LK CONSULT LIMITED

PART OF THE LK GROUP

LAND AT
LAND AT GROVE STREET
BARNSLEY

PRELIMINARY
RISK ASSESSMENT

(PHASE 1 DESK STUDY)

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1 INTRODUCTION

1.1 Introduction

LK Consult Ltd (LKC) has been commissioned by Oakwell Community Assets to carry out a Preliminary Risk Assessment (PRA) for land at Land at Grove Street Barnsley. The PRA was undertaken in support of a future planning application. The site is to be developed for residential use.

According to guidance set out in PPS23[1] and CLR11[2] a PRA with a site reconnaissance is required as a minimum to ascertain if there is a potential contamination risk. In accordance with current guidance the PRA report will include a site reconnaissance, site history, geology, hydrogeology, hydrology, and a landfill search (within 250m of the site boundary).

Information gathered from the desk study and site reconnaissance will be used to develop a contamination conceptual model for the site, which will support the identification and assessment of any pollutant linkages. Based on the findings of the PRA an appropriate site investigation can be derived, if required.

1.2 Background

The site is located east of Grove Street in the area of Oakwell at National Grid Reference 435291E 400130N (Figure 1-1). The site is bounded by Grove Street to the west, residential development to the east and south and Barnsley Football Club to the north. The site has most recently been used as a parking area for Barnsley Football Club.

The site is approximately 0.36ha in size (see Figure 1-2). The site slopes to the south with an approximate elevation of 91.0 to 94.7m AOD. The proposed layout for the site is shown in Figure 1-3.

1.3 Disclaimer

This report has been prepared by LKC who have 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 LKC which have not been independently produced or verified, LKC gives no warranty, representation or assurance as to the accuracy or completeness of such information.

This report is prepared solely for the benefit of Oakwell Community Assets Ltd. It may not be relied upon by, or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full.

Those using this information in subsequent assessments or evaluations do so at their own risk.

[1] ODPM (2004). "Planning Policy Statement 23: Planning and Pollution Control." PPS23
[2] EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11



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Figure 1-1: Location Plan, Land at Grove Street, Barnsley

Drawn: December 2011 Scale: approx 1:25,000 @ A4

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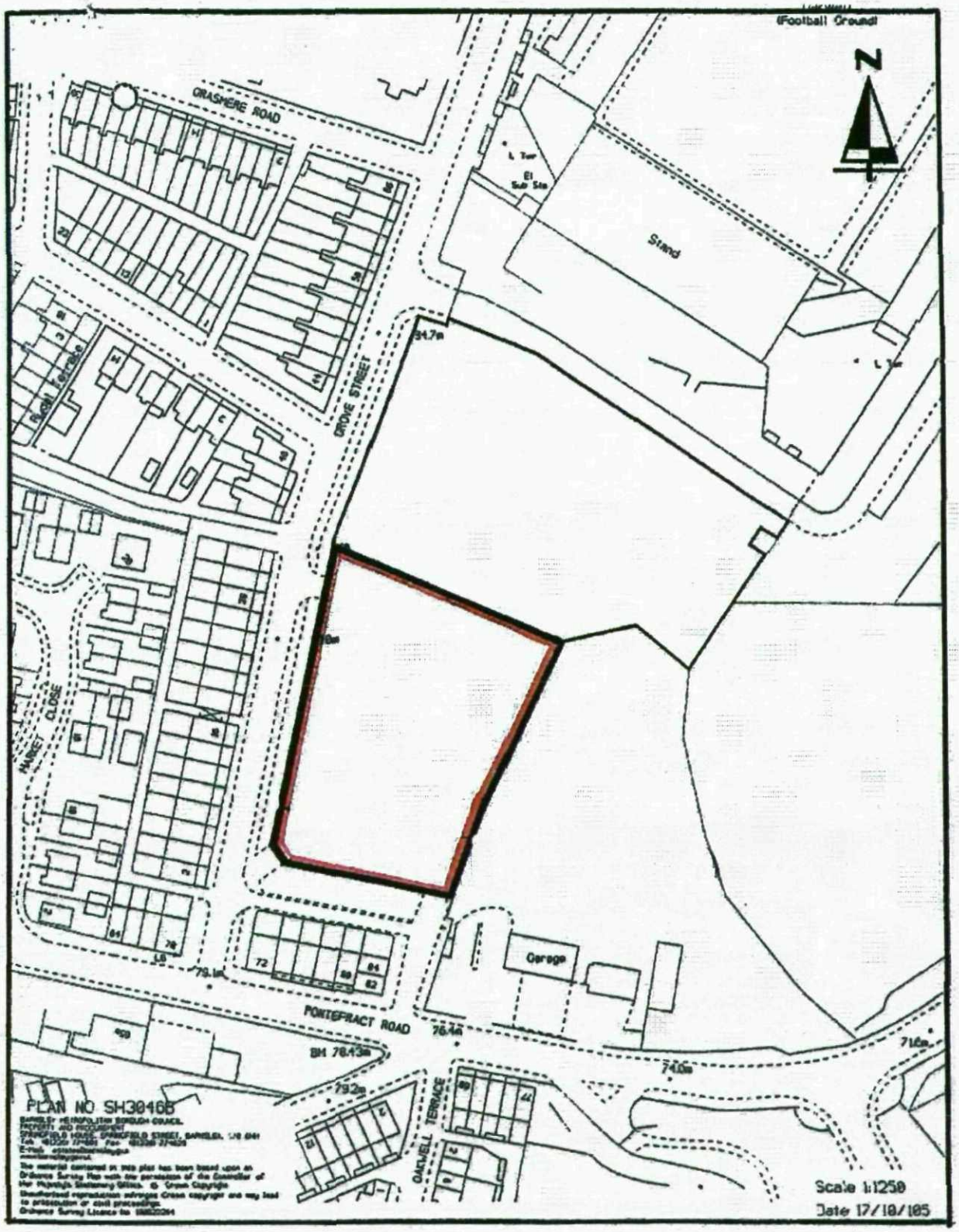


Figure 1-2: Site Boundary Plan, Grove Street, Barnsley

Drawn: December 2011 Scale: approx 1:1250

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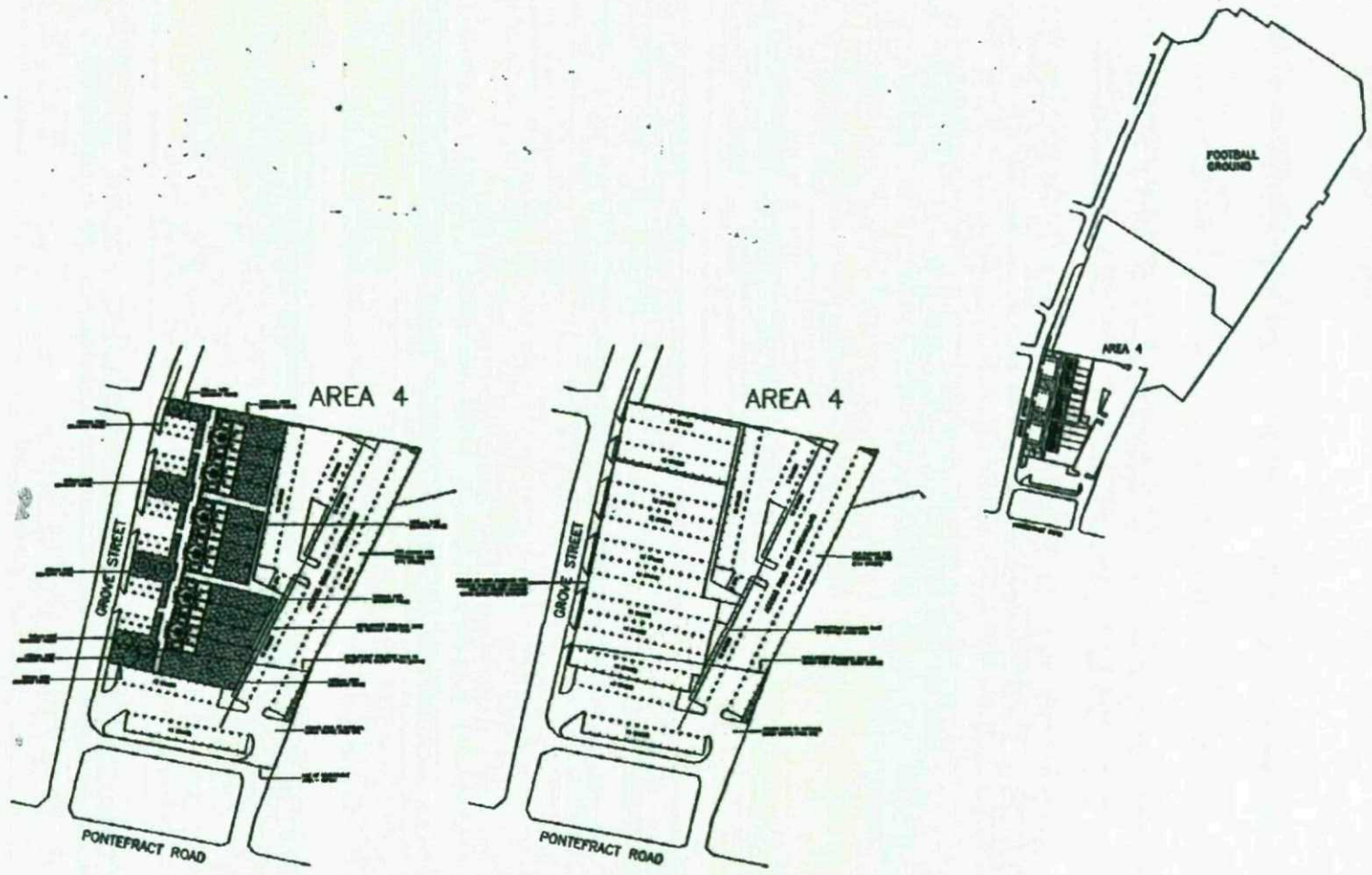


Figure 1-3: Proposed site layout, Land at Grove Street, Barnsley

Drawn: December 2011 Scale: approx 1:2500

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2 SITE HISTORY

2.1 Introduction

In compiling the site history, LKC consulted mapping and other environmental data provided by the Landmark Information Group Ltd. Copies of relevant historical plans are provided in Appendix A and are summarised below. Notable features within 250m of the site boundary have been presented (distances will be approximate).

The boundary search obtained from Landmark also took into account the wider ownership of Oakwell Community Assets Ltd. The planning boundary will only comprising the housing development in Area 4 and therefore historical features are described below for that area only.

Site Features	**Location**	**Map Dates Present**	**Comments**
Old Quarry (sandstone)	N	1855-1892	-Also annotated as Oakwell Quarry in 1982 1:2,500 mapping. -Part of quarry to the NE of site still present until 1952 mapping but not annotated.
Embankments	N	1894-1956	-Likely to be associated with Quarry. Modified in 1906 mapping to be present only on central eastern site area.
Small building	Centre	1906-1931	
Road	N	1966-1977	
'South Dike' River	S	1855-1892	-After 1892 known to be culverted.
Surrounding Area Features	**Distance/ Location**	**Map Dates Present**	**Comments**
'South Yorkshire' Railway Line	90m S	1855-2011	-Within embankments.
Allotment Gardens	10m N	1906-1956	-With associated greenhouses.
Mount Osborne Quarry (Sandstone)	240m S	1855-1956	-With associated embankments
Cranes	10m S	1892 only	
Shaft	60m E	1892 only	
Osborne Colliery	170m W	1892 only	-Annotated as disused.
Reservoir	170m W	1892 only	-With associated embankments.
Reservoir	240m NE	1892-1906	
Sough Dike	80m W	1892-1906	
Malthouse	50m SE	1892 only	
Wells	140m W 180m W 40mS 70m SE and 90m SE 100m SE,	1892 only 1892-1906 1892-1931	-Including Well annotated as Lower Oak Well 100m SE.
Brewery	240m E	1894-2011	
Queen's Ground	240m N	1894-1984	-Encompasses Running Track. -Termed Queen's Recreation Ground from mapping 1907 onwards.

Surrounding Area Features (continued)	Distance/ Location	Map Dates Present	Comments
Works	170m W	1906-1997	-Annotated as Yorkshire Metal Works 1906-1931 -1961 annotated as Works -1977 south part of the site annotated as Warehouse.
Depot	80mW	1906-1987	-Annotated as Sanitary Depot 1906-1931. -Annotated as Depot 1961-1987.
Residential Development	10m W and 10m S	1931-2011	-Mostly terraced housing.
Cattle Market	170m SE	1965-1997	
Abattoir	250m SE	1965-1993	
Mason's Yard	190m SW	1961-1962	
Bowling Greens	240m N	1961-2011	.
Works	220m SW	1961-1962	
Depot	190m W	1961-1997	-Extended SW in 1977 mapping.
Builder's Yard	240m W	1961-1996	
Garage	20m SE	1961-1997	
Electricity Sub Station	220m E and 250m E	1977-1997	
Works	160m W	1977-1997	
Electricity Sub Station	80m N	1996-1997	

3 ENVIRONMENTAL SETTING

3.1 Introduction

In compiling this Section, LKC consulted environmental information provided by the British Geological Survey (BGS), Envirocheck Report (Appendix B), Natural England, the Coal Authority (Appendix C), and the Environment Agency.

Summary of Environmental Settings			
Geology	Superficial		-N/A
	Bedrock		-Duckmantian Sandstone termed 'Woolley Edge Rock' on Envirocheck Report.
	Faulting		-1 no. fault approximately 100m NE of site. No strike shown.
	BGS logs		-See Appendix D for nearby historical logs. Borehole adjacent to the site noted 3.5m of ashy made ground.
Hydrogeology	Aquifer Designation	Superficial	-N/A
		Bedrock	-Secondary A (formerly referred to as a Minor Aquifer).
	Groundwater vulnerability		-HU (worst case assumed urban setting).
	Groundwater abstractions		-None within 500m nearest being 580m NW operated by The Barnsley Brewery Company for use as Cooling/Gen Industry.
Hydrology	Nearest surface water		-Un-named stream 364m SW. -River Dearne 713m NE graded C (fairly good).
	Flooding		-No risk.
	Surface water abstractions		-None within 500m.
	Discharge consent		-13 no. within 250m. Nearest being 37m SW operated by Yorkshire Water Services Ltd for use as Sewage Discharges and Storm Overflow.
	Pollution Incidents		-None within 250m, closest 288m SW, category 3-minor incident, pollutant being miscellaneous- fire water/foam, cause not given.
Mining	Coal Mining Referral Area		-not located within Coal Mining Referral Area.
	Coal Report		-5 no. Coal Seams at 170m to 470m depth, last worked 1979. -No shafts present within 20m of the site.
	Mineral Abstraction		-Beevor Hall on site, opencast sandstone quarry, operations listed as ceased.
	Ground Instability		-Southern site area classified as Made Ground on Envirocheck report, likely associated with former embankments.
Landfill sites (within 250m)	Known/Registered		-153m NE – 'Barnsley Football Ground'. Waste Type not Supplied. Operational June 1995-August 1995. -209m SE- 'Mount Osborne Industrial Park' Waste Type: Inert. Operational: not supplied.
	Potential		-Old Quarry present on site potentially infilled by 1894 mapping. -Mount Osborne Quarry 240m S potentially infilled by 1965 mapping. -Shaft 60m E potentially infilled by 1894 mapping. -Reservoir 170m W potentially infilled by 1894 mapping. -Reservoir 150m E potentially infilled by 1907 mapping. -Wells 140m W, 180m W and 40m S potentially infilled by 1894 mapping. -Wells 70m SE and 90m SE and 100m SE potentially infilled by 1932 mapping.
Radon			-Radon affected area, as between 1 and 3% of homes are above the action level. -No further action required.
Designated Sites			-Adopted Green Belt 303m SW.
Contemporary Trade Directory			-30 no. within 250m, nearest 24m SW (domestic appliances servicing and repairs).

4 SITE RECONNAISSANCE

The site was accessed off Grove Street through a car park entrance to the east. The area of proposed development currently comprises a large car park for the adjacent Barnsley Football Ground. The site is bounded to the west by Grove Street, to the North by Barnsley Football Ground, and by residential development on all other sides.

The ground across the site was hard stood with tarmac. Formal drainage features were observed.

The site falls evenly from north to south with a slight cross-fall to the east. The eastern boundary falls sharply down to a new development at lower level. No fuel stains or leakages were apparent across the car park surface.

5 PRELIMINARY CONCEPTUAL MODEL

5.1 Introduction

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and whether further site investigation work is required.

The Sections below are therefore divided into potential contaminant, potential pathway and potential receptor as described in CLR11[3]. The final Section provides an assessment of the potential pollutant linkages that may still be present on the site if redevelopment were to occur.

5.2 Potential Contaminants

The primary historical onsite feature that may be of concern is the former Sandstone Quarry, present on site from 1855-1952 mapping, potentially partly backfilled by 1906 mapping. In addition a number of embankments were present on site, of which the material used is unknown.

The immediate surrounding areas have been mainly developed for industrial and residential usage. Several potentially contaminative land-uses have been identified within 250m of the study site including an abattoir, a brewery, a malthouse, a bleach works, a colliery, a depot, a works site, a garage, allotment and several electricity sub stations and a garage. LKC do not consider these historical features to be a significant risk to the site due to their distance from the site.

Made ground on-site may comprise ash and clinker waste from hearths and boilers, which was historically often used as level raising material. Contaminants may include heavy metals (such as arsenic and lead) and Polycyclic Aromatic Hydrocarbons ((PAHs), such as benzo(a)pyrene (B(a)P))[4]. Depending upon the sulphate content of the combusted coal, soluble sulphate may also be generated. Ash fill was noted on a historical borehole log adjacent to the northern boundary to 3.5mbgl.

It is also unknown what material was used on site to infill the former Quarry. Considering the age of the potential infilling it may be arsings from quarrying activity and industrial waste, such as ash and clinker.

In addition, asbestos containing materials (ACMs) may be present associated with the former building structure onsite.

The Envirocheck Report has identified two licensed landfill sites within 250m of the study site.

Infilled features have the potential to generate hazardous gas primarily carbon dioxide and methane). There is a potentially infilled Quarry on site. This may be generating hazardous gas. In addition, the Envirocheck Report has identified two known/licensed landfill sites within 250m of the study site. A review of the historical OS mapping by LKC has also

[3] Defra (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11
[4] Defra (2002). "Potential Contaminants for the Assessment of Land." R&D Publication CLR 8

identified eleven potentially infilled areas within 250m of the site, which may be generating hazardous gas.

Hazardous gas generation can also occur from made ground on the site, however this is strongly dependant upon its quantity and composition. If significant amounts of putrescible or degradable material is found on site hazardous gas generation may be possible. It is possibly significant made ground may be onsite due to its former use as a Quarry.

5.3 Potential Pathways

Principal potential pathways associated with human health from soil contamination are *ingestion, dermal and inhalation. The current UK technical report document*[5] *recognises ten* such pathways comprising four ingestion, two dermal and four inhalation. These are listed as follows:

- *Ingestion of soil*
- Ingestion of soil-derived indoor dust
- Ingestion of contaminated vegetables
- Ingestion of soil attached to vegetables
- Dermal contact with soil
- *Dermal contact with soil-derived indoor dust*
- Inhalation of soil-derived outdoor dust
- Inhalation of soil-derived indoor dust
- Inhalation of vapours outside
- Inhalation of vapours inside

The proposed end-use follows a standard conceptual model of 'residential'. For this land use scenario all ten of the pathways will have to be considered.

Surface water and groundwater are principal mechanisms for the migration of contaminants, with rainwater infiltrating through contaminated material and contamination possibly going into solution. Contaminated water may then find preferential pathways to surface waters and underlying aquifer.

Culverts, ditches, drains, service drains may provide preferential pathways off site. The site reconnaissance indicated a drainage channel present on the east of the study site.

Solid and drift geology has the potential to impede or provide preferential pathways for contaminants onto or off site.

The site is situated on Sandstone, depending on the pore space and bedding orientation, this may act as a pathway for contaminants onto or off-site.

There is one known geological fault within 250m of the study site (approximately 100m north). This is not considered a viable pathway.

5.4 Potential Receptors

Potential receptors with respect to human health and hazards present on the site include:

- Human health pathways: Future site residents.
- Controlled Waters: Secondary A Aquifer present on site, the culvert present on site and unnamed surface watercourse approximately 364m SW of the study site.
- Building materials.
- Potable water pipes.
- Flora within landscaping and gardens.

[5] EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

There are no significant ecological designated sites within 250m of the site and therefore the risk to flora and fauna are not considered to be likely.

5.5 Preliminary Contamination Conceptual Model

The preliminary contamination conceptual model for Land at Grove Street, Barnsley is illustrated in Table 5-1 below and has identified seven generic potential pollutant linkages seven of which are considered possible at this stage. Each linkage is discussed below along with an assessment of the likelihood of each linkage considering the available data and the nature of the development. This conceptual model is based upon contaminant-pathway-receptor pollutant linkages, on the premise that if there is no pollutant linkage then there will be no risk to the receptor[6].

Pollutant Linkage No.	Contaminant					Pathway	Receptor
	ACM	Gases		Contaminants			
		Hazardous	Ground	Organic	Inorganic		
PL1	?	x	x	?	?	-Dermal contact. -Ingestion of soils and vegetables. -Inhalation of contaminated soil, fibres and dust.	-Future site residents (inc. veg uptake). -Nearby offsite receptor (windblown dust).
PL2	x	x	x	?	x	-Inhalation of vapours. -Vapour migration through permeable strata.	-Future site residents. -Offsite receptors. -Onsite drainage channel.
PL3	x	?	x	x	x	-Inhalation of hazardous gas. -Migration through permeable strata.	-Future site residents. -Offsite receptors (if gas is generated on site).
PL4	x	x	x	?	?	-Groundwater migration through permeable strata. -Perched waters migration on site.	-Secondary A Aquifer. -Onsite drainage channel.
PL5	x	?	x	x	?	-Contact with potential hazards.	-Site buildings.
PL6	x	x	x	?	?	-Ingestion of tainted water supply. -Corrosion of metal pipework.	-Future site residents. -Pipework.
PL7	x	x	x	x	?	-Root uptake of phytotoxic contaminants	-Flora in future landscaping.

Table 5-1 Contamination Conceptual Model for the Land at Grove Street, Barnsley.
(Key: ? – pollutant linkage possible; x – pollutant linkage unlikely)

It should be noted that there may be risk from short term exposure from contaminated soil to site workers. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance[7]) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

5.5.1 Pollutant Linkage 1

Pollutant linkage 1 refers to the potential asbestos, heavy metals and organic contaminants, such as PAHs and petroleum hydrocarbons coming into direct contact with future site residents and offsite receptors (windblown dust). This is considered possible in areas of proposed landscaping and gardens for future site residents.

5.5.2 Pollutant Linkage 2

Potential pollutant linkage 2 refers to possible inhalation of vapours affecting the future site residents from potential hydrocarbons and other volatile contaminants on site and potentially from off site sources. At this stage this pollutant linkage is considered possible.

[6] EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11
[7] HSE (1991). "Protection of workers and the general public during development of contaminated land" London HMSO.

5.5.3 Pollutant Linkage3

Potential pollutant linkage 3 refers to possible migration of hazardous gas from infilled areas on the site and offsite affecting the future site residents.

Giving the presence of a likely infilled Quarry on site, this pollutant linkage is considered possible.

5.5.4 Pollutant Linkage 4

Potential pollutant linkage 4 refers to the possible contaminants migrating to the underlying Secondary A Aquifer migrating to the nearby unidentified surface water feature. The latter is unlikely to be a significant risk given its distance from the site. This linkage is considered possible for the Secondary A Aquifer given the likely presence of made ground on the study site and no appreciable superficial drift deposits.

5.5.5 Pollutant Linkage 5

Potential pollutant linkage 5 refers to the possible deleterious effects that sulphate may have on building materials such as concrete, water pipes and building structures. In addition, methane may potentially build up within confined spaces and cause an explosion. Based on the likely contamination on site, this pollutant linkage is considered possible.

5.5.6 Pollutant Linkage 6

Potential pollutant linkage 6 refers to the possible contaminants permeating potable water pipes and consumption by the future residents of the tainted water supply. Given the likely presence of made ground on site this linkage is also considered possible.

5.5.7 Pollutant Linkage 7

Potential pollutant linkage 7 refers to the possible phytotoxic contaminants affecting plant growth. Given the possible presence of made ground onsite and likely heavy metal contaminant, this linkage is considered possible.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The primary historical onsite features that may be of concern is Old Quarry, present on mapping dating 1855-1892 and remnants of the quarry potentially infilled by the 1952 mapping. Therefore, potential contaminants that may be present on the site may be from any historical site raising (if any) and could be typically ash and clinker comprising heavy metals (such as arsenic and lead) and PAHs such as benzo(a)pyrene (B(a)P).

Envirocheck records show there is are two known/registered landfill site and several potentially infilled areas within 250m of the study site boundary. These areas may have the ability to generate hazardous gases. Radon was not identified from the desk study and therefore no special precautions are required.

It is likely that significant depths of made ground are present on site, associated with the likely infilling of the former Quarry on site and historical embankments around part of the site. This may present issues relating to human health and controlled waters, as well as ground stability.

The preliminary contamination conceptual model for Land at Grove Street, Barnsley as illustrated in Table 5-1 has identified seven pollutant linkages relating to dermal contact (PL1), vapours (PL2), hazardous and ground gas (PL3), migration of contaminants through water bodies (PL4), sulphur attack on concrete (PL5), potable water supply (PL6) and phytotoxic contaminants (PL7), all of which are considered possible at this stage.

6.2 Recommendations

In accordance with PPS23, LKC consider that sufficient information on the potential contaminative status of the site is available in this Preliminary Risk Assessment report to allow the validation of any future planning application by the Local Planning Authority and for conditional planning approval to be granted. Such conditional approval will likely include standard prescriptive conditions requiring a site investigation, risk assessment and, if appropriate, a remedial strategy are completed to the satisfaction of the Local Planning Authority prior to the commencement of any development.

LKC would recommend that once conditional planning approval is granted, a Phase II intrusive survey should be carried out across the site to investigate the seven identified potential pollutant linkages further. The scope of this Phase II survey should be prior agreed with the Local Authority and should include the following.

In order to address potential pollutant linkages 1, 2, 5, 6 and 7 soil samples should be collected from trial pits and/or boreholes undertaken across the site and subjected to appropriate chemical analyses based upon a broad range of contaminants, including those identified in Section 5.2. The investigation will follow guidance set out in BS10175[8] and BS5930[9]. Some sampling locations will target historical features such as the former Quarry on site. Full details of the proposed site investigation should be forwarded to the Local Authority for approval since a longer monitoring period may be required by them.

[8] British Standard (2011). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2011
[9] British Standard (1999). "Code of Practice for Site Investigations. " BS5930:1999

Gas monitoring is recommended to address the potential pollutant linkage 3 into the proposed building via hazardous gas migration from potentially substantial underlying infilled ground onsite and possible migration of hazardous gas from infilled features within 250m of the site. These areas may be generating methane and carbon dioxide and any boreholes drilled on the site should be converted to monitoring wells and investigated over a suitable period recommended in CIRIA C665[10]. As a minimum gas monitoring would likely be over a three month period with at least six gas monitoring visits under worst case temporal conditions. The monitoring timescales will need to be agreed beforehand with the Local Authority, since a longer monitoring period may be required by them.

Pollutant linkage 4 may be investigated by the sampling and chemical analysis of any groundwater on site or by testing for any leachable contamination in the soils on site. This will be dependent upon prevailing site conditions.

An old Quarry has been identified on site which appears to be situated on the southern site area. Depending on depth of fill their may be geotechnical constrains and possible ground instability issues for future construction. The depth of fill material should be established to aid in an appropriate foundation design, as well as allow for a robust contaminated land risk assessment.

This investigation, in conjunction with appropriate geotechnical testing, will delineate any existing areas of potential contamination and identify and characterise any contaminants encountered. Information from this investigation can then be used to provide a more detailed assessment of the identified pollutant linkages, provide appropriate foundation solutions and, if necessary, identify appropriate remedial measures to ensure that the site is made suitable for its proposed end use.

[10] CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665

APPENDIX A

HISTORICAL MAPS

Historical Mapping Legends

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

Quarry
Gravel Pit
Sand Pit
Clay Pit
Shingle
Refuse Heap
Sloping Masonry
Flat Rock
Marsh
Reeds
Osiers
Rough Pasture
Furze
Wood
Mixed Wood
Brushwood
Orchard
Fir
Ford
Stepping Stones
Ferry
Waterfall
Lock
Trig. Station
507 Altitude at Trig. Station
B.M.325·9 Bench Mark
348 Surface Level
Arrow denotes flow of water
Antiquities (site of)
Cutting
Embankment
Railway crossing Road
Level Crossing
Road crossing Railway
Railway crossing River or Canal
Road over single stream
Road over River or Canal
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

Inactive Quarry, Chalk Pit or Clay Pit
Active Quarry, Chalk Pit or Clay Pit
Rock
Boulders
Cliff
Slopes
Top
Roofed Building
Glazed Roof Building
Sloping Masonry
Archway
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
Bench Mark
Antiquity (site of)
Cave Entrance
Triangulation Station
Electricity Pylon
E T L Electricity Transmission Line
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	Wt Pt, Wt 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

Cliff
Slopes
Top
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Positioned Boulder
Scree
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
Triangulation Station
Antiquity (site of)
E T L Electricity Transmission Line
Electricity Pylon
Bench Mark
Buildings with Building Seed
Roofed Building
Glazed Roof Building
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)

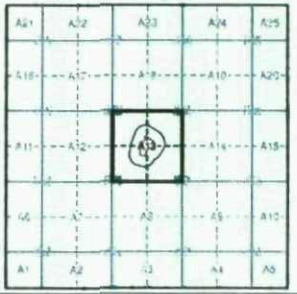
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Pillar Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governor	Wd Pp	Wind Pump
GP	Guide Post	Wt Pt, Wt 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
Yorkshire	1:2,500	1892	2
Yorkshire	1:2,500	1906	3
Yorkshire	1:2,500	1931	4
Ordnance Survey Plan	1:1,250	1961	5
Ordnance Survey Plan	1:2,500	1962	6
Ordnance Survey Plan	1:1,250	1970 - 1977	7
Supply of Unpublished Survey Information	1:1,250	1975	8
Supply of Unpublished Survey Information	1:1,250	1975	9
Additional SIMs	1:1,250	1977 - 1987	10
Additional SIMs	1:1,250	1988 - 1992	11
Ordnance Survey Plan	1:1,250	1987	12
Additional SIMs	1:1,250	1990	13
Large-Scale National Grid Data	1:1,250	1993	14
Large-Scale National Grid Data	1:1,250	1993 - 1997	15
Large-Scale National Grid Data	1:1,250	1996 - 1997	16
Large-Scale National Grid Data	1:1,250	1997	17

Historical Map - Segment A13

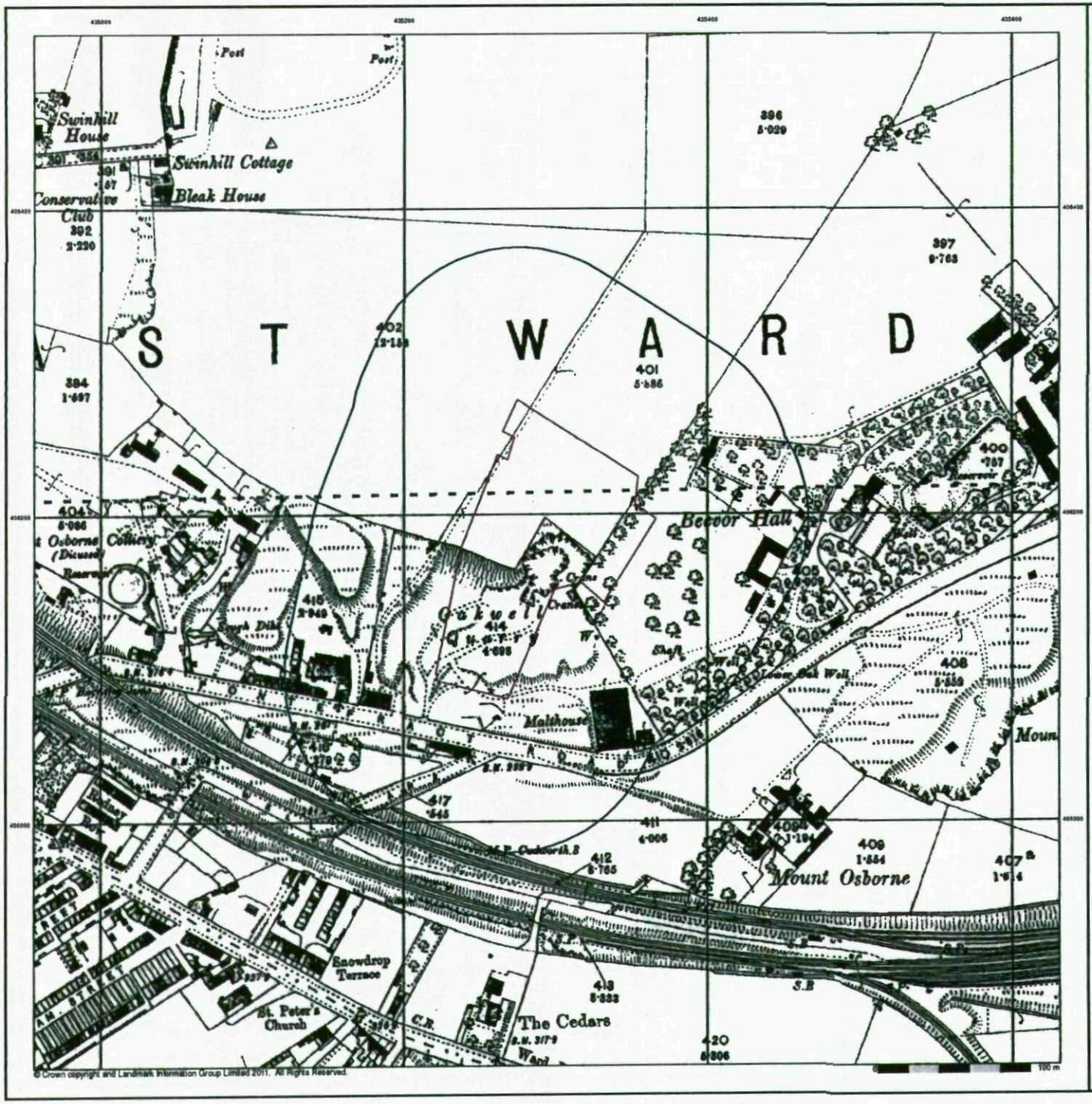


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National Grid Reference: 435280, 406170
Slice: A
Site Area (Ha): 1.44
Search Buffer (m): 100

Site Details

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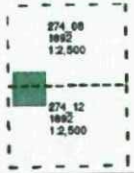
Yorkshire

Published 1892

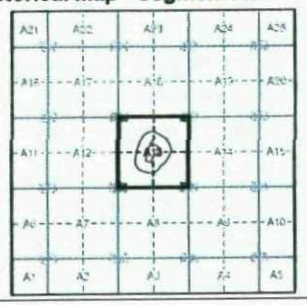
Source map scale - 1:2,500

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

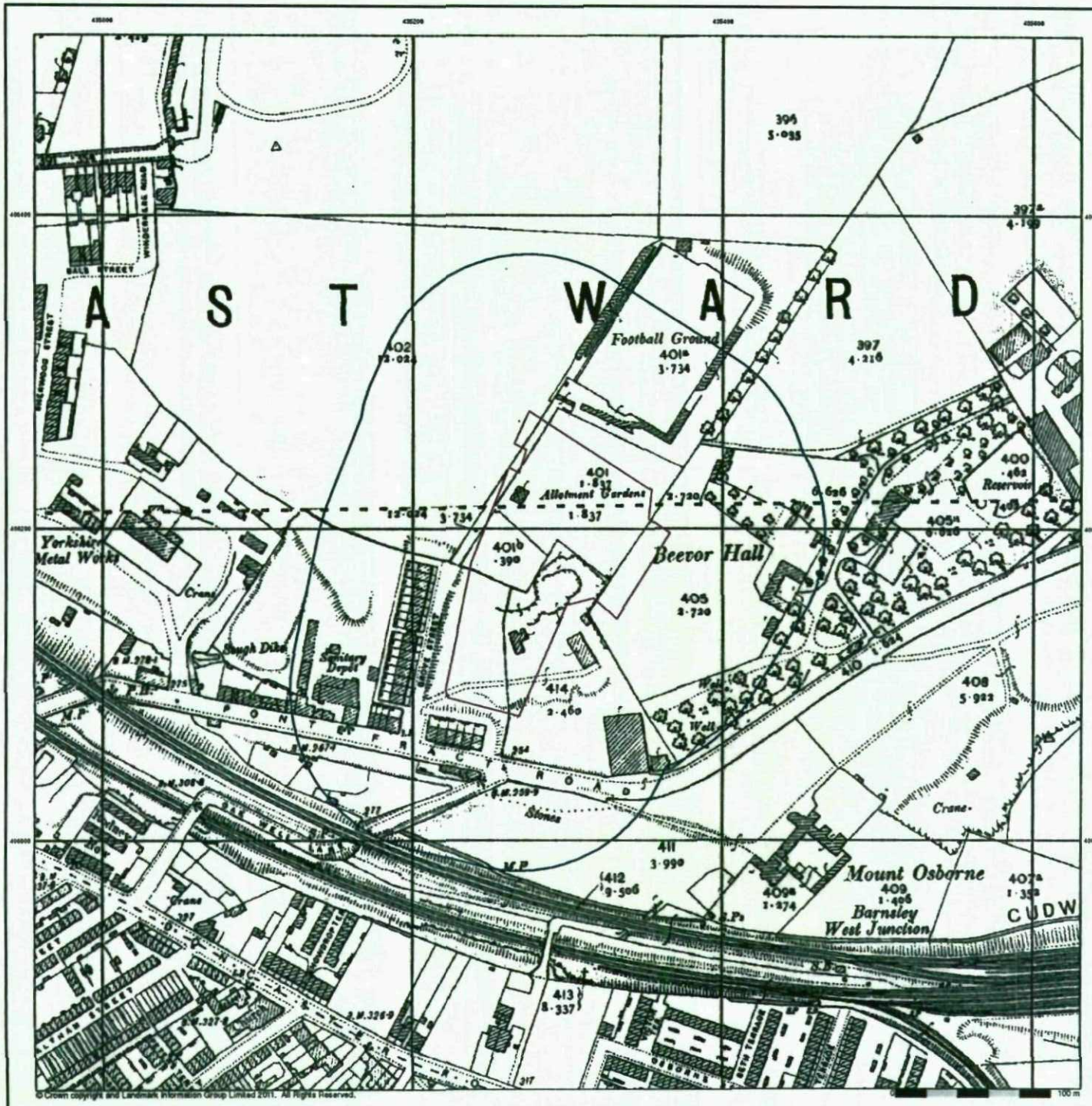


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Site Details

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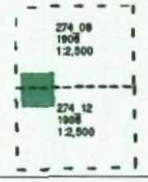
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Published 1906

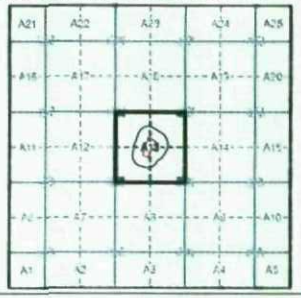
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



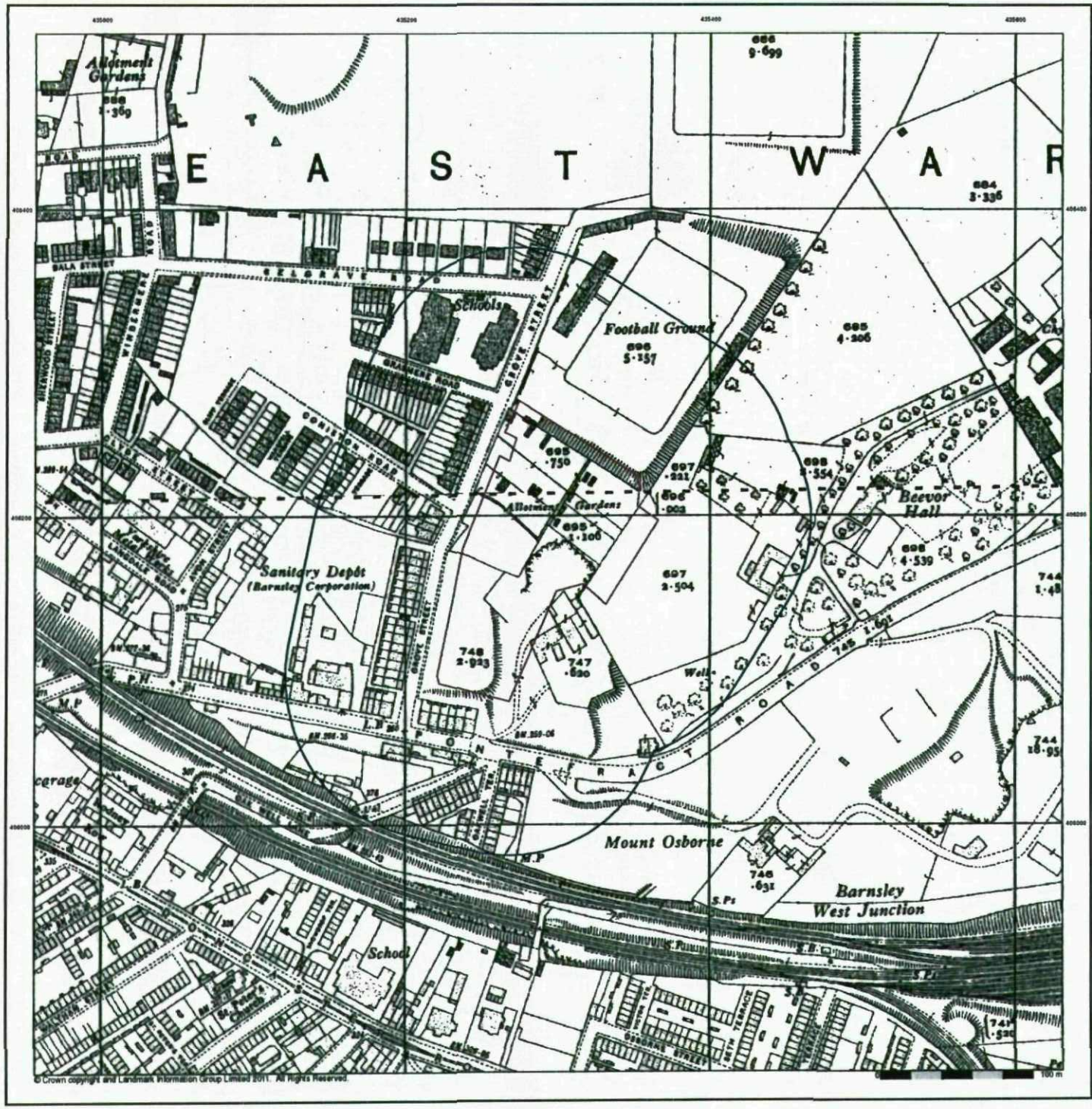
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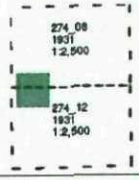
Yorkshire

Published 1931

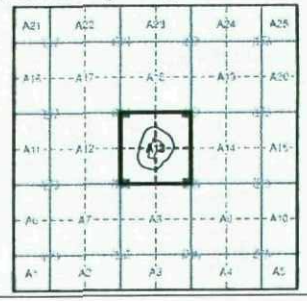
Source map scale - 1:2,500

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Historical Map - Segment A13



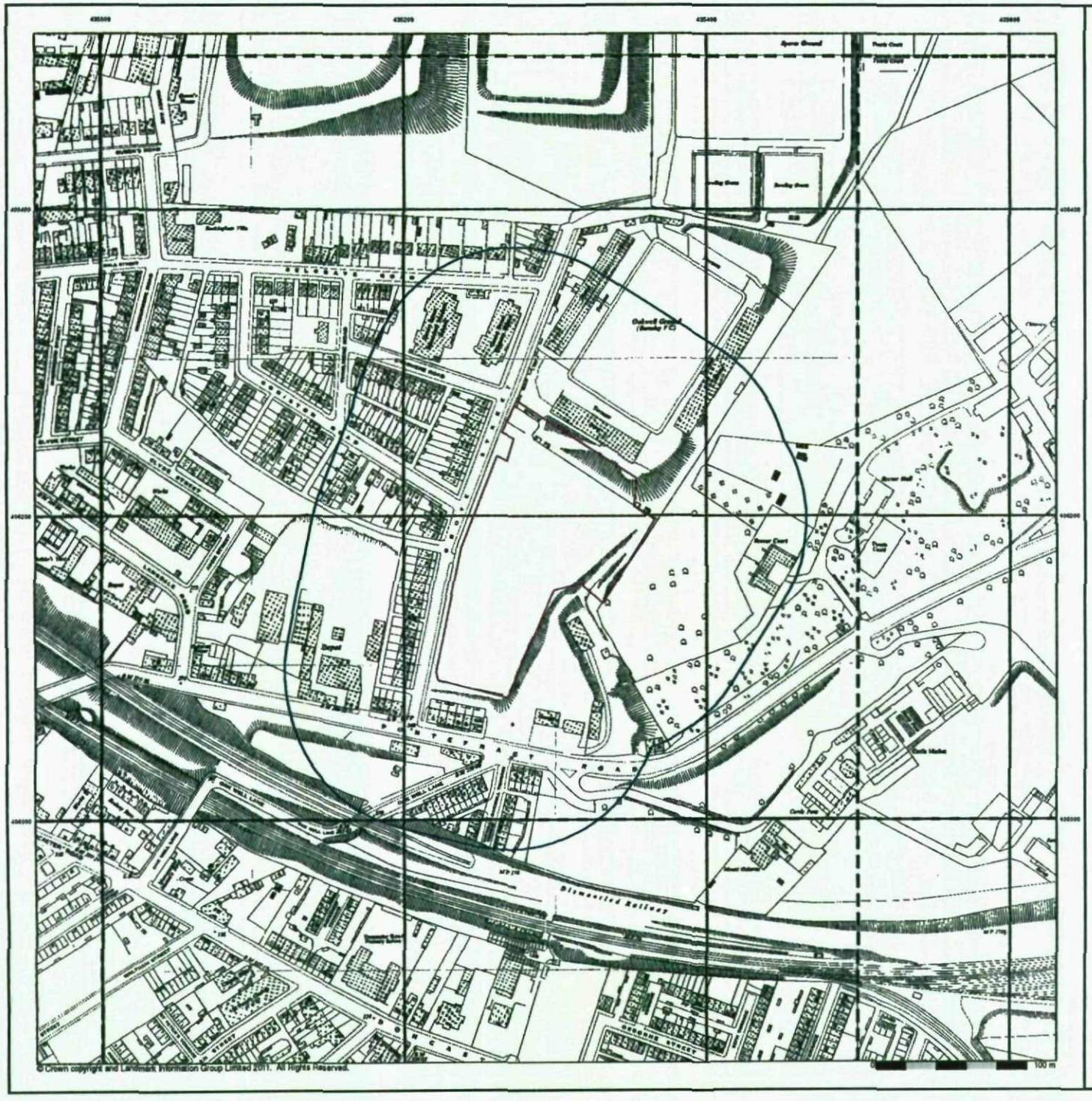
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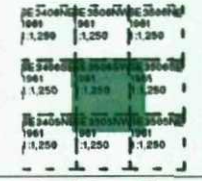
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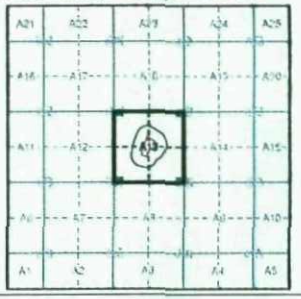
Ordnance Survey Plan
Published 1961
Source map scale - 1:1,250

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



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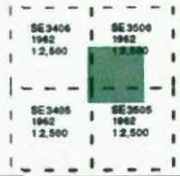
Ordnance Survey Plan

Published 1962

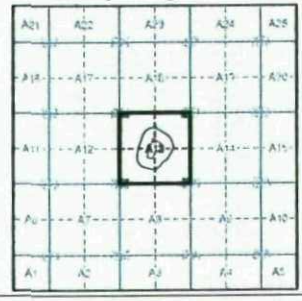
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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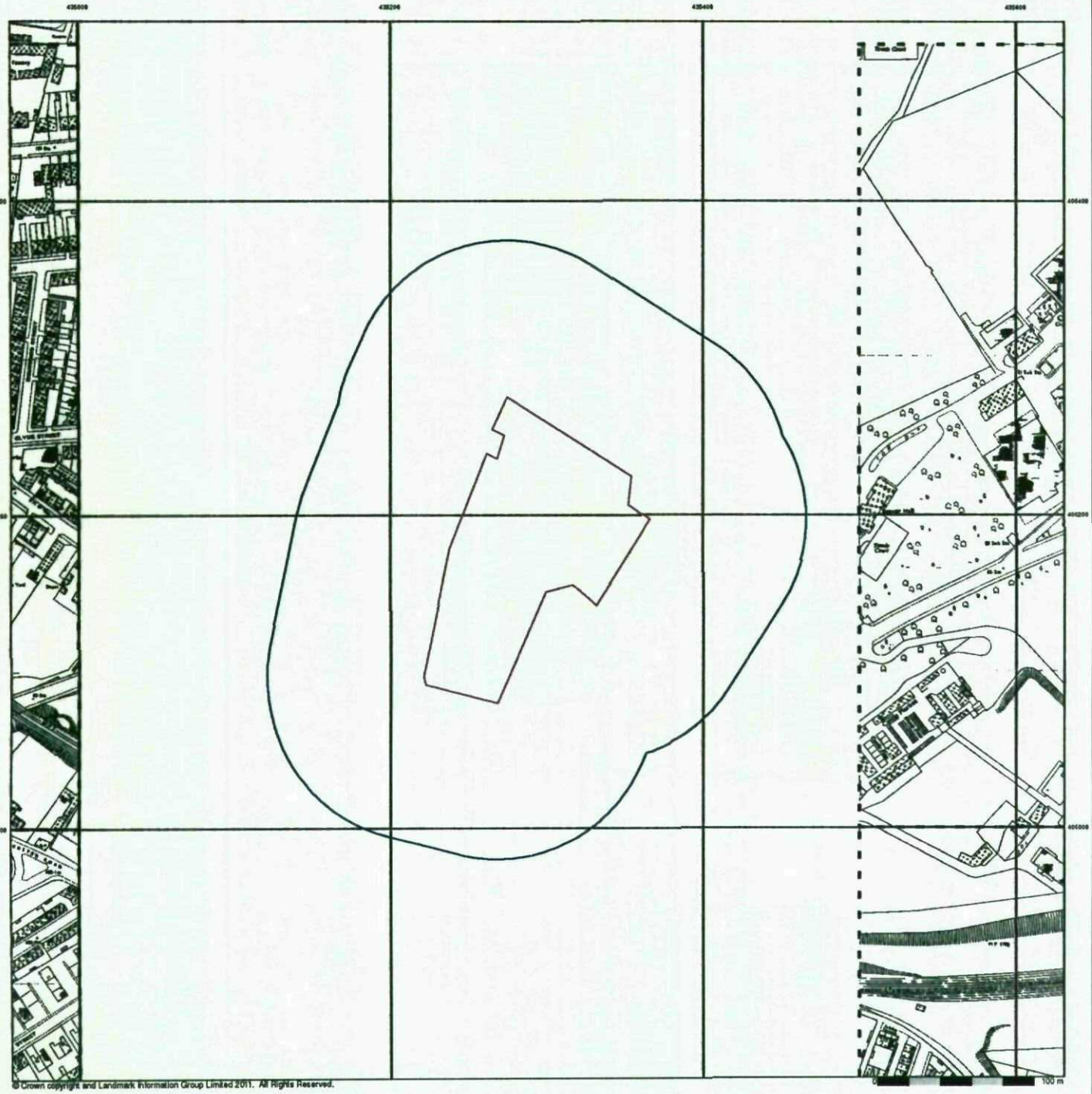
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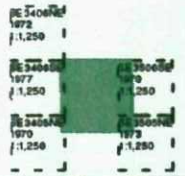
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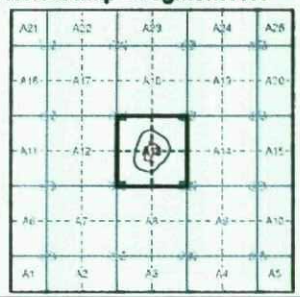
Ordnance Survey Plan
Published 1970 - 1977
Source map scale - 1:1,250

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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Supply of Unpublished Survey Information

Published 1975

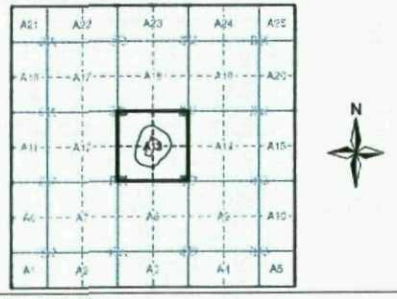
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a 'work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

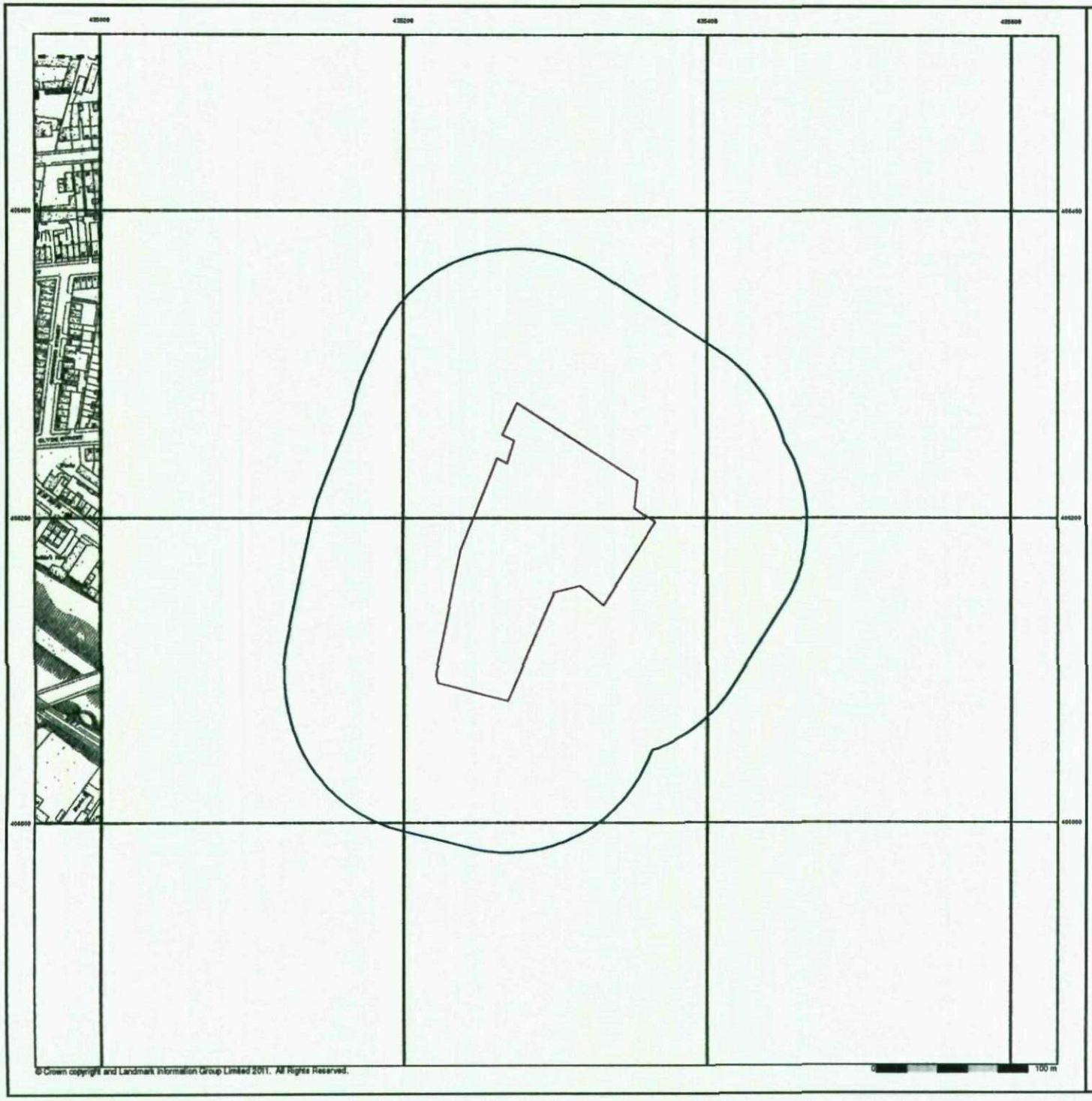
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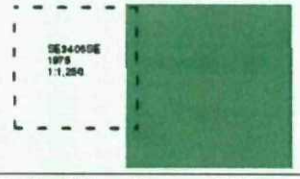
Supply of Unpublished Survey Information

Published 1975

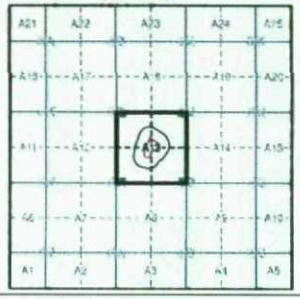
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Map Name(s) and Date(s)



Historical Map - Segment A13



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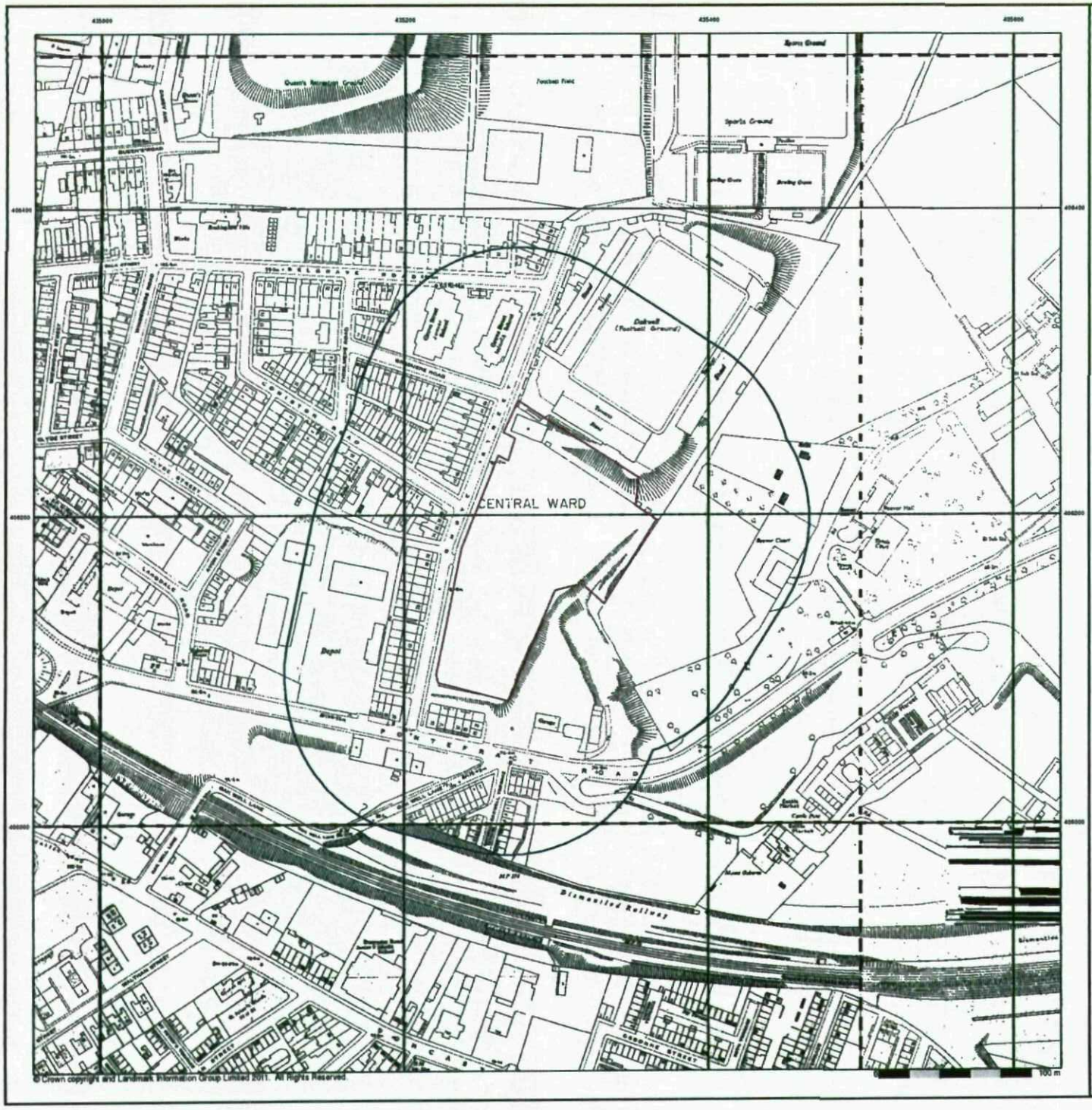
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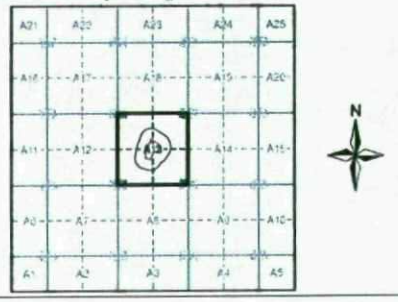
Additional SIMs
Published 1977 - 1987
Source map scale - 1:1,250

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



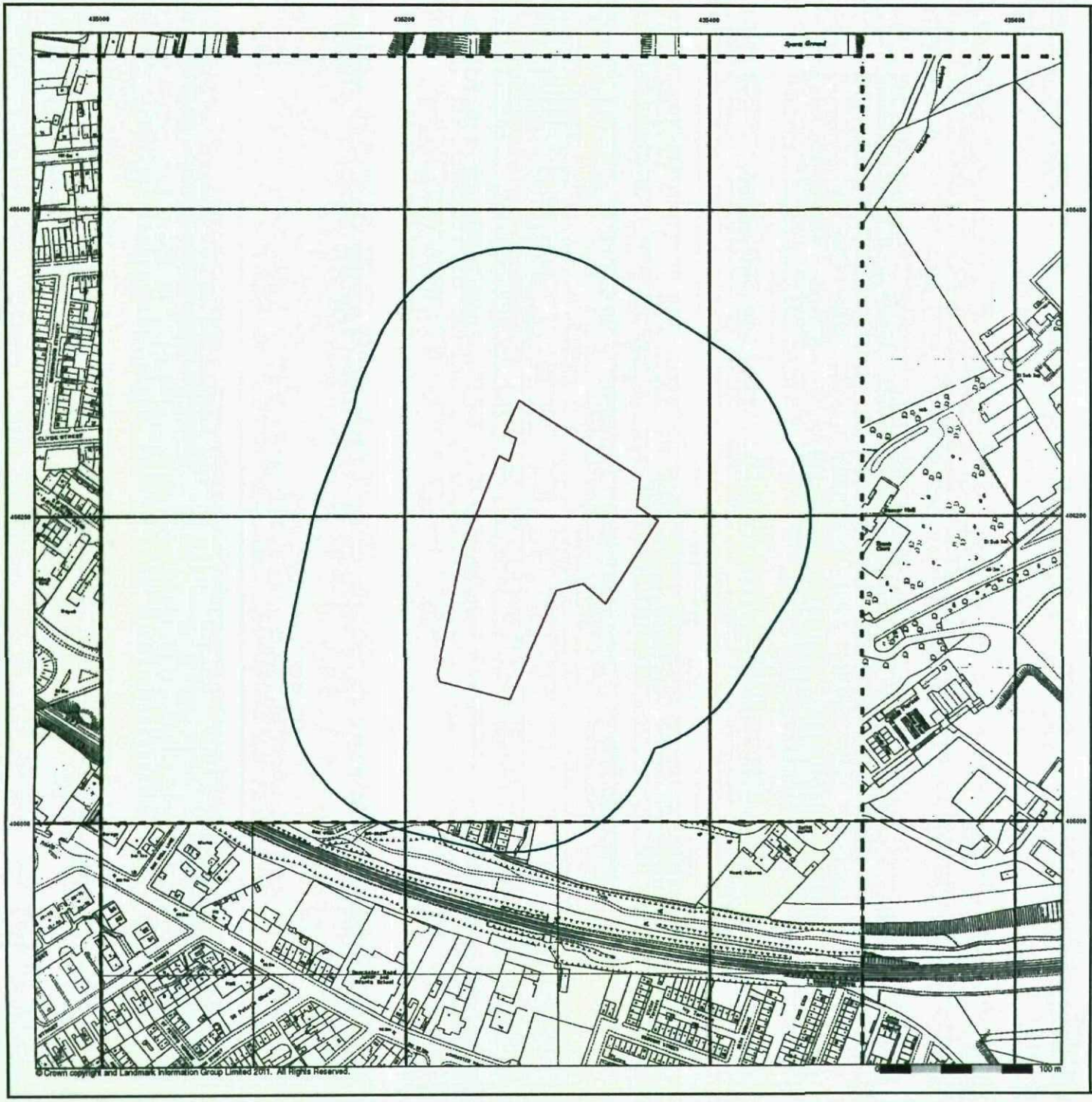
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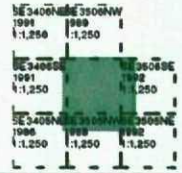
Additional SIMs

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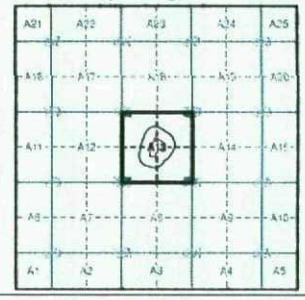
Source map scale - 1:1,250

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Map Name(s) and Date(s)



Historical Map - Segment A13

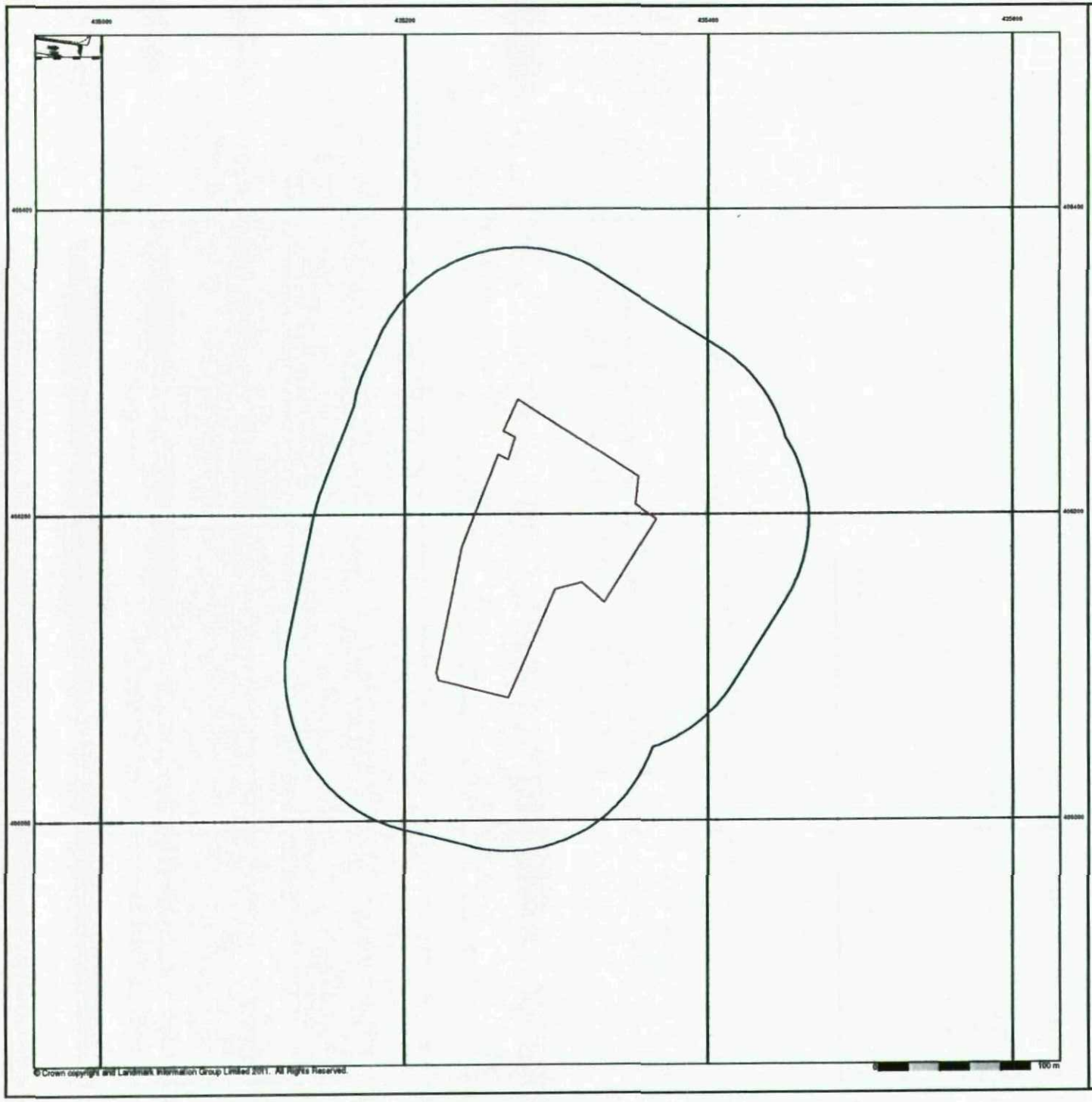


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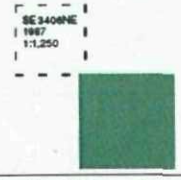
Ordnance Survey Plan

Published 1987

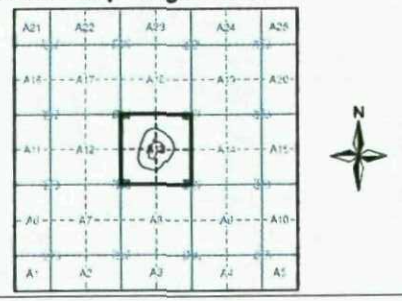
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Map Name(s) and Date(s)



Historical Map - Segment A13



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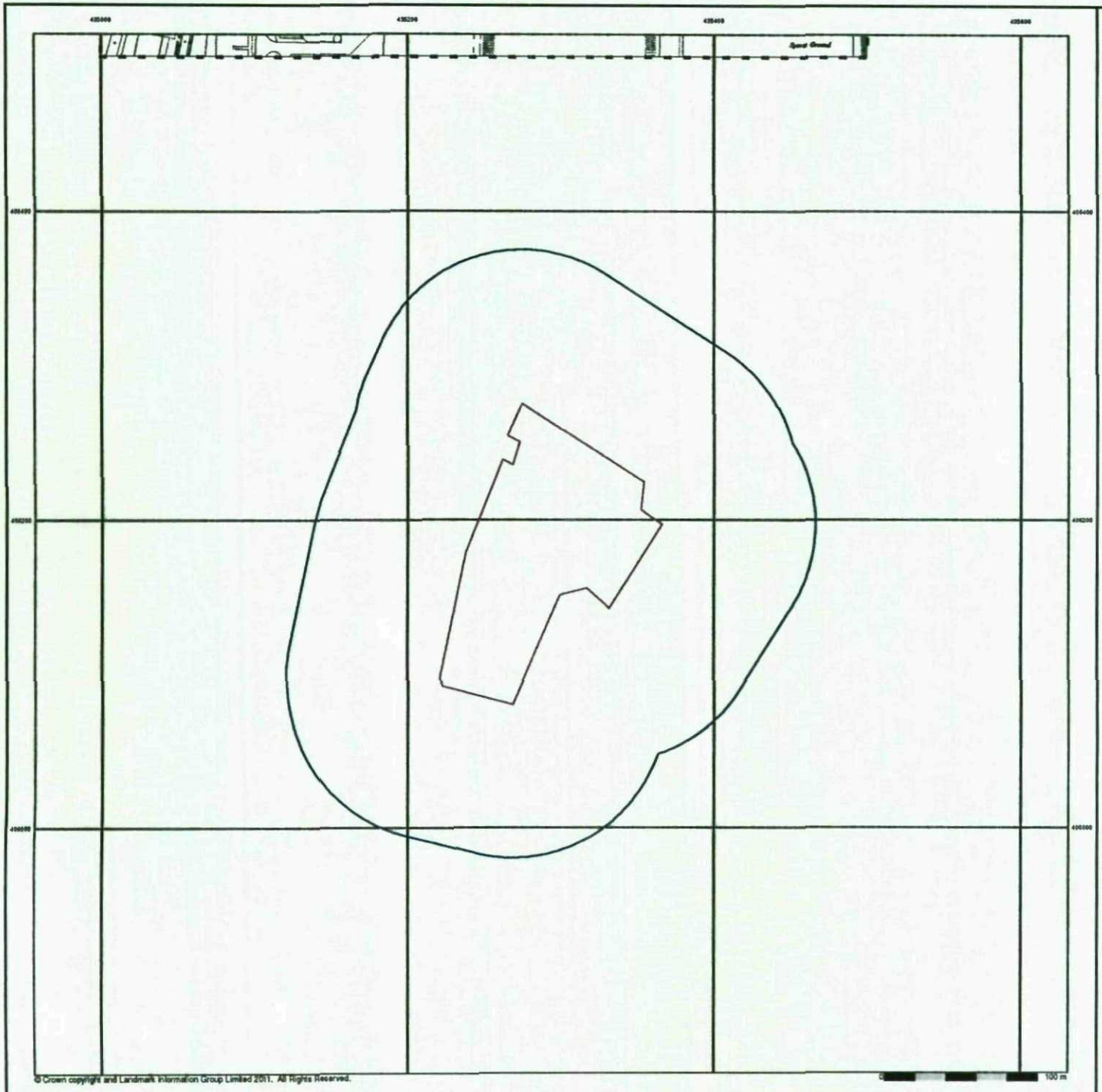
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Additional SIMs

Published 1990

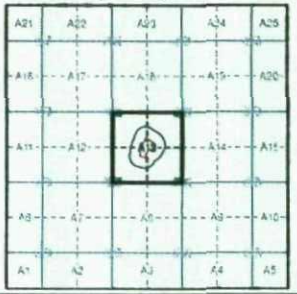
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Map Name(s) and Date(s)



Historical Map - Segment A13

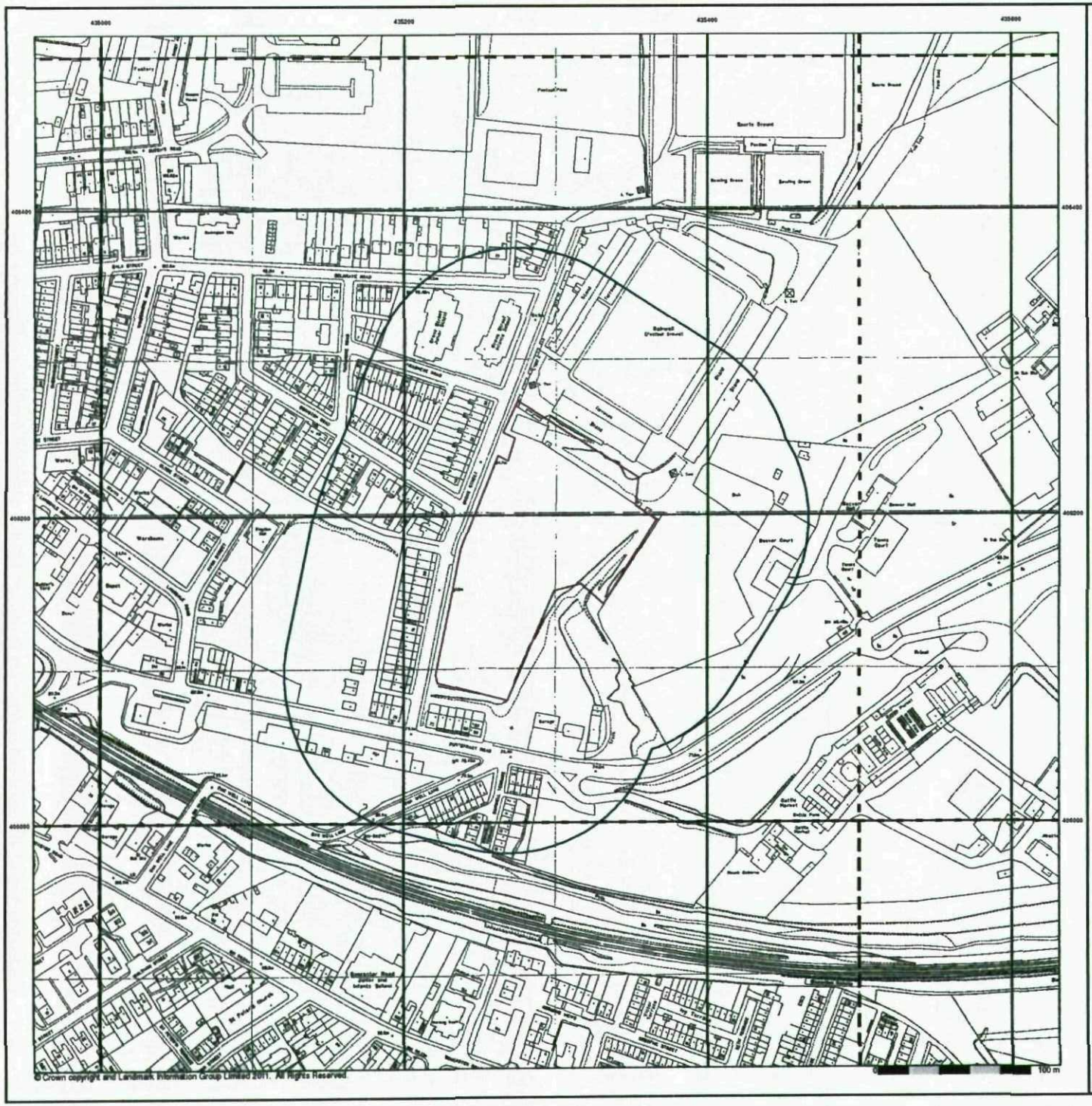


Order Details

Order Number:	36834079_1_1
Customer Ref:	CI1887
National Grid Reference:	435280, 406170
Slice:	A
Site Area (Ha):	1.44
Search Buffer (m):	100

Site Details

12 Grove Street, BARNSLEY, South Yorkshire, S71 1EX



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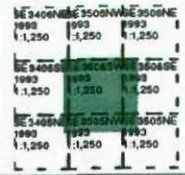
Large-Scale National Grid Data

Published 1993

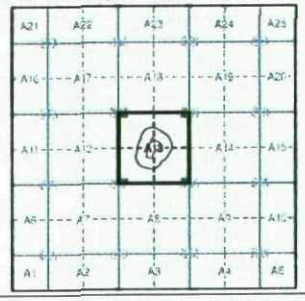
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



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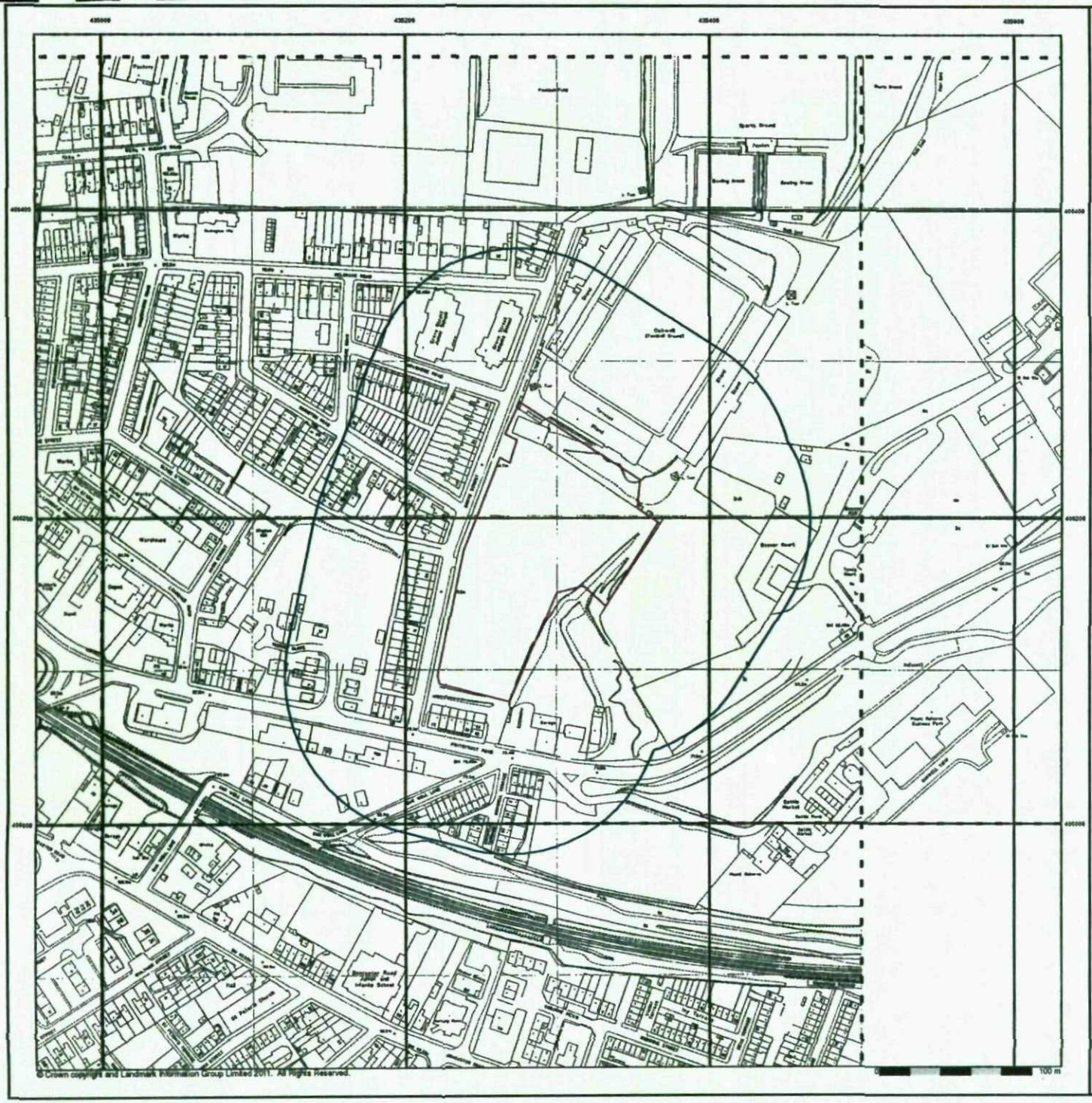
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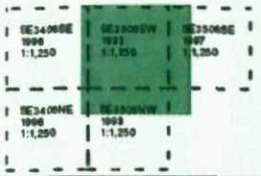
Large-Scale National Grid Data

Published 1993 - 1997

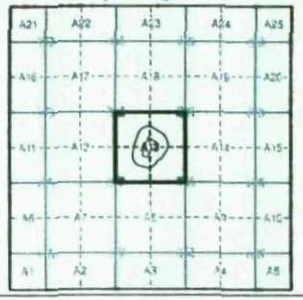
Source map scale - 1:1,250

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Map Name(s) and Date(s)



Historical Map - Segment A13



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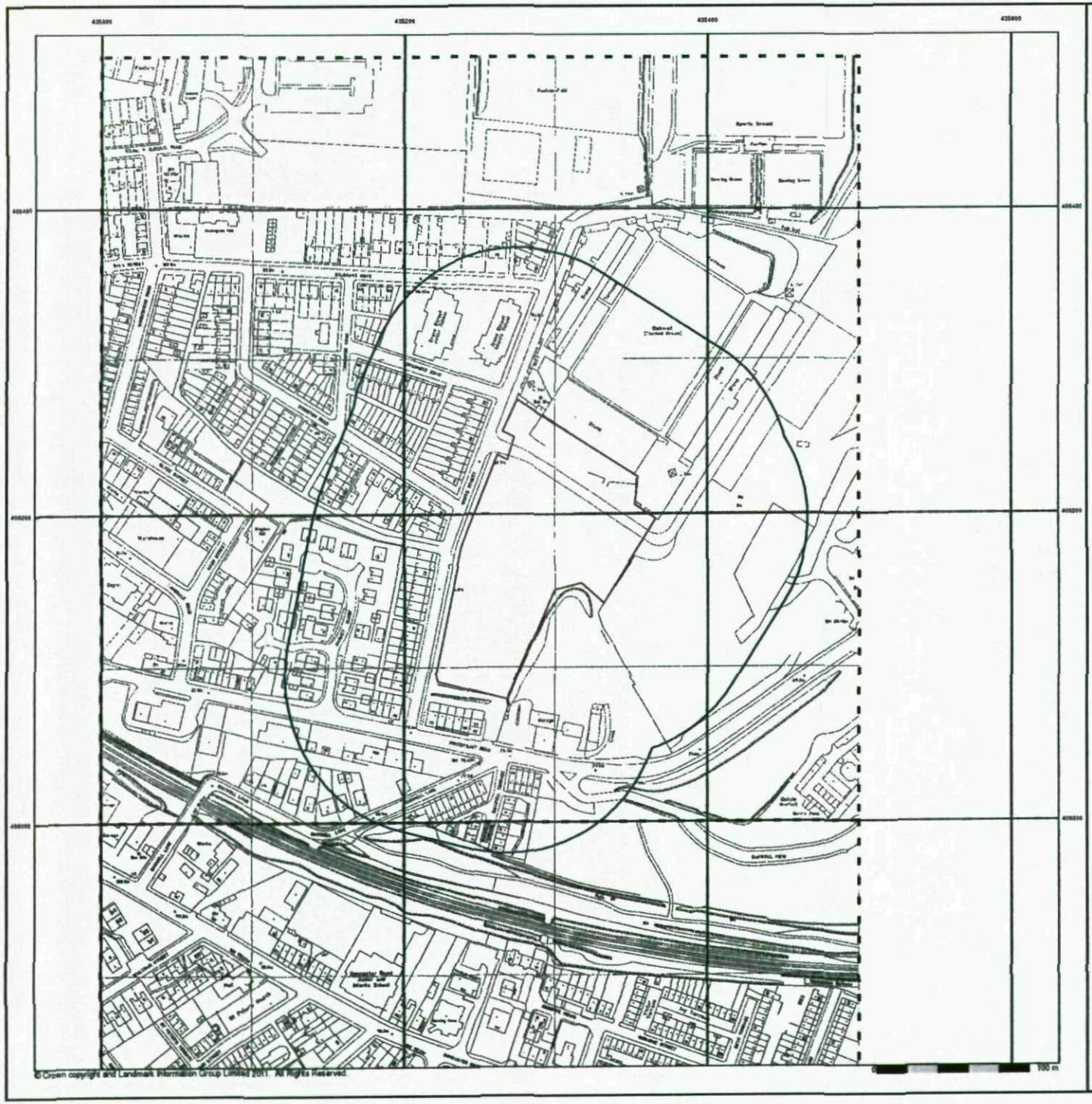
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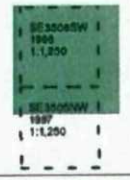
Large-Scale National Grid Data

Published 1996 - 1997

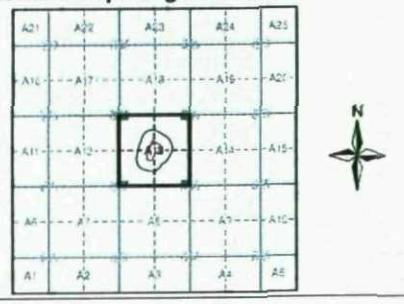
Source map scale - 1:1,250

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Map Name(s) and Date(s)



Historical Map - Segment A13



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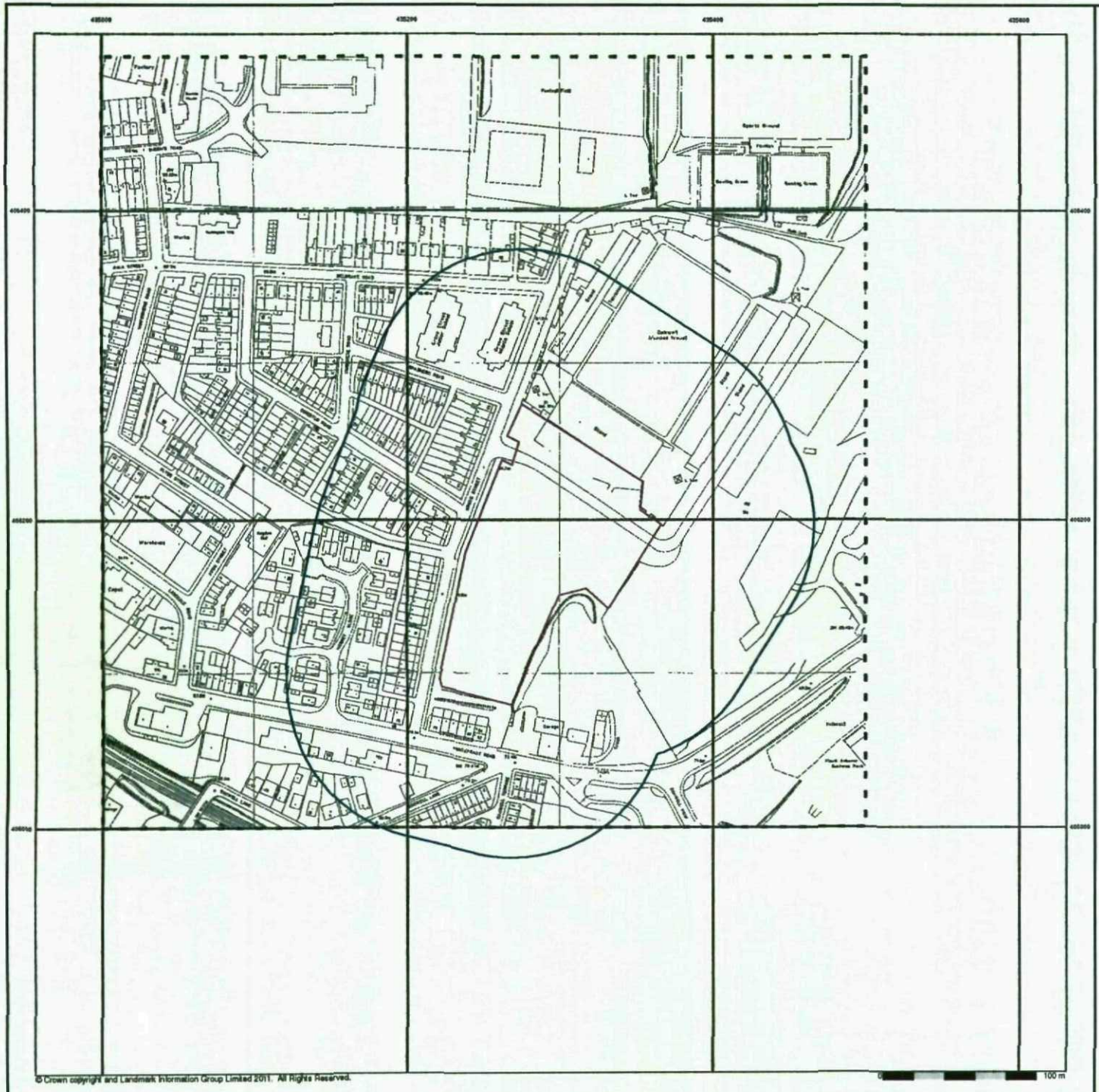
Order Number:	36834079_1_1
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Large-Scale National Grid Data

Published 1997

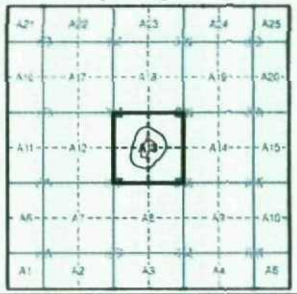
Source map scale - 1:1,250

'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.

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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
Sloping Masonry
Electricity Transmission Line
Pole
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

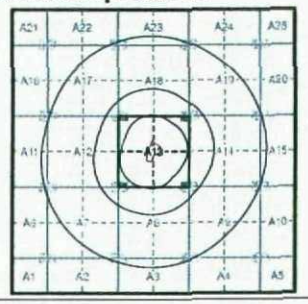
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community 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)
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
Yorkshire	1:10,560	1855	2
Yorkshire	1:10,560	1894	3
Yorkshire	1:10,560	1907	4
Yorkshire	1:10,560	1932	5
Yorkshire	1:10,560	1938	6
Yorkshire	1:10,560	1948	7
Ordnance Survey Plan	1:10,000	1955 - 1956	8
Ordnance Survey Plan	1:10,000	1965 - 1966	9
Ordnance Survey Plan	1:10,000	1973 - 1978	10
Ordnance Survey Plan	1:10,000	1980 - 1984	11
Ordnance Survey Plan	1:10,000	1989	12
Ordnance Survey Plan	1:10,000	1993	13
10K Raster Mapping	1:10,000	2000	14
10K Raster Mapping	1:10,000	2006	15
10K Raster Mapping	1:10,000	2011	16

Historical Map - Slice A

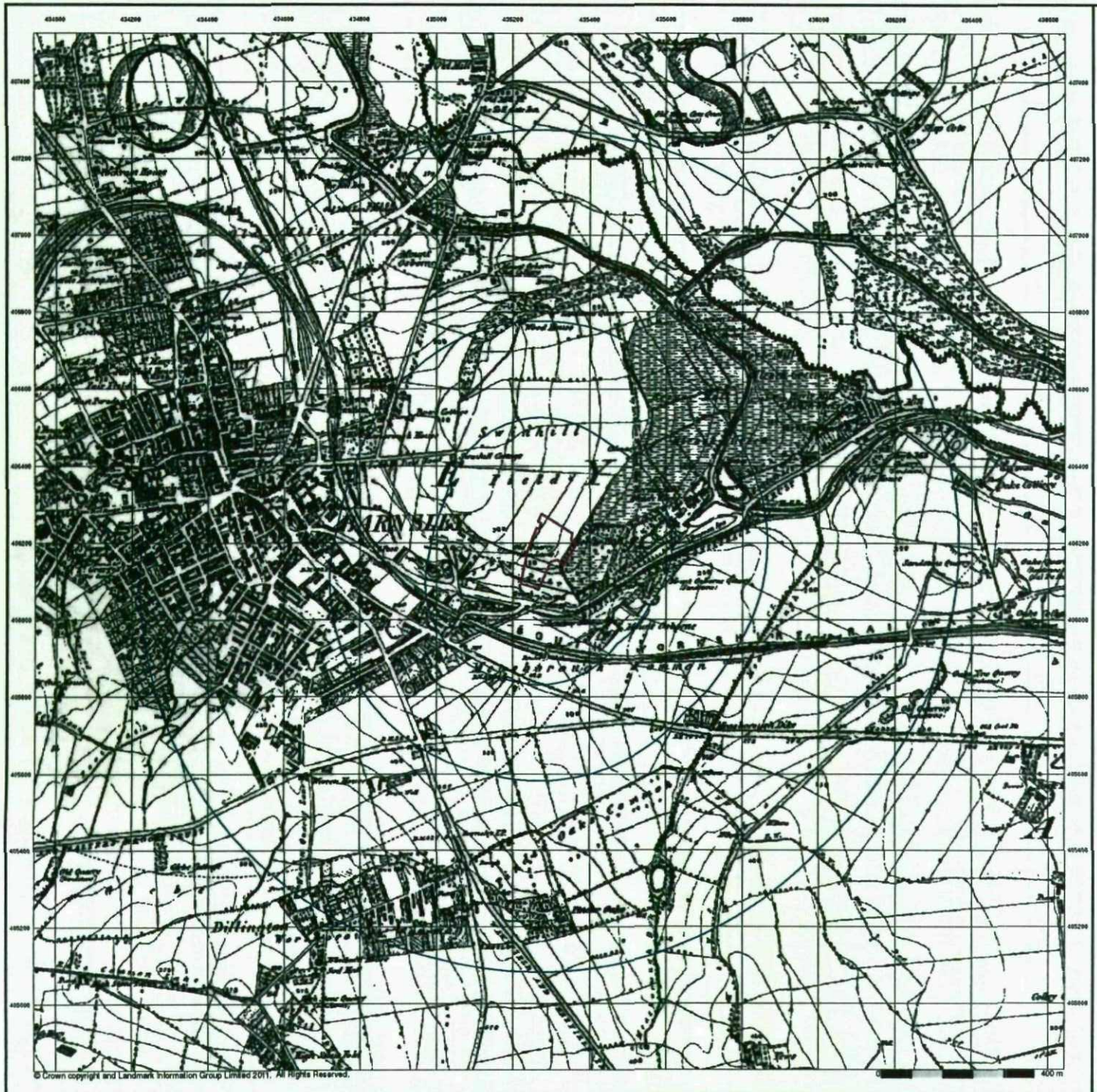


Order Details

Order Number: 36834079_1_1
Customer Ref: CI1887
National Grid Reference: 435280, 406170
Slice: A
Site Area (Ha): 1.44
Search Buffer (m): 1000

Site Details

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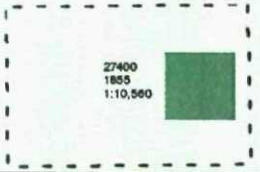
Yorkshire

Published 1855

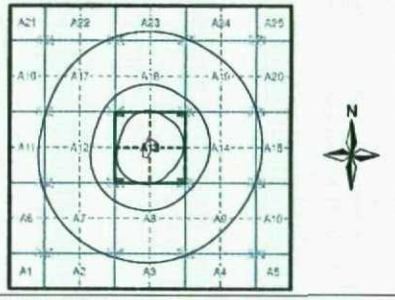
Source map scale - 1:10,560

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

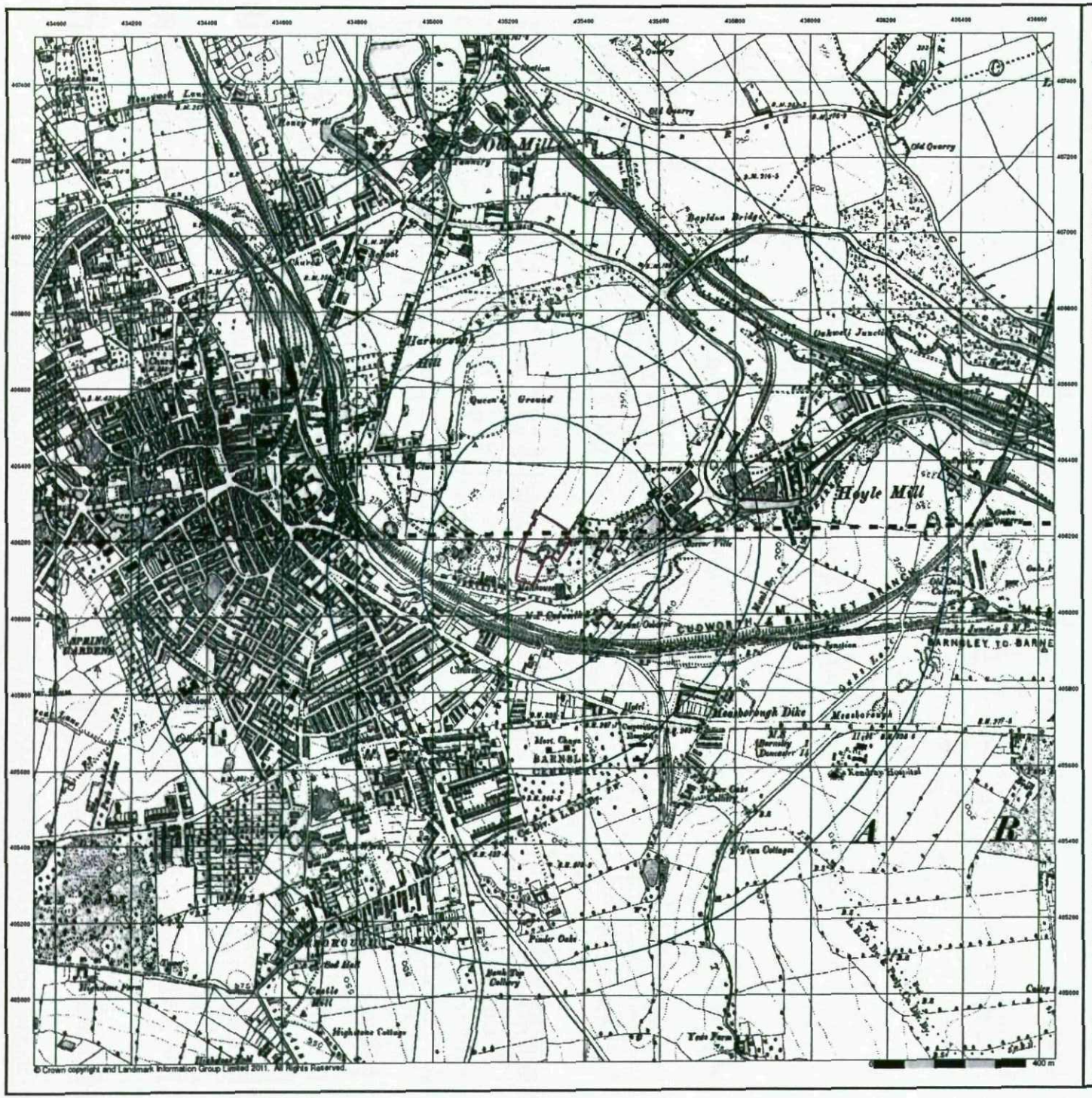
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National Grid Reference:	435280, 406170
Slice:	A
Site Area (Ha):	1.44
Search Buffer (m):	1000

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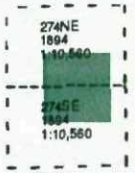
Yorkshire

Published 1894

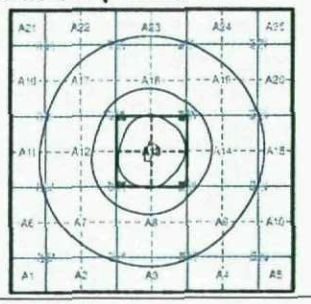
Source map scale - 1:10,560

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Historical Map - Slice A

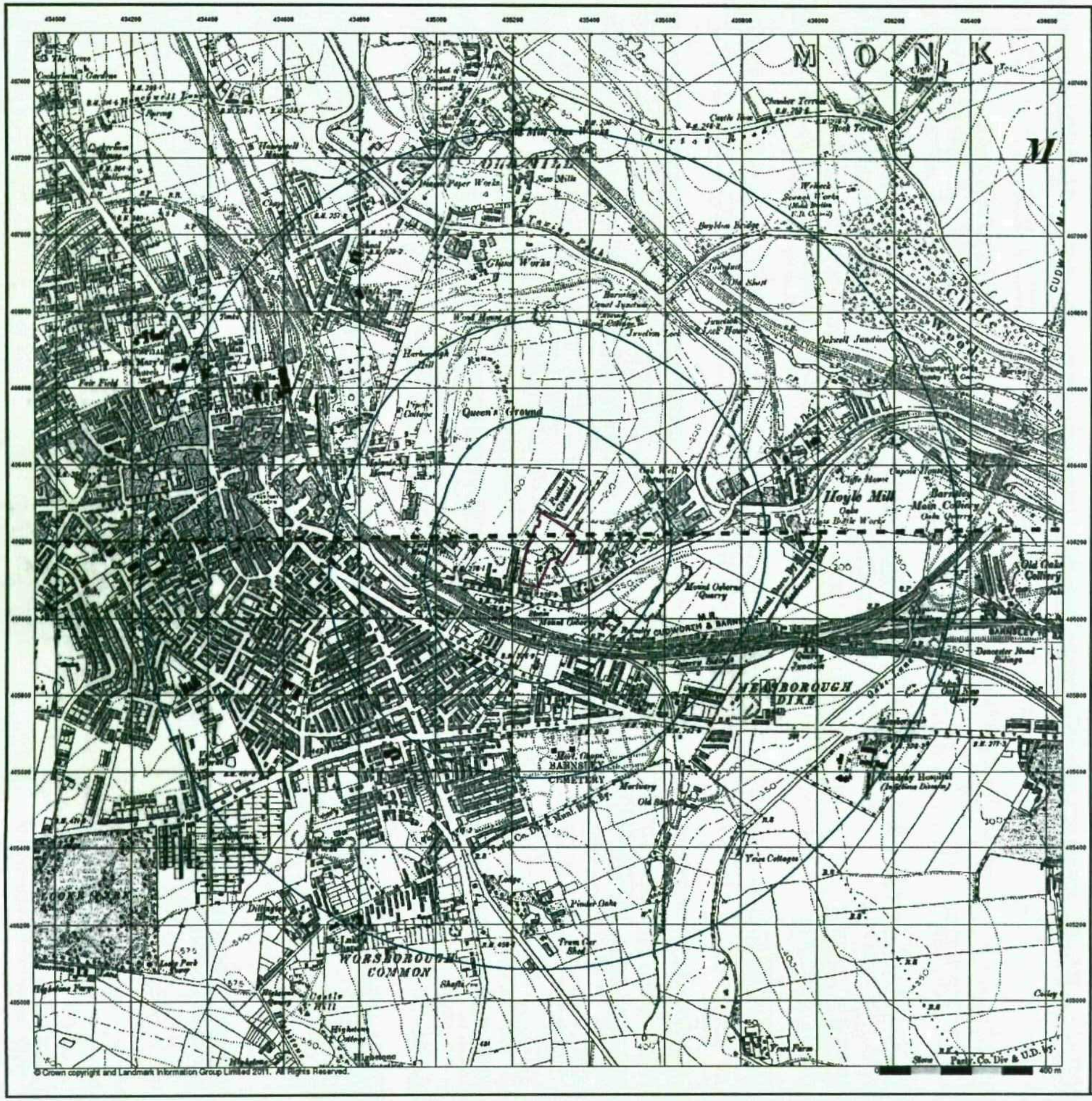


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Yorkshire

Published 1907

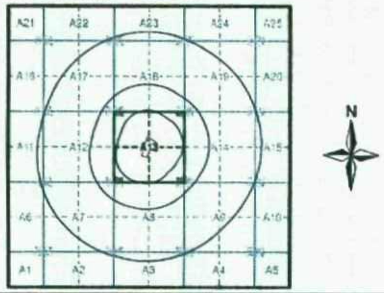
Source map scale - 1:10,560

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Yorkshire

Published 1932

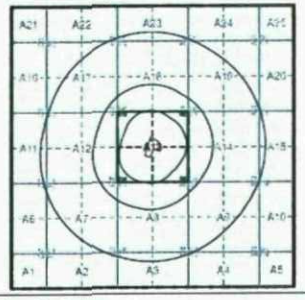
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