



Phase I Geoenvironmental Site Assessment
Smithfield Market
Manchester

Reference:12-757-R3-1
Date: July 2020



PHASE I GEOENVIRONMENTAL SITE ASSESSMENT

New Smithfield Market
Whitworth Street East
Openshaw
Manchester
M11 2WJ

Prepared for:



Report Ref: 12-757-R3-1
Date Issued: July 2020

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EXECUTIVE SUMMARY

Site Address	Whitworth Street East, Manchester, M11 2WJ	
Grid Reference	E388490, N397100	
Site Area	1.76 Hectares	
Current Site Use	The site is currently occupied by vehicle parking, industrial storage units and access associated with New Smithfield Market which is located immediately north. Storage of commercial material, including waste skips, is present on the site. Hardstanding is present across the site with peripheral landscaping in the central sector and south boundary with small trees and bushes.	
Proposed Development	E3P understands that Russell Construction propose to develop the subject site for a commercial end use. A proposed development layout indicates a steel portal frame building with external HGV loading areas and turning circle.	
Environmental Setting	Drift Geology	Glacial Till - BGS borehole logs indicate sandy silty Clay.
	Bedrock Geology	Chester Formation – Sandstone.
	Hydrogeology	Secondary A aquifer (Drift) overlying a principal aquifer (bedrock geology).
	Hydrology	The closest surface water feature is identified 136m south and is unnamed. Corn Brook is 600m west and the Ashton Canal is 1 km north of the site
	Flood Risk	The site is not within an area prone to fluvial flooding.
Site History	Historical mapping indicates the site was occupied by a locomotive and carriage works up to the mid-1900s, including railway tracks, cranes and tanks. Since circa 1970s, the New Smithfield Market has occupied the site and surrounding area; the subject site is located within the vehicle access and parking area of the market. An electricity substation is shown on plans from pre 1978 until the present.	
Utility Locations	A formal drainage survey has not been completed. It is assumed that services will be present within adjacent highways.	
Landfill Sites and Ground Gases	There is one historical landfill site located 141 m northeast which accepted inert waste and liquid sludge.	
Invasive Plant Species	No invasive species have been identified on the site.	
Radon	Unaffected – No special precaution required.	
Coal Mining/Land Stability	According to the Coal Authority Interactive Map Viewer the site is not within a Development High Risk Area, and no mine entries are identified in the vicinity, therefore, no further action considered necessary.	



GEOTECHNICAL ASSESSMENT

- ✿ Given the developed nature of the site Made Ground and obstructions are anticipated. Relict foundations will require grubbing out prior to the construction of the proposed development;
- ✿ An intrusive ground investigation will be required to assess ground conditions and undertake in-situ geotechnical testing to determine the likely foundation solutions; and,
- ✿ Underground services are likely to be present and cannot be ruled out without further investigation.

CONTAMINATED LAND RISK ASSESSMENT

Human Health	Historical and commercial land uses on the site, as well as Made Ground represent potential localised sources of heavy metal, polycyclic aromatic hydrocarbon (PAH), petroleum hydrocarbon, greasers, solvents and asbestos relating the former locomotive works and PCBs relating to the current electricity sub station. Considering the potential for direct contact during development works and within proposed landscaping areas, these potential sources of soil and groundwater contamination represent a moderate risk to construction workers and commercial end users. An intrusive ground investigation to identify and assess for the presence of these contaminants is required to facilitate further risk assessment and determine appropriate remediation and / or mitigation measures.
Controlled Waters	Historical and current commercial land uses on site, including a locomotive yard, as well as Made Ground, represent potential localised sources of mobile hydrocarbon contamination. Hardstanding across the site and underlying superficial Clay deposits reduce the potential for infiltration and migration of mobile contaminants, if present. However, considering the underlying Principal Aquifer, a moderate to high risk to controlled waters is identified. Furthermore, there closest ground water abstraction point is located 397m south west of the site and is used for process water. There are no abstractions of groundwater for use as drinking water within 1km of the site. Intrusive investigation with chemical analysis of soil and groundwater samples is recommended to assess the presence of mobile contaminants and facilitate further risk assessment.
Ground Gas	Made Ground associated with historical development may be a source of carbon dioxide and methane. Carbon dioxide and methane have associated asphyxiation and explosive risks respectively; if present, the risks can be appropriately mitigated through the careful design of building structures.

RECOMMENDATIONS

A detailed Phase II intrusive Geo-Environmental Ground Investigation should be undertaken in order to confirm the findings of the initial conceptual site model and value engineer a development solution.



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DRAWING LIST

12-757-R1-001 - Site Location Plan
12-757-R1-002 - Proposed Development Plan
12-757-R1-003 - Historical Features Plan
12-757-R1-004 - Site Features Plan



1. INTRODUCTION

1.1. BACKGROUND

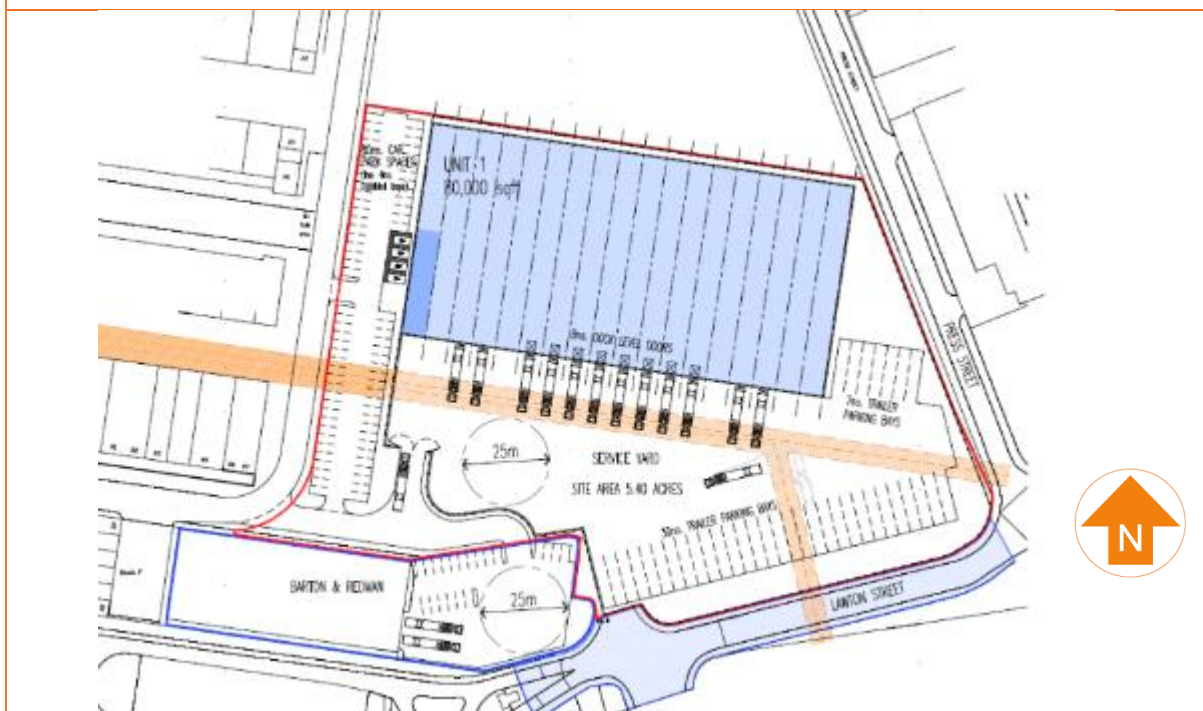
E3P has been commissioned by Russells Construction to undertake a detailed Phase I Geoenvironmental Site Assessment for a parcel of commercial and industrial land at New Smithfield Market, Openshaw, Manchester.

1.2. PROPOSED DEVELOPMENT

E3P understands that Russells Construction propose to develop the subject site for commercial end use. The proposed development includes a steel portal frame building with associated hardstanding for use as a service yard, turning circle and car park. Drawing 12-757-002 (Appendix III) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.1.

FIGURE 1.1 SNAPSHOT OF PROPOSED DEVELOPMENT



1.3. 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 *Model Procedures for the Management of Contaminated Land (Contaminated Land Report 11 (CLR11))*.
- ✳ 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.

1.4. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.5. SOURCES OF INFORMATION

Background information was sought from the following sources:

- ✳ Envirocheck Search;
- ✳ Historical mapping dated 1893 to 2017. A selection of historical maps are reproduced in Appendix V;
- ✳ On-line planning records held by Manchester City Council;
- ✳ Consultations with representatives of Manchester City Council;
- ✳ Magic Map Groundwater Vulnerability Map;
- ✳ Radon: Guidance on protective measures for new buildings (BRE Document BR 211, 2007);
- ✳ British Geological Survey Map;
- ✳ <https://zeticauxo.com/downloads-and-resources/risk-maps/>; and,
- ✳ <https://flood-map-for-planning.service.gov.uk>.

1.6. 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.



2. SITE SETTING

2.1. SITE DETAILS

TABLE 2.1 SITE DETAILS

Site Address	Whitworth Street East, Manchester, M11 2WJ
National Grid Reference	E388490, N397100
Site Area	1.76 Hectares

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

A site location plan is presented in Appendix III as Drawing 12-757-001.

2.2. CURRENT SITE USE

E3P has undertaken a site walkover of the entire site and a description of the key findings is summarised in Table 2.2.

TABLE 2.2 SITE DESCRIPTION

Occupancy/Use	The site is currently occupied by vehicle parking, industrial storage units and access associated with New Smithfield Market which is located immediately north. Storage of commercial material, including waste skips, is present on the site. Hardstanding is present across the site with peripheral landscaping in the central sector and south boundary with small trees and bushes.	
Structures	Four industrial units are present on site, a circa 3m high brick wall lines the eastern boundary of the site. A gatehouse is present on the southern boundary of the site. The site is covered in a combination of concrete and asphalt, and also houses a carpark.	
Access	Vehicular and pedestrian access is located off Whitworth Street East and is the main entrance/exit to the site.	
Slope	The site is topographically level.	
Retaining Structures	None identified.	
Surface Cover (%)	Buildings:	30%
	Hardstand:	67%
	Soft cover:	3%
Vegetation/Ecology	The site is predominantly hard standing and as such there is no vegetation bar what is encroaching through the sites southern fence line with Lawton Street.	
Hazardous Material Storage	No Above Ground Storage Tanks (ASTs) or Underground Storage Tank (USTs) were observed at the site. Due to the commercially developed nature of the site it is possible that hazardous materials storage will have occurred on the site.	
Asbestos-Containing Material (ACM)	No evidence of ACM was noted across the majority of the site during the site walkover.	



Polychlorinated Biphenyls (PCBs)	There is a current electricity substation on the northwestern boundary of the site. The substation was constructed at some point prior to 1977 and therefore may be a potential source of PCBs.
Waste Storage	A series of waste skips have been identified in the east of the site that are related to current on-site activity, however these are not known to contain hazardous materials.
Drainage	A formal drainage survey has not been completed under the scope of this report. However, drainage infrastructure is likely present in adjacent highways and there is potential for further drainage to cross under the site.

2.3. SURROUNDING AREA

The surrounding area land uses are summarised in Table 2.3.

TABLE 2.3 SURROUNDING LAND

DIRECTION	LAND USE
North	Commercial units.
East	Commercial units.
South	Commercial units and GMP Openshaw Police Complex.
West	Commercial units.

2.4. PREVIOUS REPORTS

Previous reports have been undertaken on the south eastern sector of the site. The pertinent points of the reports are provided below:

E3P Phase 1 Geoenvironmental Desk Study (ref: 12-757, dated August 2018)

- ✳ The underlying geology of the site is Glacial Till (secondary A aquifer) overlying Chester Formation sandstone (principal aquifer).
- ✳ The closest surface water feature is identified 136m south. Corn Brook is 600 m west and the Ashton Canal is 1km north of the site.
- ✳ There is one historical landfill site located 141 m northeast which accepted inert waste and liquid sludge.
- ✳ No invasive plant species were identified during the site walkover; however, their presence cannot be ruled out and a Habitat Survey may be required.
- ✳ Given the developed nature of the site Made Ground and obstructions are anticipated.
- ✳ According to the Coal Authority Interactive Map Viewer the site is not within a Development High Risk Area, and no mine entries are identified in the vicinity, therefore, no further action considered necessary.
- ✳ Historical mapping indicates the site was occupied by a locomotive and carriage works up to the mid-1900s, including railway tracks, cranes and tanks. Since circa 1970s, the New Smithfield Market has occupied the site and surrounding area; the subject site is located within the vehicle access and parking area of the market .



- ✳ Historical and current commercial land uses on site, including a locomotive yard, as well as Made Ground, represent potential localised sources of mobile hydrocarbon contamination. Hardstanding across the site and underlying superficial Clay deposits reduce the potential for infiltration and migration of mobile contaminants, if present. However, considering the underlying principal aquifer, a moderate to high risk to controlled waters is identified. Made Ground associated with historical development may be a source of carbon dioxide and methane.
- ✳ Historical and commercial land uses on the site, as well as Made Ground represent potential localised sources of heavy metal, polycyclic aromatic hydrocarbon (PAH), petroleum hydrocarbon, asbestos, and ground gas. Considering the potential for direct contact during development works and within proposed landscaping areas, these potential sources of soil and groundwater contamination represent a moderate risk to construction workers and commercial end users.

Pertinent points from the previously completed E3P Ltd ground investigation (ref: 12-757-R1-1, dated November 2018) which was completed in the south east of the subject site, are as follows:

- ✳ Made Ground was encountered within all exploratory locations, up to a maximum proven depth of 5.00 m bgl (WS105). The depth of Made Ground varies significantly between exploratory holes however it is generally less than 2.50 m thick.
- ✳ Drift deposits were encountered to a maximum proven depth of 13.00 m bgl, by CP101. Drift deposits predominantly comprise very stiff high strength gravelly sandy CLAY.
- ✳ Water strikes were encountered during the Ground Investigation at depth of between 0.60 m to 4.00 m bgl
- ✳ Rockhead was not encountered in this investigation;
- ✳ The Tier I Human Health Risk Assessment has not identified any concentrations of contaminants of concern which exceed the Tier I screening values for the protection of human health; as such the site poses no unacceptable degree of risk to future commercial site users
- ✳ Given the absence of any potentially soluble / mobile contaminants of concern within the soil and absence of a viable exposure pathway, it is concluded the site poses no unacceptable degree of risk to the controlled water receptors and the wider environ based on leachate samples taken from the site.
- ✳ Ground gas monitoring indicates the site falls into Characteristic Situation 2; as such protection measures are required in the proposed development.
- ✳ Other than a possible service in TP105b no significant obstructions were identified within trial holes. However, relics are anticipated across the site due to the historical development;
- ✳ Based on the assessment of the relative undrained shear strength, in-situ densities and corresponding safe net ABP, the suitable target founding stratum has been identified as the firm to stiff high to very high strength CLAY at a depth of between 1.50 – 3.00 m bgl where an ABP in excess of 125kN/m² can generally be achieved
- ✳ The underlying cohesive deposits are of low to moderate volume change potential, heave precautions are required to the internal face of the external load bearing walls (outside or within tree influence).
- ✳ E3P consider it feasible to construct the commercial unit with pad foundations supported by VSC on an engineered sub-grade set at least 500 mm into the clay soils to support the associated ground bearing slab and infrastructure. The requirement for the vibro stone columns is due to the presence of the deep Made Ground on the site.

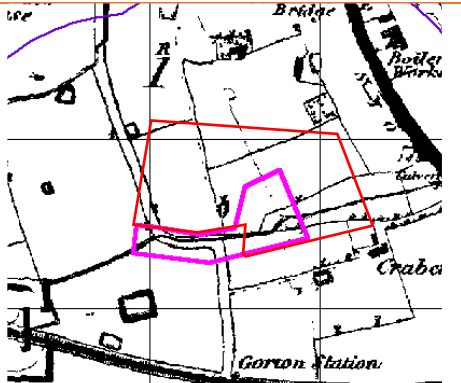
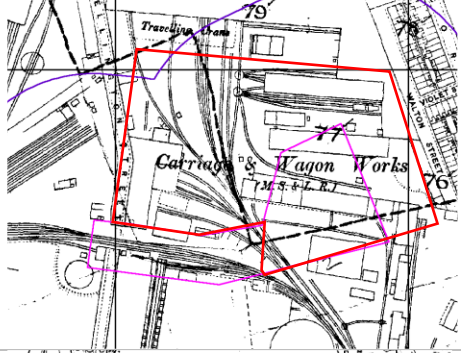
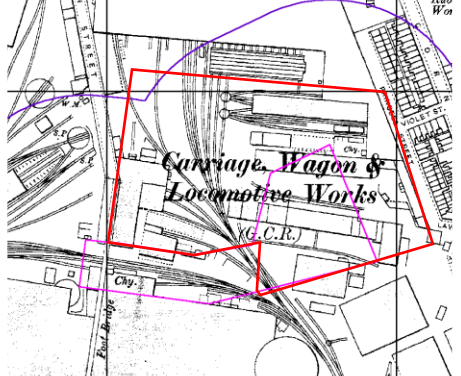
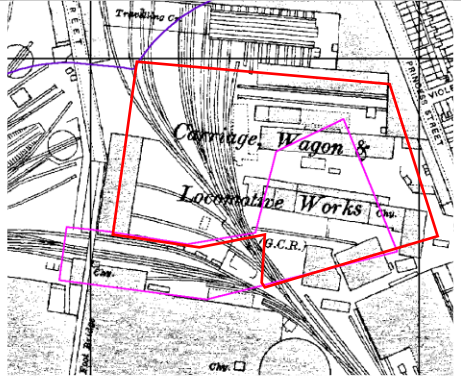


3. SITE HISTORY

3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of historical mapping pertinent to the site is summarised in Table 3.1 below.

TABLE 3.1 SITE HISTORICAL DEVELOPMENT

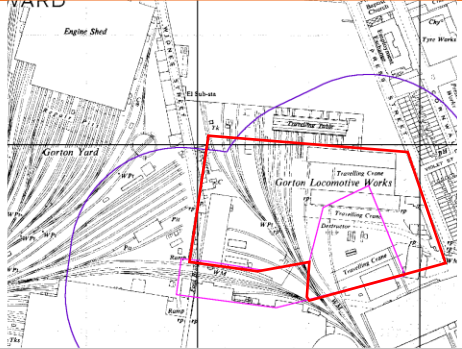
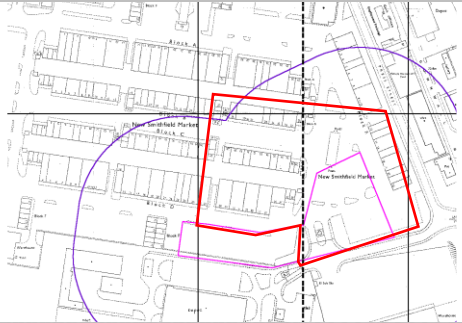
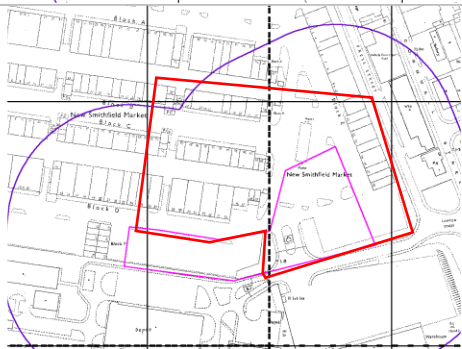
MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1848 1:10,560	The site is predominantly agricultural fields with a road running north south through the centre of the site. A small stream flows east west across the site and a pond is present in the centre of the site.	
1893 1:2,500	The site is occupied by a carriage and wagon works with railway tracks across the central sector and industrial buildings across the site. Travelling cranes related to the railway sidings are present in the north of the site.	
1908 1:2,500	No significant changes	
1933 1:2,500	The building outlines have slightly changed..	



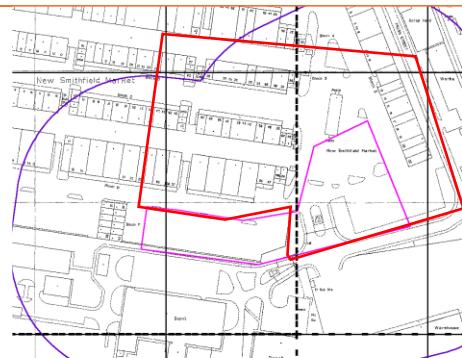
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MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1951-1952 1:2,500	A locomotive works is present on the site. Buildings have been removed indicating demolition activities. Travelling cranes are shown on site. A destructor is identified in the central sector.	
1977-1980 1:1,250	The former locomotive works have been replaced by New Smithfield Market, indicating demolition and construction work. An electricity substation is shown in the north west of the site.	
1978-1987 1:1,250	No significant changes	
1985 – 1991 1:1,250	No significant changes	
1992 1:1,250	No significant changes	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1994-1995 1:1,250	No significant changes	

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 POTENTIALLY CONTAMINATIVE LAND USES

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Tank	0m	Pre 1893 – Pre 1933	South East
Commercial units <i>Then depot and car parking</i>	0m	Pre 1908 – Pre 1977 Pre 1977 – Present	South
Electrical substation	20m	Pre 1977 – Present	South
Tank	50m	Pre 1893 – Pre 1977	South
Works	60m	Pre 1977 – Present	East
Warehouse	75m	Pre 1977 - Present	South
Vehicle dismantling yard / scrap yard	50m	Pre 1977 – Present	East
Preserving works <i>Then factory and works</i>	100m	Pre 1950 – Pre 1977 Pre 1977 – Present	East
Works	100m	Pre 1977 – Pre 1985	North
Engineering works <i>Then: rubber works</i> <i>Then: tyre works</i> <i>Then: depot</i> <i>Then: commercial units</i>	100m	Pre 1893 – Pre 1908 Pre 1908 – Pre 1933 Pre 1950 – Pre 1977 Pre 1977 – Pre 1985 Pre 1985 – Present	East
Canal depot <i>Then: coal yard</i> <i>Then: housing</i>	135m	Pre 1893 – Pre 1977 Pre 1977 – Pre 2018 Present	Southeast
Oil works <i>Then: chemical and colour works</i>	150m	Pre 1893 – Pre 1950 Pre 1950 – Pre 1977	East
Iron works <i>Then: warehouse</i>	150m	Pre 1893 – Pre 1950 Pre 1950 – Pre 1977	North
Electrical substation	150m	Pre 1908 – Present	North
Cotton mill	170m	Pre 1893 – Pre 1977	Northeast
Steel works <i>Then: works</i>	190m	Pre 1893 – Pre 1908 Pre 1950 – Present	East



3.3. PLANNING HISTORY

E3P has undertaken a detailed search of on-line planning records held by Manchester City Council which has identified that there have been some previous planning applications relating to the site. These have been detailed in Table 3.3.

TABLE 3.3 PREVIOUS PLANNING APPLICATIONS.

PLANNING APPLICATION	DETAILS	DATE	OUTCOME
109770/JO/2015/N2	A planning application for the change of use of a previously approved office building into an enclosed recycling centre on the site	2015	Approved



4. ENVIRONMENTAL SETTING

4.1. GEOLOGY AND HYDROGEOLOGY

The British Geological Survey (BGS) map for the site, (1:50,000, Solid and Drift edition) and online records indicate that 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	Glacial Till	Sands, Clay and Gravels	Secondary A Aquifer
Solid	Chester Formation	Sandstone	Principal Aquifer

TABLE 4.2 SUMMARY OF BGS BOREHOLE RECORDS

LOCATION	DEPTH	MADE GROUND	DRIFT	SOLID
100m Northeast (SJ89NE1126)	9.14m	<1.40m	Silty sandy Clay <9.14m	Not encountered

A search of online BGS records show that there are no geological faults located on site and none within 500m of the site boundary.

4.2. GEOTECHNICAL DATA

Geotechnical data presented within a commercially available environmental database is summarised within Table 4.3.

TABLE 4.3 SUMMARY OF GEOTECHNICAL DATA

HAZARD	DESIGNATION
Shrink-Swell Clay	Very Low Risk
Landslides	Very Low Risk
Ground Dissolution	No Hazard
Compressible Ground	Very Low Risk
Collapsible Deposits	Very Low Risk
Running Sand	Very Low Risk
Natural Cavities	None recorded within 2000m
Manmade Cavities	None recorded within 2000m

4.3. COAL MINING

The Envirocheck Report states the site is in an area which may be affected by coal mining. However, according to the Coal Authority Interactive Map Viewer the site is not within a Development High Risk Area, and no mine entries are identified in the vicinity, therefore, no further action considered necessary.

4.4. BRINE WORKINGS

The site is not located within the Cheshire Brine Compensation District.



4.5. HYDROLOGY

Surface water features within 250m of the subject site are summarised in Table 4.4.

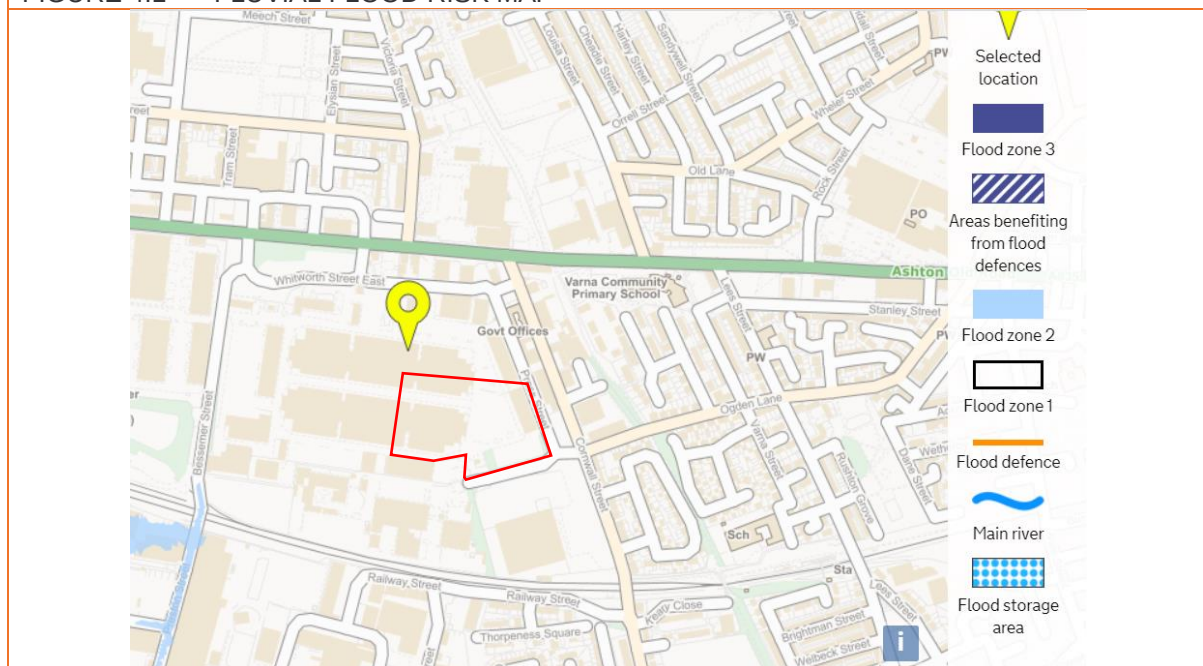
TABLE 4.4 SURFACE WATER FEATURES

SURFACE WATER FEATURE	QUALITY	DISTANCE (m)	DIRECTION
Unidentified surface water feature	N/A	136m	South

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. In addition, the Envirocheck Report states there is a limited potential for groundwater flooding to occur at the site.

The Fluvial Flood Risk Map is presented in Figure 4.1.

FIGURE 4.1 FLUVIAL FLOOD RISK MAP



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

4.6. RADON RISK POTENTIAL

The Envirocheck 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 in the construction of new dwellings or extensions.

4.7. INDUSTRIAL LAND USES

Reflecting the location of the site within a commercial area, there are 52no. Contemporary Trade Directory Entries within 250m of the site. Given that the site is an active commercial site there are on-site trade directories in the wider Smithfield Market site but not within the development site that is the subject of this report. The nearest active entry is just beyond the western boundary of the site and is a meat wholesalers. Other active entries within 250m include a fork lift trucks business, sausage manufacturers, garage services, tyre disposal, powder coatings, recycling services, engineering services, tyre dealers, garage services, distribution services, MOT Testing Centres and sand & gravel and other aggregates.



4.8. HAZARDOUS SUBSTANCE CONSENTS

The Envirocheck Report confirms the absence of the following Hazardous Installations within 1000m of the site:

- ✳ Control of Major Accident Hazard (COMAH) Sites;
- ✳ Explosive Sites;
- ✳ Notification of Installation Handling Hazardous Substances (NIHHS);
- ✳ Planning Hazardous Substance Consents; and
- ✳ Planning Hazardous Substance Enforcements.

4.9. SENSITIVE LAND USES

The closest residential properties are located approximately 100m east of the site. No other environmentally sensitive land uses have been identified near to the site.

4.10. SITE SENSITIVITY ASSESSMENT

The site is assessed to be located within a **moderate** sensitivity setting as discussed within Table 4.5.

TABLE 4.5 SITE SENSITIVITY ASSESSMENT

SENSITIVITY PROFILE	DISCUSSION	RATING
Sensitive Land Uses Within Close Proximity (e.g. Residential, School, Nursery, Local Nature Reserves)	The closest residential properties are located approximately 100m east of the site. No other environmentally sensitive land uses have been identified near to the site.	Low
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not located within a Groundwater Source Protection Zone	Low
Distance to the Closest Groundwater Abstraction Point	The closest groundwater abstractions are 397m southwest for process water.	Moderate
Aquifer Classification in Superficial Drift Deposits	The underlying superficial deposits are classified as a Secondary A Aquifer.	Moderate
Aquifer Classification in Bedrock	Principal Aquifer.	High
Is the Site Underlain by Low-Permeability Drift to Depths in Excess of 10 m?	The closest residential properties are located approximately 100m east of the site.	Low
Is the Site Located Within 50 m of a Surface Watercourse?	The site is not located within 50m of a surface watercourse.	Low
OVERALL SITE ENVIRONMENTAL SENSITIVITY		Moderate



4.11. PRELIMINARY GEOTECHNICAL ASSESSMENT

E3P has completed an assessment of potential geotechnical constraints based on the available desk-study information within the context of the proposed residential/commercial development. This assessment is summarised in Table 4.6.



TABLE 4.6 SUMMARY OF POTENTIAL GEOTECHNICAL CONSTRAINTS

POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of Contaminated Soils	On site	TBC	Additional investigation is required to determine the levels of contamination prior to developing remediation strategies.
Mine Shafts	N/A	N/A	N/A
Shallow Coal Workings	N/A	N/A	N/A
Steep Slope to Adjacent Site	N/A	N/A	N/A
Obstructions	TBC	TBC	The Made Ground on site may contain large pieces of material such as demolition rubble and bricks.
Artificially Levelled and Filled Platforms	N/A	N/A	The site appears to have been levelled.
Retaining Walls	N/A	N/A	There is no evidence of retaining walls present on the site.
Trench Collapse	N/A	N/A	N/A
Infilled Pond/Hedges	N/A	N/A	N/A
Mature Trees	Periphery	-	Arboriculture survey required to determine areas of potential tree influence.
Volume Change Potential Clay	On site	80	Clay strata is likely to be a depth beneath Made Ground and as such heave precautions are unlikely to be needed.
Running Sands	N/A	N/A	Data searches indicate low risk.
Ground Dissolution	N/A	N/A	Data searches indicate no hazard.
Shallow Bedrock	N/A	N/A	Shallow bedrock has been identified at depths less than 10.0m.
Peat	N/A	N/A	N/A
Concrete Design	TBC	-	N/A
Low-Permeability Ground	On site	80	Soakaways unlikely to be effective in areas where low permeability cohesive deposits are present or where areas of potentially contaminated soil and groundwater are present.



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POTENTIAL ABNORMAL CONSTRAINT	LOCATION ON SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Services/Sensitive Structures	On site	40	Underground services are present below the site.
Abnormal Foundation Solutions	TBC	TBC	In consideration of the proposed structures piled foundations may be required to transfer the load to competent strata.

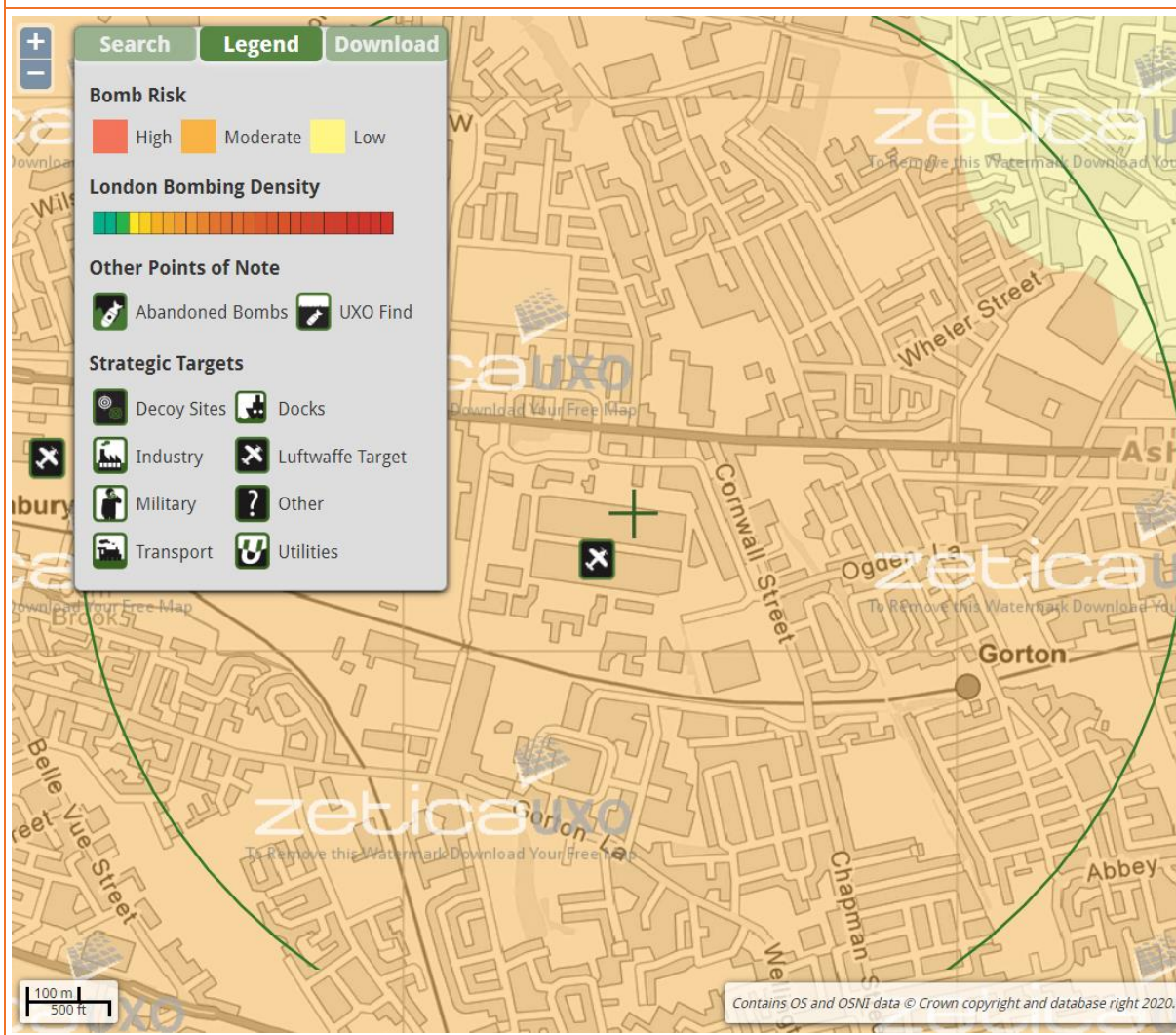


4.12. UNEXPLODED ORDNANCE

The regional unexploded bomb risk map from Zetica indicates that the site is in an area at high risk from possible Unexploded Ordnance (UXO) resulting from the Second World War. (Zetica, 2014). The Zetica UXO Risks Map is presented in Figure 4.3 (below).

As the site is within the moderate-risk area, and the site was a former Luftwaffe Target, it is recommended that further detailed assessments are carried out to establish the level of risk and the potential need for mitigation.

FIGURE 4.2 ZETICA UXO RISKS MAP



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



5. CONSULTATIONS

5.1. CONTAMINATED LAND OFFICER

E3P contacted the Environmental Health Department at Manchester City Council who have been unable to respond within the reporting timescales. Upon receipt of the search information, E3P will issue any pertinent information and / or use the information to inform the development of any intrusive investigation proposals.

5.2. LANDFILL SITES AND WASTE TREATMENT SITES

There is one historical landfill site within 250m of the site, located 141m northeast.

There are two licensed waste management sites within 250m of the site. The closest is a composting facility, located 9m east. Another composting facility is located 85m west of the site. The licences for both sites have been surrendered.

There is one registered waste treatment and disposal site within 250m of the site, identified as a scrapyards located 215m east.

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	0	None Identified (N/A).
Authorised Industrial Processes (IPC/IPPC/LAPPC)	3	LAPPCs for coal processing are 166m and 209m east. A LAPPC for mobile screening and crushing is 238m south but is revoked.
Fuel Stations Entries	0	N/A
Licensed Radioactive Substances	0	N/A
Enforcements, Prohibitions or Prosecutions	0	N/A
Discharge Consents	0	N/A
Pollution Incidents	0	N/A
Consents Issued Under the Planning (Hazardous Substances) Act 1990	0	N/A
Control of Major Accident Hazard (COMAH) Sites	0	N/A



6. INITIAL CONCEPTUAL SITE MODEL

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



TABLE 5.2 INITIAL CONCEPTUAL SITE MODEL

CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK
Human Health				
Heavy metals, non-volatile PAHs, greasers associated with historic and current commercial land use and Made Ground	Dermal contact. Dermal contact and ingestion.	Construction Workers Commercial End Users	Likely	High
Assessment Historical and current commercial land uses on site, including a locomotive yard and locomotive manufacturing facilities are potential sources of heavy metals and PAHs from ash deposits and spillages of fuel / oil. Heavy metals and non-volatile PAHs may pose a short-term risk to construction workers who may be exposed to impacted soils during earthworks. Construction works must be undertaken using the appropriate Personal Protective Equipment (PPE) to remove this risk. Future commercial end users may be exposed to impacted soils within landscaped areas. An intrusive ground investigation is required to identify and assess for the presence of heavy metals and PAHs, to facilitate further risk assessment, and to determine appropriate remediation and / or mitigation measures.				
Polychlorinated Biphenyls (PCBs) (Electricity Substation)	Dermal contact and ingestion	Site Workers and site end users	Likely	Moderate
Assessment The current electricity substation is a potential source of PCBs. PCBs may pose a short-term risk to construction workers who may be exposed to impacted soils during earthworks. Construction works must be undertaken using the appropriate Personal Protective Equipment (PPE) to remove this risk. Future commercial end users may be exposed to impacted soils within landscaped areas. An intrusive ground investigation is required to identify and assess for the presence of PCBs to facilitate further risk assessment, and to determine appropriate remediation and / or mitigation measures.				



CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK
Volatile hydrocarbon compounds associated with historic locomotive works and current commercial land use and Made Ground	Inhalation of vapours. Volatilisation / Accumulation Migration through permeable strata and preferential pathways.	Construction Workers Commercial End Users	Likely	Moderate
Assessment Historical and current commercial land uses on site, including a locomotive yard and locomotive manufacturing facilities, represent potential sources of volatile hydrocarbons from the storage and use of fuel. Volatile hydrocarbons pose a short-term risk to construction workers during earthworks. Construction works should be undertaken using the appropriate Personal Protective Equipment (PPE) to remove this risk. Proposed commercial end users may be exposed to vapour via inhalation and accumulation of vapours in indoor space, representing a long-term risk. An intrusive ground investigation with chemical analysis of soil and groundwater samples is recommended.				
ACM in the Made Ground	Inhalation of dust.	Construction Workers Commercial End Users Off-site land users.	Likely	Moderate
Assessment Made Ground, if present, may contain ACM relating to the historical industry. Disturbance of ACM may give rise to dust generation, posing a risk to adjacent site users, construction workers, and commercial end users. An intrusive ground investigation should test and assess for the presence of asbestos within Made Ground to facilitate further risk assessment.				



CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK
Methane and carbon dioxide associated with Made Ground	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future site users. Buildings. Off-site land users.	Low likelihood	Moderate
Assessment Made Ground associated with historical development represent a potential source of hazardous ground gases. Carbon dioxide and methane are associated with asphyxiation and explosive risks. Installation of monitoring wells during intrusive ground investigation is recommended to assess for the presence of ground gases and facilitate further risk assessment.				
Controlled Waters				
Hydrocarbon compounds associated with historic and current commercial land use and Made Ground	Vertical / Lateral Migration	Principal Aquifer	Likely	Moderate
Assessment Historical and current commercial land uses on site, including a locomotive yard, as well as Made Ground, represent potential localised sources of mobile hydrocarbon contamination. Hardstanding across the site and underlying superficial Clay deposits reduce the potential for infiltration and migration of mobile contaminants, if present. However, considering the underlying Principal Aquifer, a moderate to high risk to controlled waters is identified. Furthermore, there closest ground water abstraction point is located 397m south west of the site and is used for process water. There are no abstractions of groundwater for use as drinking water within 1km of the site. Intrusive investigation with chemical analysis of soil and groundwater samples is recommended to assess the presence of mobile contaminants and facilitate further risk assessment.				
Buildings and Infrastructure				
Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Likely	Moderate/Low
Assessment Presence of pH and sulphate within Made Ground may result in corrosion of buried concrete within the proposed development. Intrusive investigation with chemical analysis of soil samples is recommended to confirm the levels of pH and sulphate within Made Ground deposits and thus determine the concrete classification.				
Ecology				



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CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK
Phytotoxic contaminants (Made Ground)	Direct Contact (plant uptake).	Flora	Likely	Low
<i>Assessment</i> No significant ecological receptors are identified.				



7. CONCLUSIONS AND RECOMMENDATIONS

7.1. SITE SUMMARY

Current site use	The site is currently occupied by vehicle parking, industrial storage units and access associated with New Smithfield Market which is located immediately north. Storage of commercial material, including waste skips, is present on the site. Hardstanding is present across the site with peripheral landscaping in the central sector and south boundary with small trees and bushes.
Historical Site Use	Historical mapping indicates the site was occupied by a locomotive and carriage works up to the mid-1900s, including railway tracks, cranes and tanks. Since circa 1970s, the New Smithfield Market has occupied the site and surrounding area; the subject site is located within the vehicle access and parking area of the market. An electricity substation is shown on plans from pre 1978 until the present.
Site Sensitivity	Due to the presence of a Principal Aquifer within the underlying bedrock the site poses a moderate risk to the surrounding environment.

7.2. CONTAMINATION ISSUES

Human Health	Historical and commercial land uses on the site, as well as Made Ground represent potential localised sources of heavy metal, polycyclic aromatic hydrocarbon (PAH), petroleum hydrocarbon, greasers, solvents and asbestos relating to the former locomotive works and PCBs relating to the current electricity sub station. Considering the potential for direct contact during development works and within proposed landscaping areas, these potential sources of soil and groundwater contamination represent a moderate risk to construction workers and commercial end users. An intrusive ground investigation to identify and assess for the presence of these contaminants is required to facilitate further risk assessment and determine appropriate remediation and / or mitigation measures.
Controlled Waters	Historical and current commercial land uses on site, including a locomotive yard, as well as Made Ground, represent potential localised sources of mobile hydrocarbon contamination. Hardstanding across the site and underlying superficial Clay deposits reduce the potential for infiltration and migration of mobile contaminants, if present. However, considering the underlying Principal Aquifer, a moderate to high risk to controlled waters is identified. Furthermore, the closest ground water abstraction point is located 397m south west of the site and is used for process water. There are no abstractions of groundwater for use as drinking water within 1km of the site. Intrusive investigation with chemical analysis of soil and groundwater samples is recommended to assess the presence of mobile contaminants and facilitate further risk assessment.
Ground Gas	Made Ground associated with historical development may be a source of carbon dioxide and methane. Carbon dioxide and methane have associated asphyxiation and explosive risks, respectively; if present, the risks can be appropriately mitigated through the careful design of building structures.



7.3. GEOTECHNICAL ISSUES

Geological	The site is not underlain by potential coal workings or other historical processes which may pose a subsidence risk to the proposed development.
Civil and Structural	Given the developed nature of the site Made Ground and obstructions are anticipated. Relict foundations will require grubbing out prior to the construction of the proposed development.
Abnormal Foundations	Given the extent of historical development on the site it is anticipated that deep Made Ground will be present below the site. Therefore, abnormal foundations are likely to be required.

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)		

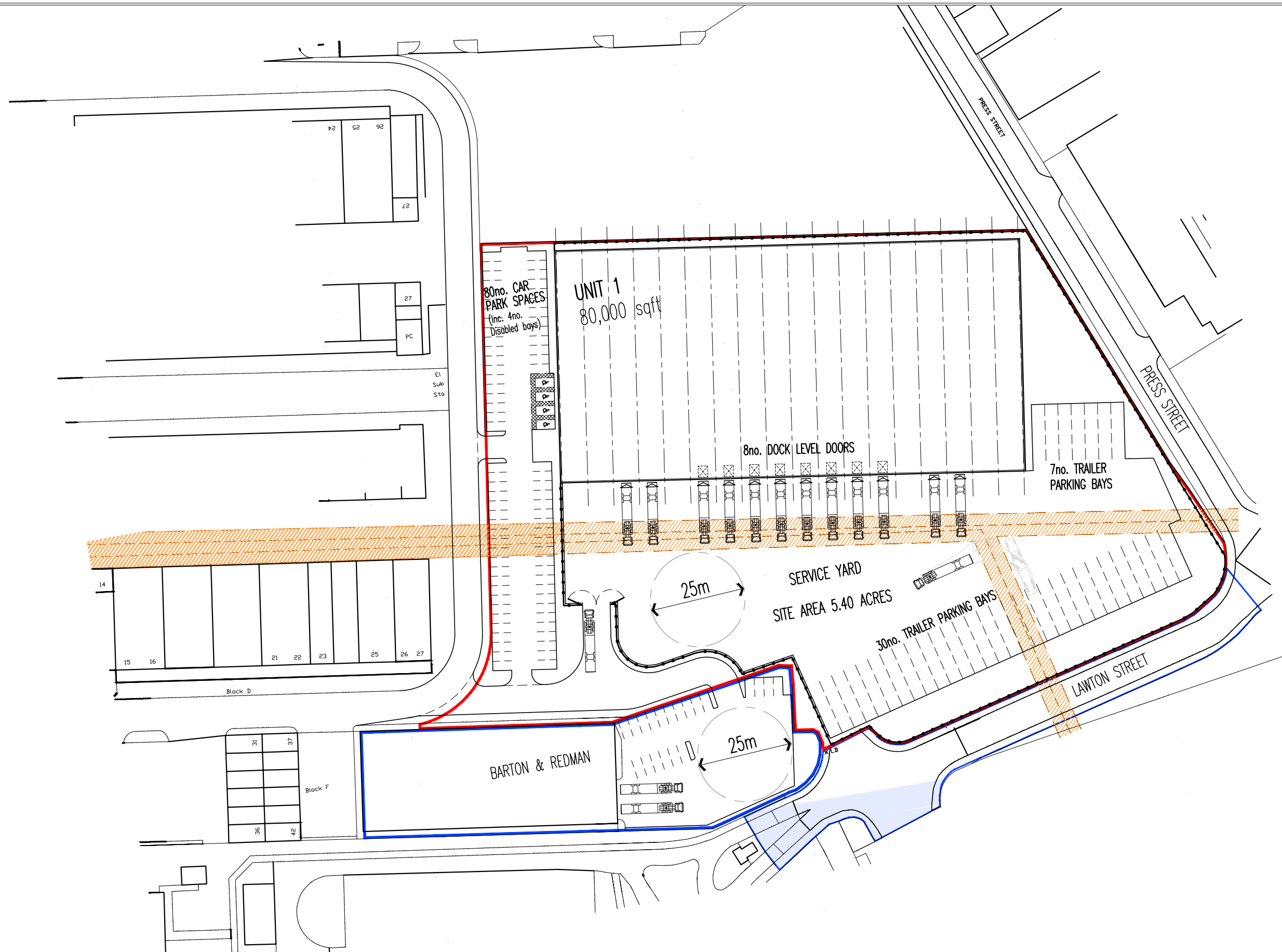


APPENDIX III

DRAWINGS

July 2020





Notes:				
P1	REVA	18.06.2020	LM	SE
Phase	Issue	Date	Drawn	Checked

Client:	
Russells Construction	
Job Title:	
Barton & Redman, Manchester	

Job No:	Date:
12-757	18.06.2020
Drawing No:	Scale:
002	NTS @ A3
Drawing Title:	
Proposed Development 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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Historical Features Storage Units Former Works Buildings Former Traveling Crane Substation Former Railway Tracks



Site Features Concrete Car Park Main Access Road Storage Units Storage Gatehouse Concrete Wall	Notes:					Client: Russells Construction	Job No: 12-757	Date: 25.06.2020	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: 004	Scale: NTS @ A3				
	P1 P1 REVB REVA 25.06.2020 17.06.2020 LM LM SE SE					Job Title: Barton & Redman, Manchester	Drawing Title: Site 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.	

APPENDIX IV

PHOTOGRAPHS

Smithfield Market

Phase I Geoenvironmental Site Assessment

July 2020

PLATE 1 A PHOTOGRAPH WITHIN SMITHFIELD MARKET



Smithfield Market

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July 2020

PLATE 2

A VIEW OF ACCESS AREAS FOR SMITHFIELD MARKET



Smithfield Market

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PLATE 3

A PHOTOGRAPH FROM WITHIN SMITHFIELD MARKET



Smithfield Market

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PLATE 4 LOOKING EAST ACROSS THE SITE



PLATE 5 LOOKING WEST ACROSS THE SITE

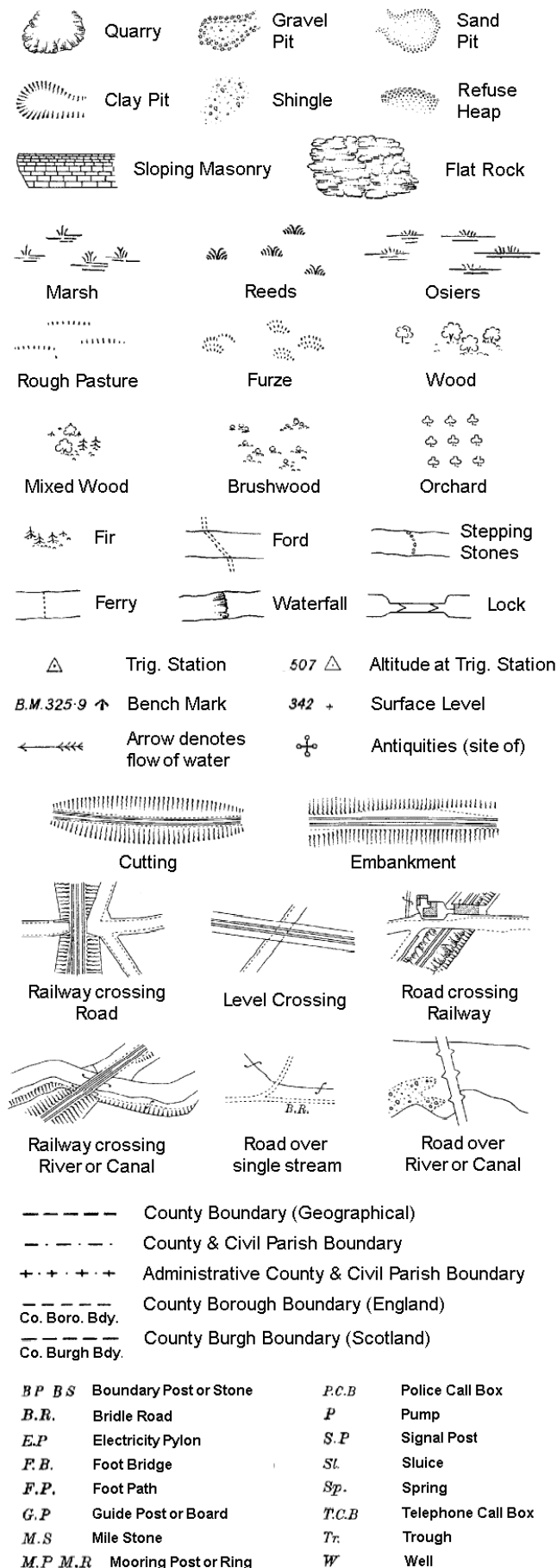


APPENDIX IV

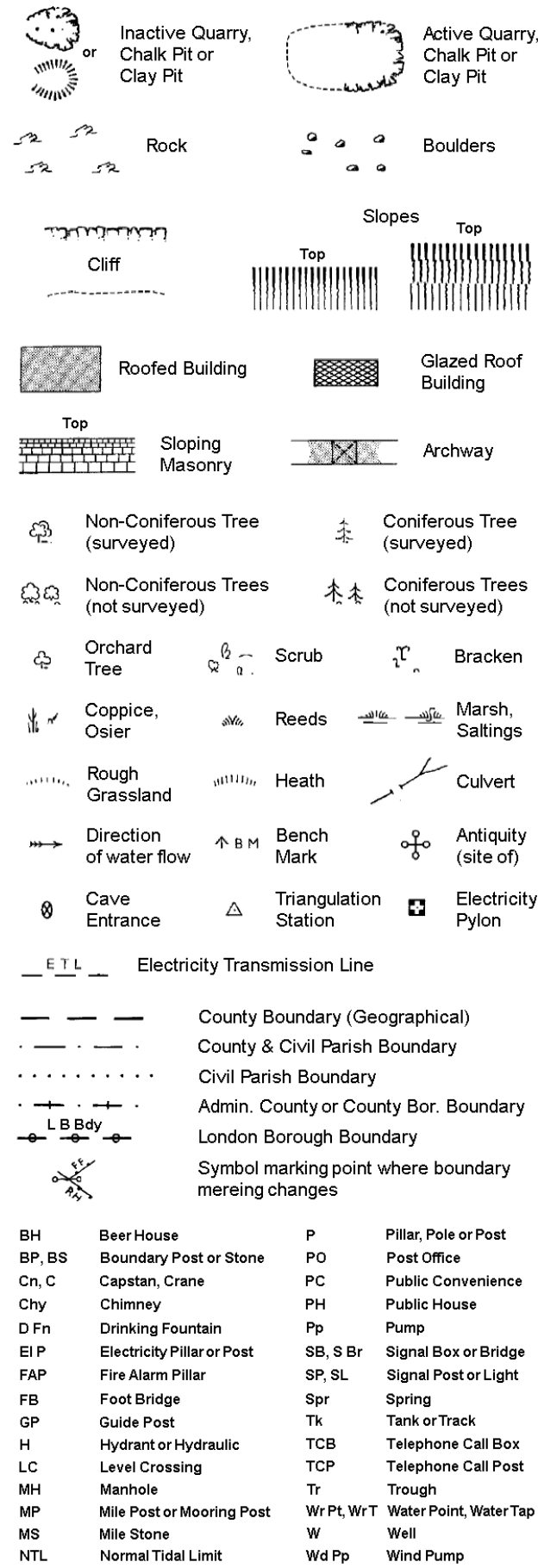
HISTORICAL MAPS

Historical Mapping Legends

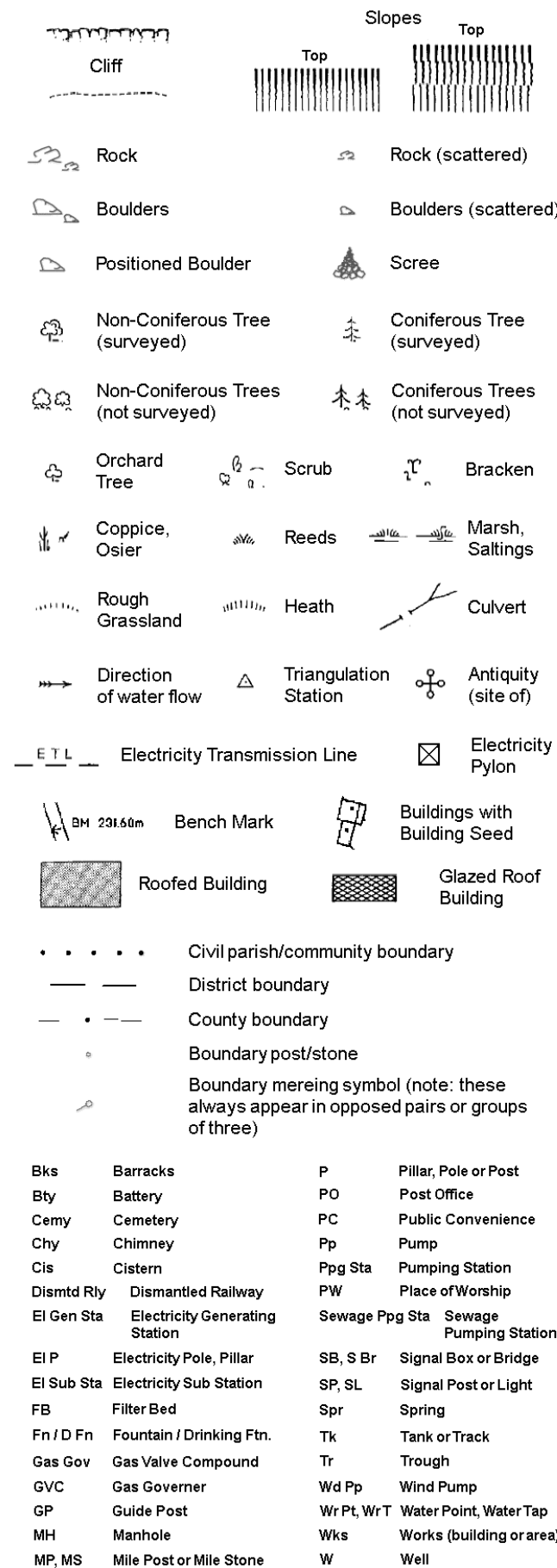
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



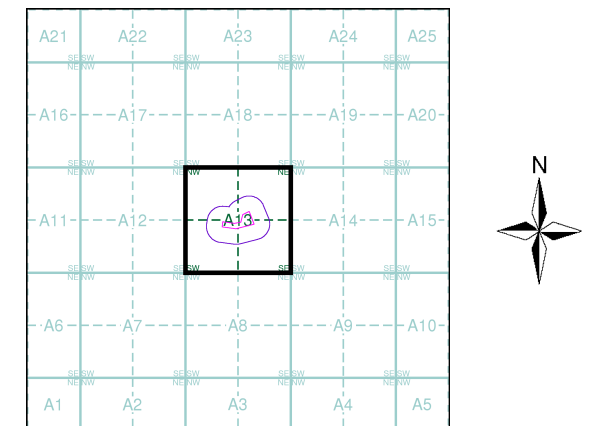
Large-Scale National Grid Data 1:2,500 and 1:1,250



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1893	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1933	4
Ordnance Survey Plan	1:1,250	1950 - 1951	5
Ordnance Survey Plan	1:2,500	1951 - 1952	6
Additional SIMs	1:1,250	1977 - 1980	7
Ordnance Survey Plan	1:1,250	1978 - 1987	8
Additional SIMs	1:1,250	1985 - 1991	9
Additional SIMs	1:1,250	1991	10
Large-Scale National Grid Data	1:1,250	1992	11
Additional SIMs	1:1,250	1992	12
Large-Scale National Grid Data	1:1,250	1994 - 1995	13
Large-Scale National Grid Data	1:1,250	1996	14

Historical Map - Segment A13



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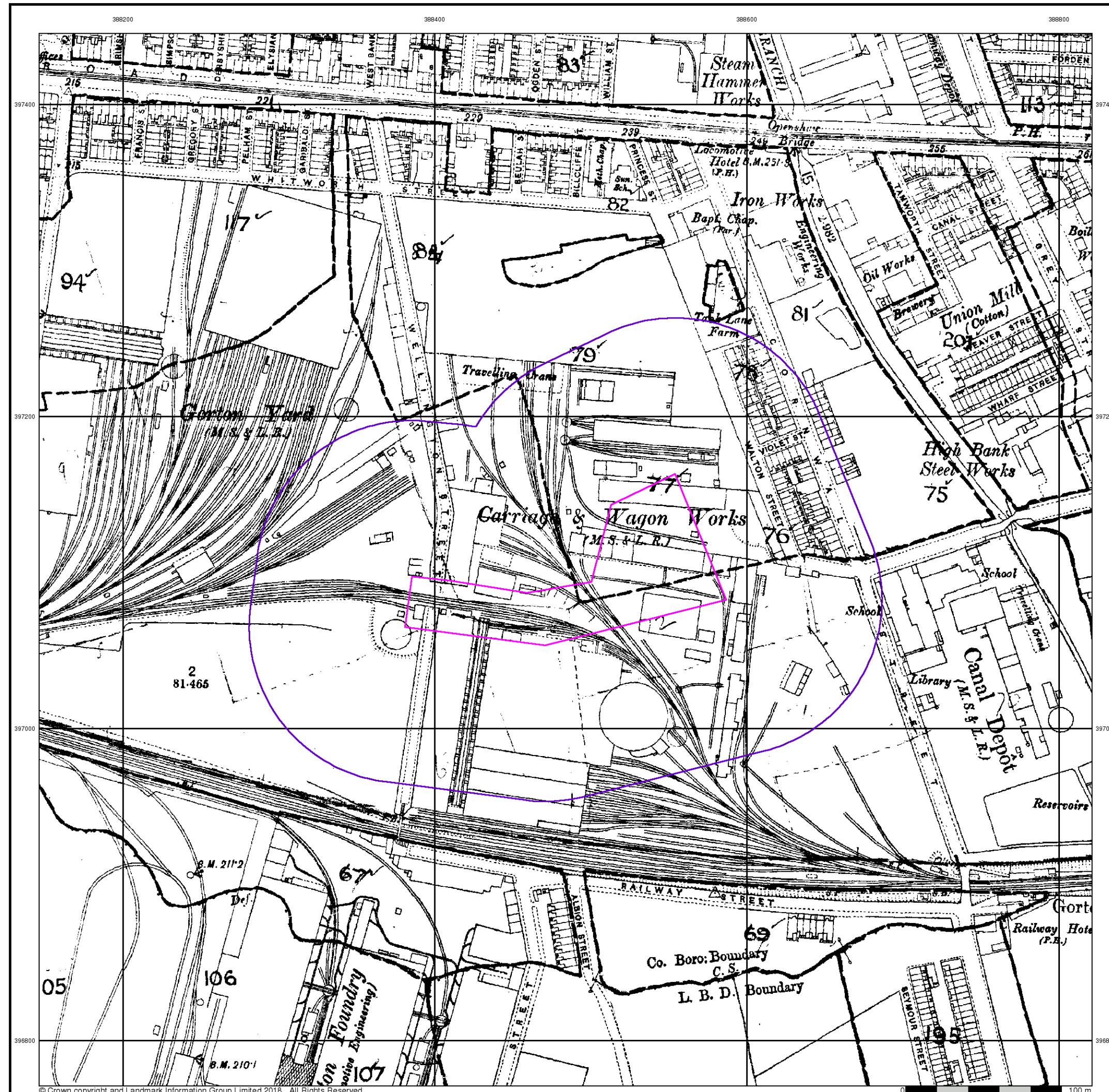
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Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details

J & B Wilde, Unit J5-J6, New Smithfield Market, Whitworth Street East, MANCHESTER, M11 2WJ



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



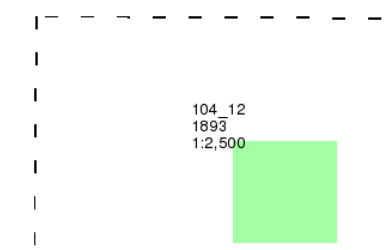
Lancashire And Furness

Published 1893

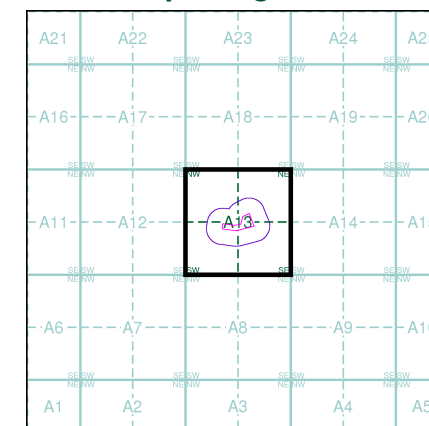
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

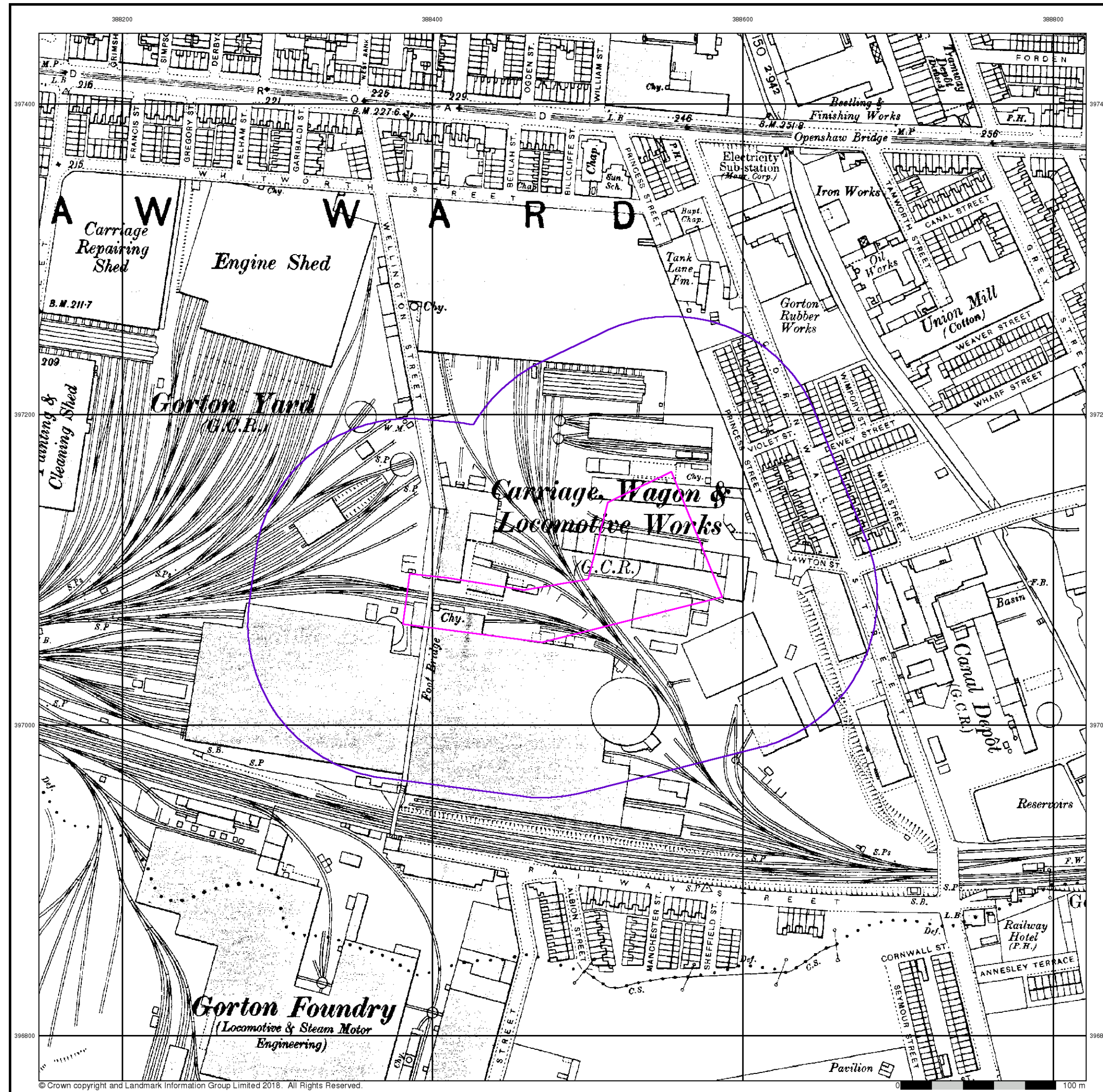
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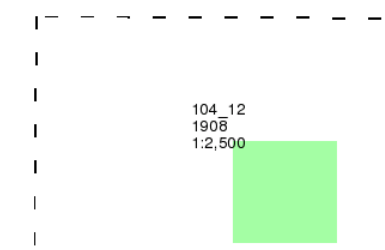
Lancashire And Furness

Published 1908

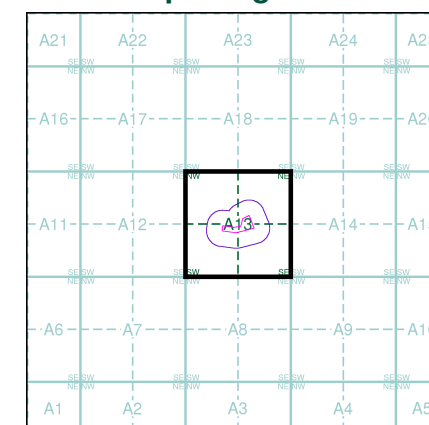
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

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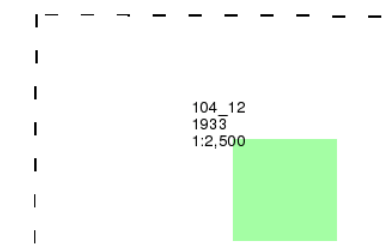
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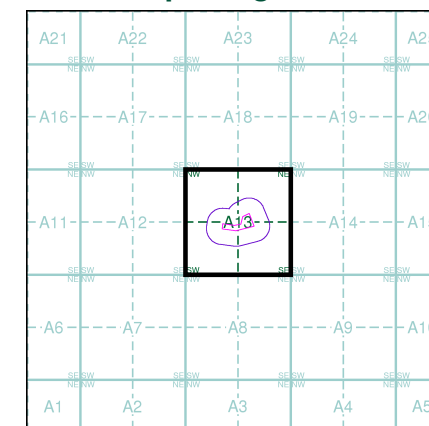
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Map Name(s) and Date(s)



Historical Map - Segment A13



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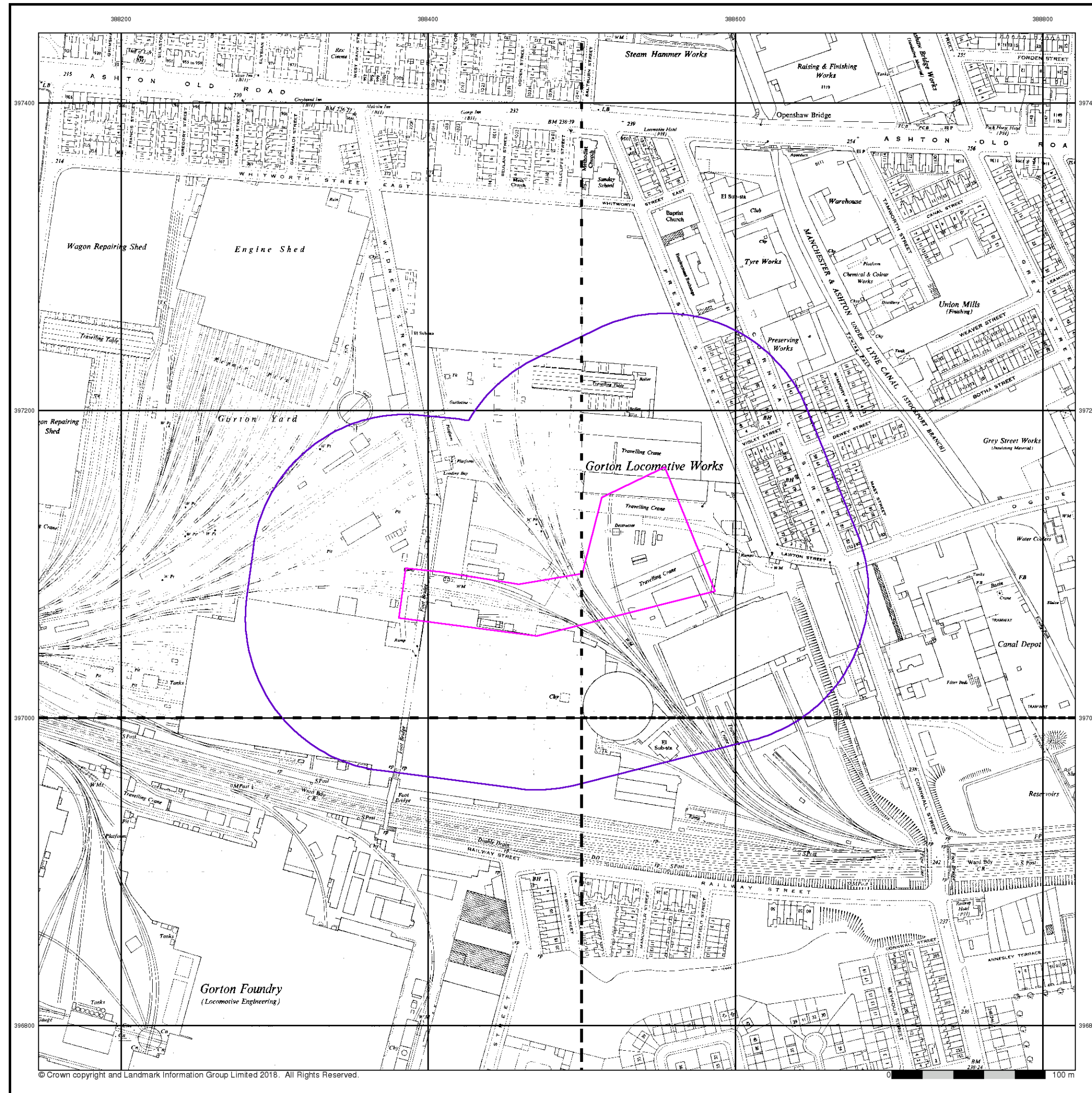
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Ordnance Survey Plan

Published 1950 - 1951

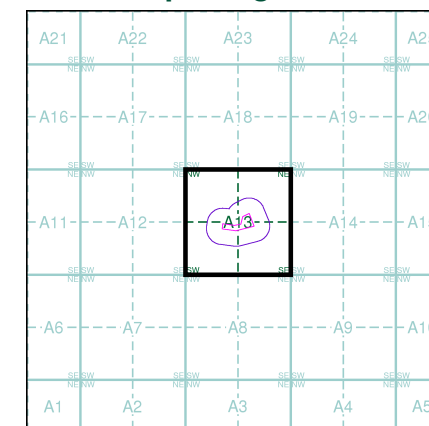
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Map Name(s) and Date(s)

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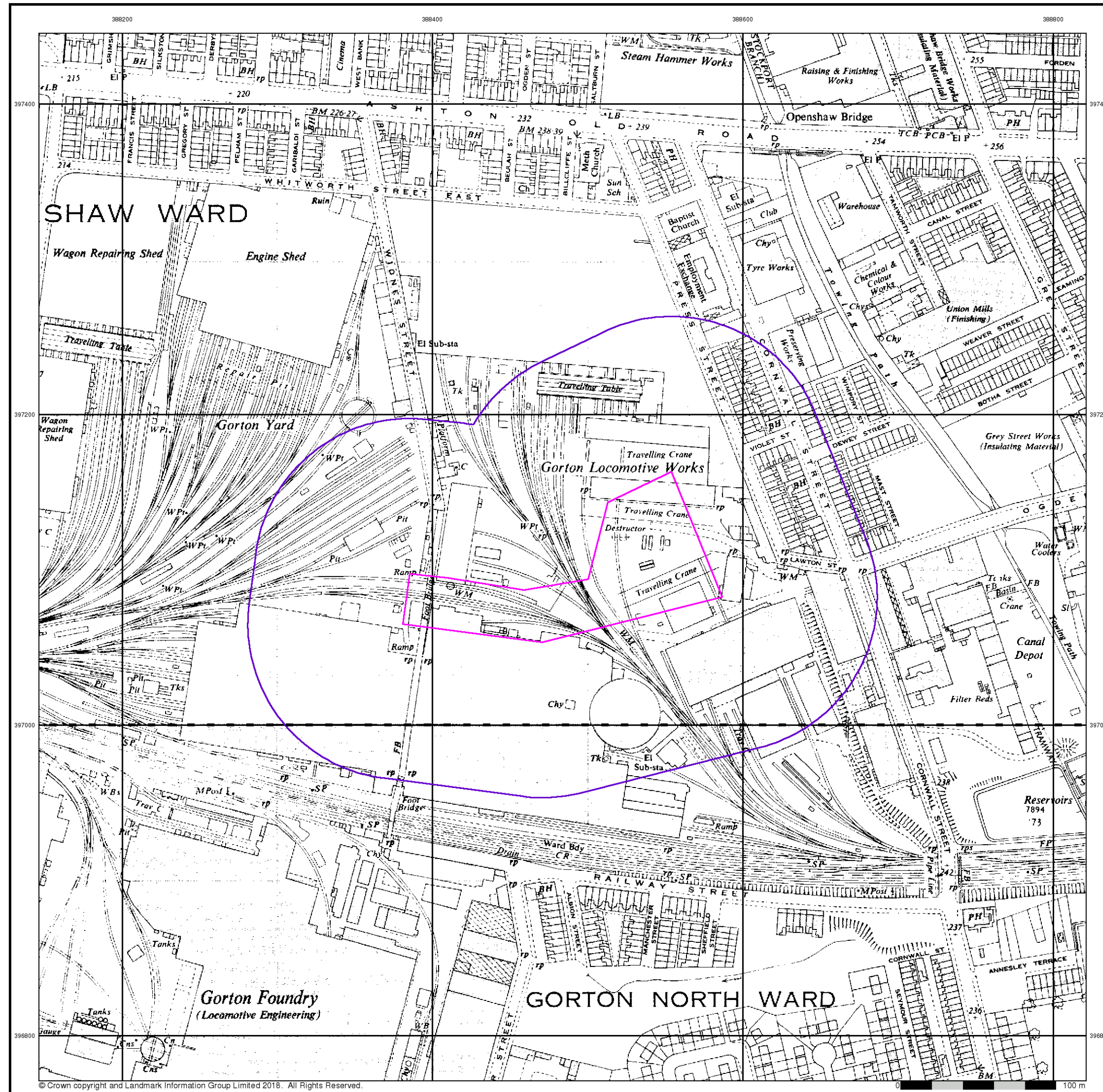
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J & B Wilde, Unit J5-J6, New Smithfield Market, Whitworth Street East, MANCHESTER, M11 2WJ

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Ordnance Survey Plan

Published 1951 - 1952

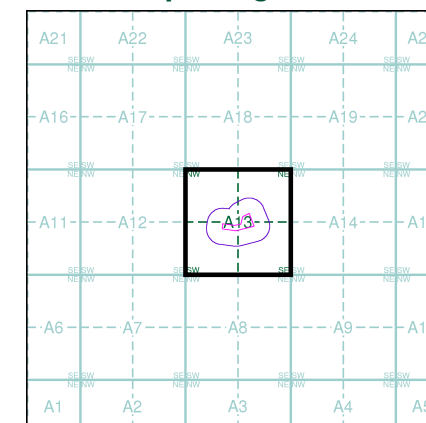
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SJ8897
1951
1:2,500
SJ8896
1952
1:2,500

Historical Map - Segment A13



Order Details

Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details

J & B Wilde, Unit J5-J6, New Smithfield Market, Whitworth Street East, MANCHESTER, M11 2WJ

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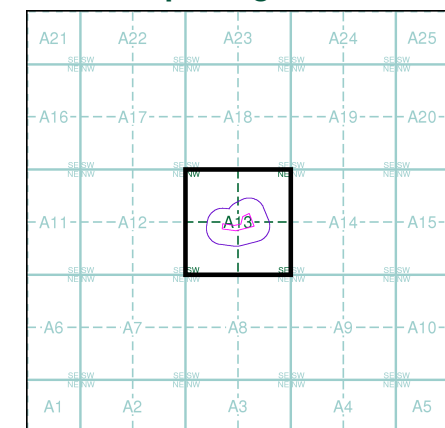
Additional SIMs
Published 1977 - 1980
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

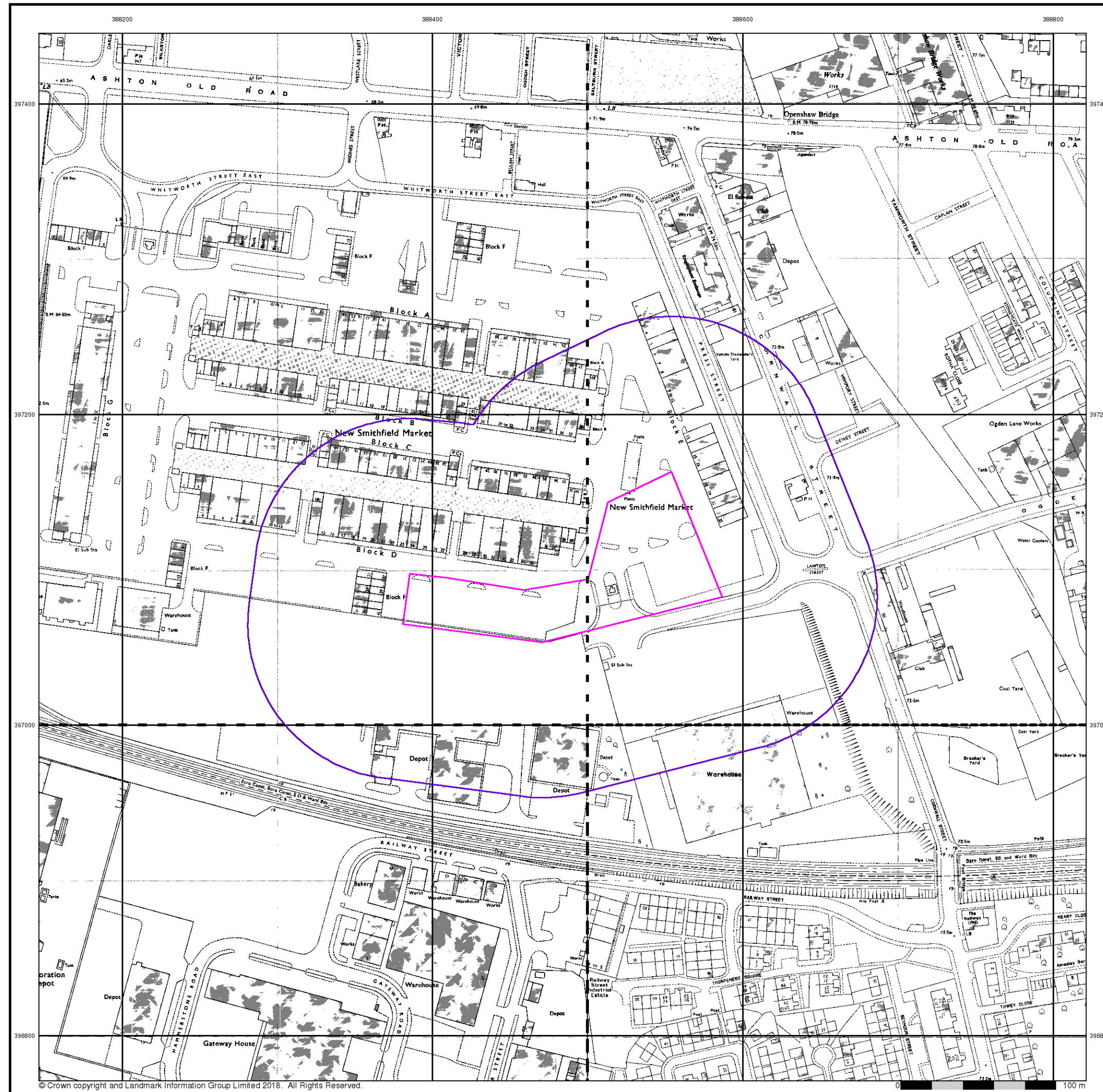
SJ8897SW	SJ8897SE
1980	1980
1:1,250	1:1,250
SJ8896NW	SJ8896NE
1977	1978
1:1,250	1:1,250

Historical Map - Segment A13



Order Details
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Site Details
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Ordnance Survey Plan

Published 1978 - 1987

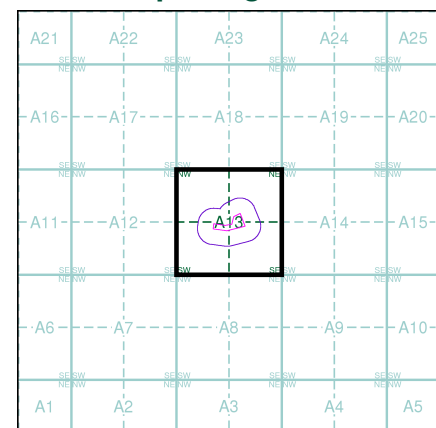
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SJ8897SW 1978 1:1,250	SJ8897SE 1978 1:1,250
SJ8896NW 1980 1:1,250	SJ8896NE 1987 1:1,250

Historical Map - Segment A13



Order Details

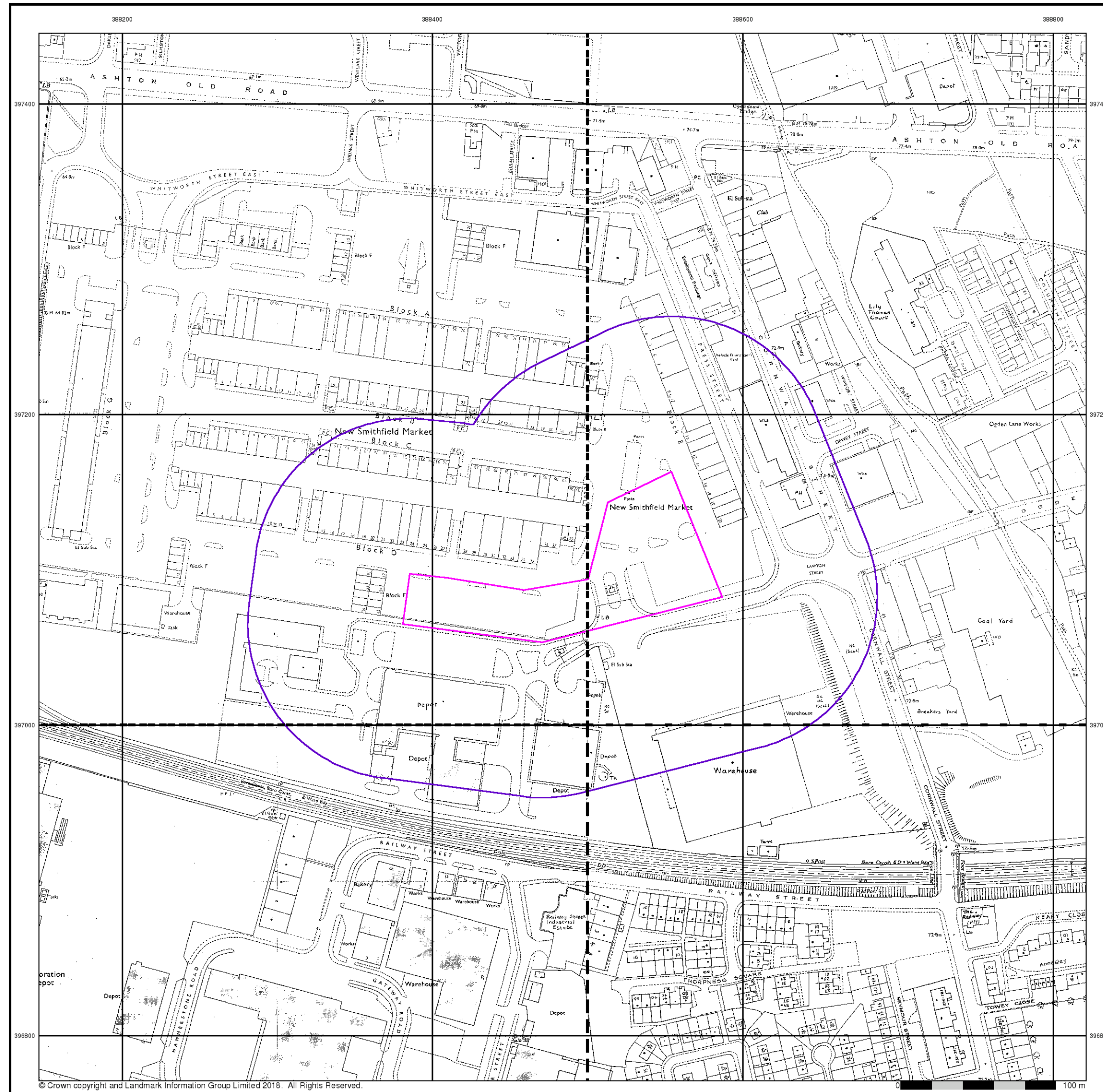
Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
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Additional SIMs

Published 1985 - 1991

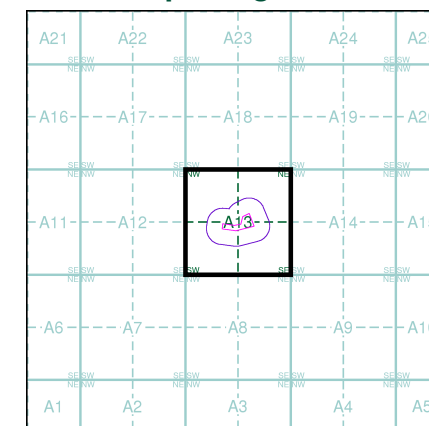
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SJ8897SW	SJ8897SE
1991	1991
1:1,250	1:1,250
SJ8896NW	SJ8896NE
1991	1985
1:1,250	1:1,250

Historical Map - Segment A13



Order Details

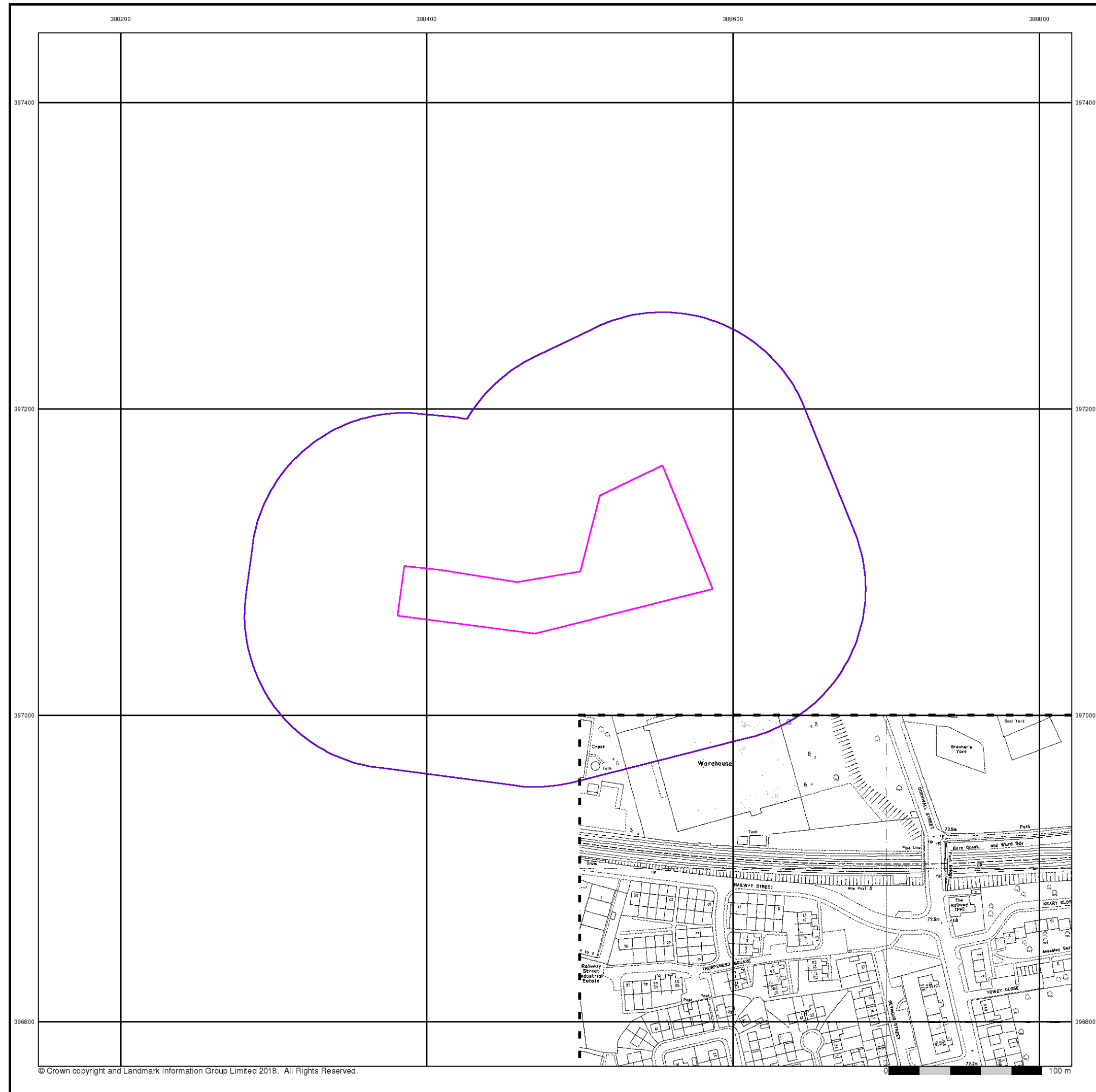
Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details

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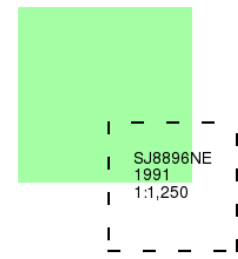
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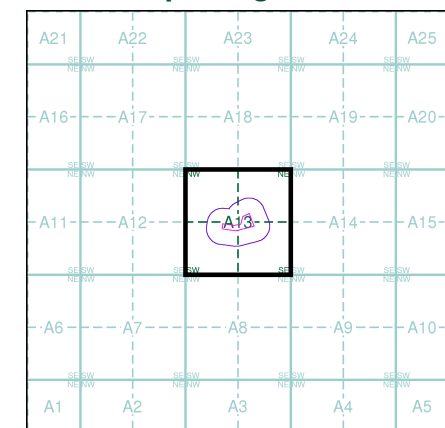
Additional SIMs
Published 1991
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

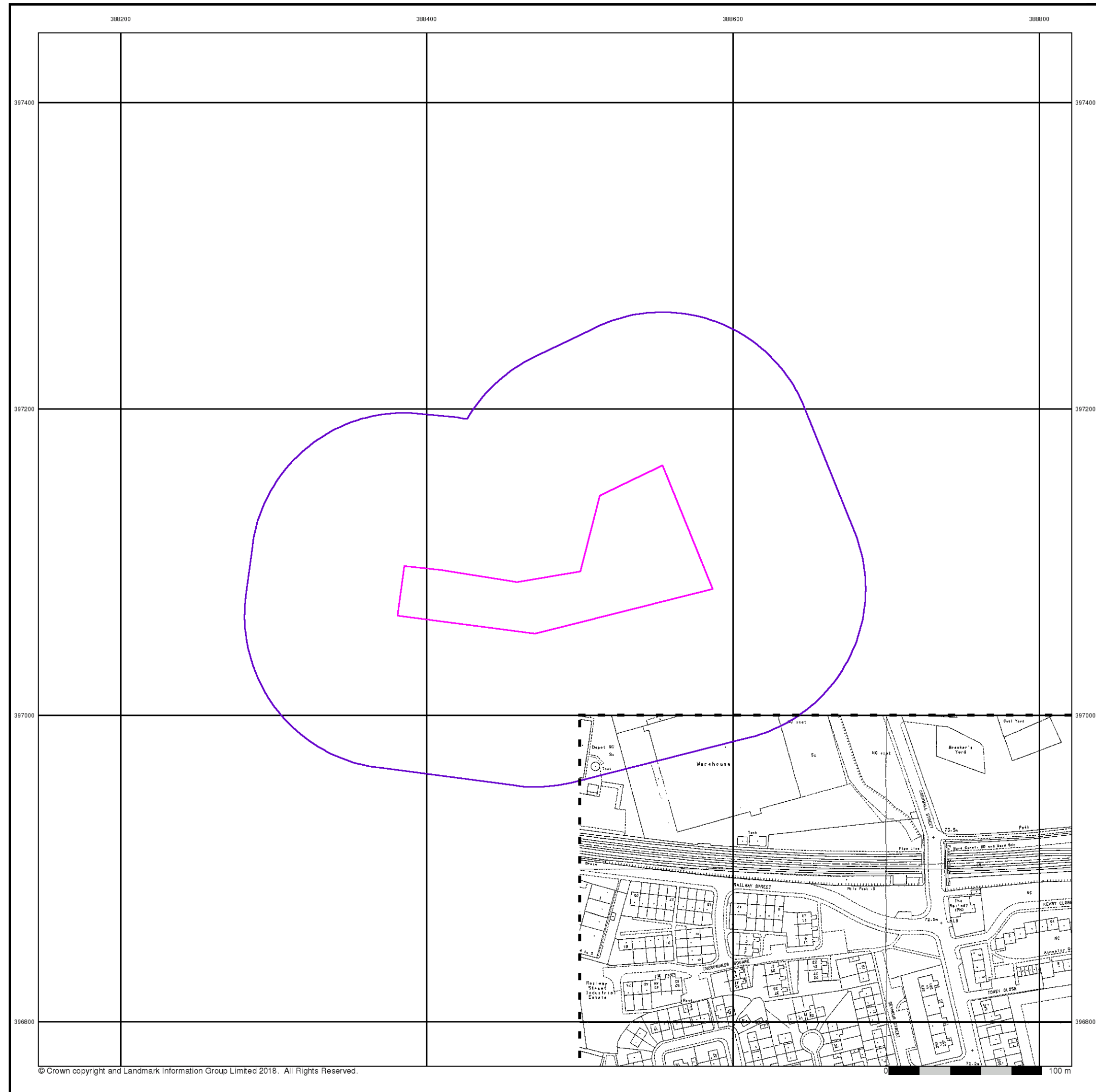


Historical Map - Segment A13



Order Details
Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
Site Area (Ha): 0.96
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Site Details
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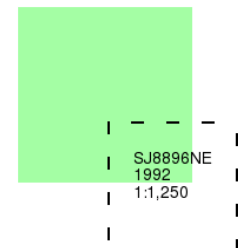
Additional SIMs

Published 1992

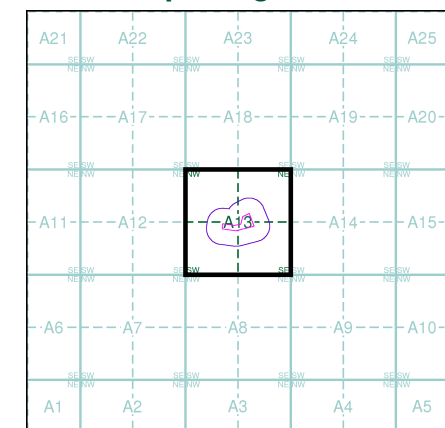
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

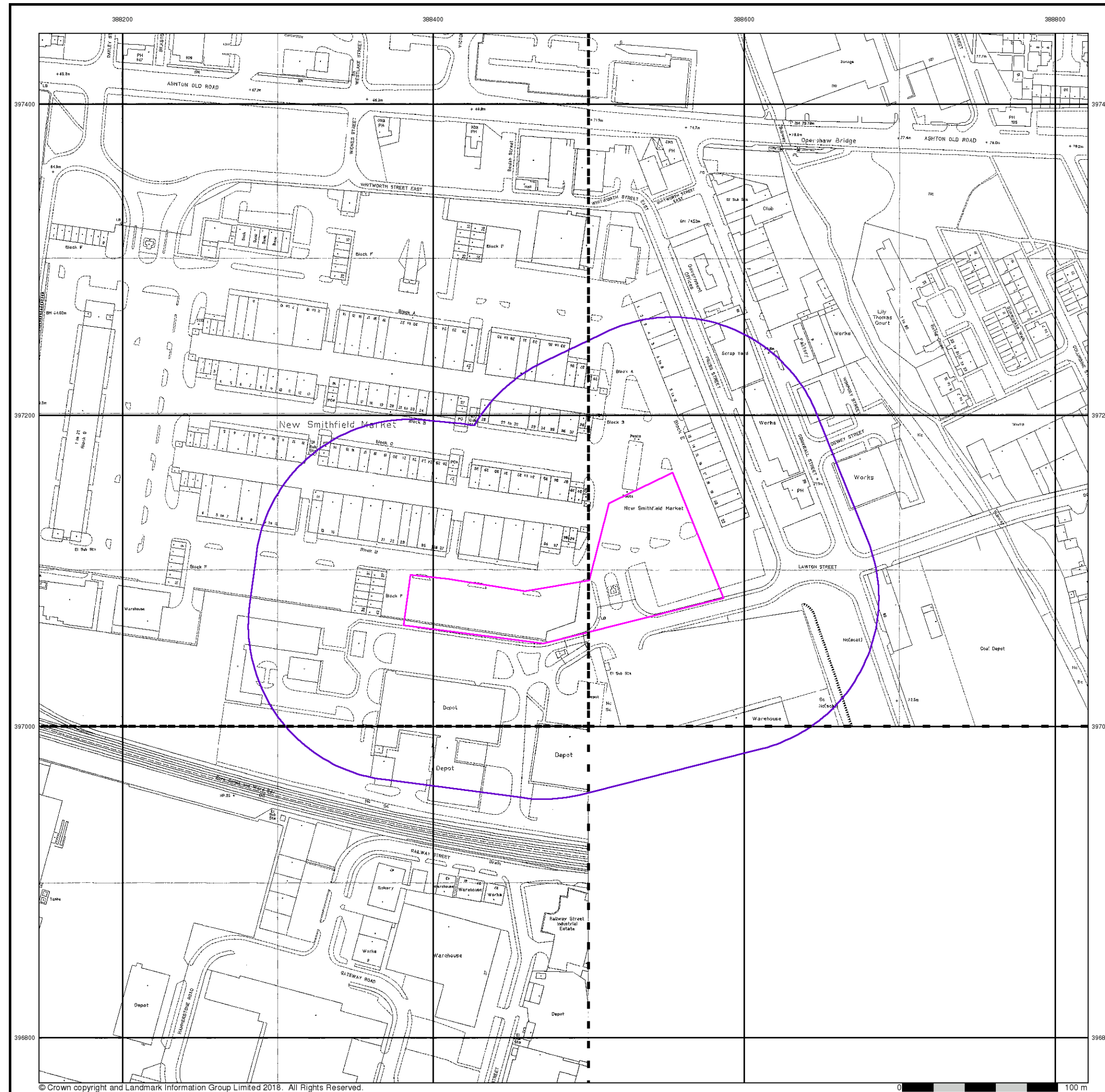
Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
Site Area (Ha): 0.96
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Large-Scale National Grid Data

Published 1994 - 1995

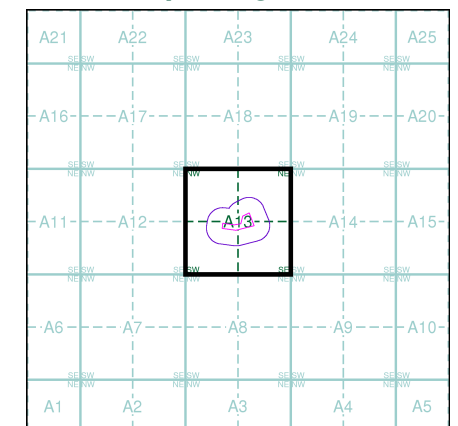
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

SJ8897SW	SJ8897SE
1994	1995
1:1,250	1:1,250
SJ8896NW	
1994	
1:1,250	

Historical Map - Segment A13



Order Details

Order Number: 176684587_1_1
Customer Ref: 12757/9527/SE
National Grid Reference: 388490, 397100
Slice: A
Site Area (Ha): 0.96
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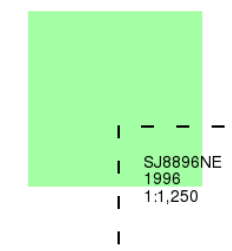
Large-Scale National Grid Data

Published 1996

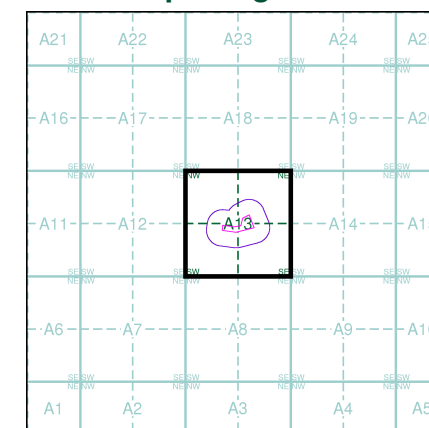
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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