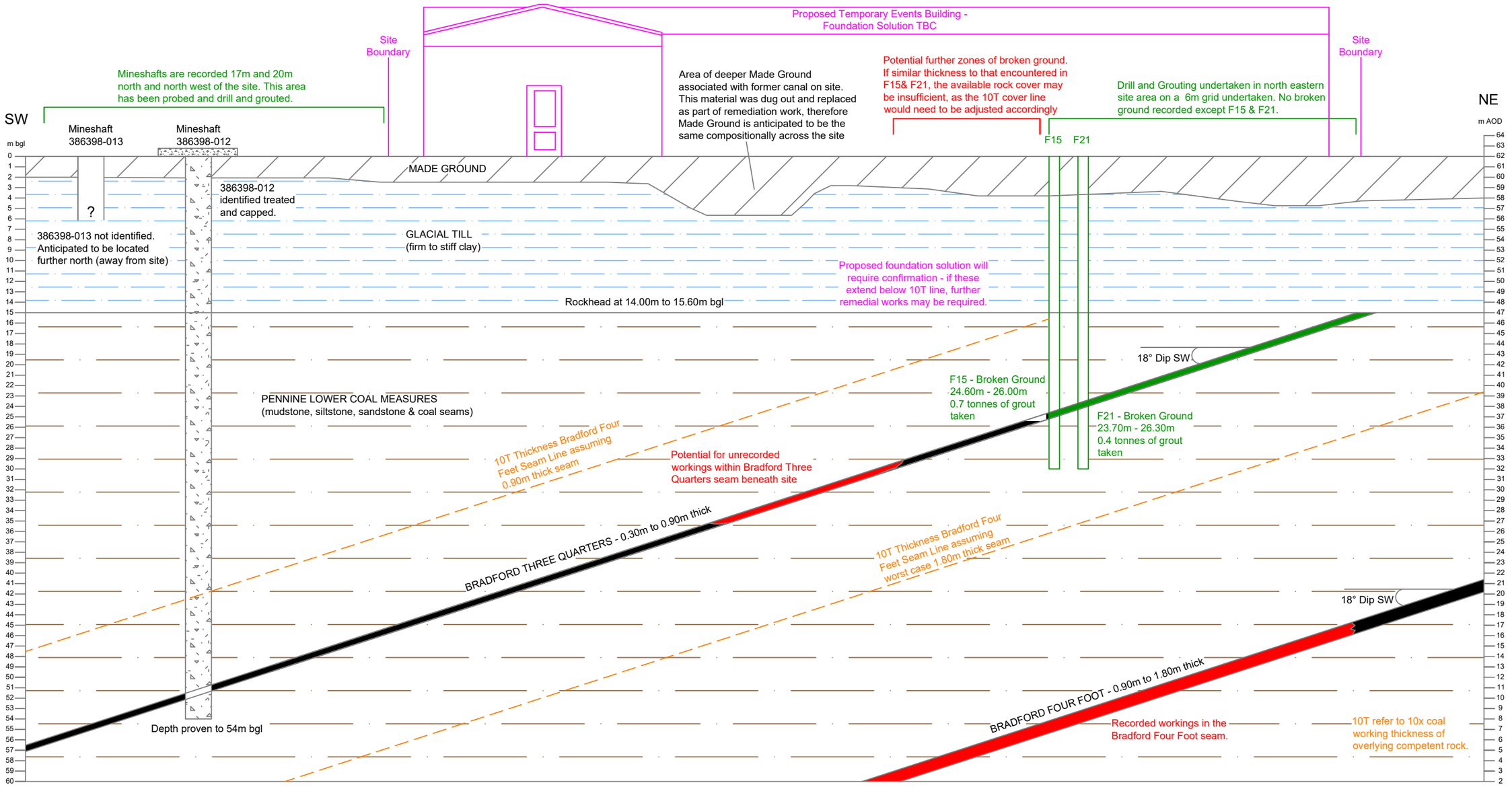
IGE consulting

1st Floor, 15, Oxford Court, Manchester, M2 3WQ
Email: contact@igeconsulting.co.uk
Web: www.igeconsulting.co.uk
Tel: 0161 914 9170

Scale: 1:4,500@A3	Date: Jan 2026	
Drawn: LG	Checked: AE	
Contract No. 4490	Drawing No. SI - 01	P1

Notes

1. This drawings is indicative and not to scale.
2. This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.



Rev	Drawn	Date	Description

Drawing Status
INFORMATION

Contract
MCFC PROJECT TAVERNA

FOR: MANCHESTER CITY FOOTBALL CLUB

Drawing Title
CONCEPTUAL GROUND MODEL

IGE consulting

1st Floor, 15, Oxford Court, Manchester, M2 3WQ
email: contact@igeconsulting.co.uk
web: www.igeconsulting.co.uk

Scale	Date	
NTS	MAR 2025	
Drawn AL	**Checked** AE	
Contract No. 4490	**Drawing No.** SI - 05	P1

FOR GUIDANCE PURPOSES ONLY

Approximate Site Boundary
Mineshafts
Coal Seam Subcrops

Bradford Three Quarters

Bradford Four Foot Coal

Charlotte Coal

Openshaw Coal

TREATED
Identified and found to be filled. Further consolidation through cement grout was undertaken in 2005. Pressure grouted to a depth of 25m utilising 10 tonnes of grout in 2001.

387398-005

387398-006

386398-017

386398-011

UNKNOWN
Mineshaft is recorded to be verified but treatment details (if any) are unknown.

TREATED
Pressure grouted to a depth of 24m

386398-006

386398-005

TREATED
Pressure grouted to a depth of 40m utilising 25.5 tonnes of grout.

386398-013

386398-012

UNKNOWN
Search with 150 probe holes undertaken in 2010. Shaft not located.

TREATED
Pressure grouted to a depth of 40m utilising 25.5 tonnes of grout.

TREATED
Pressure grouted to a depth of 40m utilising 31 tonnes of grout in 2001. Validation & additional grouting to 54m bgl carried out in 2010.

387398-032

TREATED
Pressure grouted to a depth of 25m utilising 10 tonnes of grout in 2001.

Forge Lane Bridge

Ashton Canal

Mill Street Lock

Alan Turing Way

Gibbon Street

Joe Mercer Way

0 20 40 60 80 100 m

Rev	Drawn	Date	Description

Drawing Status: Information

Contract:
MCFC Project Taverna
For: Manchester City Football Club

Drawing Title:
Mineshaft Locations & Details

IGE consulting
1st Floor, 15, Oxford Court, Manchester, M2 3WQ
Email: contact@igeconsulting.co.uk
Web: www.igeconsulting.co.uk
Tel: 0161 914 9170

Scale: 1:1000@A3	Date: Feb 2026
Drawn: AL	Checked: AE

Contract No.	Drawing No.	
4490	SI - 06	P1

APPENDIX 3

HISTORICAL ORDNANCE SURVEY MAPS



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Map legend available at:
knowledge.groundsure.com/hubfs/groundsure_legend.pdf

Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1893
Scale:	1:2,500
Printed at:	1:2,500

N
W E
S

Date: 1893
Surveyed: 1893
Revised: 1893

Date: 1893
Surveyed: 1893
Revised: 1893

Contact us with any questions at:
info@groundsure.com
01273 257 755

Groundsure
LOCATION INTELLIGENCE

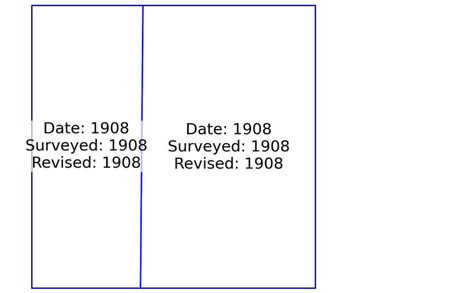
Ordnance Survey
Licensed Data

Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1908
Scale:	1:2,500
Printed at:	1:2,500

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info@groundsure.com
01273 257 755

386700 386800 386900 387000 387100 387200

399000 398900 398800 398700 398600 398500

0m 100m

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Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1922
Scale:	1:2,500
Printed at:	1:2,500

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Date: 1922
Surveyed: 1922
Revised: 1922

Date: 1922
Surveyed: 1922
Revised: 1922

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Map legend available at:
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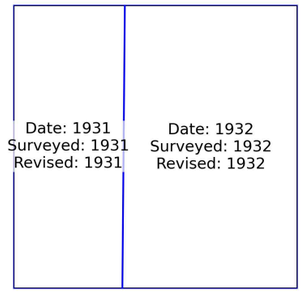
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LOCATION INTELLIGENCE

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1931-1932
Scale:	1:2,500
Printed at:	1:2,500



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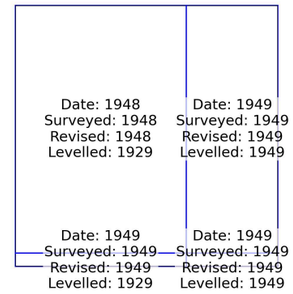
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

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

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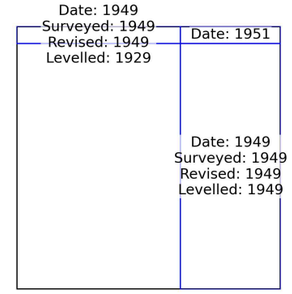
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1949-1951
Scale:	1:2,500
Printed at:	1:2,500





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250m 100m 100m 250m

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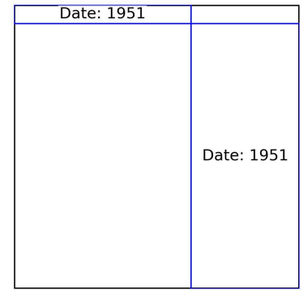
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1951
Scale:	1:2,500
Printed at:	1:2,500

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Map legend available at:
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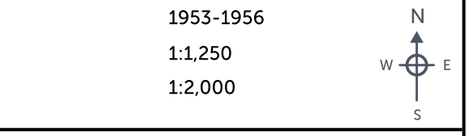
Groundsure
LOCATION INTELLIGENCE

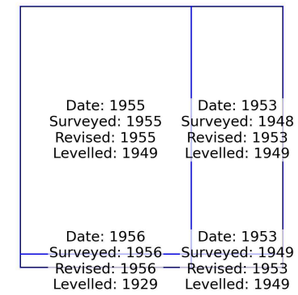
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1953-1956
Scale:	1:1,250
Printed at:	1:2,000





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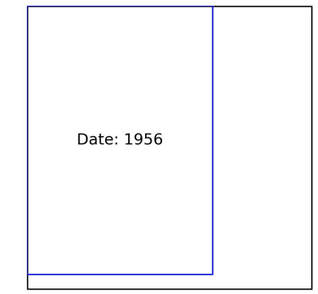
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

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

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386700 386800 386900 387000 387100

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250m
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HONLEY STREET
HUTCHINS STREET
PHILIP STREET
STUART STREET
FORGE LANE
PHILIPS PARK ROAD
ASHFIELD STREET
ABINDINE STREET
MIDDLEWOOD STREET
ELOON STREET
WOOLTON STREET
THORNBURY STREET
BENSON STREET
CHURCH STREET
BROOK PLACE
VIEW
Engine Shed
Div of PB & Ward Bdy
Def
Towing Path
Forge L ne Bridge
Lock
FB Overflow Weir
Brook's Buildings
Gratrix's Mills (Lead)
ess Bakery
Iron Foundry
Engineering Works
Shed
Lodge
Lav
Alma Hotel
Masonic Hotel (PH)
PCB
El Sub-sta
TCB
FB Lock
Weld Bdy
Beswick Goods Station
Travelling Crane
COLLIERY ARM
Bradford Iron Works (Wire)
Bradford Iron Works (Wire)
BM 200·07
BM 188·76
BM 203·31
BM 201·59
BM 202·36
CHESTER & ASHTON UNDER LYNE CANAL

0m 100m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

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

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250m
100m
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HONLEY STREET
HUTCHINS STREET
PHILIP STREET
STUART STREET
MILL STREET
PCB
El Sub Sta
BM 200·07
Travelling Crane
Forge Lane Bridge
Towing Path
MANCHESTER & ASHTON UNDER LYNE CANAL
Boro Const & Ward Bdy
Lock
F.B
Overflow Weir
Bradford Iron Works (Wire)
Brook's Buildings
Gratrix's Mills (Lead)
Bakery
PARK ROAD
PH
BM 202·66
Hammer Hotel (PH)
Lay
Laffee
D Fn
Chy
F A P
TCB
F B Lock
BH
ASHDENE STREET
ASHFIELD STREET
MIDDLEWOOD STREET
ELCOON STREET
BERWICK PLACE
WOLTON STREET
THORNBURY STREET
PARK VIEW
BM 201·59
BENSON STREET
Platform
Beswick Goods Station
Crane
Travelling Cranes
Iron Foundry
Shed
Engineering Works (Restaurant Equipment)
CHARLESWORTH STREET
WB
Wr Pl
CR

0m 100m

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LOCATION INTELLIGENCE

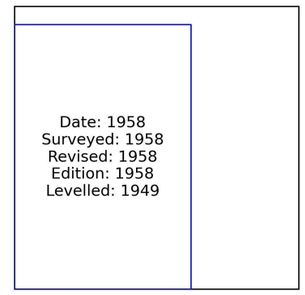
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1958
Scale:	1:2,500
Printed at:	1:2,500

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386700 386800 386900 387000 387100 387200

399000 398900 398800 398700 398600 398500

250m
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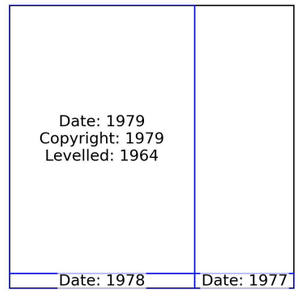
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1977-1979
Scale:	1:1,250
Printed at:	1:2,000

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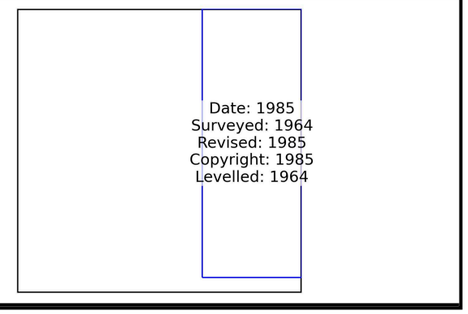
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1985
Scale:	1:1,250
Printed at:	1:2,000

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398900 398800 398700 398600 398500

250m 100m 100m

Playground NC Sc KINLOCH STREET CLAGUE STREET CAVENDISH PLACE Warehouse Union Works Lock Overflow Weir MP MP El Sub Sta BM 62.88m 61.8m Warehouse OXLEY STREET EDEN MILL STREET PRINCESS STREET QUIXALL STREET SLOANE STREET GIBBON Works Yard

0m 100m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1983-1987
Scale:	1:1,250
Printed at:	1:2,000

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Date: 1987
Surveyed: 1966
Revised: 1987
Copyright: 1987
Levelled: 1966

Date: 1985

Date: 1983
Surveyed: 1963
Revised: 1983
Copyright: 1983
Levelled: 1963

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398900 398800 398700 398600 398500

250m 100m 100m

0m 100m

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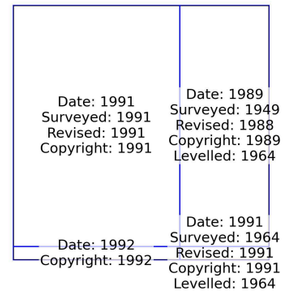
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1989-1992
Scale:	1:1,250
Printed at:	1:2,000

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398900 398800 398700 398600 398500

250m 100m 100m

Philips Park Playground Lodge PC Alexandra Hotel (PH) MILL STREET STUART STREET TORKINGTON STREET Towing Path Ashton Canal Forge Lane Bridge Lock FB Overflow Weir El Sub Sta PARK ROAD PH FELTON GROVE ASHFIELD STREET Foundry ILSHAM STREET CLASS STREET TOPAZ STREET Works BM 61.30m WILLDALE CLOSE KINLOCH STREET CLARE STREET CAVENDISH PLACE Warehouse Posts Tanks OXLEY STREET GIBBON STREET HILL STREET PRINCESS STREET QUIXALL STREET SLOANE STREET Scrap Yard Depot Tank

0m 100m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1992-1995
Scale:	1:1,250
Printed at:	1:2,000



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386700 386800 386900 387000 387100

398900 398800 398700 398600 398500

250m 100m 100m

Philips Park Playground Lodge Alexandra Hotel (PH) STUART STREET MILL STREET KINLOCH STREET CLASS STREET WILLDALE CLOSE CAVENDISH PLACE Warehouse Towing Path Ashton Canal Forge Lane Bridge FORGE LANE Lock Overflow Weir PH Posts Tanks El Sub Sta PHILIPS PARK ROAD HAILSHAM STREET ASHFIELD STREET Foundry GIBBON STREET OXLEY STREET Works Depot Scrap Yard PRINCESS STREET QUIXALL STREET SLOANE STREET

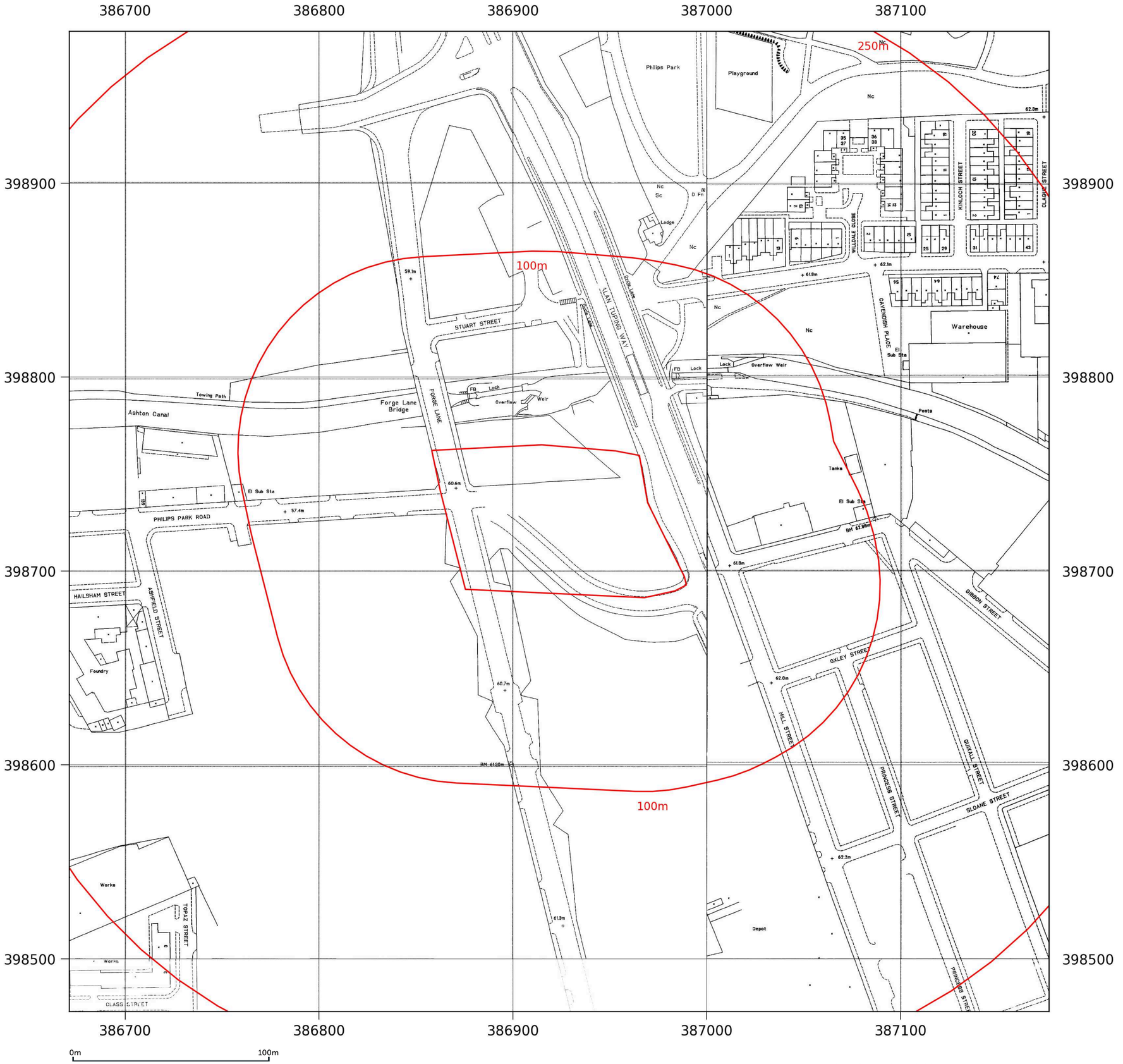
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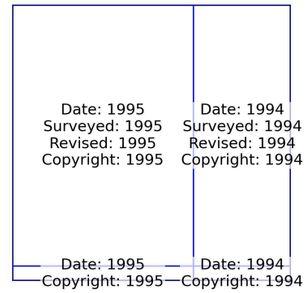
Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1994-1995
Scale:	1:1,250
Printed at:	1:2,000

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LOCATION INTELLIGENCE

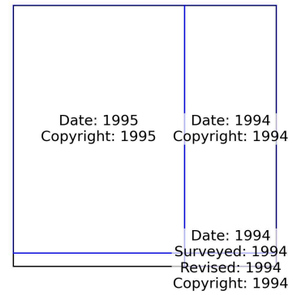
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1994-1995
Scale:	1:1,250
Printed at:	1:2,000

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386700 386800 386900 387000 387100

398900 398800 398700 398600 398500

250m 100m 100m

Philips Park Playground Nc Sc Lodge Nc 62.3m 59.9m 61.8m 62.0m 62.1m 62.2m 60.6m 57.4m 60.7m 61.3m BM 61.32m BM 62.88m

WILLDALE GLOBE KINLOCH STREET CLOSE STREET DAVENDISH PLACE El Sub Sta Warehouse Posts Tanks El Sub Sta

STUART STREET ALAN TURING WAY FORGE LANE Forge Lane Bridge Towing Path Ashton Canal Lock Overflow Weir FB Lo

PHILIPS PARK ROAD El Sub Sta HAILSHAM STREET ASHFIELD STREET Foundry

GIBBON STREET OXLEY STREET HILL STREET PRINCESS STREET QUIXALL STREET SLOANE STREET PRINCESS STREET

Works TOPAZ STREET Depot

0m 100m

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Map legend available at:
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Groundsure LOCATION INTELLIGENCE

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1995
Scale:	1:1,250
Printed at:	1:2,000

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386700 386800 386900 387000 387100

398900 398800 398700 398600 398500

250m
100m
100m

Playground
Nc
62.3m
KINLOCH STREET
CLARK STREET
WILLDALE CLOSE
+ 61.8m
+ 62.1m
CAVENDISH PLACE
Warehouse
El Sub Sta
Lock
Overflow Weir
Posts
BM 62.98m
GIBBON STREET
OXLEY STREET
QUIXALL STREET
SLOANE ST SET
PRINCESS STREET
L Twr

0m 100m

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LOCATION INTELLIGENCE

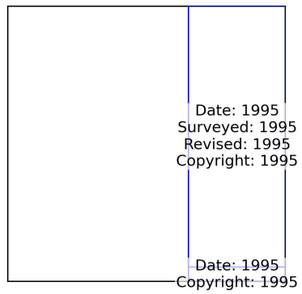
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1995
Scale:	1:1,250
Printed at:	1:2,000

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386700 386800 386900 387000 387100

398900 398800 398700 398600 398500

250m
100m
100m

Playground
Nc
62.3m
KINLOCH STREET
CLARENCE STREET
WILLDALE CLOSE
+ 62.1m
+ 61.8m
CAVENDISH PLACE
Warehouse
El Sub Sta
Lock
Overflow Weir
Posts
BM 62.86m
GIBBON STREET
OXLEY STREET
PRINCESS STREET
QUIXALL STREET
SLOANE STREET
L Twr

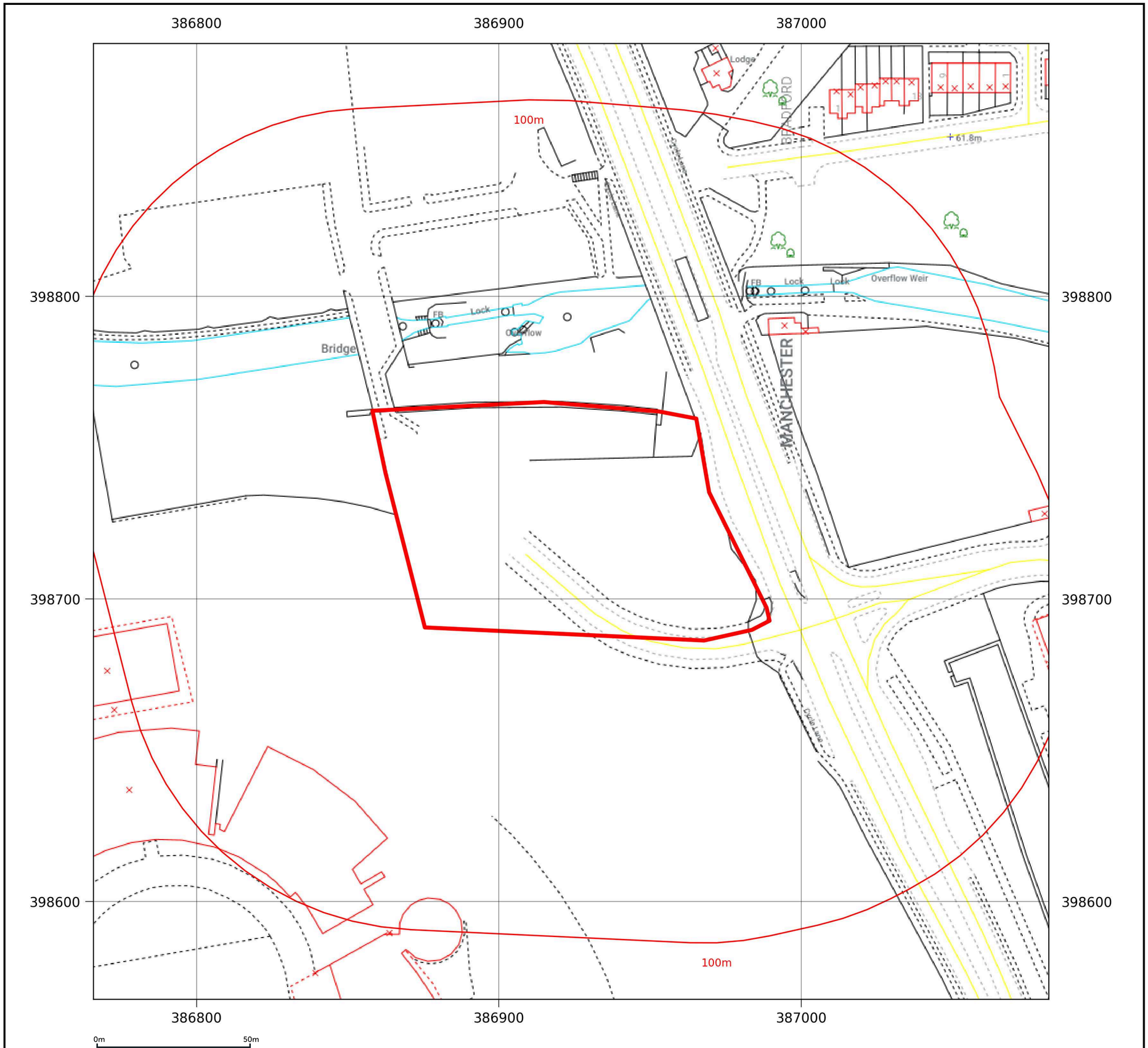
0m 100m

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Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	LandLine
Map date:	2003
Scale:	1:1,250
Printed at:	1:1,250

N
W E
S

Date: 2003

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info@groundsure.com
01273 257 755

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1848
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S

Date: 1848
Surveyed: 1845
Edition: 1848

Contact us with any questions at:
info@groundsure.com
01273 257 755

386000 386500 387000 387500 388000

400000 399500 399000 398500 398000 397500

750m
500m
500m
750m

0m 500m

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Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1890-1891
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S

Date: 1891
Surveyed: 1891
Revised: 1891

Date: 1890
Surveyed: 1890
Revised: 1890

Contact us with any questions at:
info@groundsure.com
01273 257 755

386000 386500 387000 387500 388000

400000 399500 399000 398500 398000 397500

250m 500m 750m

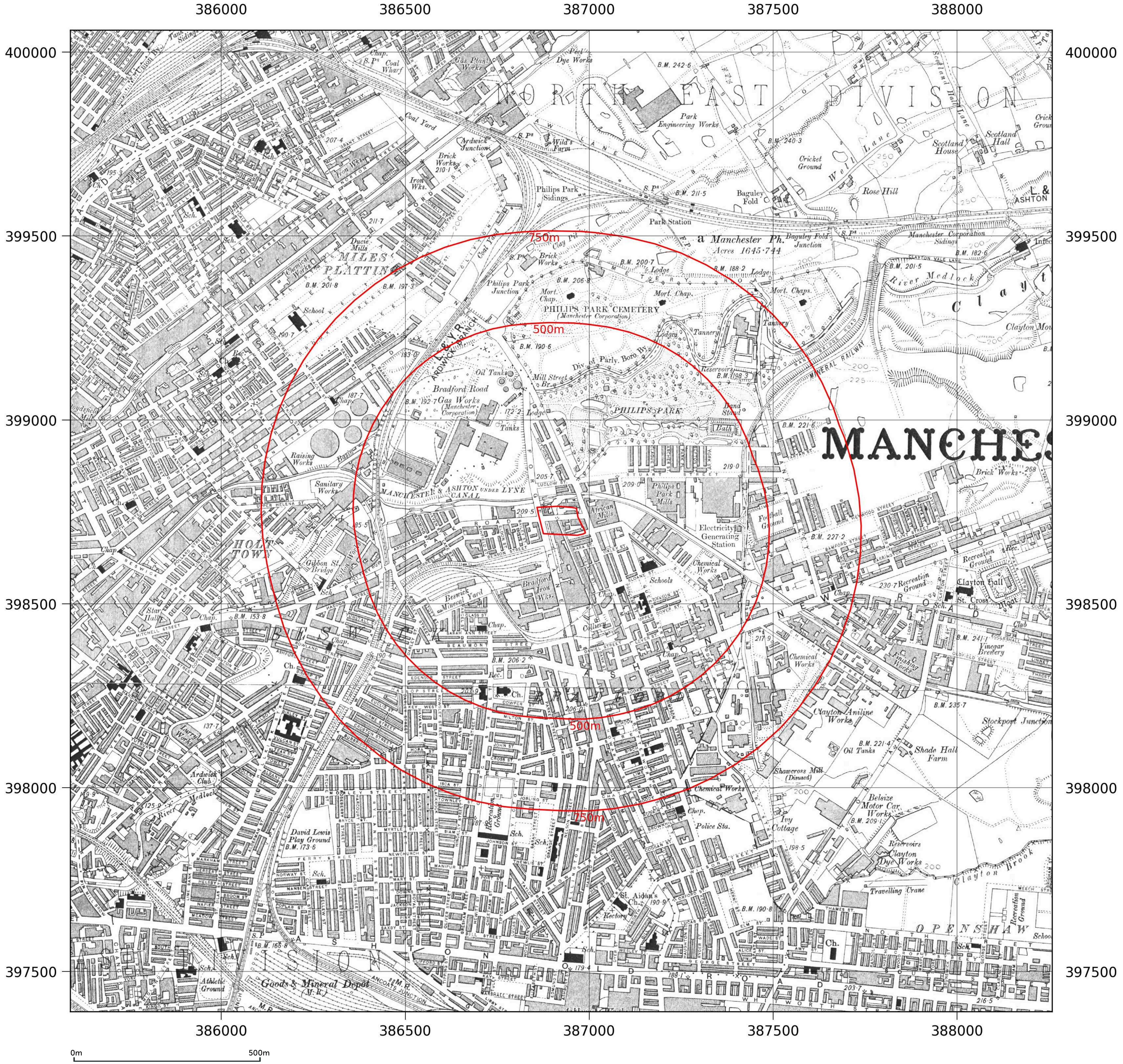
0m 500m

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Map legend available at:
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Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1905-1906
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S

Date: 1906
Surveyed: 1844
Revised: 1906

Date: 1905
Surveyed: 1844
Revised: 1905

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1915
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S



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info@groundsure.com
01273 257 755

386000 386500 387000 387500 388000

400000 399500 399000 398500 398000 397500

750m
500m

0m 500m

Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1921
Scale:	1:10,560
Printed at:	1:10,560

N W E S

Date: 1921
Surveyed: 1844
Revised: 1921

386000 386500 387000 387500 388000

400000 399500 399000 398500 398000 397500

750m
500m
500m
750m

0m 500m

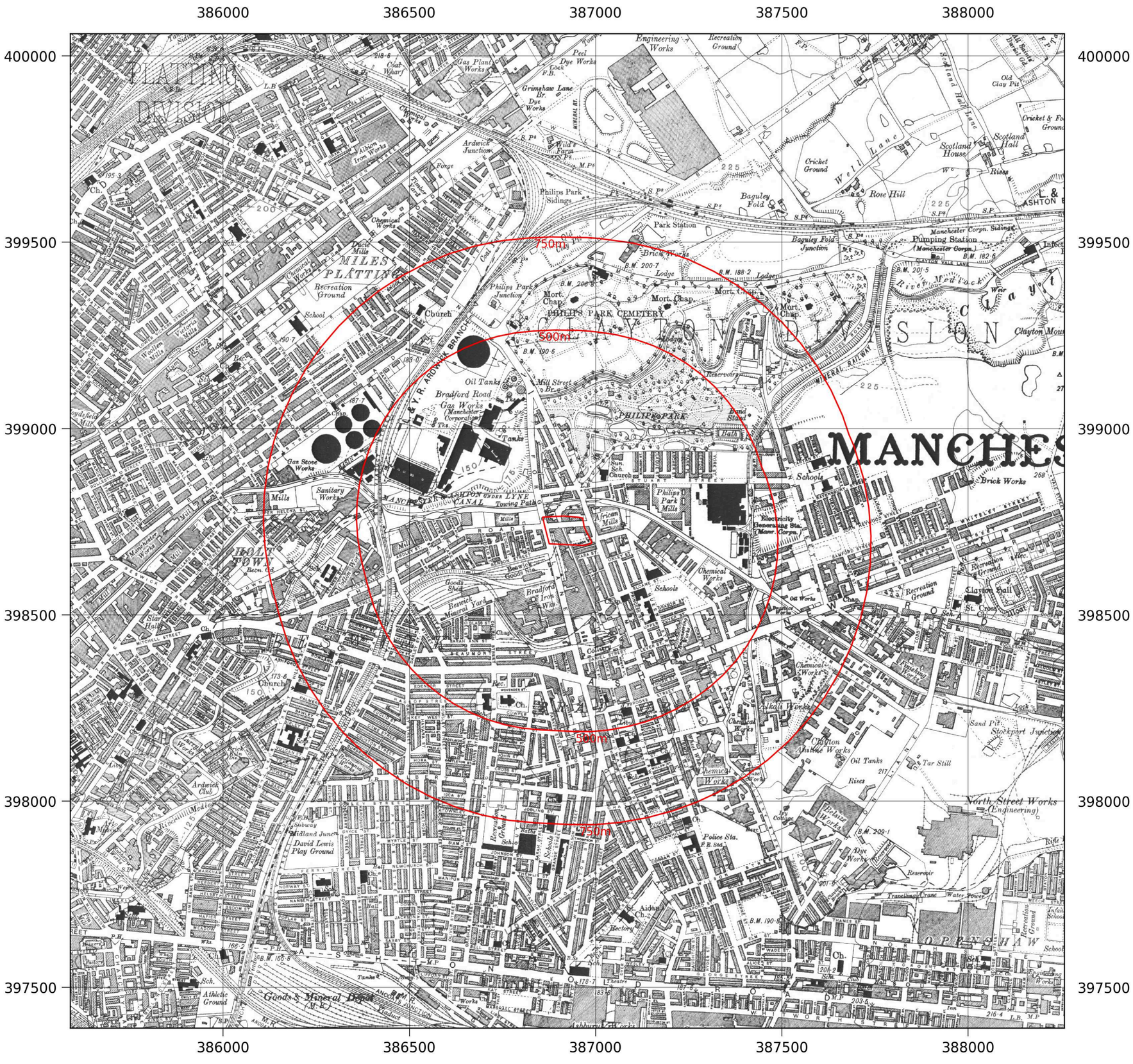
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1923
Scale:	1:10,560
Printed at:	1:10,560

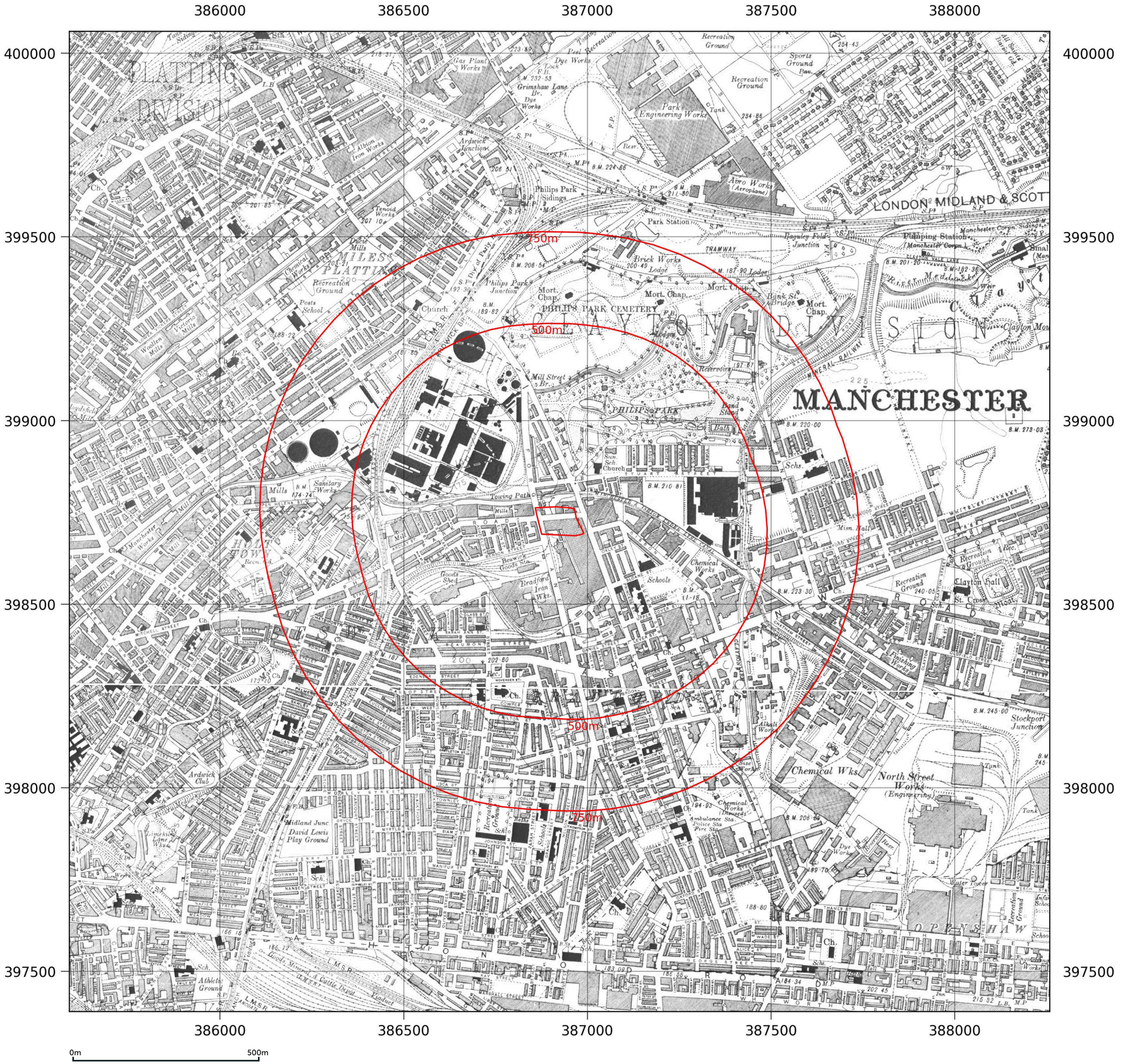
N
W E
S

Date: 1923
Surveyed: 1844
Revised: 1923

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1933-1934
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S

Date: 1933
Surveyed: 1844
Revised: 1933

Date: 1934
Surveyed: 1844
Revised: 1934

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	County Series
Map date:	1938
Scale:	1:10,560
Printed at:	1:10,560

N W E S

Date: 1938
Surveyed: 1844
Revised: 1938

Date: 1938
Surveyed: 1844
Revised: 1938

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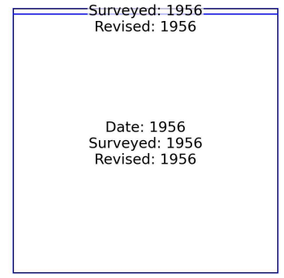
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knowledge.groundsure.com/hubfs/groundsure_legend.pdf

Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	Provisional
Map date:	1956
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S



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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	Provisional
Map date:	1966-1968
Scale:	1:10,560
Printed at:	1:10,560

N
W E
S

Date: 1966
Surveyed: 1966
Revised: 1966

Date: 1968
Surveyed: 1968
Revised: 1968

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1981
Scale:	1:10,000
Printed at:	1:10,000

N
W E
S

Date: 1981
Surveyed: 1976
Revised: 1980
Copyright: 1981
Levelled: 1976

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01273 257 755

386000 386500 387000 387500 388000

399500 399000 398500 398000 397500

750m 500m 500m 750m

Miles Platting Bradford Beswick

0m 500m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1985
Scale:	1:10,000
Printed at:	1:10,000

N
W E
S

Date: 1985
Surveyed: 1985
Revised: 1985

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	1991
Scale:	1:10,000
Printed at:	1:10,000

N
W E
S

Date: 1991
Surveyed: 1985
Revised: 1991

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386000 386500 387000 387500 388000

399500 399000 398500 398000 397500

750m 500m 500m 750m

Miles Platting Bradford Beswick

0m 500m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	2001
Scale:	1:10,000
Printed at:	1:10,000

N W E S

Date: 2001

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01273 257 755

386000 386500 387000 387500 388000

399500 399000 398500 398000 397500

0m 500m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	2010
Scale:	1:10,000
Printed at:	1:10,000

N
W E
S

Date: 2010

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01273 257 755

386000 386500 387000 387500 388000

399500 399000 398500 398000 397500

750m 500m 500m 500m

0m 500m

Map legend available at:
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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	2015
Scale:	1:10,000
Printed at:	1:10,000

N
W E
S

Date: 2015

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info@groundsure.com
01273 257 755

386000 386500 387000 387500 388000

399500 399000 398500 398000 397500

750m 500m 500m 500m

Miles Platting Bradford Beswick Philips Park Philips Park Junction Philips Park Cemetery Riverpark Trading Estate Bradford Park Rochdale Canal River Medlock Ashton Ca Metrolink

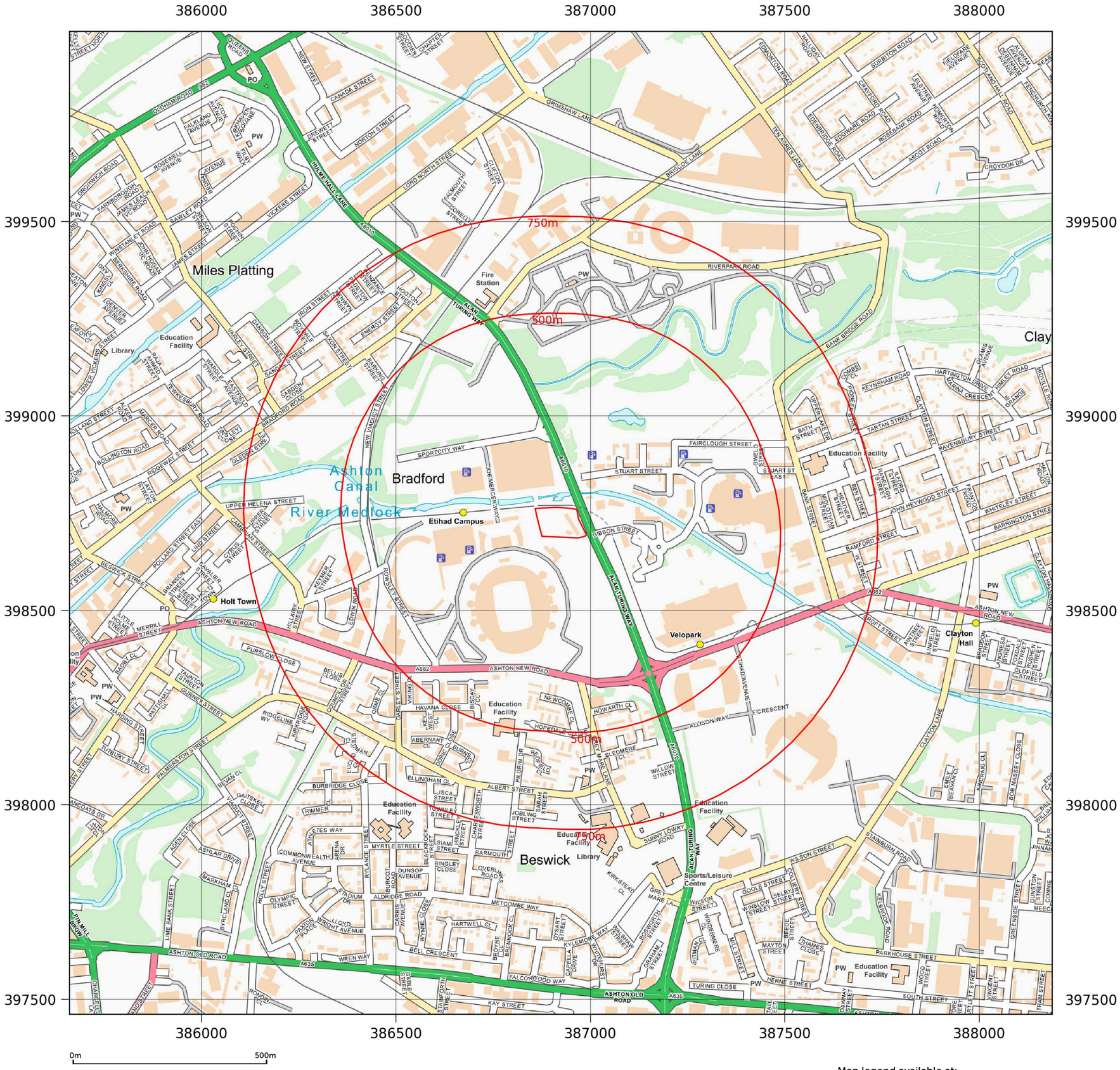
0m 500m

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Map Insight

Site details:	MCFC Entertainment
Client ref:	4490/LG
Report ref:	GS-RGU-MSH-7VL-P1N
Grid ref:	386921.48, 398725.28
Production date:	5 January 2026

Map name:	National Grid
Map date:	2025
Scale:	1:10,000
Printed at:	1:10,000

N
W E
S

Date: 2025

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APPENDIX 4

MINING REMEDIATION AUTHORITY CONSULTANTS COAL MINING REPORT AND PLAN

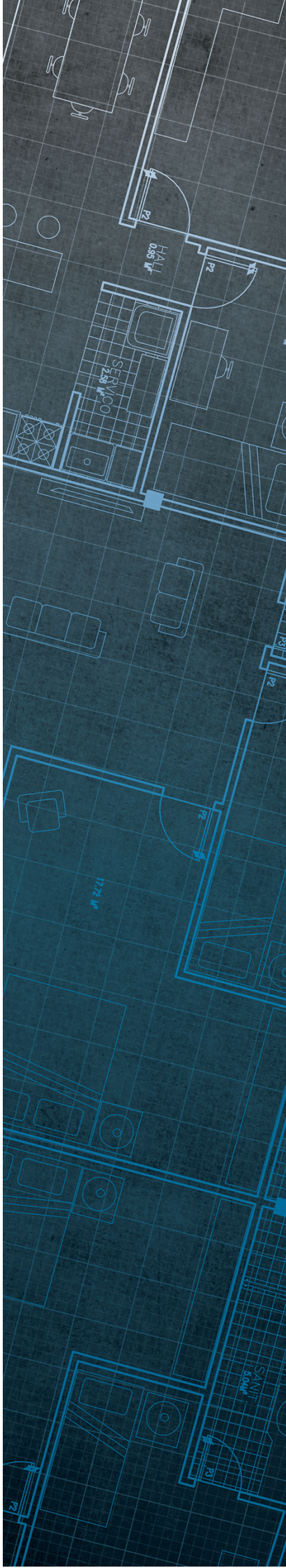
The Coal Authority

Consultants

Coal Mining Report

Mcfc
Gibbon Street
Manchester
Greater Manchester
M11 3FF

Date of enquiry:	**12 January 2026**
Date enquiry received:	**12 January 2026**
Issue date:	**12 January 2026**
Our reference:	**51003546900001**
Your reference:	**4490/LG**



Consultants
Coal Mining Report

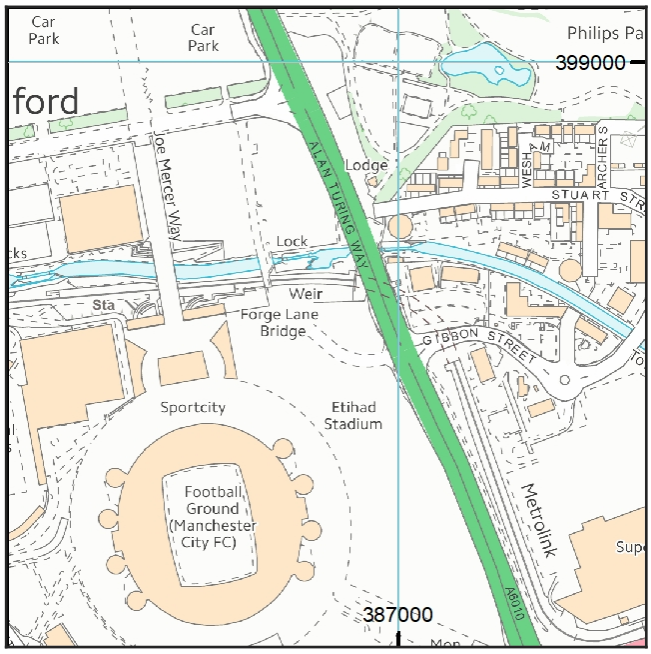
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Andrew Edwards

Enquiry address

Mcfc
Gibbon Street
Manchester
Greater Manchester
M11 3FF



Approximate position of property

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How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

reports@miningremediation.gov.uk

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	BRADFORD FOUR FEET	Coal	35CZ	47	Beneath Property	18.4	South-West	120	1760
unnamed	BRADFORD FOUR FEET	Coal	35CS	51	Beneath Property	18.4	South-West	120	1760
unnamed	DOCTOR	Coal	35CJ	268	North	18.0	South-West	40	1900
unnamed	TWO FEET	Coal	35CG	461	South	32.3	South-West	100	1880
unnamed	PARKER	Coal	35BS	471	Beneath Property	18.0	South-West	80	1935
unnamed	PARKER	Coal	35BL	517	North	18.0	South-West	80	1935
unnamed	PARKER	Coal	35BU	518	Beneath Property	18.0	South-West	80	1935
unnamed	PARKER	Coal	35BN	531	Beneath Property	18.0	South-West	80	1935
unnamed	PARKER	Coal	35BQ	531	North-West	22.5	South	80	1935
unnamed	PARKER	Coal	35BM	551	South-West	18.0	South-West	80	1935
unnamed	PARKER	Coal	35BP	568	West	18.0	South-West	80	1935
unnamed	PARKER	Coal	35BO	570	South-West	18.0	South-West	80	1935
unnamed	TWO FEET	Coal	35CH	615	South	34.0	South-West	100	1880
unnamed	ROGER	Coal	35AY	697	North	16.1	South-West	180	1961
unnamed	CROMBOUKE	Coal	359J	712	North-East	16.0	South-West	120	1933
unnamed	ROGER	Coal	35AT	722	North	16.9	South-West	170	1956
unnamed	CROMBOUKE	Coal	359G	724	East	13.5	South-West	120	1914
unnamed	ROGER	Coal	35AU	773	North	18.7	South-West	170	1956
unnamed	CROMBOUKE	Coal	359H	793	Beneath Property	17.4	South-West	120	1913
unnamed	CROMBOUKE	Coal	359F	796	North	21.0	South-West	120	1924
unnamed	ROGER	Coal	35AV	797	Beneath Property	19.4	South-West	170	1956
unnamed	CROMBOUKE	Coal	359E	801	Beneath Property	16.5	South-West	120	1932

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Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	ROGER	Coal	35AX	808	South-East	19.5	South-West	170	1945
unnamed	ROGER	Coal	35AZ	816	South-West	20.8	South-West	180	1957
unnamed	ROGER	Coal	35AW	817	South-East	19.6	South-West	170	1945
unnamed	ROGER	Coal	35B0	874	South-West	19.0	South-West	180	1958
unnamed	CROMBOUKE	Coal	359I	901	South	17.0	South-West	120	1913
unnamed	CROMBOUKE	Coal	359K	928	South	13.3	South-West	120	1947

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	386398-005	386801 398759	The shaft fill was pressure grouted to a depth of 40m. The total grout take for the shaft being 23 tonnes. The works were carried out by contractors acting for Amec Capital Projects Ltd.	Coal	
Shaft	386398-006	386850 398773	This shaft was pressure grouted to a depth of 40m with 25.5 tonnes of grout by conttactors acting on behlaf of AMEC Captial Projects Ltd.	Coal	
Shaft	386398-011	386948 398788	Treatment details unknown.*	Coal	
Shaft	386398-012	386921 398759	This shaft was pressure grouted in October 2001 to a depth of 40m with 31 tonnes of grout, the works having being carried out by Contractors acting for AMEC Capital Projects Ltd. In November 2010 a series of probe holes were drilled into and around the shaft and shaft capping to validate the previous works. Further grouting works were undertaken on the 6th December 2010 upwards from a depth of 54m bgl, in 2m stages, utilizing a total of 29 tonnes of a 10:1 pfa/cement grout mix. These works were undertaken under the supervision of BWB Consulting Ltd, Nottingham.	Coal	
Shaft	386398-013	386882 398761	In October 2010 this shaft was searched for but not found.	Coal	
Shaft	386398-017	386967 398792	Treatment details unknown.*	Coal	
Shaft	387398-005	387035 398814	This shaft was exposed in December 2005 during site investigations and found to be filled. The fill material was drilled to the full depth of the shaft and consolidated by injecting 3.75 tonnes of cement grout. These works were carried out by contractors Van Elle on behalf of Morrison Construction Services Ltd.	Coal	
Shaft	387398-032	387051 398720	This shaft was located during investigation works carried out in September 2001. The shaft was pressure grouted to a depth of 25m. The total grout take for the shaft being 10 tonnes. These works were undertaken by Contractors acting for AMEC Capital Projects Ltd.	Coal	

*For your information, before the coal industry was nationalised in 1947, there was no requirement for a mine operator to record mine entry treatment details when a mine was abandoned. Therefore, it is not unusual for us to have no treatment details for many of the 176,000 recorded mine entries on our database. Despite this lack of information, please be assured that the fact we have no treatment recorded does not necessarily mean that the mine entries were left untreated when abandoned.

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Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

2655	NW437	NW1168
NW1171	NW645	14917
NW1167	PO0	989

Our records show we have more plans than those shown above which could affect the enquiry boundary.

For assistance in identifying the specific abandoned mine plans relevant to your requirements, **please contact us at InformationManagers@MiningRemediation.gov.uk**.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
BRADFORD THREE QUARTERS	Coal	Yes	Within	N/A	134
BRADFORD THREE QUARTERS	Coal	Yes	16.6	East	315

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

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Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
Within	N/A
Within	N/A
Within	N/A
36.7	North
36.0	North
42.7	North
37.7	North
36.8	West

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices
The property is in an area where a notice to withdraw support was given in 1955.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

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Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please email us at reports@miningremediation.gov.uk.

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Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **email us at reports@miningremediation.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

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Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

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Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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The Coal Authority

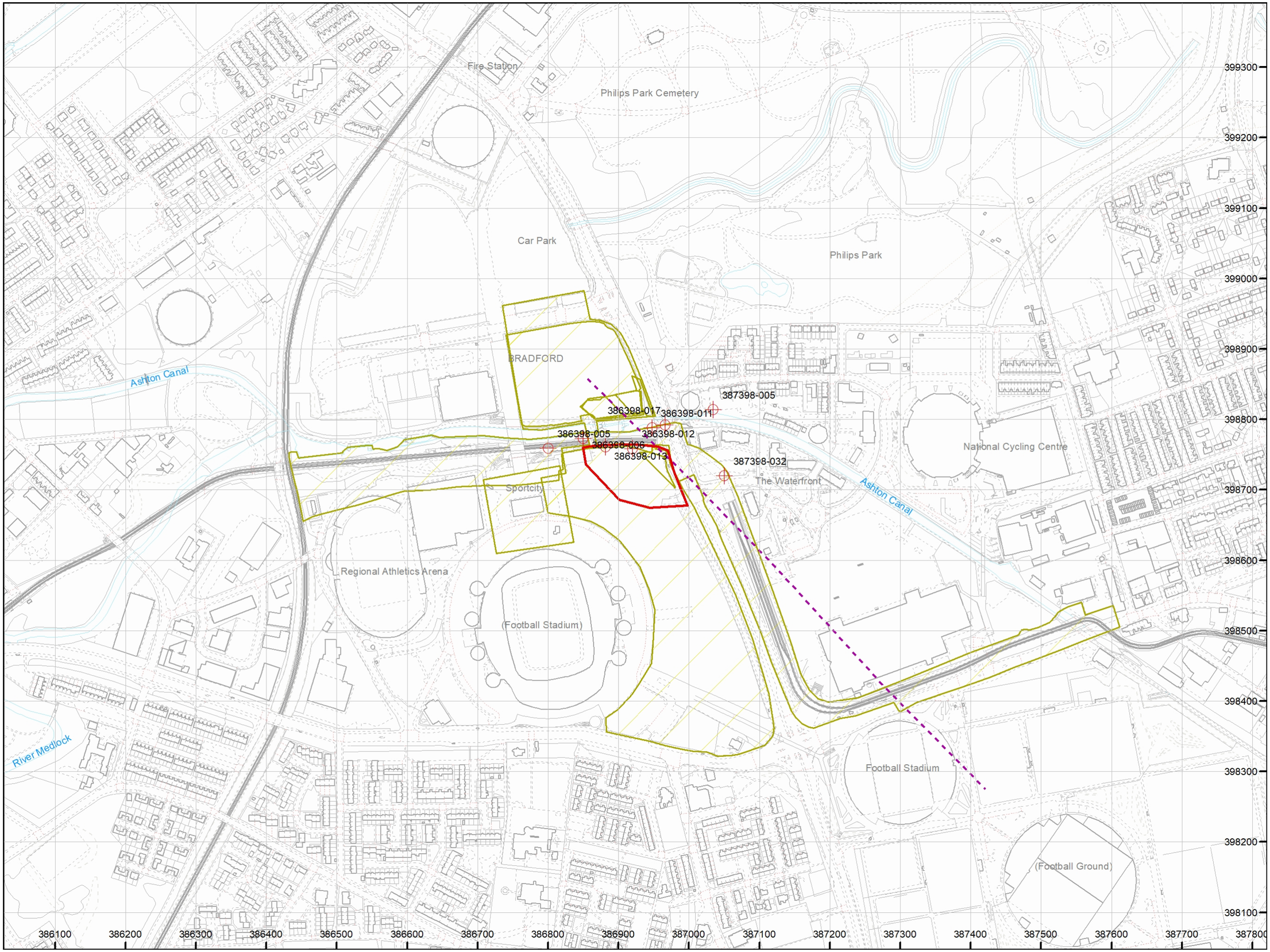
Summary of findings

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The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

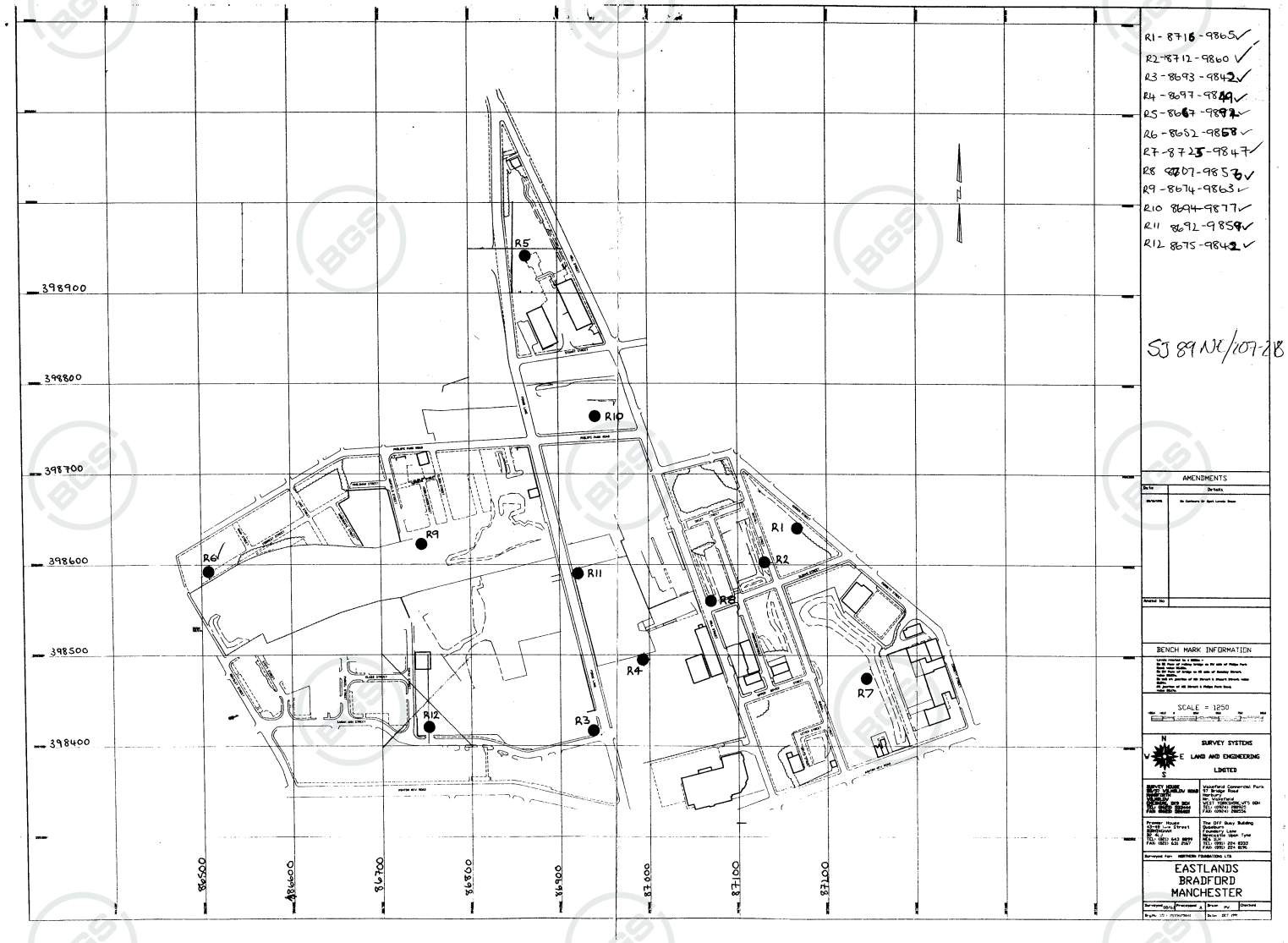
- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Outcrop (Conjectured)
- Site investigations

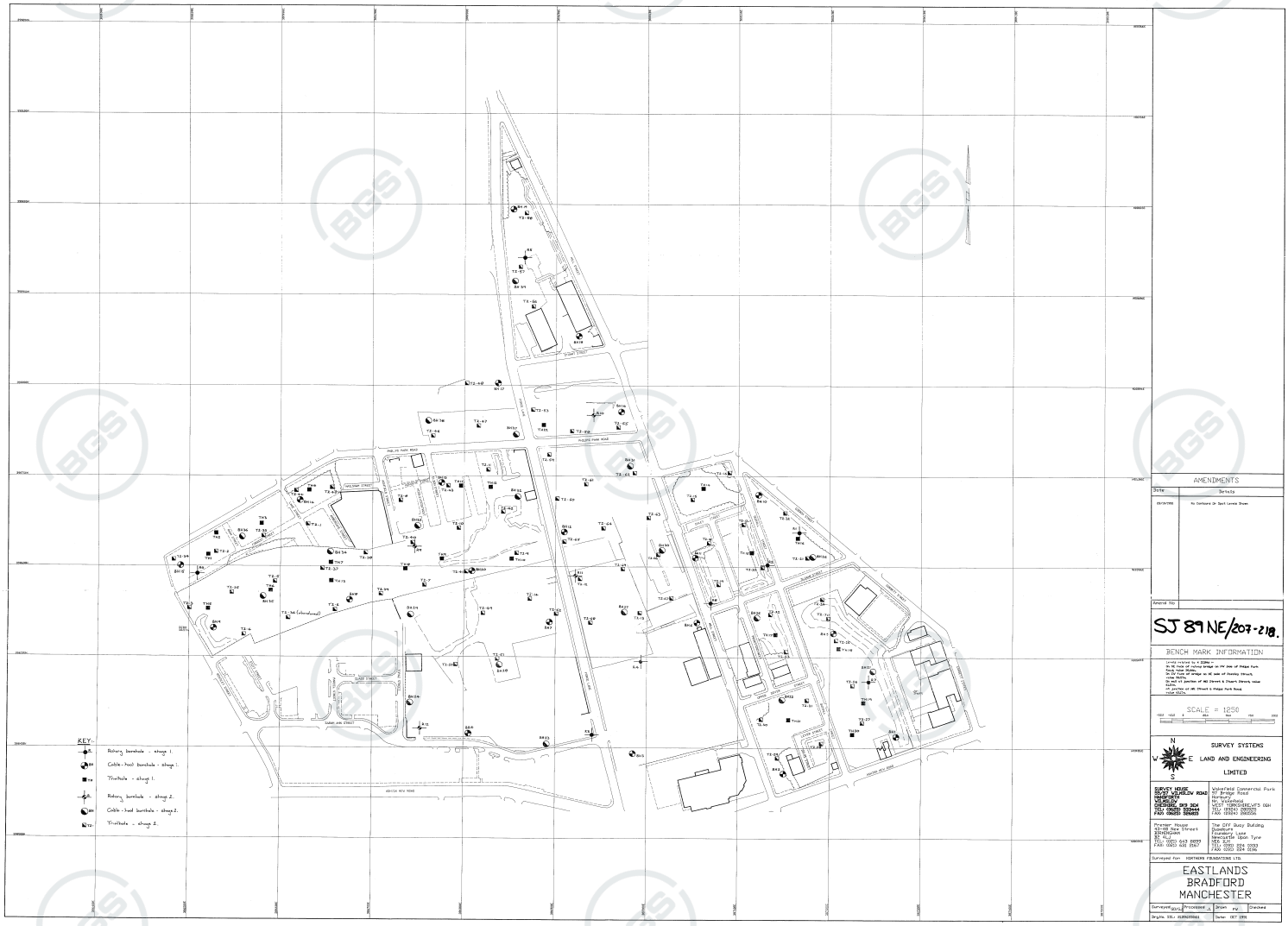


How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
reports@miningremediation.gov.uk

APPENDIX 5

BGS BOREHOLE LOGS


R1 - 8716 - 9865
R2 - 8712 - 9860
R3 - 8693 - 9842
R4 - 8697 - 9849
R5 - 8667 - 9897
R6 - 8652 - 9858
R7 - 8725 - 9847
R8 8707 - 9853
R9 - 8674 - 9863
R10 8694 - 9877
R11 8692 - 9859
R12 8675 - 9842
SJ 89 NE/107-28
AMENDMENTS
BENCH MARK INFORMATION
SCALE = 1250
SURVEY SYSTEMS LAND AND ENGINEERING LIMITED
EASTLANDS
BRADFORD
MANCHESTER
398900
398800
398700
398600
398500
398400
86500
86600
86700
86800
86900
87000
87100
87200


KEY:
Rotary borehole - stage 1.
Cable-tool borehole - stage 1.
Trialhole - stage 1.
Rotary borehole - stage 2.
Cable-tool borehole - stage 2.
Trialhole - stage 2.
AMENDMENTS
SJ 89 NE/207-218.
BENCH MARK INFORMATION
SCALE = 1250
SURVEY SYSTEMS LAND AND ENGINEERING LIMITED
EASTLANDS
BRADFORD
MANCHESTER

British Geological Survey

BGS ID: 936633 : BGS Reference: SJ89NE216
British National Grid (27700) : 386940,398770

Borehole Log SJ89NE 246 8694-9877

Site EASTLANDS
Client Manchester City Council
Borehole No. R 10 sheet 1
Grid Ref.
Ground Level 61.75 m a.o.d.

Job No. S.I. 5400
Date Oct. 1991
Diameter 75 mm core
Method Rotary
Scale 1 : 100

Description	Depth m	Legend	O.D. level m	Samples and in situ tests: Depth, m	Type	Dip	TCR %	RQD %	I_s (50) MN/m²
Concrete	0.60								
Fill - brick rubble, clay	1.50								
Clay - glacial boulder clay / till - stiff	15.15		46.60	15.00	C				
Mudstone - brown & mid-grey - highly or completely weathered - very weak	17.00						94	38	0.01

Remarks
Continued on sheet 2

Water - flush ; coreline

Key U – undisturbed
B – bulk
D – disturbed
S – SPT: SC – Solid Cone
C – Core
W – Water

Northern Foundations

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 936633 : BGS Reference: SJ89NE216
British National Grid (27700) : 386940,398770

Borehole Log

SJ89NE 216

Site EASTLANDS
Client Manchester City Council
Borehole No. R 10 sheet 2
Grid Ref.
Ground Level

Job No. S.I. 5400
Date Oct. 1991
Diameter 75 mm core
Method Rotary
Scale 1 : 100

Description	Depth m	Legend	O.D. level m	Samples and in situ tests: Depth, m	Type	Dip	TCR %	RQD %	I_s (30) MN/m²
Continued from sheet 1	17.00								
Mudstone - as sheet 1	17.50			17.50	C1				
Mudstone - dark grey, shaley - moderately weathered & fractured - very weak	18.45		43.30						0.03
Coal - highly fragmented	19.25		42.50		C2		98	12	
Seatearth - with plant fossils - weak	19.65								0.11
Mudstone - light to mid-grey - some plant fossils - occasional ironstone nodules - mod. weathered & fractured - weak	21.30			20.00	C3				0.12
Mudstone - mid-grey - with occasional thin (up to 300 mm) bands of fine grained sandstone - fresh - moderately fractured, some oxidation on fracture planes - initially moderately weak, improving with depth to becoming moderately strong	32.00			22.70 25.75 28.80 31.80	C4 C5 C6 C7	21°	100 98 100 87	21 47 41 19	0.32 0.30 0.75
Mudstone - dark grey - mod. weathered & fractured - moderately weak	34.00			33.35	C8		50	65	0.43

Remarks
Coal : 18.45 - 19.25

Water - flush, coreline

Key U - undisturbed
B - bulk
D - disturbed
S - SPT: SC - Solid Cone
C - Core
W - Water

Northern Foundations

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 936633 : BGS Reference: SJ89NE216
British National Grid (27700) : 386940,398770

Borehole Log

SJ89NE 216

Site EASTLANDS
Client Manchester City Council
Borehole No. R10 sheet 3
Grid Ref.
Ground Level

Job No. S.I. 5400
Date Oct. 1991
Diameter 75 mm core
Method Rotary
Scale 1 : 100

Description	Depth m	Legend	O.D. level m	Samples and in situ tests: Depth, m	Type	Dip	TCR %	RQD %	I_s (50) MN/m²
Continued from sheet 2	34.00								
Mudstone - as sheet 2 - some oxidation on fract: planes	34.55		27.20						(0.43)
Void	36.15		25.60		C 8		50	65	
Seatearth - some plant fossils - weak	36.35			36.35					0.18
Mudstone - light or mid-grey with occasional thin bands dark grey or black - occasional very thin (20-100mm) bands of sandstone - occasional ironstone nodules, some plant fossils - fresh or slightly weathered - moderately fractured - initially moderately weak, becoming moderately strong				39.35	C 9		100	55	0.22
				40.85	C 10		99	61	
				43.55	C 11		98	16	0.43
				46.30	C 12		98	44	
				49.00	C 13	16°	100	63	1.28
				50.35	C 14		100	35	
Continued on sheet 4	51.00				C 15		100	68	

Remarks
Void : 34.55 - 36.15 m.

Water flush ; coreline

Key U - undisturbed
B - bulk
D - disturbed
S - SPT: SC - Solid Cone
C - Core
W - Water

Northern Foundations

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 936633 : BGS Reference: SJ89NE216
British National Grid (27700) : 386940,398770

Borehole Log

SJ89NE 216

Site EASTLANDS
Client Manchester City Council
Borehole No. R10 sheet 4
Grid Ref.
Ground Level

Job No. S.I. 5400
Date Oct. 1991
Diameter 75 mm core
Method Rotary
Scale 1 : 100

Description	Depth m	Legend	O.D. level m	Samples and in situ tests: Depth, m	Type	Dip	TCR %	RQD %	I_s (50) MN/m²
Continued from sheet 3	51.00								
Mudstone - as sheet 1 - moderately strong				52.00	C 15		100	68	
					C 16		98	58	0.70
	54.95		6.80						
Coal - highly fragmented	55.20		6.55	57.00					
Mudstone - mid-grey - occasional thin bands of sandstone - fresh - slightly fractured - moderately strong					C 17	16°	92	77	1.30
				58.00					
	59.05								
Sandstone - lt.gr., fine grain - strong	59.35				C 18		96	57	3.70
Mudstone - mid-grey - fresh - moderately fractured - some oxidation at base - some ironstone nodules - moderately strong				61.00	C 19		100	36	1.24
	63.25			63.25					
Mudstone - dark grey - sl. weathered, highly fractured	64.00		-2.25						
Mudstone breccia - confused - traces of coal - loose - collapsed workings	65.10		-3.35		C 20		40	0	
Seatearth	65.25		-3.50						

Remarks
Coal : 54.95 - 55.20
Collapsed workings : 64.00 - 65.10, very poor recovery
Water flush ; coreline. Re-drill - water at 19m

Key U – undisturbed
B – bulk
D – disturbed
S – SPT: SC – Solid Cone
C – Core
W – Water

Northern Foundations

Contact BGS: ngdc@bgs.ac.uk

Norwest Holst Soil Engineering Ltd.

BOREHOLE LOG - CABLE PERCUSSION

Hole ID.
A38
Header

Contract No.	F11212	Method	Cable Percussion	Coordinates	86828.8 E
Project	Manchester Stadium S.I. Phase 1				98747.6 N
		Drilling Rig	Edeco	Ground Level	59.70m AOD
Client	Manchester City Council	Driller	ID	Orientation	Vertical
		Logged by	MF	Date Started	25/11/1998
Consultant	Ove Arup and Partners			Date Completed	30/11/1998

PROGRESS

Date	Time	Hole depth	Casing depth	Water depth	Remarks
25/11/1998	1800	9.60	0.00	Dry	
26/11/1998	0800	9.60	0.00	Dry	
26/11/1998	1800	14.90	3.00	Dry	

DRILLING DETAILS

Hardbore from depth	Hardbore to depth	Chiselling hours	Remarks
13.50	13.80	0.75	
14.20	14.60	1.00	

CASING

Hole diam.	Max depth of hole at dia.	Casing diameter	Max depth of casing of dia.
150	14.90	150	3.00

WATER STRIKES

Date	Time	Strike at depth	Rise to depth	Time taken to rise	Flow	Casing depth at strike time	Casing depth to seal flow

GENERAL NOTES

1. Borehole complete at 14.90m.
2. 19mm casagrande piezometer installed at 7.90m.
   Sand filter from 5.00m to 8.00m.

SPT DETAILS

Depth	Type	Incremental blow count/penetration in mm
0.50	S	N=1 (1,0,0,1,0,0)
1.50	S	N=12 (1,1,2,3,3,4)
3.10	S	N=17 (2,3,4,4,4,5)
4.20	S	N=28 (3,3,5,6,7,10)
5.30	S	N=26 (3,4,4,6,8,8)
6.40	S	N=18 (1,2,3,4,5,6)
7.60	S	N=20 (2,2,4,4,5,7)
9.10	S	N=17 (2,2,3,4,5,5)
10.60	S	N=22 (2,3,3,5,6,8)
12.10	S	N=38 (3,5,6,10,11,11)
13.50	S	34/75mm* (4, 30 NP)
13.90	S	67/150mm (8,14,26,41)
14.60	S	50/70mm (14,28,50/70)

* Seating blows only.

NB All depths in metres, all diameters in millimetres,
water strike rise time in minutes, chiselling time in hours.

Form	ARIAL CP HEADER
Version	1.00
Revised	01/10/1998

British Geological Survey

BGS ID: 12700637 : BGS Reference: SJ89NE1450
British National Grid (27700) : 386828,398747

Norwest Holst Soil Engineering Ltd.

BOREHOLE LOG - CABLE PERCUSSION

Hole ID. A38 Sheet 1 of 2

Contract No.	F11212	Method	Cable Percussion	Coordinates	86828.8 E
Project	Manchester Stadium S.I. Phase 1	Drilling Rig	Edeco		98747.6 N
		Driller	ID	Ground Level	59.70m AOD
Client	Manchester City Council	Logged by	MF	Orientation	Vertical
				Date Started	25/11/1998
Consultant	Ove Arup and Partners			Date Completed	30/11/1998

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	SPT N & (U blows)	SPT type & depth	Install-ation
MADE GROUND: Brown sandy clay with some fine to coarse angular to subrounded gravel including housebricks.		0.30	59.40				
MADE GROUND: Greyish green mottled black slightly sandy clay with occasional fine to coarse angular to subrounded gravel including housebricks.				D 0.50 - 0.95	S1	S 0.50 - 0.95	
				B 1.00 - 1.50			
		1.60	58.10	D 1.50 - 1.95	S12	S 1.50 - 1.95	
Firm to stiff, brown mottled grey thinly laminated fissured slightly sandy CLAY with some to occasional fine to coarse angular to subrounded gravel.				D 2.20			
				U 2.50 - 3.00	(26)		
---from 2.50m to 3.00m stiff				D 3.10	S17	S 3.10 - 3.55	
				D 3.10 - 3.55			
				U 3.60 - 4.10	(46)		
		4.00	55.70				
Stiff brown sandy CLAY with some to much fine to coarse angular to subrounded gravel.				D 4.20	S28	S 4.20 - 4.65	
				D 4.20 - 4.65			
				U 4.70 - 5.20			
				D 5.30	S26	S 5.30 - 5.75	
				D 5.40 - 5.75			
				U 5.80 - 6.30			
---from 6.40m to 10.00m becomes firm to stiff				D 6.40	S18	S 6.40 - 6.85	
				D 6.40 - 6.85			
				U 7.00 - 7.50	(34)		
				D 7.60	S20	S 7.60 - 8.05	
				D 7.60 - 8.05			
				U 8.50 - 9.00	(28)		
				D 9.10	S17	S 9.10 - 9.55	
				D 9.10 - 9.55			
				U 10.00 - 10.50	(34)		

NB All depths in metres, all diameters in millimetres.
See header sheet for details of drilling, progress and water strikes. See legend sheet for key to symbols.

Form	ARIAL CP LOG
Version	1.00
Revised	01/10/1998

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 12700637 : BGS Reference: SJ89NE1450
British National Grid (27700) : 386828,398747

Norwest Holst Soil Engineering Ltd.

BOREHOLE LOG - CABLE PERCUSSION

Hole ID. A38 **Sheet 2 of 2**

Contract No.	F11212	Method	Cable Percussion	Coordinates	86828.8 E
Project	Manchester Stadium S.I. Phase 1	Drilling Rig	Edeco		98747.6 N
		Driller	ID	Ground Level	59.70m AOD
Client	Manchester City Council	Logged by	MF	Orientation	Vertical
				Date Started	25/11/1998
Consultant	Ove Arup and Partners			Date Completed	30/11/1998

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	SPT N & (U blows)	SPT type & depth	Install-ation
Stiff brown sandy CLAY with some to much fine to coarse angular to subrounded gravel.				U 10.00 - 10.50	(34)		
				D 10.60	S22	S 10.60	
				D 10.60 - 11.05		11.05	
				U 11.50 - 12.00	(29)		
				D 12.10	S38	S 12.10	
---from 12.10m becomes very stiff				D 12.10 - 12.55		12.55	
				U 13.00 - 13.50	(48)		
---from 13.00m stiff				B 13.50 - 13.80	S34/75mm*	S 13.50	
				D 13.50 - 13.57		13.58	
		13.80	45.90				
Grey highly to moderately weathered MUDSTONE weak.				D 13.90 - 14.20	S67/150mm	S 13.90	
						14.20	
				D 14.30			
				D 14.60 - 14.82	S50/70mm	S 14.60	
						14.82	
		14.90	44.80				
Cable Percussion boring complete at 14.90 m.							

NB All depths in metres, all diameters in millimetres.
See header sheet for details of drilling, progress and water strikes. See legend sheet for key to symbols.

Form	ARIAL CP LOG
Version	1.00
Revised	01/10/1998

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 12700768 : BGS Reference: SJ89NE1492
British National Grid (27700) : 386876,398681

Norwest Holst Soil Engineering Ltd.

TRIAL PIT LOG

Hole ID. TPA25 **Sheet 1 of 1**

Contract No.	F11212	Method	Machine Excavated	Coordinates	86876.0 E
Project	Manchester Stadium S.I. Phase 1	Equipment	JCB JS130		98681.6 N
				Ground Level	60.60m AOD
Client	Manchester City Council	Logged by	JTM	Date Started	21/11/1998
				Date Completed	23/11/1998
Consultant	Ove Arup and Partners				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Notes
MADE GROUND: Light grey and white fine to coarse angular and subangular limestone gravel.		0.10	60.50	D 0.20	0.20m PID 0.8ppm
		0.40	60.20	CD 0.20 CJ 0.20	0.50m PID 0.7ppm
MADE GROUND: Brown fine to coarse subrounded and subangular gravel with some clay and occasional fine to coarse sand.		0.70	59.90	D 0.50 CD 0.50 CJ 0.50	0.80m PID 0.6ppm
MADE GROUND: Red brown cobbles of brick with some fine to coarse sand and occasional medium and coarse angular gravel of brick.				B 0.70 - 1.80 D 0.80 CD 0.80 CJ 0.80	
MADE GROUND: Grey mottled black soft to firm clay with some fine to coarse subrounded and subangular gravel with occasional wood, metal, plastic and cobbles of brick rare boulder of concrete.		1.80	58.80		
MADE GROUND:Reinforced concrete.		2.30	58.30	D 2.40 CD 2.40 CJ 2.40	2.40m PID <0.1ppm 2.60m PID <0.1ppm
Soft to firm brown CLAY. ---from 2.50m becoming friable brown mottled blue grey CLAY with occasional fine to coarse subrounded and subangular gravel ---from 3.00m becomes stiff to very stiff				B 2.50 - 3.50 D 2.60 CD 2.60 CJ 2.60 B 3.50 - 4.50 D 4.00	
Trial pit complete at 4.50 m.		4.50	56.10	D 4.50	

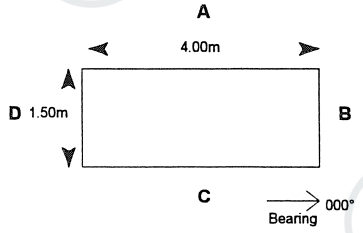
Stability: Stable

Shoring: None

Groundwater: Dry

Remarks:
1. No visual or olfactory evidence of heavy contamination.
2. Pocket penetrometer at 3.00m = 171, 147, 147. At 196, 208, 196.
3. See photographs in Section E.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks

REMARKS - All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic north

Form	ARIAL TP LOG
Version	2.00
Revised	01/10/1998

Contact BGS: ngdc@bgs.ac.uk

Norwest Holst Soil Engineering Ltd.

TRIAL PIT LOG

Hole ID. TPA29 **Sheet 1 of 1**

Contract No.	F11212	Method	Machine Excavated	Coordinates	86900.0 E
Project	Manchester Stadium S.I. Phase 1	Equipment	JCB JS130		98700.1 N
				Ground Level	60.90m AOD
Client	Manchester City Council	Logged by	JTM	Date Started	13/11/1998
				Date Completed	13/11/1998
Consultant	Ove Arup and Partners				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling		Notes
MADE GROUND: Reinforced concrete.		0.50	60.40	B D CD CJ	0.50 - 1.50 0.60 0.60 0.60	0.50m PID <0.1ppm
MADE GROUND: Black slightly clayey very sandy fine to coarse subrounded and subangular gravel of ash and clinker with and occasional cobbles of brick and boulders of sandstone.		1.50	59.40	B D CD CJ	1.60 - 2.60 1.70 1.70 1.70	1.40m PID <0.1ppm
MADE GROUND: Orange, brown and red sandy silt with occasional fine and medium gravel of brick (Possible Dryworks waste).		3.10	57.80	B D CD CJ	3.10 - 4.10 3.20 3.20 3.20	2.30m PID <0.1ppm
Firm to stiff brown mottled blueish grey sandy CLAY with occasional fine to coarse rounded and subrounded gravel.		4.50	56.40	D	4.50	
Trial pit complete at 4.50 m.						

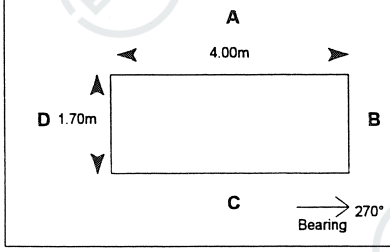
Stability: Some spalling between 0.5 and 1.5m

Shoring: None

Groundwater: None Encountered

Remarks:
1. Pipe installed to base of pit to allow static cone testing.
2. Wall at either end of pit (see sketch for details).
3. See photographs in Section E.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks

REMARKS - All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic north

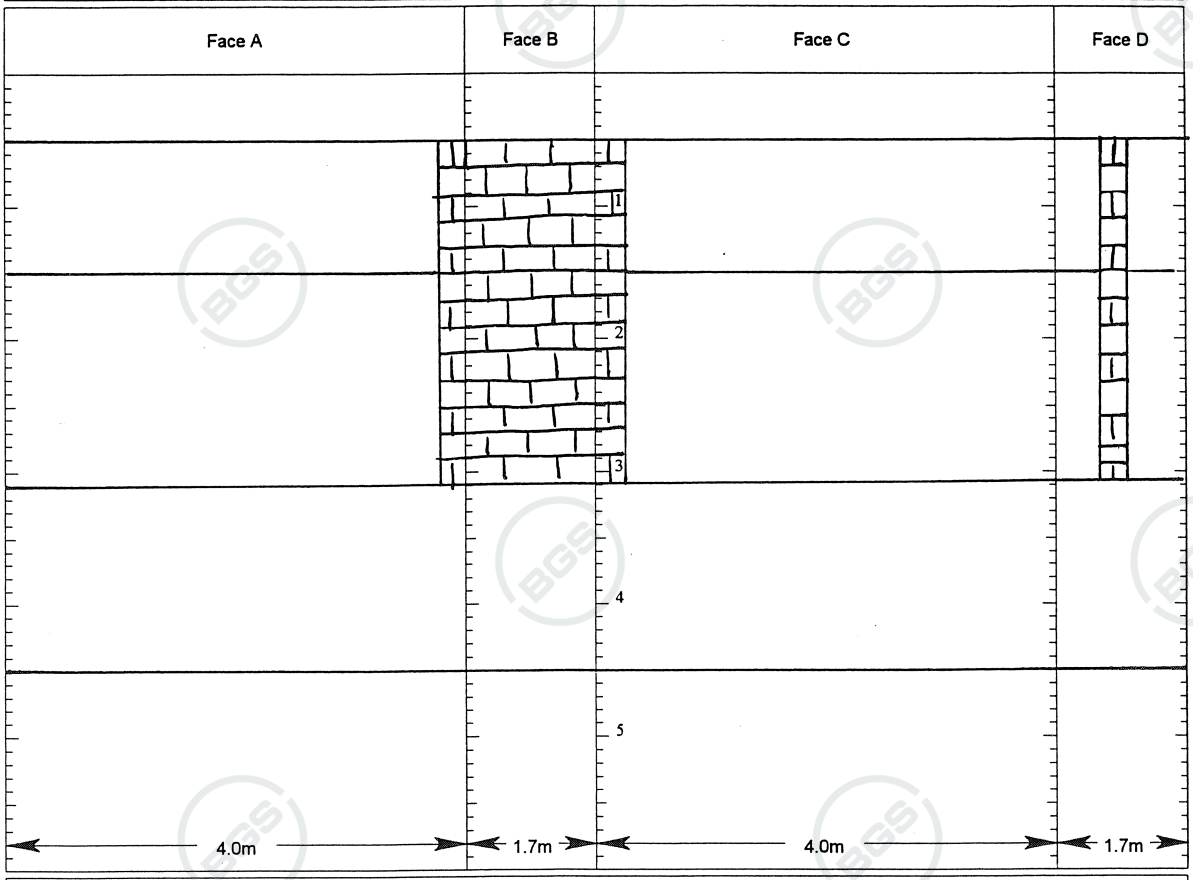
Form	ARIAL TP LOG
Version	2.00
Revised	01/10/1998

Norwest Holst Soil Engineering Ltd.

TRIAL PIT SKETCH

Trial Pit No.
TPA29
SKETCH

Contract No.	F11212	Method	Machine Excavated	Coordinates	86900.0 E
Project	Manchester Stadium S.I. Phase 1	Equipment	JCB JS130		98700.1 N
		Logged by	JTM	Ground Level	60.90m AOD
Client	Manchester City Council			Date Started	13/11/1998
				Date Completed	13/11/1998
Consultant	Ove Arup and Partners				



See main log for strata descriptions and sampling details.

NB Sketch is not to scale.

REMARKS - All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic north.

Form	ARIAL TP SKETCH
Version	1.00
Revised	01/10/1998



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