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Phase 1

Environmental Assessment Report

76 Sherborne Street,

Cheetham,

M8 8HT

Date: 22nd May 2023

Version 1

ENVIROSOLUTION LTD

Suite 53

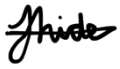
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Executive Summary

The preliminary environmental site assessment indicates that the site can be classified as moderate – high risk in terms of contamination and the risks to the identified receptors (e.g., human health and buildings) following redevelopment is considered to be moderate - high.

This classification is due to the historical on-site land use as former clay pit which may have been infilled with putrescible material. Therefore, there is the potential for contaminants to be present in the ground beneath the site such as heavy metals, polyaromatic hydrocarbons (PAHs), hydrocarbons and also ground gases such as methane and carbon dioxide.

It is recommended a Phase 2 intrusive ground investigation is undertaken prior to site redevelopment to obtain additional information on the ground conditions and the contamination status. The investigation should be carried out by qualified and competent persons. The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the Phase 2 intrusive works.

It is also recommended that basic gas protection measures are included within the design of the building in the form of a suitably install gas protection membrane.

Disclaimer

This report has been prepared by EnviroSolution Ltd who has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant experienced in preparing reports of a similar scope.

However, to the extent that the report is based on or relies upon information contained in records, reports or other materials provided to EnviroSolution Ltd, which have not been independently produced or verified, EnviroSolution Ltd, gives no warranty, representation or assurance as to the accuracy or completeness of such information.

The scope of this report is restricted to potential ground contamination and its environmental impact; it does not cover above-ground hazards (e.g., asbestos in buildings), ecological sensitivities (e.g., bats), biological or horticultural hazards (e.g., Japanese Knotweed) or structural hazards (e.g., building stability) unless specifically referred to in the text of this report.

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1 Introduction

1.1 Background

EnviroSolution Ltd was commissioned to undertake a Phase 1 Environmental Site Assessment at a site located at 76 Sherborne Street, Cheetham, M8 8HT. This report was commissioned to provide information on the potential contamination status of the site.

1.2 Objectives

The objective of the preliminary environmental site assessment was:

1. To provide a summary of the environmental setting and historical land use of the site and immediate surrounding area.
2. To obtain information on the ground conditions present beneath the site.
3. To develop a conceptual site model and complete a generic quantitative risk assessment to identify any environmental risks and liabilities associated with ground conditions at the site.

1.3 Scope of Work

To achieve the objectives, the following scope of work was completed:

1. A desk-based study of the site comprising a review of available environmental information for the site such as geological and hydrogeological data and historical land use information.
2. A site walkover.
3. Assessment of potential hazards and constraints during construction and longer term.

This work has been devised to generally comply with the relevant principles and requirements of the following legalisation and guidance:

- Part IIA of the Environmental Protection Act, 1990 and Section 57 of the Environmental Act 1995;
- Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, April 2012);
- National Planning Policy Framework (Ministry of Housing, Communities and Local Government, July 2021);
- BS10175: 2011 +A2:2017 “Investigation of Potentially Contaminated Sites- Code of Practice”; and

- Environment Agency (2020) Land Contamination Risk Management Report LCRM "How to assess and manage the risks from land contamination".

1.4 Information Sources

Historical Ordnance Survey maps have been obtained from historical records, ranging from 1848 to 2023. These maps provide high quality information on historical site use.

The British Geological Survey Geoindex database has been used to provide information on geo-environmental aspects of the site and the immediate surrounding area such as geological, hydrogeological and hydrological data.

The Environment Agency website (www.gov.uk/government/organisations/environment-agency) and Magic website (www.magic.gov.uk) was also used to obtain environmental information.

Industry Profiles produced by the Department of the Environment were utilised to obtain information on processes, materials and wastes associated with potential contaminative land uses near the site.

Readily available information sources have been used to produce this desk-based study. Additional information may be requested by the Local Planning Authority (e.g., local authority environmental information request).

2 The Site

2.1 Site Location

The site is located at the 76 Sherborne Street, Cheetham, M8 8HT. The British National Grid Reference for the approximate site centre is GR: 384031, 400279.

The site location is shown on **Figure 1** in **Appendix A**.

2.2 Site Description

The site is rectangular in shape and covers an approximate area of 500m square metres. The site is level with an approximate mean elevation of 55m aOD.

The site is occupied by a vacant commercial building (with sliding doors), a front access yard and the ground surface is 100% covered in concrete hardstanding. There is a drain cover in the northeast corner. Up until recently, the site was occupied by a clothing wholesaler.

Sherborne Street forms the western site boundary. Commercial developments are present at the north, south and eastern boundaries.

Land use in the surrounding area is predominantly commercial.

No petrol filling stations have been identified within a 250m radius of the site.

The existing site plan is shown on **Figure 2** which is included in **Appendix A**.

2.3 Development Proposals

The proposed development comprises the erection of the extension in together with associated elevational alterations in connection with subdivision of existing building to create 5 cash and carry units (sui generis).

The proposed development plan is shown on **Figure 3** which is included in **Appendix A.**

2.4 Site History

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area is summarised in Table 1. Copies of the historical OS maps are included in **Appendix C**. A search buffer of 250m has been used.

Table 1 - Historic Mapping Review

Date	Scale	On Site	Off Site
1848	1:10,560	The site is occupied by agricultural fields.	The surrounding site is occupied by residential development west of the site. Pond 230m southwest.
1850	1:1,056	Pond on the north of the site.	Pond 120m northwest.
1890	1:1,056	Pond appears to be infilled. The site appears to be located on an old clay pit.	Residential developments west appear to be demolished and replaced with commercial units and Cheetham park. Brick works adjacent to the south of the site. Ponds appears to be infilled. Clay Pit 200m northeast.
1892	1:2,500	Site appears to be located on an old clay pit.	Residential development southwest and east of the site. Pond 50m northeast and 150m northeast. Clay Pitt 100m northeast and 70m west. Old clay pits 150m southeast, 160m east, 220m southwest and 200m west. Kilns 100m southeast. Tramway adjacent to the southern border of the site. Gymnasium 100m northwest and 120m northwest.
1894	1:10,560	No significant changes.	No significant changes.

Date	Scale	On Site	Off Site
1908	1:2,500	No significant changes.	Further residential development west of the site. Ponds 50m northeast appears to be infilled. Cabinet Works 250m southwest. Jew's Hospital 150m northeast. Tramway 50m east.
1909	1:10,560	No significant changes.	No significant changes.
1923	1:10,560	No significant changes.	Clay Pit 100m southwest.
1931-32	1:10,560	No significant changes.	No significant changes.
1933	1:2,500	No significant changes.	Residential development southwest appears to be demolished. Preserve works 190m west. Tank 100m southeast. Chimney 80m southeast.
1938	1:10,560	No significant changes.	Commercial developments south and west of the site.

1949-52	1:1,250	No significant changes.	All clay pits west of the site appear to be removed and developed on. The north western electricity board 50m southwest. Mortuary 120m northeast. Pond 25m southeast and 180m east. Garage 150m northwest. Quetrans Works (Waterproof Garments) 190m northwest. Clothing works 170m northwest and 250m northwest. Electric sub-station 190m northwest. Printing works 200m northwest. Britannia Preserve Works 190m west. Weighing Machine Repair works 200m southwest. Garment Waterproofing Works 200m southwest. Cabinet works relabelled as Waterloo Cabinet Works. Rainproof Garment works 200m southwest. Works (clothing) 210m southwest. Chimney 230m southwest, 240m southwest, 120m south and 120m southeast. Works (meat canning) 250m southwest. Workshop 130m south.

Date	Scale	On Site	Off Site
			Aquatite Mills (Garment rainproofing) 160m south. Tank 120m southeast. Tramway 140m southeast and 100m southeast. Pump house 200m southeast. Refuse heap 200m east and 170m northeast.
1951-53	1:2,500	No significant changes.	Shaft 180m southeast. Saw Mills 250m southeast.
1952-63	1:1.250	No significant changes.	Clay pits appear removed and developed on. Warehouse 50m northeast. Depot 70m north and 180m northeast. Brick works relabelled as works. Chimney 150m north. Ponds appear to be infilled.
1956	1:10,000	No significant changes.	Further commercial development west of the site. Recreation Ground 200m southwest.

1958-75	1:1,250	The site is development with a residential/commercial development.	The surrounding site is developed with further warehouses. Clay pits and old clay pits appear to be demolished and developed with several of warehouses. Tramways appear to be removed. Warehouses 70m north, 60m northeast, 50m northeast, 50m east, 70m southeast, 70m south, 200m northeast, 190m northeast, 150m east, 160m southeast, 100m southeast and 200m southwest. Motor repair works 220m southwest. Britain works 30m southwest. Manchester Victoria Memorial Jewish Hospital 90m north. Garage 250m northeast. Printing works 140m east. Car Breaker's Yard 100m northeast. Travelling Crane 230m east. Tank 250m southeast. Clothing factory 130m southeast, 150m southwest and 250m west. Scrap Metal Yard 210m southwest. Factory 240m southwest. Printing works 170m west. Quetrans Works (Waterproof Garments) 190m northwest is relabelled as Clothing works. Depot 160m northwest. Works 210m northwest.

Date	Scale	On Site	Off Site
			Britannia Preserve Works 190m west appears removed.
1966-68	1:10,000	No significant changes.	Depot 200m northeast. Works 200m southwest and northwest.
1972-79	1:10,000	No significant changes.	Works 200m northwest is relabelled as a factory. Warehouse 100m northeast. Works replaced by commercial/residential developments.
1978-89	1:1,250	No significant change.	No significant change.
1980-86	1:10,000	No significant changes.	No significant changes.
1992	1:1,250	No significant changes.	All commercial/industrial development relabelled as Works.
1993-94	1:1.250	No significant changes.	No significant changes.
1999	1:10,000	No significant changes.	Commercial/residential development surrounding the whole site. Sherborne Trading Estate is 150m northeast.
2023	1:10,000	No significant changes.	River Irk 1000m east.

3 Environmental Setting

3.1 Geology

Geological maps of the area indicate that the site is directly underlain by superficial Till deposits, deposited during the Pleistocene Epoch. Till is unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier.

The underlying bedrock is the Chester Formation – Sandstone, deposited during the Triassic Period. The formation shows a progressive change in lithology northwards, from a coarse-grained, typically well-cemented proximal facies to a fine-grained, less well-cemented distal facies.

The nearest geological fault is located approximately 360m west of the site.

A borehole (Ref: SD80SW225) located 270m northeast of the site was obtained from BGS online records. The borehole penetrated 7.6m bgl (25 feet) and shows 0.8m of Made Ground, 1.1m of light brown sandy clay and 6.5m of stiff red/brown boulder clay.

A copy of the geological maps is included in **Appendix D.** A copy of the BGS borehole records is included in **Appendix E**.

3.2 Radon

The site lies within the lowest band of radon potential where it is estimated that less than 1% of the properties are above the action level (low probability). Radon protective measures are not deemed necessary for the development.

3.3 Coal Mining Activity

The site does fall within a Coal Mining Reporting Area described as having minable coal deposits and does not lie within a 'Development High Risk Area' for coal mining, as defined by the Coal Authority. As such, it is considered that there are no coal mining related hazards which could affect the site.

A copy of the coal authority map is included in **Appendix F.**

3.4 Hydrogeology

The superficial Till Deposit is designated as Secondary (undifferentiated) Aquifer, defined as; has been assigned in cases where it has not been possible to attribute either category A or B to a rock type due to the variable characteristics of the rock type.

The underlying Chester Formation – Sandstone bedrock is designated as a Principal Aquifer, defined as; layers of rock or drift deposits that have high intergranular and/or fracture

permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

There are 2 no. records of groundwater abstraction licences located within a 1km radius of the site and summarised in Table 2.

Table 2 – Groundwater Abstraction Licences

Site Name	Primary Description	Use Description	Version Start Dates	Distance
JOSEPH HOLT LTD	Industrial, Commercial And Public Services	Process Water	1966	480m SE
JOSEPH HOLT LTD	Industrial, Commercial And Public Services	General Cooling (Existing Licences Only) (Low Loss)	1966	480m SE

The site is not located within a Source Protection Zone within a 1km radius of the site.

A copy of the hydrogeological maps is included in **Appendix F**.

3.5 Hydrology

There is a single major surface water feature located within a 1km radius of the site. The River Irk 1000m east of the site.

There are no minor surface water features located within a 250m radius of the site.

3.6 Flood Risk

The site lies within a Flood Zone 1 (low probability), land assessed as having less than a 1 in 1,000 annual probability of river flooding (0.01%) in any year (low risk). The completion of a detailed Flood Risk Assessment is not deemed necessary for this site.

A copy of the flood risk map is included in **Appendix H**.

3.7 Waste Management Facilities

There are 4 no. records of historic landfill located within a 1km radius of the site and is summarised in Table 3.

Table 3 – Historic Landfill

Landfill Site	Operation Dates	Waste Type	Distance from Site
Elizabeth Street	Unknown	Unknown	95m SW
Land at Fairy Lane	Unknown	Commercial/Household	345m NW
Queens Road Tip - Land to South of Queens Road	1955-70	Inert/Industrial/Commercial/ Household/Special/Liqsludge	505m SE
Overbridge Road	Unknown	Unknown	745m SW

A copy of the historic landfill map is included in **Appendix I**.

There are no currently authorised landfill sites located within a 1km radius of the site.

There are 2 no. records of sites operating under an environmental permit for waste operations located within a 1km radius of the site.

Table 4 - Environmental permit for waste operations

Licence Holder Name	Site Name	Site Type	Date	Distance
MOTOR BODY SERVICES (SALFORD) LIMITED	M B S & Partfirst	A19: Metal Recycling Site (Vehicle Dismantler)	2004	1000m SW
John Ryan	J Ryan	A11: Household, Commercial & Industrial Waste T Stn	2002	1000m SE

3.8 Environmental Permits, Incidents and Registers

There are 10 no. records of sites located within a 1km radius of the development site operating under an environmental permit for discharges to water and groundwater and are summarised in Table 5.

Table 5 - Environmental permit for discharges to water and groundwater

Permit Holder Name	Site Name	Site Type	Start Date	Distance
UNITED UTILITIES WATER LIMITED	SHERBOURNE ST	Storm Tank/CSO on Sewerage Network (water company)	1995	700m NW
UNITED UTILITIES WATER LIMITED	BURY NEW ROAD/WATERLOO ROAD CSO	Storm Tank/CSO on Sewerage Network (water company)	2019	800m SW
UNITED UTILITIES WATER LIMITED	DANTZIC ST WARFORD ST CSO 288A7	Storm Tank/CSO on Sewerage Network (water company)	2018	900m SE
UNITED UTILITIES WATER LIMITED	BROMLEY STREET CSO 281MT	Storm Tank/CSO on Sewerage Network (water company)	2018	900m SE
UNITED UTILITIES WATER LIMITED	ASPIN LANE CSO 281CJ	Storm Tank/CSO on Sewerage Network (water company)	2018	1000m SE

Permit Holder Name	Site Name	Site Type	Start Date	Distance
UNITED UTILITIES WATER LIMITED	BURTON ST NR DALTON ST CSO 281HX	Storm Tank/CSO on Sewerage Network (water company)	2018	1000m SE
UNITED UTILITIES WATER LIMITED	VERDON STREET/SCOTLAND CSO	Storm Tank/CSO on Sewerage Network (water company)	2019	1000m SE
UNITED UTILITIES WATER LIMITED	SHERBORNE STREET CSO	Storm Tank/CSO on Sewerage Network (water company)	2018	1000m SE
UNITED UTILITIES WATER LIMITED	FAIRY LANE CSO 281T3	Storm Tank/CSO on Sewerage Network (water company)	2018	1000m W
UNITED UTILITIES WATER LIMITED	BURY NEW RD LOCKETT ST CSO	Storm Tank/CSO on Sewerage Network (water company)	2018	1000m SW

There are 18 no. records of pollution incidents recorded by the Environment Agency having occurred within a 1km radius of the site and are summarised in Table 6.

Table 6 - Records of pollution incidents recorded by the Environment Agency

Poll_Type	Pollutant	Distance from Site
Specific Waste Materials	Contaminated Soil	335m S
Specific Waste Materials	Commercial Waste	335m S
Inert Materials and Wastes	Construction and Demolition Materials and Wastes	335m S
Specific Waste Materials	Household Waste	335m S
Organic Chemicals/Products	Solvents	680m SE
Inert Materials and Wastes	Construction and Demolition Materials and Wastes	770m SE
Specific Waste Materials	Household Waste	770m SE
Inert Materials and Wastes	Construction and Demolition Materials and Wastes	765m SE
Specific Waste Materials	Commercial Waste	765m SE
Specific Waste Materials	Tyres	765m SE
Specific Waste Materials	Household Waste	765m SE
Atmospheric Pollutants and Effects	Dust	720m SE
Atmospheric Pollutants and Effects	Effects on Humans	720m SE
Atmospheric Pollutants and Effects	Smoke	720m SE
Specific Waste Materials	Tyres	810m SE
Specific Waste Materials	Household Waste	810m SE

Poll_Type	Pollutant	Distance from Site
Specific Waste Materials	Asbestos	810m SE
Specific Waste Materials	Commercial Waste	810m SE

There are no records of sites located within a 1km radius of the development site operating under an environmental installation permit.

3.9 Designated Environmentally Sensitive Sites

Records of designated environmentally sensitive sites located within a 1km radius of the site are summarised in Table 5 and shown on plans included in **Appendix J**.

Table 7 – Environmental Designations Summary

Designation	Distance	Details
Objective 2 Areas (England)	On site	The site is located within the Objective 2 Areas.
Community Forests (England)	On site	The site is located within the Community Forests.
Nitrate Vulnerable Zones (England)	On site	The site is located within the Nitrate Vulnerable Zones.

4 Preliminary Conceptual Site Model

4.1 Introduction

In order to assess the environmental risks present, a preliminary conceptual model has been developed for the site. This model has been developed using best practice guidelines in conjunction with the current assessment framework taking into account the development proposals. This preliminary conceptual model is based on the gathered desk-based information (e.g., historical OS data and data sourced from the EA, Geoindex and Magic databases).

The conceptual site model is a representation of the hypothesised relationships between sources, pathways and receptors which allows the identification of potential pollutant linkages and whether these linkages have the potential to comprise significant harm and/or pollution of controlled waters in relation to the site. This model comprises three elements:

Source – the key pollutant hazards associated with the site.

Receptor – the key targets at risk from the sources

Pathway – the means by which the contaminant can cause harm to the receptor.

If all three elements are present, then a potential pollutant linkage exists, and this may require further assessment.

4.2 Potential Contamination Sources

The site has been developed and occupied by a commercial development since the 1950s and up until recently, it was used as a clothing warehouse. The use of the building prior to this is unknown and therefore, the potential for contamination to be present in the ground beneath the site associated with the former land uses cannot be discounted at this stage.

A couple of historical on-site land uses have been identified that have the potential to contaminate shallow soils on site. The land uses and their associate contaminants are summarised in Table 8 below:

Table 8 – Historical On-Site Land Use Summary.

Land Use	**Potential Contaminants**
Old Clay Pits	Heavy metals, polyaromatic hydrocarbons (PAHs), asbestos, methane and carbon dioxide.
Ponds (infilled)	Ground gases (carbon dioxide and methane).

There is the potential for Made Ground to be present beneath the site, associated with the infilling of the former clay pit. There is no available information relating to this. However, if putrescible material was used to infill the pit, then there is the potential for ground gases such as methane and carbon dioxide and volatile vapours to be present in the ground beneath the site.

It is also recommended that basic gas protection measures are included within the design of the building in the form of a suitably install gas protection membrane.

The former onsite pond can be discounted as a potential source of contamination as it was infilled 1890s. Given the age of backfilling, it is unlikely that it will be generate ground gases. The location of the pond has since been developed over with the existing commercial property.

A number of off-site land uses have been identified in the surrounding area that have the potential to contaminate the shallow soils at the site. The land uses and their associated contaminants are summarised in Table 9 below:

Table 9 – Off-Site Land Use Summary

Land Use	**Potential Contaminants**
Brick Works	Heavy metals, polyaromatic hydrocarbons (PAHs), asbestos, methane and carbon dioxide.
Cabinet Works	Heavy metals, solvents.
Car Breaker's Yard	Heavy metals, polyaromatic hydrocarbons (PAHs), solvents.
Chimney	Nitrates, sulphates and chlorides.
Clay Pits/Old Clay Pits	Heavy metals, polyaromatic hydrocarbons (PAHs), asbestos, methane and carbon dioxide.
Clothing Works	Heavy metals, inorganic compounds, sizing agents, organic compounds, dyes, pesticides, anthrax spores.
Electric sub-station (1949)	Polychlorinated biphenyls (PCBs).
Engineering Works	Heavy metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), solvents.
Factory	Heavy metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), solvents.

Land Use	Potential Contaminants
Garage	Heavy metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), solvents.
Kilns	Heavy metals, polyaromatic hydrocarbons (PAHs).
Mortuary	Heavy metals, pathogens, sulphates.
Motor Repair Works	Heavy metals, inorganic compounds, acids/alkalis, asbestos, polychlorinated biphenyls (PCBs), organic solvents, halogenated compounds, mineral oils.
Ponds (infilled)	Ground gases (carbon dioxide and methane).
Preserve Works	Heavy metals, inorganic compounds, acids/alkalis, asbestos, polychlorinated biphenyls (PCBs), organic solvents, halogenated compounds, mineral oils.
Printing Works	Heavy metals, inorganic compounds, acids, asbestos, organic solvents, polychlorinated biphenyls (PCBs) (electrical transformers/capacitors).
Pollution Incidents	Pollutants (see Table 6).
Refuse Heap	Heavy metals, ground gases.
Saw Mills	Heavy metals, inorganic compounds, acids/alkalis, asbestos, organic solvents, fuels.
Scrap Metal Yard	Heavy metals, inorganic compounds, acids/alkalis, asbestos, organic compounds, polyaromatic hydrocarbons (PAHs).
Shaft	Mine gas (carbon dioxide and methane).
Tank	Hydrocarbons.
Tramways (disused)	Heavy metals, hydrocarbons, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), asbestos.
Warehouse	Heavy metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), solvents.

Land Use	Potential Contaminants
Waterproof / Rainproof Garments Works	Heavy metals, inorganic compounds, sizing agents, organic compounds, dyes, pesticides, anthrax spores, PFAS.
Weighing Machine Repair Works	Heavy metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), solvents.
Works	Heavy metals, inorganic compounds, acids/alkalis, asbestos, polychlorinated biphenyls (PCBs), organic solvents, halogenated compounds, mineral oils.
Works (Britain)	Heavy metals, inorganic compounds, acids/alkalis, asbestos, polychlorinated biphenyls (PCBs), organic solvents, halogenated compounds, mineral oils.
Works (Meat Canning)	Heavy metals, inorganic compounds, acids/alkalis, asbestos, polychlorinated biphenyls (PCBs), organic solvents, halogenated compounds, mineral oils.

The site and surrounding area are underlain by superficial Till (Diamicton) deposits. As they are low permeability deposits, they will act as an impermeable barrier, limiting contaminant migration and preventing the migration of any contamination from off-site sources to the site. Therefore, it is considered that the identified off-site sources of contamination can be discounted.

Additionally, the pond adjacent to the site can be discounted as a contamination source as it was infilled prior to the 1970s. Given the age of backfilling, it is unlikely that they will generate ground gases. The pond has since been developed with residential properties.

4.3 Receptors

The potential receptors considered to be at risk from soil and groundwater contamination associated with the site are summarised in Table 10 below:

Table 10 - Receptor Description

Receptor	Details
Human (On Site)	- Construction workers - Future site users - Site visitors
Human (Off Site)	- Adjacent site users
Controlled Waters	- Secondary (undifferentiated) Aquifer - River Irk
Building/ construction materials	- Foundations - Buried services
Environmental Receptors	- Objective 2 Areas - Community Forests - Nitrate Vulnerable Zones

4.4 Pathways

The potential exposure pathways linking contamination with the receptors identified above are summarised in Table 11 below:

Table 11 - Exposure Pathways Summary

Receptor	Details of Exposure Pathway
Human (on-site)	- Direct ingestion of contaminated soil/groundwater - Dermal contact with soil/groundwater - Inhalation of gases and vapours
Human (off-site)	- Inhalation of fibres and particulates - Inhalation of migrating gases and vapours

Receptor	Details of Exposure Pathway
Controlled waters	- Vertical and lateral migration of dissolved phase contaminants via preferential pathways to groundwater aquifers - Direct surface water run-off to surface water features
Building/construction	- Buried materials/services - Contact with contaminated soil and/or groundwater

4.5 Potential Pollution Linkages

4.5.1 Human Health

The proposed development is the erection of extension in together with associated elevational alterations in connection with subdivision of existing building to create 5 cash and carry units (sui generis). There are no formal plans for landscaping. This is considered to be a sensitive end use.

The presence of buildings and hardstanding would eliminate the risk of exposure, via the dermal contact and ingestion pathways to future site users to any ground contamination that may remain following development.

There could be a potential risk of exposure to any ground contamination that remains following redevelopment in any areas of soft landscaping (i.e., gardens), to future site users, via all possible exposure pathways.

Any ground gases (i.e., methane and carbon dioxide) and vapours that are present within the soils beneath the site could potentially ingress into future buildings through preferential pathways (e.g., service entry points). Therefore, there would be a risk of exposure via inhalation to future site users.

There is the potential for construction workers and adjacent land users to be exposed to soil and groundwater contamination during site redevelopment. However, the use of appropriate PPE and the adoption of suitable Health and Safety methods will help to reduce the risks posed to human health during this work.

4.5.2 Controlled Waters

The site is immediately underlain by the Taplow Gravel Member which is designated as a Secondary A Aquifer. It is considered that if any contamination is present at the surface, it would be in direct contact with the underlying aquifer and could allow the migration of contaminants to the groundwater.

There are 2 no. groundwater abstraction licences located within 1km radius of the site, shown in Table 2. However, can be discounted due to the distances from the site (>480m).

The site does not lie within a Source Protection Zone within a 1km radius of the site.

There is a single significant surface water features (rivers, lakes or reservoirs) located within a 1km radius of the site. The River Irk 1000m east of the site. Migration of pollutants via direct surface water run-off is deemed unlikely due to the distance from site (>1000m).

Overall, the risk to controlled waters is deemed to be low.

4.5.3 Building/Construction Materials/Buried Services

The presence of any soil and groundwater contaminants beneath the site could potentially impact on construction materials for future new developments, such as below ground structures and services. Concrete foundations are particularly sensitive to aggressive ground conditions, i.e., sulphate attack.

If ground gases and / or vapours are present in the soil beneath the site, then there would be the potential risk of ingress into new properties which could present a risk of explosion.

4.6 Environmental Designations

No sensitive environmental designations have been identified.

4.7 Preliminary Hazard Assessment

A preliminary hazard assessment is presented in Table 11. The preliminary hazard assessment is a qualitative assessment of the risks posed by each potential pollutant linkage described above and is used to identify the requirement for additional work (e.g., intrusive ground investigation).

Table 12 – Preliminary Hazard Assessment

Source 1	Pathway	Receptor	Likelihood	Effect	Risk	Assessment
Contaminated soil	Ingestion (via soil dust), inhalation (via soil dust and vapours), ingestion through dirty hands, dermal contact with soil/water.	Future site users Adjacent site users Construction workers	3	3	Moderate	On-site contamination source identified. Impermeable superficial deposits will limit the migration of off-site contaminated to the site. Potential risk of exposure via inhalation of volatile compounds.
Contaminated soil / groundwater	Direct contact	Buildings/ services	3	3	Moderate	On-site contamination source identified.
Contaminated groundwater	Downward or lateral migration Surface water run-off	Secondary (undifferentiated) Aquifer River Irk	1	3	Low	Impermeable superficial deposits will act as an impermeable barrier, preventing migration of any potential contaminants at the surface to the aquifer receptors. The site does not lie within a Source Protection Zone and there are no groundwater abstraction licences located nearby.
Ground gas / vapours	Inhalation, ingress into buildings	Buildings / services Future site users	3	4	High	Ground gas source identified from former clay pits on-site.

Source 1	Pathway	Receptor	Likelihood	Effect	Risk	Assessment
Radon		Adjacent site users Construction workers				Site located within a low probability area for radon.

Using Risk Matrix (Table 13) Degree of Risk (R) = Likelihood (L) x Effect (E)

Table 13 - Risk Matrix, Degree of Risk (R) = Likelihood (L) x Effect (E)

Likelihood	Description	Probability	Effect (E)	Description
5	Almost certain	>70%		
4	Probable	50-70%	4	Severe
3	Likely	30-50%	3	Medium
2	Unlikely	10-30%	2	Mild
1	Negligible	<10%	1	Minor
Risk (R)	**Risk Level**	**Action**		
1-5	Low	None required		
6-10	Moderate	Further assessment via Phase 2 intrusive ground investigation.		
>10	High	Further assessment via Phase 2 intrusive ground investigation.		

5 Conclusions and Recommendations

The preliminary environmental site assessment indicates that the site can be classified as moderate – high risk in terms of contamination and the risks to the identified receptors (e.g., human health and buildings) following redevelopment is considered to be moderate - high.

This classification is due to the historical on-site land use as former clay pit which may have been infilled with putrescible material. Therefore, there is the potential for contaminants to be present in the ground beneath the site such as heavy metals, polyaromatic hydrocarbons (PAHs), hydrocarbons and also ground gases such as methane and carbon dioxide.

It is recommended a Phase 2 intrusive ground investigation is undertaken prior to site redevelopment to obtain additional information on the ground conditions and the contamination status. The investigation should be carried out by qualified and competent persons. The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the Phase 2 intrusive works.

It is also recommended that basic gas protection measures are included within the design of the building in the form of a suitably install gas protection membrane.

APPENDICES

Appendix A – Site Location and Site Plan



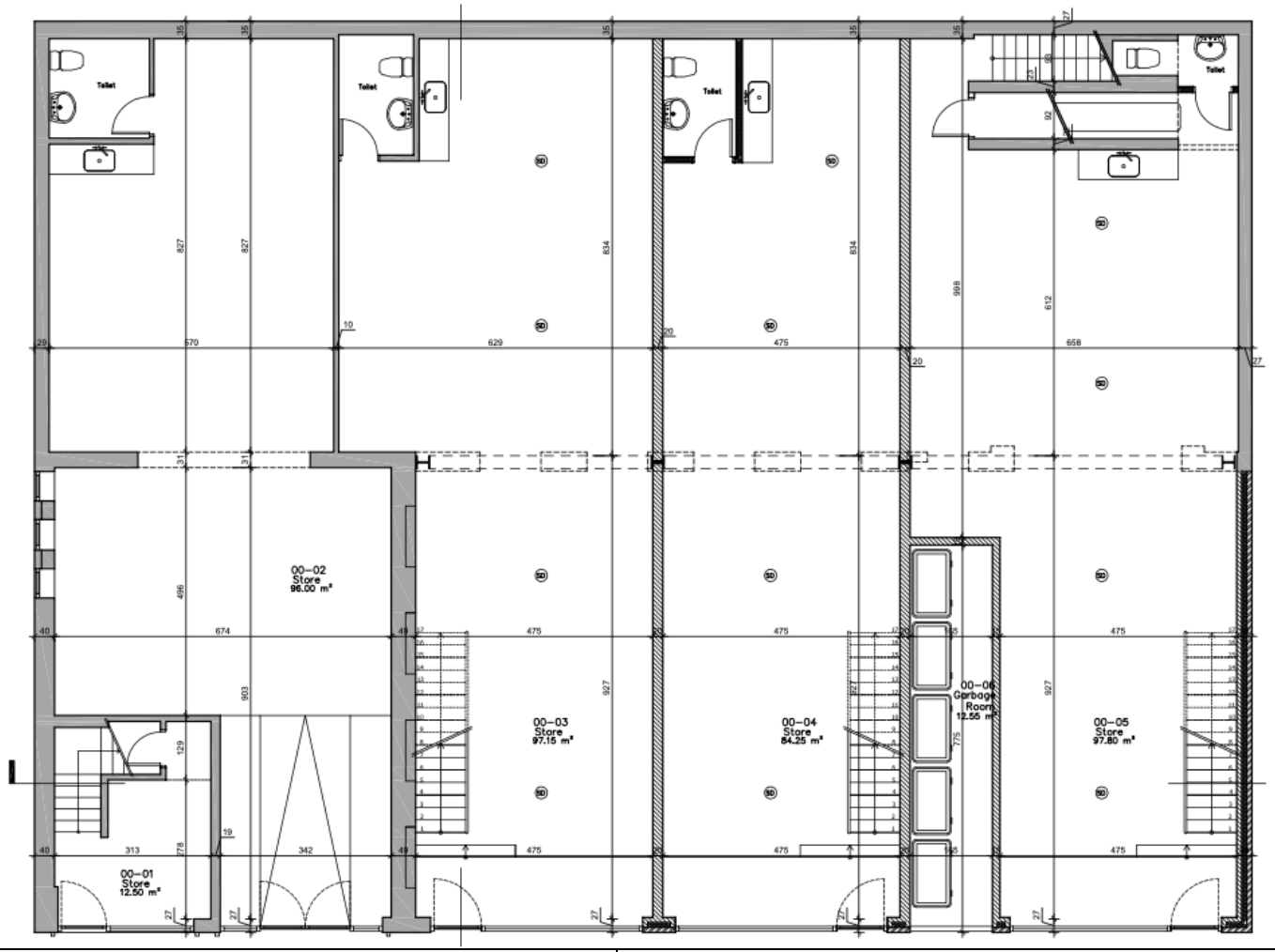
enviro | solution	**Site Location Map**

Figure 1



enviro | solution	**Existing Site Plan**

Figure 2



enviro | solution

Proposed Development Plan

Figure 3

Appendix B – Site Photographs



enviro | solution	**Adjacent Depot**



enviro | solution	**Adjacent road and boundary fence.**



enviro | solution	**Bricks stored on site.**



enviro | solution	**Drain cover at NE corner of building.**



enviro | solution	**Front elevation 2.**



enviro | solution	**Front elevation.**



enviro | solution	**Gate to rear of property.**



enviro | solution	**Interior.**



enviro | solution	**Rear of building.**



enviro | solution	**Sliding Door.**



enviro | solution	**View of front access and yard.**

Appendix C – Historic Maps

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

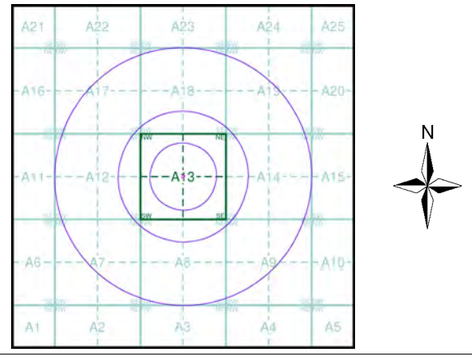
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1848	2
Cheshire	1:10,560	1882	3
Lancashire And Furness	1:10,560	1894	4
Lancashire And Furness	1:10,560	1909	5
Lancashire And Furness	1:10,560	1923	6
Lancashire And Furness	1:10,560	1931 - 1932	7
Lancashire And Furness	1:10,560	1938	8
Ordnance Survey Plan	1:10,000	1956	9
Ordnance Survey Plan	1:10,000	1966 - 1968	10
Ordnance Survey Plan	1:10,000	1972 - 1979	11
Ordnance Survey Plan	1:10,000	1980 - 1986	12
Ordnance Survey Plan	1:10,000	1985 - 1987	13
Ordnance Survey Plan	1:10,000	1989	14
Ordnance Survey Plan	1:10,000	1990 - 1994	15
10K Raster Mapping	1:10,000	1999	16
Street View	Variable		17

Historical Map - Slice A



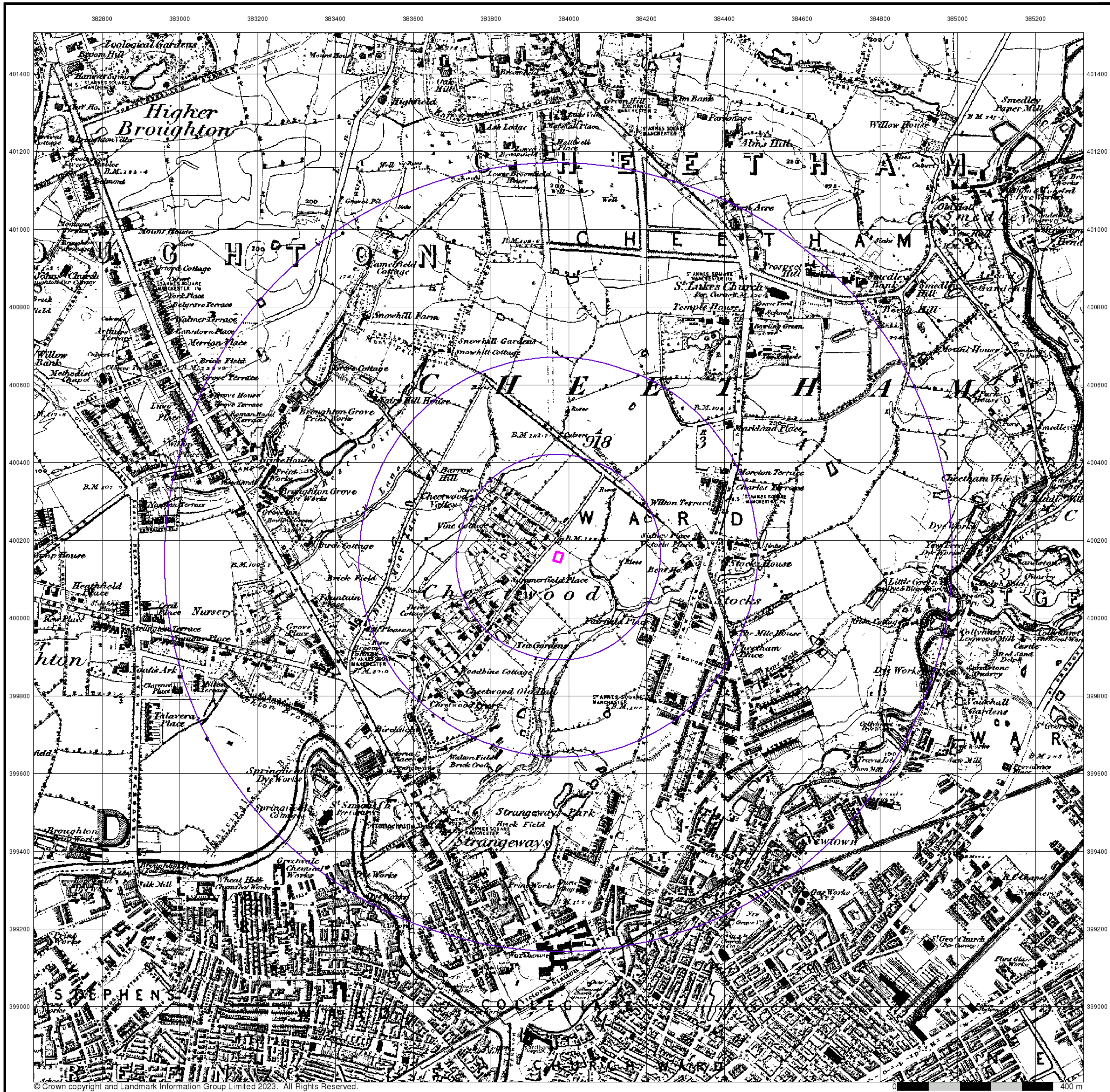
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Slice: A
Site Area (Ha): 0.05
Search Buffer (m): 1000

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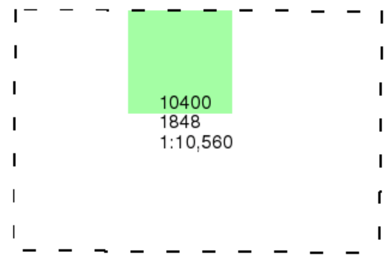
Lancashire And Furness

Published 1848

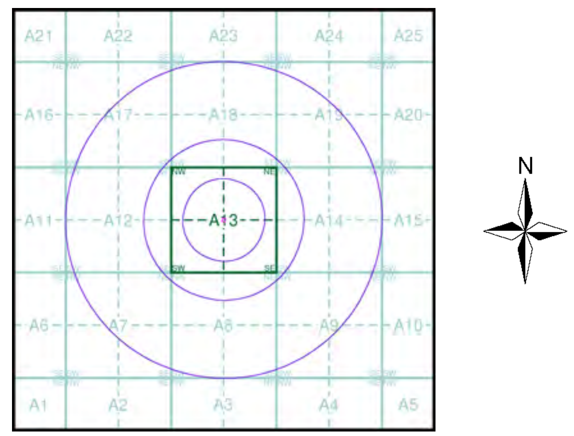
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Map Name(s) and Date(s)



Historical Map - Slice A



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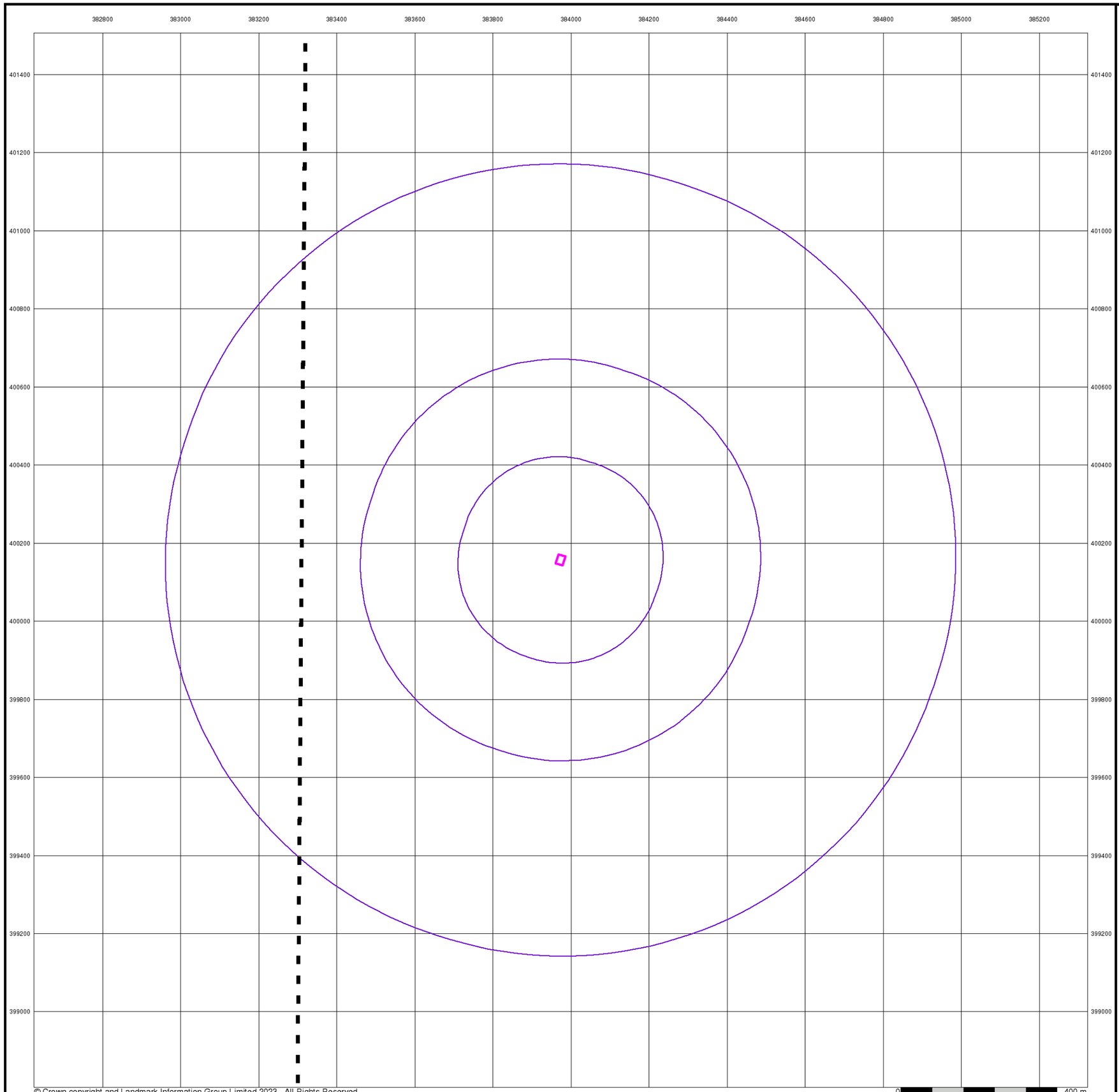
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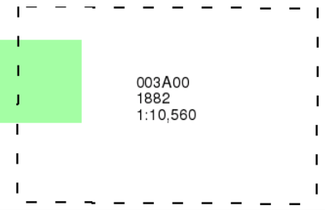
Cheshire

Published 1882

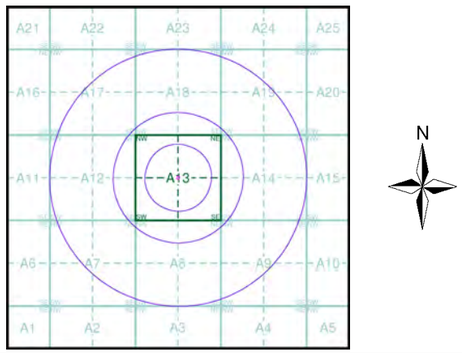
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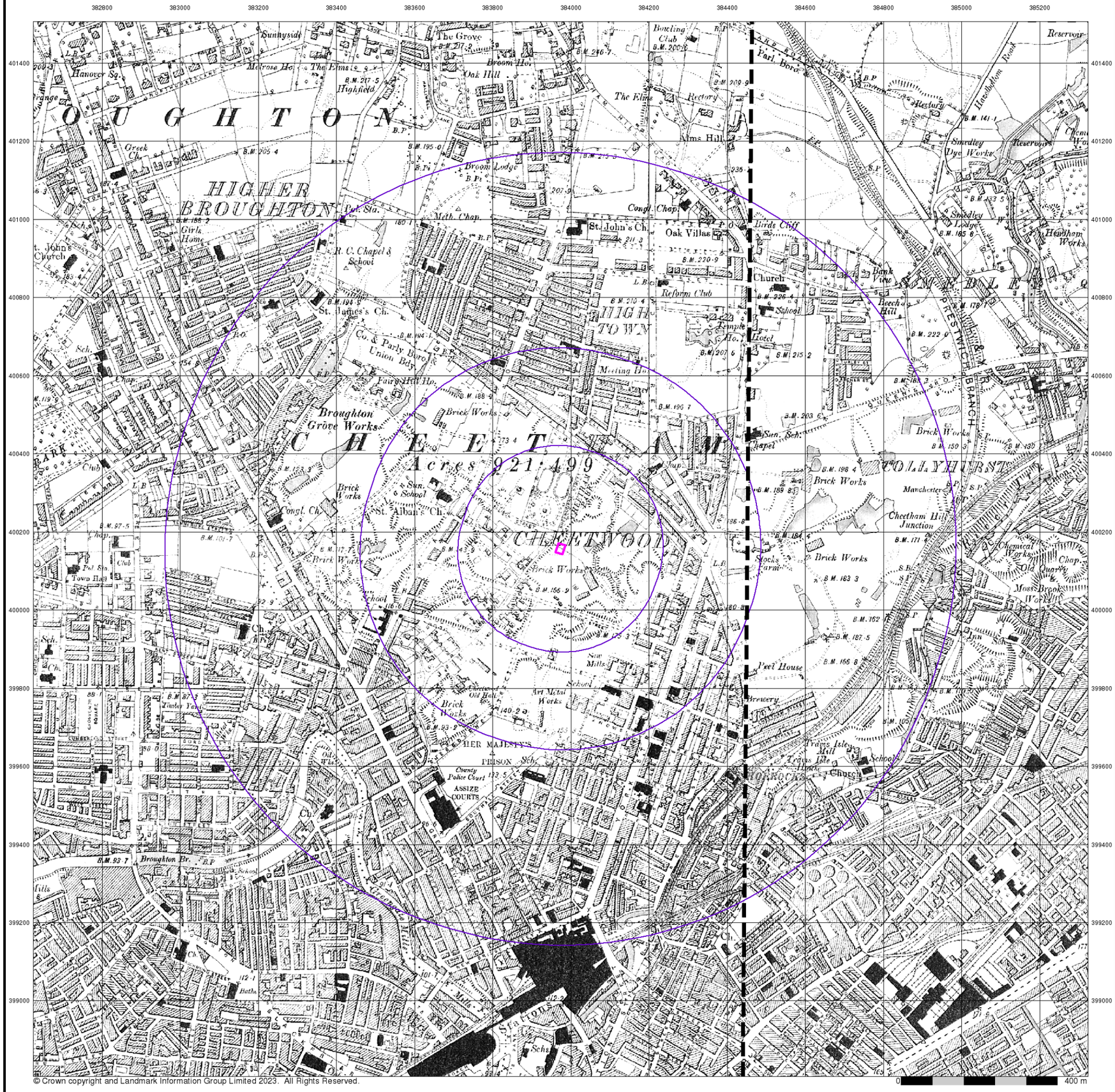
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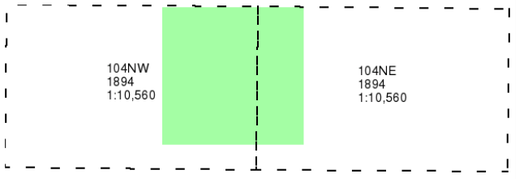
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Published 1894

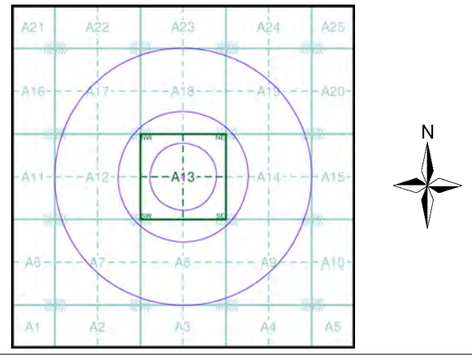
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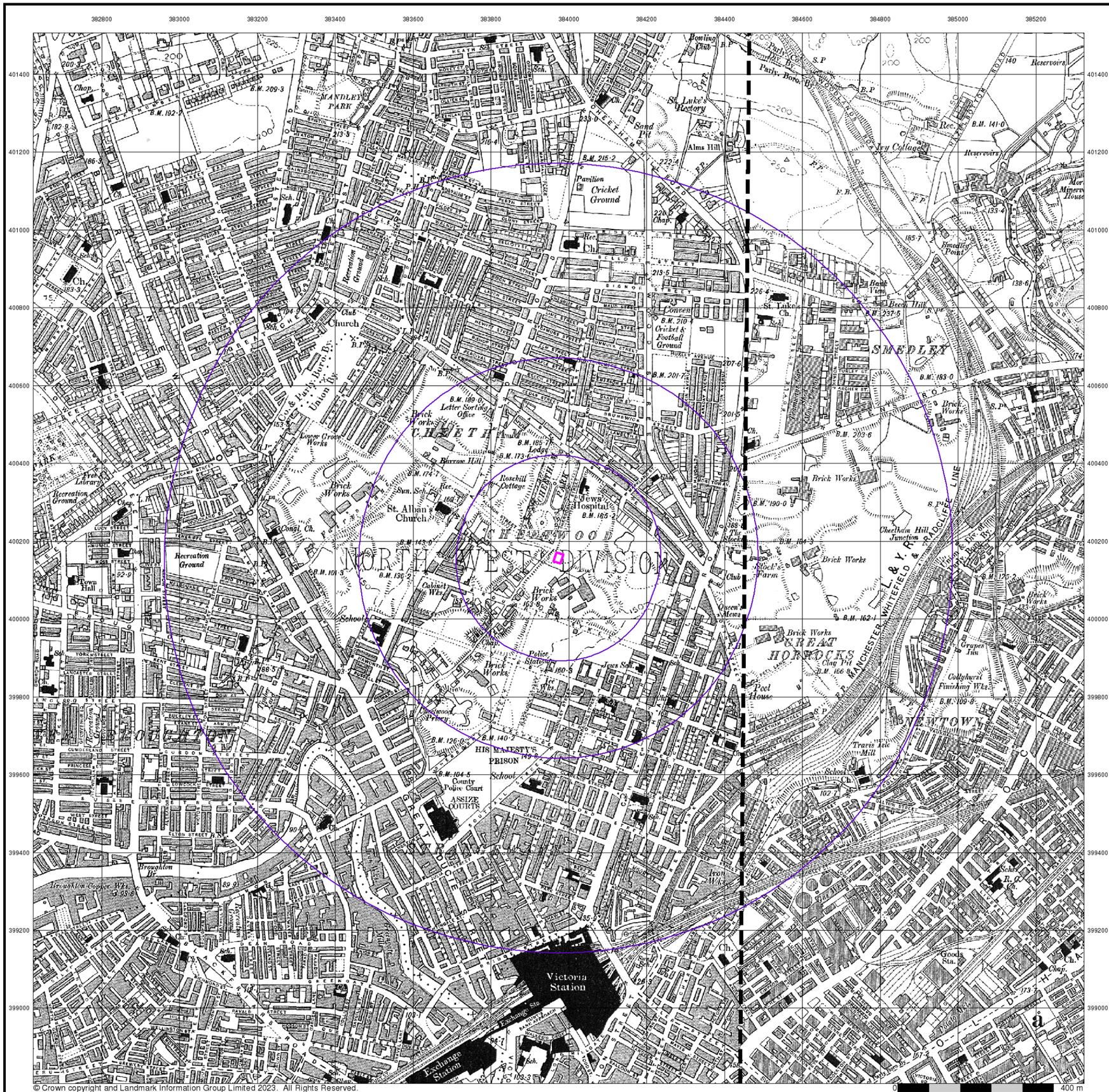
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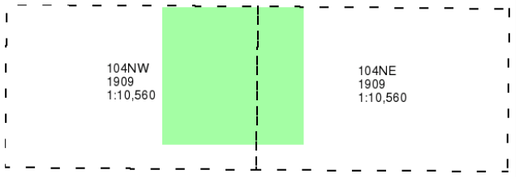
Lancashire And Furness

Published 1909

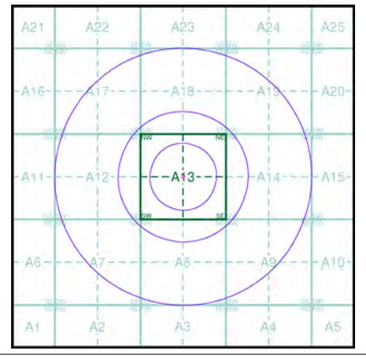
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Map Name(s) and Date(s)



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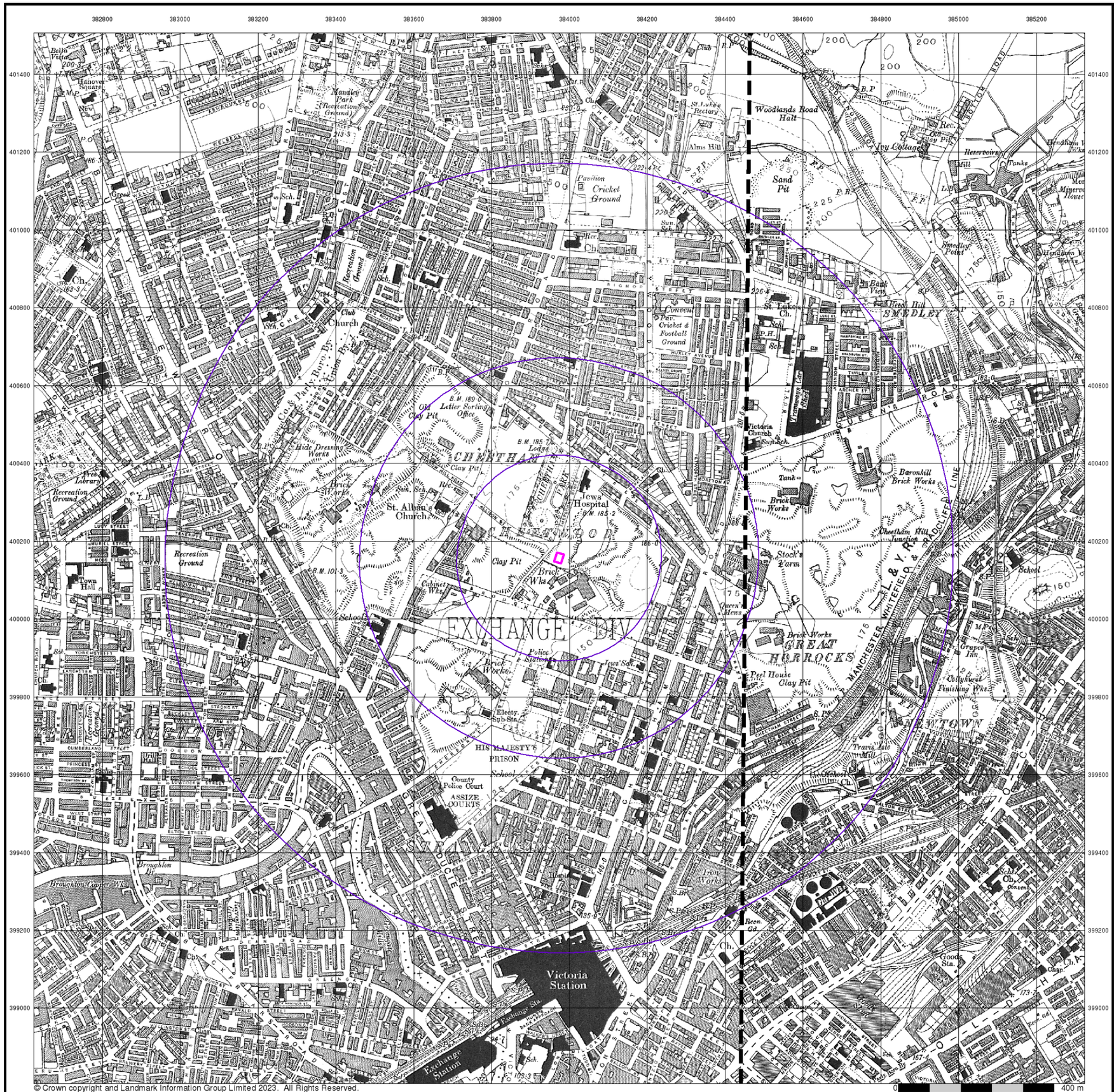
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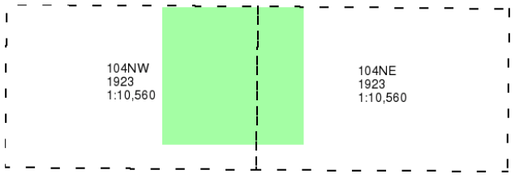
Lancashire And Furness

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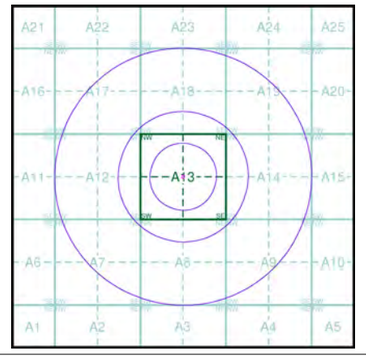
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Map Name(s) and Date(s)



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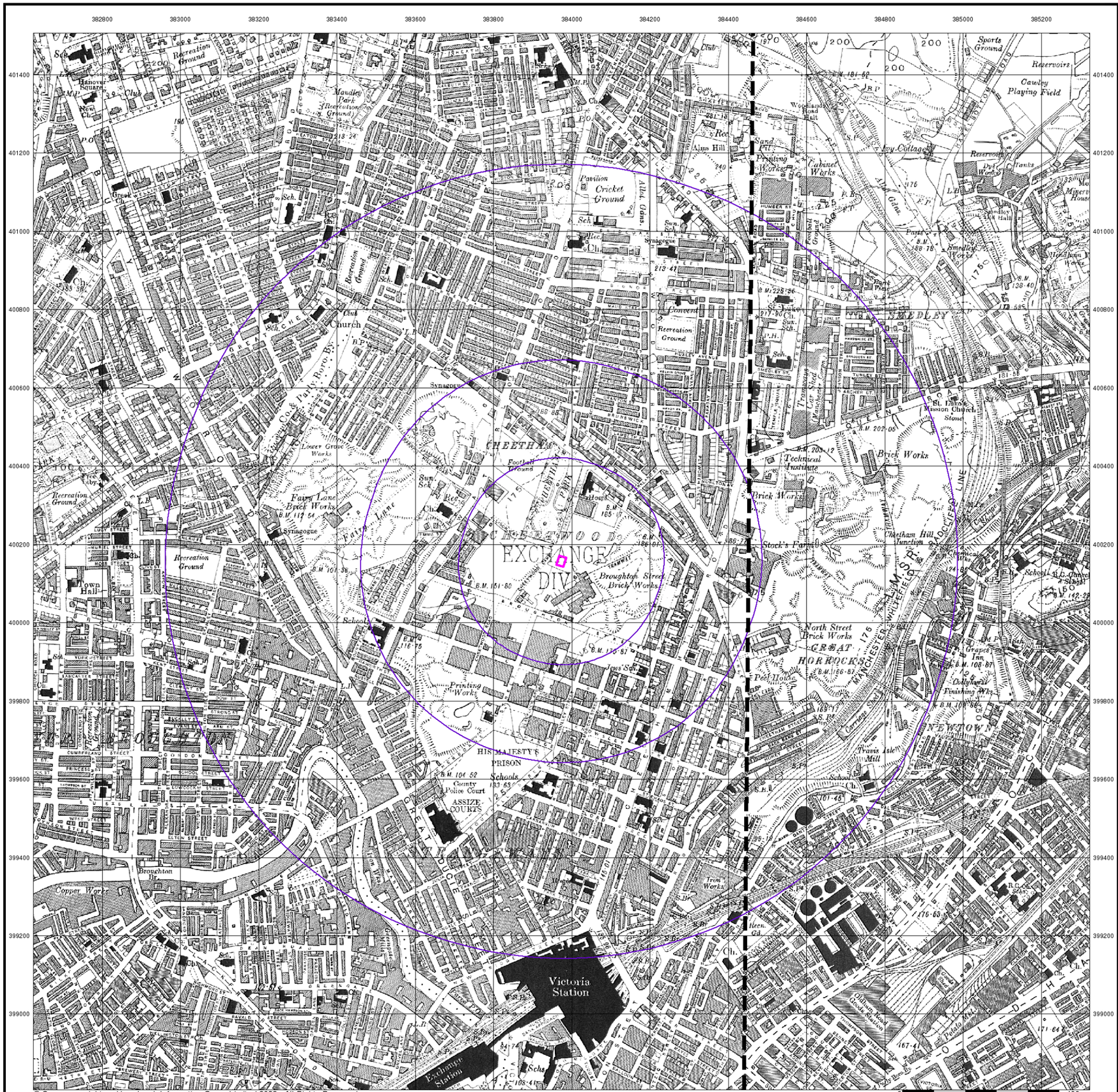
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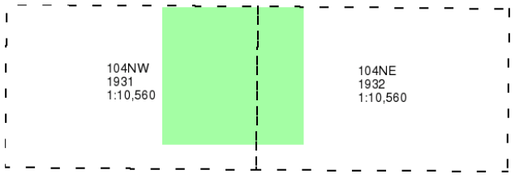
Lancashire And Furness

Published 1931 - 1932

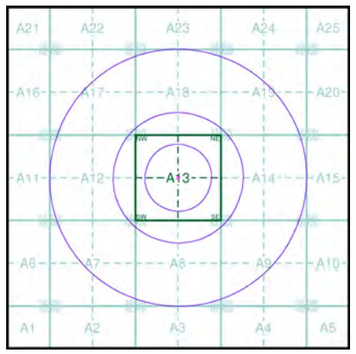
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Map Name(s) and Date(s)



Historical Map - Slice A



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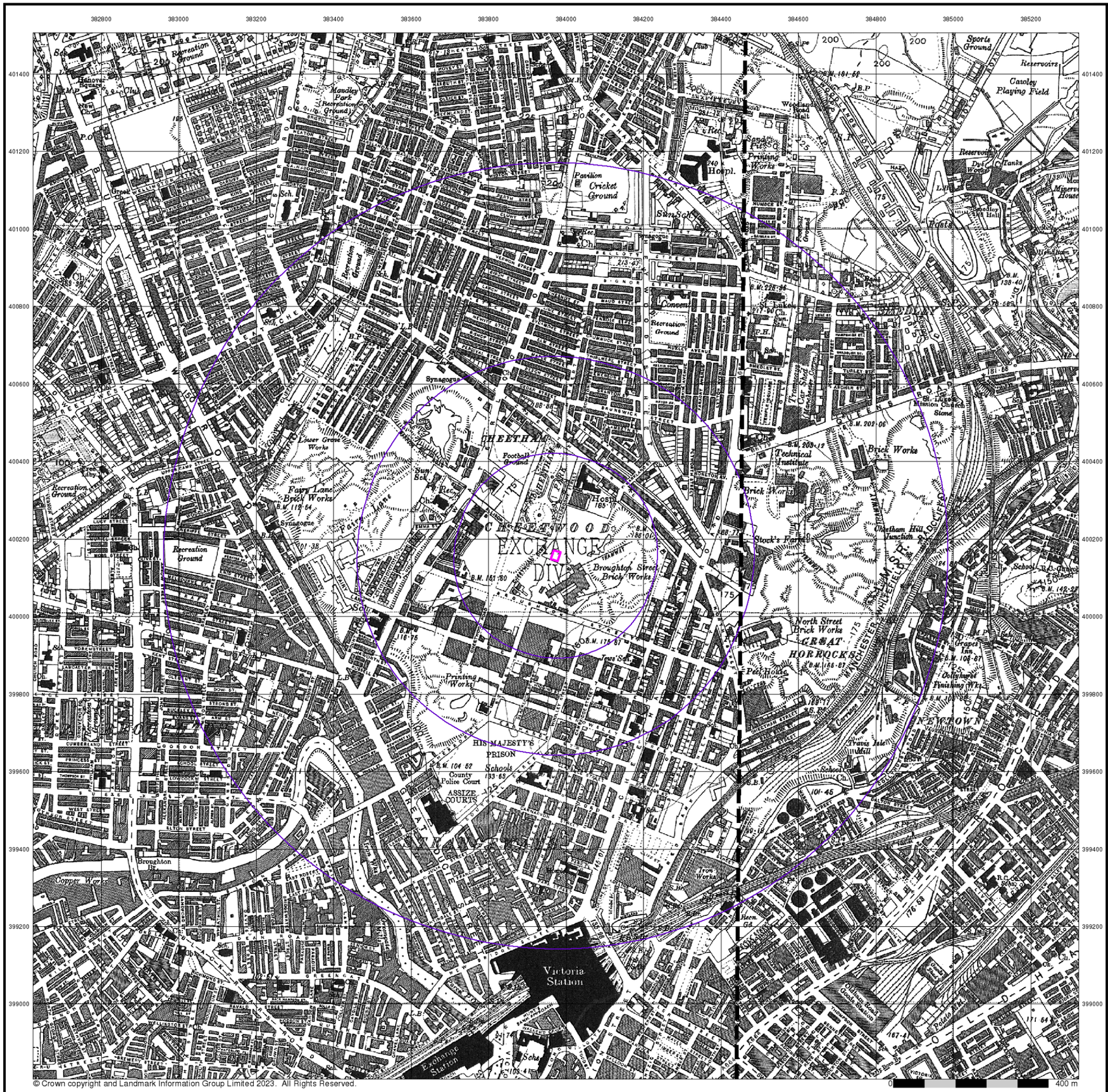
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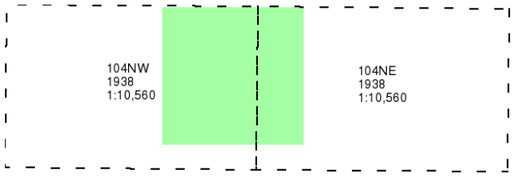
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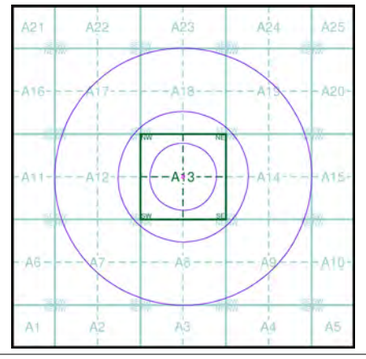
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

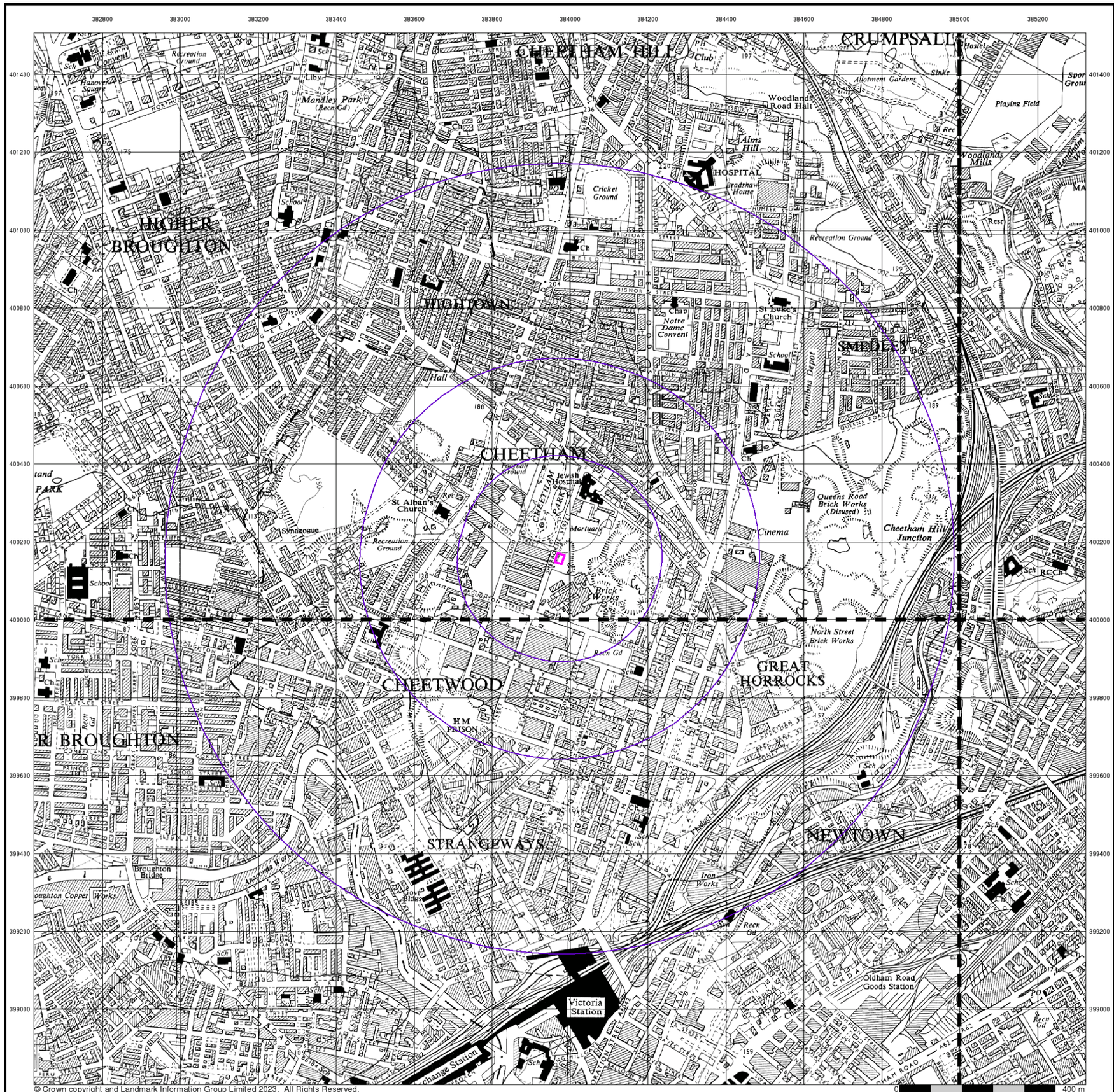
Order Number:	311554510_1_1
Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

Site Details

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Ordnance Survey Plan

Published 1956

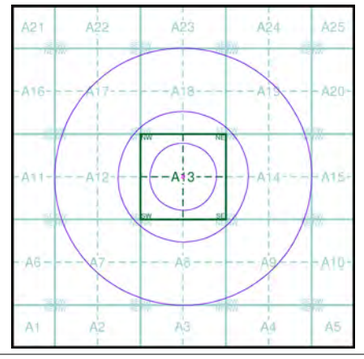
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SW 1956 1:10,560	SD80SE 1956 1:10,560
SJ89NW 1956 1:10,560	SJ89NE 1956 1:10,560

Historical Map - Slice A





Order Details

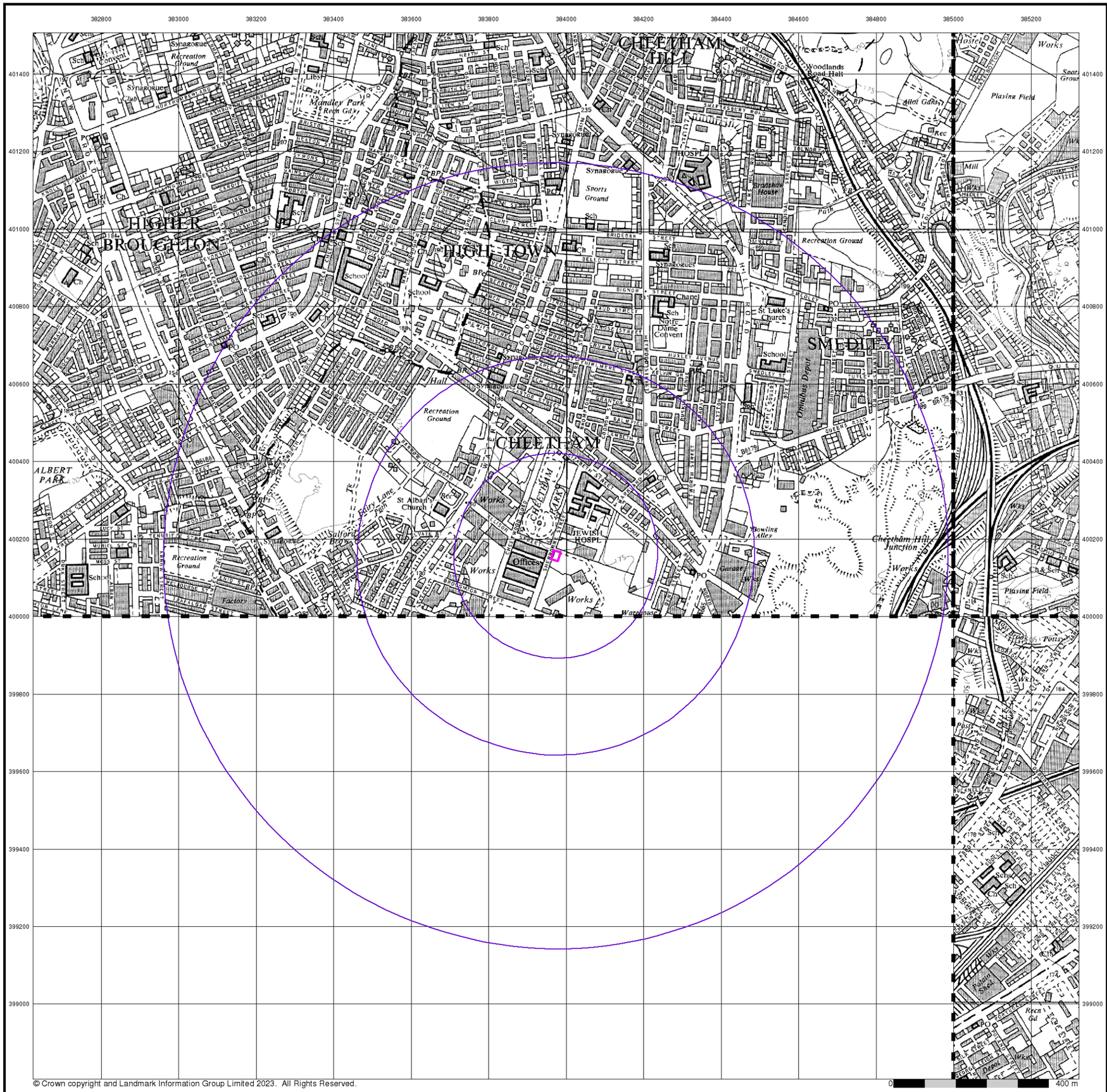
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Customer Ref:	ES190523
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Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

Site Details

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Ordnance Survey Plan

Published 1966 - 1968

Source map scale - 1:10,000

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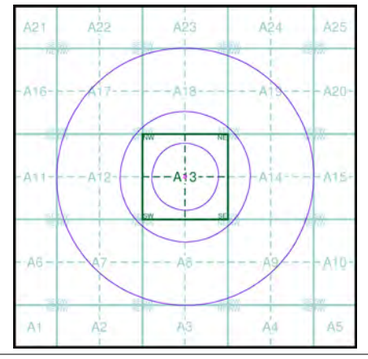
Map Name(s) and Date(s)

SD80SW 1968 1:10,560

SD80SE 1966 1:10,560

SJ89NE 1968 1:10,560

Historical Map - Slice A



N

Order Details

Order Number:	311554510_1_1
Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

Site Details

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Ordnance Survey Plan

Published 1972 - 1979

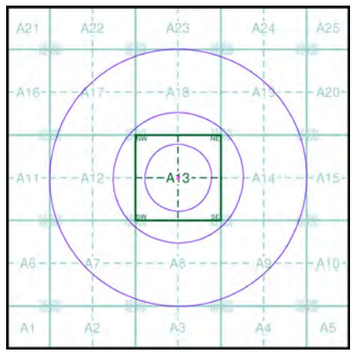
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SW 1979 1:10,000
SD80SE 1978 1:10,000
SJ89NW 1972 1:10,000

Historical Map - Slice A



Order Details

Order Number:	311554510_1_1
Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
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Search Buffer (m):	1000

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Ordnance Survey Plan

Published 1980 - 1986

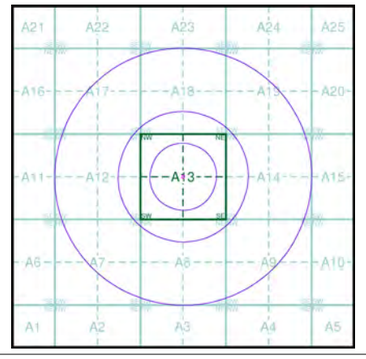
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SD80SW 1986 1:10,000	SD80SE 1982 1:10,000
SJ89NW 1980 1:10,000	SJ89NE 1981 1:10,000

Historical Map - Slice A



Order Details

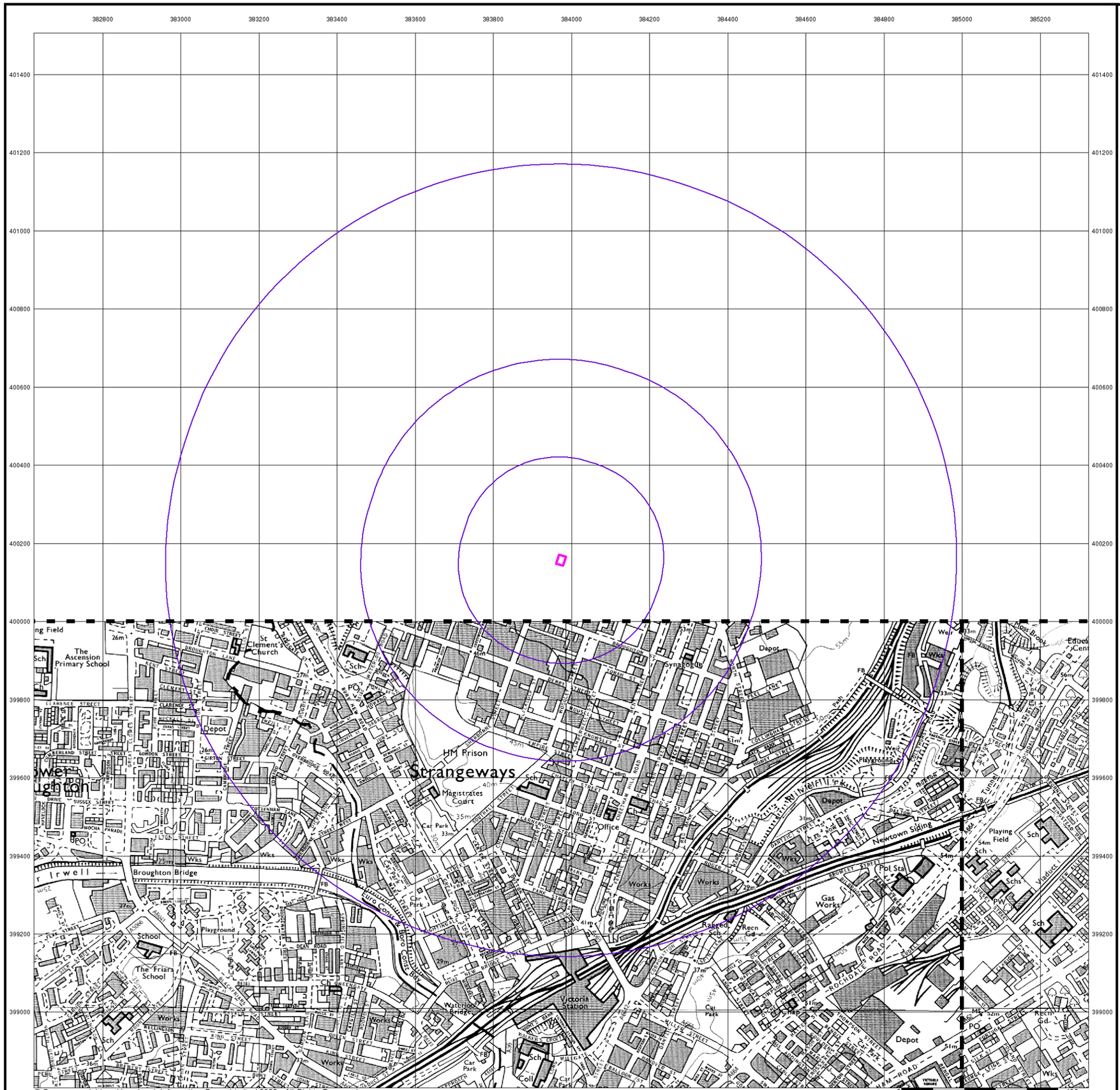
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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
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Site Area (Ha):	0.05
Search Buffer (m):	1000

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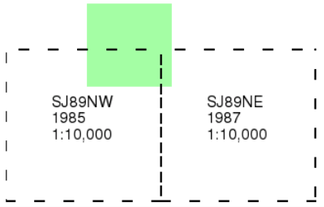
Ordnance Survey Plan

Published 1985 - 1987

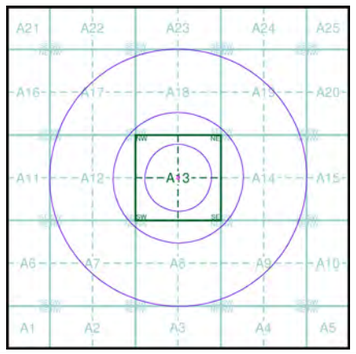
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

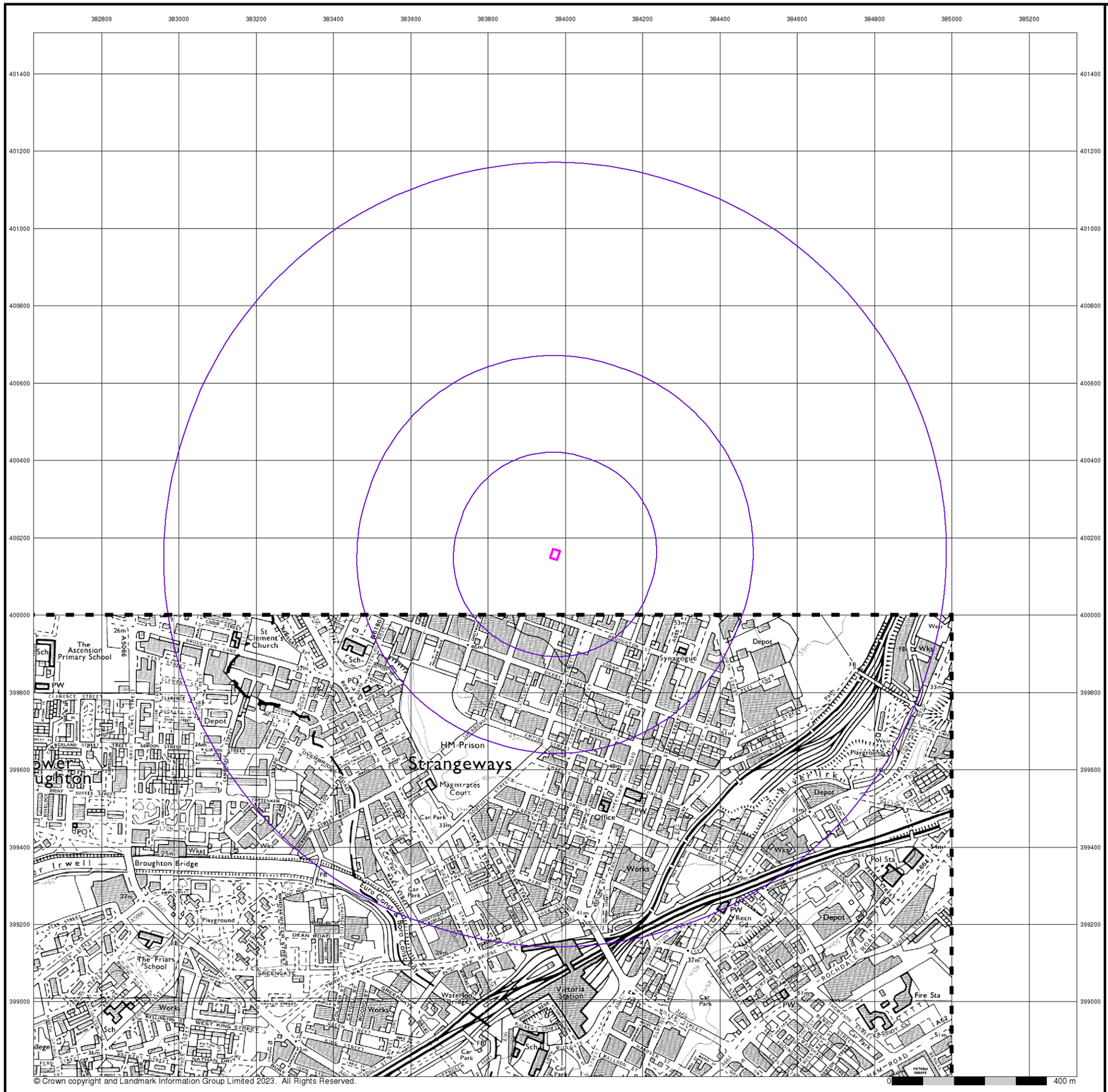
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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

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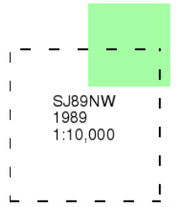
Ordnance Survey Plan

Published 1989

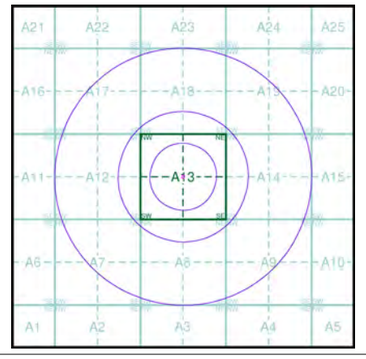
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



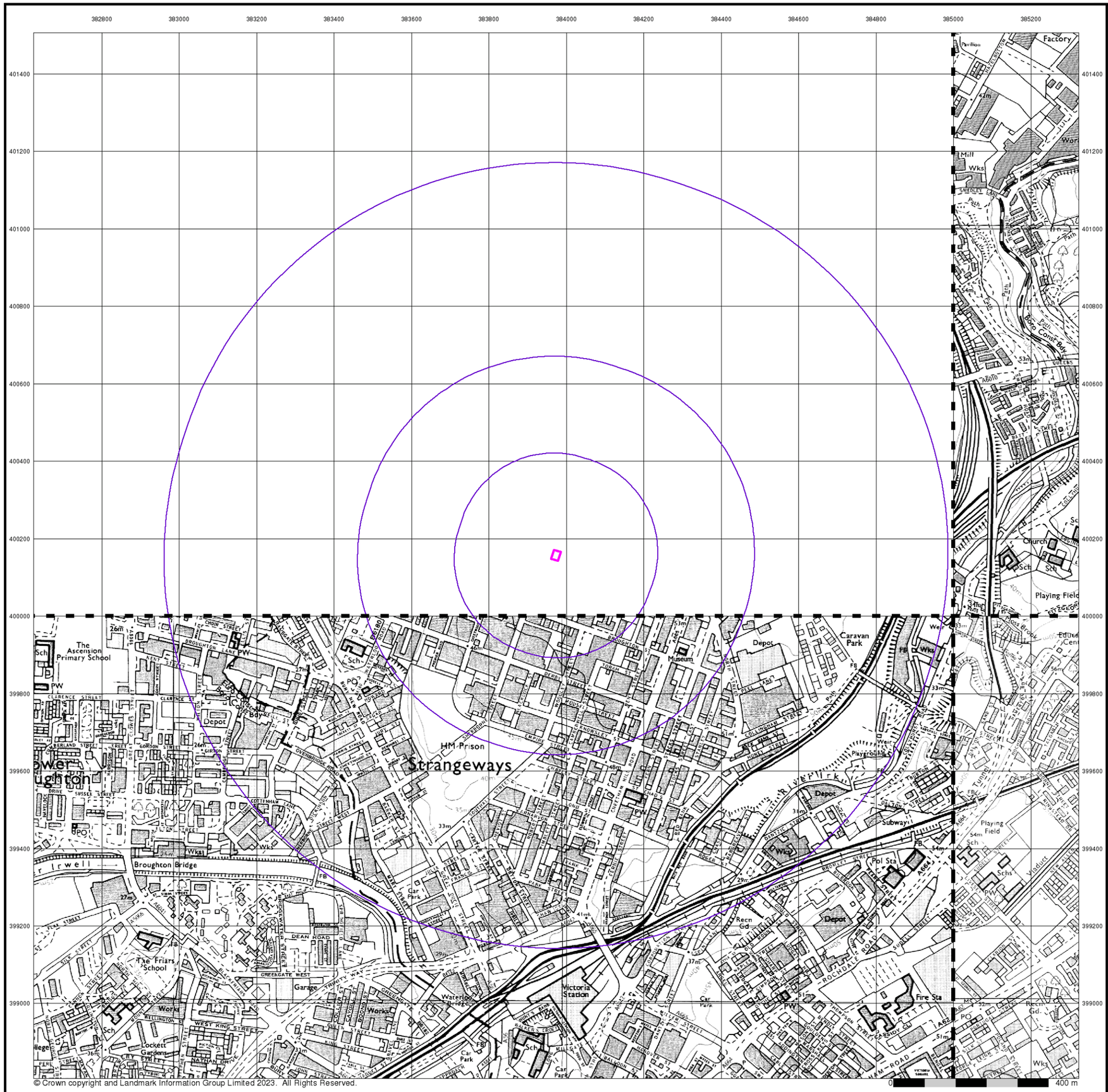
Order Details

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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

Site Details

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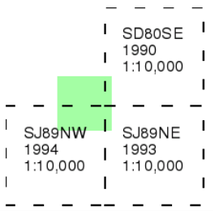
Ordnance Survey Plan

Published 1990 - 1994

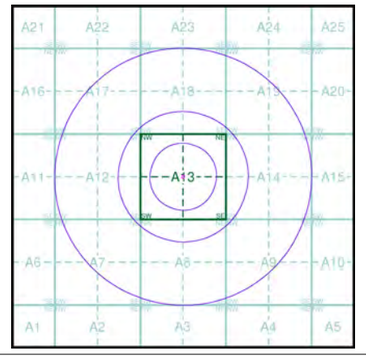
Source map scale - 1:10,000

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

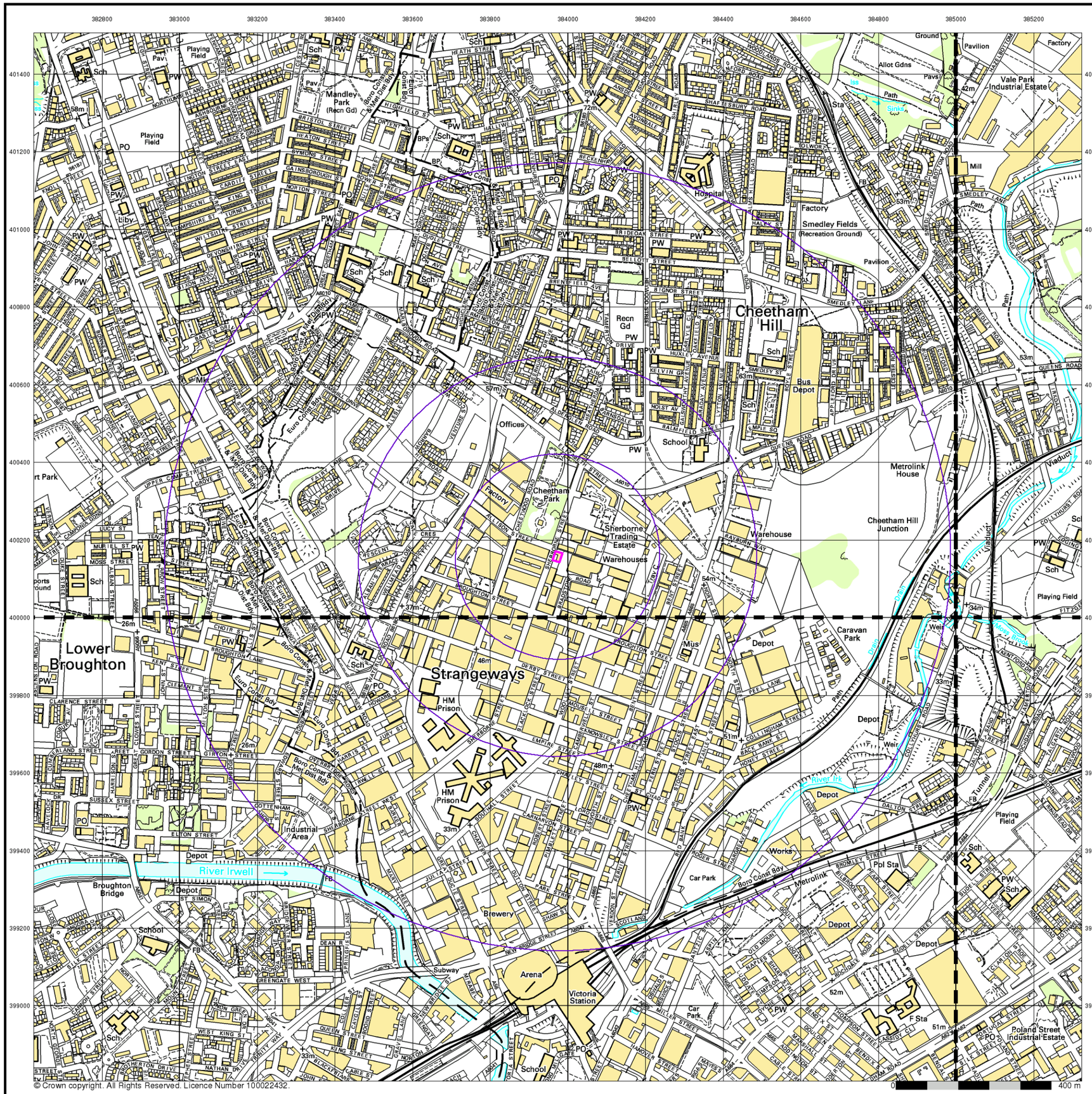
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Customer Ref:	ES190523
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Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

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10k Raster Mapping

Published 1999

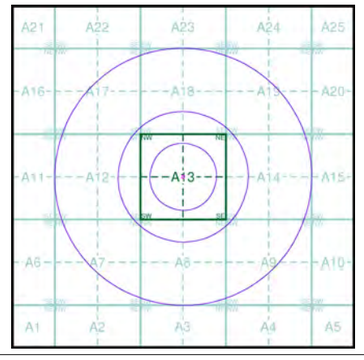
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SD80SW 1999 1:10,000	SD80SE 1999 1:10,000
SJ89NW 1999 1:10,000	SJ89NE 1999 1:10,000

Historical Map - Slice A



N

Order Details

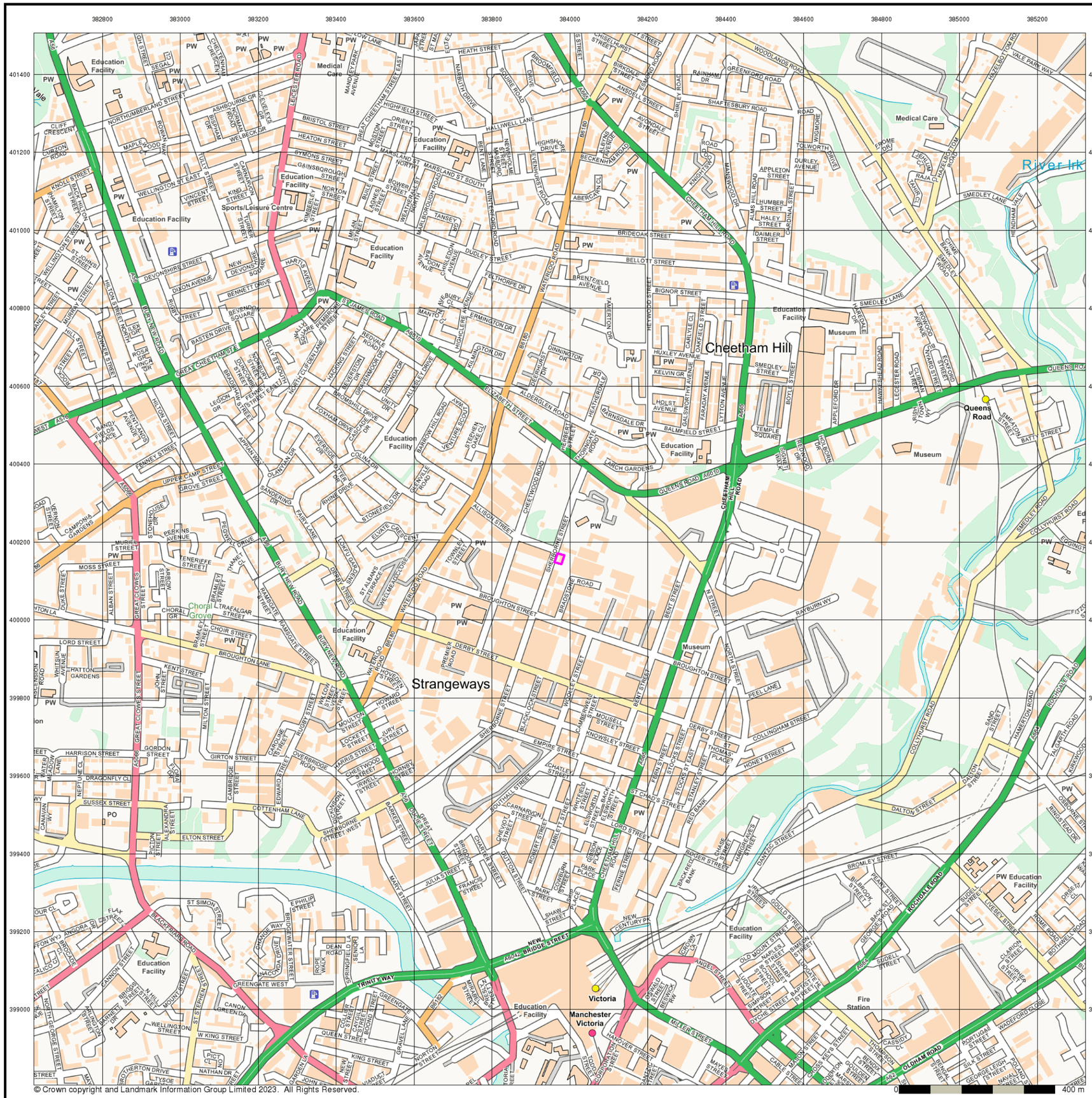
Order Number:	311554510_1_1
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Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	1000

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Street View

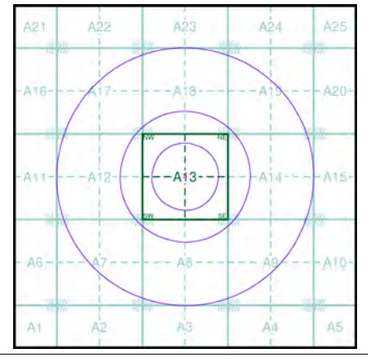
Published 2023

Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)

Street View Map - Slice A



Order Details

Order Number:	311554510_1_1
Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
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Site Details

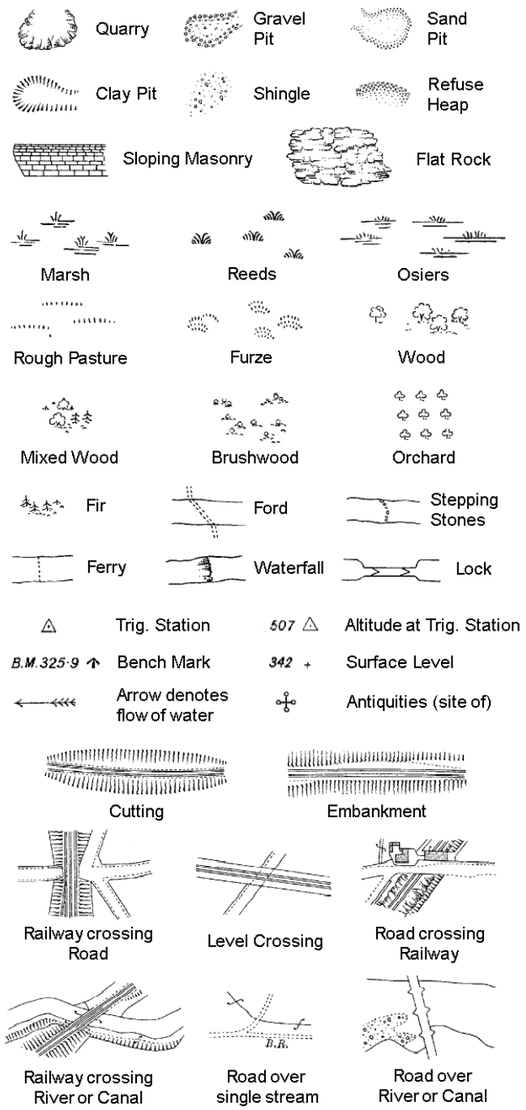
F Z Imports Ltd, 76, Sherborne Street, MANCHESTER, M8 8NU

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Historical Mapping Legends

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



County Boundary (Geographical)

County & Civil Parish Boundary

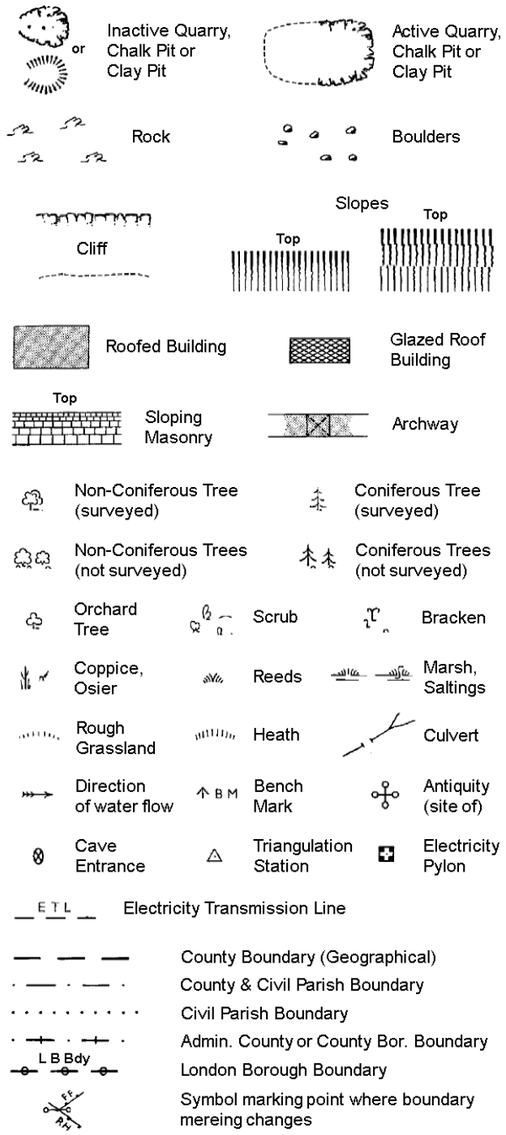
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

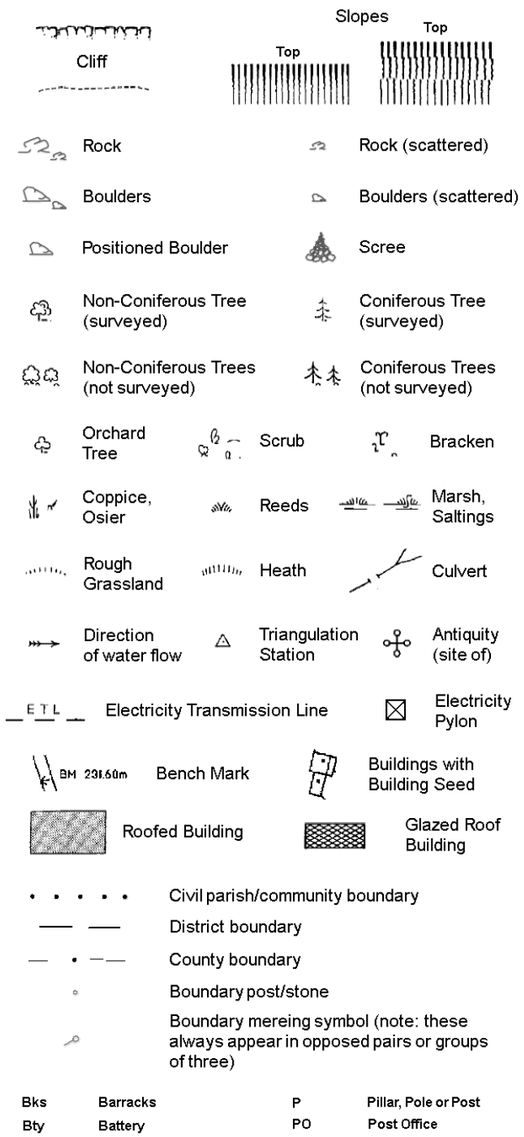
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

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



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

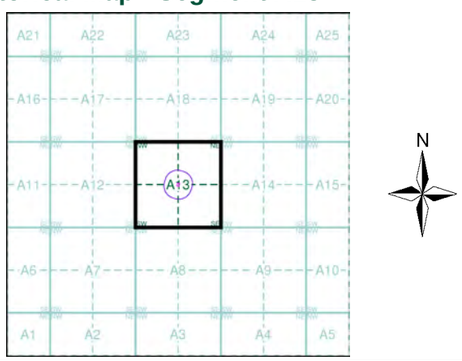
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1892 - 1893	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1933	4
Ordnance Survey Plan	1:1,250	1949 - 1952	5
Ordnance Survey Plan	1:2,500	1951 - 1953	6
Ordnance Survey Plan	1:1,250	1952 - 1963	7
Ordnance Survey Plan	1:2,500	1953 - 1965	8
Ordnance Survey Plan	1:1,250	1958 - 1975	9
Ordnance Survey Plan	1:2,500	1959	10
Ordnance Survey Plan	1:2,500	1966	11
Ordnance Survey Plan	1:1,250	1968 - 1975	12
Additional SIMs	1:1,250	1978 - 1989	13
Additional SIMs	1:1,250	1988	14
Ordnance Survey Plan	1:1,250	1989	15
Large-Scale National Grid Data	1:1,250	1992	16
Large-Scale National Grid Data	1:1,250	1993 - 1994	17
Large-Scale National Grid Data	1:1,250	1996	18
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Historical Map - Segment A13

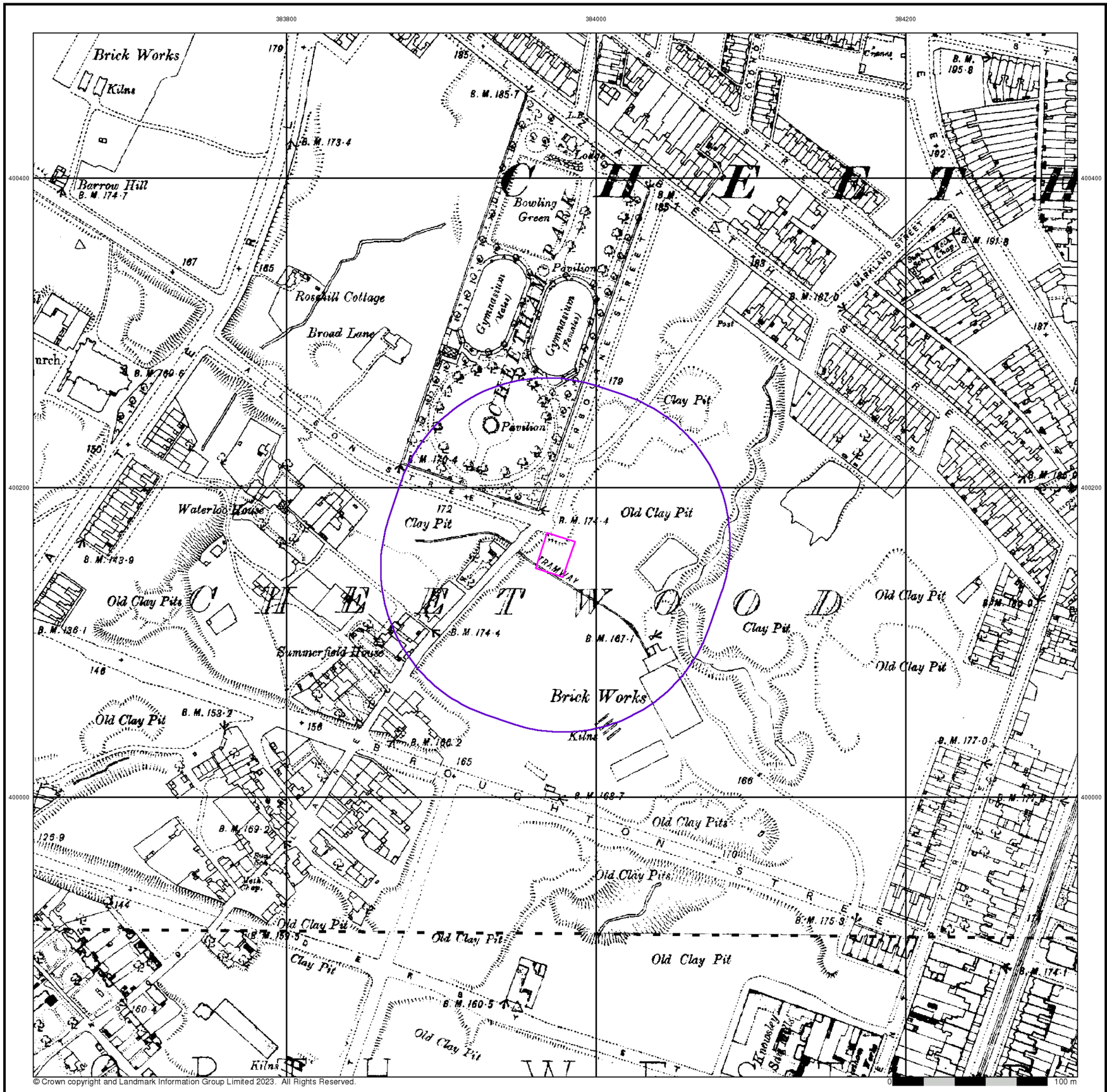


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Search Buffer (m):	100

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Lancashire And Furness

Published 1892 - 1893

Source map scale - 1:2,500

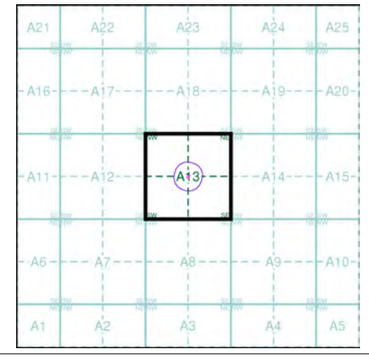
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. 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)

104_02
1893
1:2,500

104_06
1892
1:2,500

Historical Map - Segment A13



Order Details

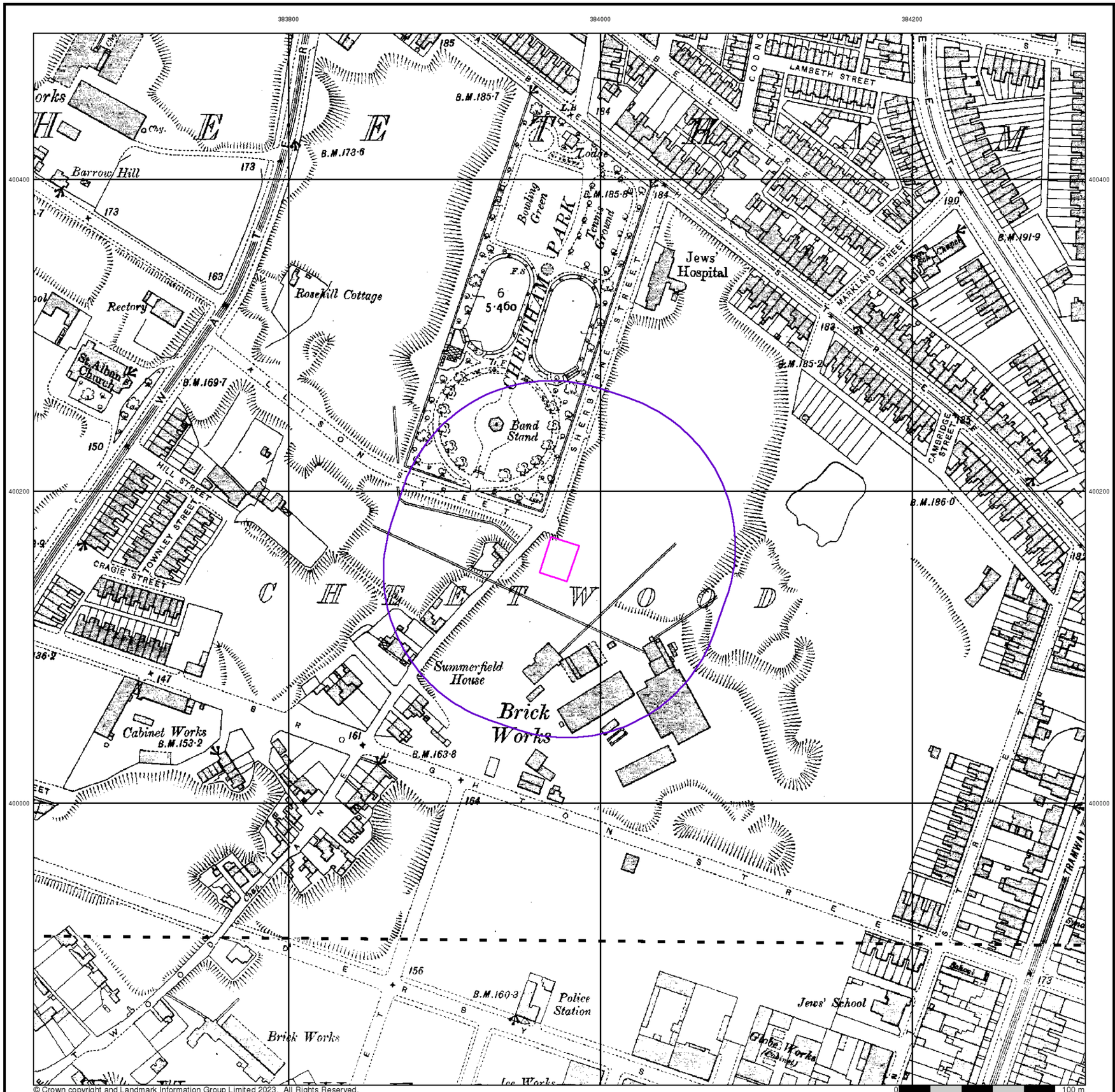
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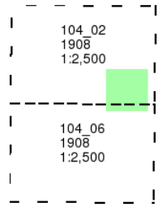
Lancashire And Furness

Published 1908

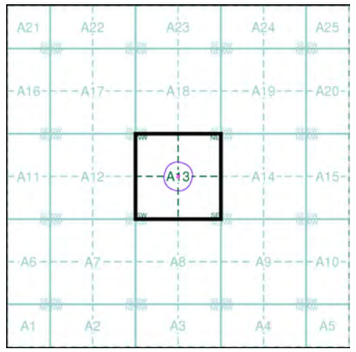
Source map scale - 1:2,500

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)



Historical Map - Segment A13



Order Details

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National Grid Reference:	383970, 400160
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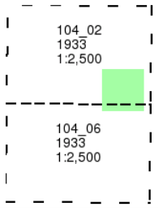
Lancashire And Furness

Published 1933

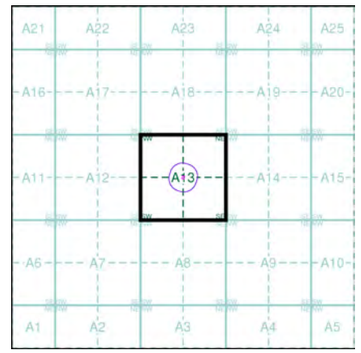
Source map scale - 1:2,500

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)



Historical Map - Segment A13



Order Details

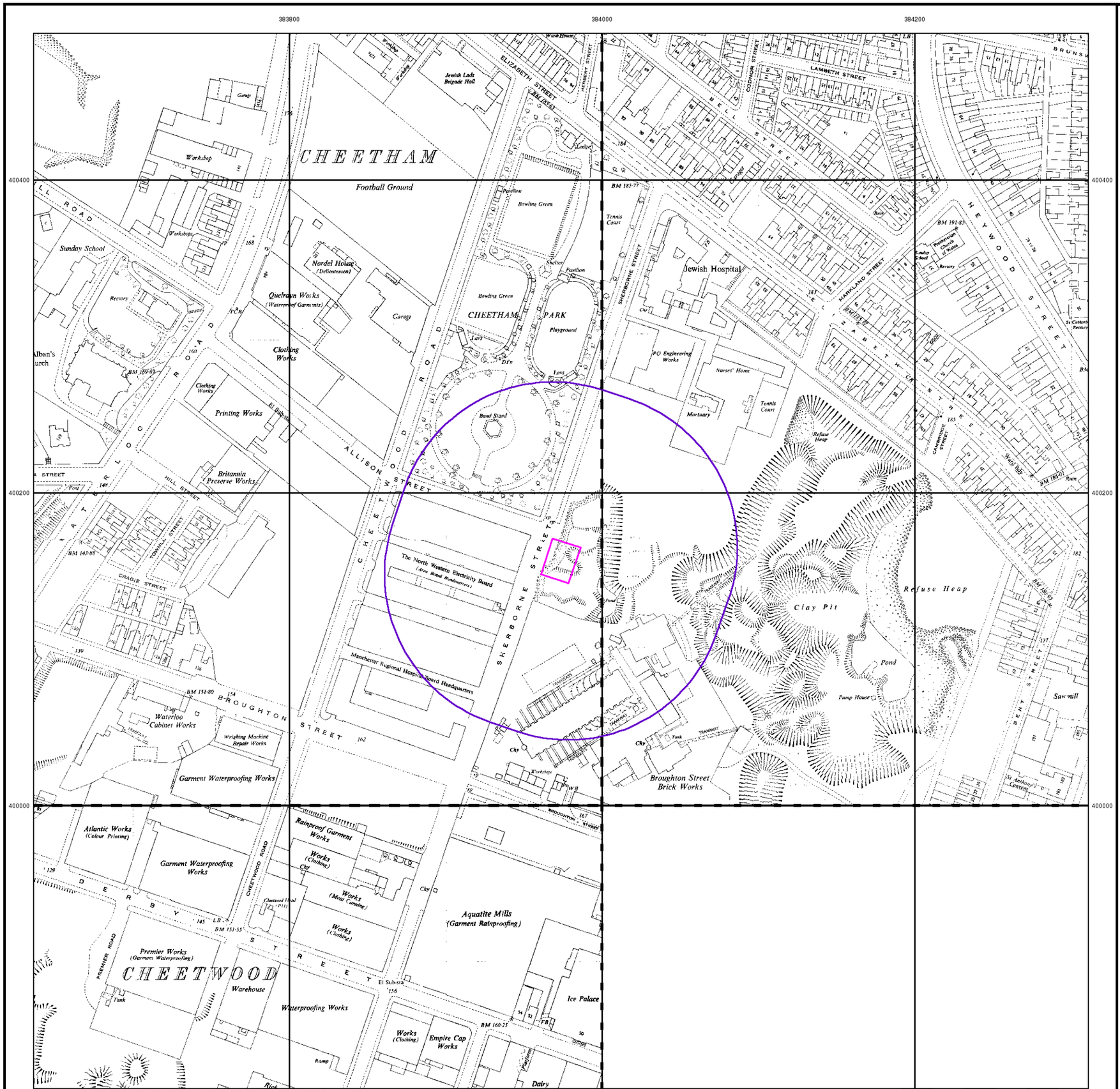
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Ordnance Survey Plan

Published 1949 - 1952

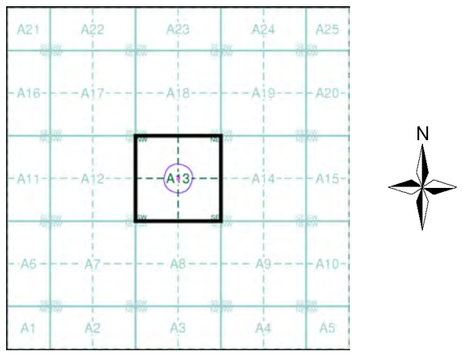
Source map scale - 1:1,250

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)

SD8300SE 1952 1:1,250
SD8400SW 1949 1:1,250
SJ8399NE 1951 1:1,250

Historical Map - Segment A13



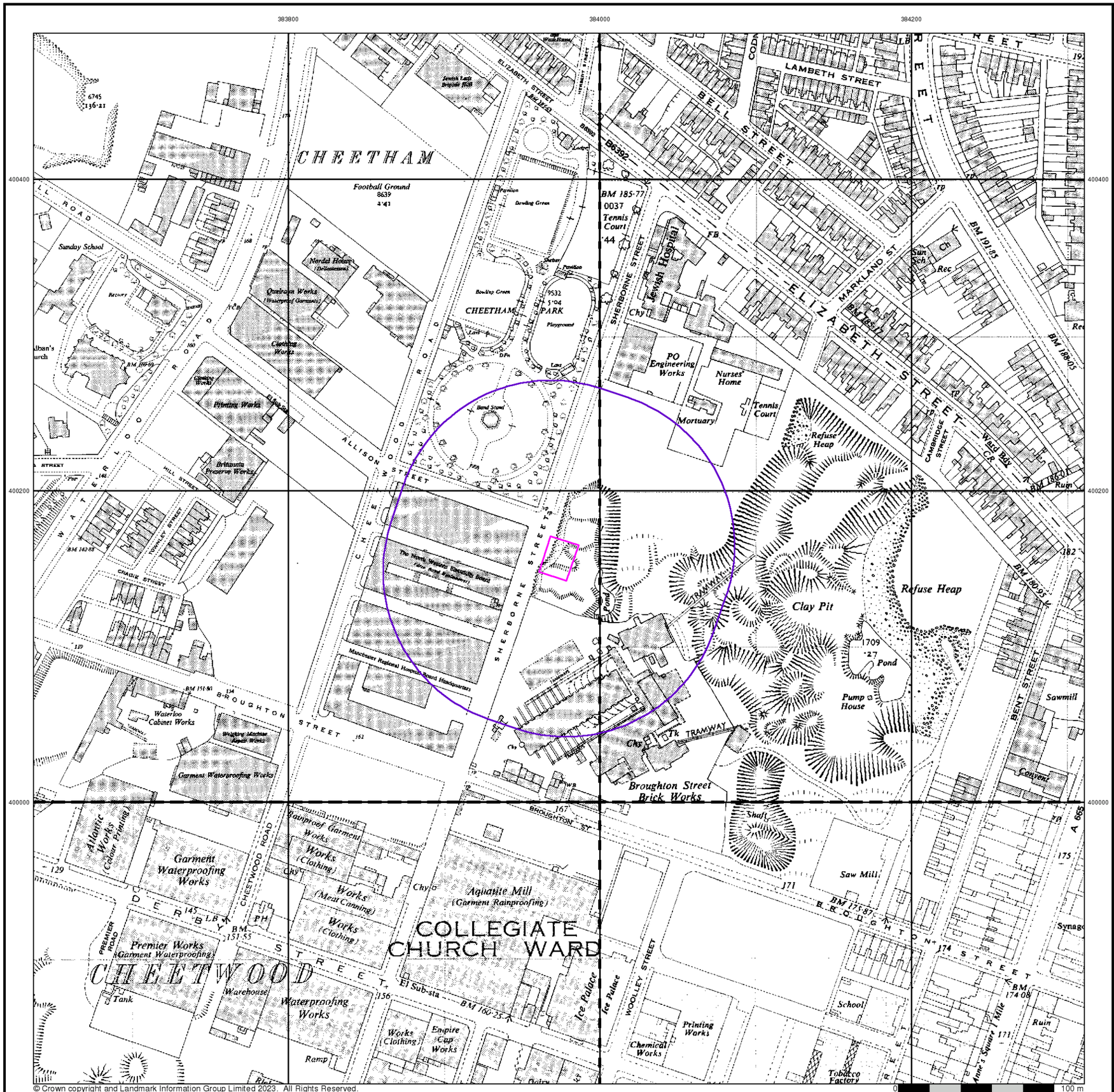
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Ordnance Survey Plan

Published 1951 - 1953

Source map scale - 1:2,500

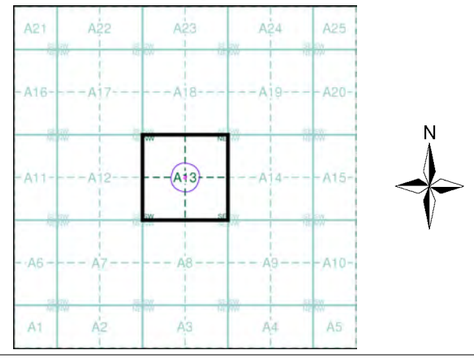
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. 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)

SD8300 1953 1:2,500 | SD8400 1951 1:2,500

SJ8399 1952 1:2,500 | SJ8499 1951 1:2,500

Historical Map - Segment A13



Order Details

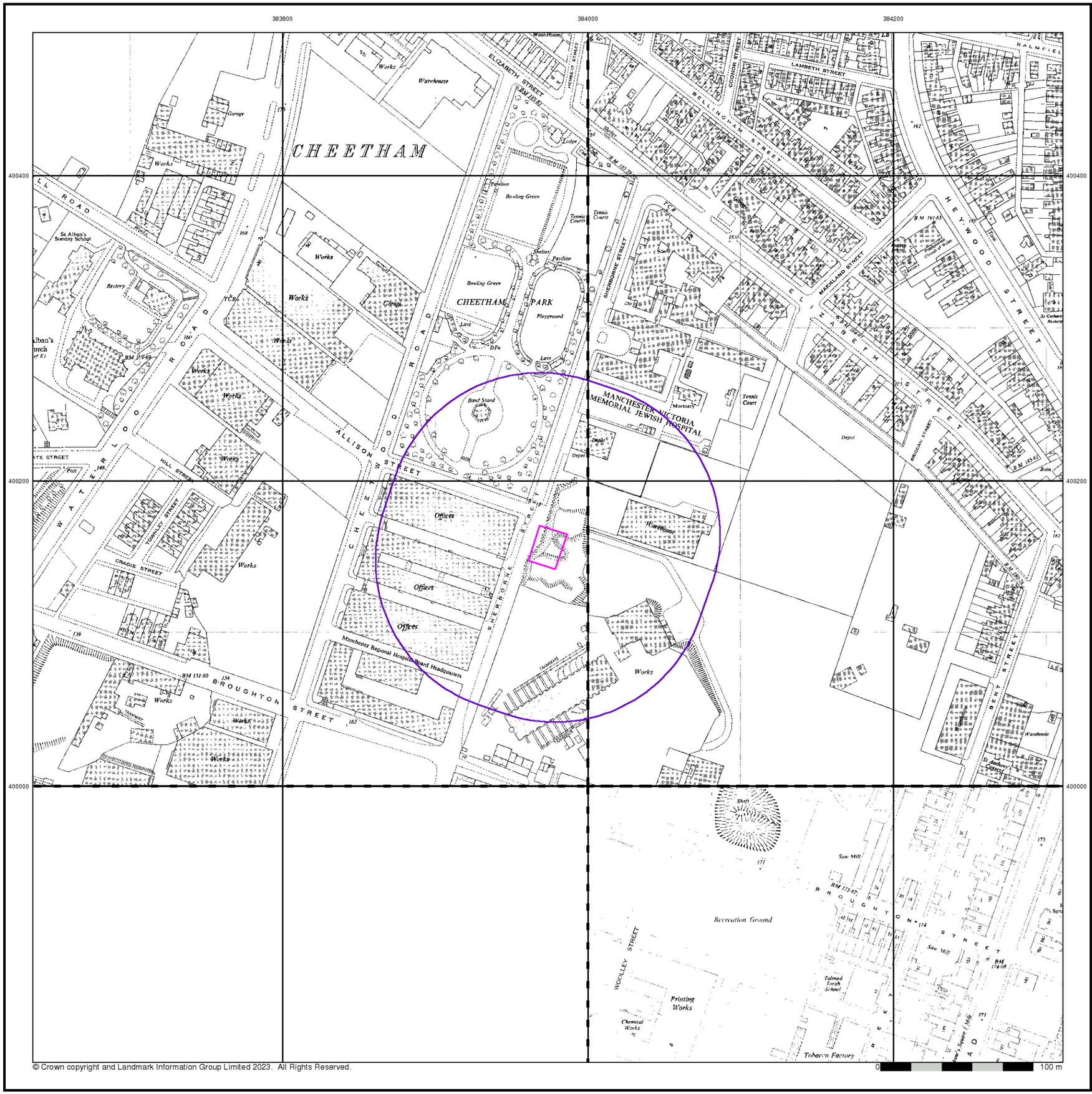
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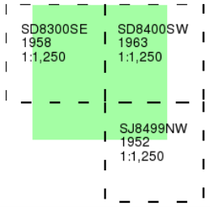
Ordnance Survey Plan

Published 1952 - 1963

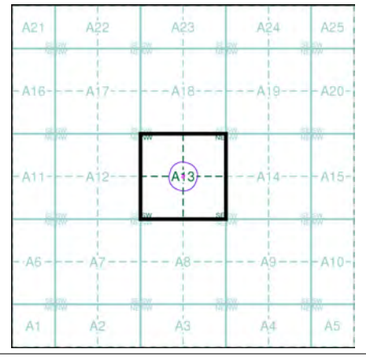
Source map scale - 1:1,250

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)



Historical Map - Segment A13



Order Details

Order Number:	311554510_1_1
Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
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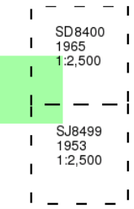
Ordnance Survey Plan

Published 1953 - 1965

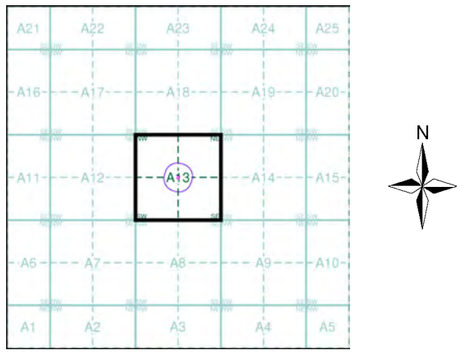
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

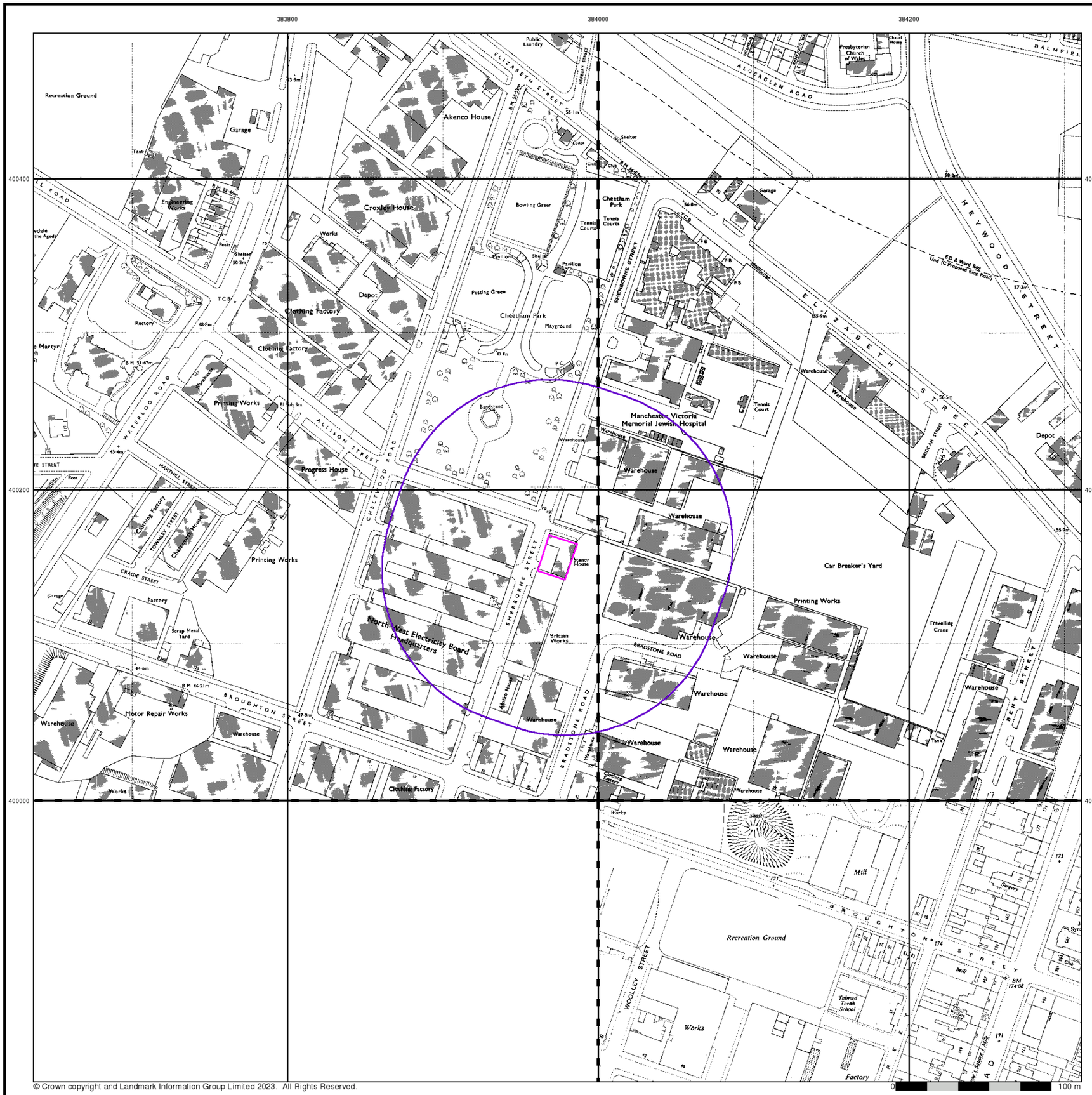
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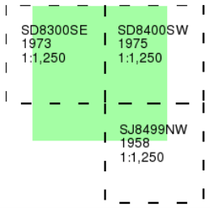
Ordnance Survey Plan

Published 1958 - 1975

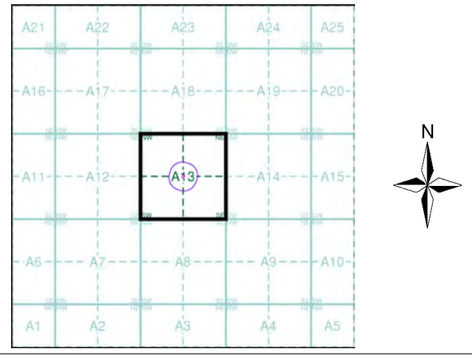
Source map scale - 1:1,250

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)



Historical Map - Segment A13



Order Details

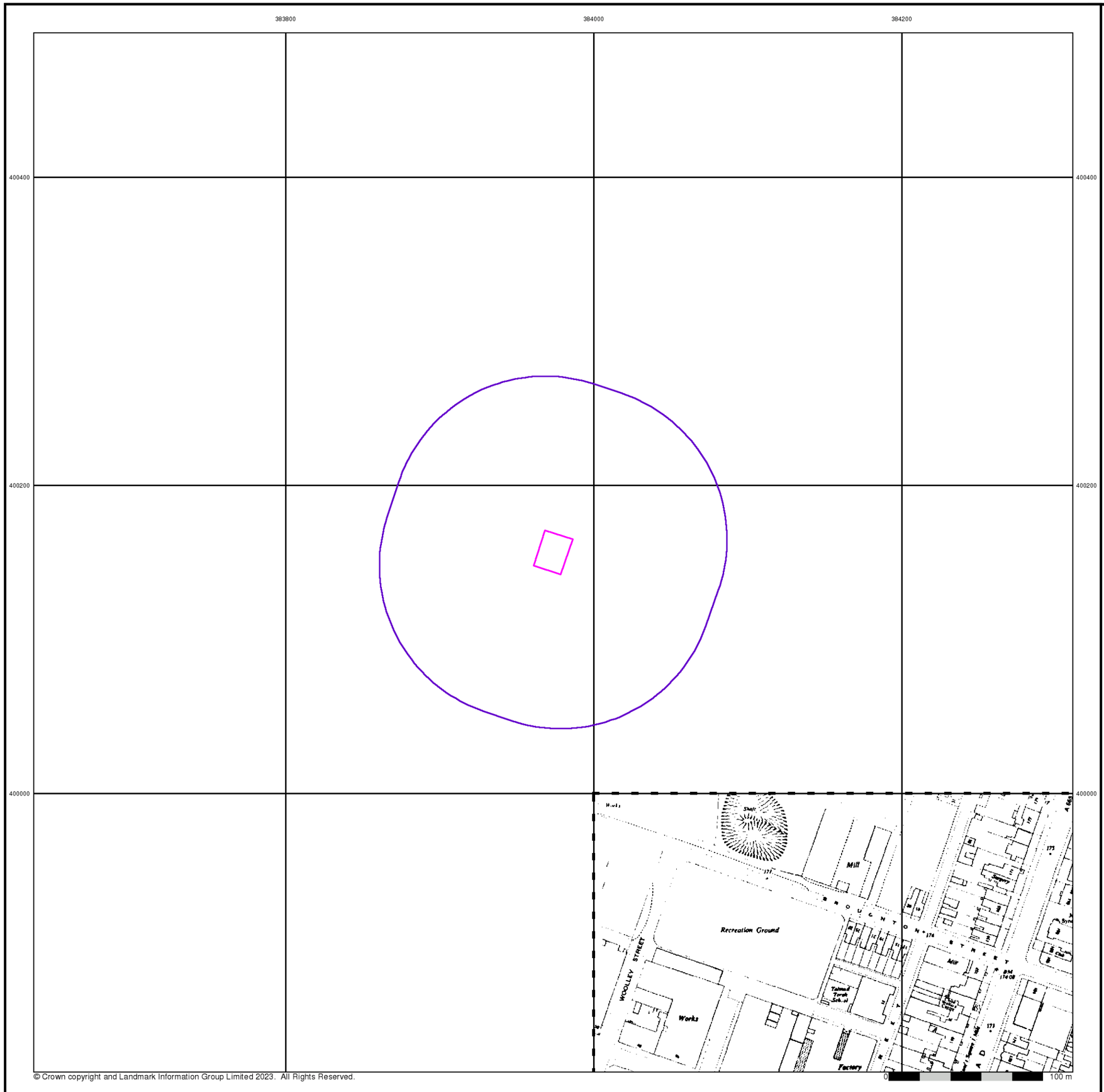
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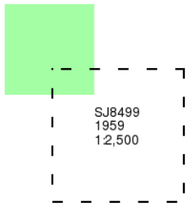
Ordnance Survey Plan

Published 1959

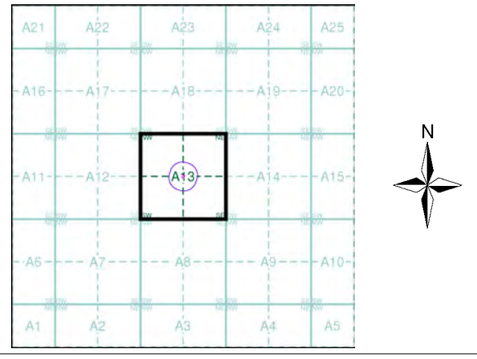
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

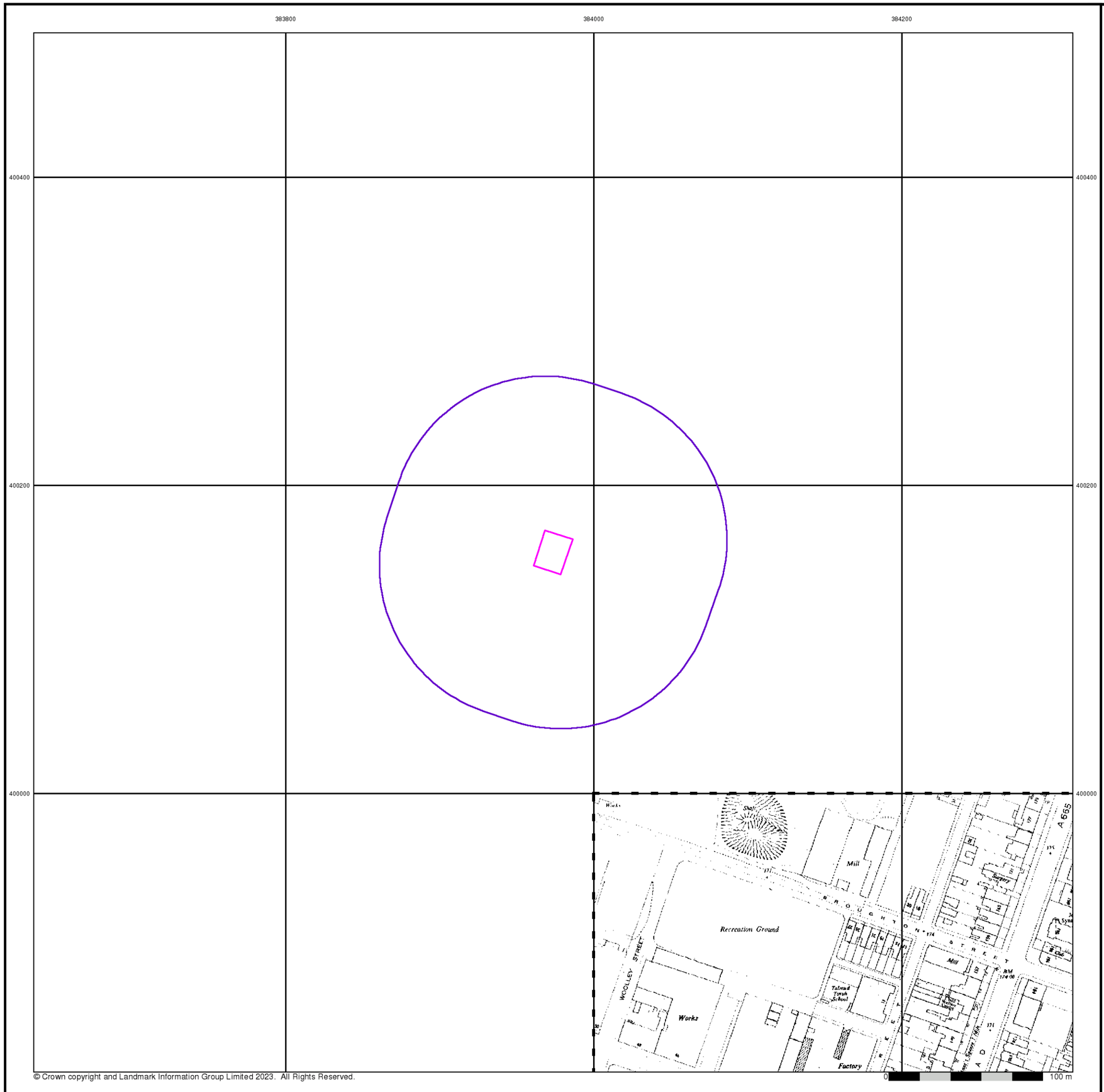
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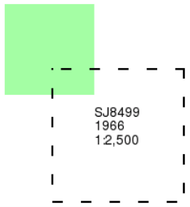
Ordnance Survey Plan

Published 1966

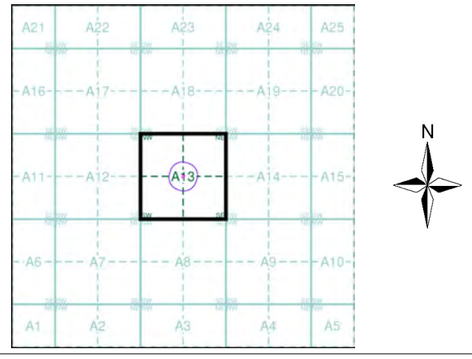
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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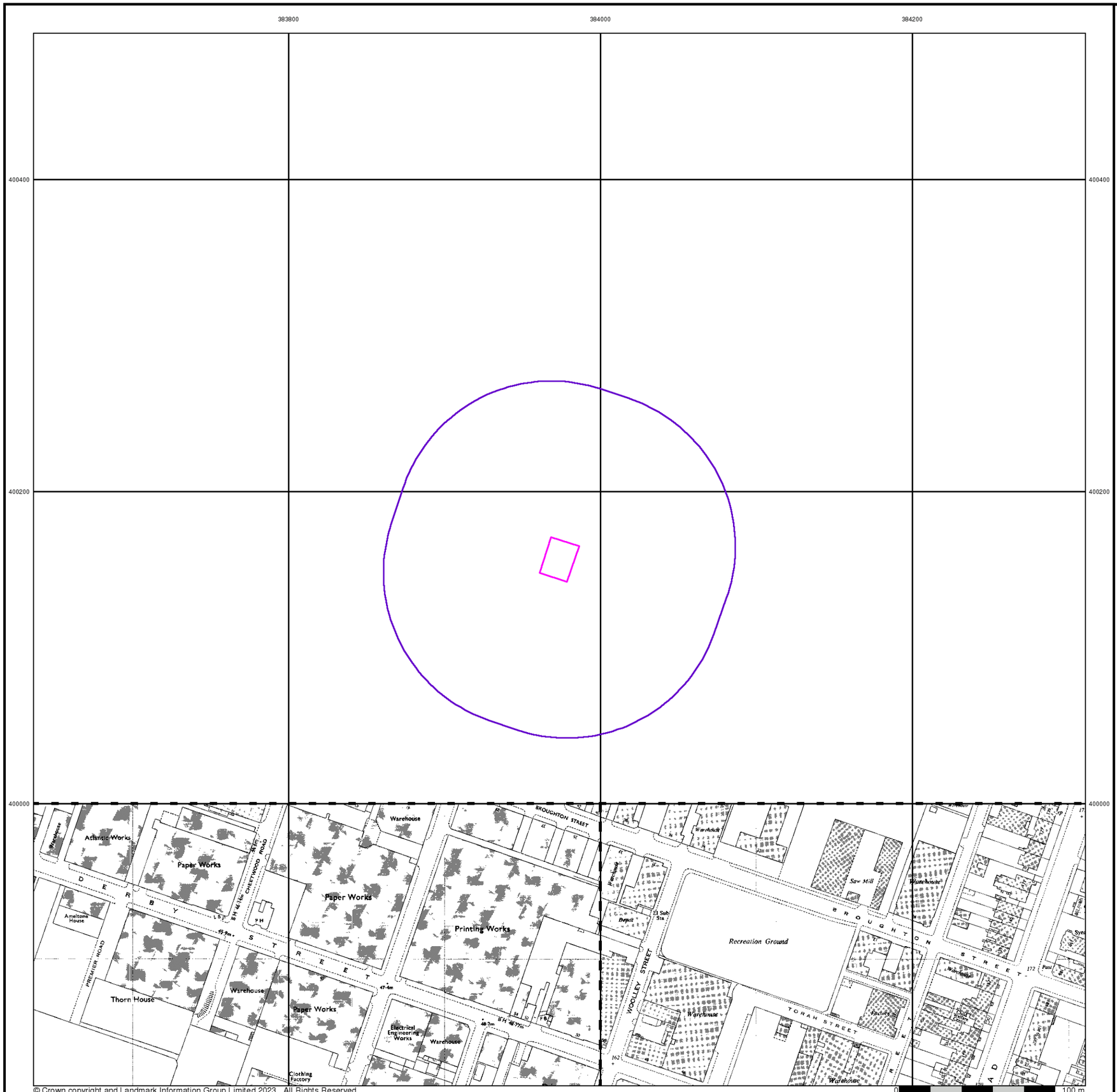
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Ordnance Survey Plan

Published 1968 - 1975

Source map scale - 1:1,250

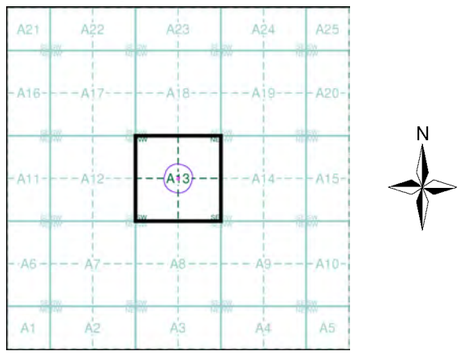
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Map Name(s) and Date(s)

SJ8399NE 1975 1:1,250

SJ8499NW 1968 1:1,250

Historical Map - Segment A13



Order Details

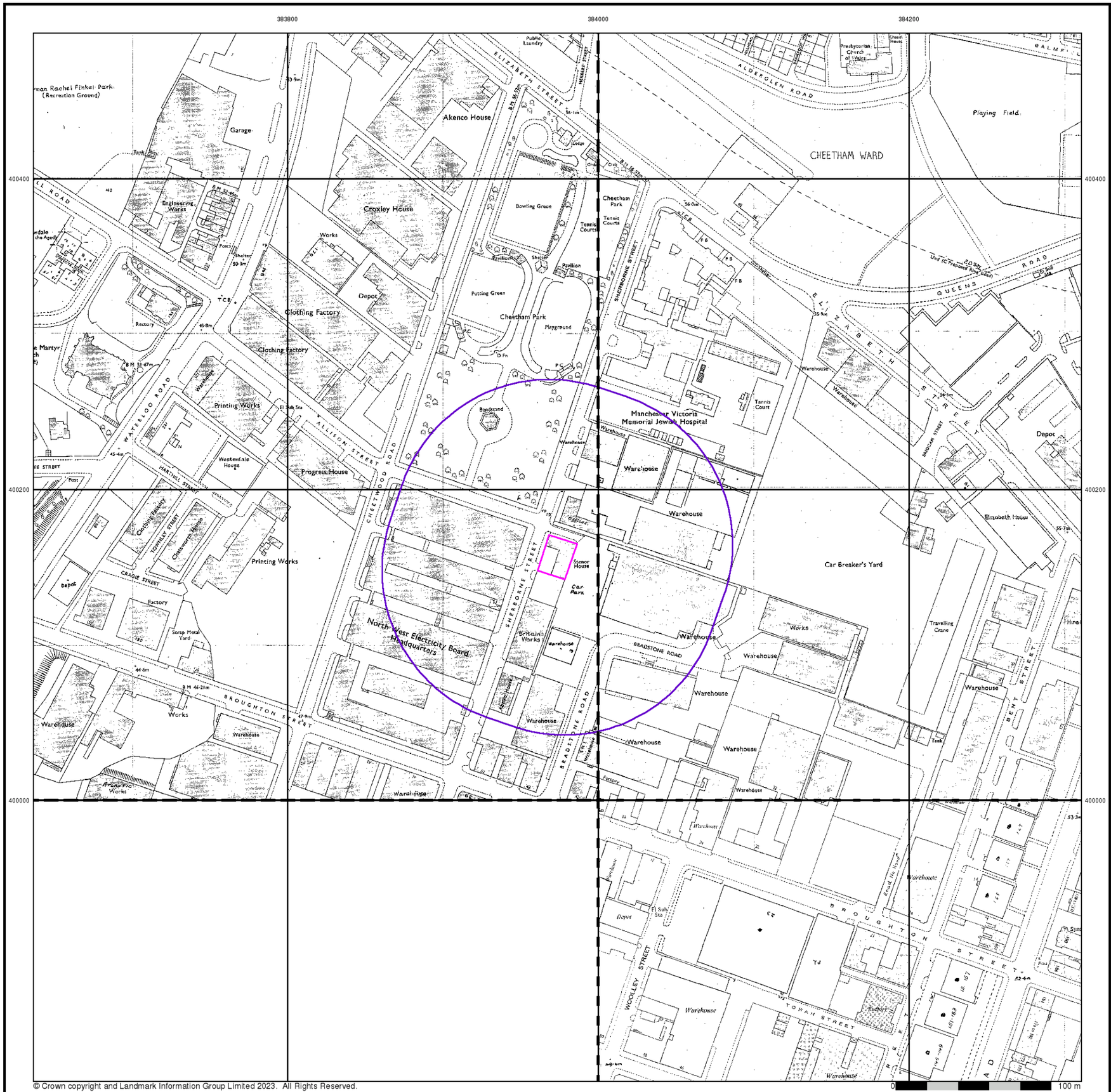
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Additional SIMs

Published 1978 - 1989

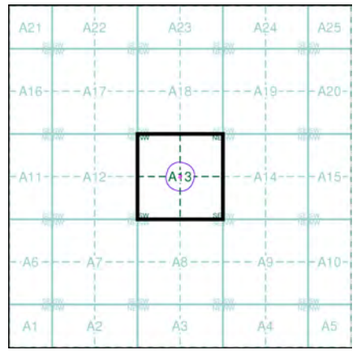
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The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information 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)

SD8300SE 1978 1:1,250	SD8400SW 1982 1:1,250
SJ8399NE 1989 1:1,250	SJ8499NW 1978 1:1,250

Historical Map - Segment A13



Order Details

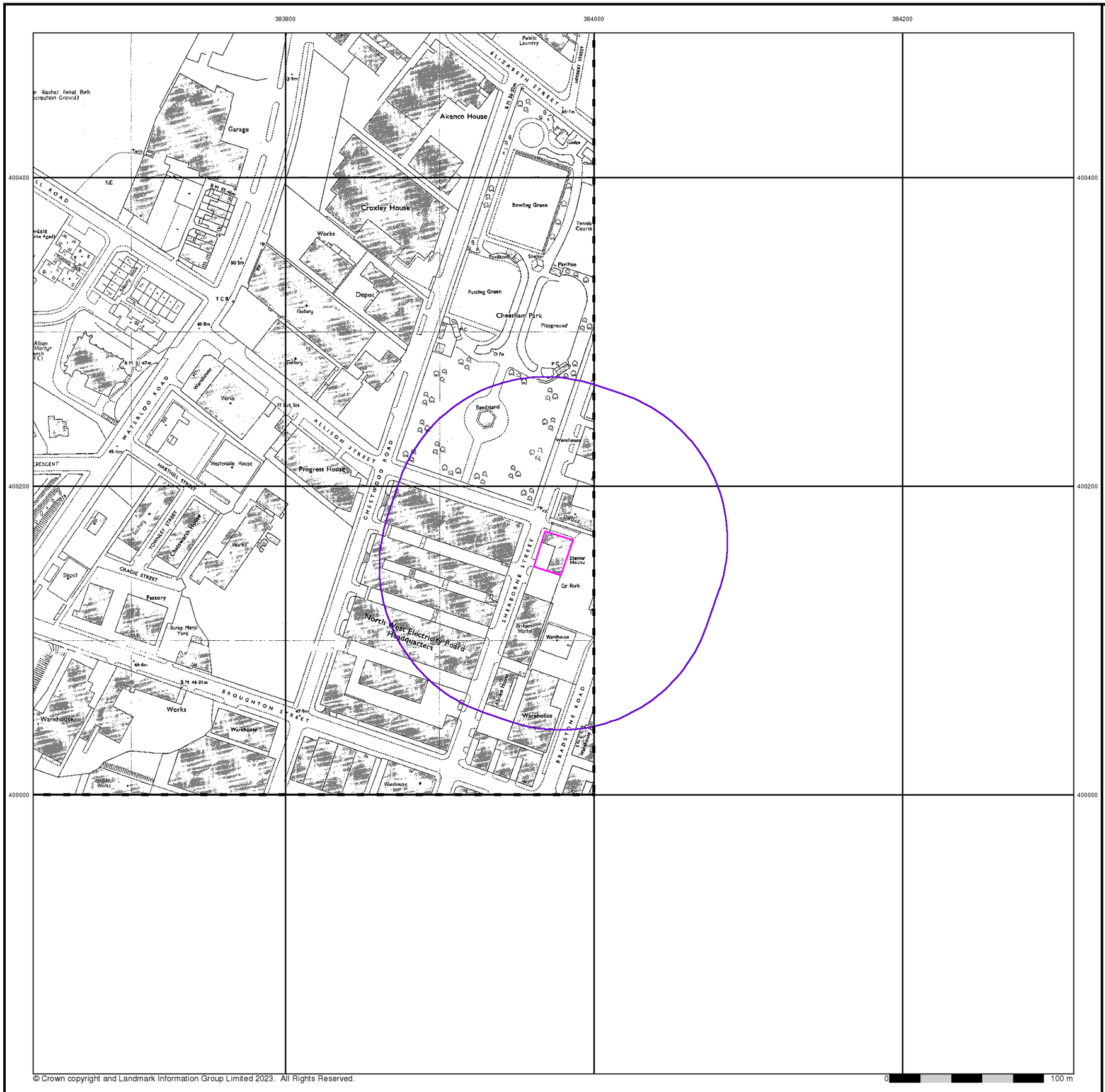
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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	100

Site Details

F Z Imports Ltd, 76, Sherborne Street, MANCHESTER, M8 8NU

Landmark INFORMATION GROUP

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



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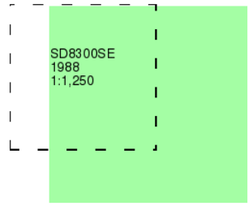
Additional SIMs

Published 1988

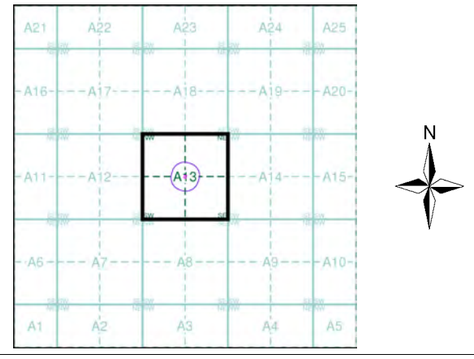
Source map scale - 1:1,250

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

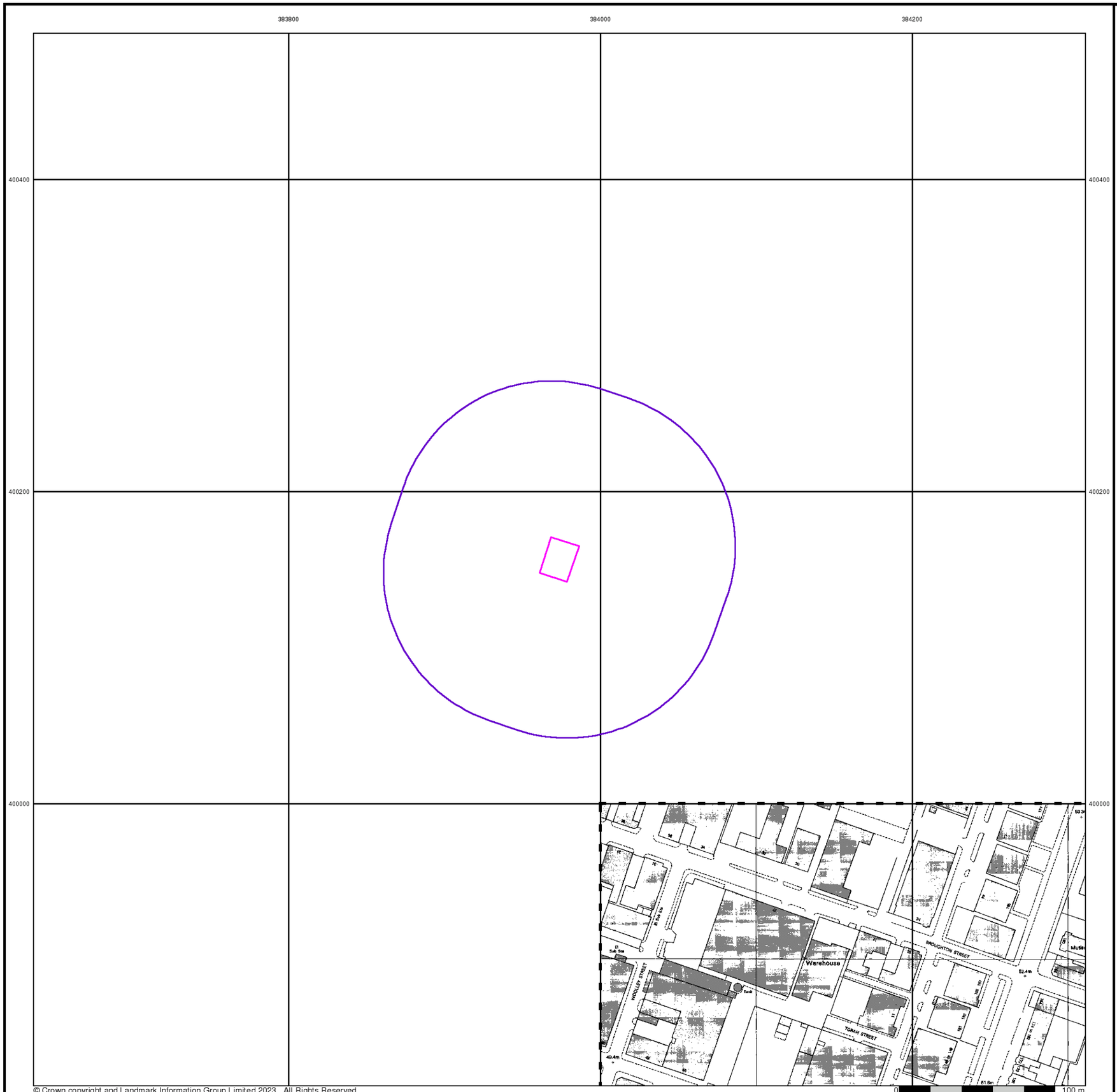
Order Number:	311554510_1_1
Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	100

Site Details

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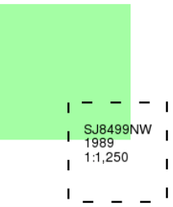
Ordnance Survey Plan

Published 1989

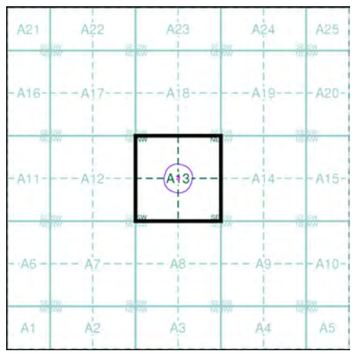
Source map scale - 1:1,250

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)



Historical Map - Segment A13

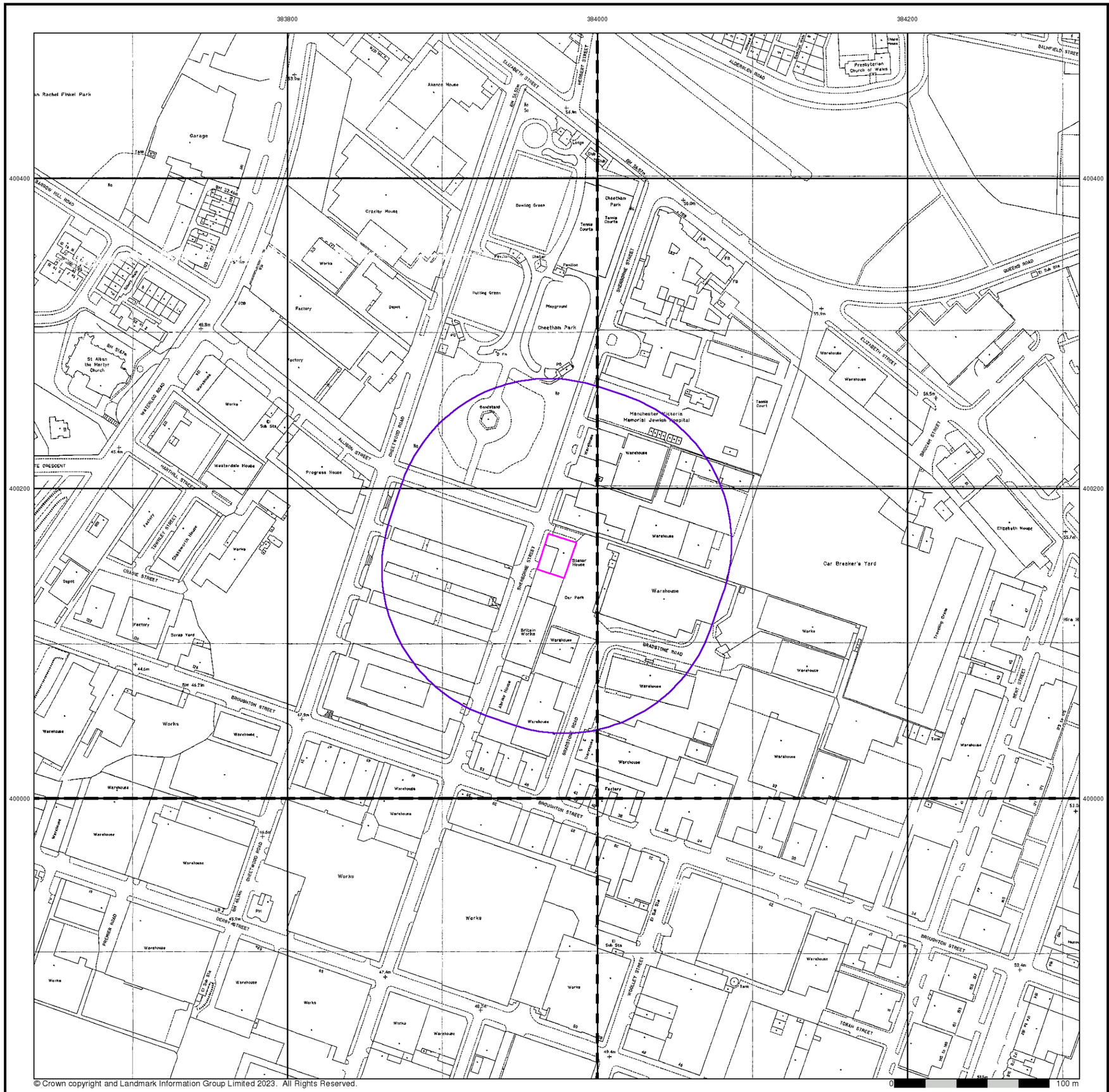


Order Details

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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	100

Site Details

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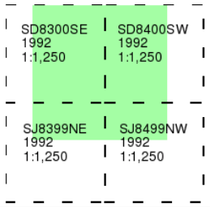
Large-Scale National Grid Data

Published 1992

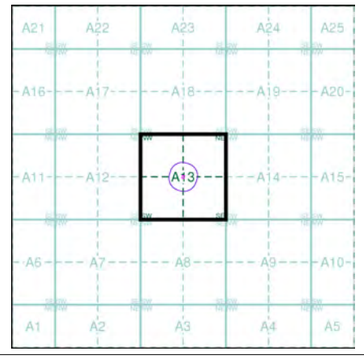
Source map scale - 1:1,250

'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



Order Details

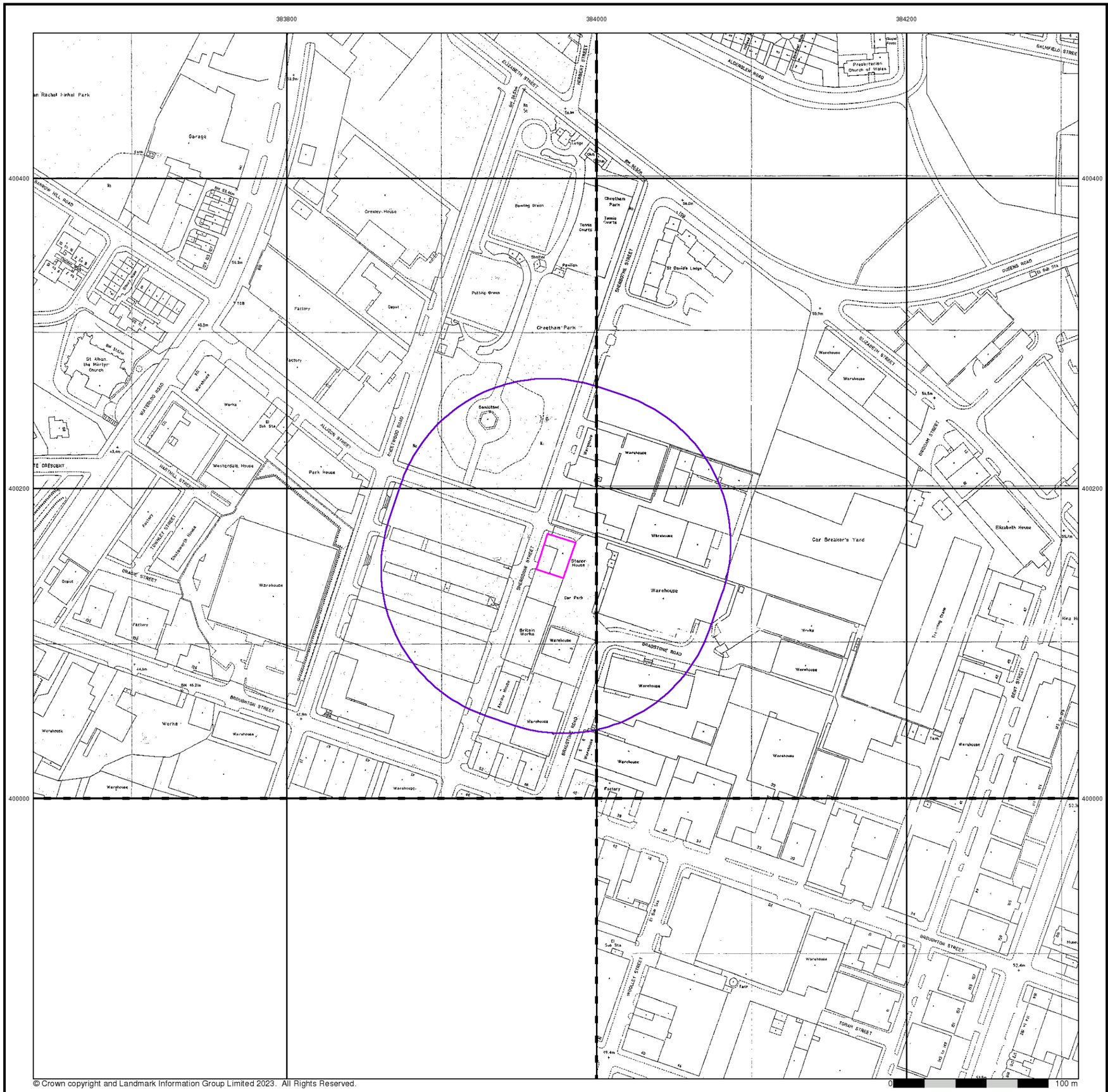
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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	100

Site Details

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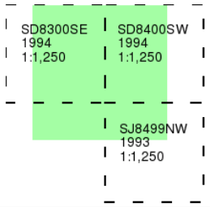
Large-Scale National Grid Data

Published 1993 - 1994

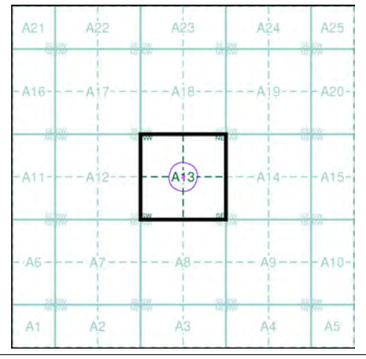
Source map scale - 1:1,250

'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



Order Details

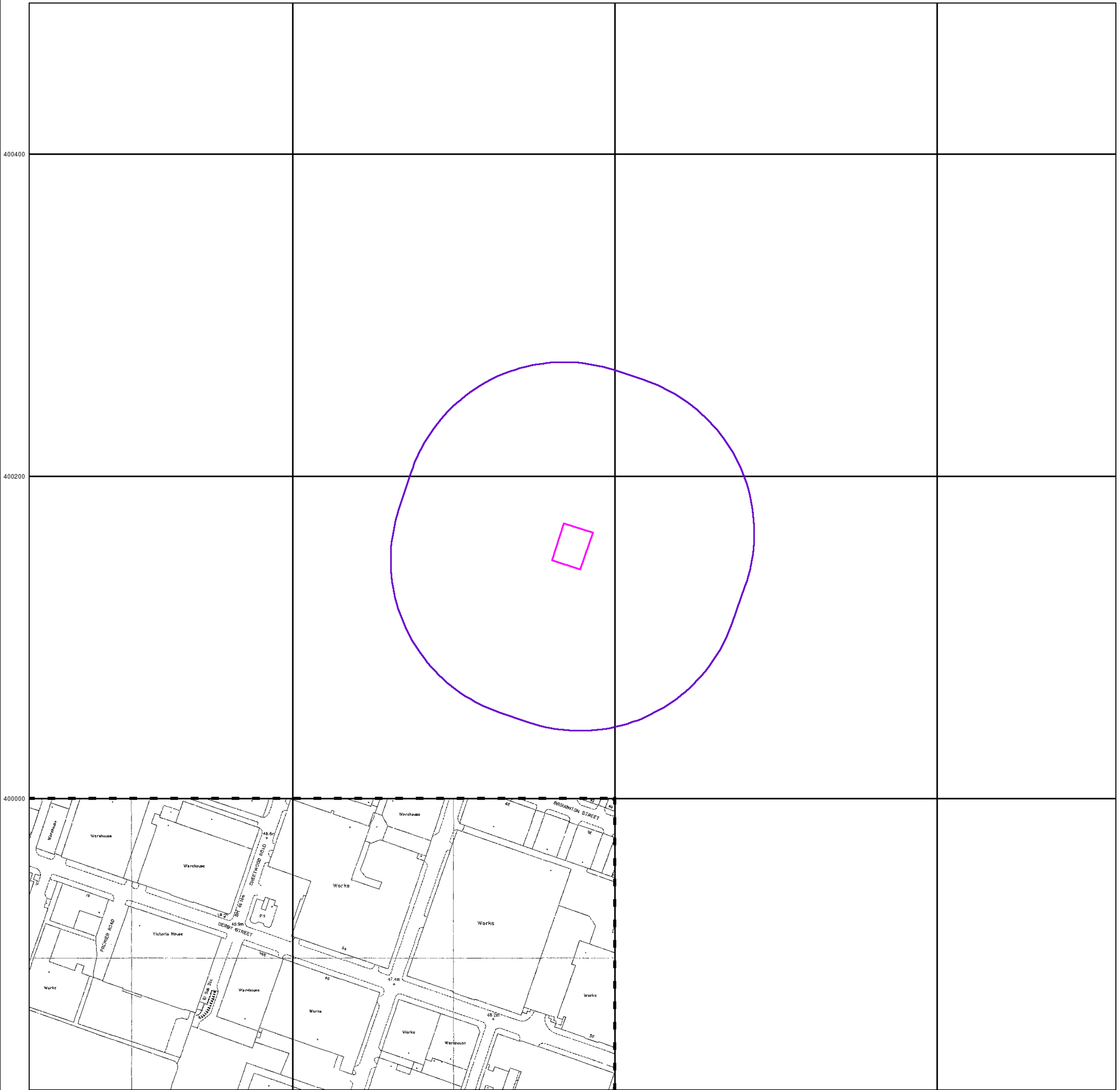
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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	100

Site Details

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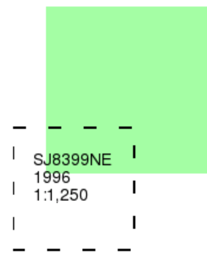
Large-Scale National Grid Data

Published 1996

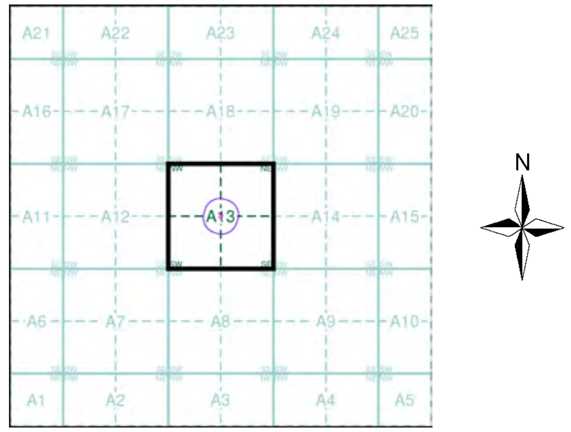
Source map scale - 1:1,250

'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

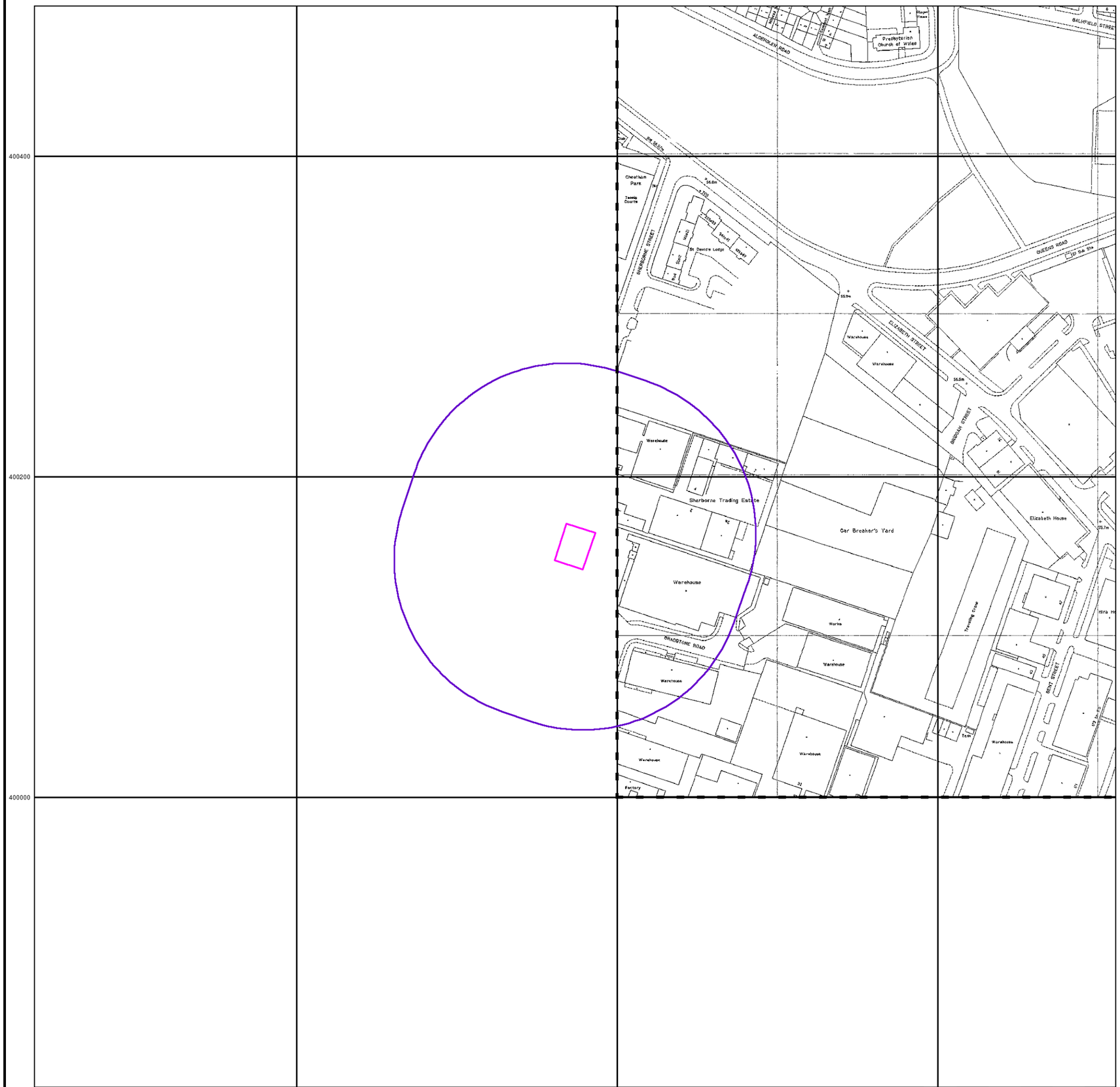


Order Details

Order Number: 311554510_1_1
Customer Ref: ES190523
National Grid Reference: 383970, 400160
Slice: A
Site Area (Ha): 0.05
Search Buffer (m): 100

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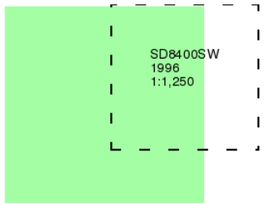
Large-Scale National Grid Data

Published 1996

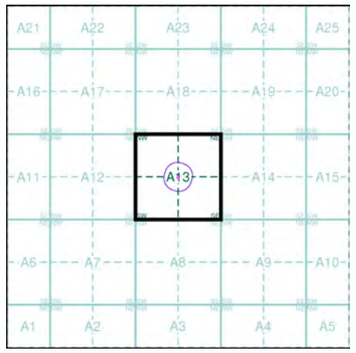
Source map scale - 1:1,250

'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



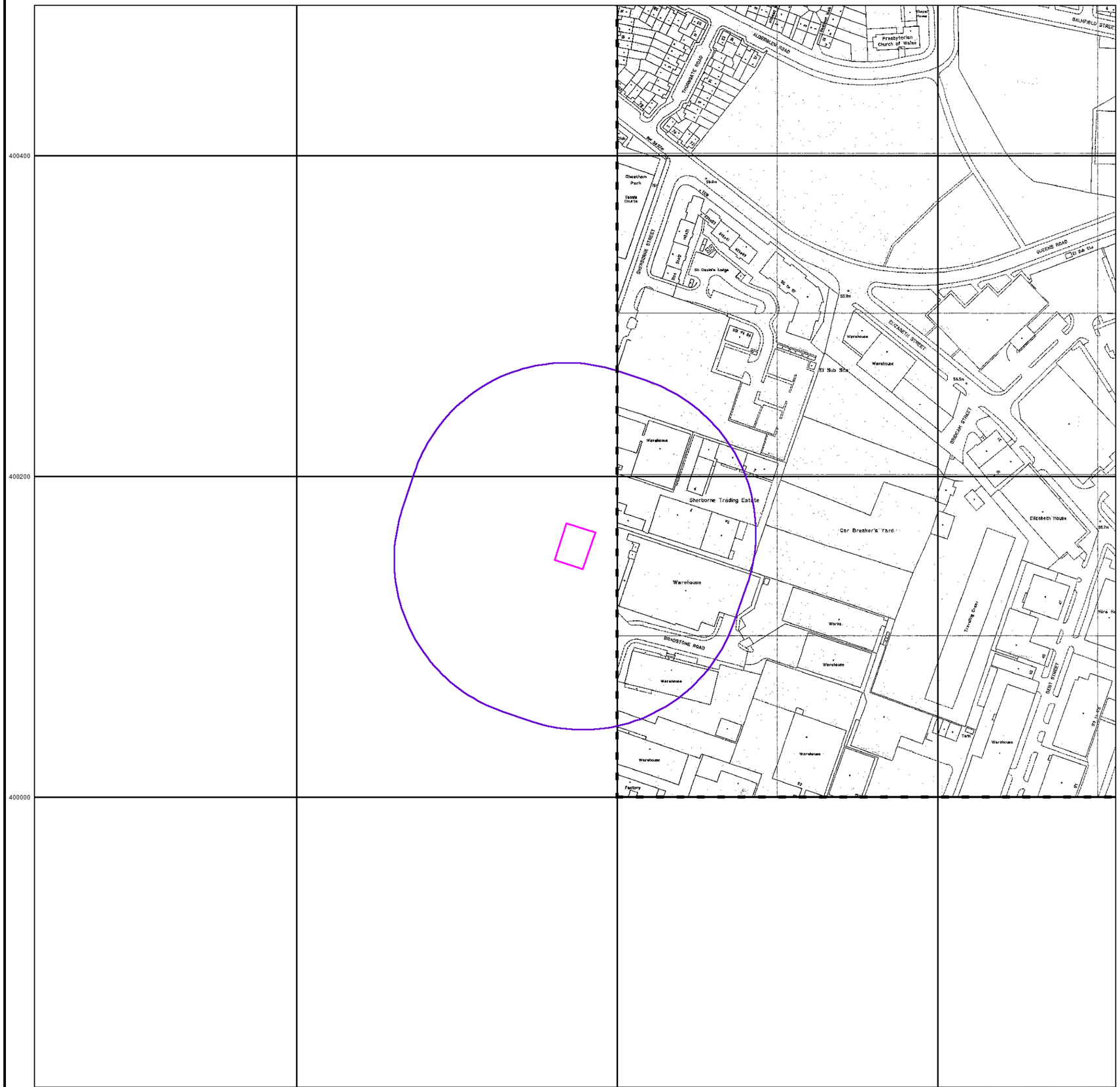
Order Details

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Customer Ref:	ES190523
National Grid Reference:	383970, 400160
Slice:	A
Site Area (Ha):	0.05
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Site Details

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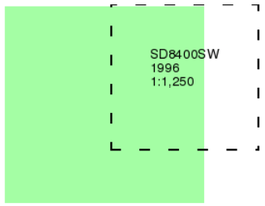
Large-Scale National Grid Data

Published 1996

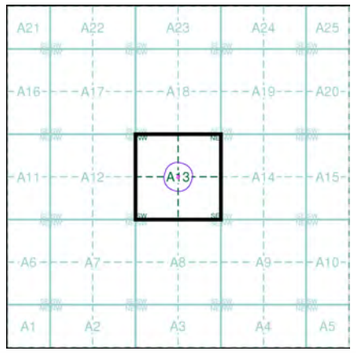
Source map scale - 1:1,250

'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



Order Details

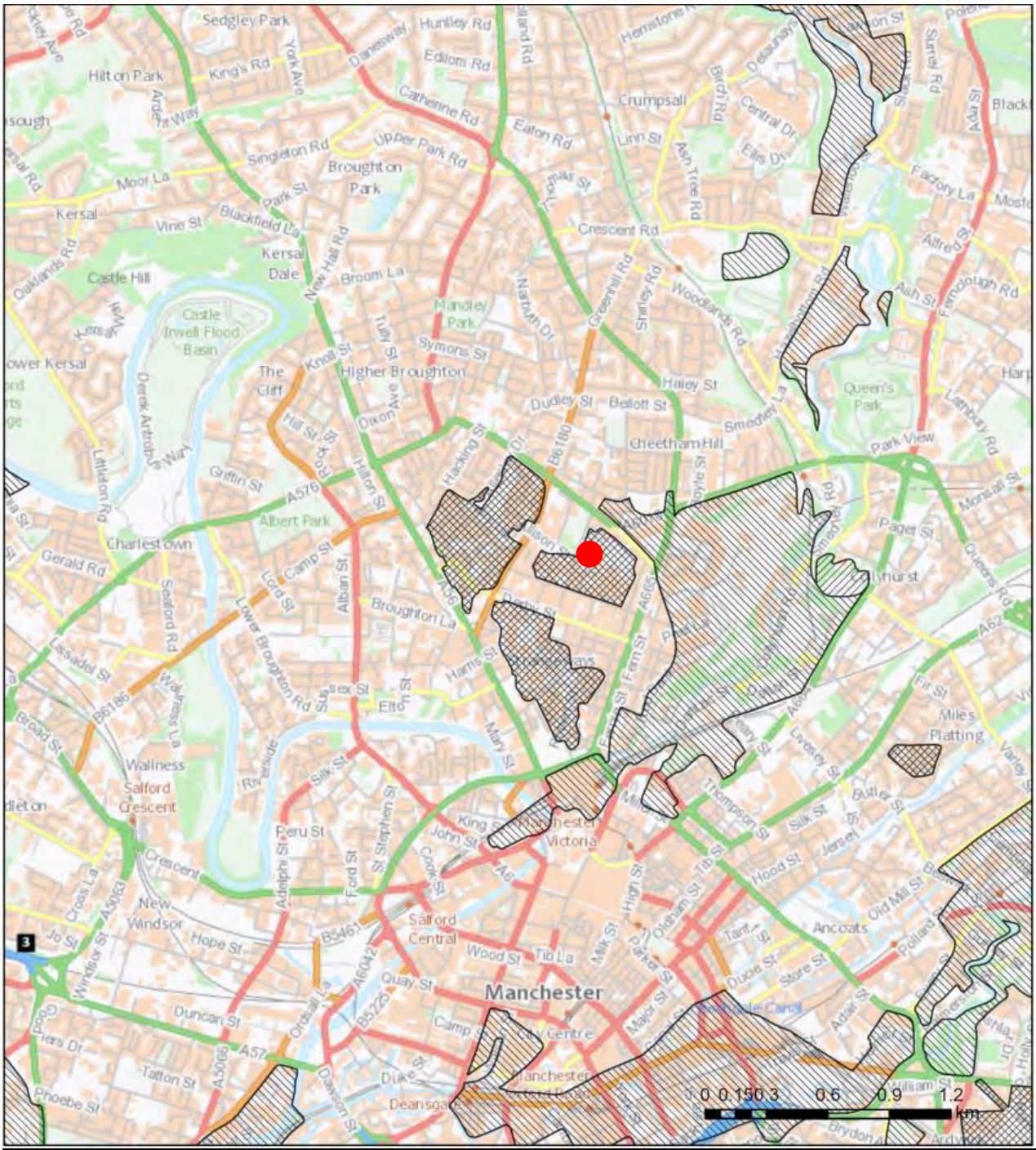
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Customer Ref:	ES190523
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Slice:	A
Site Area (Ha):	0.05
Search Buffer (m):	100

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Appendix D – Geological Maps



enviro | solution	**Artifical Ground Geology**

Artificial ground 1:50,000 scale

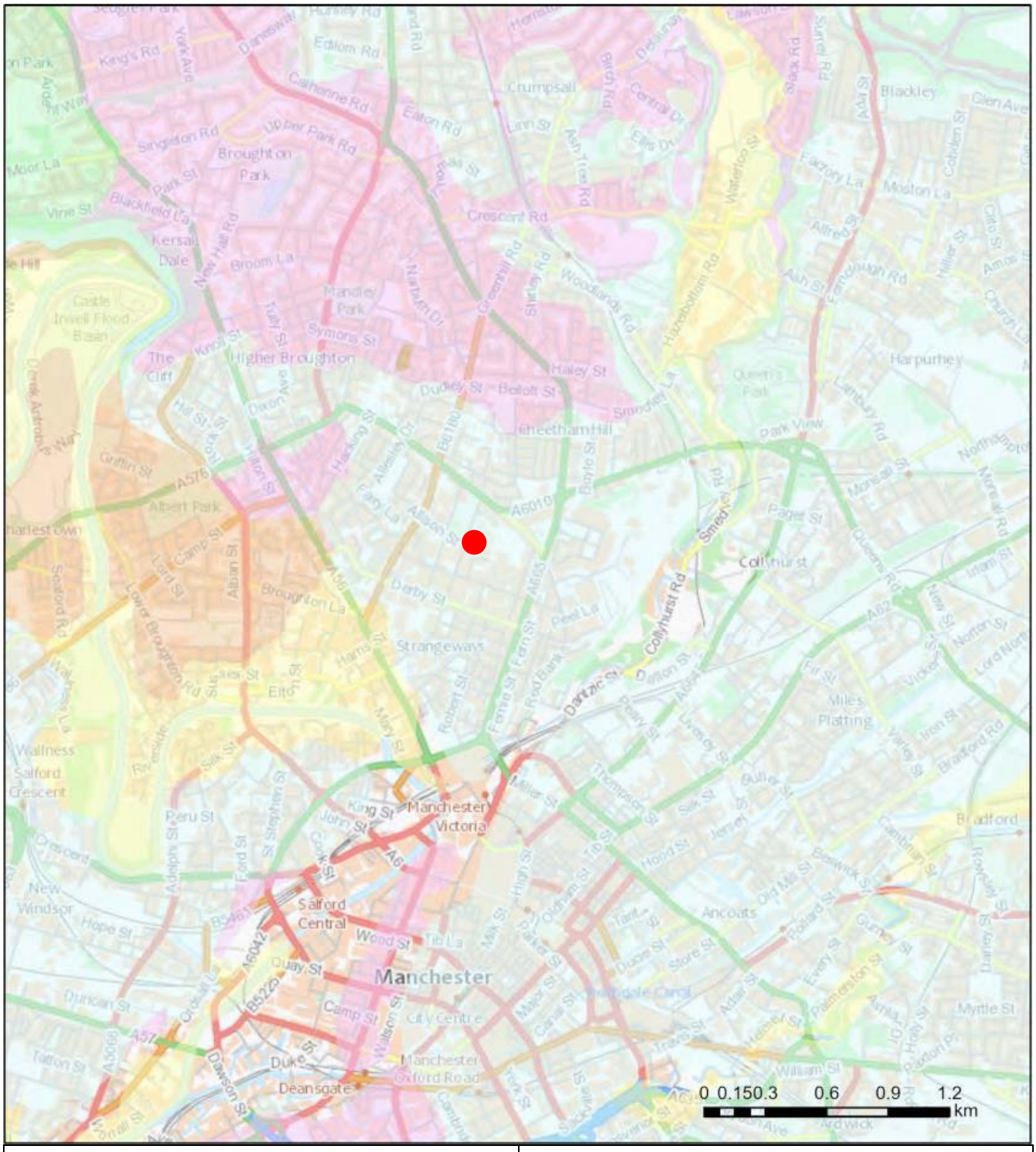


MADE GROUND (UNDIVIDED) - ARTIFICIAL DEPOSIT

WORKED GROUND (UNDIVIDED) - VOID

INFILLED GROUND - ARTIFICIAL DEPOSIT

enviro | solution	**Artificial Ground Geology Key**

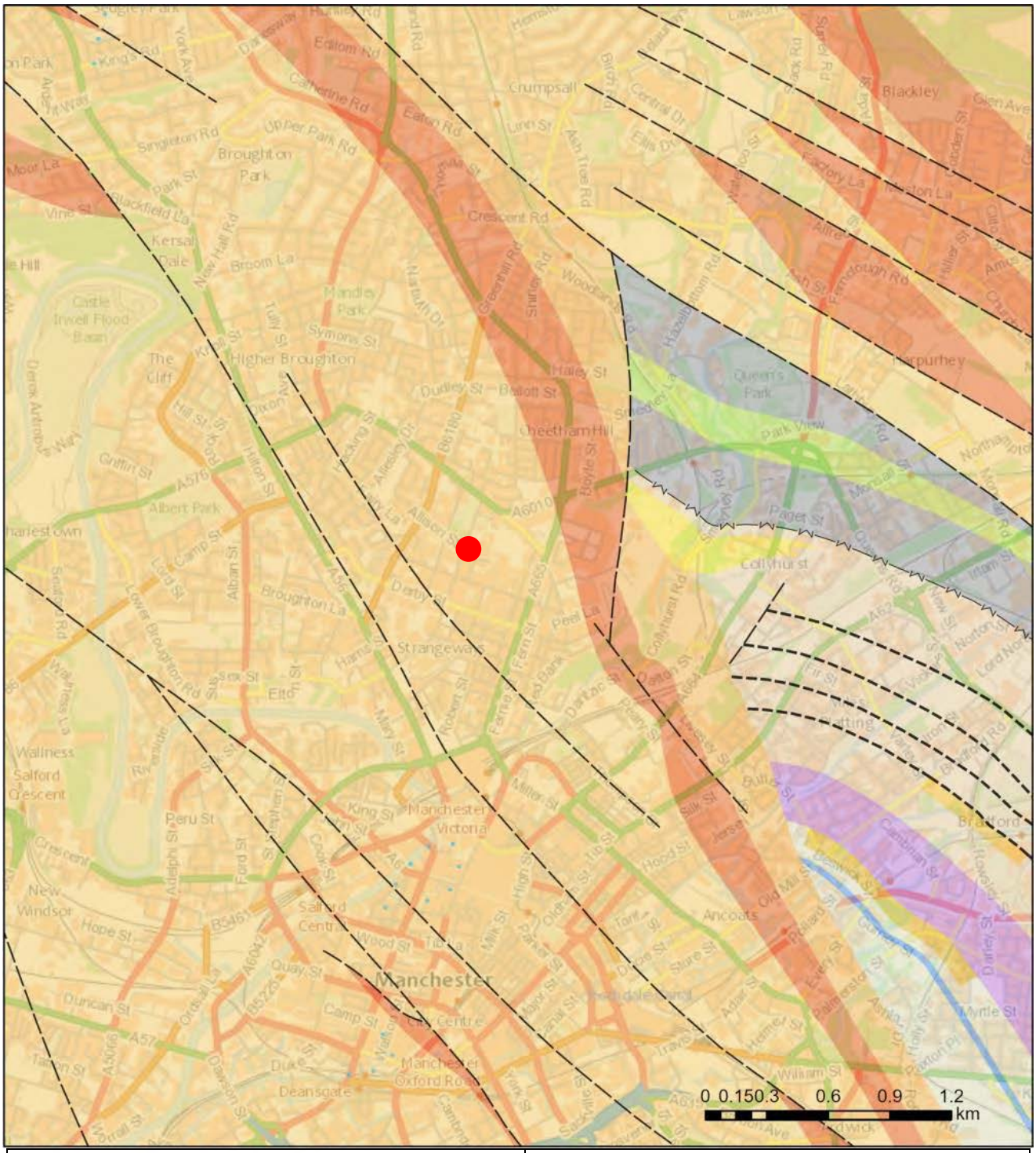


enviro | solution	**Superficial Geology**

Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- HUMMOCKY (MOUNDY) GLACIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- RIVER TERRACE DEPOSITS, 1 - SAND AND GRAVEL
- PEAT - PEAT

enviro | solution	**Superficial Geology Key**



enviro | solution	**Bedrock Geology**

Bedrock geology 1:50,000 scale

- GREAT MINE LIMESTONE - LIMESTONE
- ETRURIA FORMATION - SANDSTONE AND MUDSTONE
- HALESOWEN FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- PENNINE UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- CHESTER FORMATION - SANDSTONE
- COLLYHURST SANDSTONE FORMATION - SANDSTONE
- NEWTON HEATH SANDSTONE - SANDSTONE
- WORSLEY DELF ROCK - SANDSTONE
- OPENSHAW SANDSTONE - SANDSTONE
- MANCHESTER MARLS FORMATION - MUDSTONE
- HOLT TOWN SANDSTONE BED - SANDSTONE

Linear features 1:50,000 scale

- Buried_channel_Margin
- Coal_seam_Inf
- Coal_seam_Obs
- Fault_Inf_Crossmark_on_downthrow_side
- Marine_band

enviro | solution	**Bedrock Geology Key**

Appendix E – BGS Borehole

British Geological Survey

BGS ID: 29013 : BGS Reference: SD80SW225
EPSG: 27700 : 384220,400310

SD 80 SW 225

8422 0031

HOLST & CO. LTD.
SITE INVESTIGATION DEPT.
5-7, NEW YORK ROAD
LEEDS, 2

Contract No. M1946/F1261 Borehole No. 2
Location vCheetham Hill Ground Level
Client Manchester City Architect Date 1.7.69

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	ø deg.	m.c %	γ lb/cu. ft.	N
Made ground: Road sets		2'6"	2'6"	3'0"					
Light brown sandy clay		3'6"	1'0"		1800	0	23.9	122	
Stiff red/brown boulder clay				8'0"	5450	0	18.2	130	
				12'9"	4280	0	19.7	131	
			21'6"	18'0	1790	0	20.8	126	
				23'6"	2030	0	19.9	132	
		25'0"							

Water Struck at None encountered Maximum Observed Water Level

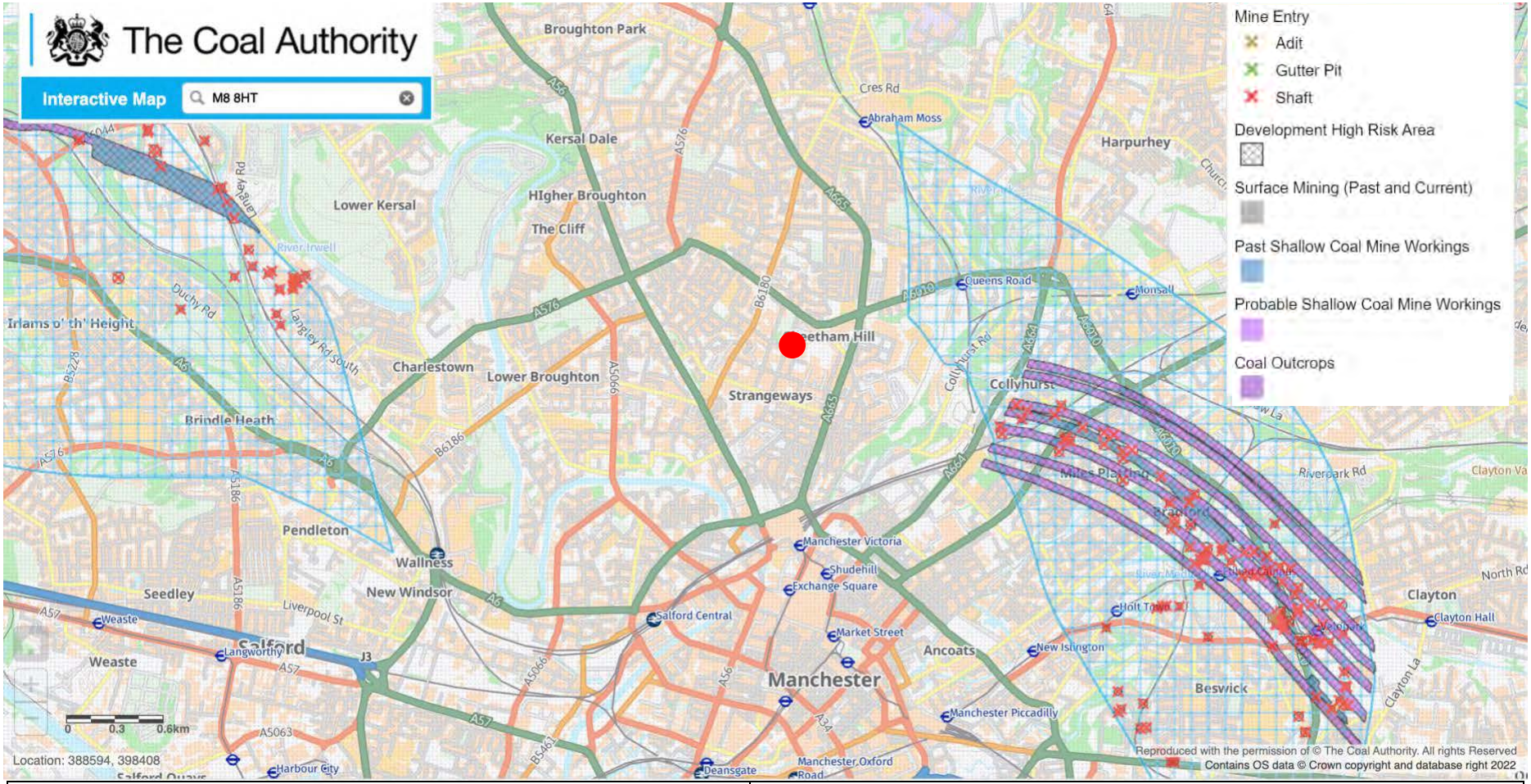
Undisturbed Sample []
Disturbed Sample o
Water Sample Δ
Penetration Test I

c = Cohesion
ø = Angle of Internal Friction
m.c = Moisture Content
γ = Bulk Density
N = Standard Penetration Value

Water levels are subject to seasonal or tidal variation and should not be taken as constant

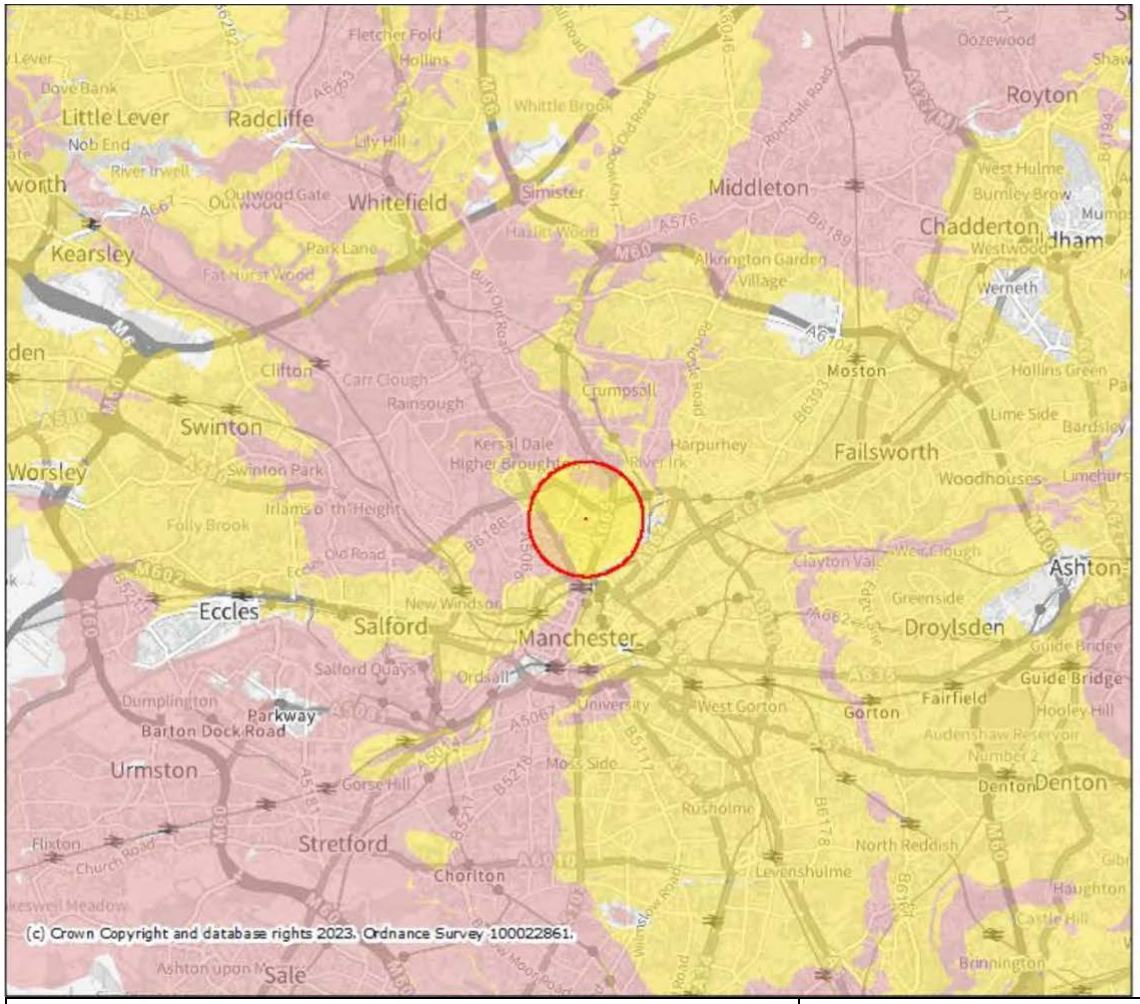
Contact BGS: ngdc@bgs.ac.uk

Appendix F – Coal Authority Map



enviro | solution	**The Coal Authority Map**

Appendix G – Hydrogeological Maps



Legend

Aquifer Designation Map (Superficial Drift) (England)

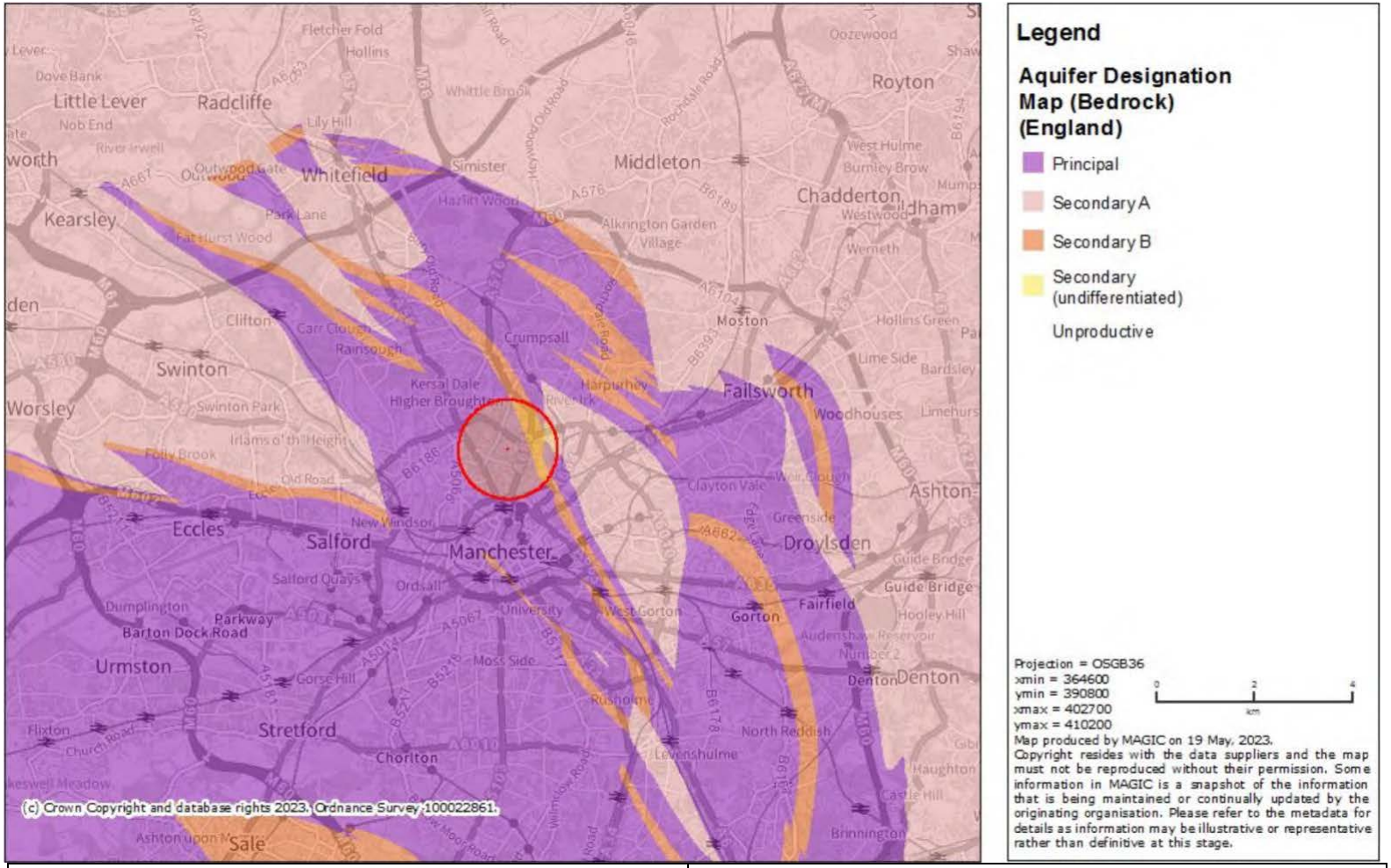
- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive

Projection = OSGB36
xmin = 364600
ymin = 390800
xmax = 402700
ymax = 410200

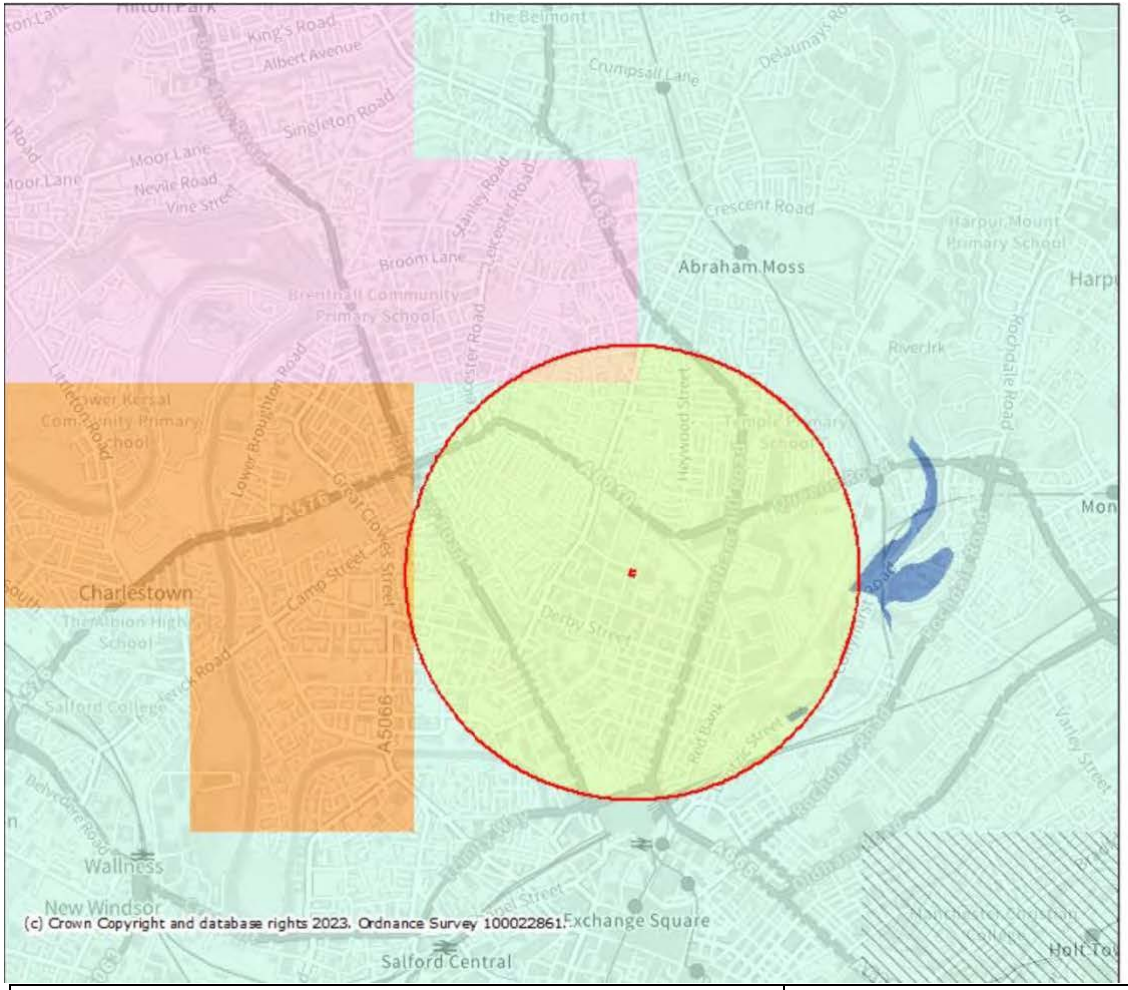
0 2 4
km

Map produced by MAGIC on 19 May, 2023.
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enviro | solution	**Superficial Aquifer**



enviro | solution	**Bedrock Aquifer**



Legend

Groundwater Vulnerability Map (England)

- Local Information
- Soluble Rock Risk
- High
- Medium - High
- Medium
- Medium - Low
- Low
- Unproductive

Projection = OSGB36
xmin = 378900
ymin = 398100
xmax = 388400
ymax = 402900

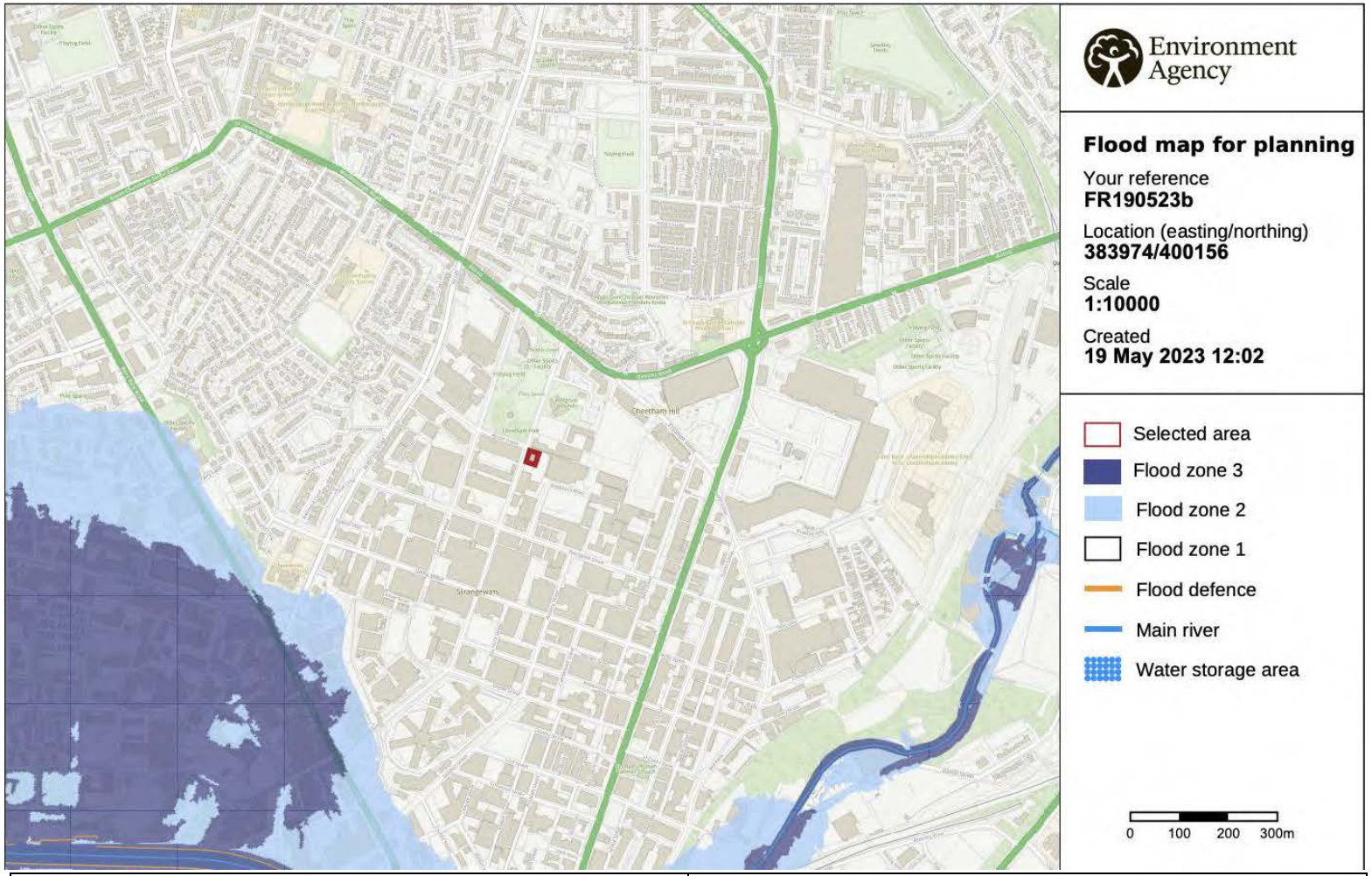
0 0.5 1
km

Map produced by MAGIC on 19 May, 2023.

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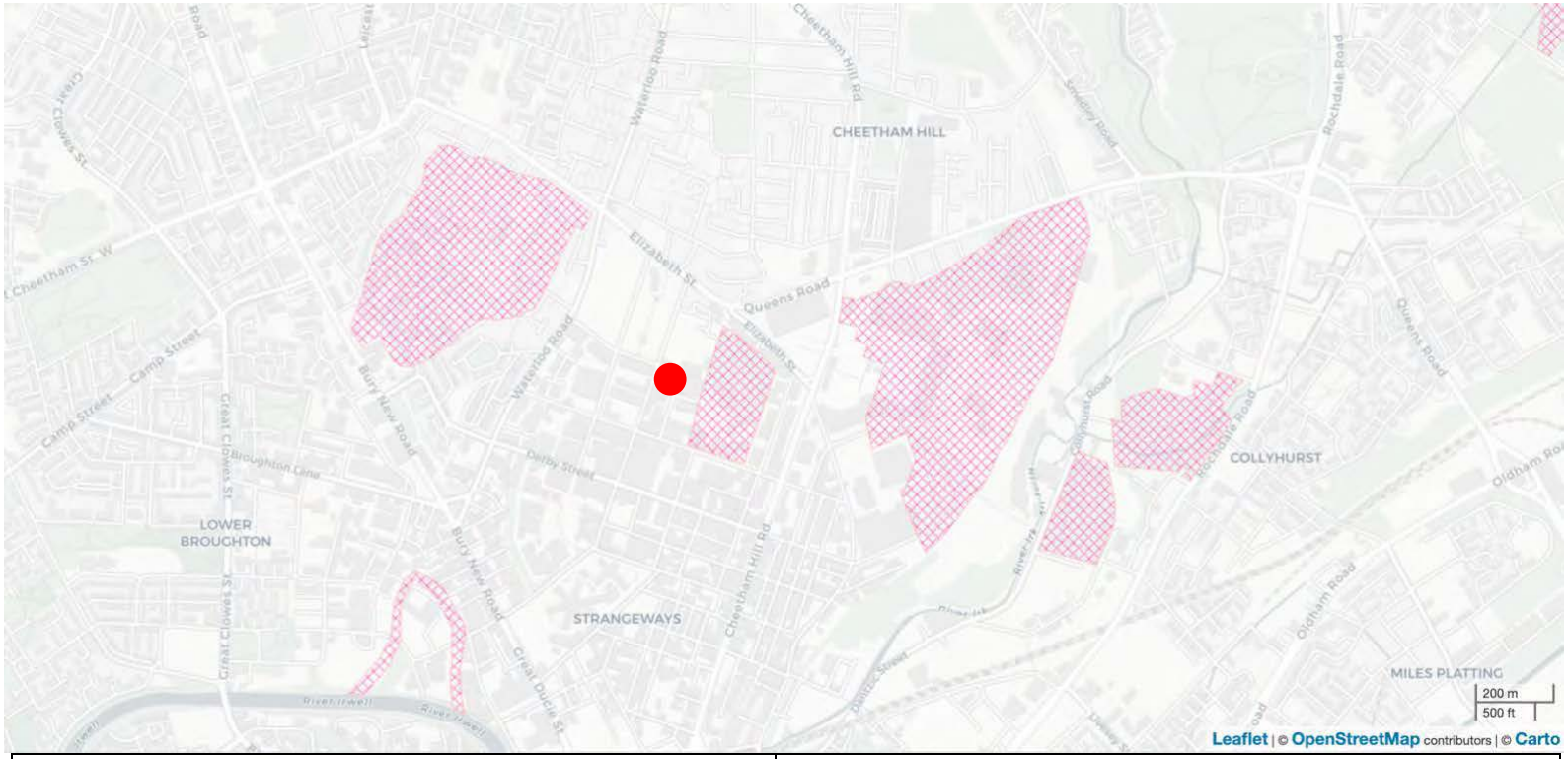
enviro | solution	**Groundwater Vulnerability**

Appendix H – Flood Risk Map



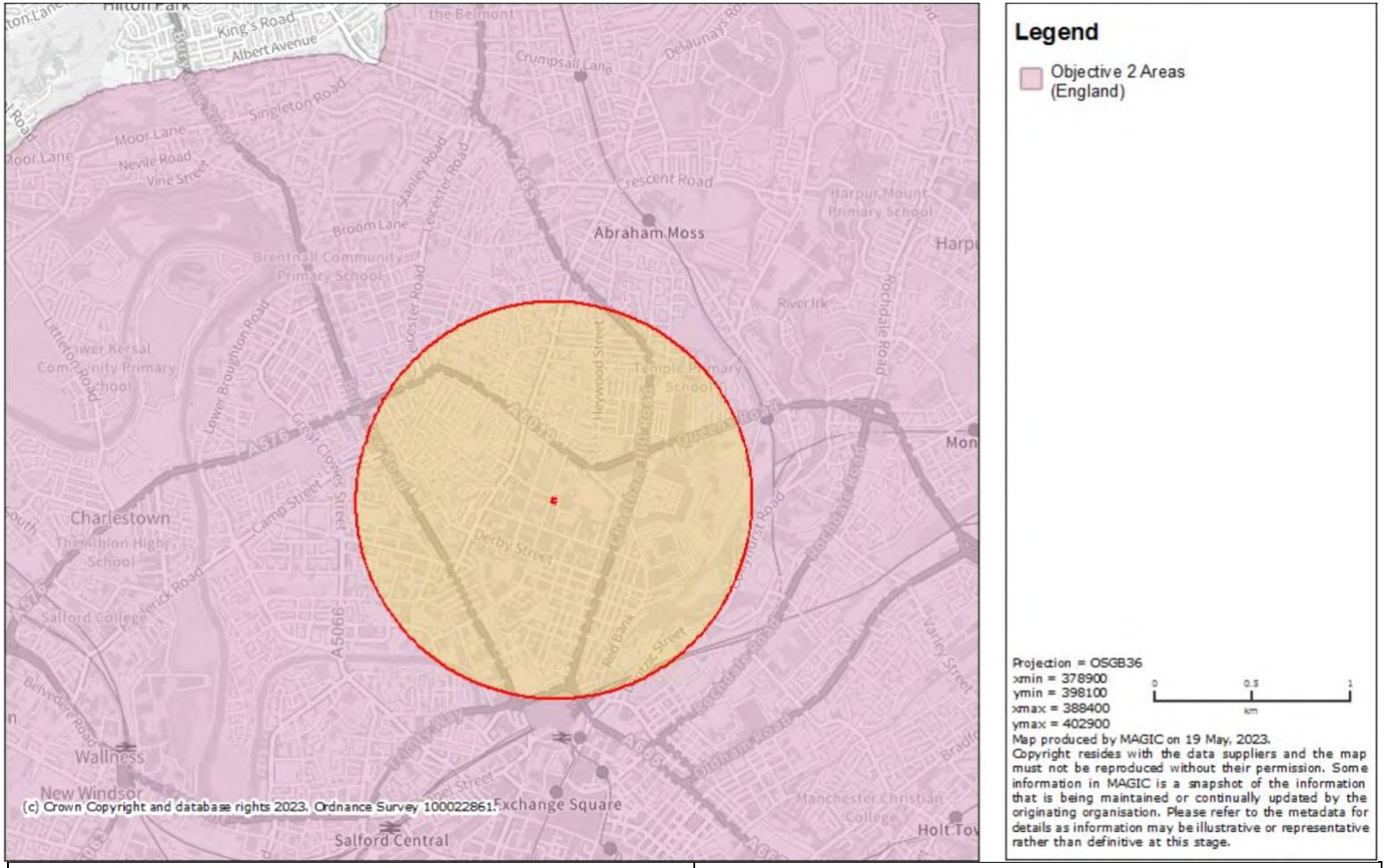
enviro | solution	**Flood Risk Map**

Appendix I – Historic Landfill Map

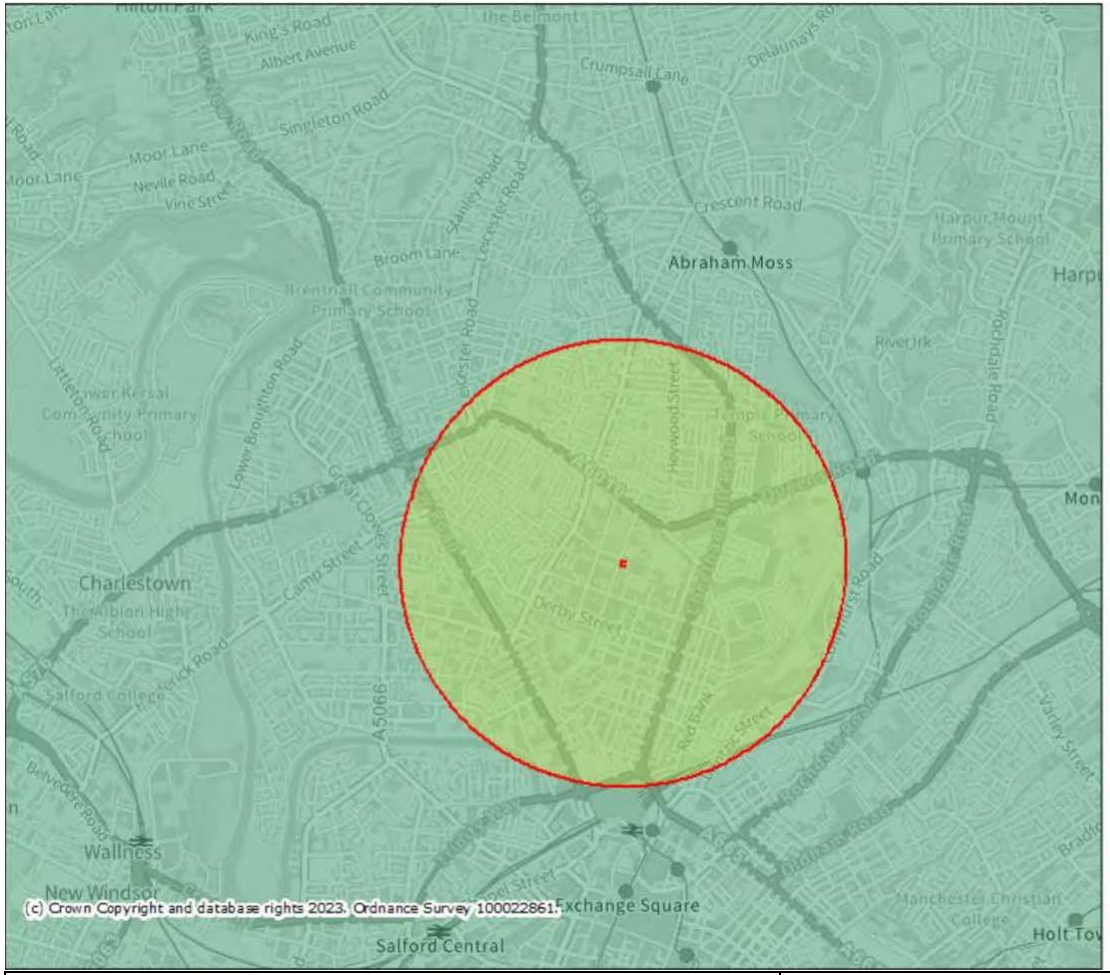


enviro | solution	**Historic Landfill Map**

Appendix J – Environmental Designations



enviro | solution	**Objective 2 Areas (England)**



Legend

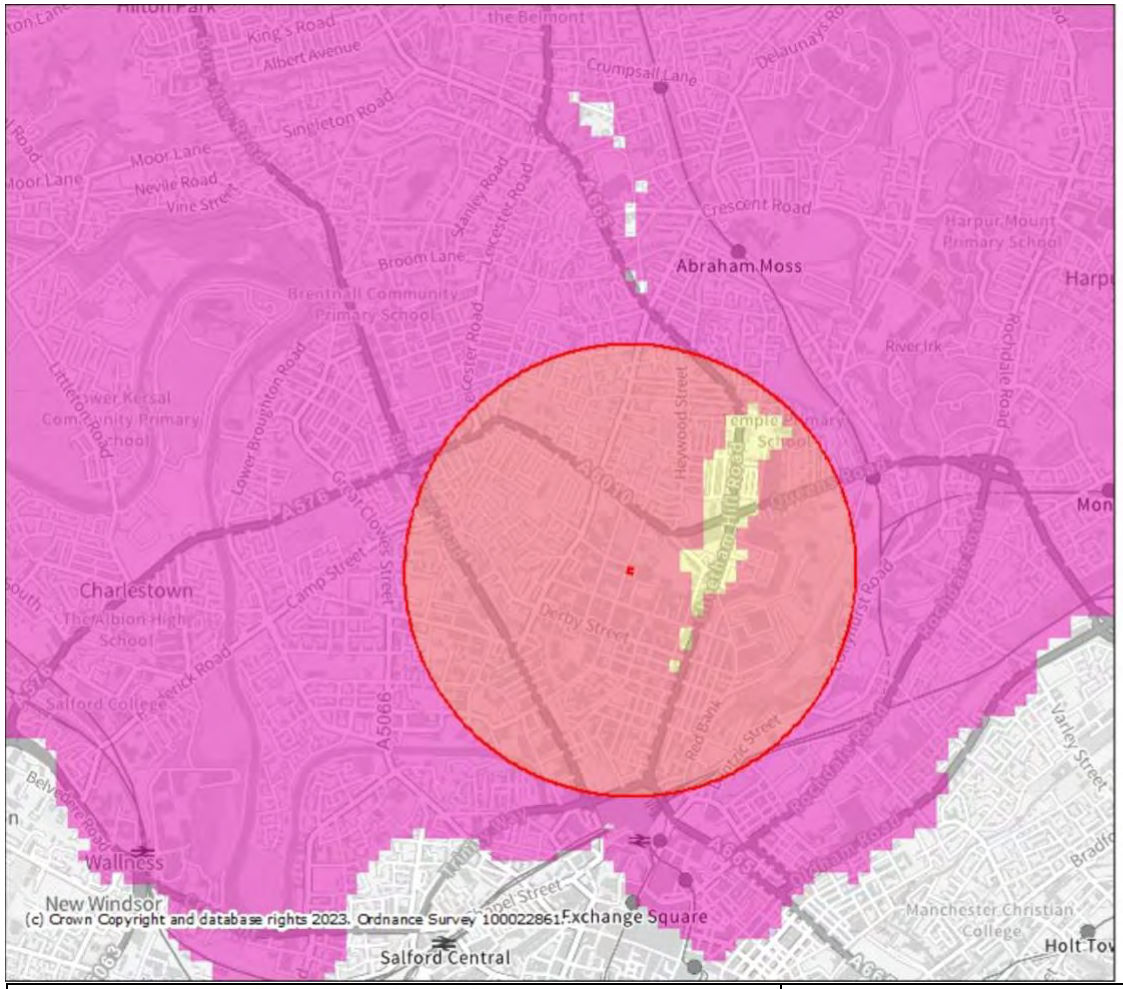
Community Forests (England)

Projection = OSGB36
xmin = 378900
ymin = 398100
xmax = 388400
ymax = 402900

0 0.5 1
km

Map produced by MAGIC on 19 May, 2023.
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enviro | solution	**Community Forests (England)**



Legend

Nitrate Vulnerable Zones 2017 Designations (England)

Projection = OSGB36
xmin = 378900
ymin = 398100
xmax = 388400
ymax = 402900
0 0.5 1 km
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