



e3p

Phase I Geoenvironmental Site Assessment
Smethurst Street, Heywood

Reference: 13-224
Date: November 2021



PHASE I GEOENVIRONMENTAL SITE ASSESSMENT

Car Park
Smethurst Street
Heywood
OL10 4PW

Prepared for:
Emm Bee

Report Ref: 13-224-R1-1
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Smethhurst Street – Car Park

Phase I Geoenvironmental Site Assessment
November 2021

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EXECUTIVE SUMMARY

Site Address	Smethurst Street, Heywood, OL10 4PW	
Grid Reference	E 384931, N 410835	
Site Area	0.15 Ha.	
Proposed Development	The land parcel will be developed as a car park that will form part of a wider development of a motorhomes sales facility. The main facility is subject to separate planning approval.	
Current Site Use	The site is to the east of Smethurst Street, it is currently occupied by scrubland, trees and landscaping.	
Site History	A review of the pertinent Ordnance Survey maps suggests that the site was a reservoir pre-1851 with a brook recorded along the eastern boundary. The surrounding area comprises mainly cotton mills to the east and west with presumed residential properties to the south. . The reservoirs appear to be backfilled pre-1890. A cutting on the eastern side of the site is recorded on the 1910 map. The cutting is reformed along the eastern boundary with the brook by 1929. In 1956 the northern section of the site is allotments and in the southern section of the site, buildings are present. Between 1970 – 1990 the buildings on site are added to and some are demolished. The locations of the buildings also change. In 2003 all buildings are demolished and only one remains on the western boundary of the site. To the present day, the land has been left to grow and now is formed of trees, scrubland and landscaping.	
Environmental Setting	Drift Geology	Till, Devensian - Diamicton
	Bedrock Geology	Pennine Lower Coal Measure Formation
	Faults	67 m west, normal fault, trending north to south, down throwing to the east.
	Hydrogeology	A secondary undifferentiated aquifer is located within the Devensian Till. A Secondary A aquifer is located within the Pennine Lower Coal Measures Formation.
	Hydrology	No surface water features within 25 m of site. However, historical mapping indicates that a brook was present at the eastern site boundary. This may now be culverted beneath the site.
	Flood Risk	The site is located within Flood Risk Zone 1.
Utility Locations	No formal survey has been completed however from reviewing imagery on google maps street lighting is present on the western boundary and overhead lines are present over the site.	
Landfill Sites and Ground Gases	Former scrapyards 20 m northeast of the site.	
Radon	Less than 1% of houses are above the 'Action Level' – no special precautions required.	
Coal Mining/Land Stability	The site is within a Coal Authority Coal Reporting Area, however, but it is not within a high-risk development zone so no further assessment is required.	



Hazardous Installations	No hazardous installations that could potentially prejudice the proposed construction of residential dwellings have been identified within influencing distance of the subject site.
Initial Conceptual Site Model	Contaminant Sources ☛ Infilled Reservoir and Cutting – Made Ground – PAH, TPH, heavy metals and asbestos. ☛ Former buildings – Asbestos containing material. ☛ Former allotments – inorganic and organic compounds. ☛ Former cotton mills – metals, inorganic and organic compounds, soaps and detergents. ☛ Scrapyard – heavy machinery, oil, hydrocarbons, metals, inorganic compounds. ☛ Other Industrial Work Mills – metals, inorganic and organic compounds. Pathways ☛ Dermal contact and inhalation. ☛ Vapour inhalation. ☛ Dust inhalation. ☛ Vertical migration. Receptors ☛ Future site users (commercial end-user and construction workers). ☛ Underlying aquifer - secondary A in bedrock. ☛ Adjacent culvert (if present).
Conclusion	Made Ground is expected on-site due to the historical site use and infilling of reservoir and cutting. Heavy metals, TPH, PAH, asbestos and sulphates may be present within the Made Ground. Construction workers may be exposed to any impacted soils during any initial phases of development but these risks could be mitigated through the use of personal protective equipment. There is not considered to be a significant risk to future end users as there are not likely to be viable contaminant pathways given the proposed car-park end-use.
Recommendations	A Phase II Ground investigation should be undertaken to fully characterise the site and to confirm the findings of the initial conceptual site model.



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DRAWING LIST

13-224-R1-001 - Site Location Plan
13-224-R1-002 - Proposed Development Plan
13-224-R1-003 - Site Features Plan
13-224-R1-004 - Historical Features Plan
13-224-R1-005 - Conceptual Site Model



1. INTRODUCTION

1.1. BACKGROUND

E3P Ltd has been commissioned by Fleet Grace Ltd to undertake a Phase I Geoenvironmental Site Assessment at land to the east of Smethurst Street, Heywood, OL10 4PW. This report is required to determine potential contaminated land liabilities and geotechnical constraints as part of a proposed site redevelopment

The land parcel will be developed as a car park that will form part of a wider development of a motorhomes sales facility. The main facility is subject to separate planning approval reference 18/00971/FUL.

A snapshot of the proposed development area is indicated in Figure 1.1 (shaded red).

FIGURE 1.1 SNAPSHOT OF PROPOSED DEVELOPMENT



1.2. OBJECTIVES

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 in order to complete a desk study in line with Environment Agency (EA) document Land Contamination: Risk Management (LC:RM) (2019)
- ✦ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors.
- ✦ Assess the desk-study information and, where possible, provide preliminary recommendations in relation to foundations, pavement construction and floor slabs.
- ✦ Provide recommendations regarding future works required and undertake a preliminary pre-construction cost appraisal.

1.3. SOURCES OF INFORMATION

Background information was sought from the following sources:

- ✦ Groundsure Report.
- ✦ Historical mapping dated 1851 to 2021. A selection of historical maps are reproduced in Appendix V.
- ✦ On-line planning records held by Rochdale Metropolitan Borough Council.
- ✦ Consultations with representatives of Rochdale Metropolitan Borough Council.
- ✦ 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>.

1.4. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.5. 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 contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.



1.6. RISK CLASSIFICATION

E3P has utilised the available data to classify the site on the basis of its likely contaminated land liability and potential for geotechnical constraints in relation to the site development. The risk classification definitions are summarised in Table 1.1.

TABLE 1.1 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.



2. SITE SETTING

2.1. SITE DETAILS

Site Address	Land east of Smethurst Street, Heywood, OL10 4PW
National Grid Reference	E 384931, N 410835
Site Area	0.15 Ha.

All acronyms used within this report are defined in the Glossary presented in Appendix II.

A site location map is presented in Appendix III as Drawing 13-244-001.

2.2. CURRENT SITE USE

E3P has undertaken a desk-based study of the entire site and a description of the key findings are summarised in Table 2.1.

TABLE 2.1 SITE DESCRIPTION

Occupancy/Use	The site is a piece of land to the east of Smethurst Street which is occupied by shrubland and trees.	
Surface Cover (%)	Buildings	0%
	Hardstand	0%
	Soft Cover	100%
Structures	No structures are present on site.	
Access	Access can be gained from Smethurst Street, Sunset Drive and Britannia Street which all surround the site.	
Slope	There is a ridge in the southwest corner where the land in the corner is lower than the rest of the site.	
Retaining Structures	No retaining structures have been identified.	
Vegetation/Ecology	Scrub vegetation is present on-site with trees covering most of the site.	
Hazardous Material Storage	No above-ground storage tanks (ASTs) or underground storage tanks (USTs) were observed during the desk study.	
Asbestos-Containing Material (ACM)	There is potential for ACM to be present on-site due to the historical uses of the site and the presence of buildings and structures from 1890.	
Polychlorinated Biphenyls (PCBs)	There is no equipment identified that may contain PCBs within the site boundary.	
Waste Storage	Potentially hazardous waste streams are unlikely to be generated at the site.	
Drainage	A formal drainage survey has not been completed.	



2.3. SURROUNDING AREA

The surrounding area land uses are summarised in Table 2.2.

TABLE 2.2 SURROUNDING LAND USES

DIRECTION	LAND USE
North	Residential units and park land containing scrubland.
East	The residential area and a small car park.
South	Residential area.
West	Car park, Heywood Veterinary Centre, industrial units.

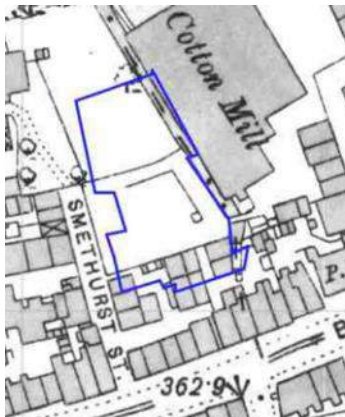


3. SITE HISTORY

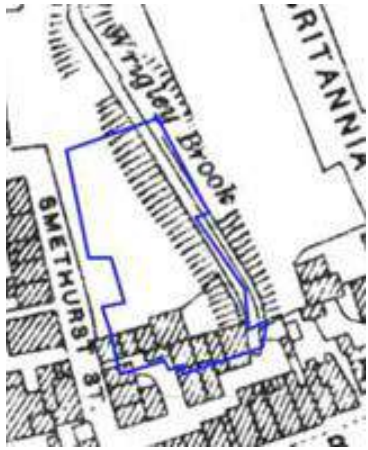
3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of historical mapping and historical aerial imagery pertinent to the site is summarised in Table 3.1. In addition, historical site features are presented on Drawing No 13-224-004 in Appendix III.

TABLE 3.1 HISTORICAL DEVELOPMENT

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1851 1:1,056	The site is mapped to be split into two sections. The southern section is a reservoir, while the northern section of the site is a field with trees.	
1890 1:2,500	The reservoir is no longer mapped in the southern section of the site. The northern section is still a field however the trees are no longer marked. A watercourse is marked on the eastern boundary flowing in a northerly direction	
1910 1:2,500	The site is no longer split into two sections. A cutting has been marked on site starting the southeast corner arcing round to the northwest corner. Buildings are marked present in the south of the site.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1929 1:2,500	Groundworks have occurred onsite and the cutting has been redirected to follow the eastern boundary of the site.	
1937 1:2,500	The flow of water on the eastern boundary has been named as Wrigley Brook	
1956 1:1,250	The site has been split up into northern and southern sections. In the northern section allotment gardens are present. In the southern section, five buildings are marked.	
1970 - 1975 1:1,250	The site is still split into two sections, the northern section is no longer allotments and there are four buildings marked in a row going across the site. The southern section still has five buildings however the position of these has changed, they are in a line going across the site west to east. The cutting/brook is no longer marked.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1975 – 1979 1:1250	Two more buildings are marked in the south of the site. No other significant changes noted.	
1985 – 1990 1:1,250	A building has been added to the row in the north and the position of all the buildings has moved, they are now more spread out and cover the whole site west to east. Three buildings have been removed in the south of the site as well as the building on the eastern boundary. A path can be seen connecting the two rows.	
2003 1:1,250	All the buildings have been removed from the site apart from one on the western boundary. A path is marked connecting this building to a building on the western boundary of the site.	
2021 1:10,000	The site is scrubland and densely wooded.	



3.2. OFF-SITE HISTORICAL DEVELOPMENT

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 250 m radius of the site is summarised in Table 3.2.

TABLE 3.2 SURROUNDING HISTORICAL DEVELOPMENT

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Wrigley Bank Cotton Mill Then: no longer marked	0 m	1851 – 1890 1890 – Present	East
Reservoirs Then: no longer marked	20 m	1851 – 1890 18902 – present	North East
Scrapyard Then: no longer marked	20 m	1985 – 2003 2003 – present	North East
Reservoirs Then: no longer marked	50 m	1890 – 1937 1937 – present	North
Mossfield Mill (Cotton) Then: no longer exists	75 m	1851 – 1992 1992 – present	North East
Reservoirs Then: no longer marked	90 m	1851 – 1981 1981 – present	North East
Gasometer Then: no longer marked	90 m	Pre 1851 1851 – present	North West
Joinery Works Then: no longer marked	90 m	1956 – 1975 1975 - present	South
Cotton Mill Then: Demolished	90 m	1851 – 1929 1929 – present	East
Reservoirs Then: no longer marked	90 m	1851 – 1929 1929 – present	South
Smithy Then: No longer marked	95 m	Pre 1851 1851 – present	South East
Bridge Street Mills (Cotton) Then: changed to Brook Mills Then: no longer marked	100 m	1851 – 1890 1890 - 1957 1957 - present	South East
Cotton Mill Then no longer marked	100 m	Pre 1851 1851 – present	South East
Electrical Sub Station	109m	1989 – present	North East
Peel Mills (Cotton) Then: no longer marked	120 m	1851 – 1937 1937 – present	North West
Railway Sidings (not located on map but from Groundsure)	168 m	1891 - 1910	South
Electrical Substation	170 m	1985 - present	South East
Brookfield Rubber Works) & Reservoir Then: X. L. Mill	175 m	1890 - 1910 1910 - 1929	South West
Joinery Works Then: no longer marked	180 m	1956 – 1969 1969 – present	South West
Electrical Substation	216 m	1985 – present	South West



SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Paved Brown Mill Then: disused Then: no longer marked	250 m	1890 – 1929 1929 – 1937 1937 – present	South West

3.3. PLANNING HISTORY

E3P has undertaken a review of online planning records held by Rochdale Borough Council and details are set out below.

- 21/00145/DOC – Peel Lane, Heywood, Planning permission for the erection of 12 dwellings including associated landscaping. Granted with conditions, to comply with condition 5 invasive species, Himalayan balsam on site.
- 21/00227/FUL – Moss Lea, Strakey Street, residential development consisting of 6 no. semi-detached bungalows together with a single-story office building following demolition of the existing building. Granted subject to conditions.

3.4. ANECDOTAL INFORMATION

E3P has undertaken a web-based search of the subject site and no other information was recovered, no photos from Britain from Above were recovered.

3.5. PREVIOUS REPORTS

The following previous site investigation reports have been provided to E3P that have been specifically written for land to the north of the subject site.

- LK Consult – Britannia Metals, George Street, Heywood – Phase 1 Preliminary Risk Assessment – LKC 18 1262.
- LK Consult Britannia Metals, Heywood – Environmental Investigation, Risk Assessment and Remediation Strategy CL-62-LKC 18 122-02

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



- ✚ The site has experienced significant historical development. Pre 1851 reservoirs were located on-site and potentially infilled. Cotton mills were present on-site between 1851 – 1969. The southeast of the site has been used as a scrapyard since the 1980s.
- ✚ Ground conditions beneath the site are comprised of made ground underlain by natural sandy gravelly clay and gravelly clayey sand bedrock was not encountered.
- ✚ Made ground was recorded at depths of 0.70 – 3.90m bgl and generally consisted of gravelly sand/clay with brick, ash, pottery and clinker.
- ✚ Potential contaminants sources affecting the site were identified as heavy metals, PAHs, sulphates, asbestos, mercury, hydrocarbons, organic contaminants and gas (carbon dioxide and methane).
- ✚ Previous site investigation identified the presence of organic and inorganic contamination, elevated levels of carbon dioxide in the soil and a hydrocarbon plume in the scrapyard area, this was not considered to be a significant risk to controlled waters.
- ✚ The preliminary geotechnical assessment has also identified the following potential risk which will need investigating:
 - Deep/variable Made Ground depth with in-ground structures.
 - Unknown strength of superficial deposits for foundation design.
 - Depth and variability of the water table.
 - Plasticity of any clay deposits.
 - CBR values of any proposed footpaths/access roads.
 - Unknown sulphate content of natural and Made Ground on-site.
 - The proximity of the culvert to the proposed development.



4. ENVIRONMENTAL SETTING

4.1. GEOLOGY AND HYDROGEOLOGY

The British Geological Survey (BGS) map (Sheet 85) for the site, (1:50,000, Solid and Drift editions) and online records indicate the site is underlain by the geological sequence presented in Table 4.1.

TABLE 4.1 SUMMARY OF UNDERLYING GEOLOGY

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
Drift	Till, Devensian – Diamictin	DIAMICTON	Secondary Undifferentiated
Solid	Pennine Lower Coal Measures Formation	MUDSTONE, SILTSTONE & SANDSTONE	Secondary A

A summary of the findings of exploratory holes by LK closest to the site are shown in Table 4.2

TABLE 4.2 SUMMARY OF LK EXPLORATORY HOLES - CL-62-LKC 18 122-02

LOCATION	DEPTH	MADE GROUND	DRIFT	SOLID
TP103	3.8 m	0.00m – 1.70m, grass over blackish brown gravelly sandy silty clay with frequent ash, brick fragments, occasional glass, metal fragments and rare polystyrene. 1.70m – 1.80m, Concrete.	1.80m – 3.10m, soft to firm yellowish grey brown mottled slightly sandy silty CLAY with rare caol fragments, sand fine to medium. 3.10m – 3.80m, orange brown slightly gravelly SAND.	Not encountered
TP106	4.40 m	0.00m – 1.70m, grass over blackish brown gravelly sandy silty clay with occasional brick fragments, pottery fragments, metal fragments, ash, plastic and glass.	1.70m – 4.20m, soft to stiff slightly gravelly slightly sandy silty CLAY. Sand is fine to medium, gravel is fine to medium, subangular to subrounded of mudstone and sandstone 4.20m – 4.30m, Orange fine to coarse SAND. 4.30m – 4.40m, soft to stiff slightly gravelly slightly sandy silty CLAY. Sand is fine to medium, gravel is fine to medium and subangular to subrounded of mudstone and sandstone	Not encountered
WS103	5.45m	0.00m – 0.70m, brown slightly clayey gravelly sand with frequent brick fragments, occasional ash and plastic. 0.70m – 1.70m, black sandy gravel of predominantly ash and clinker with rare clay inclusions, brick fragments and lumps of slag.	1.70m - 3.40m, firm consistency silty CLAY with rare sandstone gravel. 3.40m -4.20m, Dark orange coarse SAND. 4.20m – 5.45m, soft consistency brown silty CLAY	Not encountered



LOCATION	DEPTH	MADE GROUND	DRIFT	SOLID
WS 104	5.45m	0.00m -0.30m, brown sandy gravelly clay with occasional rootlets and cobbles f sandstone. 0.30m – 0.50m, concrete slab. 0.50m – 1.00m, black gravelly sand of predominantly ash and clinker with occasional pockets of very fine compressible ash. 1.00m – 2.00m, brown slightly clayey gravelly sand with frequent brick fragments, slate, occasional concrete fragments and inclusions of clay with depth. 2.00m – 3.10m – brown sandy gravelly clay with frequent brick fragmens, slate and occasionsl concrete fragments.	3.10m – 5.45m, firm consistency brown silty CLAY.	Not encountered

TABLE 4.3 FAULTING

LOCATION	DESCRIPTION
67 m W	Normal fault, trending north to south.

The Groundsure report indicates that the site is not located within a groundwater source protection zone. There are no current groundwater abstraction licenses within 250 m of the site.

4.2. NATURAL LANDFORM AND GEOMORPHOLOGY

Based on the initial geological assessment, a review of available topographic data and pertinent mapping, E3P has undertaken a preliminary geomorphological assessment of the landform.

From the LIDAR imagery shown in Figure 4.2 the site has a varied topography and alteration to the natural landform has occurred. In the south-east corner, there is a ridge that is higher than the rest of the site and some smaller ridges can be seen on the western and eastern boundaries. These could be from the infilling of the cutting and reservoir.

The historical development of the site including buildings and structures means the rest of the site is quite level. There are trees on the eastern border and in the south-west corner.



FIGURE 4.2 SURFACE LIDAR DATA (GROUNDSURE IO)



<https://groundsurre.io/>

4.3. GEOTECHNICAL DATA

Geotechnical data presented within a commercially available environmental database is summarised in Table 4.4.

TABLE 4.4 SUMMARY OF GEOTECHNICAL DATA

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

4.4. RADON RISK POTENTIAL

The Grounsure report indicates the site is situated in an area where less than 1% of homes are above the “Action Level” and that the BGS reports that full radon protective measures are not necessary for the construction of new dwellings or extensions.



4.5. PRELIMINARY GEOTECHNICAL ASSESSMENT

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

- ✚ Due to the historical development and different site uses it is expected that Made Ground deposits will be present throughout the site.
- ✚ In the southeast corner, there is a ridge that where the land in the corner is lower than the rest of the site.
- ✚ Due to the presence of buildings on the site throughout its history, there is potential for asbestos-containing materials (ACM) to be present within the Made Ground.

4.6. HYDROLOGY

The Groundsure report indicates that there are no surface water features within 250 m of site.

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 indicates a low for groundwater flooding.

The Environment Agency (EA) Flood Risk Map for the site is presented in Figure 4.3.

FIGURE 4.3 EA FLOOD RISK MAP



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



4.7. INDUSTRIAL LAND USES

The site is located within a predominantly residential area, a list of current industrial land uses listed within the Trade Directory within 250 m of the site are shown in Table 4.5.

TABLE 4.5 – CURRENT INDUSTRIAL LAND USES

LOCATION	COMPANY	ACTIVITY
12 m South	Peel Graphics	Published goods, signs, industrial products
36 m North	Hummer for Hire	Hire services
51m East	Britannia Mill Industrial Estate	Industrial features
59 m East	C & B Tyres	Motoring, vehicle parts and accessories
66m North East	Keith Wood Motors	Vehicle repair, testing and servicing
107m South	Janian Architecture & Metalwork	Construction completion services
116m North East	Electricity Substation	Electrical features
161m East	JT Joinery	General construction supplies
179m South East	Electricity Substation	Electrical features
200m East	M L Motors	Vehicle repair, testing and servicing
229m South West	Electricity Substation	Electrical features

4.8. SENSITIVE LAND USES

The site is located in a SSSI Impact Risk Zone however, the current proposal does not require consultation.

4.9. SITE SENSITIVITY ASSESSMENT

The site is assessed to be located within a “Low/Moderate” sensitivity setting as discussed within Table 4.6.

TABLE 4.6 SITE SENSITIVITY ASSESSMENT

SENSITIVITY PROFILE	DISCUSSION	RATING
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	None recorded.	Low
Distance to the Closest Groundwater Abstraction Point	None within 1000 m.	Low
Aquifer Classification in Superficial Drift Deposits	Secondary undifferentiated.	Moderate
Aquifer Classification in Bedrock	Secondary A.	High
Is the Site Underlain by Low-Permeability Drift to Depths in Excess of 10 m?	Records from exploratory holes by LK show the drift to be clay bedded with sandy clays and gravels which increases the potential for mobile phase contaminants to migrate.	Moderate
Is the Site Located Within 50 m of a Surface Watercourse?	None identified though there is evidence to suggest that a possible culvert will be present at the eastern boundary.	Low



SENSITIVITY PROFILE	DISCUSSION	RATING
Sensitive Land Uses	The site is located adjacent to residential property.	Low
OVERALL SITE ENVIRONMENTAL SENSITIVITY		Low/Moderate



5. CONSULTATIONS

5.1. CONTAMINATED LAND OFFICER

E3P has contacted the environmental health department at Rochdale Metropolitan Borough Council.

5.2. LANDFILL SITES AND WASTE TREATMENT SITES

There is a historical scrap yard bordering the north east of the site, as well as a metal recycling site 21 m north, however this license was surrendered in March 2019. This area comprises the main part of the proposed development.

5.3. REGULATORY DATABASE

The information summarised in Table 5.1 has been obtained from a commercially available environmental database. The summary table only includes records from within 250 m of the subject site and not otherwise detailed in the report.

TABLE 5.1 SUMMARY OF ENVIRONMENTAL DATA

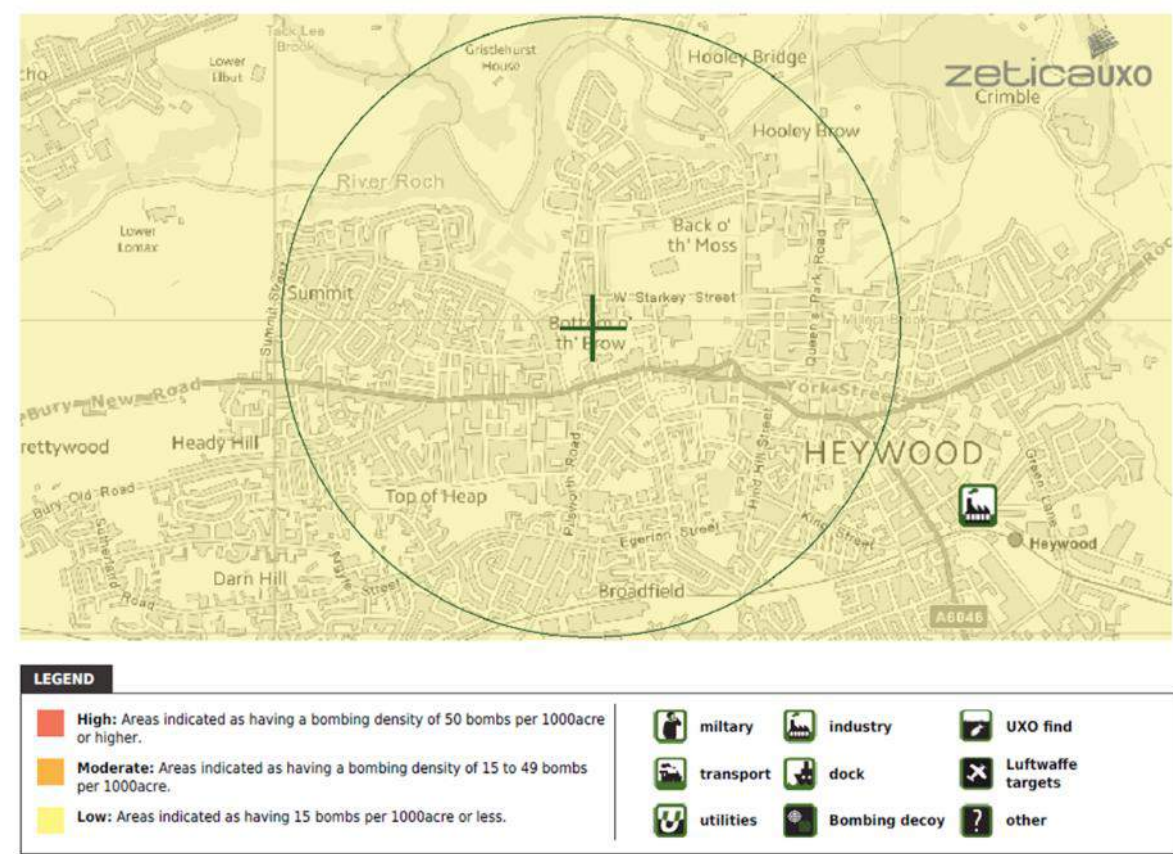
RECORD	ENTRIES WITHIN 250 m	DETAILS
Contaminated Land Register Entries and Notices	1	176 m NW, the site was a former refuse incinerator and waste tip c. 1900-1970s. Issues identified include landfill gas, migration, lead, B(a)P, and dioxins. Remediation has been completed.
Authorised Industrial Processes (IPC/IPPC/LAPPC)	0	None Identified
Fuel Stations Entries	0	None Identified
Licensed Radioactive Substances	0	None Identified
Enforcements, Prohibitions or Prosecutions	0	None Identified
Discharge Consents	0	None Identified
Pollution Incidents	0	None Identified
Consents Issued Under the Planning (Hazardous Substances) Act 1990	0	None Identified
Control of Major Accident Hazard (COMAH) Sites	0	None Identified

5.1. UNEXPLODED ORDNANCE

The regional unexploded bomb risk map from Zetica (2014) indicates that the site is in an area at low risk from possible unexploded ordnance (UXO) resulting from the Second World War. The Zetica UXO Risk Map is presented as Figure 5.1.



FIGURE 5.1 ZETICAUXO UXO RISK MAP



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



5.2. INITIAL CONCEPTUAL SITE MODEL

In accordance with EA LCRM (2019) and BSI 10175 (Code of Practice for Investigation of Potentially Contaminated Land), E3P has developed an initial conceptual site model (CSM) to identify potential contamination sources, migration pathways and receptors within the study area. This is summarised within Table 5.2.

ON-SITE SOURCES OF CONTAMINATION

The following potential on-site sources of contamination have been identified:

- ✚ Infilled Reservoir and Cutting – Made Ground – PAH, TPH, heavy metals and asbestos
- ✚ Former buildings – Asbestos containing material
- ✚ Former allotments – inorganic and organic compounds

OFF-SITE SOURCES OF CONTAMINATION

The following potential off-site source of contamination have been identified:

- ✚ Former cotton mills – metals, inorganic and organic compounds, soaps and detergents
- ✚ Scrapyard – heavy machinery, oil, hydrocarbons, metals, inorganic compounds
- ✚ Electrical Substations - Polychlorinated Biphenyl (PCBs)
- ✚ Other Industrial Work Mills – metals, inorganic and organic compounds,



5.3. CONCEPTUAL SITE MODEL

Following the completion of a desk based study, the conceptual model shown in Table 5.1 has been prepared for the site.

TABLE 5.2 CONCEPTUAL MODEL

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL1 PL2	Heavy Metals, non-volatile PAH, (Made Ground)	Dermal contact. Dermal contact and ingestion.	Future site users. Off-site receptors.	Likely	Moderate	LOW
Discussion: Heavy metals and PAH are considered likely due to Made Ground from historical development on the site and from the infilled reservoir and cutting. These sources may pose a short-term risk to construction workers, who may come into contact with impacted soils during earthworks. All construction works must be undertaken using the appropriate Personal Protective Equipment (PPE) to remove this potential risk. Recommendation: An intrusive investigation is required to confirm the conceptual site model.						
PL3	ACM (Made Ground)	Inhalation of dust.	Future site users. Buildings. Off-site land users.	Likely	Moderate	LOW
Assessment: ACM may be present in the Made Ground associated with the demolition of historical buildings. This may pose a risk to future site users and site neighbours who may come into contact with fibres. 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 (Asbestos in Soil and Made Ground: A guide to understanding risk). Recommendation: An intrusive investigation is required to confirm the conceptual site model.						



Smethurst Street – Car Park

Phase I Geoenvironmental Site Assessment

November 2021

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL4	Volatile Contaminants such as hydrocarbons (Made Ground).	Inhalation of vapours. Migration through permeable strata and preferential pathways.	Future site users. Off-site receptors.	Low Likelihood	Low	To be determined
Assessment: No significant sources of volatile contamination have been identified at the site from historical mapping. However, hydrocarbon compounds and S/VOCs may be present in the Made Ground derived from potential historical uses of the site. If present, any hydrocarbon impact is likely to be localised and would require hotspot delineation and further assessment. All construction works must be undertaken using the appropriate Personal Protective Equipment (PPE) to remove this potential risk. Recommendation: Intrusive investigation required to confirm the conceptual site model.						
PL4	Methane, carbon dioxide (infilled reservoir and cutting on-site and infilled brook on the eastern boundary of the site)	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future site users.	Likely	Low	Low
Assessment: The infilled reservoir and cutting onsite and the brook on the eastern boundary may contain degradable/putrescible organic material which may produce carbon dioxide and methane. Glacial Till will likely restrict migration of any ground gas and in addition, the site comprises hardstanding car-park with no above ground structures in which ground gas could accumulate. Recommendation: Further gas assessment will be completed in due course but the risk is likely to be low given the low sensitivity of the site.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL5	Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (Made Ground)	Surface runoff. Migration through permeable strata and preferential pathways. Perched waters migration.	Groundwater (Secondary Undifferentiated and Secondary A aquifer).	Low Likelihood	Low	Low
Assessment: Potential sources of contamination have been identified but given the presence of a likely low permeability secondary undifferentiated aquifer beneath the site, the risk to the underlying secondary A aquifer would be considered low. Clay within the superficial deposits will reduce the vertical migration of mobile contamination sources into the water features. Recommendation: Sampling of groundwater required as part of an intrusive investigation to confirm the conceptual site model.						
PL6	Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Likely	Low	Low
Assessment: Likely probability due to presence of Made Ground on site. Elevated sulphates may increase the chance of a sulphate attack and foundations. However, no structures are proposed for this sector of the site. Recommendation: Further assessment may be needed if structures are placed within this sector of the site.						
PL7	Organic contaminants such as hydrocarbons (Made Ground)	Ingestion of tainted water supply.	Future site users. Water pipes.	Low Likelihood	Low	Low
Assessment: No structures are proposed within the subject site and no potable water supply pipe are likely to be present within the site. Recommendation: Further assessment may be needed if potable pipe supply infrastructure is placed within the site.						

Notes

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



6. CONCLUSIONS AND RECOMMENDATIONS

6.1. SITE SUMMARY

Current Site Use	The site is to the east of smethurst street, it is currently occupied by scrubland, trees and landscaping.
Historical Site Use	A review of the pertinent Ordnance Survey maps suggests that the site was a reservoir pre 1851, with heavy industrial buildings surrounding the site. Pre 1890 the reservoir was infilled, and a brook is present on the eastern boundary. A cutting on the eastern side for the side is formed in 1910, which was then redirected along the eastern boundary in 1929. In 1956 the northern section of the site is allotments and in the southern section of the site buildings are present. Between 1970 – 1990 the buildings on site are added to and some are demolished. The locations of the buildings also change. In 2003 all buildings are demolished and only one remains on the western boundary of the site. To the present day the land has been left to grow and no is formed of trees and scrubland.
Site Sensitivity	The site is of Low/Moderate sensitivity due to due to the Secondary A aquifer in the Pennine Lower Coal Measures.

6.2. CONTAMINATED LAND ASSESSMENT

Human Health	The following contamination sources have been identified onsite: ☛ Made Ground associated with infilling of cutting and reservoir Potential contaminants include heavy metals, PAH, TPH, and asbestos. The risk to futures users of the site is considered to be low on the basis that the subject site will be utilised as a hardstanding car park at which there are unlikely to be a plausible contaminant pathways.
Controlled Waters	The underlying sedcondary A aquifer is a receptor however due to the presence of underlying low permeability clay drift, absence of water abstractions within 1 km of the site risk to controlled waters is low. Further assessment will however be required to assess any risk to a possible culvert that may be present at the eastern boundary of the site.
Ground Gas	Made Ground on the site has potential to generate gases which could be hazourdous. However, given an absence of above ground structures the risk is considered to be low.
Potable Water	TPH and PAH are likely to be present within the the Made Ground deposits at pipeline depth, further assessment may be needed if potable pipework is to be placed within this sector of the wider development.



6.3. GEOTECHNICAL ASSESSMENT

Geological	No significant issues have been identified for this sector of the development.
Civil and Structural	Given the historical development for the site including lots of different buildings and the infilling of the cutting and reservoir Made Ground is likely to present on the site. For proposed areas of hardstanding, it will be necessary to ensure that any obstructions or oversized material is removed and the area prepared in accordance with the Specification for Highways Works. Further assessment will be required in due course.
Abnormal Foundations	No structures are being proposed for this sector of the proposed development.

END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained 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 it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with 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 requires advice from legal professionals.
4. During the site walkover, 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 do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, 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, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
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



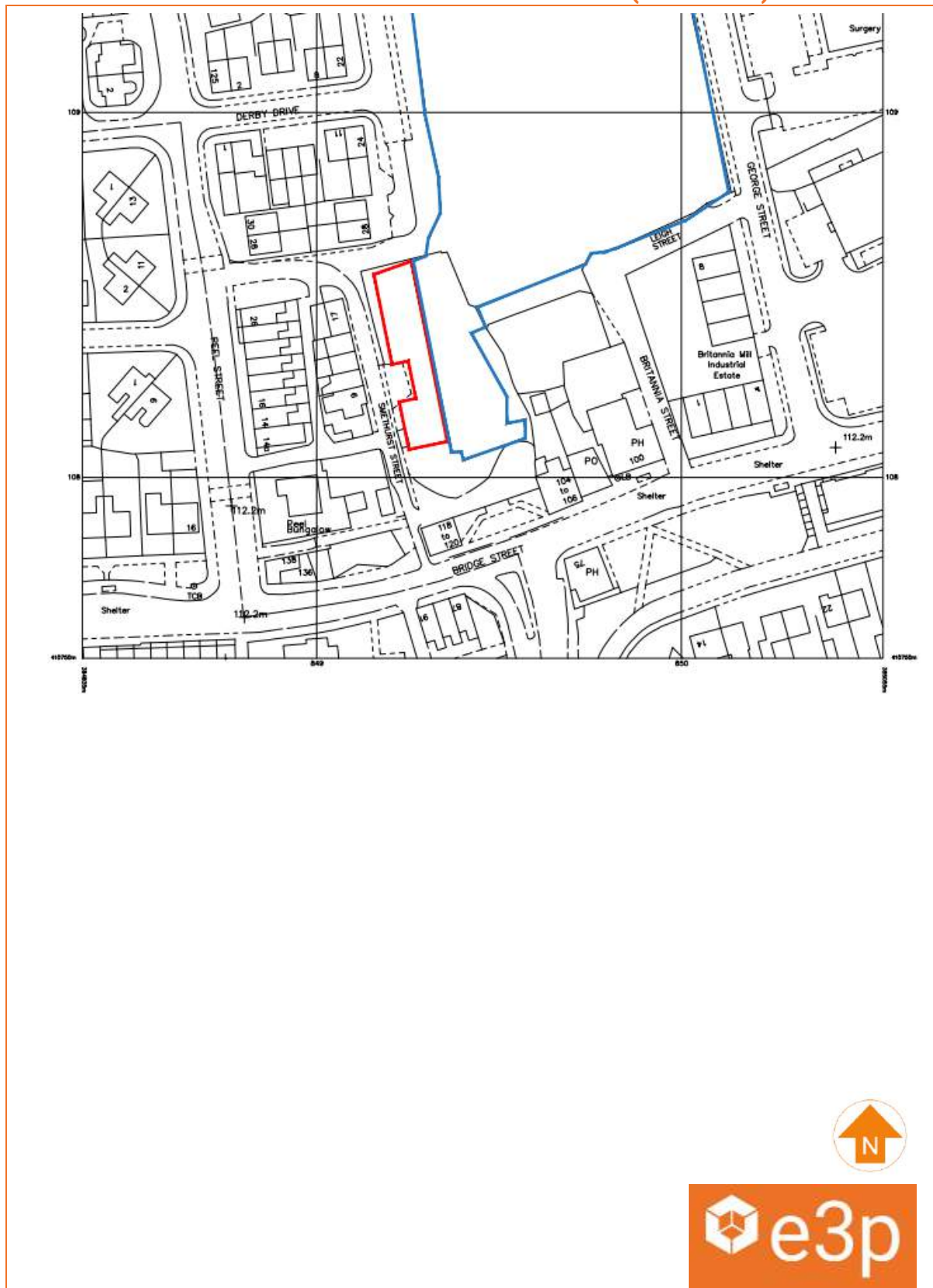
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts 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

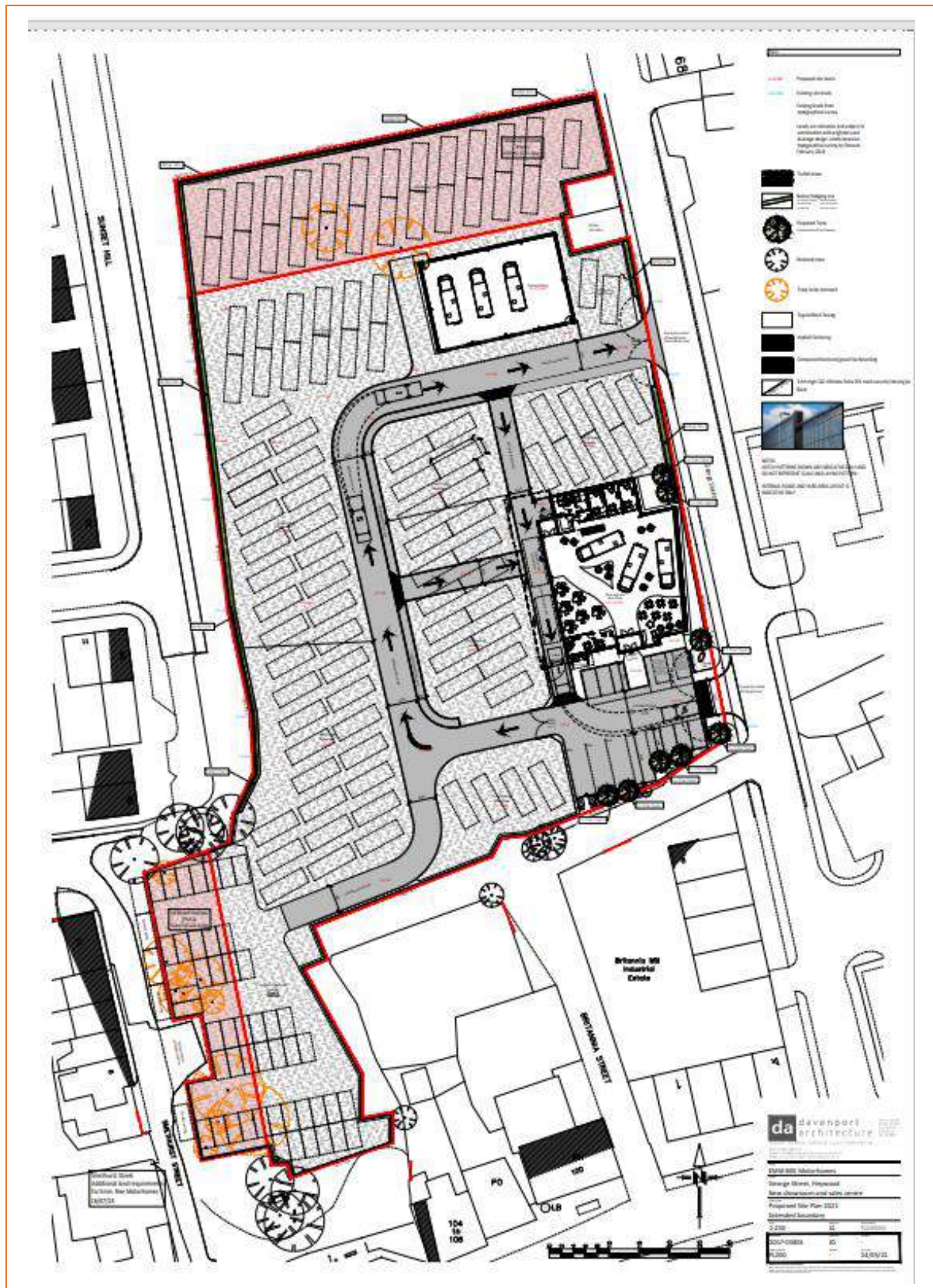


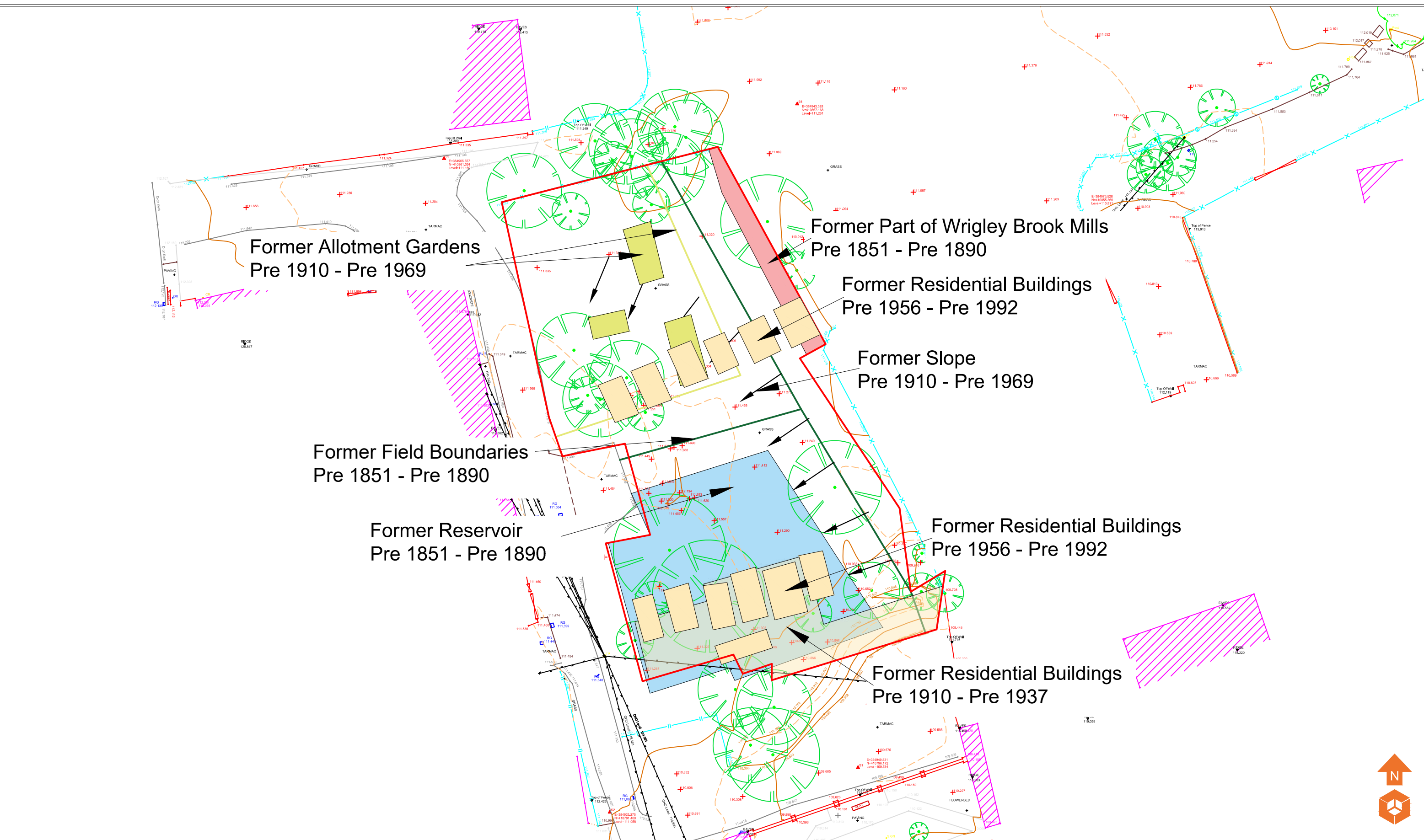
APPENDIX III

DRAWINGS

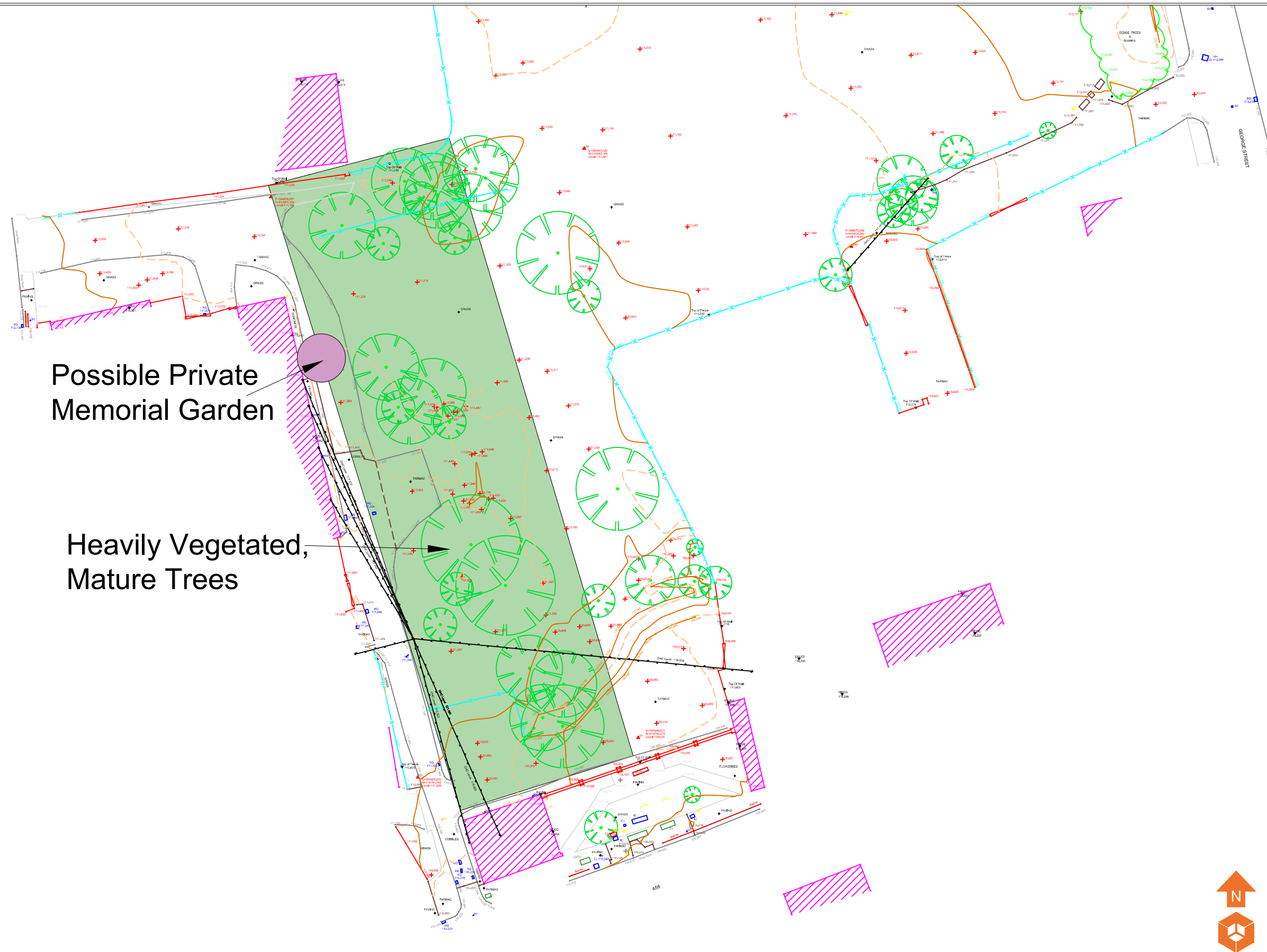
DRAWING 13-224-001 – SITE LOCATION PLAN (RED LINE)







Historical Features Former Reservoir Former Residential Buildings Former Allotment Gardens Former Part of Wrigley Brook Mills Former Field Boundaries Former Slopes	Notes:					Client: Leydon Kirby		Job No: 13-224	Date: 16.11.2021	e3p Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk	
								Drawing No: 003	Scale: NTS@ A3		
						Job Title: Emm Bee Motorhomes		Drawing Title: Historical Features Plan			The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.
					P1	REVA	16.11.2021	EB	AE		
					Phase	Issue	Date	Drawn	Checked		



Site Features

-  Heavily Vegetated, Mature Trees
-  Possible Private Memorial Garden

Notes:

P1	REVA	16.11.2021	EB	AE
Phase	Issue	Date	Drawn	Checked

Client:

Leydon Kirby

Job Title:

Emm Bee Motorhomes

Job No:

13-224

Drawing No:

004

Date:

16.11.2021

Scale:

NTS@ A3

Drawing Title:

Site Features Plan



Environmental Engineering
Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

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APPENDIX IV

HISTORICAL MAPS

Site Details:

GEORGE STREET, HEYWOOD,
OL10 4PW

Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: 1056 Scale Town Plan

Map date: 1851

Scale: 1:1,056

Printed at: 1:1,056



Surveyed 1848
Revised N/A
Edition 1851
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Site Details:

GEORGE STREET, HEYWOOD,
OL10 4PW

Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: County Series

Map date: 1890

Scale: 1:2,500

Printed at: 1:2,500



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Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: County Series

Map date: 1910

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1910
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Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: County Series

Map date: 1929

Scale: 1:2,500

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Map Name: County Series

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Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1956

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Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1956-1957

Scale: 1:2,500

Printed at: 1:2,500



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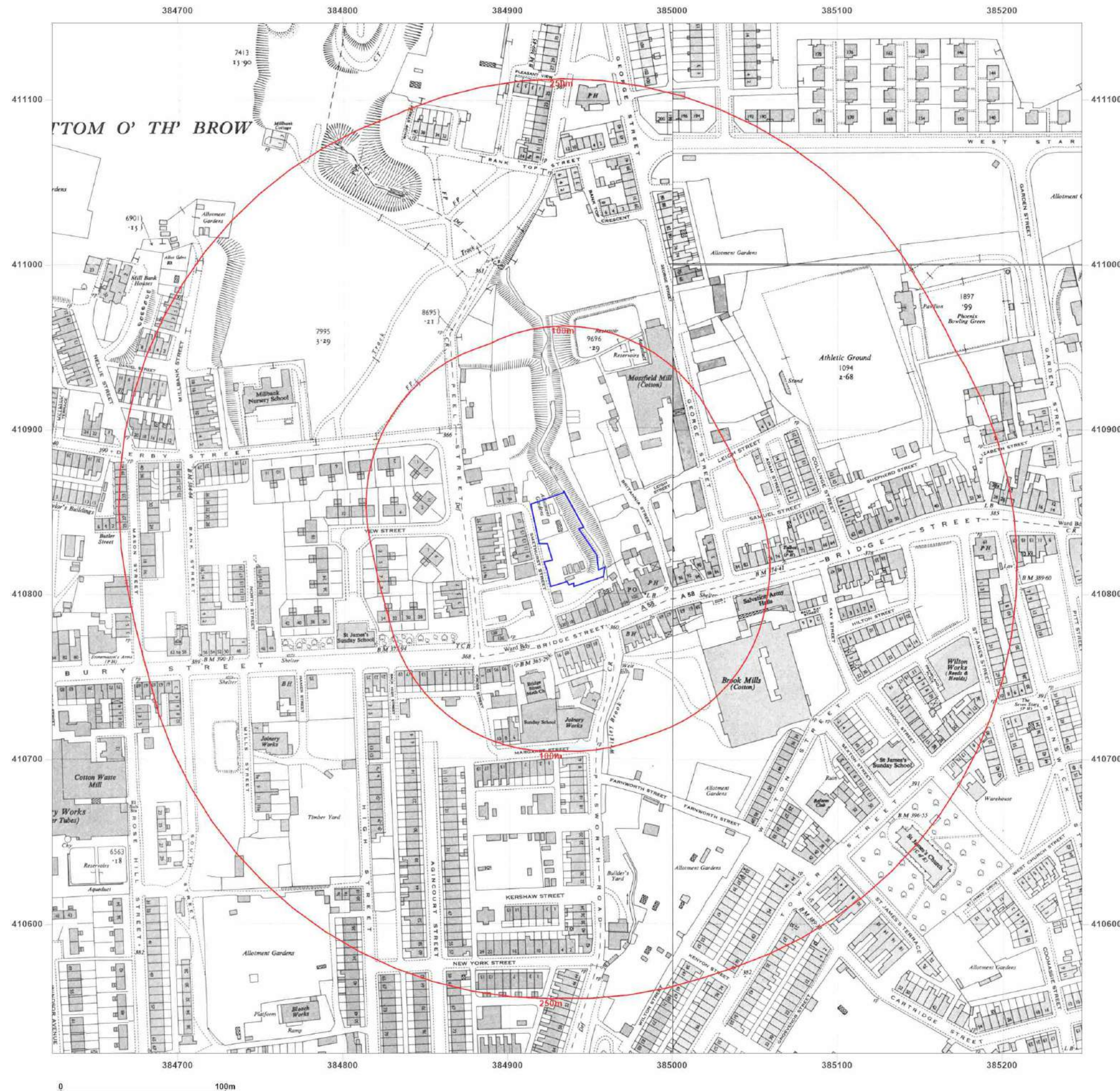


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Report Ref: GS-8320402
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Map Name: National Grid

Map date: 1964

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1963
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Levelled 1956

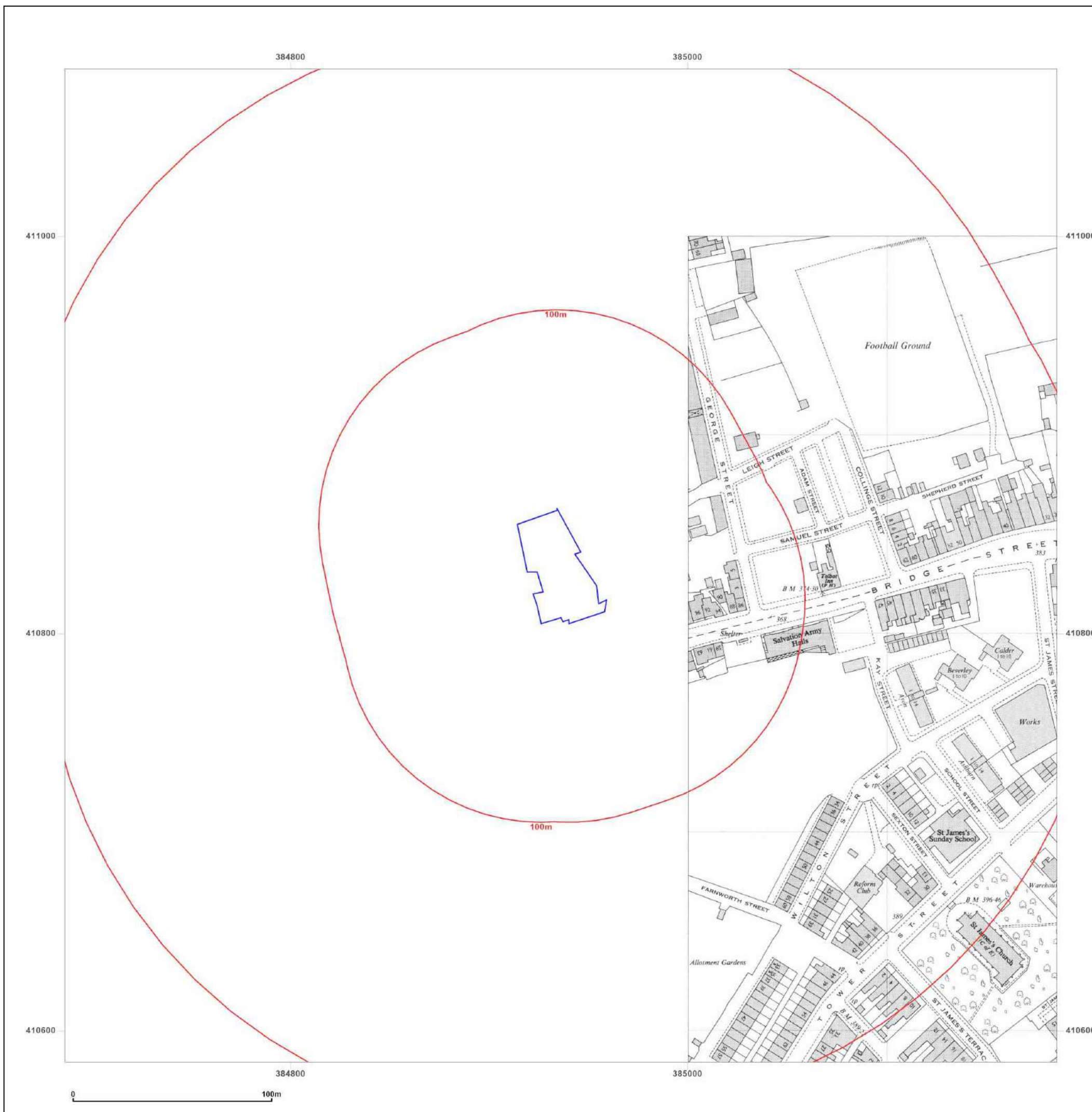


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Client Ref: 13-224HMA
Report Ref: GS-8320402
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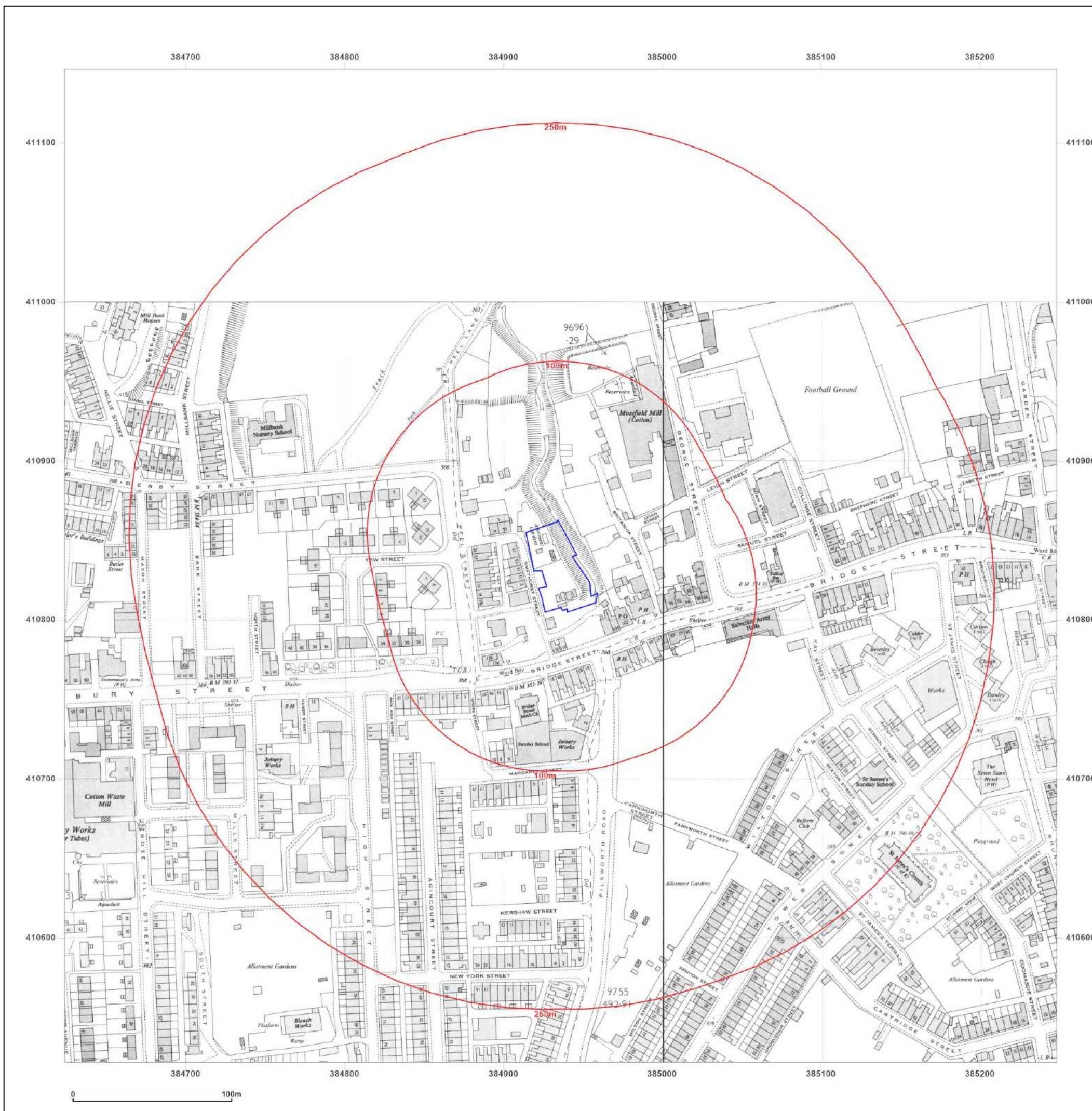


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OL10 4PW

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Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1970-1975

Scale: 1:1,250

Printed at: 1:2,000



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Revised N/A
Edition N/A
Copyright 1975
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Surveyed 1956
Revised 1969
Edition N/A
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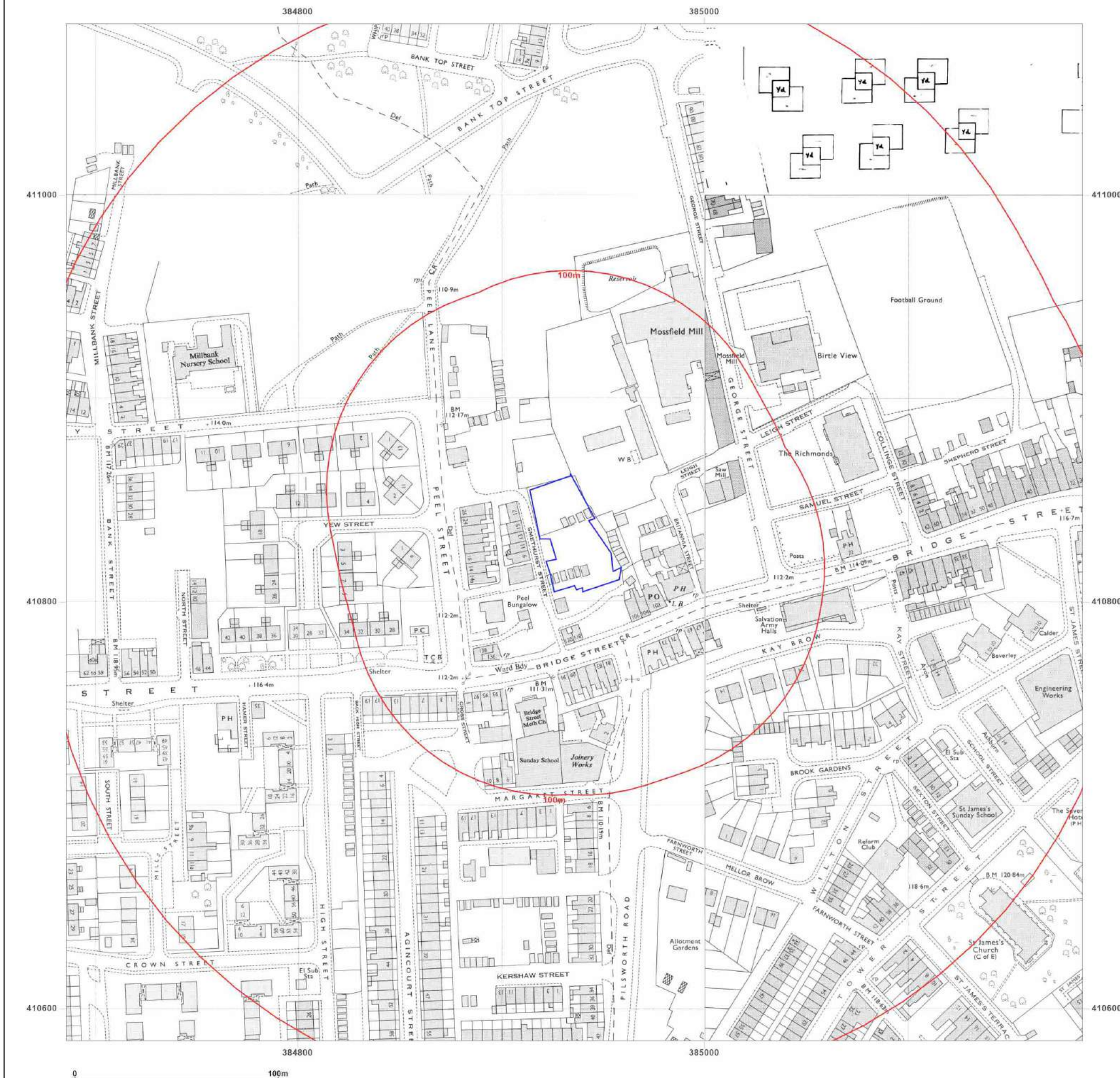


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Site Details:

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OL10 4PW

Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1975-1979

Scale: 1:1,250

Printed at: 1:2,000



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Edition N/A
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Revised 1975
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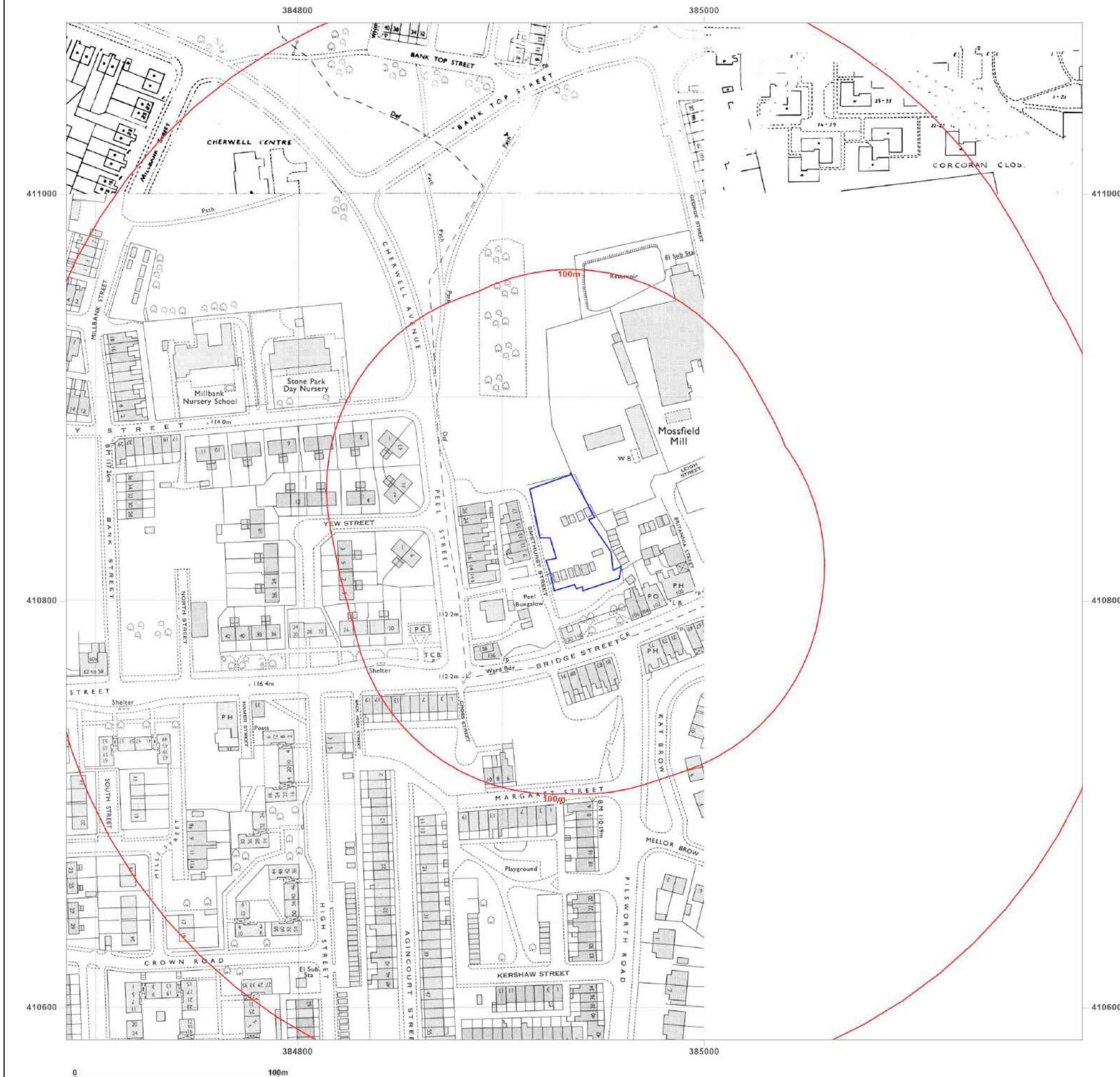


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Site Details:

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OL10 4PW

Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

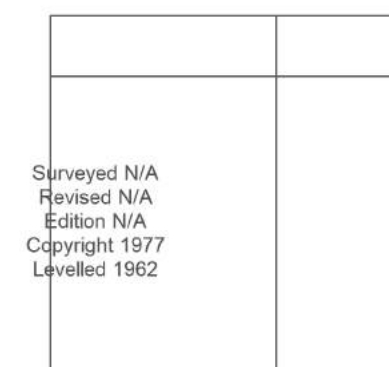
Map date: 1977-1981

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1956
Revised 1980
Edition N/A
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Surveyed N/A
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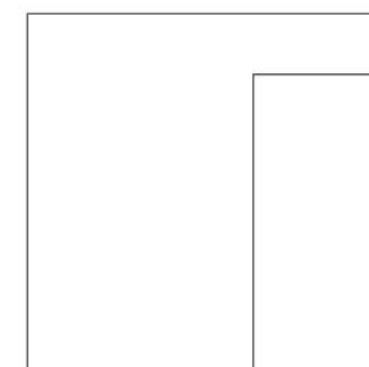
Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1986

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1962
Revised 1986
Edition N/A
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Levelled 1962

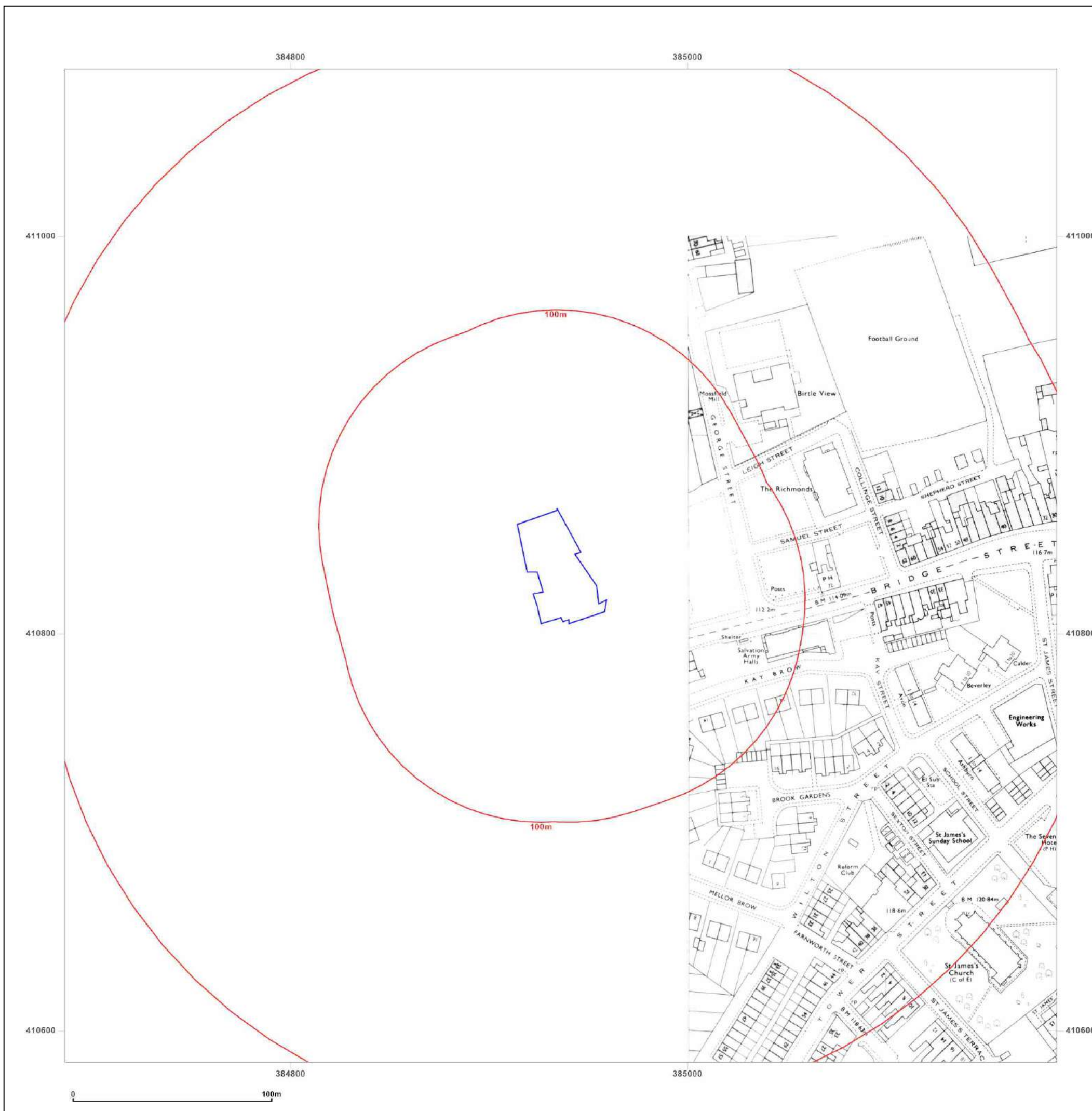


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Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1979-1987

Scale: 1:1,250

Printed at: 1:2,000



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Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1985-1990

Scale: 1:1,250

Printed at: 1:2,000



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Client Ref: 13-224HMA
Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1990-1992

Scale: 1:1,250

Printed at: 1:2,000



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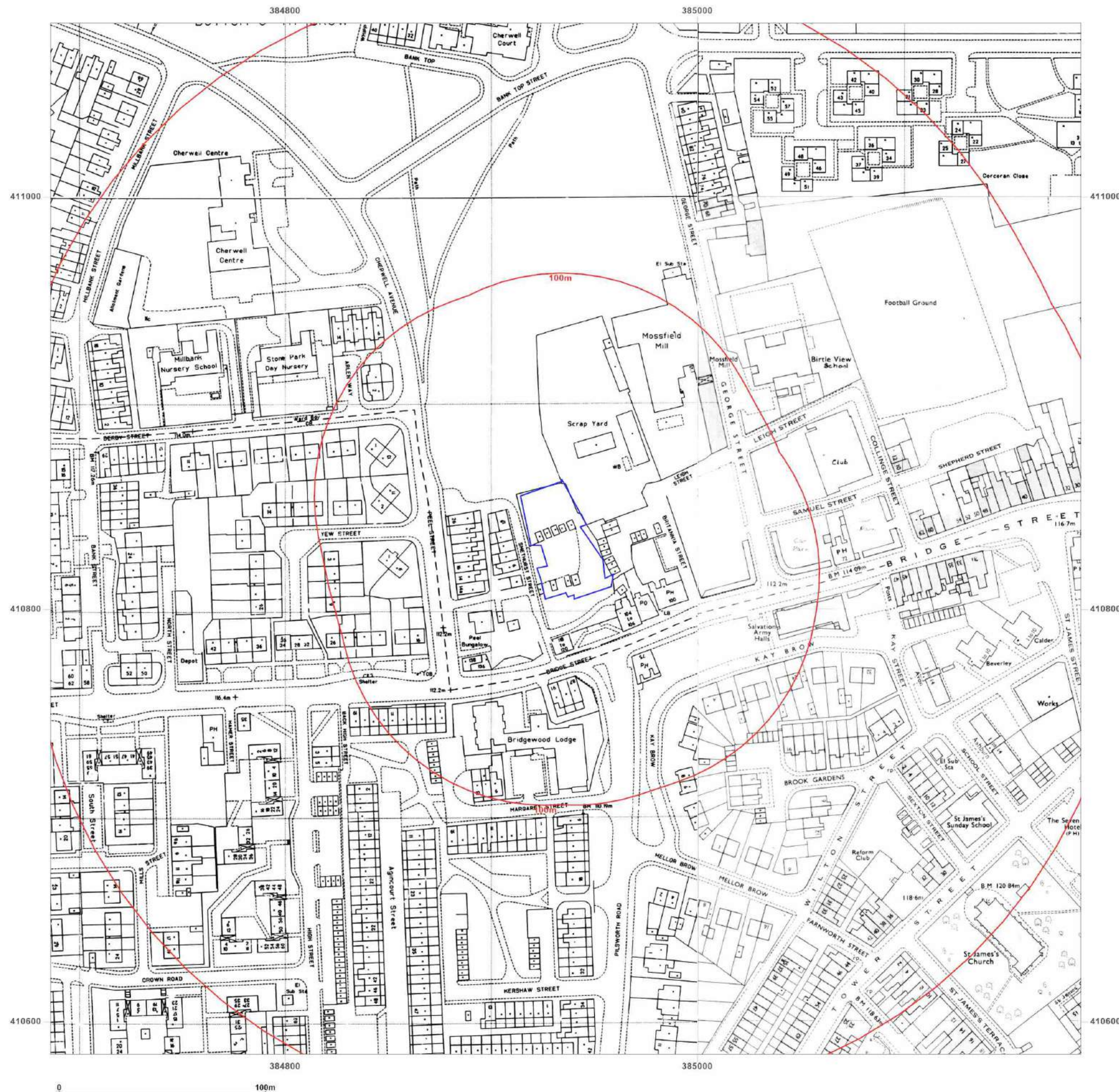


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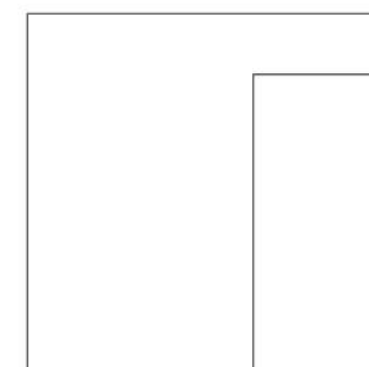
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Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1992

Scale: 1:1,250

Printed at: 1:2,000



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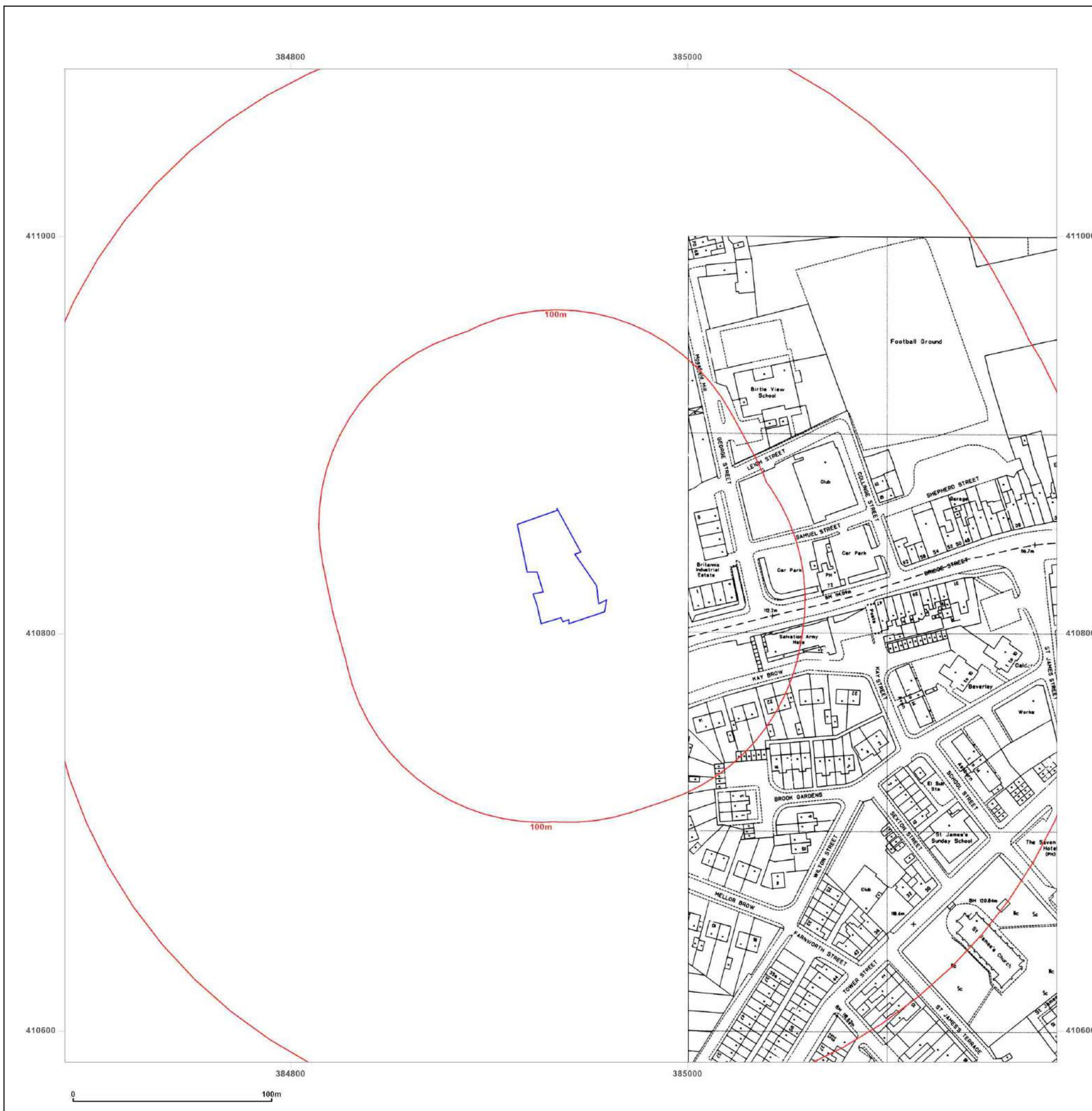


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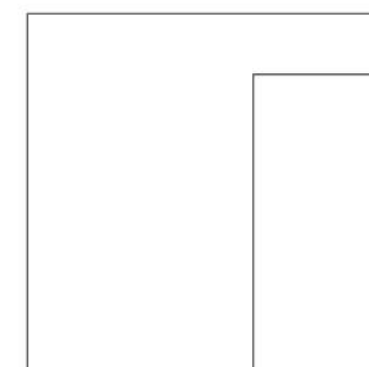
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Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1995

Scale: 1:1,250

Printed at: 1:2,000



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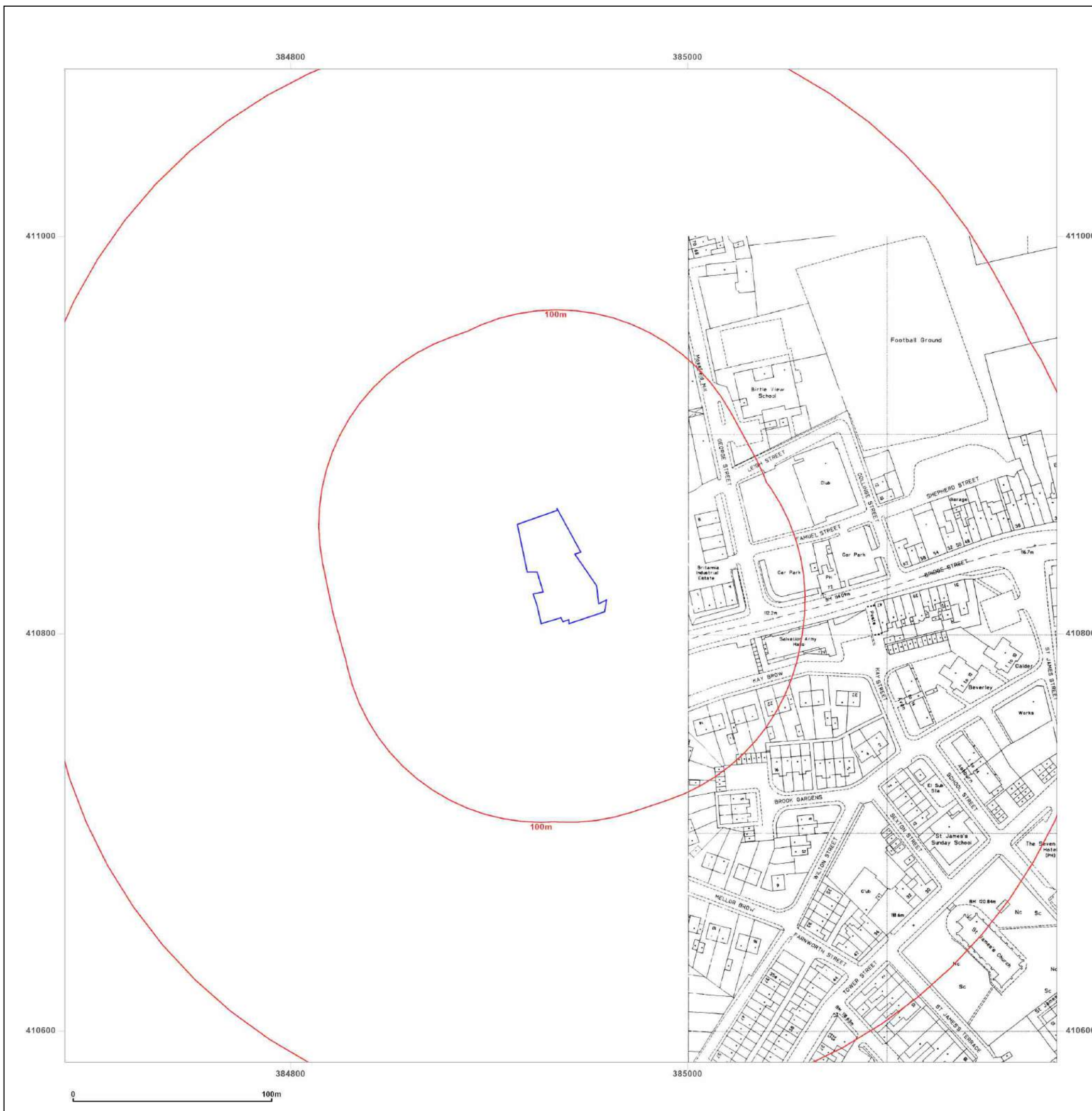


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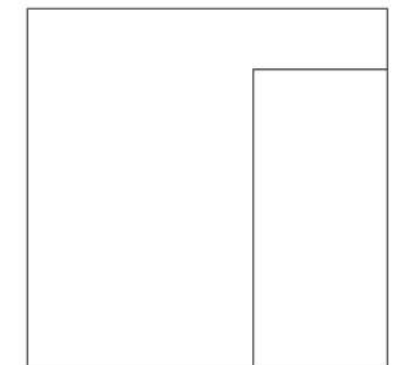
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Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: National Grid

Map date: 1995

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1995
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Edition N/A
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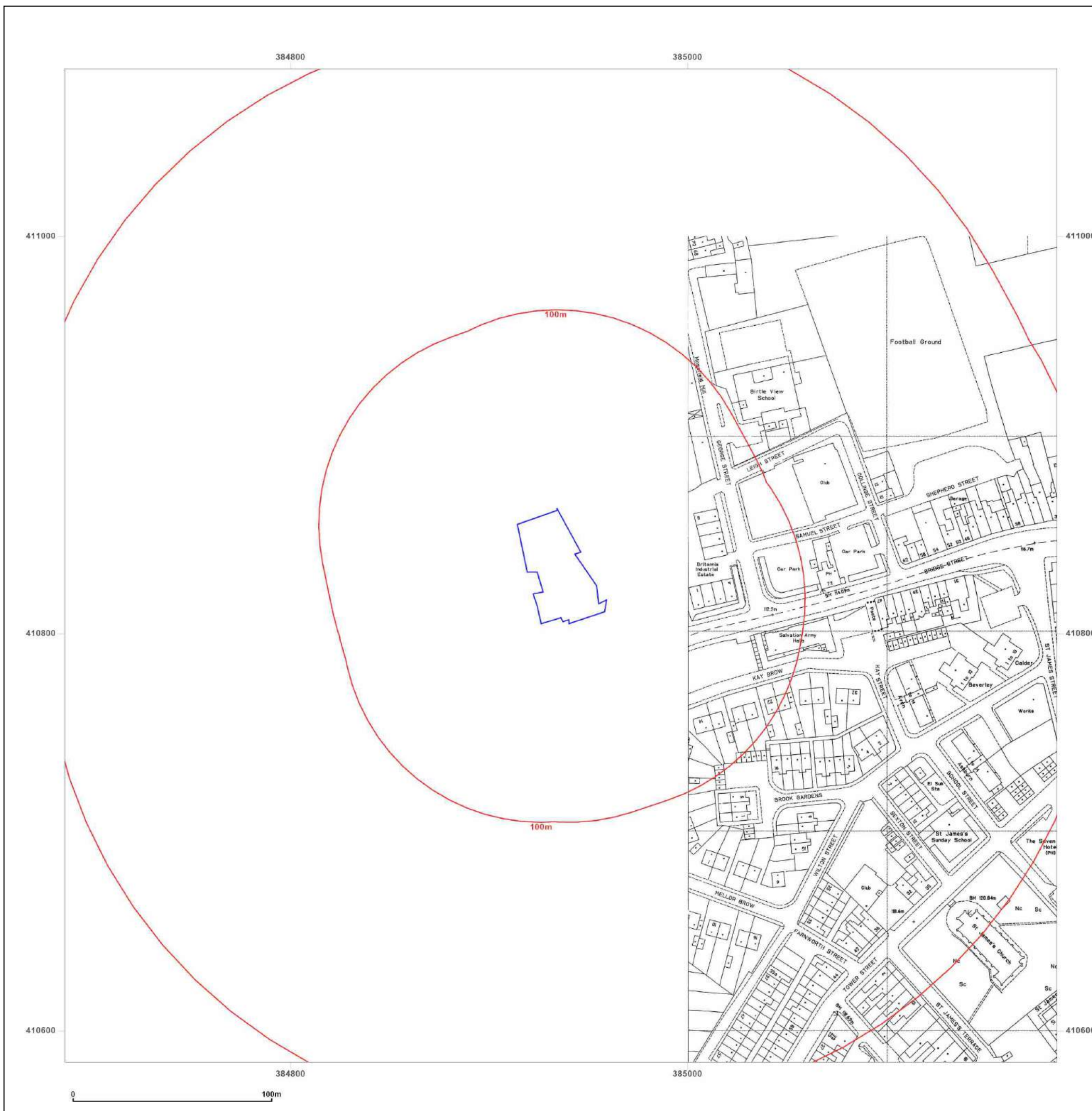


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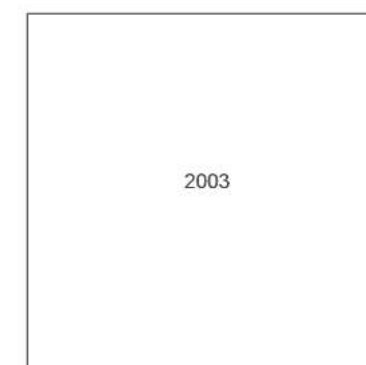
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Report Ref: GS-8320402
Grid Ref: 384936, 410834

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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