

Phase I Geoenvironmental Site Assessment

Site: Riverpark Road, Manchester, M40 2XP

Reference: 17-246-R1-5

Date: March 25





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EXECUTIVE SUMMARY

Site Address	Riverpark Road, Manchester M40 2XP
Grid Reference	E 387308, N 399470
Site Area	7.43 Ha
Proposed Development	Kellen Homes intends to create a new community on a sustainably located site in East Manchester, delivering new family housing and affordable homes. The proposed residential development will comprise a total of 221 low rise residential dwellings and 277 apartments across five buildings ranging from 4 to 6 storeys in height with associated gardens, estate roads and infrastructure.
Current Site Use	At the time of the walkover in February 2024 the subject site was an irregularly shaped parcel of land located to the northeast of Manchester city centre, occupied by a former meat processing and wholesale ring and industrial/commercial warehouse units. Various occupancies and site uses were noted during the walkover, including HGV parking facility, butchery, drain clearance, self-storage facility, mechanical and electrical warehouse(s) and an outdoor furniture warehouse. At the time of the walkover in February 2024 , six structures were present, including an office block in the west, former livestock building (west) and warehouses in the east. Structures largely comprise of brick and concrete. The central self-store warehouse and eastern warehouse are steel clad, portal frame structures. A communication tower is present atop a concrete pillar located immediately adjacent north of the centre of the self-store building. As of March 2025, the buildings are currently being demolished. It would appear that the ground level of the former livestock building (central building) was historically partially open to allow ventilation. However, observations suggest that since the cessation of livestock processing, a breeze block has been used to infill and form a completely enclosed building. The cylindrical former market and butchery building had two levels, the top level accessed on the eastern side via a ramp beneath the building. A cutting is present east of the structure to facilitate access to the central outdoor area. A retaining wall and slope are present along the northern boundary of the railway embankment, supporting active Network Rail infrastructure. A further retaining wall is present separating the warehouses in the east from the western area, placing the eastern sector at circa 1.00m lower level than the west. A gentle slope is present in the central area, sloping down from the north and south and leading to a cutting in the centre that allows access to the former abattoir building. The surrounding areas in the west and east are generally topographically flat. The Site is predominantly covered in concrete or asphalt hardstands. The retaining wall and slope present along the northern boundary are densely vegetated with multiple semi-mature and mature trees and scrub vegetation. A further area of rough scrub vegetation is present in the very east. There are also areas of landscaped grass along the southern boundary and outside the eastern entrance of the central building.

	A former livestock delivery ramp connects to the railway, which is located on the crest of the embankment (higher elevation). Japanese knotweed has also been identified within the vegetation along the northern boundary and localised on the western boundary. As of March 2025, demolition of the onsite structures is ongoing.
Site History	Examination of the relevant Ordnance Survey maps shows that the site originally consisted of agricultural land pre 1843 with several footpaths and field boundaries. A cutting is also marked on this mapping series along the western boundary. From 1890, cuttings named clay pits were marked in the centre and south, with a pond also indicated in the centre west boundary. Further cutting continued into the 1900s along the western and southern boundary, with some structures marked southwest of the site boundary. A brickwork is marked in the west from circa 1923, with kilns and a chimney at the centre of the works. A tramway was present through the centre of the site, connecting the clay pit and brickworks, which later extended to the east circa 1933. Aerial imagery (courtesy of Britain From Above) from 1936 and 1939 shows the cutting/excavation in the south east with the northern embankment/batter visible along the northern boundary. Circa 1966, the brickworks and tramway were demolished, and the clay pits are no longer marked. It is likely that the clay pits were nominally infilled with incinerated wastes, as was common at the time of the early to mid-20th century, to aid the construction of the development platform of the abattoir. The depth of filling is unknown, however, aerial imagery (from 1939) and review of topography and historic contours on historic mapping suggest that the site was lowered with shallow excavations over time, with the development platform (circa 1966) constructed at the base of the former excavations. Three structures marked on Site from circa 1966 utilised as an abattoir. A large slope is marked along the northern boundary with cattle pens and cattle walk located in the north east. Along the southern boundary, cattle grids are marked with a ramp leading to a platform. A footbridge connects the eastern structure to the circular structure in the centre, with a cutting forming a ramp for access in the centre. From 1966 until approximately 2000, when the abattoir closed, it stayed in this formation until being marked as Riverpark Trading Estate in 2010. During this time, the footbridge is demolished, connecting the buildings in the east to the centre. The Site remained in this configuration until 2025 when demolition of on-site buildings occurred. At the time of writing (March 2025) demolition is ongoing.

ENVIRONMENTAL SETTING

Geology	Drift Geology	Glacial Till- CLAY, SAND, GRAVEL
	Bedrock Geology	East- Chester Formation- SANDSTONE
		Centre and west- Pennine Middle Coal Measures Formation- SANDSTONE, SILTSTONE, MUDSTONE
		South west corner- Pennine Upper Coal Measures Formation- SANDSTONE, SILTSTONE, MUDSTONE
	Faults	The Bradford Fault is located in the centre of the site in a north to south orientation dipping North East at 15°
Geomorphology	The site has been subjected to historic cutting from the extraction from the clay pits on site.	
	It is considered that the natural landform may have originally stood at a higher elevation and the recent development is currently at the base of the old clay pit and embankments formed to construct the railway.	
	Some historic levelling has likely occurred during the most recent stage of development resulting in Made Ground across the site. The depth of filling is unknown, however, aerial imagery (from 1939) and review of topography and contours on historic mapping suggest that the site was lowered with shallow excavations over time, with the development platform (circa 1966) constructed at the base of the former excavations.	
Hydrogeology	A Secondary (undifferentiated) Aquifer has been recorded on site in the drift with a Principal Aquifer and a Secondary A Aquifer in the bedrock geology.	
	No groundwater abstractions have been identified within a 500m radius; the closest being 555m west for construction use (Hansen Quarry products).	
Hydrology	No surface water features have been identified within 50 m of the subject site. The closest surface water feature is the River Medlock located 56 m south east of the site boundary, with a cemetery located between the site and watercourse.	
	Due to the local topography, it is likely that any shallow groundwater, if present, will flow in a Southerly direction towards The River Medlock.	
	The Groundsure report states there is a high potential for groundwater flooding at the Site concentrated in the centre and west of the site.	
	The site is located within Flood Zone 1 - no risk of flooding	
Utility Locations	A full ground penetrating radar (GPR) survey has not been undertaken for the site, however borehole clearance was carried out and identified numerous services within the site boundary. An electricity cable was identified within the south western car park, orientated east to west towards Briscoe Lane.	
	A review of online records held by United Utilities indicates the presence of a combined sewer located on the central southern boundary and an abandoned sewer present along the western boundary. A control kiosk, sewer overflow and network storage tank are also present adjacent to the western boundary. A water pipe was also identified along the northern retaining wall structure in the western parcel.	

	An electrical substation and a transformer is present within the gatehouse off Riverpark Road in the south western sector. This internal infrastructure is not marked on the publicly available utility plans. A second substation is located within the second storey of the self-store warehouse.
Landfill Sites and Waste Sites	A historical landfill is located 168m east of the site at Clayton Vale Power Station known to dispose of inert, industrial, commercial, household, special and liquid sludge which was filled prior to 1974. The Site has undergone some historical development and ground working, the Made Ground associated with the development may produce hazardous ground gases such as methane and carbon dioxide.
Radon	A BGS report was obtained for the Site and confirmed the Site falls within Radon Class 1 - less than 1% of homes are estimated to be at or above the Action Level. No radon protection measures required to new structures.
Unexploded Ordnance	Moderate risk
Hazardous Installations	No hazardous installations that could potentially prejudice the proposed construction of highly sensitive residential dwellings have been identified within influencing distance of the subject site.

PREVIOUS REPORTS

The following previous reports have been completed for the site:

-  E3P- Phase I and Phase II Geoenvironmental Site Assessment ref 13-492-R1, dated January 2020

PRELIMINARY CONTAMINATED LAND ASSESSMENT

Human Health	Made Ground deposits are anticipated due to previous uses as a brick works with associated tramlines, clay pits, potentially infilled ponds, chimney and tanks along with subsequent demolition of buildings. Made Ground deposits are potential sources of heavy metals, long-chain hydrocarbons and polycyclic aromatic hydrocarbons (PAH). Where backfilled, any former clay pits are likely to have been infilled with incinerated wastes, as was common at the time of the early to mid-20th century. Incinerated wastes are likely sources of heavy metals and PAHs. Other waste sources may have been subjected to landfill in the former clay pits which may act as an additional source of Heavy Metals and PAHs. If present, heavy metals and non-volatile PAHs may pose a short-term risk to construction workers who may encounter impacted soils during earthworks. However, this risk can be mitigated through the use of appropriate Personal Protective Equipment (PPE) and the provision of adequate welfare facilities. . If impacted soils are identified, then localised remediation or an appropriate cover system, designed in accordance with BRE465 (Cover Systems for Land Regeneration), will remove the exposure pathway and therefore risk to future commercial site users.
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	Historical land use of an abattoir and meat wholesalers that operated within the central buildings may be a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes. The risk of encountering pathogens associated with the former animal processing land use will lessen over time, therefore given the elapsed time period since the cessation of abattoir operations the risk is considered significantly reduced. During the demolition of the former abattoir and meat wholesaler buildings, a watching brief should be implanted during the removal of tanks, pits and pipework to identify any potentially blood or animal fat impacted soils Given the age of the structures on site it is likely that asbestos containing materials (ACM) is present within the building materials. Prior to demolition of onsite structures a detailed asbestos survey will be required. ACM is likely to be present within Made Ground in the west of the site from the demolition of former structures. ACM poses a risk through fibre and dust inhalation and if present may pose a risk to construction workers during any future earthworks / demolition and to adjacent third-party property should dust be generated during those works. The initial site walkover and review of historical mapping did not identify the presence of any tanks on site. Historical industrial land uses including a former brick works, as well as Made Ground, represent potential sources of mobile hydrocarbon contamination. Additionally, the previous report completed by E3P has identified the presence of volatile contamination in isolated areas. The potential for internal tanks cannot be ruled out. Tanks are a potential source of TPHs, SVOC and VOCs. Intrusive investigation and assessment will be required to determine the level of mitigation measures and/or remediation.
Controlled Waters	There is a limited potential for any elevated contaminants to migrate towards the underlying aquifers due to the presence of impermeable CLAY identified through the previous site investigation. Furthermore, the site is not located within a source protection zone and the closest abstraction point is located 555m from the site with a general. Therefore, there is considered to be a low risk to controlled waters. Further sampling and investigation should be undertaken to confirm this.
Ground Gas	Localised infilled features such as ponds, clay pits and field boundaries are noted. Made Ground may contain organic alluvial materials. These may be a source of ground gas onsite. Additionally, a historic landfill is noted 168m east of the site. Given the low permeability of the drift strata, these features are not considered likely to affect a wide area but will need local development assessment.

PRELIMINARY COAL MINING ASSESSMENT

Coal Stability Mining/Land	A review of the Coal Mining Authority Report and mapping indicates that coal mining activity has occurred within the site boundary at depths from 80 m bgl. According to the Coal Mining Authority Report, the Doctor coal seam sub crops beneath the northern area of the site. However, the location is recorded as unproven and there is no indication of probable workings from the Coal Authority. There are no mine shaft entries present within the site boundary. E3P have completed a preliminary coal mining risk assessment as part of this geoenvironmental site assessment that concluded there is a moderate risk of unrecorded coal mining at shallow depth. The CA, as a statutory consultee, will require a series of rotary open holes across the site to determine the presence of any coal on site and to understand the nature of any coal workings. To satisfy this condition E3P has previously completed eight 40 m rotary boreholes to investigate shallow mine workings in the area of the conjectured seam (as indicated by the CA), and across the wider site. Rotary boreholes identified the presence of in-tact coal at one location of eight and no evidence of workings within any of the boreholes.
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PRELIMINARY GEOTECHNICAL ASSESSMENT

Initial Geotechnical Assessment	Obstructions may be present within the Made Ground due to the presence of historic chimneys, tramways and raised bridges. Variable Made Ground has been identified across the site, Made Ground will require ground improvement works for the majority of foundations.
Civil and Structural	Further assessment of the site will be required to determine to presence of any infilled ponds and hedges and to assess the underlying Glacial Till (clay) for effects related to moisture variation due to trees. Given the entire site is underlain by Glacial Till, soakaway drainage is unlikely to be feasible. A steep slope and retaining wall is present on the northern boundary of the site which will require further geotechnical assessment. An underpass/cutting is present on the eastern side of the butchers building. Dependant on final development levels there is potential for a large voided area that will require upfill to a suitable geotechnical design.
Abnormal Foundations	Abnormal foundations may be required in areas where deeper Made Ground is present, which was identified in the previous investigation conducted by E3P. Deeper foundations may also be needed in areas of tree influence, and for plots within influencing distance of retaining features and slopes.

RECOMMENDATIONS

Further detailed intrusive ground investigation will be required to confirm the findings of the initial conceptual site model and provide data for foundation and highways design so that a value-engineered development solution can be determined.

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APPENDIX III RISK CLASSIFICATION

APPENDIX IV DRAWINGS

APPENDIX V PHOTOGRAPHS

APPENDIX VI HISTORICAL MAPS

Drawing List

17-246-R1-001 - Site Location Plan

17-246-R1-003 - Site Features Plan

17-246-R1-004 - Historical Features Plan

17-246-R1-027 - Human Health Conceptual Site Model (Current/Historic)

17-246-R1-028 - Human Health Conceptual Site Model (Residential End Use)

Kellen Homes Drawing KH012-Q

1. INTRODUCTION

1.1. BACKGROUND

Kellen Homes (the client) commissioned E3P to undertake a Phase I Geoenvironmental Site Assessment at Riverpark Road, Manchester.

This report is required to determine potentially contaminated land and geotechnical liabilities for the proposed site redevelopment.

1.2. PROPOSED DEVELOPMENT

Kellen Homes intends to create a new community on a sustainably located site in East Manchester, delivering new family housing and affordable homes. The proposed residential development will comprise a total of 221 low rise residential dwellings and 277 apartments across five buildings ranging from 4 to 6 storeys in height with associated gardens, estate roads and infrastructure.

Kellen Homes Drawing KH012-Q (APPENDIX IV) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.

Figure 1 Snapshot of Proposed Development



1.3. OBJECTIVES AND SCOPE

The objectives of the geoenvironmental investigation are as follows:

- 🔍 Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available to complete a desk study in line with Environment Agency (EA) document Land Contamination: Risk Management (LCRM) (updated June 2023).
- 🔍 Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site concerning the site's future use and in relation to off-site receptors.

- ✚ Assess the desk study information and, where possible, provide preliminary recommendations concerning foundations, pavement construction, general geotechnical issues, floor slabs and coal mining related issues.
- ✚ Provide recommendations regarding future works required.

1.4. SOURCES OF INFORMATION

Background information was sought from the following sources:

- ✚ Groundsure Enviro+Geo Insight Search Reference GS-C3Q-6HI-L76-DJJ;
- ✚ Historical mapping dated 1848 to 2024. A selection of historical maps is reproduced in APPENDIX VI;
- ✚ Online planning records held by Manchester City Council;
- ✚ Consultations with representatives of Manchester City Council;
- ✚ Consultations with representatives of the Coal Authority;
- ✚ Magic Map Groundwater Vulnerability Map;
- ✚ Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007);
- ✚ British Geological Survey Map;
- ✚ Groundsure IO database;
- ✚ <https://zeticauxo.com/downloads-and-resources/risk-maps/>;
- ✚ <https://flood-map-for-planning.service.gov.uk>
- ✚ Search results | Catchment Data Explorer | Catchment Data Explorer

1.5. LIMITATIONS

The limitations of this report are presented in APPENDIX I.

1.6. RISK CLASSIFICATION

The description of risk classification and the likely action required as set out in CIRIA C552 are included in APPENDIX III.

1.7. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed or with whom an assignment has been agreed. Should any third party wish to use or rely upon the report's contents, written approval must be sought from E3P; a charge may be levied against such consent.

2. SITE SETTING

2.1. SITE DETAILS

Table 1 **Site Details**

Site Address	Riverpark Trading Estate, Manchester, M40 2XP.
National Reference	Grid E 387308, N 399470.
Site Area	7.43 Ha.
Developer	Kellen Homes

The Glossary presented in APPENDIX II defines all acronyms used within this report.

A site location map is presented in APPENDIX IV as Drawing 17-246-001.

2.2. CURRENT SITE USE

A site walkover was completed by an E3P representative on 10 January 2024, with the full details of the walkover included in Table 2.



Table 2 **Site Description**

Occupancy/Use

The subject site is an irregular-shaped parcel of land located to the north east of Manchester. The site is currently occupied by industrial/commercial warehouse units with various occupancies and site uses; including a HGV parking facility, former abattoirs, self-storage facility, butchers and an outdoor furniture warehouse.

Western Sector:

HGV parking and a dis-used office/workshop building is present. A United Utilities control kiosk is present at the south western corner of the site and is associated with the sewer overflow and network storage tank also located in that vicinity.

Vehicular access can be gained from the entrance of Riverpark Road. A gatehouse is present at the access point, adjacent to the southern boundary.

Former butchery building utilised as workshop space (furniture repairs, textile wholesalers and meat wholesalers). A reduced level/cutting is present at the eastern side of the building to allow access to the centre of the circular building.

Buildings in this area of the site are generally two storey brick and concrete structures with sheet metal cladding.

Aerial Image of the site:



Central former butchery building:





Central:

Further car parking and vehicular access are present within this sector.

An active self-storage facility is present to the east of the former abattoir, this building extends eastwards and houses warehouse space.

A metal fence separates vehicular access between the central and western sectors.

Easter Sector:

It would appear that the ground level of the former livestock building was historically partially open to allow ventilation. However, observations suggest that since the cessation of livestock processing, breeze block has been used to infill and form a completely enclosed building.

Further car parking is located to the south of the warehouse buildings, which houses a garden furniture warehouse. Offices associated with the garden furniture business are located in a separate building adjacent to the southern site boundary. A communication tower is present atop a concrete pillar immediately adjacent to the self-storage facility.

At the time of the walkover the most easterly warehouse was vacant.

Access to this sector of the site can be gained from Riverpark Road. A ramp is located east of the access point, allowing access to car parking spaces.

Semi-mature trees and shrubs occupy the area adjacent to the eastern boundary.

Warehouses in centre/east:





	Northern sector: A steep embankment vegetated with semi-mature trees, shrubs and Japanese knotweed traverses the northern boundary from west to east. A former livestock delivery ramp connects the site with the railway which is located on the crest of the embankment. A retaining wall is present at the base of the embankment, present from the central sector to the eastern boundary. As off 2025 demolition of onsite structures is ongoing.	Northern Embankment: 
Structures	There are six structures present, including an office block in the west, former livestock building and warehouses in the east. Western structures and the MODA furniture building in the east, are comprised of brick and concrete. The central self-store warehouse and eastern warehouse are steel clad, portal frame structures. A communication tower is present atop a concrete pillar located immediately adjacent east of the centre of the self-store building. A small office building is present along the southern boundary. As off 2025 demolition of onsite structures is ongoing.	

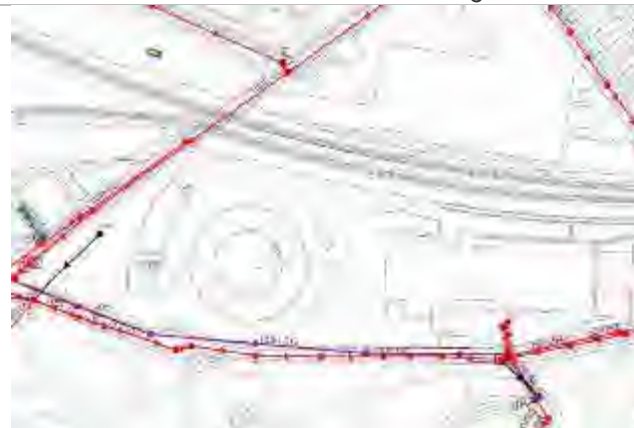


Retaining Structures	A slope and retaining wall are present along the northern boundary of the site, supporting the railway embankment shown in the image. A further retaining wall is present separating the warehouses in the east from the remainder of the site in the west, placing the east of the site at circa 1.00m lower in level than the west. Location of retaining features are shown on Drawing 17-246-004 in Appendix IV.	
Access	Vehicle and pedestrian access can be granted to site via gates on Riverpark Road located along the southern boundary, with the main entrance adjacent to the security hut. Both access routes have vehicle control barriers and gates.	



Slope	A steep slope is present along the northern boundary of the site, sloping in a southerly direction away from the railway and towards the site. The slope is well vegetated and currently appears stable, however, a slope stability model may be required. A large cast in situ reinforced concrete retaining wall is present at the base of the embankment, traversing from the central sector to the eastern site boundary. Generally, the site is uniform in topography, with a gentle slope to the east. However, a slope is present in the centre of the site with a low point at the base of the ramp access for the central circular building.	
Vegetation/Ecology	The retaining wall and slope along the northern boundary of the site are populated with vegetation including multiple semi-mature and mature trees and scrub vegetation. There are also areas of landscaped grass along the southern boundary of the site and outside the eastern entrance of the central building. Japanese knotweed has been identified within the vegetation along the northern and western boundary. A habitat survey will be required to support the planning application.	
Hazardous Material Storage	No above-ground storage tanks (ASTs) or underground storage tanks (USTs) were observed at the site during the preliminary site walkover. However, due to the active nature of the site complete access to the industrial and commercial buildings was not granted and there may be internal ASTs present within the buildings.	



	Due to the current site use as an abattoir, lorry park and food wholesalers, it is unlikely there has been significant historical storage of industrial chemicals.	
Asbestos-Containing Material (ACM)	Given the age of the structures on site it is likely that asbestos containing materials (ACM) is present within the building materials. Prior to demolition of onsite structures, a detailed asbestos survey was undertaken to ensure no ACM was present prior to demolition. ACM is likely to be present within Made Ground in the west of the site from the demolition of former structures.	
Polychlorinated Biphenyls (PCBs)	An electrical substation and a transformer is present within the gatehouse off Riverpark Road in the south western sector. This internal infrastructure is not marked on the publicly available utility plans. A second substation is located within the second storey of the self-store warehouse. Due to the age of the site, there is potential for PCBs to be present within the transformer(s).	
PFAS/PFOA	The Groundsure report identified a fire that had occurred adjacent to the eastern boundary of the site in 2003. Firefighting foams used to control the fire may have run off onto site, however, due to the ground and water impact of this event being Category 3 (minor) this is unlikely.	
Waste Storage	Potentially hazardous waste streams are unlikely to be generated at the site and none were observed during the preliminary site inspection, however complete access was not granted to the warehouse and commercial buildings.	
Drainage	A formal drainage survey has not been completed; however, a review of online records held by United Utilities indicates the presence of a combined sewer located to the central southern boundary and an abandoned sewer present along the western boundary. A control kiosk, sewer overflow and network storage tank are also present within the site boundary on the western boundary adjacent to Briscoe Lane.	



2.3. SURROUNDING AREA

The immediate surrounding area land uses are summarised in Table 3.

Table 3 **Surrounding Land Uses**

DIRECTION	LAND USE
North	Railway embankment and railway line (higher elevation than the subject site)
East	Mauser Packaging Solutions
South	Riverpark Road and Phillips Park Cemetery
West	Industrial and Commercial units



3. SITE HISTORY

3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of historical mapping and historical aerial imagery pertinent to the site is summarised in Table 4. In addition, historical site features are presented in Drawing No 17-426-003 in APPENDIX IV.

Table 4 Historical Development

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1843 1:10,000	The site appears to be mainly agricultural land with several footpaths and field boundaries across the site. A roadway transects the site north to south through the centre of the site. A cutting is also marked along the western boundary of the site. The north of the cutting appears linked to a stream/drainage ditch, as such, it is assumed this cutting was dug as part of surface water management during works to the adjacent rail and road infrastructure.	
1890 1:10,000	The cutting along the western boundary of the site is no longer marked. However, cuttings marked as clay pits are marked in the centre of the site with a pond along its southern boundary. A further clay pit is marked along the southern boundary. The road is no longer marked on site, with the railway encroaching on the northern boundary.	

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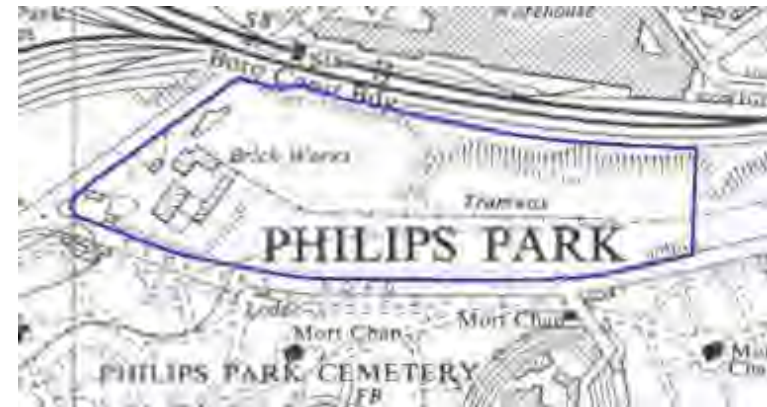


1956
1:10,000

The large pond in the north east is no longer marked.

The tramway has been extended east across the entirety of the site boundary.

Hatchings in the east suggest further mining of the clays has occurred across the eastern half of the site.



1966
1:10,000

The brickworks and the tramway have been demolished and are no longer marked on the mapping series.

Clay pits are no longer marked with a generally flat topography marked across the site (with the exception of the northern boundary).

Development has occurred on site with four structures marked on site. The western circular building is being utilised as an abattoir, with a subway entrance marked into this structure, present day walkover confirms this as a cutting allowing access to the central area of the structure. Eastern structures appear to be industrial warehouses.

A large slope is marked along the northern boundary of the site, suggesting structures may have been constructed at the base of the former clay pits.

Cattle pens and a cattle walk are located in the north east of the site.

Along the southern boundary cattle grids are marked with a ramp leading to a platform.

A footbridge connects the eastern structure to the circular structure in the west of the site.





2010 Aerial Photography (Getmapping)	Aerial photography from 2010 show the majority of the site to be capped with hardstanding, with soft standing at the peripheries. The footbridge is visible connecting the circular shaped building and the warehouses in the west. HGV parking is present in the west. The structure/storage area in the south west is no longer present.	
2010 1:10,000	The site is no longer named as an abattoir, but as Riverpark Trading estate. The footbridge is no longer marked on site. No further changes have occurred on site.	
2024/2025 Aerial Photography (Getmapping)	Recent aerial photography from 2024 has not identified any major changes on site. As of 2025, demolition of on-site structures has begun. At the time of writing (March 2025) demolition is on-going.	



3.2. SUMMARY OF ON-SITE HISTORICAL DEVELOPMENT

The following summary points have been highlighted after a detailed review of the historical mapping series.

3.2.1. POTENTIAL HISTORICAL CONTAMINATION ISSUES

- ✳ Brickworks (including kilns and chimneys).
- ✳ Tramway and railway sidings.
- ✳ Abattoir.
- ✳ Industrial Warehouses/Land Use.
- ✳ Tanks.
- ✳ Localised infilling of clay pits with incinerated waste materials (ash).
- ✳ Infilled Ponds.

3.2.2. POTENTIAL HISTORICAL GEOTECHNICAL ISSUES

- ✳ Infilled features including field boundaries and clay pits and ponds.
- ✳ Obstructions including chimney bases.
- ✳ Retaining features and slope along the northern boundary.
- ✳ Relict foundations from previous development.

3.3. OFF-SITE HISTORICAL DEVELOPMENT

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 100 m radius of the Site is summarised in Table 5.

Table 5 Surrounding Historical Development

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Railway line	0 m	Pre 1884–Present	North
Phillips Park Cemetery	25m	Pre1906–Present	South
Warehouse	50 m	Pre 1970–Present	West
Factory	50 m	Pre 1970–Present	West
Avro Works (Aeroplane) Then: marked as Warehouse Then: marked as depot	80 m	Pre 1932–Pre 1951 Pre 1951–Pre2019 Pre2019–Present	North
Clay Pit Then: marked as Old Clay pit Then: infilled and marked as refuse heap Then: no longer marked	100 m	Pre 1908–Pre 1922 Pre 1922–Pre 1949 Pre 1949–Present Pre1970–Present	West
Bank Print Works	100 m	Pre 1848–Pre 1893	South



Then: marked as disused
Then: marked as Bank Bridge
Rubber Works and Tannery
Then: marked as Bank Bridge
Rubber works and Leather
Works
Then: marked as Bank Bridge
Rubber works and Plating Works
Then: no longer marked

Pre 1893–Pre 1908
Pre 1908– Pre 1923
Pre 1923– Pre1932
Pre1932-Pre1970

Pre1970-Pre2001

Pre2001-Present

3.4. ANECDOTAL INFORMATION

A web-based search of the subject site has recovered the photographs within Table 6, courtesy of Britain From Above and Historic England. Historic images from 1927 to 1939 show the brickworks in the south west of the site and excavations advanced across the east. Aerial imagery from 1939 shows the cutting/excavation in the south east with the rail embankment/batter visible along the northern boundary.

Table 6 Summary of Anecdotal Information

PLATE
01-
HISTORIC
ENGLAND
1927

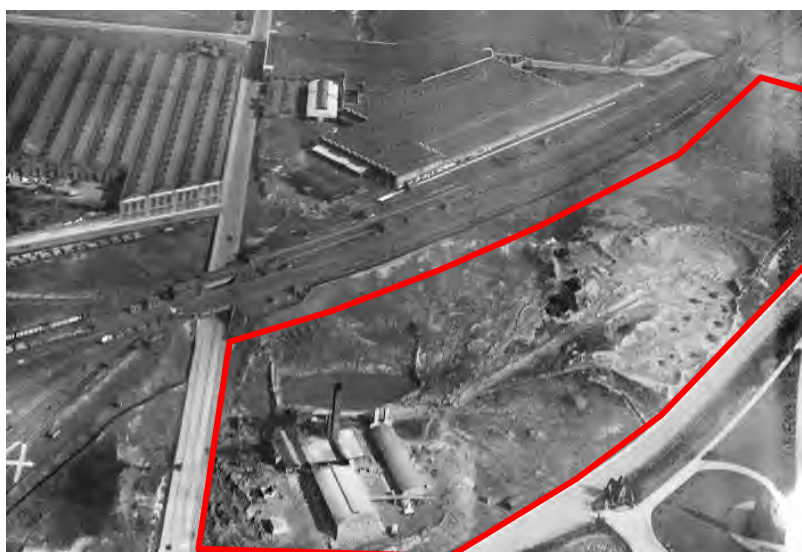


PLATE
02-
HISTORIC
ENGLAND
1932





PLATE 03
—
BRITAIN
FROM
ABOVE
1936



PLATE 04
—
BRITAIN
FROM
ABOVE
1939





3.5. PREVIOUS REPORTS

The following previous site investigation reports have been provided to E3P for review:

Table 7 Previous Reports

AUTHOR	TITLE / REFERENCE	CLIENT	DATE
E3P	Phase I and Phase II Geoenvironmental Site Assessment ref 13-492-R1	Countryside Properties	January 2020

The key findings of the previous site investigation reports are summarised below, and where necessary, data has been used to support the E3P geoenvironmental site assessment.

Site Details

- ✳ A retaining wall and slope are present along the northern boundary of the site along the railway embankment supporting active Network Rail infrastructure.
- ✳ The retaining wall and slope present along the northern boundary of the site is densely vegetated with multiple semi-mature and mature trees and scrub vegetation. A further area of rough scrub vegetation is present in the very east of the site. There are also areas of landscaped grass along the southern boundary of the site and outside the eastern entrance of the central building.
- ✳ During the site investigation a UST was encountered at the southern site boundary, adjacent to Riverpark Road. On inspection of the tank, it was identified as a drainage chamber for storm water.
- ✳ Due to the former site use as an abattoir and food wholesalers, it is unlikely there has been significant historical storage of industrial chemicals.
- ✳ A review of online records held by United Utilities indicates the presence of a combined sewer located to the central southern boundary and an abandoned sewer present along the western boundary. A control kiosk, sewer overflow and network storage tank are also present adjacent to the western boundary. A water pipe was also identified along the northern retaining wall structure in the western parcel.
- ✳ An electrical substation and a transformer to the south of the site within the gatehouse at Gate 1 in the western sector of the site is present. This internal infrastructure is not marked on the publicly available utility plans, , however, anecdotal evidence from site workers notes a substation to be located within the MODA furniture building, likely associated with the communication tower.

Coal Mining

- ✳ A review of the Coal Mining Authority Report and mapping indicates that coal mining activity has potentially occurred within the site boundary. However, there are no mine shaft entries present within the site boundary.
- ✳ An area of probable coal workings is present within the north western corner of the site. There is also an area described as the 'Coal Claim' on the Coal Authority Mapping in the western parcel of land, however, the claim was rejected so no coal is anticipated to have been removed from this area or subsidence occurred.
- ✳ According to the Coal Mining Authority Report, the Doctor coal seam sub crops beneath the northern area of the site. The interactive CA map suggest the outcrop dips in a south westerly direction beneath the site.



- ✧ An intrusive ground investigations comprising eight rotary boreholes to 40 m bgl identified one location where coal was found to be intact at a thickness of 0.30m, which suggest this was not worked. There was no other evidence of coal or historic mine workings to the base of the other boreholes.

Ground Conditions

- ✧ Made Ground deposits were encountered within the majority exploratory hole locations to a maximum recorded depth of 5.20 m bgl (CP101 in west of site). The full depth of Made Ground was not proven in eighteen locations across the site predominantly due to the presence of obstructions.
- ✧ The Made Ground deposits generally comprise asphalt or concrete being underlain by a light-yellow brown grey slightly sandy gravel (MOT) with gravel of sandstone and mudstone. This was generally underlain by a reddish black sandy gravel of mudstone, brick, coal traces and ash, with occasional cobbles of brick. At several locations, this was underlain by a grey, brown sandy gravelly clay with gravel of mudstone and brick.
- ✧ A Made Ground reworked topsoil was encountered at several locations (TP111, WS105, WS106 and WS119) being of a slightly sandy clay with occasional rootlets.
- ✧ Drift deposits were encountered within twenty-nine of the exploratory locations with the exception of eighteen locations where the full depth of Made Ground could not be proven. The drift deposits are varied, generally comprising a stiff high strength very stiff very high strength red / brown slightly sandy gravelly CLAY with gravel being of mudstone and coal traces. A firm medium strength to stiff high strength red brown slightly sandy CLAY with occasional gravel of mudstone and coal traces is also generally present across the site.
- ✧ A very stiff high strength brown silty CLAY is present at CP101, CP103, CP104 and RB102.
- ✧ A brown dense coarse SAND is present at CP103 and CP105 with occasional gravel of sandstone. A brown medium SAND was also present TP109.
- ✧ The solid bedrock geology was encountered between 5.00m and 15.00m bgl, with the solid geology not being encountered within CP103. The solid geology comprised a light / dark grey weathered MUDSTONE with SANDSTONE bands. Red brown SANDSTONE was also encountered at CP104 and CP105.
- ✧ Coal was encountered as intact at RB102 between 12.70m and 13.00m bgl.
- ✧ Groundwater was encountered between 0.40m bgl and 2.10m bgl during the site investigation. The water strikes encountered within the natural drift deposits resulted from a minor ingress of perched water confined within the clay deposits. No continuous groundwater table was encountered.

Contaminated Land Risk Assessment

- ✧ A preliminary Tier I human health risk assessment has been undertaken using the chemical analysis results of the soils and comparing to the relevant Tier I criteria for residential end use. This assessment has identified the presence of elevated lead, arsenic, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, asbestos and hydrocarbon (TPH) bands C12-C16, C16-C21 and C21-C35.
- ✧ With regards to the elevated TPH C12-C16, these present a potential volatilisation to indoor air risk. These elevated concentrations have only been identified within two areas of the site (WS109 and WS118). However, due to the limited access in areas of the site, the presence of further volatile TPH impact cannot be ruled out.



- ✧ Asbestos, in the form of chrysotile and amosite, has also been identified within localised areas in Made Ground deposits. Asbestos quantification indicates asbestos to be present at <0.001% in both samples (WS101 and WS114) where asbestos was detected.
- ✧ Chemical analysis of the natural CLAY drift deposits has identified these soils to be acceptable for use as subsoil within the proposed garden areas.
- ✧ The anticipated risk from the historical fill material is anticipated to be low, due to the likelihood that the fill is made up of incinerated wastes. Any potential issues that may arise from these fill materials can be addressed by standard remediation techniques.
- ✧ The chemical analysis for groundwater samples identified lead and arsenic as the contaminants of concern. Given the general low soluble nature of the identified contaminants of concern, in addition to the relatively low sensitivity of the site with respect to controlled waters due to the overlying CLAY drift deposits, it is considered there is unlikely to be any degree of unacceptable risk to the controlled water receptors and the wider environ.
- ✧ Ground gas monitoring thus far has indicated the site would be classed as Characteristic Situation 1, suggesting no gas protection measures will be required. However, the final ground gas regime will be confirmed following the completion of the ground gas monitoring programme. An allowance for CS2/Amber 1 across the site should be made.
- ✧ The current ground conditions and recorded concentrations of TPH above 10ppm suggest that PE pipe will not be suitable within the proposed development.

Geotechnical Assessment

- ✧ The underlying natural clay drift deposits have been assessed as being very stiff, high strength with a net allowable bearing pressure (ABP) in the order of 150 kN/m² at circa 1.00m bgl increasing to 200–250 kN/m² at circa 2.00m bgl.
- ✧ Therefore, upon completion of these remediation works it is likely that the most cost effective option for the majority of the site would be to remediate and re-engineer the Made Ground to facilitate Ground Improvements by Vibro Stone Columns (VSC) that will ensure a uniform ABP in the order of 100kN/m² for the construction of a doubly reinforced strip footing at ~600mm below remediated ground level (typically 1050mm below FFL).
- ✧ Should areas of Made Ground be present in excess of 8.0m bgl and in the vicinity of the retaining wall in the north of the site, VSC may not be technically viable and a driven pile solution may need to be utilised.



4. ENVIRONMENTAL SETTING

4.1. GEOLOGY

The British Geological Survey (BGS) map (Sheet 085) for the Site (1:50,000, Solid and Drift editions) and online records indicate the area is underlain by the geological sequence presented in Table 8.

Table 8 Summary of Underlying Geology

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
Drift	Glacial Till	SAND, CLAY and GRAVEL	Secondary undifferentiated
Solid	East - Chester Formation	SANDSTONE	Principal aquifer
	Centre and west - Pennine Middle Coal Measures Formation	MUDSTONE, SILTSTONE, SANDSTONE	Secondary A aquifer
	South west corner - Pennine Upper Coal Measures Formation	MUDSTONE, SILTSTONE, SANDSTONE	Secondary A aquifer

E3P has reviewed the BGS database, which identified available BGS boreholes in close proximity, from which to compare the published geology above.

The borehole logs are summarised in Table 9 below.

Table 9 Summary of BGS Borehole Records

LOCATION	DEPTH	MADE GROUND	DRIFT	SOLID
SJ89NE2343 On Site	4.40 m	2.80 m	CLAY > 4.40 m	Not encountered
SJ89NE2470 300m W	6.00	2.60	CLAY > 6.00 m	Not encountered

Previous ground conditions encountered during the 2019 E3P ground investigation are summarised in Table 910 below.

Table 10 Summary of Strata From 2019 Investigation

LOCATION	DEPTH (M BGL)					
	MADE GROUND	TOPSOIL	STIFF CLAY	SAND	COAL	BED ROCK
TP101	0.00-0.80	-	0.80-2.20	-	-	-
TP102	0.00-0.70	-	0.70-2.00	-	-	-
TP103	0.00-0.60	-	0.60-2.00	-	-	-
TP104	0.00->0.80	-	-	-	-	-
TP105	0.00-0.60	-	0.60-2.00	-	-	-
TP106	0.00-0.50	-	0.50-1.90	-	-	-
TP107	0.00-0.80	-	0.80-1.90	-	-	-
TP108	0.00-0.80	-	0.80-2.20	-	-	-
TP109	0.00-0.30	-	0.30-2.00	2.00-2.20	-	-
TP110	0.00-0.60	-	0.60-1.80	-	-	-
TP111	0.00->2.00	-	-	-	-	-
WS101	0.00-0.50	-	0.50-5.45	-	-	-
WS102	0.00-0.50	-	0.50-5.45	-	-	-



LOCATION	DEPTH (M BGL)					
	MADE GROUND	TOPSOIL	STIFF CLAY	SAND	COAL	BED ROCK
WS103	0.00-0.60	-	0.60-4.45	-	-	-
WS104	0.00->0.50	-	-	-	-	-
WS105	0.00->2.45	-	-	-	-	-
WS106	0.00->3.45	-	-	-	-	-
WS107	0.00->2.45	-	-	-	-	-
WS108	0.00-1.20	-	1.20-3.80	-	-	-
WS109	0.00->5.45	-	-	-	-	-
WS110	0.00->0.30	-	-	-	-	-
WS111	0.00->4.45	-	-	-	-	-
WS112	0.00->5.45	-	-	-	-	-
WS113	0.00->0.50	-	-	-	-	-
WS114	0.00-0.60	-	0.60-3.45	-	-	-
WS115	0.00->0.60	-	-	-	-	-
WS116	0.00->0.60	-	-	-	-	-
WS117	0.00->3.45	-	-	-	-	-
WS118	0.00-0.80	-	0.80-3.45	-	-	-
WS119	0.00->2.45	-	-	-	-	-
WS120	0.00->0.60	-	-	-	-	-
WS121	0.00-0.40	-	0.40-2.45	-	-	-
WS122	0.00-0.80	-	0.80-2.45	-	-	-
WS123	0.00->2.50	-	-	-	-	-
WS124	0.00-0.70	-	0.70-1.45	-	-	-
WS125	0.00->3.45	-	-	-	-	-
CP101	0.00-10.50	-	10.50-	-	-	15.00-
CP102	0.00-0.80	-	0.80-9.10	-	-	9.10-12.00
CP103	0.00-0.60	-	0.60-7.60	7.60-9.00	-	-
CP104	-	0.00-0.20	0.20-5.00	-	-	5.00-6.00
CP105	0.00-1.00	-	1.00-4.20	4.20-5.50	-	5.50-7.00
RB101	0.00-0.60	-	0.60-14.00	-	-	14.00-
RB102	0.00-0.50	-	0.50-12.70	-	12.70-	13.00-
RB103*	0.00-0.80	-	0.80-9.10	-	-	9.10-40.00
RB104**	0.00-0.60	-	0.60-7.60	7.60-9.00	-	9.00-40.00
RB105	0.00-0.40	-	0.40-10.50	-	-	10.50-
RB106	0.00-0.30	-	0.30-11.70	-	-	11.70-
RB107	0.00-0.80	-	0.80-12.10	-	-	12.10-
RB108	0.00-0.50	-	0.50-8.90	-	-	8.90-40.00

* RB103 was completed as a follow-on borehole of CP102 from 10.00m bgl.

** RB104 was completed as a follow-on borehole of CP103 from 9.00m bgl

The BGS mapping also identifies the location of faults, as presented in Table 11.



Table 11 Faulting

LOCATION	DESCRIPTION
The Bradford Fault	North to South orientation Through the centre of the site Dips North East at 15°
The Bradley Fold Fault (30 m East)	North to South orientation 30m East of Site Dips South West at ~25°

4.2. HYDROGEOLOGY

The Groundsure report indicates that the Site is not located within a groundwater source protection zone. Furthermore, there is a groundwater abstraction point located 555m west of the site used for general use relating to Hanson Quarry Products.

Based on the local topography, the location of surface watercourses, it is likely that shallow groundwater, if present, will flow in a southerly direction following the topographical gradient towards River Medlock to the south.

4.3. HYDROLOGY

No surface water features have been identified within 50 m of the subject site. The closest surface water feature is the River Medlock located 56 m south east of the site boundary, with a cemetery located between the site and watercourse.

The site is located within a currently defined "Flood Risk Zone 1", defined as land assessed as having less than 1 in 1,000 annual probability of river or sea flooding (< 0.1%) and, as such, is considered to be unaffected by river flooding.

The Groundsure report states there is a high potential for groundwater flooding at the Site concentrated in the centre and west of the site. The Environment Agency (EA) Flood Risk Map for the Site is presented in Figure 2 and the Groundsure map for groundwater is given in Figure 3.

Figure 2 EA Flood Risk Map – Surface Water



Source - <https://flood-map-for-planning.service.gov.uk/>



Figure 3 Groundsure Flood Risk Map - Groundwater



Source – Groundsure Report

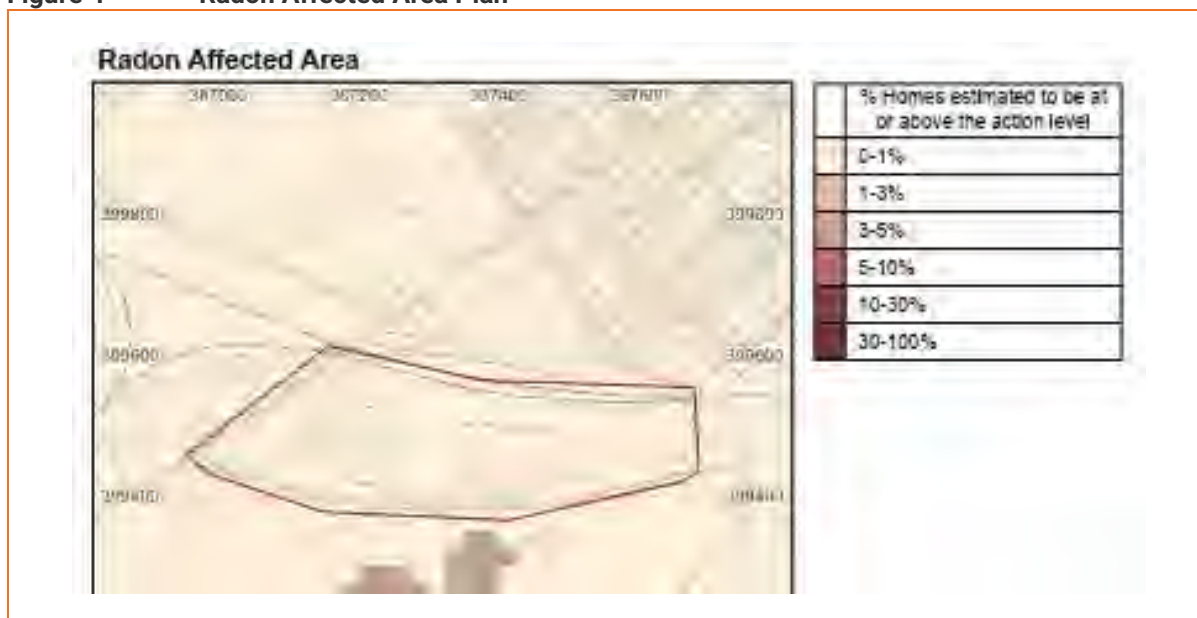
4.4. RADON RISK POTENTIAL

UK Radon indicates the site is situated in an area where 3-5% of homes are above the “Action Level”. As such, a BGS Radon Report was obtained for the site (ref: BGS_337047/52150).

The site specific report summarised that the entirety of the site is in an area where less than 1% of homes are estimated to be at or above the action level. As such, basic radon protective measures are not necessary for the construction of new dwellings or extensions.

A snapshot of the BGS radon report map is provided in Figure 4.

Figure 4 Radon Affected Area Plan





4.5. LANDFILL SITES

A historical landfill is located 168 m east of the site at Clayton Vale Power Station known to dispose of inert, industrial, commercial, household, special and liquid sludge.

Correspondence with the Environmental Health Officer at Manchester City Council regarding the landfill has gained the following response;

'The landfill was filled prior to the Control of Pollution Act 1974 (which required that the disposal of all controlled wastes onto land be licensed); therefore the exact nature of the fill materials is not known. However, a review of documentation and historical maps held by MCC indicates that tipping commenced in Clayton Vale prior to 1909, with a small area of waste disposal located to the west of Clayton Vale House near Clayton Vale Bridge.

Larger-scale tipping appears to have started in the early 1920's at western end of Clayton Vale, adjacent to Bank Bridge Street, Clayton Vale Lane and the Manchester Corporation Sidings. Waste disposal activities spread eastward down the valley and by 1966 the maps indicate that the entire area of Clayton Vale had either been used for tipping or was in current use as a landfill site. The River Medlock had been straightened at the eastern end of the site and the reservoirs to the north had been infilled. The fill is thought to comprise of domestic and trade waste, pulverised fuel ash (PFA) and colliery spoil.

It is understood that tipping ceased prior to 1974 and the historical maps indicate that the site was disused by 1981. Reclamation of the site to public open space is thought to have occurred during the mid-1980's.' The Groundsure report has identified the following landfill recorded as holding a licence (post COPRA 1974) within Table 11.

Table 12 Licensed Landfills

LANDFILL NAME	OPERATING DATE	ACCEPTED WASTE	DIRECTION
Clayton Vale Power Station	12 th March 1979 – 21 st July 1983	Inert and industrial	168 m East

A screenshot of the mapping showing landfill locations within 250m radius of the site is included in Figure 5 overleaf.

Figure 5 Locations of Landfills





4.6. WASTE MANAGEMENT LICENSES AND ENVIRONMENTAL PERMITS

The Groundsure report has identified four waste management licenses located 78m north west of the site at Wright Waste Solutions for 75kte HCI Waste TS and treatment.

A further license is held 86m north west at M CR Central Skips Ltd for 75kte HCI Waste TS + treatment.

Waste exemptions within 100m of the site are given in Table 13 below.

Table 13 Waste Exceptions

SITE	CATEGORY	NUMBER OF EXEMPTIONS	DISTANCE (M)	DIRECTION
224, BRISCOE LANE	Treating waste	6	33 m	West
	Storing Waste	2		
Unit 1b 230 Briscoe lane	Treating waste	2	100 m	West
	Storing Waste	2		

4.7. UNEXPLODED ORDNANCE

The regional unexploded bomb risk map from Zetica (2014) indicates that the Site is in an area of moderate risk from possible unexploded ordnance (UXO) resulting from the Second World War. The Zetica UXO Risk Map is presented in Figure 6.

Figure 6 Zetica UXO Risk Map



Source - <https://zeticauxo.com/downloads-and-resources/risk-maps/>

4.8. INDUSTRIAL LAND USES

The site is located within a predominantly industrial area, therefore several industrial land uses have been identified within a 100m radius of the site, summarised in Table 14.



Table 14 Industrial Land Uses

INDUSTRIAL LAND USE	DISTANCE	DIRECTION	STATUS
Apex Self Storage	On site	-	Active
I K Moore	On site	-	Active
All Party Fancy Dress	On site	-	Active
Issik House of Fashion	On site	-	Active
Basic Welding Servies	40m	West	Active
George Jones & Sons	40m	West	Active
Chimney (redundant from old Tannary)	97 m	South East	Inactive

4.9. SITE SENSITIVITY ASSESSMENT

The site is assessed to be located within a “Moderate” sensitivity setting, as discussed in Table 15.

Table 15 Site Sensitivity Assessment

SENSITIVITY PROFILE	DISCUSSION	RATING
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not located within a groundwater source protection zone or a drinking water safeguard zone.	Low
Distance to the Closest Groundwater Abstraction Point	The nearest groundwater abstraction point is located 555m W, used for construction by Hanson Quarry Products Europe Limited.	Low
Aquifer Classification in Superficial Drift Deposits	Secondary Undifferentiated.	Moderate
Aquifer Classification in Bedrock	Principal and Secondary A	High
Is the Site Underlain by Low-Permeability Drift to Depths in Excess of 10 m?	The underlying superficial deposits are likely to comprise of stiff CLAY identified within the previous site investigation completed by E3P to depths in excess of 10m. The low permeability strata will offer protection to the underlying bedrock aquifer.	Low
Is the Site Located Within 50 m of a Surface Watercourse?	The nearest surface water course, the River Medlock is located 56m south east of the site. Additionally, a cemetery is present between the site and watercourse.	Low
Sensitive Land Uses/ Sensitive Ecological Receptors	An area of adopted green belt and local nature reserve is located 103m east and 196m south east of the site respectively, named as Clayton Vale. The site is also located within a SSSI impact risk zone.	Moderate
OVERALL SITE ENVIRONMENTAL SENSITIVITY		Moderate

4.10. REGULATORY DATABASE

The information summarised in Table 16 has been obtained from a commercially available environmental database. The summary table only includes records from within 250 m of the subject site and is not otherwise detailed in the report.



Table 16 Summary of Environmental Data

RECORD	ENTRIES WITHIN 250 M	DETAILS
Contaminated Land Register Entries and Notices	0	None Identified
Authorised Industrial Processes (IPC/IPPC/LAPPC)	3	LAPPC – GRM Insulation Solutions (on site) PG6/32 adhesive coating. LAPPC - Northern Butchers 54m West - Animal and Plant/Vegetable Processes LAPPC - North Manchester Commercials 113m West - Respraying of Road Vehicles All of the above are historical permits
Fuel Stations Entries	0	None Identified
Licensed Radioactive Substances	0	None Identified
Enforcements, Prohibitions or Prosecutions	0	None Identified
Discharge Consents	7	All licences are assigned to United Utilities for sewerage discharges and storm tanks.
Pollution Incidents	7	5 associated with an incident located 23m east of the site on the 25/12/2003: Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 2 (Significant) 1 incident located 44m east on the 1/10/2002 Pollutant: Specific Waste Materials Pollutant Description: Metal Wastes Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact) 1 incident located 174m east on the 19/03/2005 Pollutant: Sewage Materials Pollutant Description: Crude Sewage Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
Consents Issued Under the Planning (Hazardous Substances) Act 1990	1	213m South at Clifford Whatmough Limited
Control of Major Accident Hazard (COMAH) Sites	0	None Identified



4.11. REGULATORY CONSULTATIONS

E3P contacted Laura Miller, the environmental protection officer at Manchester City Council who responded on 23rd January 2024 stating that they are aware of past land uses on the site and surrounding area.

The council have not identified the site or surrounding area as being contaminated land as defined under the Environmental Protection Act 1990, Part 2A. However, they did identify that the area to the north of Vale Street was developed as St Willibrords Primary School prior to 1981. The Contaminated Land Section holds a site investigation carried out at the school. The investigation found 'coal' and clinker waste present and elevated levels of copper and arsenic were encountered in topsoil of the playing fields located to the south of the school.



5. PRELIMINARY MINING ASSESSMENT

5.1. COAL MINING

The Coal Authority (CA) mapping and records indicate that the site is in an area that may be affected by coal mining.

A CA mining report was obtained (Ref: 51002321219001) dated November 2020.

The CA operates a risk-based approach to assessing potential instability issues associated with future land development located within the predefined CA consultation areas. This risk-based approach subdivides the potential risk into “low” and “high” risk categories.

The risk categories can be defined as:

Low-Risk Sites – Deemed to be land where coal mining has taken place, however, it was at such depth not to pose a risk to new development, and it, therefore, contains no known recorded risks and as such, no further assessment is required.

For low-risk sites, the CA categorically states:

If your proposed development is within the Development Low Risk Area, there is no need for you to submit any coal mining information with your planning application and The Coal Authority will not be consulted by the LPA. The LPA will include our Standing Advice as an informative note within the decision notice.

High-Risk Sites – Deemed to be landholdings located within an area known to contain legacy risks that include:

- ✚ Mine entries (shaft or adit);
- ✚ Shallow coal workings (recorded and probable);
- ✚ Workable coal seam outcrops;
- ✚ Mine gas sites and areas;
- ✚ Recorded coal-mining-related hazards;
- ✚ Geological features (fissures and break lines); and
- ✚ Former surface mining sites (sometimes using historic opencast extraction methods).

5.2. COAL MINING INFORMATION

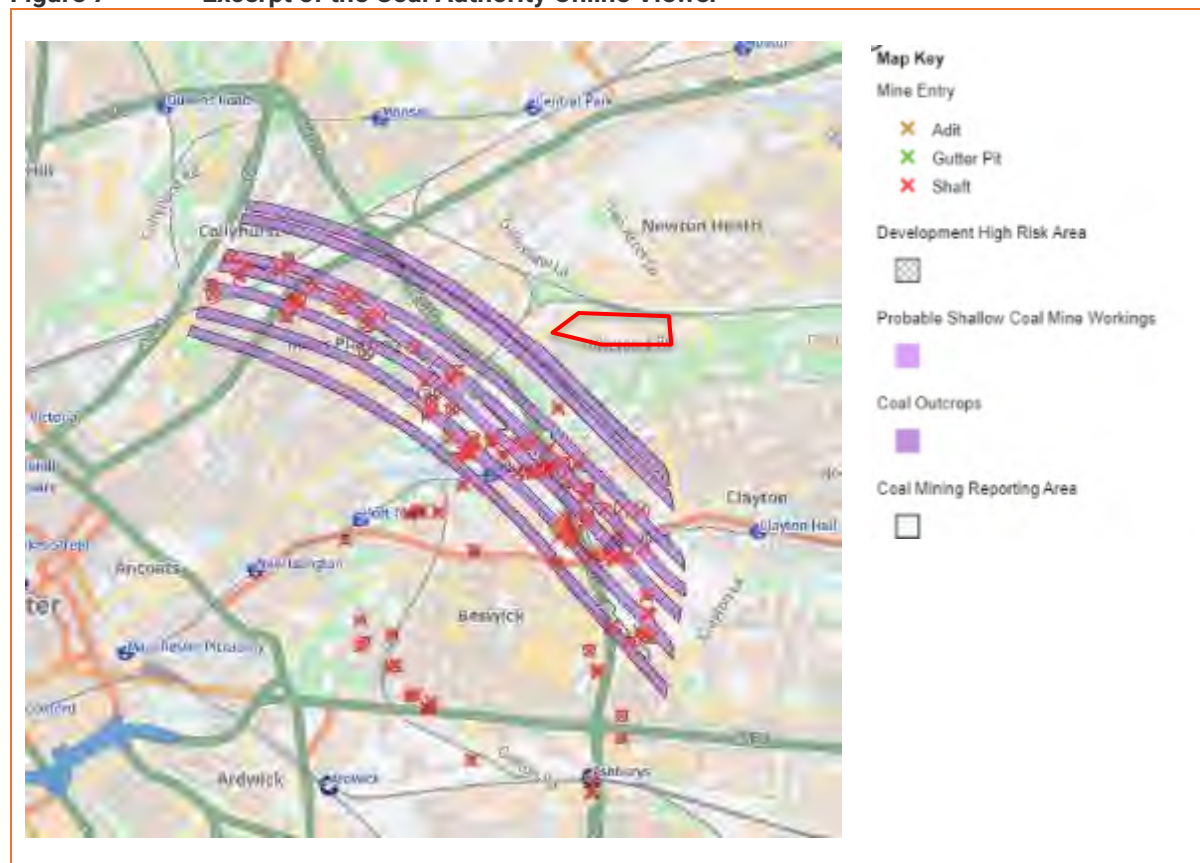
Prior to the enactment of the Coal Mines Regulation Act (1872), which came into force on the 1st of January 1883, there was no statutory requirement to record the extent of abandoned mine workings and as such the CA has no knowledge of extensive workings throughout the UK Coal Fields where shallow workings are present at a depth that could result in a subsidence event in the future (through successive cavitation) associated with failure of support mechanism.

Determining if a site may have unrecorded or recorded coal mine workings requires the consideration of a wide range of information, and E3P has completed a review of relevant information in relation to potential coal mining activities.



In the first instance, E3P has reviewed the Coal Authority Online Viewer, and an excerpt of this is presented in Figure 7. This map shows that the site does not lie within a high-risk development area. Furthermore, coal seams have been identified to the south west of the site.

Figure 7 Excerpt of the Coal Authority Online Viewer



However, as the site is within a coal mining reporting area, E3P has obtained a Consultant Coal Mining Report for the site (ref: 51002177949001).

Table 17 provides a summary of pertinent coal mining information with this report.

Table 17 Coal Mining Information

SOURCES OF INFORMATION	SUMMARY				
	SEAM	DIP	EXTRACTION THICKNESS (CM)	DEPTH (M)	YEAR
Known Past Underground Mining	PARKER	18.0	80	213	1935
	CROMBOUKE	13.5	120	563	1931
	CROMBOUKE	16	120	575	1933
	ROGER	16.9	170	609	1956
	CROMBOUKE	21.0	120	610	1924
	ROGER	16.1	180	618	1961
Probable Unrecorded workings	Yes				
Spine Roadways at Shallow Depth	No spine roadway recorded at shallow depth.				
Mine Entries within 100m of the Site	None recorded within 100m of the site boundary.				



Mine Abandonment plans	Yes
Known outcrops	DOCTOR – Workable: No
Faults / Fissures	The Bradford fault transect the site running approximately north-south. The location of fault is shown on Figure 8.
Opencast mines	None recorded within 500 metres of the site boundary.
Coal Authority Managed Tips	None recorded within 500 metres of the site boundary.
Remediated Sites	None recorded within 50 metres of the site boundary.
Coal Mining Subsidence	A damage notice or claim for alleged subsidence damage was made in September 2001 for Riverpark Trading Estate 25 Rochdale Road, Manchester, Lancashire, M4 4HT. However, the claim was rejected. 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. No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.
Mine Gas	None recorded within 500 metres of the site boundary.
Mine Water	None recorded within 500 metres of the site boundary.
Future Underground Mining	None recorded.
Coal Authority 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. The site is within an area of previous interest. It is close to where the Coal Authority or licensed mine operator has investigated and where necessary remediated issues relating to coal mining subsidence.
British Geological Survey Mapping	The 1:50,000 geological mapping for the area notes that there are no coal outcrops within the site boundary, however the CA mapping for the site indicates that a conjectured outcrop may cross the northern boundary of the site in a NW to SE orientation (Doctor Seam).
Review of Coal Authority Archive	There are seven CA archives/mine abandonment plans are available that intersect some or all of the site boundary. CA archives/mine abandonment plans are made available.
Historical Ordnance Survey Mapping	A review of the 1:10,000 Ordnance Survey mapping from circa 1884, which has records of mine workings that predate the Mining & Regulation Act of 1872, identified the following features indicative of historical mine workings in proximity to the application site:  Coal pit – 250m SW. In consideration of the historical mining features in proximity to the site and potential for coal close to the surface it is considered possible that coal extraction has occurred, underlying the site at relatively shallow depths; further investigation would be required to determine the extent and depth of any worked seams.



Historical Site Investigations

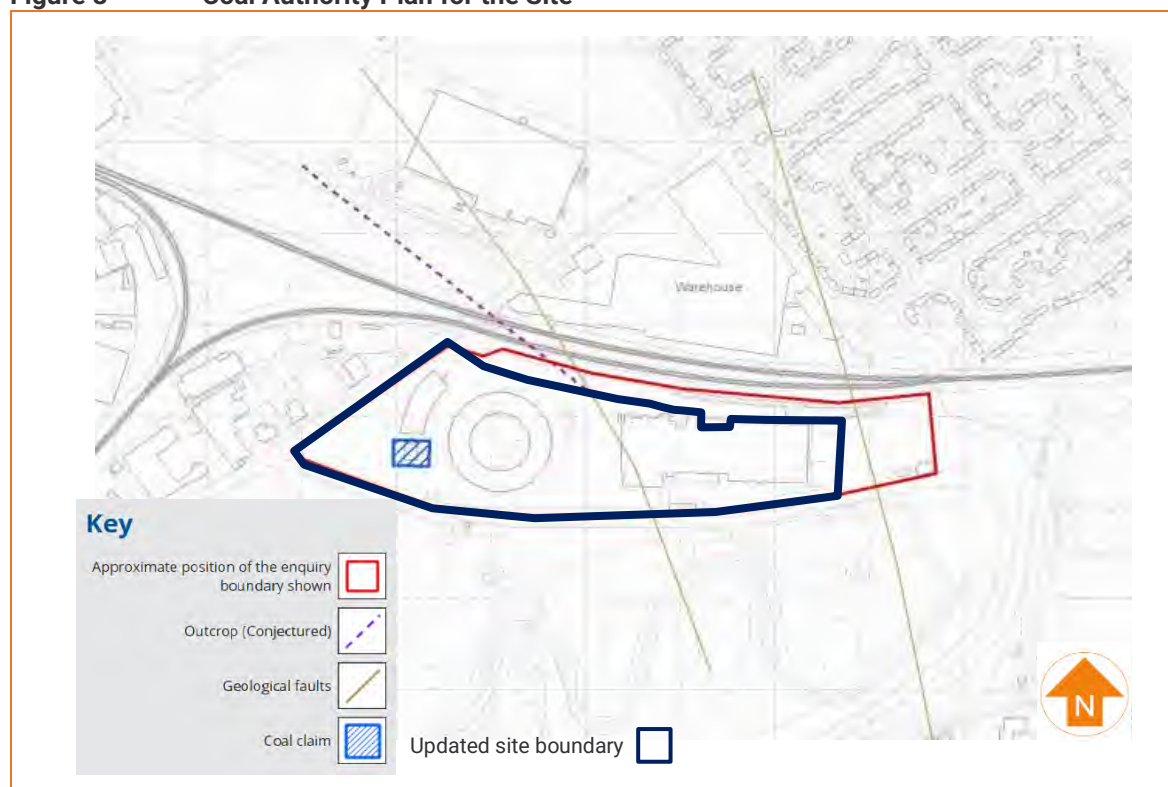
E3P previously undertook a coal mining investigation in November 2019 comprising eight rotary open holes to 40 m bgl. Works were advanced in accordance with Coal Authority Permission ref: 18954, dated 31st October 2019, to assess the potential presence of shallow workings within this seam and the potential for ground instability to induce a future subsidence event within the proposed development. A summary of findings are listed below:

- ✧ Eight 40 m rotary holes advanced.
- ✧ Top of rockhead was encountered from 8.90 m bgl to 14 m bgl.
- ✧ In-tact coal encountered in one location (RB102) sub-cropping from 12.70 m bgl to 13 m bgl (0.30 m thick).
- ✧ No coal encountered within remaining boreholes.
- ✧ No workings encountered to base of boreholes.
- ✧ No soft drilling noted by drilling team to base of boreholes.
- ✧ There was evidence to suggest that some seams were being locally displaced by possible fault sub-inclusions of rock.

5.3. COAL AUTHORITY PLAN

The Coal Authority plan referenced: MR-LARGE-PLOT-GS-7294009 shows the projected sub-crop of the doctor seam, former rejected coal claim and location of faults within vicinity of the site as illustrated in Figure 8.

Figure 8 Coal Authority Plan for the Site





5.4. COAL MINING GEOLOGY

Figure 9 is a snapshot of the 1:50,000 BGS map (sheet 85) for the site, no coal seams are mapped to outcrop within the site boundary, however the CA mapping for the site indicates that a conjectured outcrop may cross the northern boundary of the site in a NW to SE orientation (Doctor Seam).

BGS mapping shows the location of the two faults in relation to the subject site. The eastern fault has the downthrow side on the west, whilst the western fault has the downthrow side on the east.

Geological strata are recorded to dip 15° south west across the site, as such, any underlying coal seams are assumed to follow this dip direction and angle.

Figure 9 Snapshot of the 1:50,000 BGS Map for the Site



5.5. OPEN CAST MINING

There are no records of open-cast mining related to the site.

5.6. PRELIMINARY MINE GAS ASSESSMENT

If coal mining is present below the site, this may be a potential source of ground gas that could pose a risk to site end users. A preliminary mine gas assessment is provided in Table 18.



Table 18 Preliminary Mine Gas Assessment

SCENARIO	DISCUSSION	RATING
Are there known coal seams beneath the Site?	Yes – one known coal seam enters the site from the northern boundary. However, does not cross the entirety of the site. No recorded working of this seam beneath the site.	Moderate
Are there coal seams within 150m of the top of the bedrock?	Yes – the coal seams beneath the Site are known to be between 80m and 180 m bgl.	Low/Moderate
Are there any known workings below the Site?	Yes – there are known workings from 80 m bgl and 180 m bgl, worked seams are a potential source of ground gas. The risk is somewhat reduced given the depths to worked seams.	Moderate
Are the underlying drift deposits impermeable?	Yes – the Site is underlain by >10 m of low permeability stiff clay, the presence of low permeability deposits will inhibit the migration of ground gas towards the surface.	Low
Are there any mine entrances within the site boundary or within 50m of the Site?	No	Low
Are there any faults below the Site or in close proximity?	Yes – there is a fault beneath the centre of the Site. A further fault is located on the eastern boundary of the site. Faults may provide a pathway for mine gas to migrate towards the surface, however, in this scenario the fault doesn't transect through a mining area as such the risk is somewhat reduced.	Moderate
Is there any records of mine gas emission on or within 50m of the Site	No	Low
Is there any record of historical mine stabilisation works?	No	Low
Evidence of rising groundwater in flooded mine workings?	No	Low
OVERALL, MINE GAS RISK		Low/Moderate
Conclusions: Source: The Site is underlain by known coal workings at depth, which are a potential source of ground gas. No shallow worked seams have been identified from searches and previous investigations undertaken to date. Pathway: The Site is underlain by >10m of permeable clay, additionally, workings are present at significant depth 980 m – 120 m bgl) that reduces the risk given the distance mine gas must migrate through permeability strata to the surface; therefore, the likelihood of mine gas migration through the clay and significant rock cover to the ground surface is low. Where faults are present these may offer a migration route for mine gas, however, the presence of >10 m of low permeability stiff clay across the site will inhibit the migration of gas to the surface. Recommendations: Further ground gas monitoring and assessment to confirm the above conclusions and characterise the gas regime across the site.		



5.7. COAL MINING RISK ASSESSMENT

This risk assessment comprises a desk-based review of all available information on coal mining issues that are relevant to the application site deemed to be located within a coal affected area. This includes:

- ✳ Interpretation of information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- ✳ Setting 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; and
- ✳ Demonstrating to the local planning authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

The coal mining risk assessment is summarised in Table 19.

Table 19 Summary of Coal Mining Risk Assessment

COAL MINING RISK ASSESSMENT	YES/NO	RISK ASSESSMENT
Recorded Underground Coal Mining at Shallow Depth (< 30 m)	No	Low
Recorded Underground Coal Mining at Shallow Depth (> 30 m)	Yes	Moderate
Evidence of Unrecorded Surface Extraction of Coal Outcrop	No	Low
Unrecorded Underground Coal Mining at Shallow Depth (< 30 m)	Yes	Moderate
Mine Entries (Shaft/Adits)	No	Low
Coal Mining Geology – Fractures/Fissures	Yes	Low
Recorded Gas Emissions	No	Low
Recorded Mining Surface Hazard	No	Low
Surface Mining (Opencast)	No	Very Low/Low

Based on the above, a moderate risk of unrecorded coal mining at shallow depth has been identified.

The CA, as a statutory consultee, will require a series of rotary open holes across the site to determine the presence of any coal on site and to understand the nature of any coal workings. To satisfy this condition E3P has previously completed eight 40 m rotary boreholes to investigate shallow mine workings in the area of the conjectured seam (as indicated by the CA), and across the wider site. Rotary boreholes identified the presence of in-tact coal at one location of eight and no evidence of workings within any of the boreholes.



6. PRELIMINARY GEOTECHNICAL ASSESSMENT

6.1. GEOTECHNICAL DATA

Geotechnical data presented within a commercially available environmental database is summarised in Table 20.

Table 20 Summary of Geotechnical Data

HAZARD	DESIGNATION
Shrink-Swell Clay	Very low risk
Landslides	Low risk
Ground Dissolution	Negligible
Compressible Ground	Moderate risk
Collapseable Deposits	Very low risk
Running Sand	Low risk

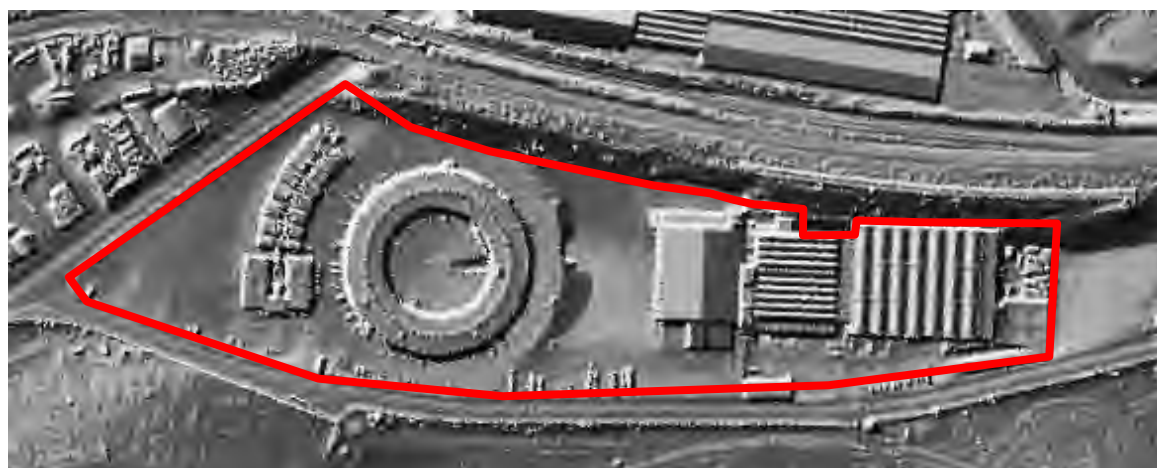
6.2. ARTIFICIAL LANDFORM AND GEOMORPHOLOGY

Based on the initial geological assessment, a review of available topographic data and pertinent mapping, E3P has undertaken a preliminary geomorphological evaluation of the landform and its possible mechanism for formation.

Superficial soils beneath the site were deposited through glacial action that will have formed the wider natural landscape. Historical mapping shows the site has been subjected to clay extraction throughout the 1900s, with multiple phases of extraction of underlying clays extended across the site. As a result of clay extraction the site now sits at a reduced level with the rail and land to the north more accurately representing the original ground level. The result of this large scale cut and resulting steep embankment along the northern boundary is visible in the Lidar data given below in Figure 10 in the centre and east of the site.

It is likely that to during the creation of a development platform circa 1966, historical levelling and localised cut and fill works have occurred, this has resulted in an artificially level site with little topographical change. The depth of filling is unknown, however, aerial imagery (from 1939) and review of topography and historic contours on historic mapping suggest that the site was lowered with shallow excavations over time, with the development platform (circa 1966) constructed at the base of the former excavations.

Figure 10 Surface Lidar Data





6.3. GROUND CAVITIES AND SINK HOLES

Information within the Groundsure Report states the site is within an area with no hazards to very low hazards from rock solubility.

6.4. PRELIMINARY GEOTECHNICAL ASSESSMENT

Based on the desk-study information, the following geotechnical assessment has been made:

- ✚ Existing buildings will require demolition, with all relict foundations grubbing out before the proposed development's construction.
- ✚ Several historically infilled ponds and reservoirs are present within the site boundary, which are potential sources of alluvial deposits, silts and possible organic peat deposits, and potential depths of Made Ground. An investigation will be required to assess these and undertake in-situ geotechnical testing to determine the potential foundation solution for plots in these areas.
- ✚ Significant slopes and retaining features are present on site, which will require slope stability assessments.
- ✚ Potential obstructions within the west of the site are anticipated due to historic development within this area of the site including the presence of chimney bases. These will be required to be grubbed out and removed.
- ✚ Some cut and fill will be required on site due to the variance of topography, especially in the centre of the site.
- ✚ The previous ground investigation conducted by E3P identified deep Made Ground in the west (circa 5m bgl) of the site which will likely require reengineering.
- ✚ Site is underlain by cohesive soils that are potentially susceptible for seasonal shrink and swelling, heave precautions may be required to new structures.
- ✚ Trees are present within the embankment at the northern boundary and clays in this area may be subject to desiccation, however, their removal is an unlikely option as their excavation may undermine the embankment. It is recommended that the conjectured extent of desiccation be modelled and that the appropriate foundation solution be adopted.



7. INITIAL CONCEPTUAL SITE MODEL

Under EA LCRM (updated June 2023) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), and BS EN ISO 21365:2021 (Soil Quality – Conceptual models for potentially contaminated sites), E3P has developed a Tier 1 risk assessment comprising an initial conceptual site model (CSM) to identify potential contamination sources, migration pathways and receptors within the study area. An initial screening of the on and potential off-site sources of contamination has been undertaken in Table 21, with the more detailed initial CSM included overleaf as Table 22.

Table 21 Initial Contaminant Source Screening

SOURCE	SOIL	GROUNDWATER	GROUND GAS
ON-SITE			
Made Ground	Heavy metals, PAHs, TPHs, VOCs, asbestos	Heavy metals, PAHs, TPHs, VOCs	Methane, Carbon dioxide, volatile vapours
Infilled Features (ponds and site boundaries)	Heavy metals, PAHs, TPHs, VOCs, asbestos	Heavy metals, PAHs, TPHs, VOCs	Methane, Carbon dioxide
Historical Industrial Site use (brick works)	Heavy metals, PAHs, TPHs, VOCs, asbestos	Heavy metals, PAHs, TPHs, VOCs	Methane, Carbon dioxide, Volatile vapours
Current Commercial Use (butchers, furniture repair, lorry park)	Heavy metals, PAHs, TPHs, VOCs, asbestos	Heavy metals, PAHs, TPHs, VOCs	Volatile vapours
Current/Formers Structures	Asbestos	N/A	N/A
Deep coal workings	N/A	N/A	Methane, Carbon dioxide
Butchers/Abattoir	Biological Pathogens	N/A	N/A
Substation	PCBs	N/A	N/A
OFF-SITE			
Railway infrastructure/use	TPHs, PAHs – limited due to distance	Heavy metals, PAHs, TPHs, VOCs	Unlikely
Landfill	Heavy metals, PAHs, TPHs, VOCs, asbestos	Heavy metals, PAHs, TPHs, VOCs	Methane, Carbon dioxide



7.1. INITIAL CONCEPTUAL SITE MODEL

After reviewing all environmentally pertinent information and the potential contaminant sources, the following initial conceptual site model has been developed for the site.

Table 22 Initial Conceptual Model

CONTAMINANT RISK			HUMAN HEALTH			
SOURCES	MIGRATION PATHWAYS	RECEPTORS	LIKELIHOOD	SEVERITY	LEVEL OF RISK	JUSTIFICATION
Made Ground, Historical Brick Works, Infilled Features and Current Commercial Activities Heavy Metals, PAHs, long chain TPHs	Accidental ingestion and/or dermal contact with contaminated soil and/or leachate. PL1/PL2 Inhalation of contaminated dust. PL3	Human Health – construction workers	Likely	Medium	Moderate	Made Ground deposits are anticipated across the site due to previous site uses as a brick works with associated tramline and infilled clay pits, infilled ponds, chimney and tanks along with subsequent demolition of buildings. Made Ground deposits are potential sources of heavy metals, long chain hydrocarbons and polycyclic aromatic hydrocarbons (PAH). Where backfilled, any former clay pits are likely to have been infilled with incinerated wastes, as was common at the time of the early to mid-20th century. Incinerated wastes are likely sources of heavy metals and PAHs. Other waste sources may have been subjected to landfill in the former clay pits which may act as an additional source of Heavy Metals and PAHs. If present, heavy metals and non-volatile PAHs may pose a short-term risk to construction workers who may encounter impacted soils during earthworks.
		Human Health – end users	Low likelihood	Medium	Moderate	



HUMAN HEALTH						
CONTAMINANT RISK			LIKELIHOOD	SEVERITY	LEVEL OF RISK	JUSTIFICATION
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
						The former abattoir and meat wholesalers that operated within the central buildings may be a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes.
Former abattoir and meat wholesalers. Biological pathogens	Accidental ingestion and/or dermal contact PL1/PL2	Human Health – construction workers	Likely	Medium	Moderate	The former abattoir and meat wholesalers that operated within the central buildings may be a potential source of biological pathogens associated with the former slaughter of livestock and removal of animal wastes.
		Human Health – end users	Low likelihood	Medium	Moderate	Liquid blood and fat waste that was not fully removed from the site or did not fully drain from the site may be a potential source of harmful microorganisms if encountered by ground workers. These wastes may have leaked from tanks, pipework, and storage chambers through construction joints in floor slabs or through permeable surfaces. The risk of encountering pathogens associated with the former animal processing land use will lessen over time, therefore given the elapsed time period since the cessation of abattoir operations the risk is considered significantly reduced.



HUMAN HEALTH						
CONTAMINANT RISK			LIKELIHOOD	SEVERITY	LEVEL OF RISK	JUSTIFICATION
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
						During the demolition of the former abattoir and meat wholesaler buildings, a watching brief should be implanted during the removal of tanks, pits and pipework to identify any potentially blood or animal fat impacted soils.
Made Ground and Current/Formal Structures Asbestos (Asbestos containing materials (ACM) and loose fibres)	Inhalation (of fibres). Construction works disturbing bound material and releasing fibres. PL3	Human Health – construction workers, end land users, and users of adjacent sites	Likely	Medium	Moderate	Given the age of the structures on site it is likely that asbestos containing materials (ACM) is present within the building materials. Prior to demolition of onsite structures a detailed asbestos survey will be required. ACM is likely to be present within Made Ground in the west of the site from the demolition of former structures. ACM poses a risk through fibre and dust inhalation and if present may pose a risk to construction workers during any future earthworks / demolition and to adjacent third-party property should dust be generated during those works. These risks can be mitigated through the development of a detailed enabling works strategy following guidance and protocol specified within the Control of Asbestos Regulations (2012) and industry best practice as detailed in CIRIA733 (<i>Asbestos in Soil and Made Ground: A guide to understanding risk</i>).



HUMAN HEALTH						
CONTAMINANT RISK			LIKELIHOOD	SEVERITY	LEVEL OF RISK	JUSTIFICATION
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
Brickworks, Historical Tramline and localised spillages from Lorry Park VOCs, hydrocarbons, volatile PAHs (naphthalene)	Inhalation of vapours. PL4 Migration through permeable strata and preferential pathways.	Human Health – end users Human Health – Off-site receptors	Low likelihood	Medium	Moderate	The initial site walkover and review of historical mapping did not identify the presence of any tanks on site. Historical industrial land uses including a former brick works, as well as Made Ground, represent potential sources of mobile hydrocarbon contamination. Additionally, the previous report completed by E3P has identified the presence of volatile contamination in isolated areas. Intrusive investigation and assessment will be required to determine the level of mitigation measures and/or remediation.
Made Ground Sulphate from potential ash within the Made Ground.	Sulphate attack on concrete. PL6	Building concrete	Low likelihood	Medium	Low	The presence of pH and sulphate within Made Ground deposits may result in corrosion of buried concrete within the proposed development. Assessment must be undertaken to confirm the levels of pH and sulphate within the underlying strata and in particular any Made Ground deposits so that a concrete classification can be determined.
Made Ground Organic contaminants such as hydrocarbons, solvents	Ingestion of tainted water supply. PL7	Human Health – End Users Water pipeline	Likely	Medium	Moderate/Low	Likely probability as contamination is anticipated at pipeline depth across the west of the site (0.75–1.35 m). Intrusive investigation is required. Barrier pipe is likely to be required within any future development.
Made Ground	Direct contact (plant uptake). PL8	Flora	Likely	Low	Low	Likely probability as contamination is considered possible, which may be taken up by flora in soft landscaping/gardens.



HUMAN HEALTH						
CONTAMINANT RISK			LIKELIHOOD	SEVERITY	LEVEL OF RISK	JUSTIFICATION
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
Phytotoxic contaminants						Intrusive investigation is required. Cover systems to provide a suitable growing medium are likely to be required as part of any future development.
CONTROLLED WATERS						
Made Ground	Leaching of contaminants from Made Ground through infiltration and percolation of rainwater. PL5	Controlled waters, underlying Principal and Secondary A aquifer	Low likelihood	Medium	Low	Limited on site contamination sources have been identified. If isolated contamination sources are identified during intrusive works there is a low likelihood for any elevated contaminants to migrate towards the underlying aquifers due to the presence of impermeable CLAY across the site (identified during site investigation). Further sampling and investigation should be undertaken to confirm this.
		Infrastructure and services	Low likelihood	Low	Low	
Made Ground, Historic Brickworks, Lorry park, Infilled Features, Current Commercial Land Use Heavy metals, VOCs, TPH and PAH leaching into Groundwater	Contact with contaminated groundwater. PL2	Human Health – site personnel	Low likelihood	Low	Low	Groundwater is known to be below construction level and as such, is expected to not rise above ground level or the final level of the road.
	Contaminants leached from the Made Ground and from off-site sources may be mobilised to greater distances through advective flow. PL5	Human Health – end users	Low likelihood	Low	Low	If present, any impacted groundwater is unlikely to migrate laterally or vertically through impermeable strata. However, given the limited contamination sources identified on site the risk of this is low. Site works will not exacerbate this, and site work will be undertaken above the water table. Groundwater will need to be considered for surrounding developments.



HUMAN HEALTH						
CONTAMINANT RISK			LIKELIHOOD	SEVERITY	LEVEL OF RISK	JUSTIFICATION
SOURCES	MIGRATION PATHWAYS	RECEPTORS				
GROUND GAS						
Made Ground, Deep Coal Workings Ground gases (methane and carbon dioxide arising from Made Ground)	Inhalation of ground gas. PL4	Human Health – site personnel	Low likelihood	Low	Low	Limited for ground gases may migrate through underlying impermeable strata to enter proposed buildings. A period of ground gas monitoring will be required to determine the gas regime for the site. Previous monitoring suggests CS1, this reduces the risk level, however, will need confirmation.
	Accumulation of ground gas in confined spaces (asphyxiation or explosion)	Human Health – end users	Low likelihood	Medium	Moderate/Low	
		Infrastructure and services	Low likelihood	Low	Low	
Radon	Inhalation of ground gas and accumulation in confined spaces (carcinogenic). PL4	Human Health – site personnel	Unlikely	Low	Very low	Radon mapping has identified the site is within an area not at risk from radon. Basic Radon mitigation measures are not required.
		Human Health – end users	Unlikely	Low	Very low	

MAIN EXPOSURE PATHWAYS:

PL1 = SOIL INGESTION, PL2 = DERMAL CONTACT AND INGESTION, PL3 = DUST INHALATION; PL4 = VAPOUR/GAS INHALATION; PL5 = VERTICAL / LATERAL MIGRATION; PL6 = CORROSION OF CONCRETE; PL7=TAINTING OF WATER SUPPLY; PL8 = UPTAKE BY PLANTS.

LEVEL OF RISK

Very Low	
Low	
Low/Moderate	
Moderate	
Moderate/High	
High	



END OF REPORT

APPENDIX I LIMITATIONS



1. This report and its findings should be considered concerning the terms of reference and objectives agreed upon between E3P and the client, as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data from the sources identified. The information is not necessarily exhaustive, and further information relevant to the Site may be available from other sources. When using the information, it has been assumed that it is correct. No attempt has been made to verify the information.
3. This report has been produced following current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and require advice from legal professionals.
4. During the site walkover, a reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the Site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the Site limited the locations where sampling locations could be installed and the techniques that could be used.
6. 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.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and does not constitute or replace full and proper surveys.
8. The report's executive summary, conclusions and recommendations sections provide an overview and guidance only. They should not be relied on explicitly without fully considering the report's context.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that it was prepared for. The copyright in this report and other plans and documents designed by E3P is owned by them, and no such plans or documents may be reproduced, published or adapted without written consent. However, complete copies of this may be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied. Still, no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II

GLOSSARY



TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation



MCV	Moisture condition value	WRAP	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection

APPENDIX III

RISK CLASSIFICATION

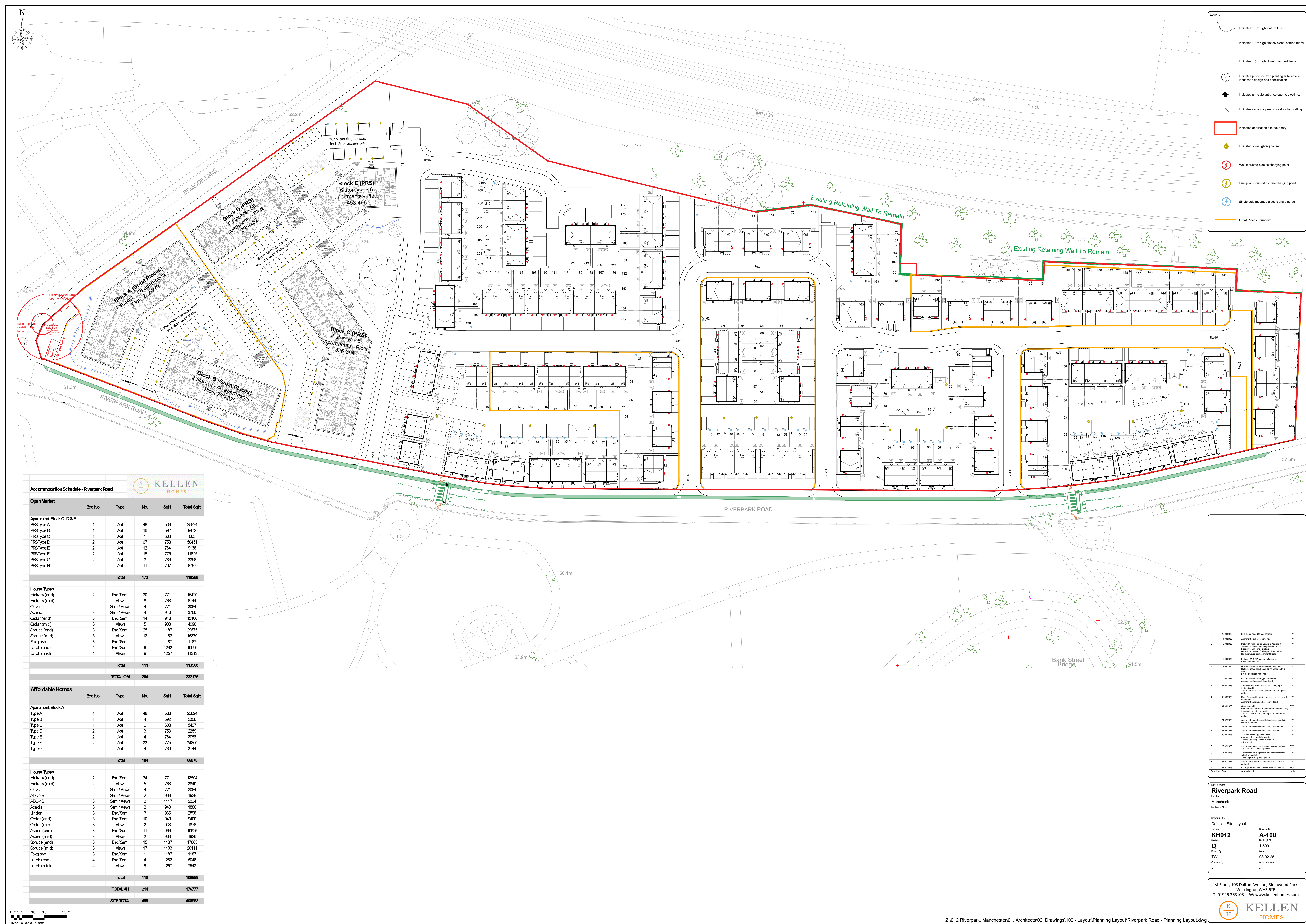
RISK CLASSIFICATION

RISK	DEFINITION
Low	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
Low Moderate	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of future redevelopment of the Site.
Moderate	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the Site will likely require further site investigation.
Moderate High	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that requires further assessment, including intrusive ground investigations.
High	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine the level of risk and associated liability.

APPENDIX IV DRAWINGS

DRAWING 17-246-001 – Site Location Plan





Accommodation Schedule - Riverpark Road					
Open Market					
	Bld No.	Type	No.	Sqft	Total Sqft
Apartment Block C, D & E					
PRS Type A	1	Apt	48	538	25824
PRS Type B	1	Apt	16	552	9472
PRS Type C	1	Apt	603	633	38049
PRS Type D	2	Apt	67	753	50451
PRS Type E	2	Apt	12	764	9168
PRS Type F	2	Apt	15	775	11625
PRS Type G	2	Apt	3	736	2358
PRS Type H	2	Apt	11	797	8767
Total			173		118268
House Types					
Hickory (end)	2	End/Semi	20	771	15420
Hickory (mid)	2	Mews	8	798	6384
Olive	2	Semi/Mews	4	771	3084
Acacia	3	Semi/Mews	4	940	3760
Cedar (end)	3	End/Semi	14	940	13160
Cedar (mid)	3	Mews	5	938	4690
Spruce (end)	3	End/Semi	25	1187	29675
Spruce (mid)	3	Mews	13	1183	15379
Fordglove	3	End/Semi	1	1187	1187
Larch (end)	4	End/Semi	8	1262	10096
Larch (mid)	4	Mews	9	1257	11313
Total			111		113908
TOTAL OM			284		232176
Affordable Homes					
	Bld No.	Type	No.	Sqft	Total Sqft
Apartment Block A					
Type A	1	Apt	48	538	25824
Type B	1	Apt	4	552	2208
Type C	1	Apt	9	603	5427
Type D	2	Apt	3	753	2259
Type E	2	Apt	4	764	3056
Type F	2	Apt	32	775	24800
Type G	2	Apt	4	736	3144
Total			104		66878
House Types					
Hickory (end)	2	End/Semi	24	771	18504
Hickory (mid)	2	Mews	5	798	3990
Olive	2	Semi/Mews	4	771	3084
ADU-2B	2	Semi/Mews	2	969	1938
ADU-4B	3	Semi/Mews	2	1117	2234
Acacia	3	Semi/Mews	2	940	1880
Linden	3	End/Semi	3	965	2896
Cedar (end)	3	End/Semi	10	940	9400
Cedar (mid)	3	Mews	2	938	1876
Aspen (end)	3	End/Semi	11	966	10626
Aspen (mid)	3	Mews	2	963	1926
Spruce (end)	3	End/Semi	15	1187	17805
Spruce (mid)	3	Mews	17	1183	20111
Fordglove	3	End/Semi	1	1187	1187
Larch (end)	4	End/Semi	4	1262	5048
Larch (mid)	4	Mews	6	1257	7542
Total			110		108899
TOTAL AH			214		176777
SITE TOTAL			498		408953

- Legend
- Indicates 1.8m high feature fence.
 - Indicates 1.8m high plot divisional screen fence.
 - Indicates 1.8m high closed boarded fence.
 - Indicates proposed tree planting subject to a landscape design and specification.
 - Indicates principle entrance door to dwelling.
 - Indicates secondary entrance door to dwelling.
 - Indicates application site boundary.
 - Indicated solar lighting column.
 - Wall mounted electric charging point.
 - Dual pole mounted electric charging point.
 - Single pole mounted electric charging point.
 - Great Places boundary.

Revisions		
Q	26.03.2025	Blue stone added to rear garden
P	14.03.2025	Apartment block total corrected
O	13.03.2025	Plot 62-67 added for Cedar & Acacia & accommodation schedule updated to match
N	12.03.2025	Plot 6, 108 & 212 added to Brownstones
M	11.03.2025	Double corner fence removed to Brownstones
L	10.03.2025	Double corner fence removed to Brownstones
K	07.03.2025	Double corner fence removed to Brownstones
J	06.03.2025	Double corner fence removed to Brownstones
I	04.03.2025	Double corner fence removed to Brownstones
H	26.02.2025	Double corner fence removed to Brownstones
G	21.02.2025	Double corner fence removed to Brownstones
F	21.02.2025	Double corner fence removed to Brownstones
E	20.02.2025	Double corner fence removed to Brownstones
D	20.02.2025	Double corner fence removed to Brownstones
C	17.02.2025	Double corner fence removed to Brownstones
B	09.02.2025	Double corner fence removed to Brownstones
A	07.02.2025	Double corner fence removed to Brownstones
Revision	Date	Amendment

Project Name: Riverpark Road

Location: Manchester

Drawing Title: Detailed Site Layout

Job No: KH012

Scale: 1:500

Drawn By: TW

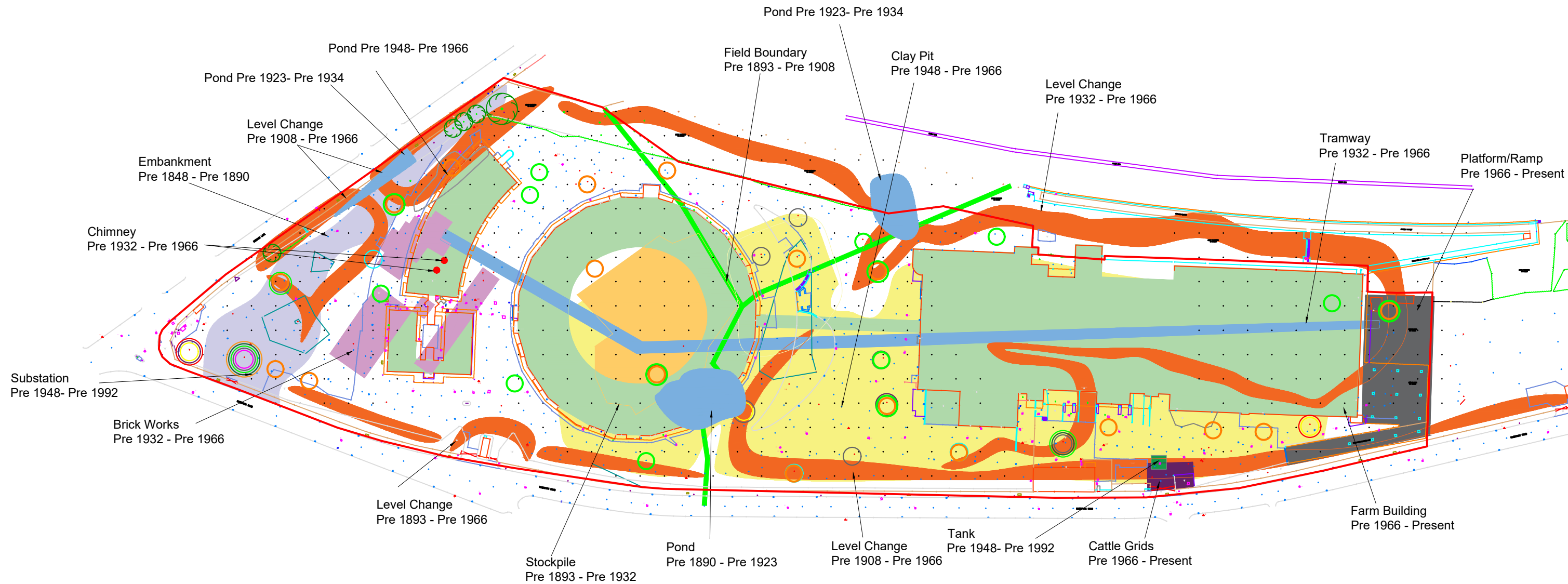
Date: 03.02.25

Checked By: TW

Date Checked: TW

1st Floor, 103 Dalton Avenue, Birchwood Park, Warrington WA3 6YE
T: 01925 363108 W: www.kellenhomes.com





Historical Features	
	Stockpile
	Field Boundary
	Level Change
	Clay Pit
	Chimney
	Tramway
	Brickworks
	Platform
	Farm Buildings
	Cattle Grid
	Pond
	Substation
	Tank
	Ponds
	Embankment

Notes:					
P1	REVC	21.11.2024	TG	MD	MD
P1	REVB	16.05.2024	OW	MD	MD
P1	REVA	12.02.2024	EB	MD	MD
Phase	Issue	Date	Drawn	Checked	PM

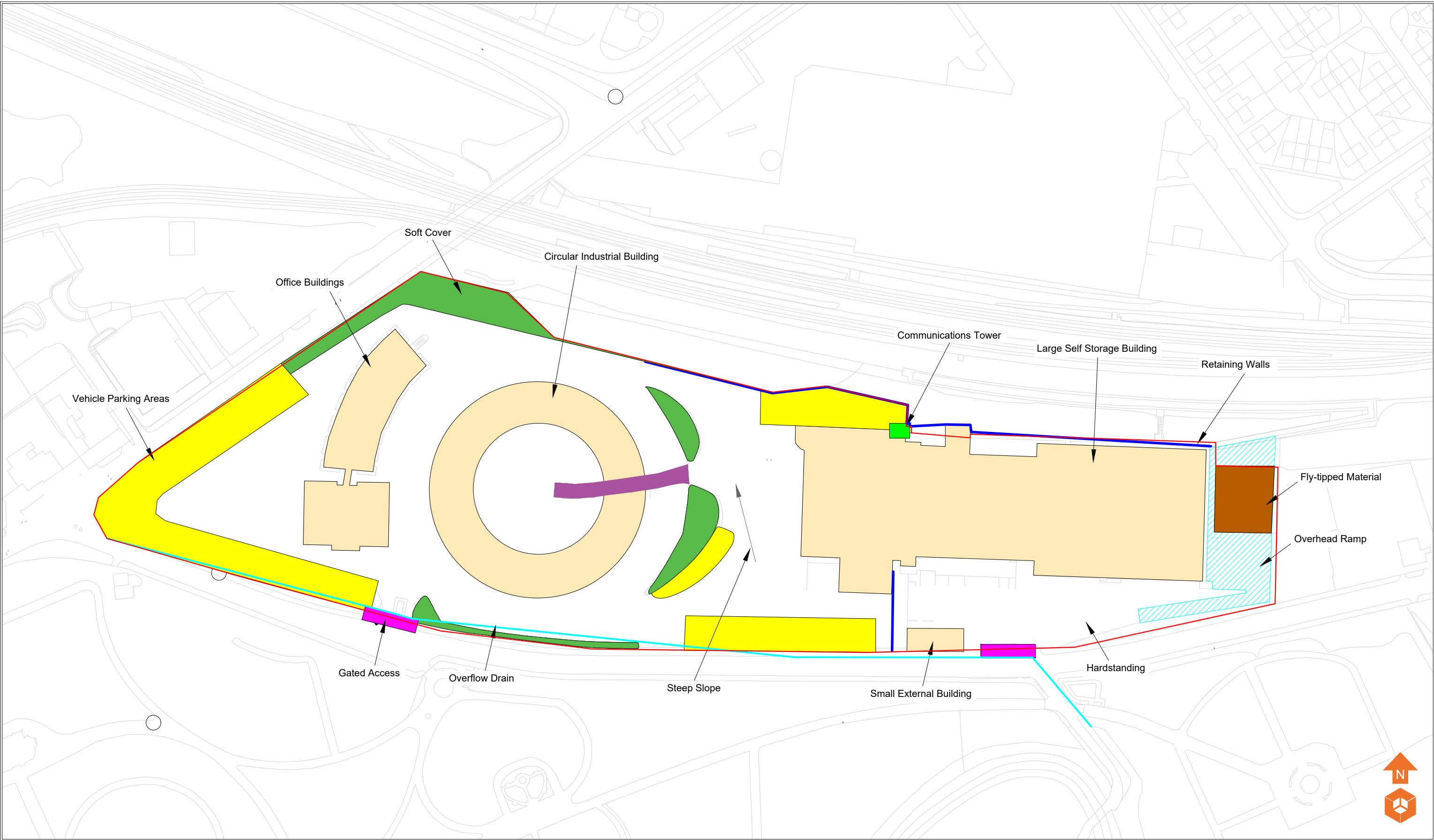
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Kellen	
Job Title:	
Riverpark	

Job No:	17-246
Drawing No:	003
Date:	21.11.2024
Scale:	NTS @ A3
Drawing Title:	
Historical Features Plan	



Environmental Engineering
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Website: www.e3p.co.uk

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- Site Features
- Buildings
 - Steep Slope
 - Hardstanding
 - Soft Cover
 - Fly-tipped Materials
 - Communications Tower
 - Overhead Ramp
 - Vehicle Parking Areas
 - Retaining Walls
 - Overflow Drain
 - Underpass

Notes:

P1	REVD	21.11.2024	TG	MD	MD
P1	REVC	16.05.2024	OW	MD	MD
P1	REVB	01.03.2024	OW	LC	MD
P1	REVA	29.02.2024	OW	LC	MD
Phase	Issue	Date	Drawn	Checked	PM

Client:

Kellen

Job Title:

Riverpark

Job No:

17-246

Drawing No:

004

Date:

21.11.2024

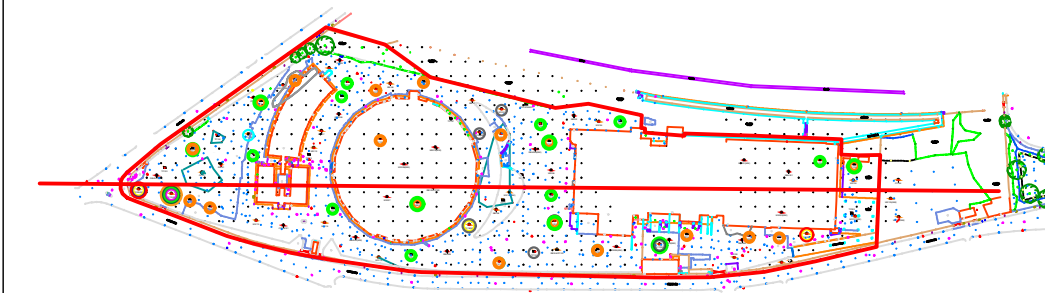
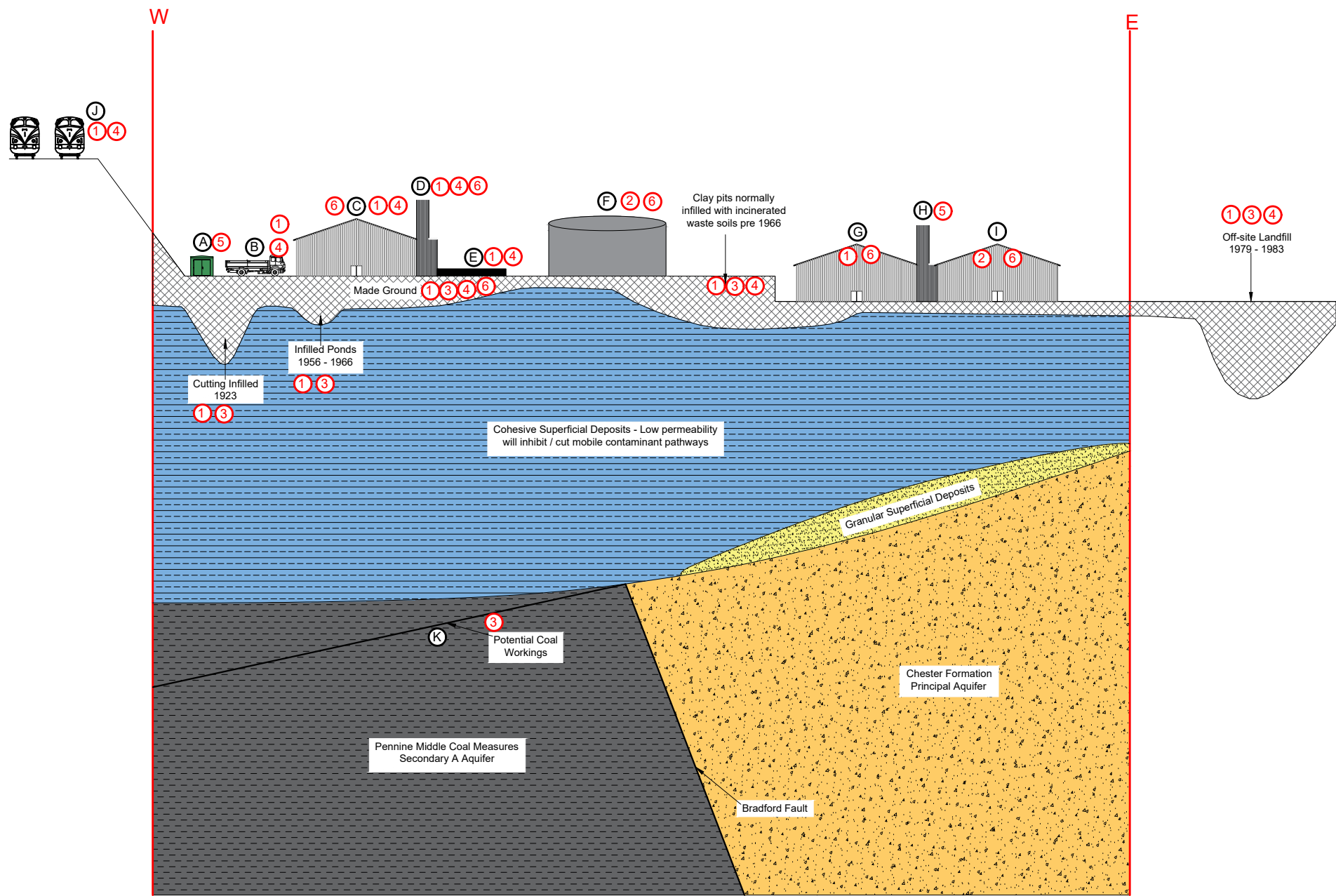
Scale:

NTS @ A3

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Current / Historic Uses



Geology Key		Potential Contaminants		Potential Coal Workings			
	Made Ground	①	Heavy Metals, Non Volatile PAH's, Non Volatile TPH's	Ⓐ	Substation	Ⓚ	Potential Coal Workings
	Cohesive Superficial Deposits	②	Biological Pathogens	Ⓑ	Lorry (HGV) Park		
	Chester Formation Principle Aquifer	③	Ground Gas	Ⓒ	Former Brickworks		
	Granular Superficial Deposits	④	Volatile Contaminants (TPH C5 - C12), Napathalene, BTEX	Ⓓ	Chimney		
	Pennine Middle Coal Measures	⑤	PCB's	Ⓔ	Former Tramway		
		⑥	Asbestos	Ⓕ	Butchers		
				Ⓖ	Current Commercial Activities		
				Ⓗ	Communication Tower		
				Ⓘ	Former Abattoir		
				Ⓝ	Off-site Railway & Rail Infrastructure		

Notes:					
P1	REVE	21.11.2024	TG	MD	MD
P1	REVD	16.05.2024	OW	MD	MD
P1	REVC	20.03.2024	EB	MD	MD
P1	REVB	19.03.2024	EB	GC	MD
P1	REVA	15.03.2024	EB	GC	MD
Phase	Issue	Date	Drawn	Checked	PM

Client:		Job No:	
Kellen		17-246	
Riverpark		Drawing No:	
		027	
Job Title:		Date:	
		21.11.2024	
		Scale:	
		NTS	

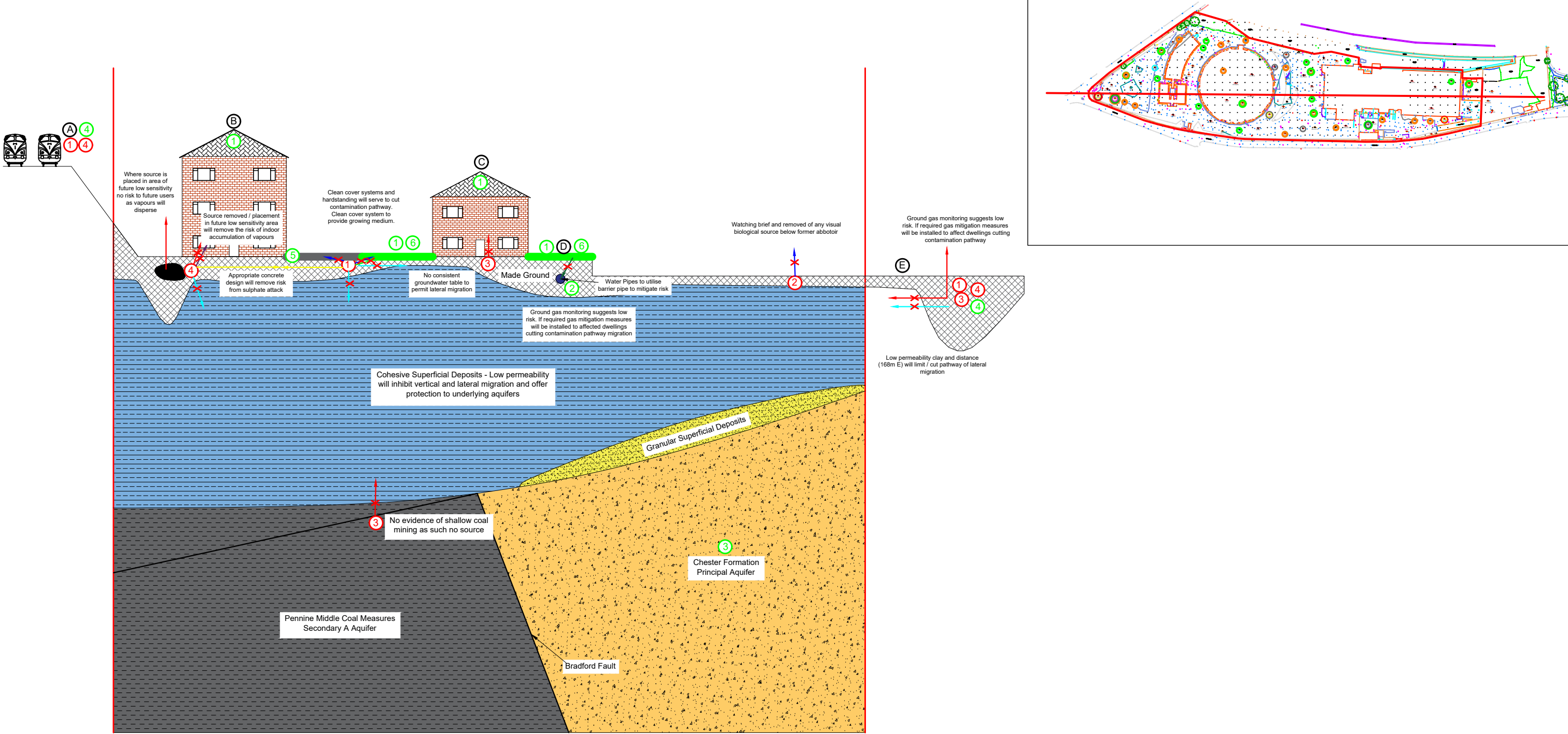
Drawing Title:	
Human Health Conceptual Site Model	



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Residential End Use



Geology Key	Potential Contaminants	Pathways	Receptors	Mitigation Measures
Made Ground Cohesive Superficial Deposits Chester Formation Principle Aquifer Granular Superficial Deposits Pennine Middle Coal Measures Pathway interrupted	① Heavy Metals, Non Volatile PAH's, Non Volatile TPH's ② Biological Pathogens ③ Ground Gas ④ Volatile Contaminants (TPH C5 - C12), Napthalene, BTEX ⑤ PCB's ⑥ Asbestos	Dermal Contact / Ingestion Vapour Inhalation Inhalation / Accumulation Tainting of Water Supplies Dust Inhalation Vertical / Lateral Migration Sulphate Attack on Concrete Plant Uptake	① Future End Users ② Water Pipes ③ Groundwater (Principal Aquifer) ④ Off-site Receptors ⑤ Building Structure ⑥ Flora	A Off-site Railway & Rail Infrastructure B Apartment Block C Low Rise D Site Cover / Private Gardens E Off-site Landfill

Notes:					
P1	REVD	21.11.2024	TG	MD	MD
P1	REVC	16.05.2024	OW	MD	MD
P1	REVB	19.03.2024	EB	GC	MD
P1	REVA	15.03.2024	EB	GC	MD
Phase	Issue	Date	Drawn	Checked	PM

Client:	Kellen
Job Title:	Riverpark

Job No:	17-246
Drawing No:	028
Date:	21.11.2024
Scale:	NTS
Drawing Title:	Human Health Conceptual Site Model



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APPENDIX V

PHOTOGRAPHS

PLATE 1 EASTERN SIDE OF THE SITE



PLATE 2 SMALL RETAINING WALL IN THE EAST OF THE SITE



PLATE 3 INSIDE EASTERN WAREHOUSE

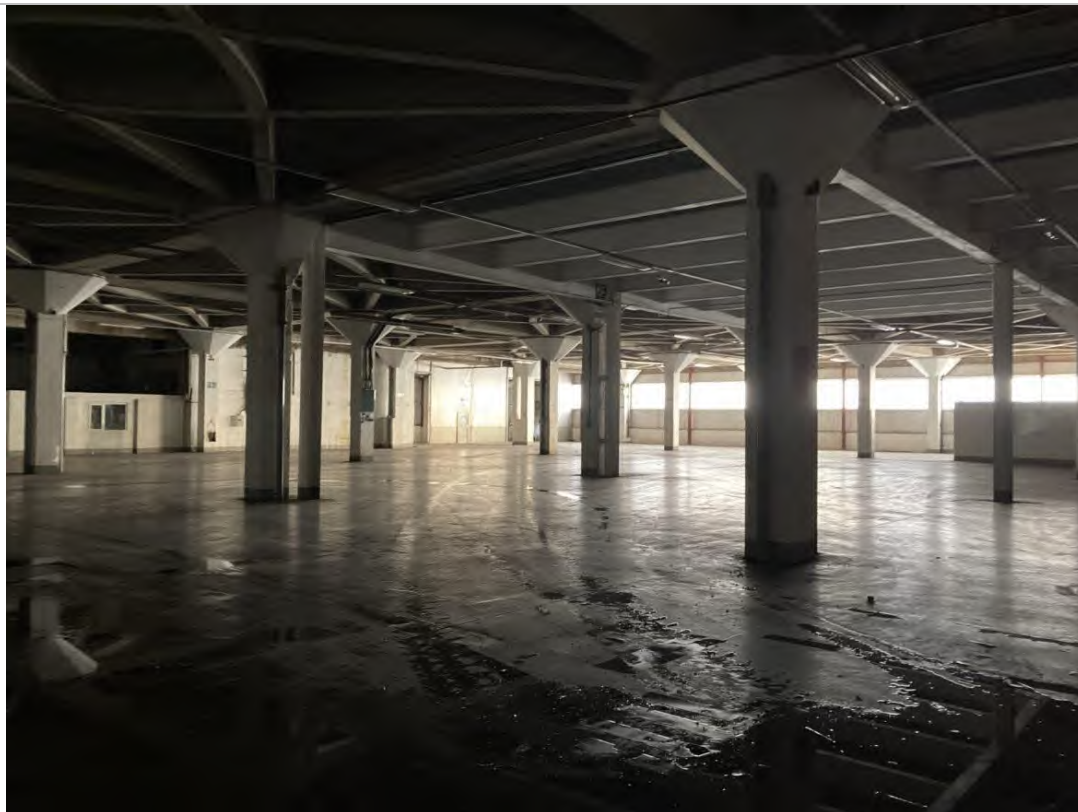


PLATE 4 VIEW OF SITE UNDER THE RAMP IN THE EAST OF THE SITE



PLATE 5 SELF STORE WAREHOUSE



PLATE 6 SLOPE IN THE CENTRE OF THE SITE



PLATE 7 UNDERPASS IN THE CENTRE OF THE SITE



PLATE 8 RETAINING WALL AND SLOPE ALONG THE NORTHERN BOUNDARY



PLATE 9 ELECTRICAL SUBSTATION AT THE SITE ENTRANCE



PLATE 10 INSIDE THE CENTRAL BUILDING ON SITE



APPENDIX VI

HISTORICAL MAPS

Site Details:

RIVERPARK ROAD,
MANCHESTER, M40 2XP

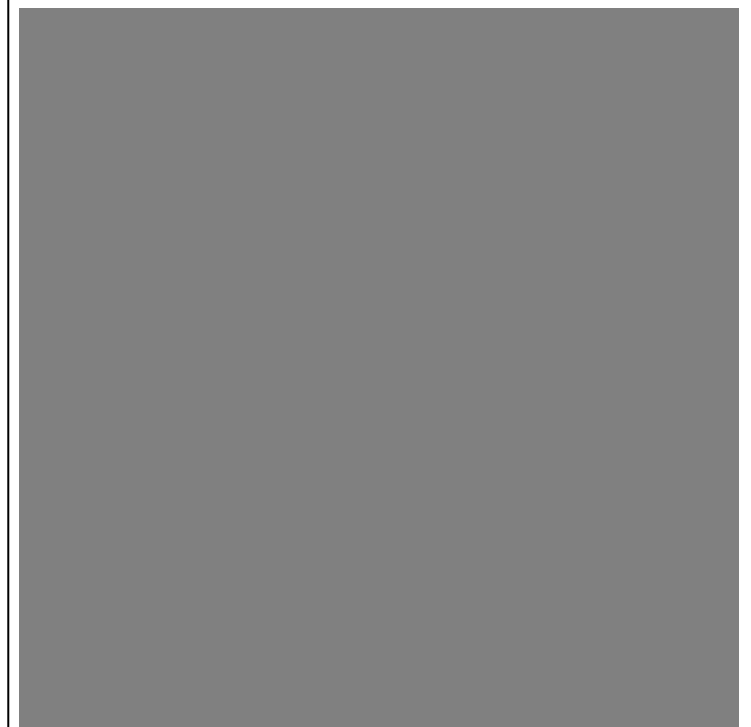
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Map Name: County Series

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Printed at: 1:10,560

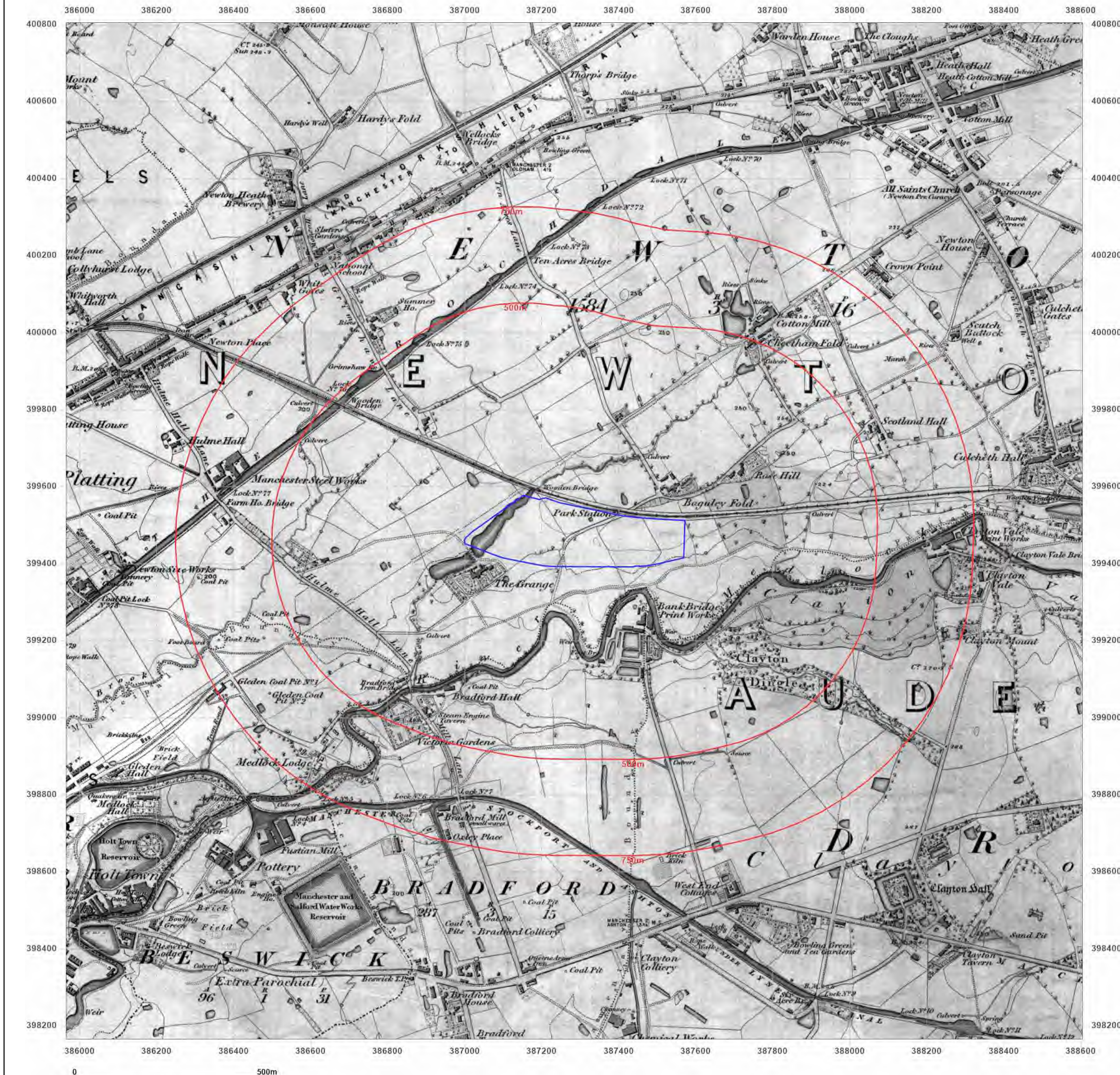


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Client Ref: 007231
Report Ref: GS-X1C-114-525-TLT
Grid Ref: 387284, 399484

Map Name: County Series

Map date: 1890-1891

Scale: 1:10,560

Printed at: 1:10,560



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Edition 1891
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Revised 1890
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Map Name: County Series

Map date: 1905-1906

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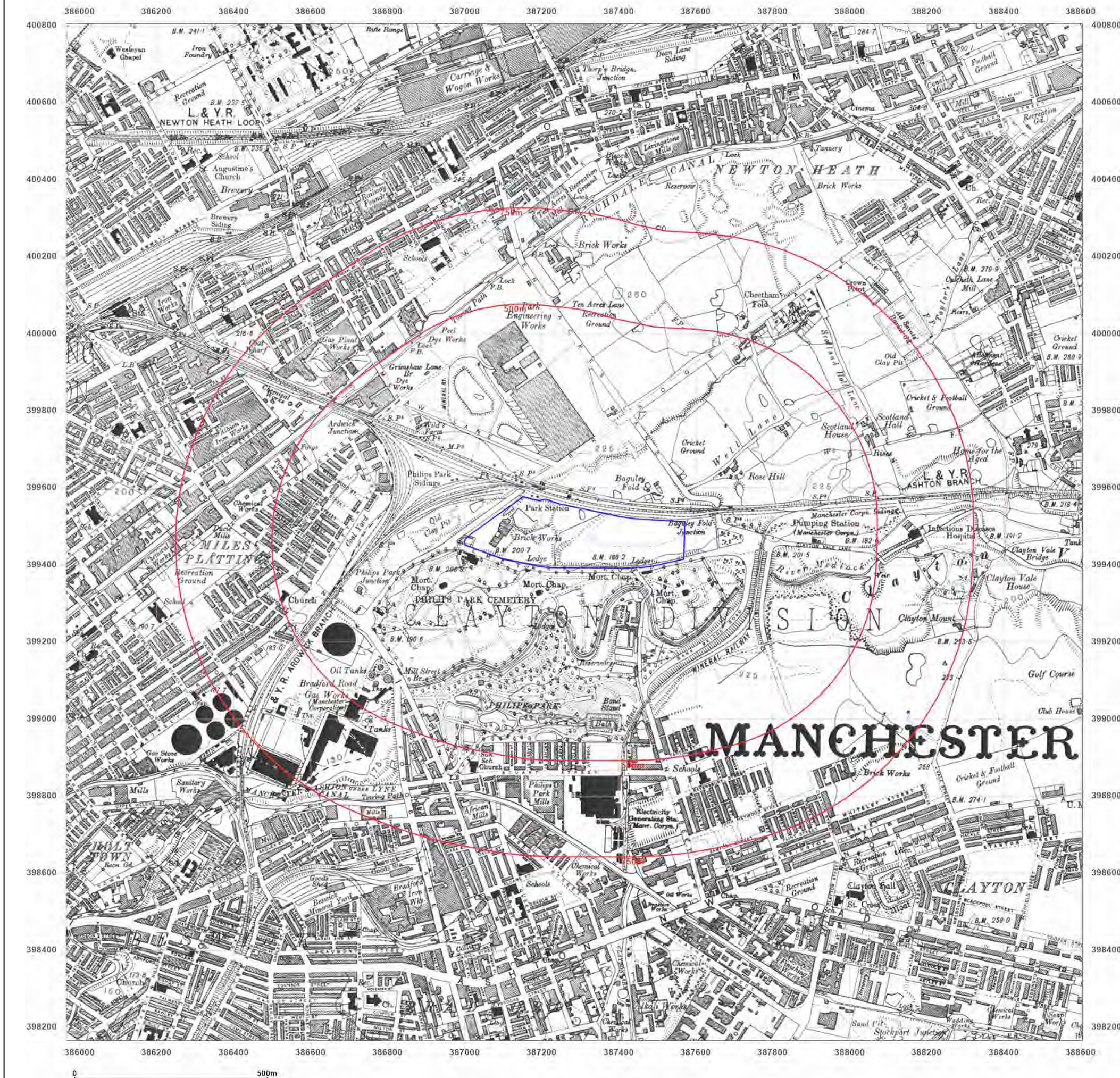


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Edition 1923
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Surveyed 1844
Revised 1915
Edition 1923
Copyright N/A
Levelled 1915

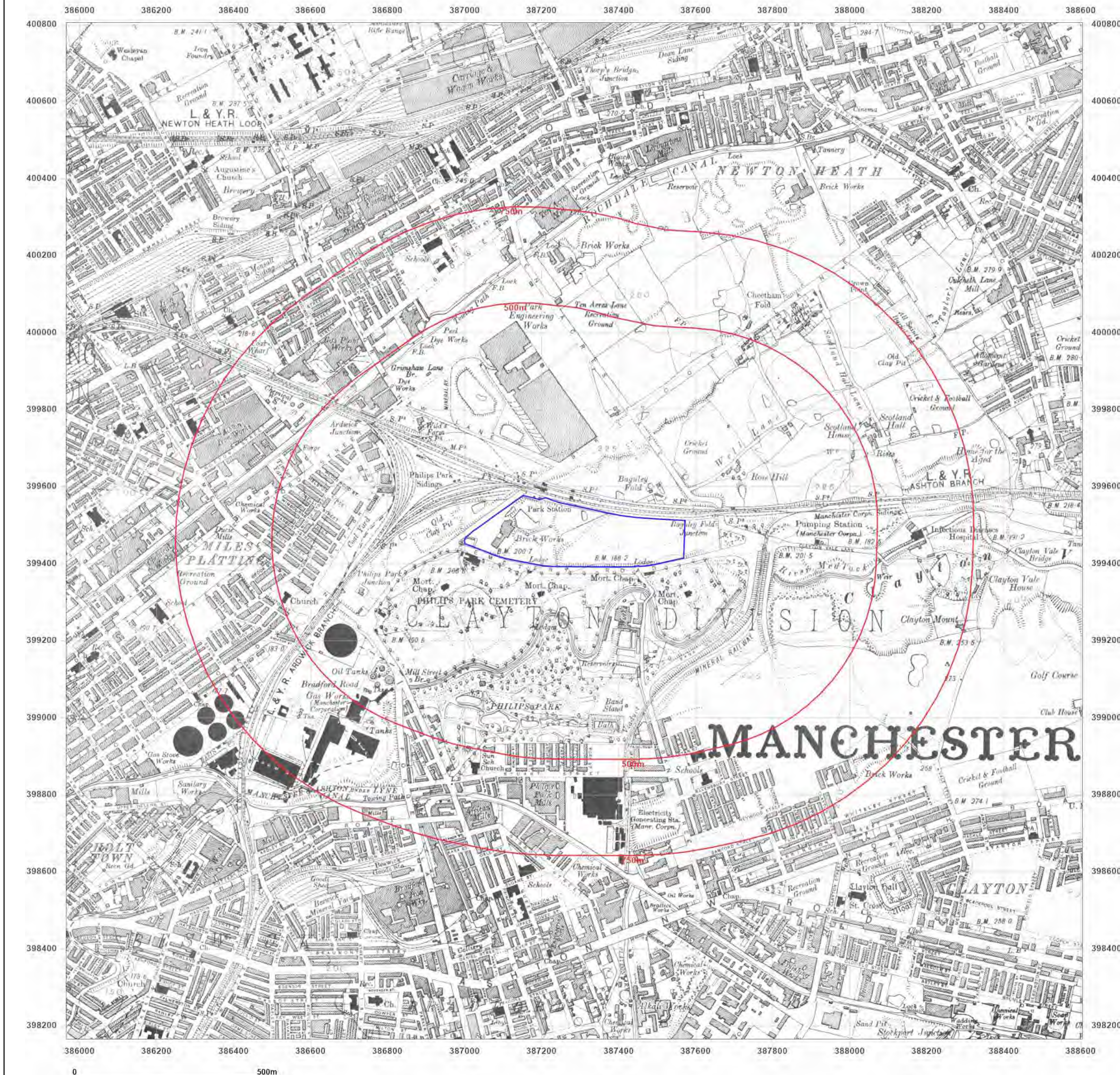


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Grid Ref: 387284, 399484

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Edition 1933
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Surveyed 1844
Revised 1934
Edition 1934
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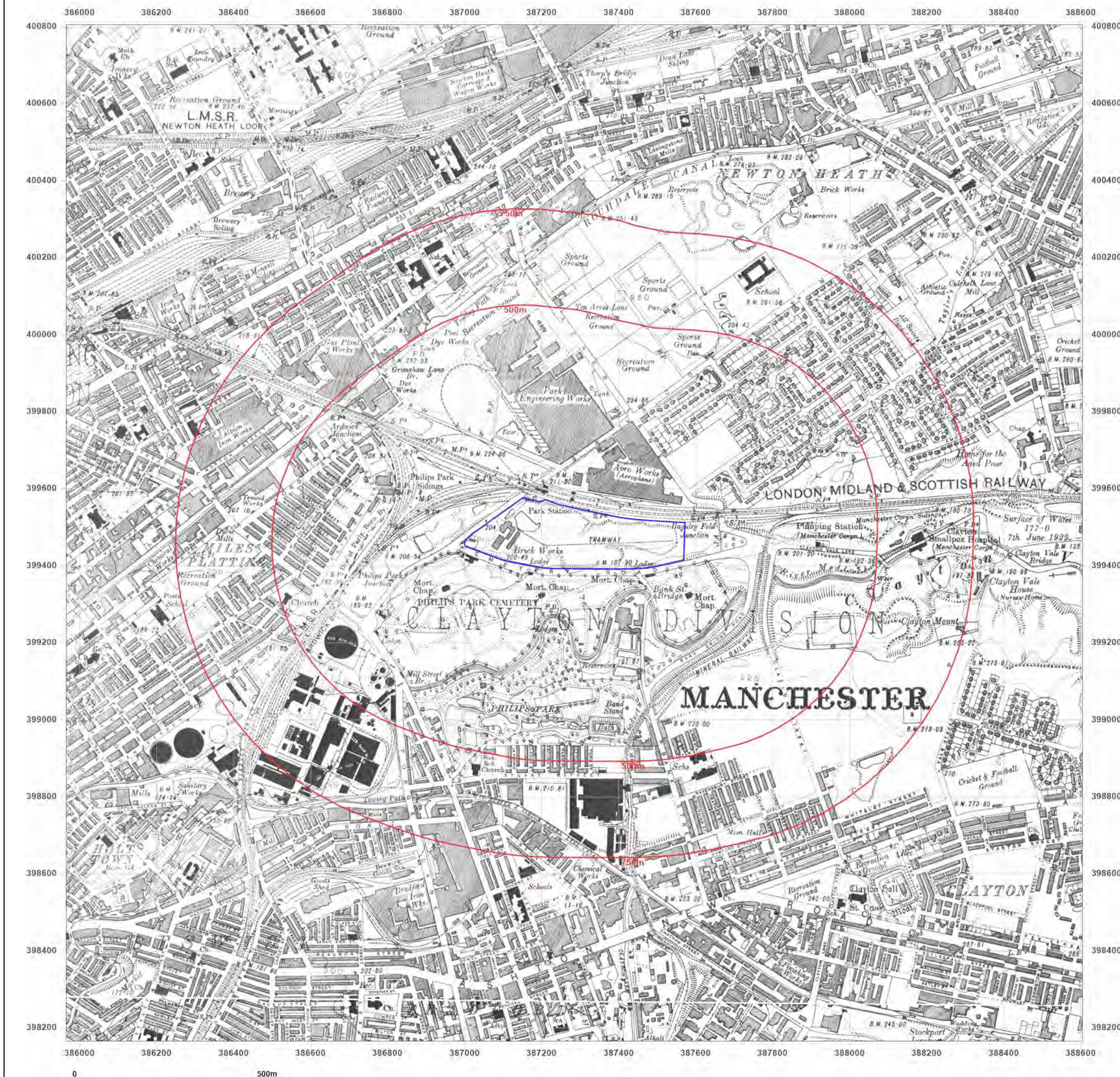


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Report Ref: GS-X1C-114-525-TLT
Grid Ref: 387284, 399484

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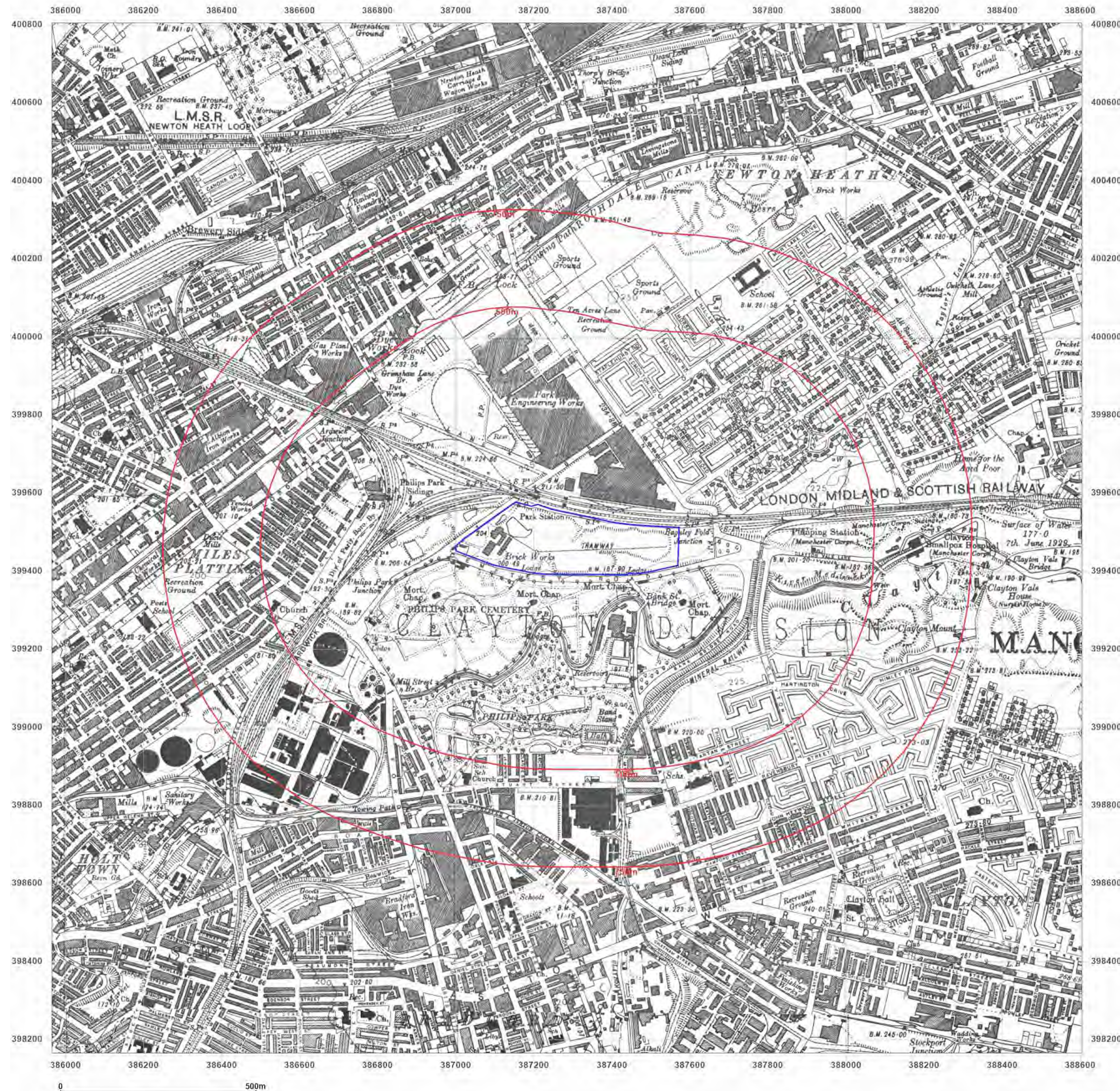


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Report Ref: GS-X1C-114-525-TLT
Grid Ref: 387284, 399484

Map Name: Provisional

Map date: 1966-1968

Scale: 1:10,560

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

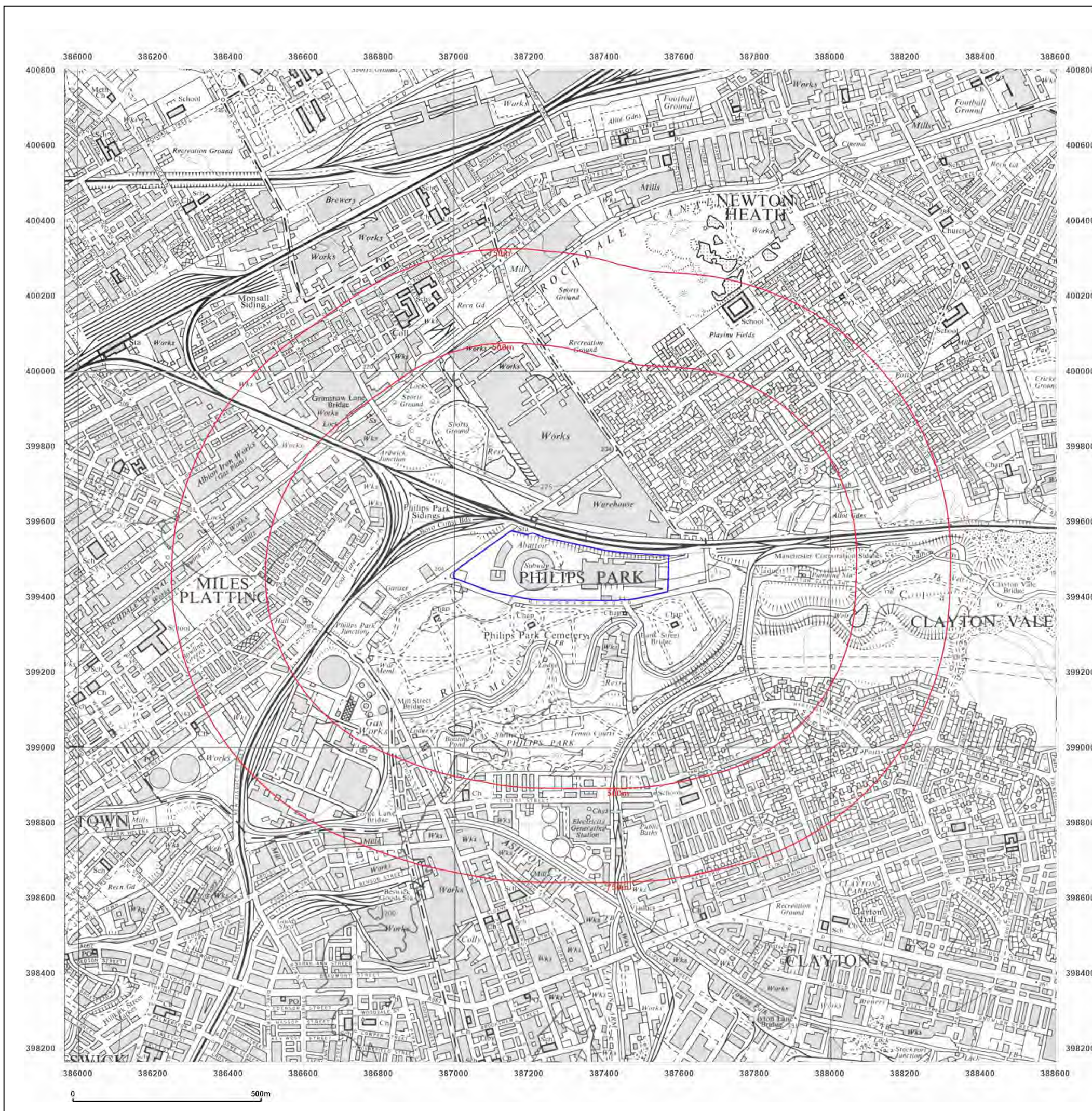


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Client Ref: 007231
Report Ref: GS-X1C-114-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

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Printed at: 1:10,000



Surveyed 1975
Revised 1975
Edition N/A
Copyright N/A
Levelled N/A

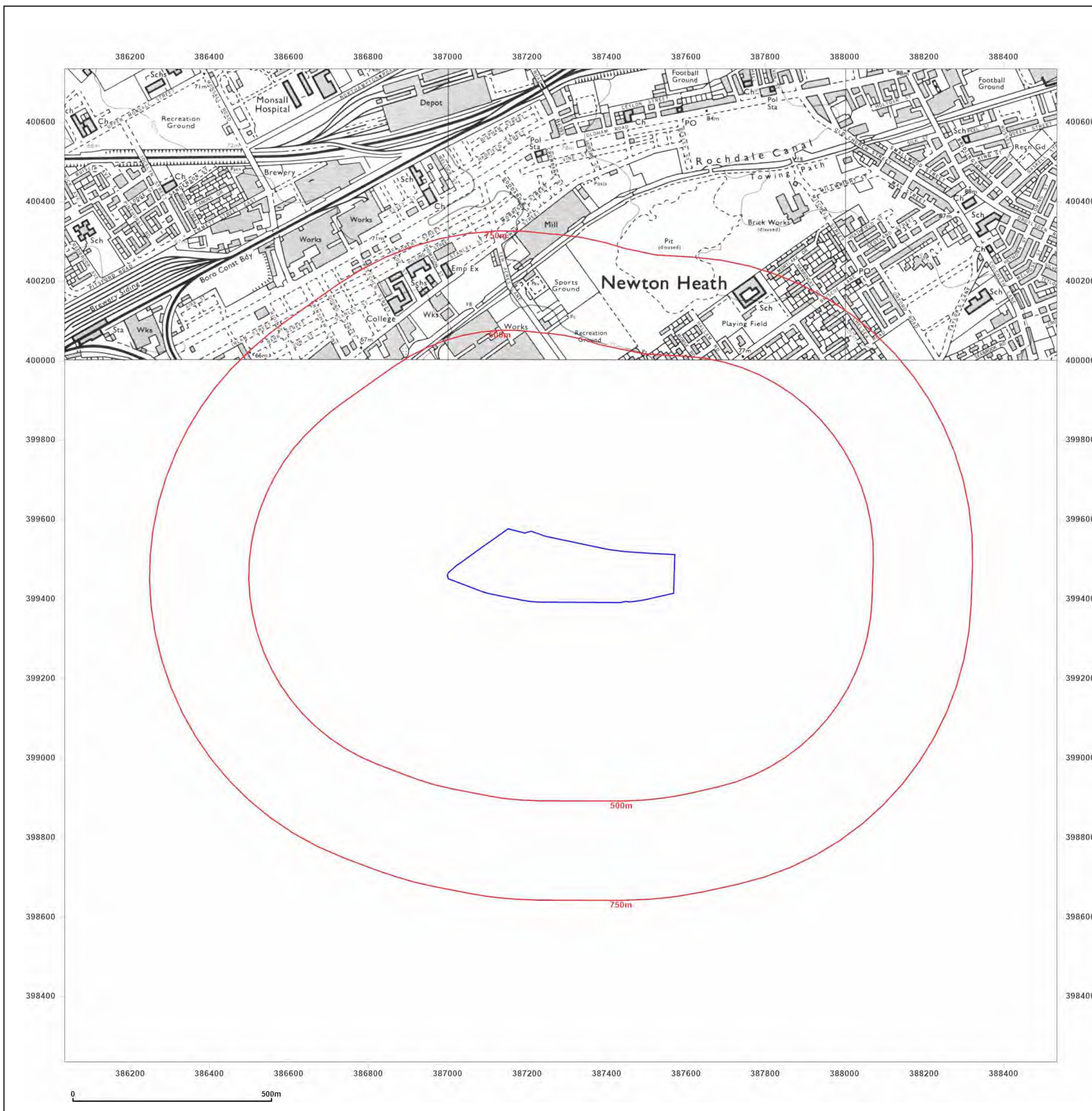


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Grid Ref: 387284, 399484

Map Name: National Grid

Map date: 1980-1981

Scale: 1:10,000

Printed at: 1:10,000



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Revised 1980
Edition N/A
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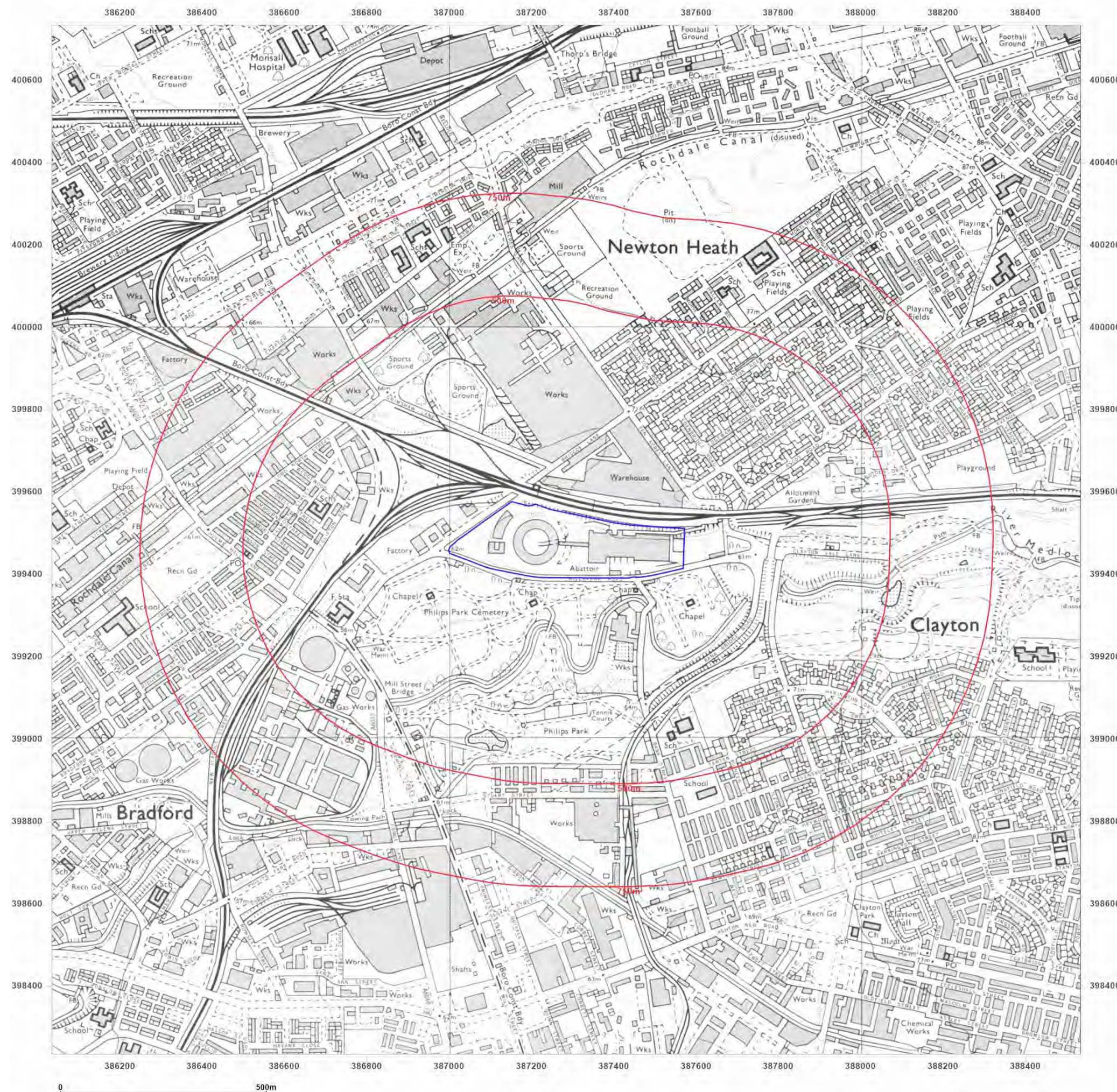


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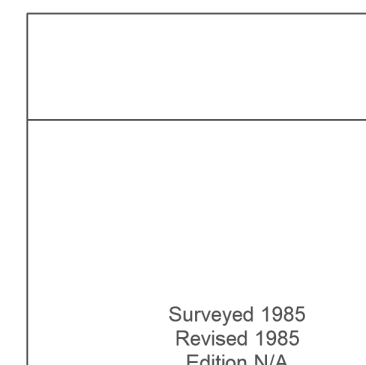
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Surveyed 1985
Revised 1985
Edition N/A
Copyright 1985
Levelled 1981

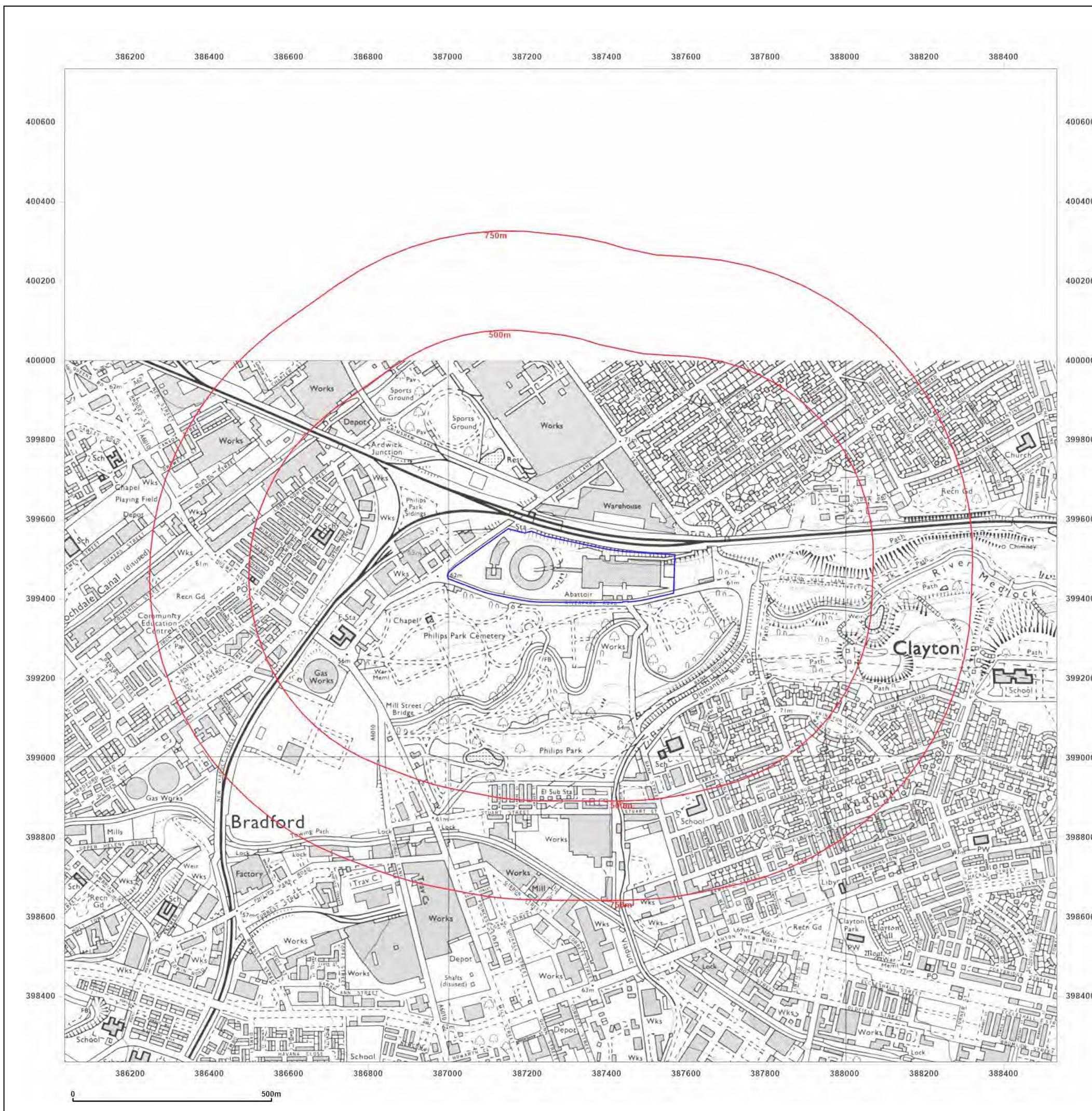


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Production date: 22 January 2024

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Site Details:

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MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-114-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



2001

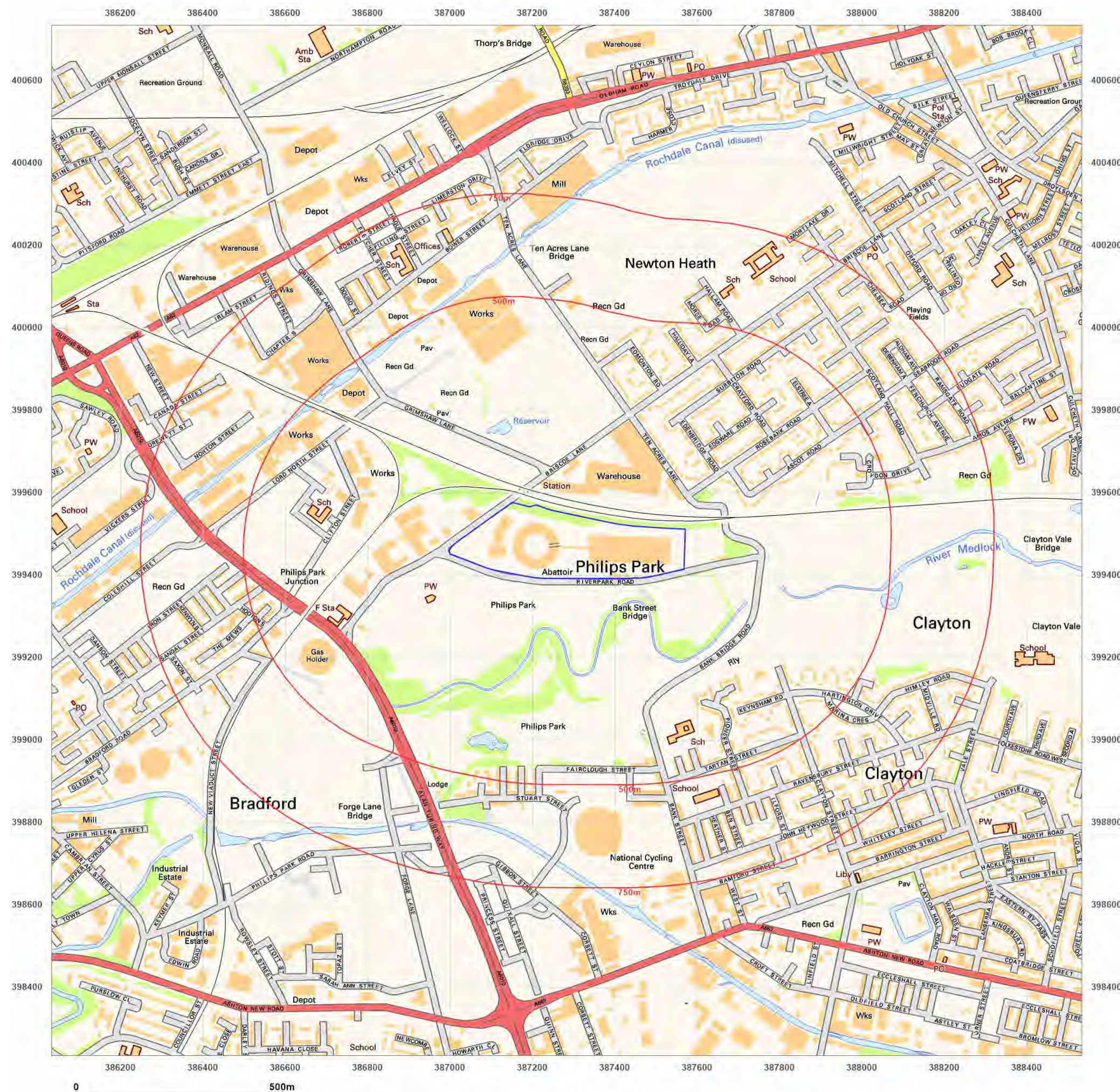


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Site Details:

RIVERPARK ROAD,
MANCHESTER, M40 2XP

Client Ref: 007231
Report Ref: GS-X1C-114-525-TLT
Grid Ref: 387284, 399484

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

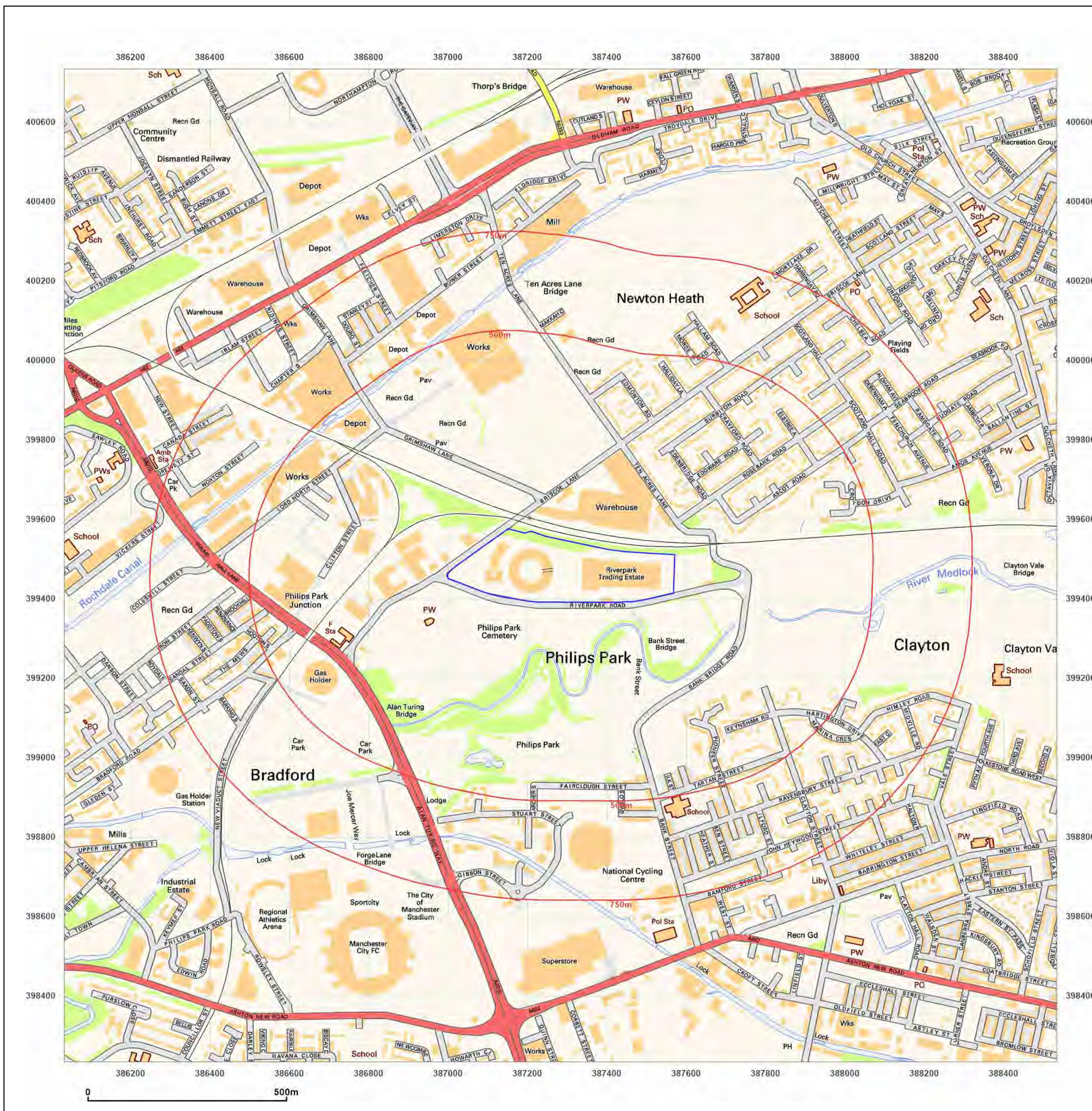


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Map date: 2024

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2024



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