

21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

2

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m

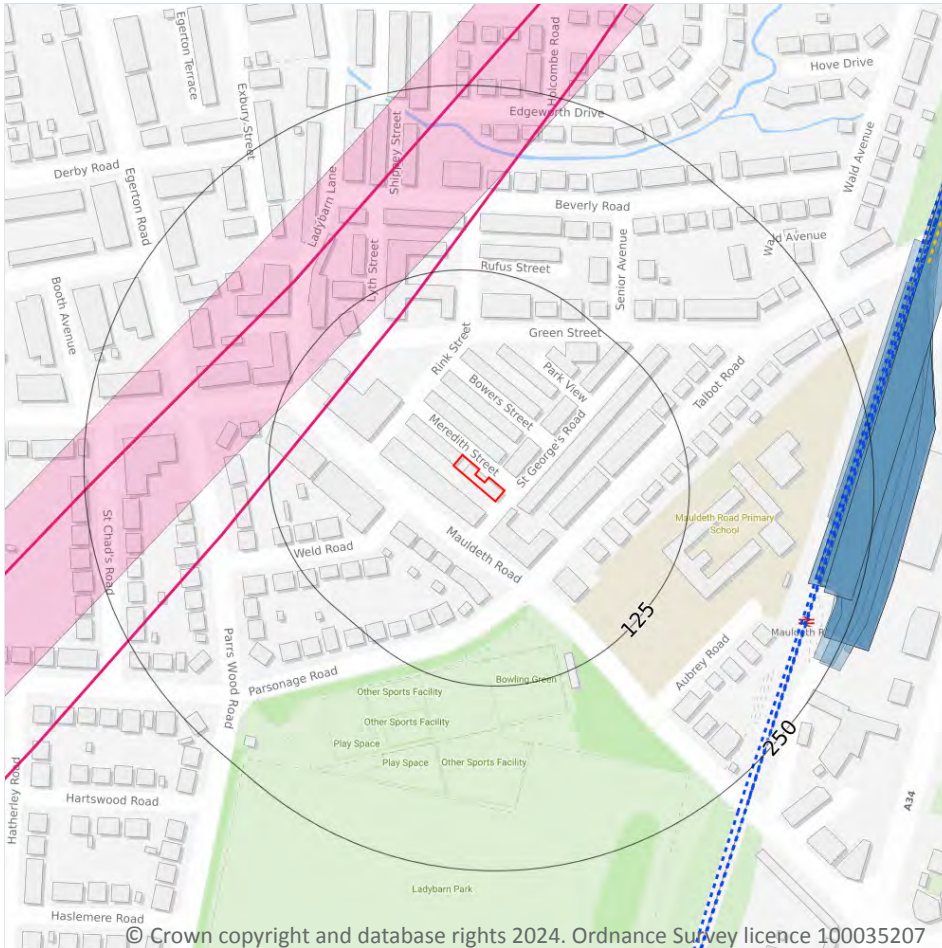
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The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)**
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

22.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.



This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m

13

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on [page 99 >](#)

Location	Land Use	Year of mapping	Mapping scale
215m E	Railway Sidings	1938	10560
215m E	Railway Sidings	1934	10560
218m E	Railway Sidings	1974	10000
218m E	Railway Sidings	1955	10560
218m E	Railway Sidings	1965	10560
219m E	Railway Sidings	1916	10560
220m E	Railway Sidings	1934	2500
223m E	Railway Sidings	1956	2500
223m E	Railway Sidings	1923	10560
227m E	Railway Sidings	1983	10000
227m E	Railway Sidings	1989	10000
234m E	Railway Sidings	1988	1250
234m E	Railway Sidings	1956	1250

This data is sourced from Ordnance Survey/Groundsure.



22.5 Royal Mail tunnels

Records within 250m**0**

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m**0**

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m**4**

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways. Features are displayed on the Railway infrastructure and projects map on [page 99 >](#)

Location	Name	Type
219m E	Styal Line	rail
221m E	Styal Line	rail
222m E	Not given	Multi Track
227m E	Not given	Multi Track

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m**0**

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.



22.9 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m

2

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

Features are displayed on the Railway infrastructure and projects map on [page 99 >](#)

Location	Track Type	Speed (mph)	Speed (km/h)	Status
92m NW	Tunnel	143mph	230kph	Section is scheduled for cancellation
163m NW	Tunnel	143mph	230kph	Section is scheduled for cancellation

This data is sourced from HS2 Ltd.



Data providers

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APPENDIX 5

HISTORICAL ORDNANCE SURVEY MAPS

Site Details:

22, MEREDITH STREET,
MANCHESTER, M14 6ST

Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1881

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1881
Revised N/A
Edition 1881
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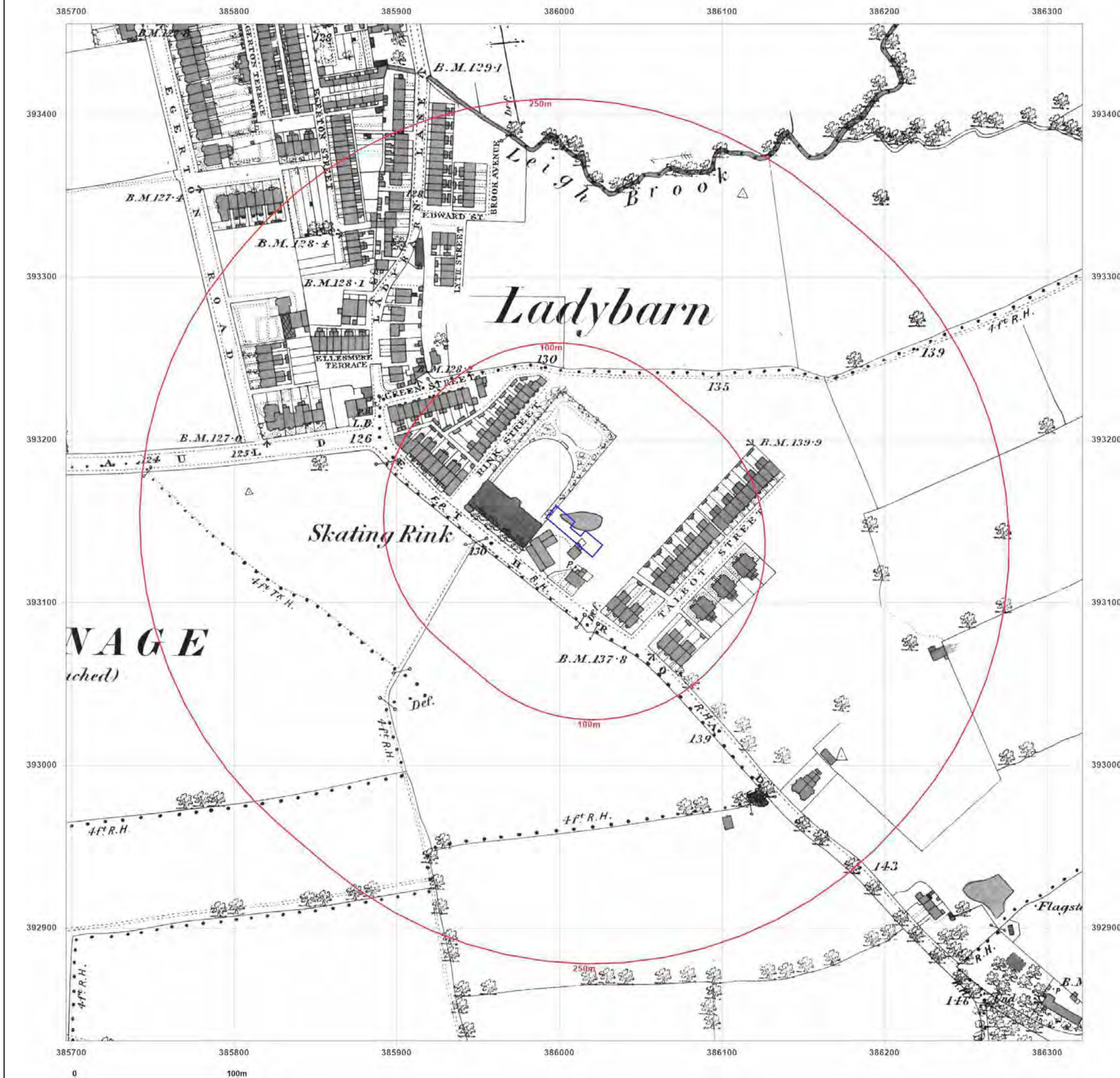


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1893-1894

Scale: 1:2,500

Printed at: 1:2,500



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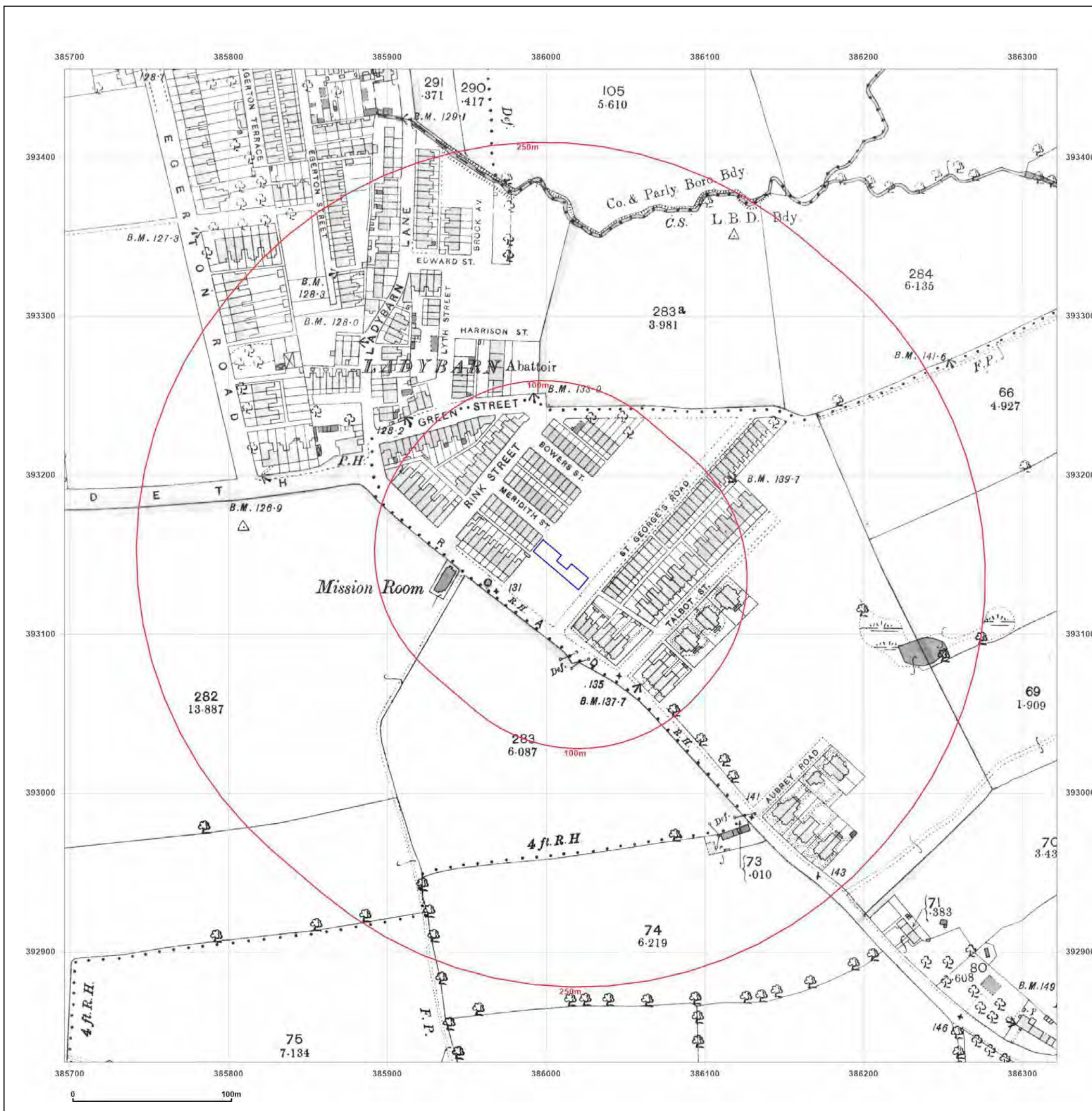


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1907

Scale: 1:2,500

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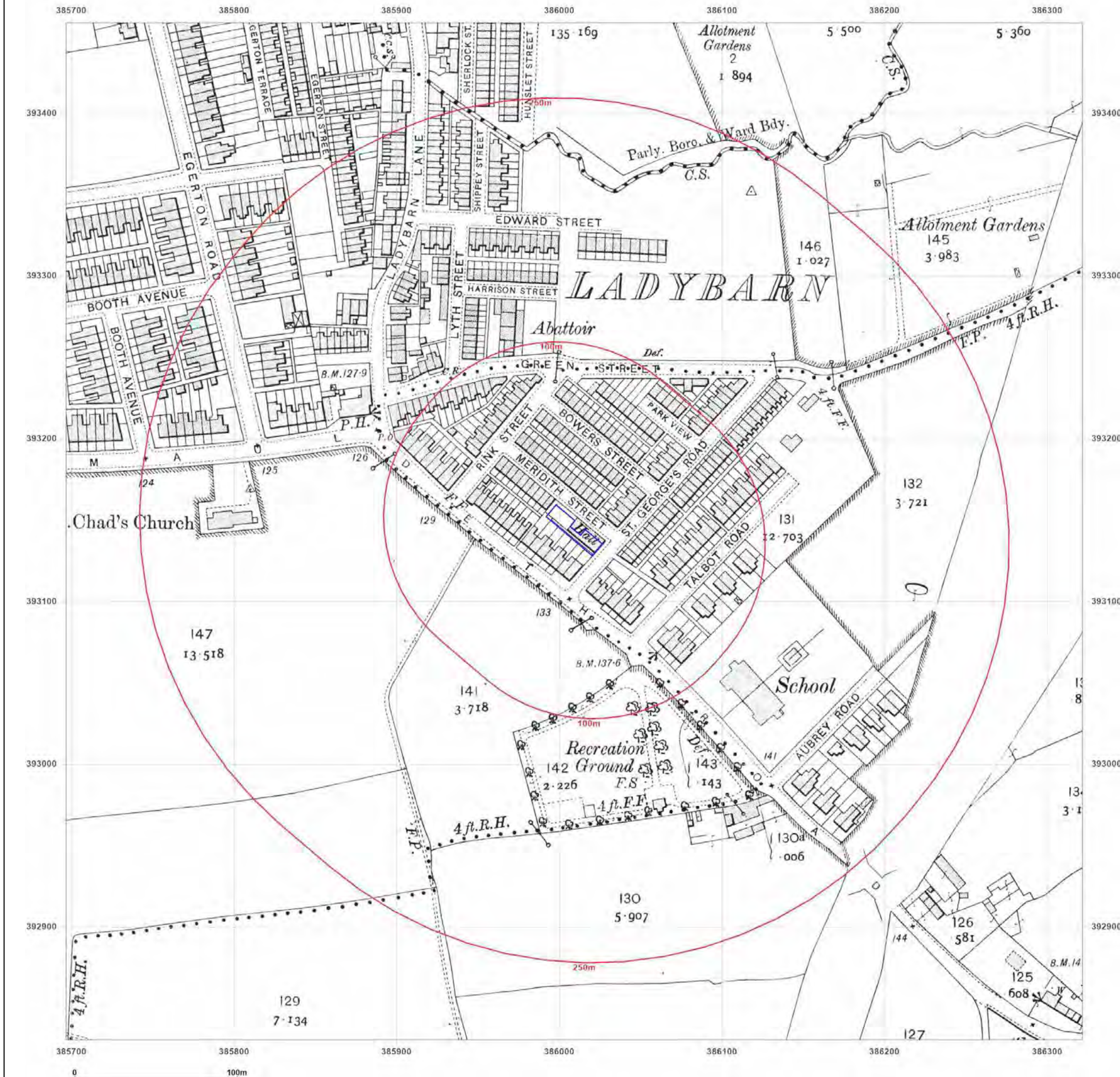


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Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1922

Scale: 1:2,500

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Surveyed 1922
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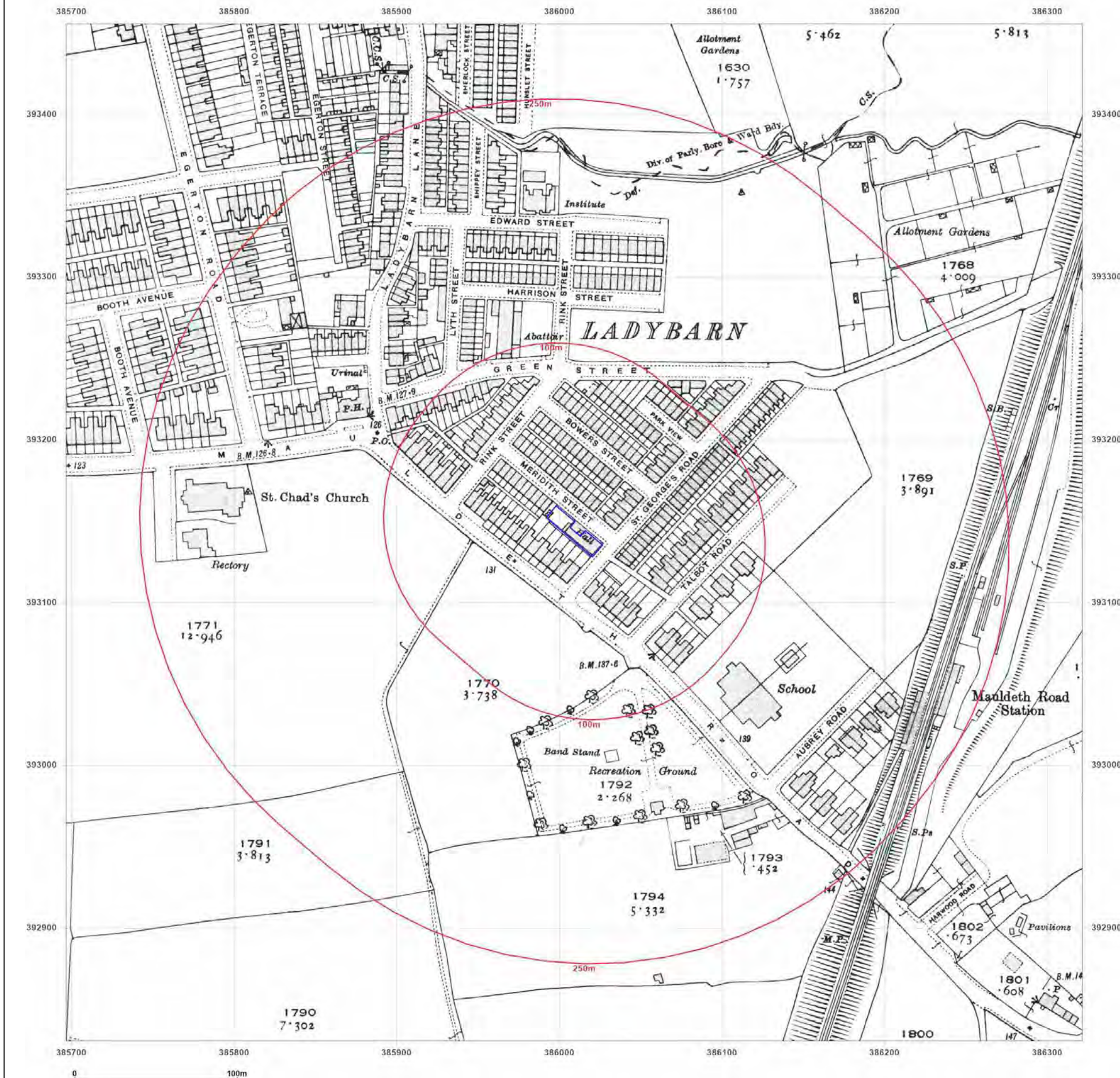


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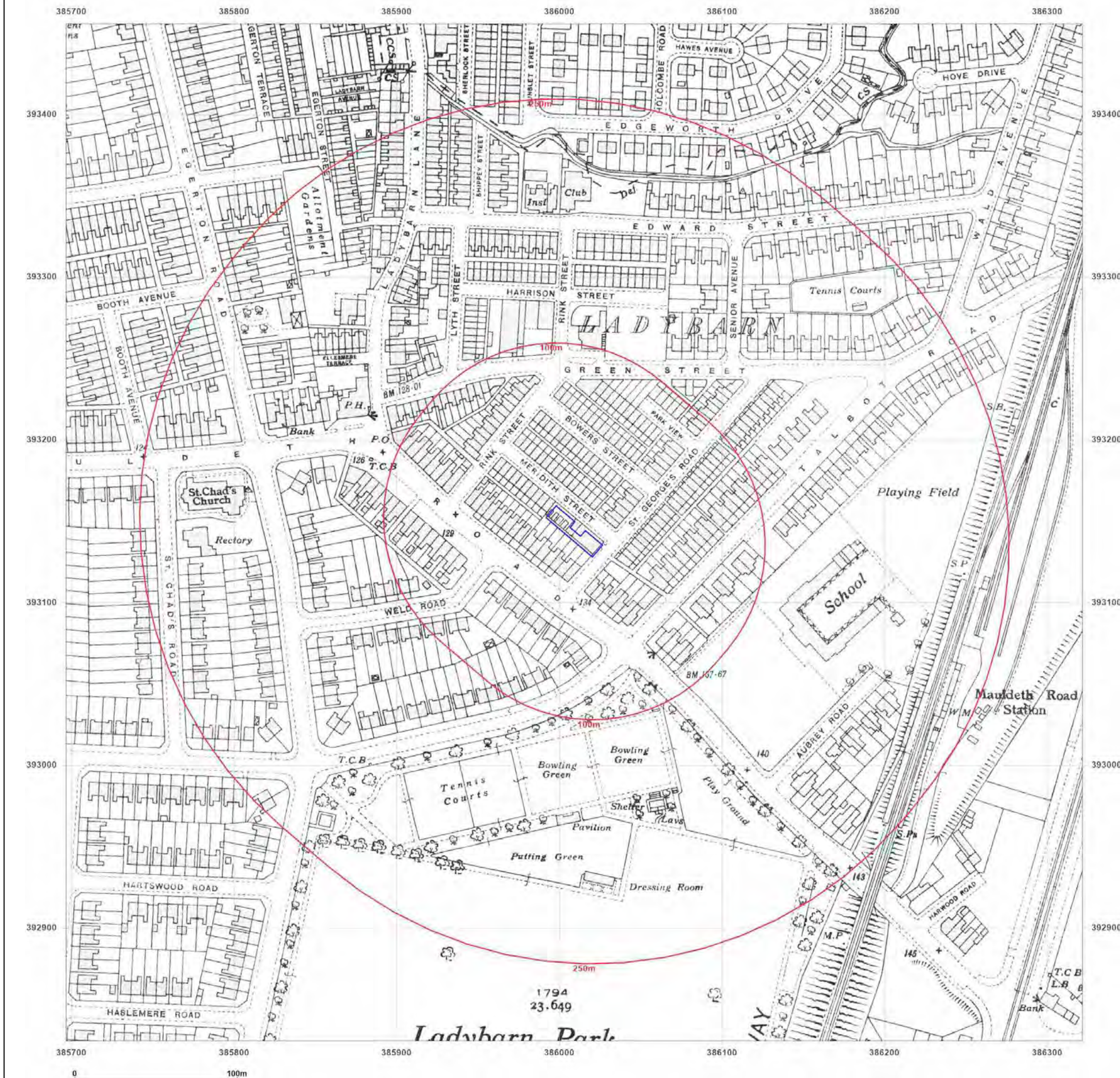


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Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1956-1957

Scale: 1:1,250

Printed at: 1:2,000



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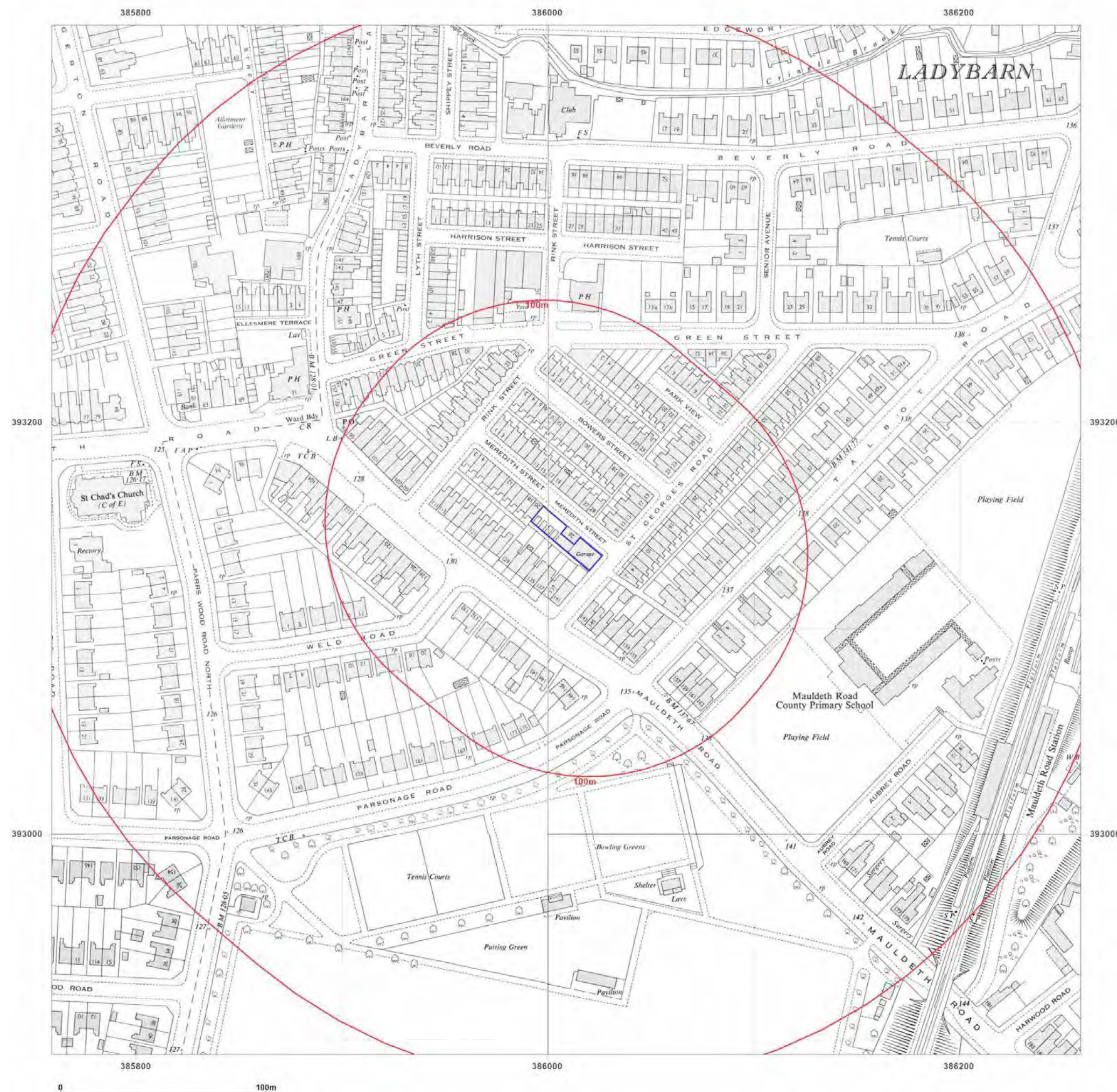


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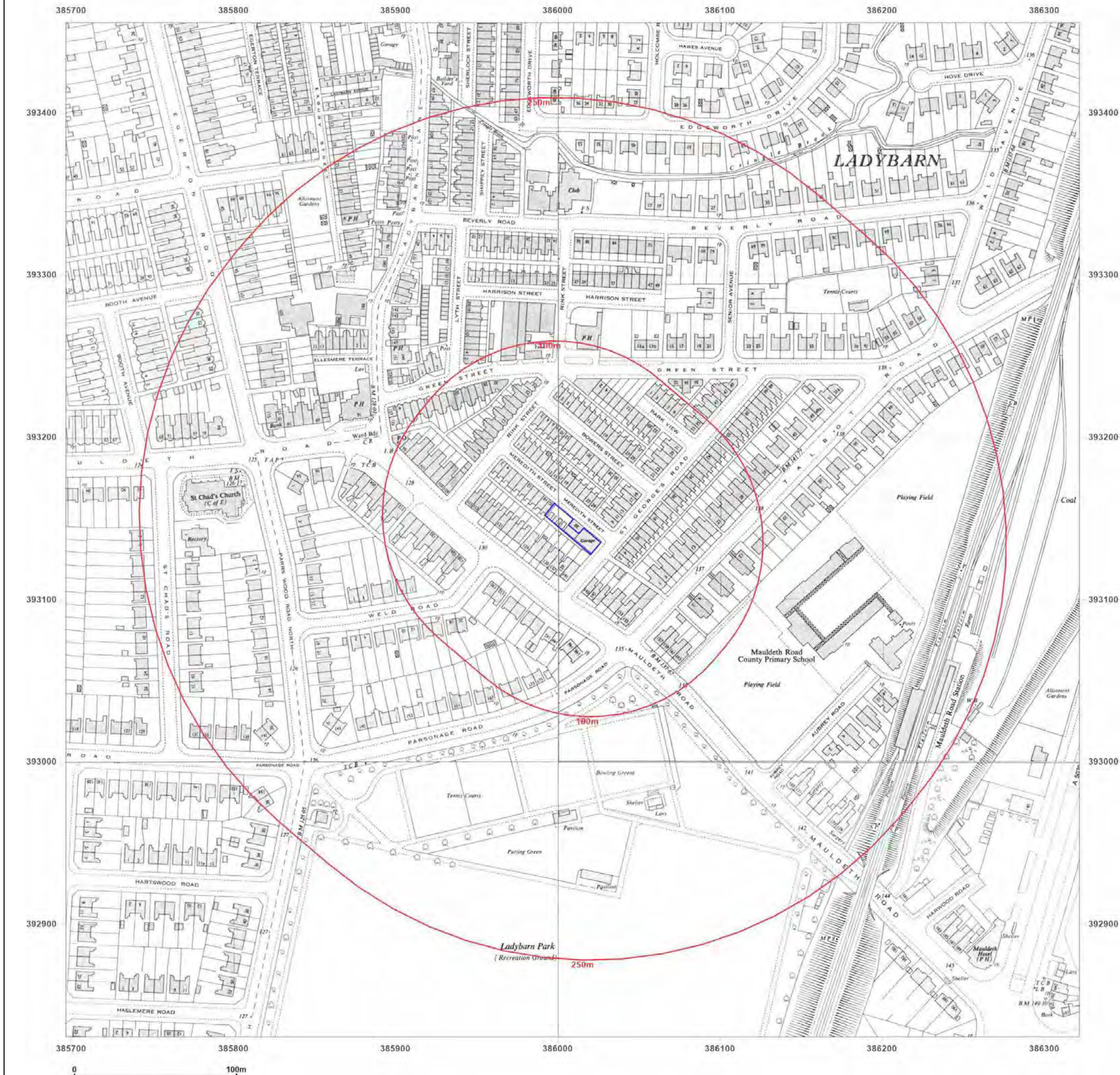


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Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1958

Scale: 1:1,250

Printed at: 1:2,000



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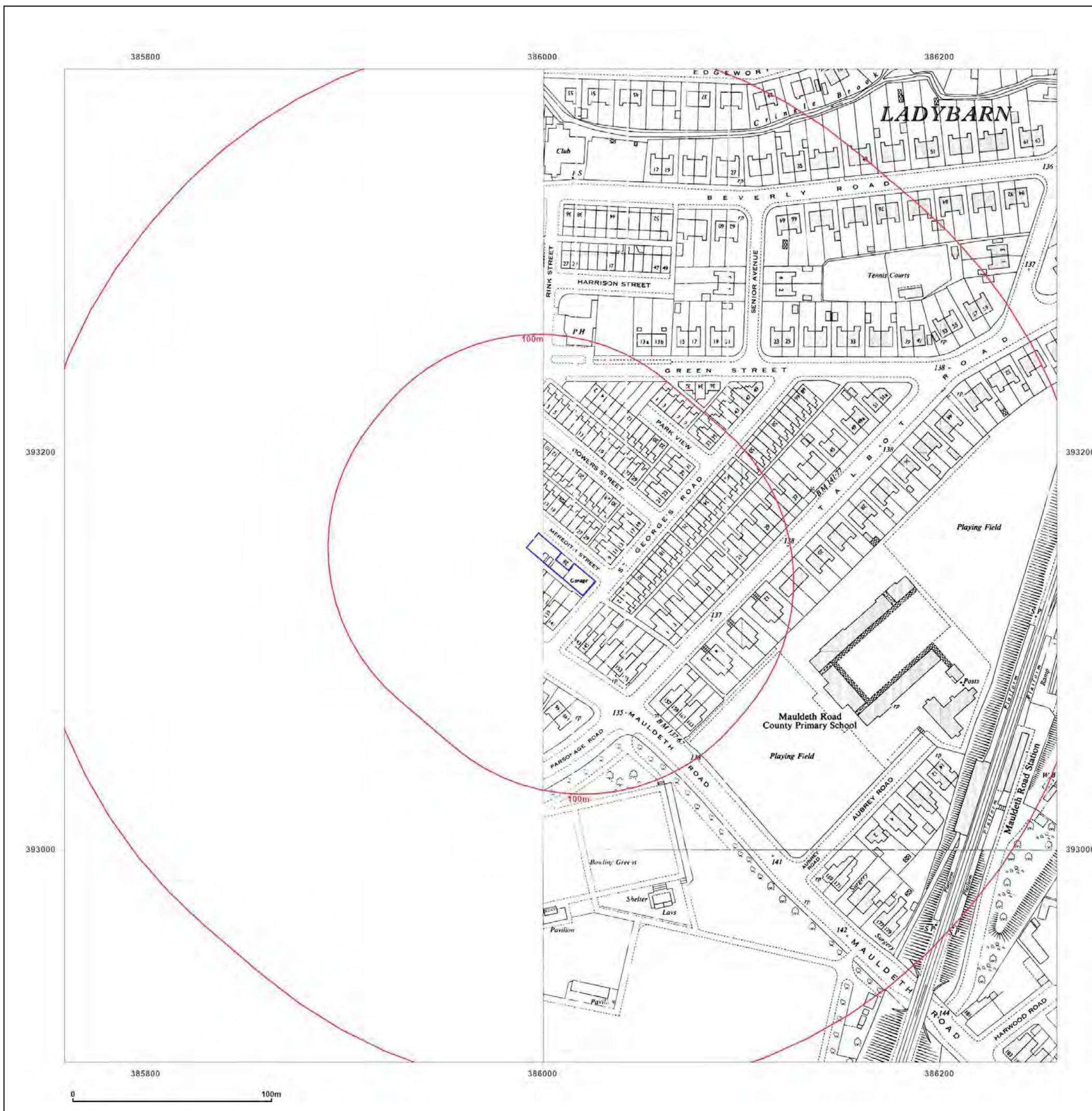


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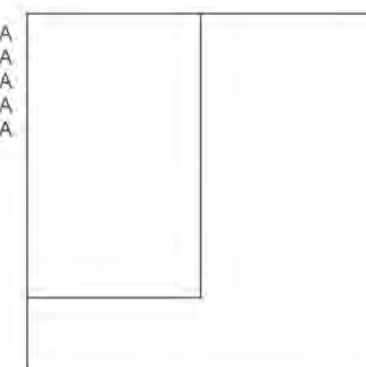
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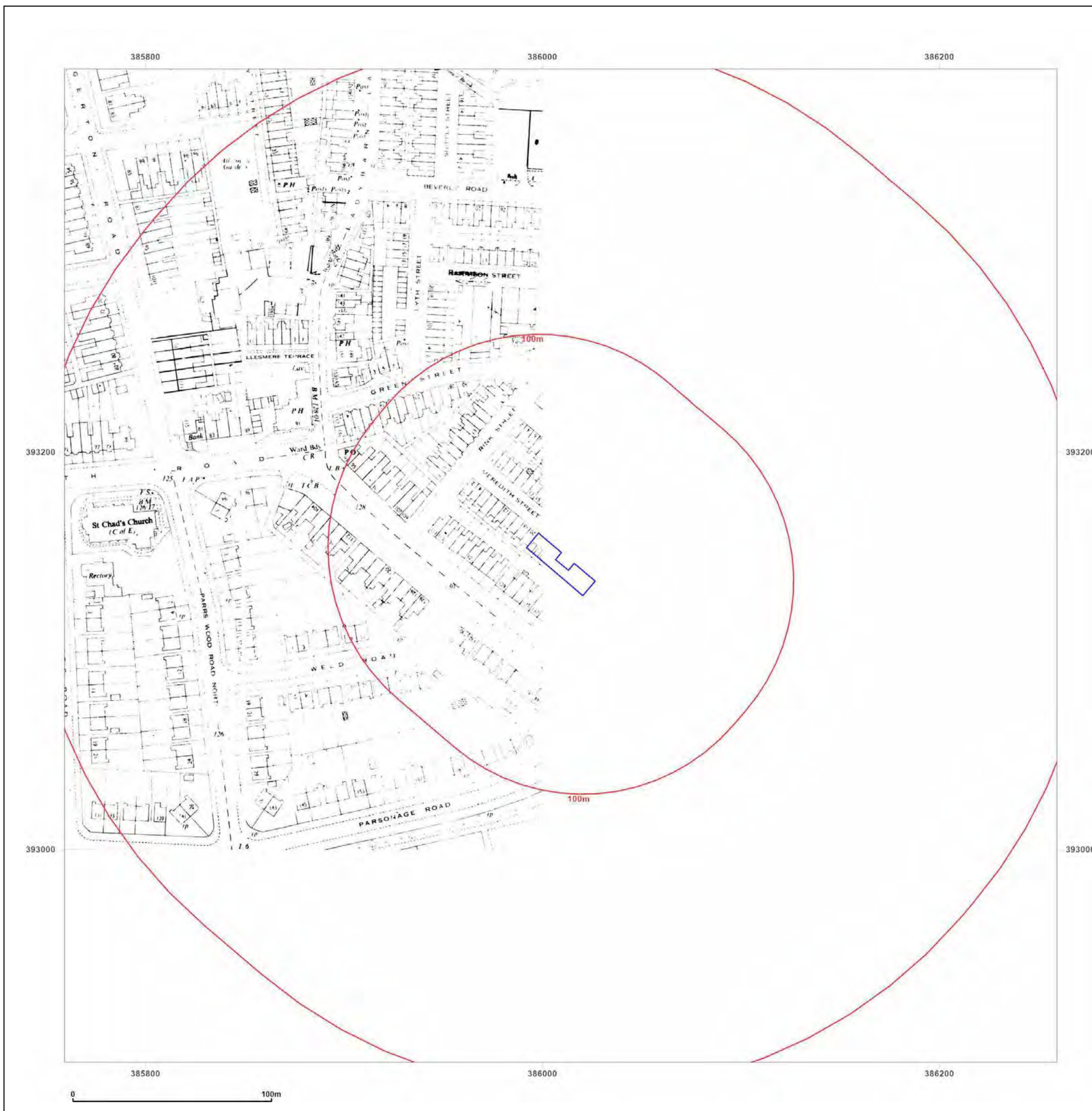


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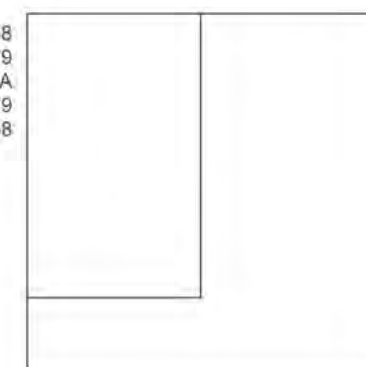
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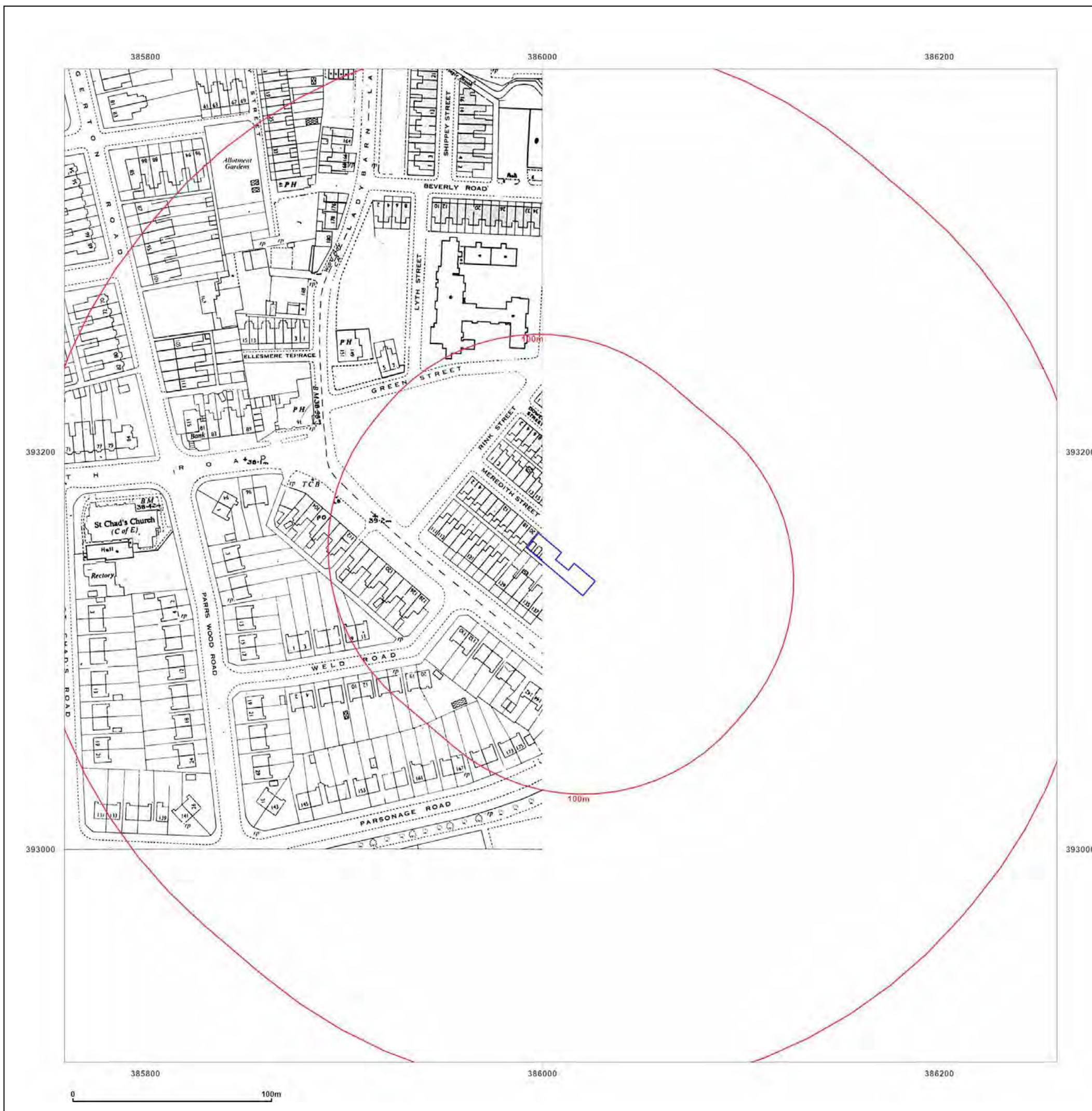


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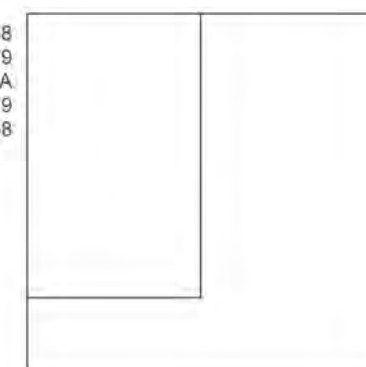
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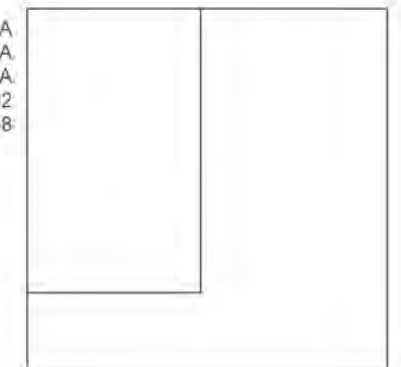
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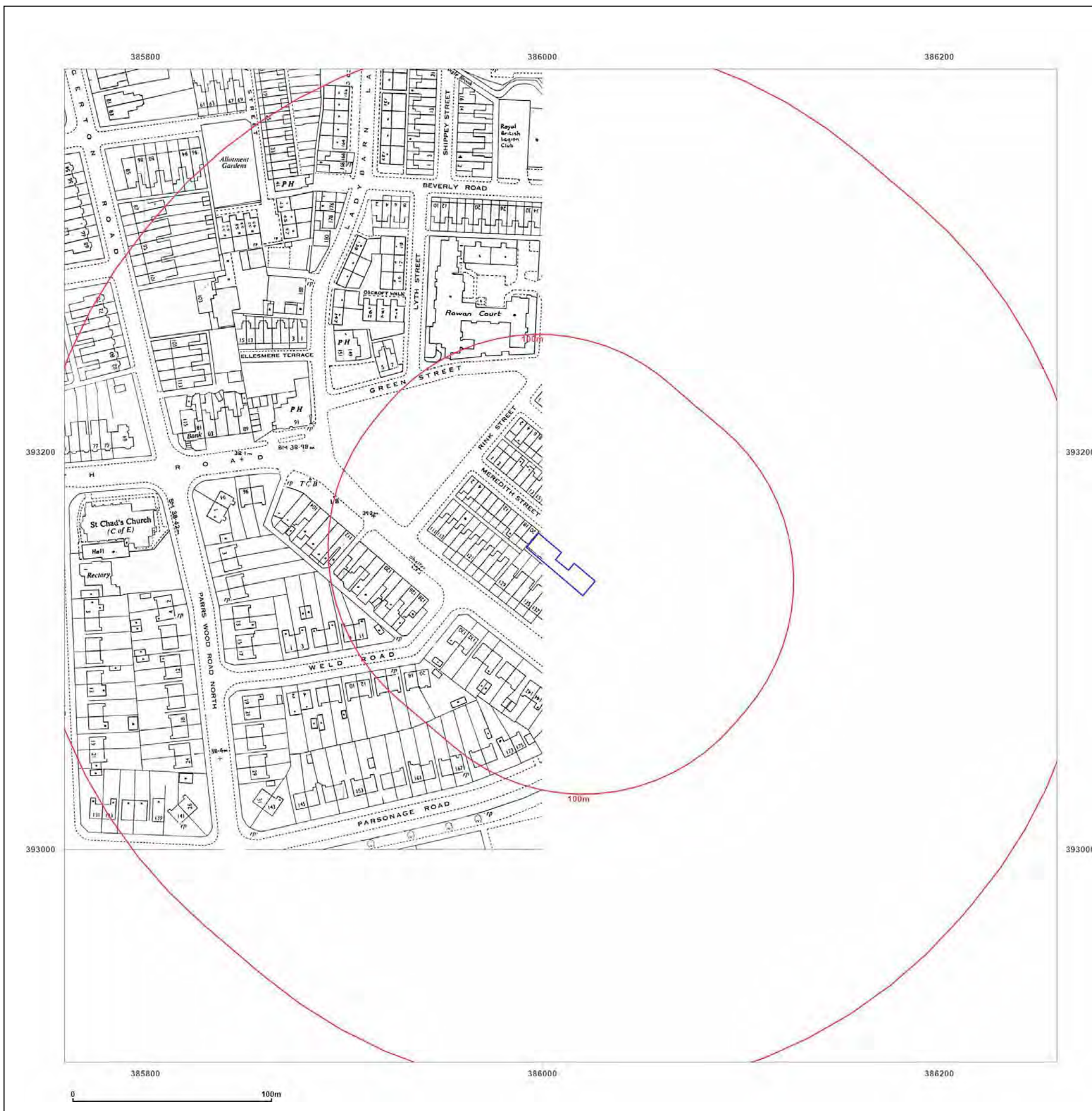


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Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1987-1989

Scale: 1:1,250

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Revised 1988
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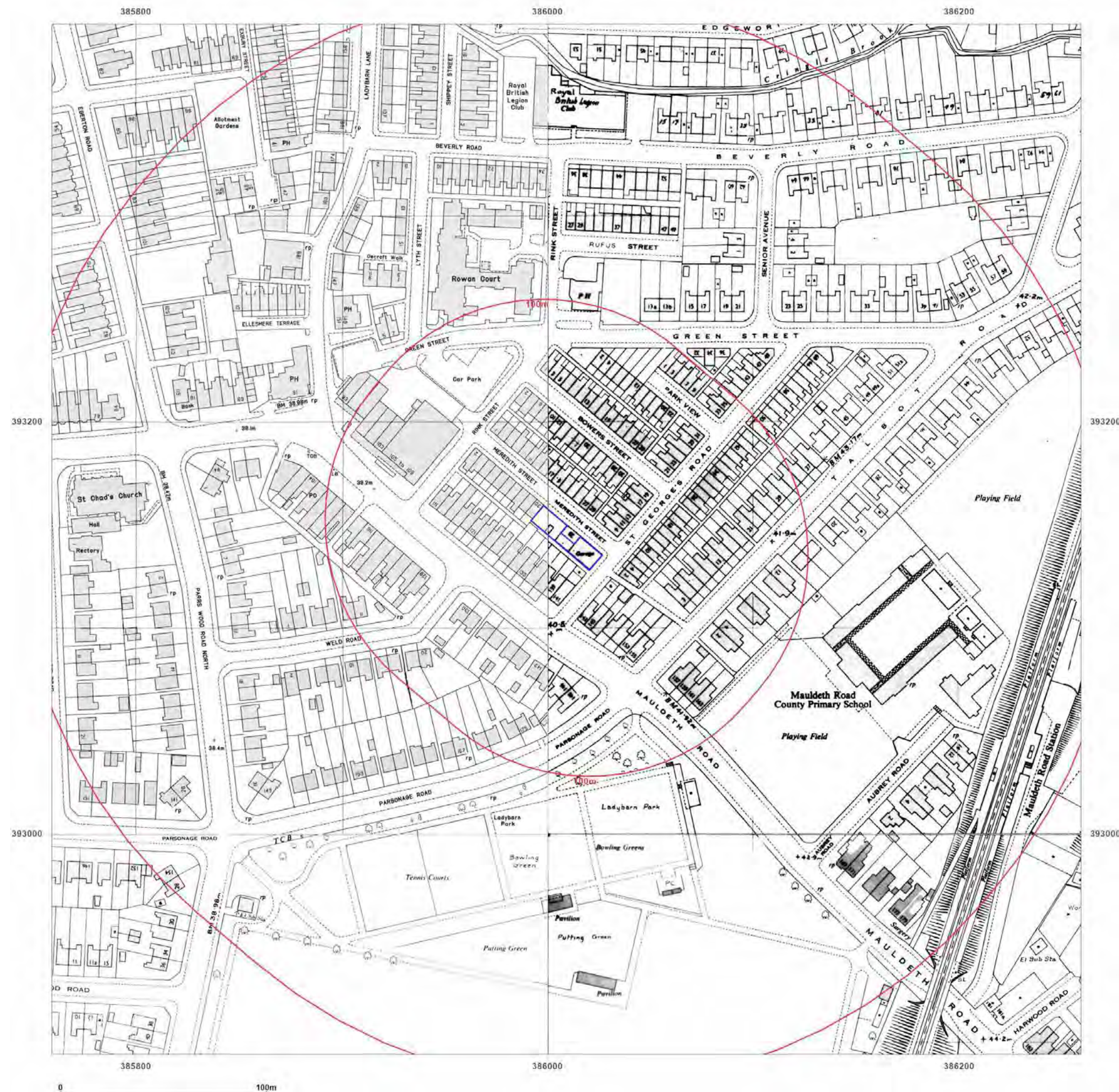


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1990-1992

Scale: 1:1,250

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Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1990-1992

Scale: 1:1,250

Printed at: 1:2,000



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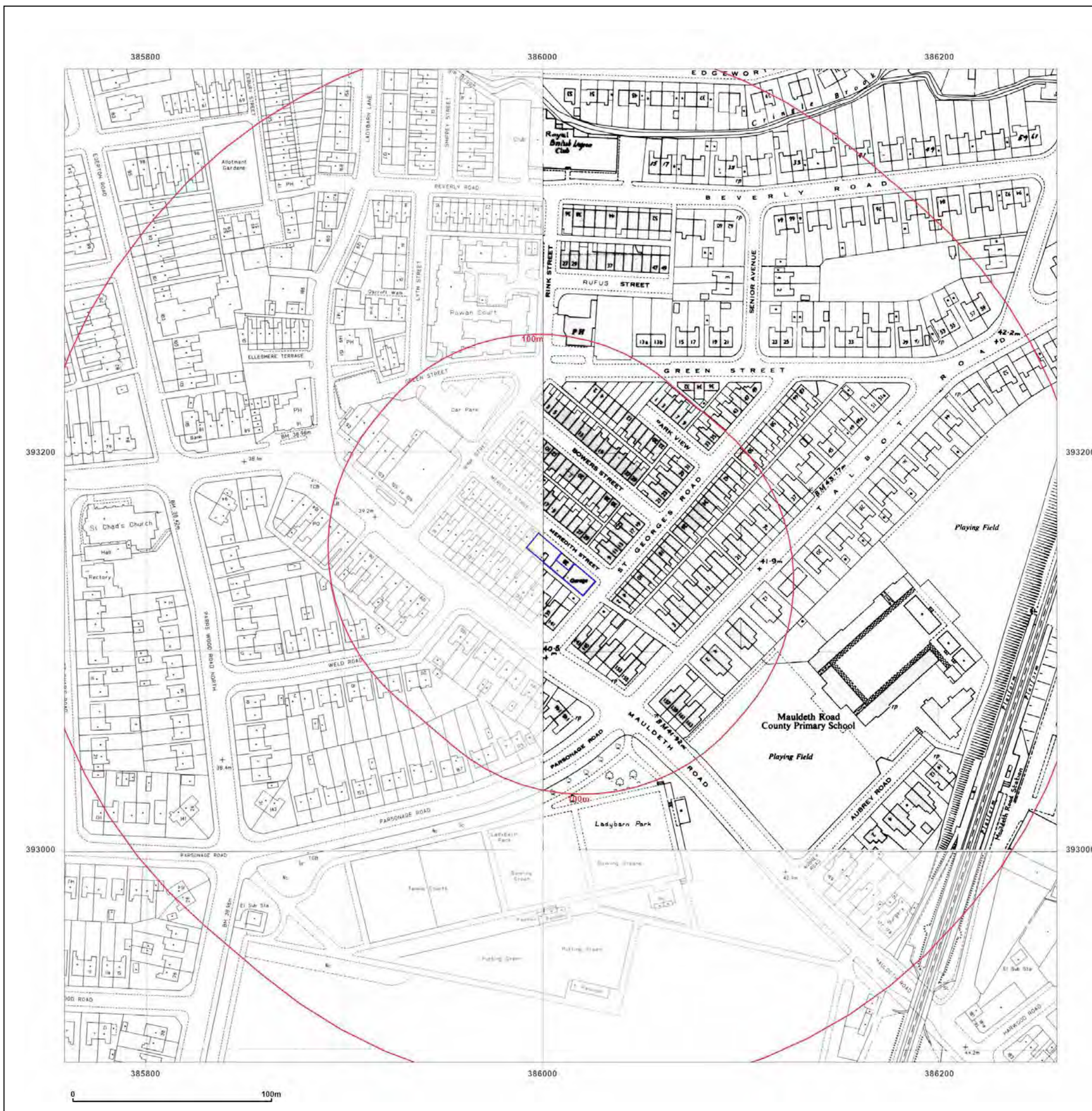


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Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

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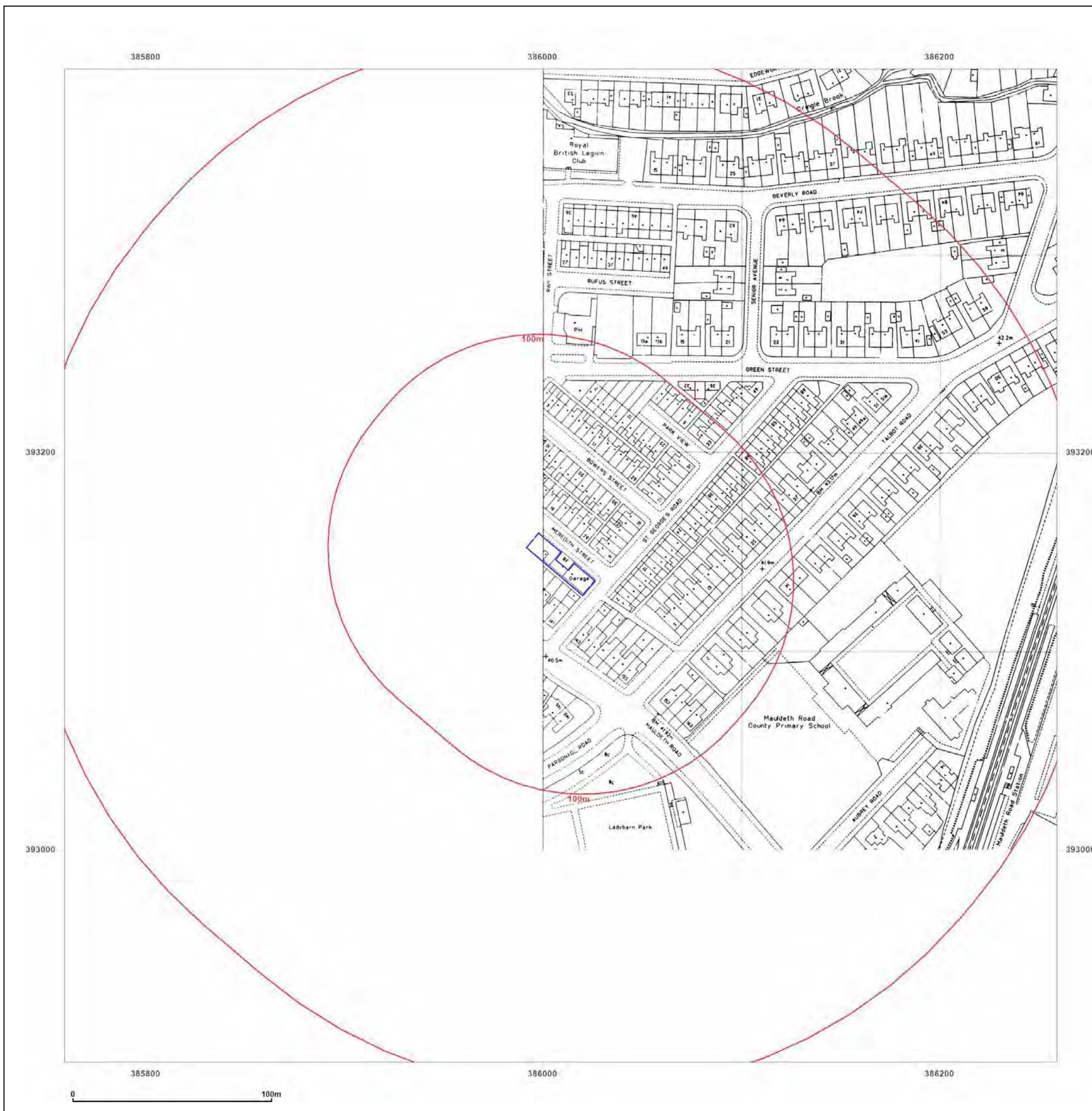


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Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1849

Scale: 1:10,560

Printed at: 1:10,560



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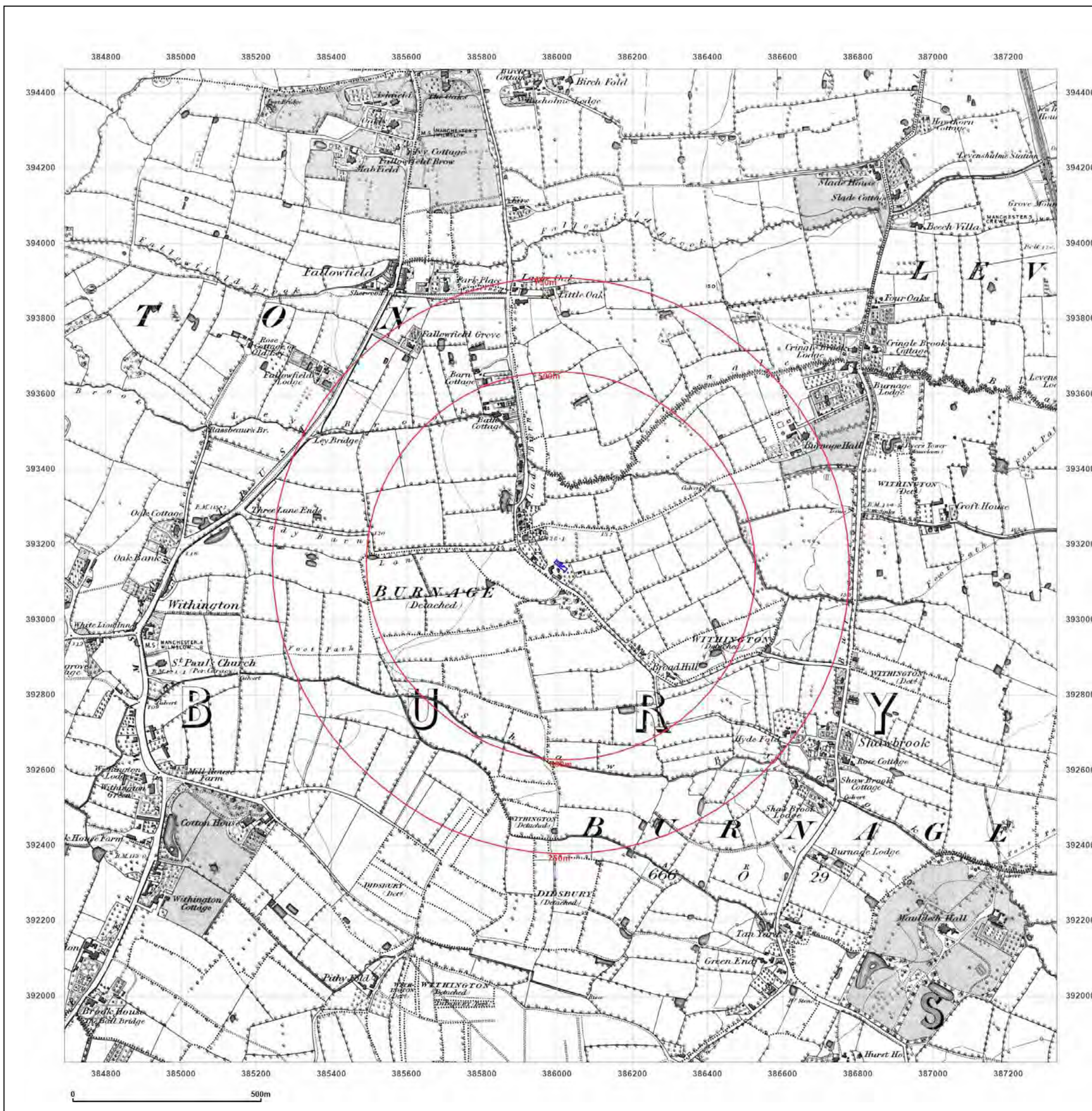


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Map Name: County Series

Map date: 1892

Scale: 1:10,560

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Edition 1892
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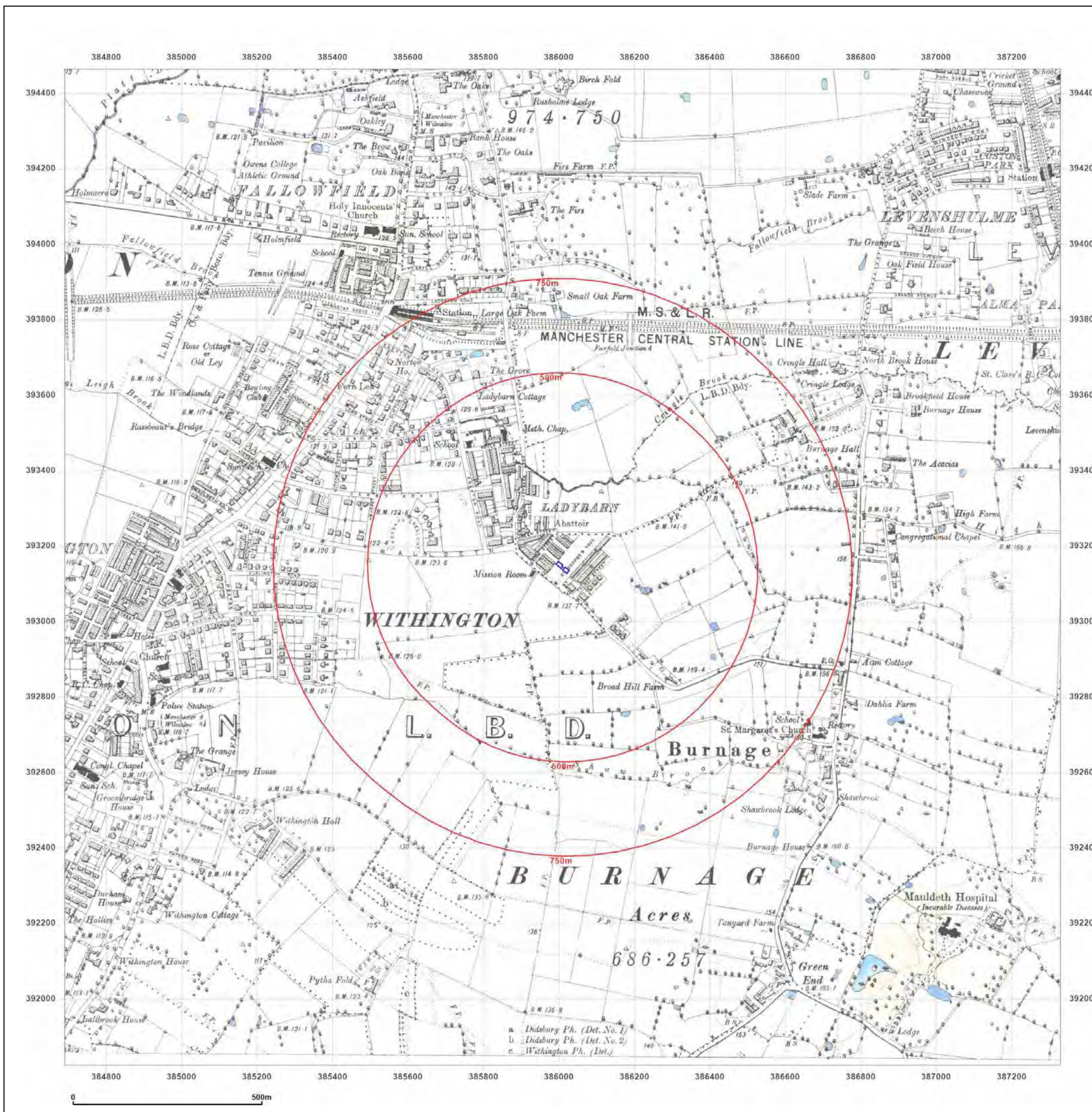


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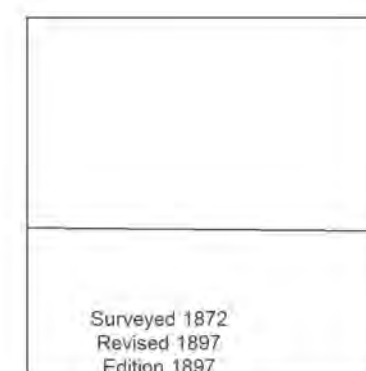
Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1897

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1872
Revised 1897
Edition 1897
Copyright N/A
Levelled N/A

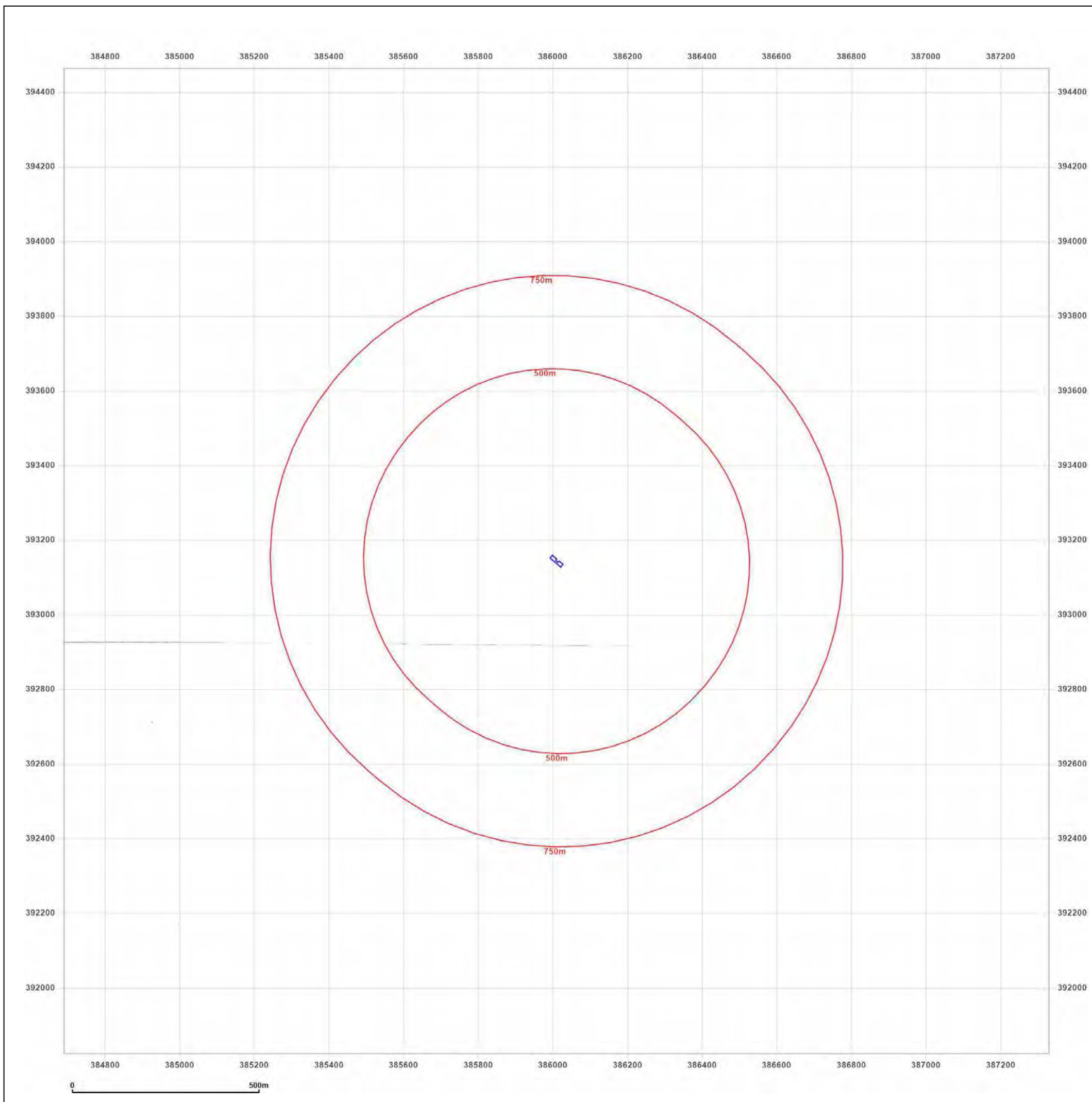


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1905

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1905
Edition 1905
Copyright N/A
Levelled N/A

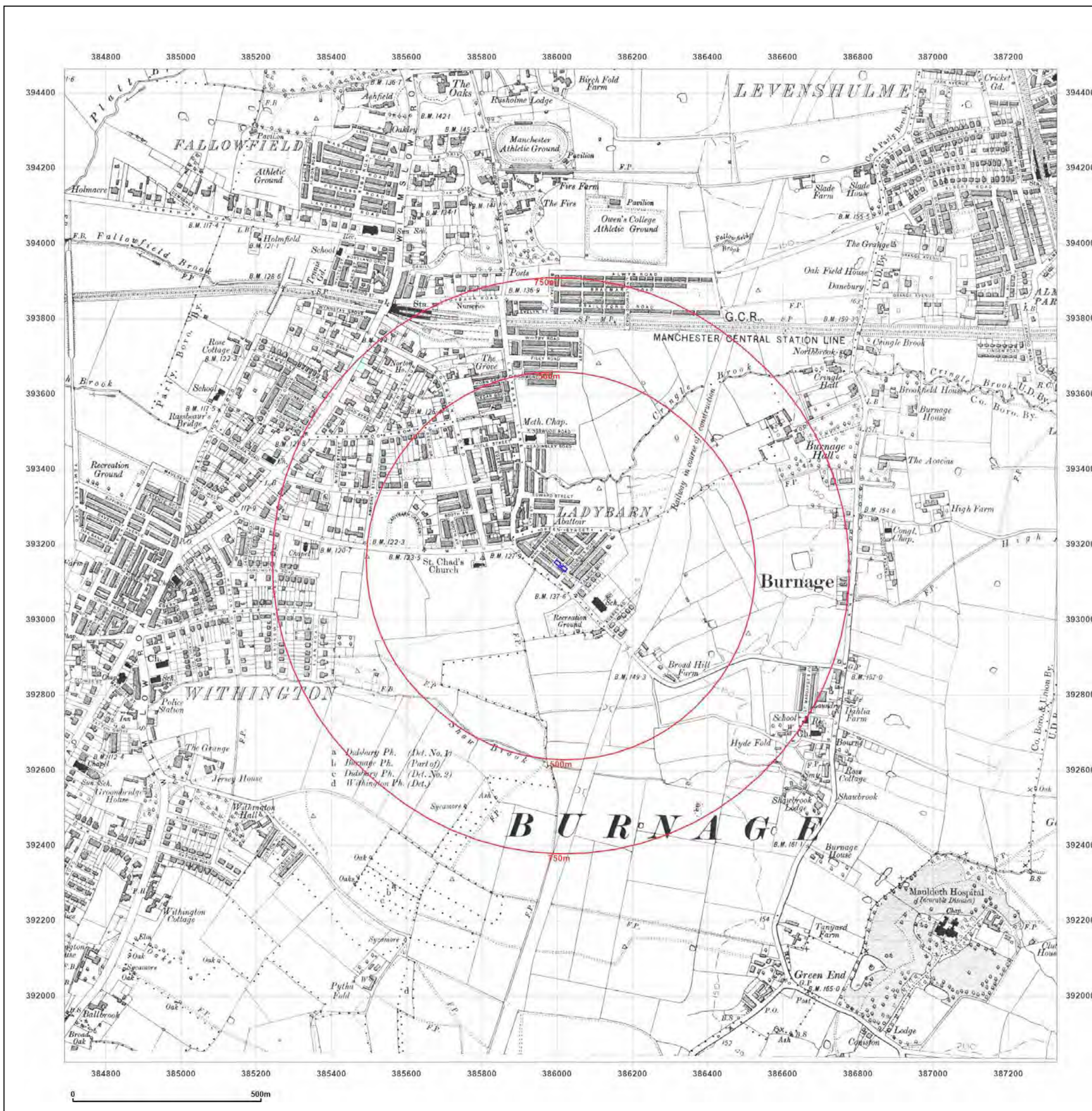


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1911

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1872	Surveyed 1844
Revised 1908	Revised 1904
Edition 1911	Edition 1911
Copyright N/A	Copyright N/A
Levelled N/A	Levelled N/A

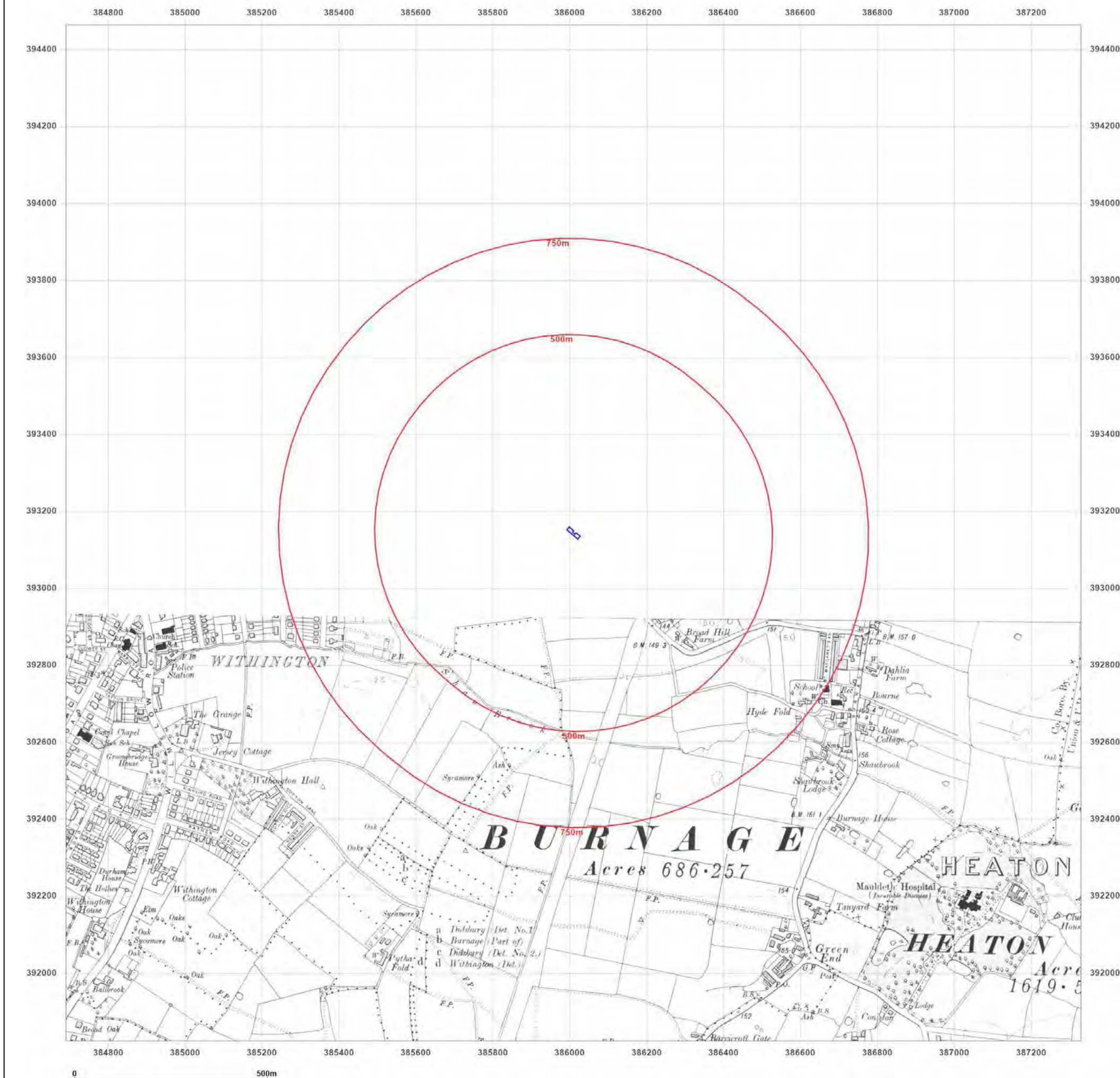


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

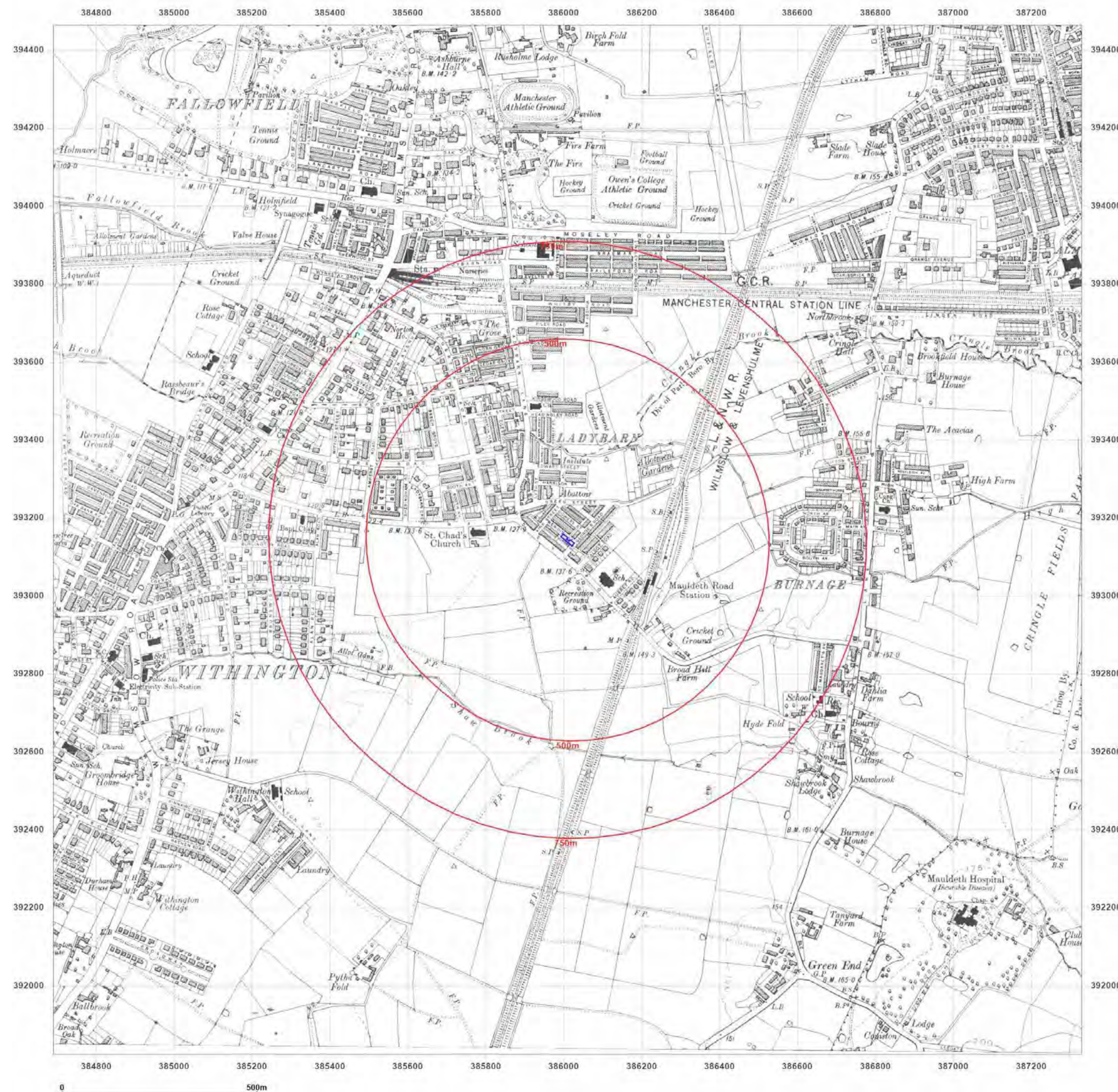


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Site Details:

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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

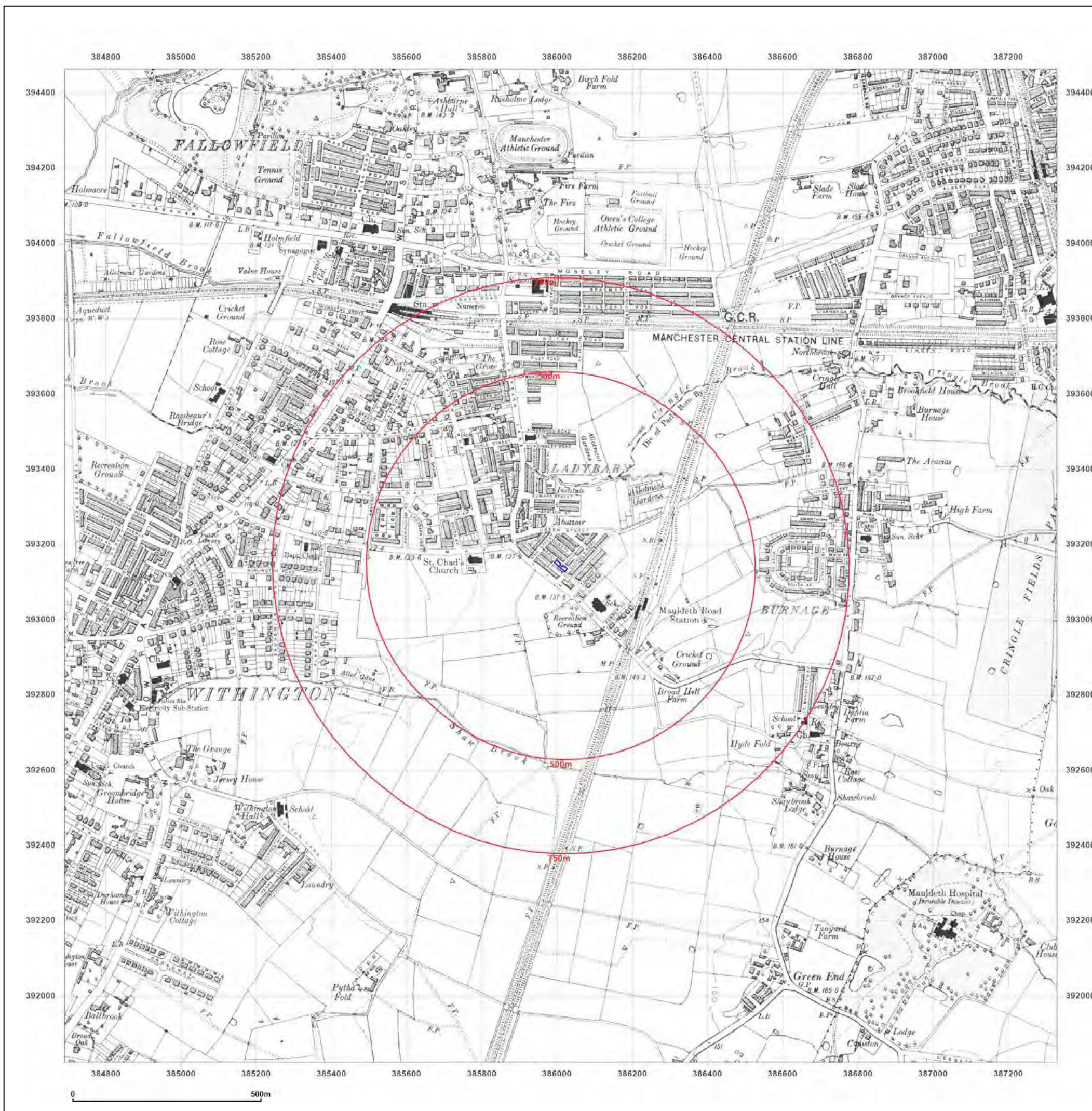


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1934

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1934
Edition 1934
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1934
Edition 1934
Copyright N/A
Levelled 1927

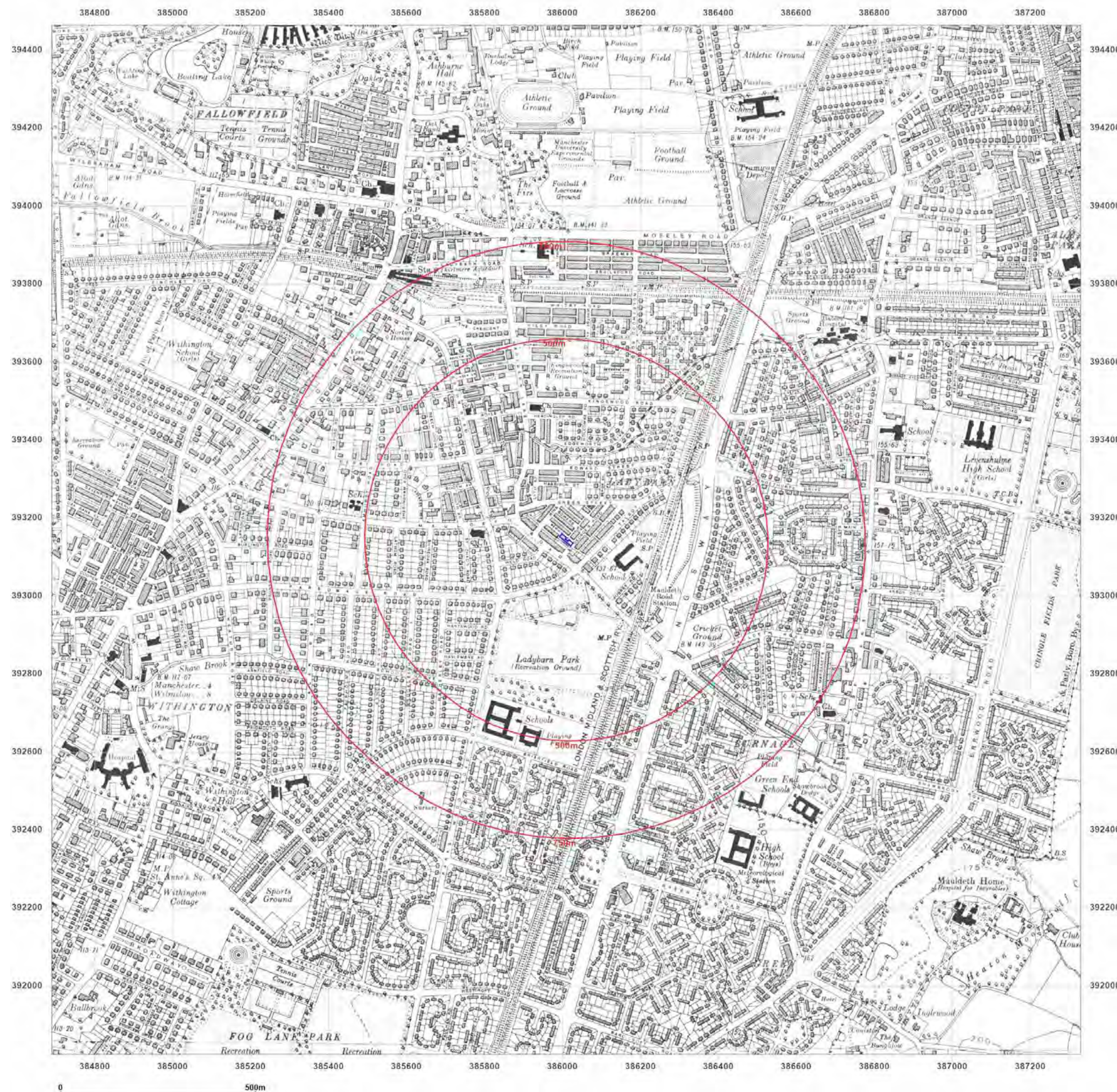


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Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

Surveyed 1872
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

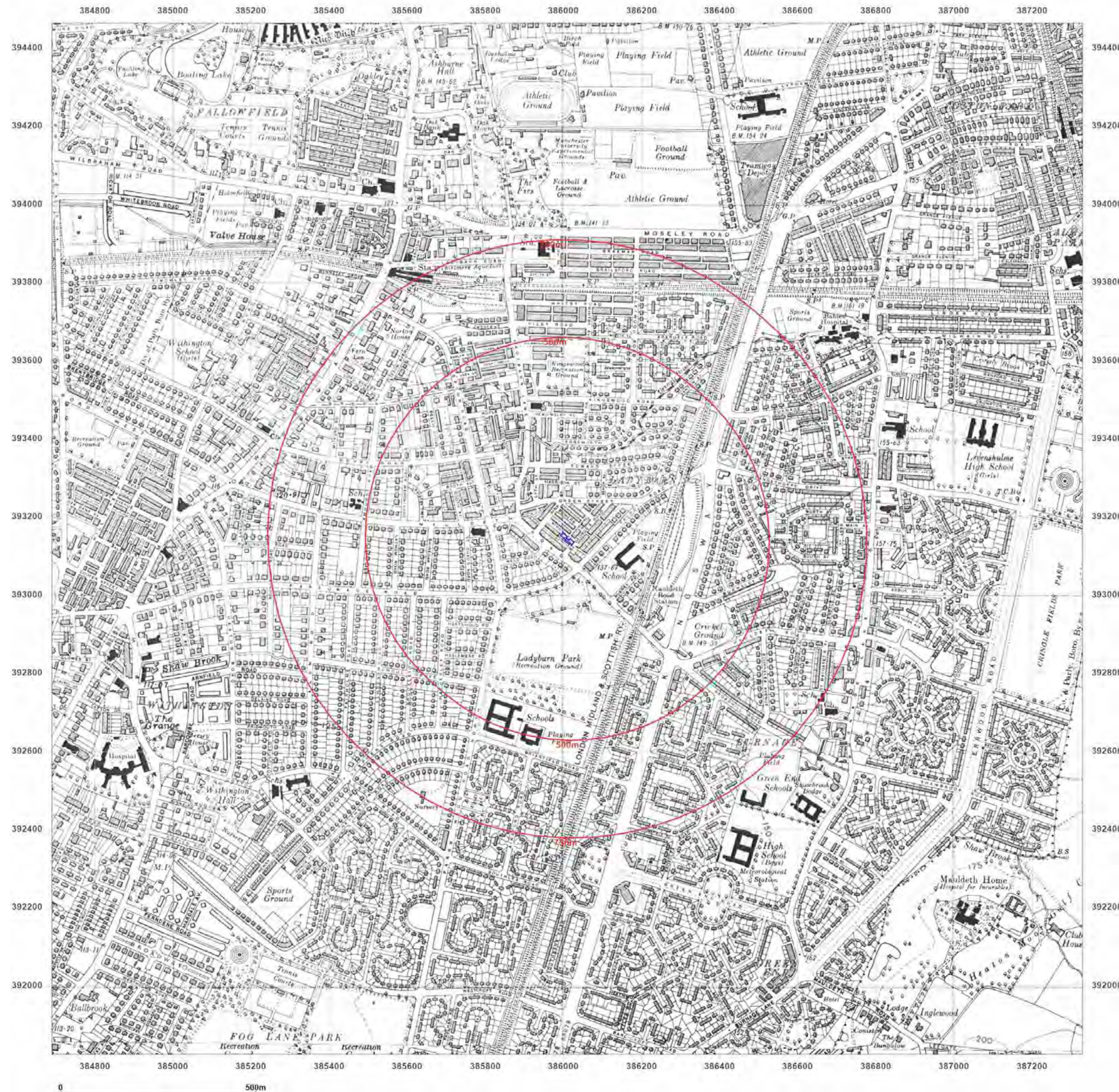


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1872	Surveyed 1844
Revised 1938	Revised 1934
Edition 1938	Edition 1938
Copyright N/A	Copyright N/A
Levelled N/A	Levelled 1927

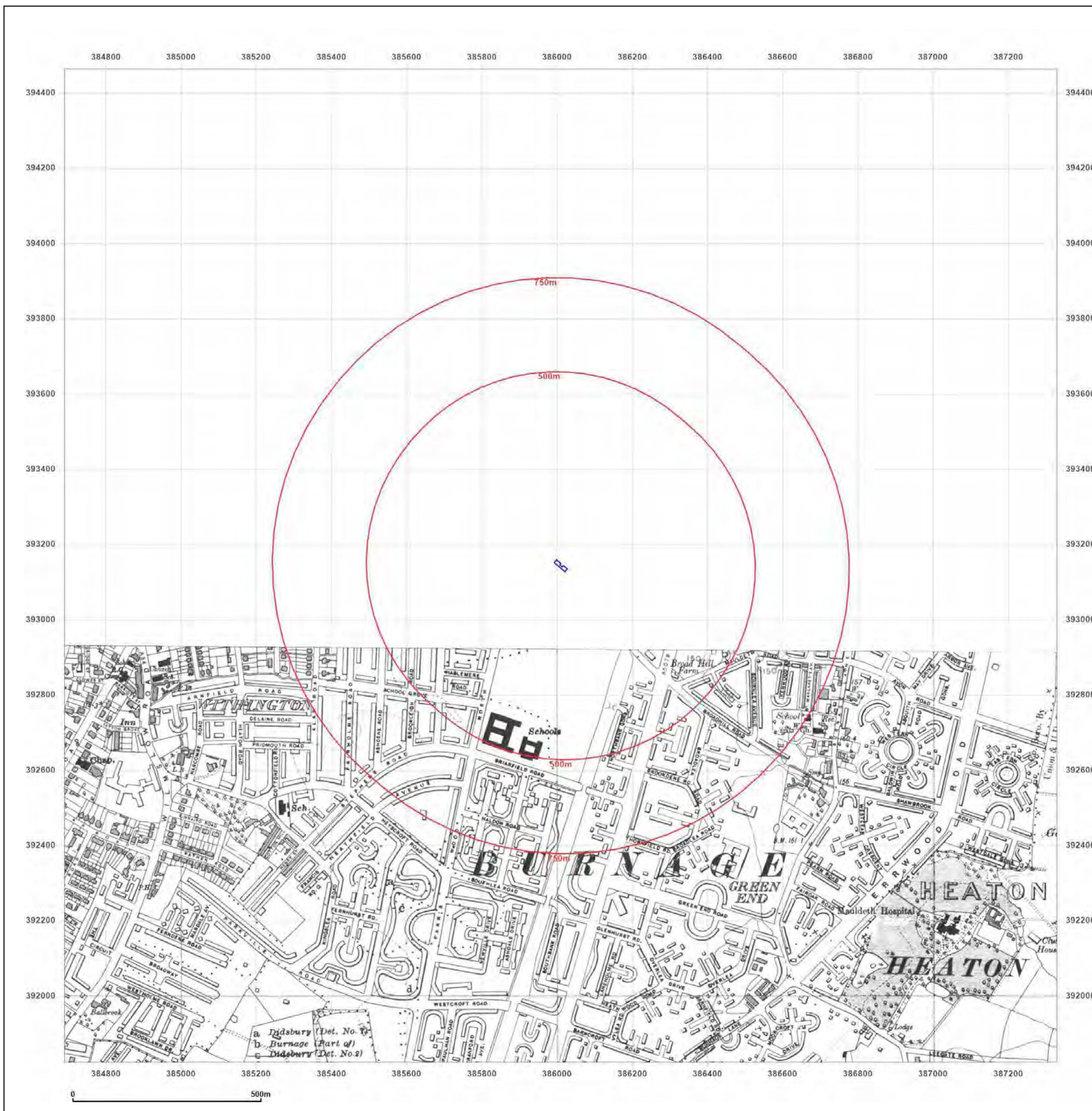


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: Provisional

Map date: 1955

Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised 1955
Edition N/A
Copyright 1955
Levelled N/A

Surveyed N/A
Revised 1955
Edition N/A
Copyright 1955
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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1976

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1974
Revised 1975
Edition N/A
Copyright 1976
Levelled 1964

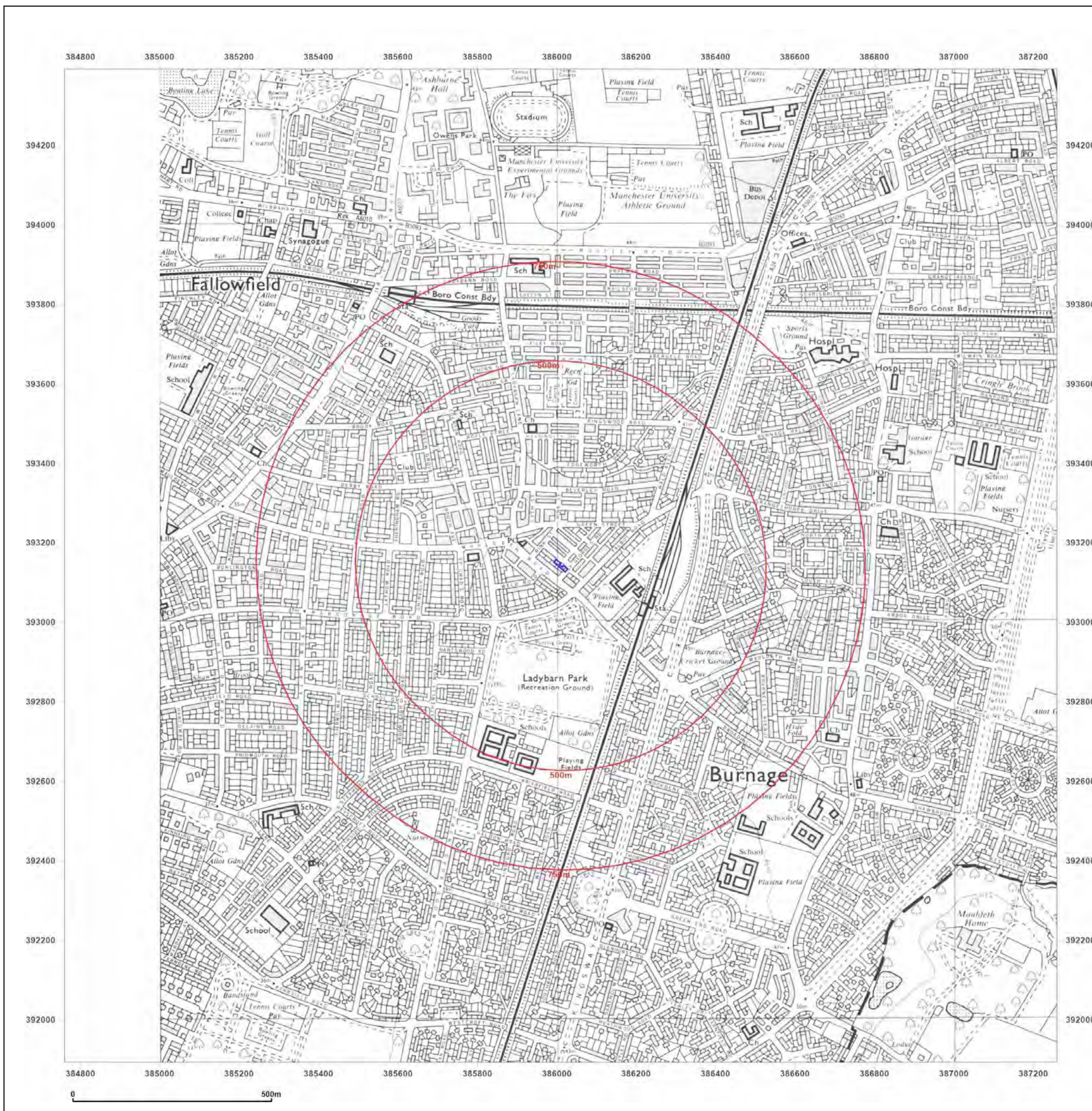


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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1981-1983

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1977
Revised 1981
Edition N/A
Copyright 1981
Levelled 1976

Surveyed 1981
Revised 1983
Edition N/A
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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 1988-1989

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1985
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Edition N/A
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Levelled 1981

Surveyed 1986
Revised 1989
Edition N/A
Copyright 1989
Levelled 1981



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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000



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Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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MANCHESTER, M14 6ST

Client Ref: 4127
Report Ref: GS-DE6-4MF-RNE-XNG
Grid Ref: 386009, 393143

Map Name: National Grid

Map date: 2024

Scale: 1:10,000

Printed at: 1:10,000

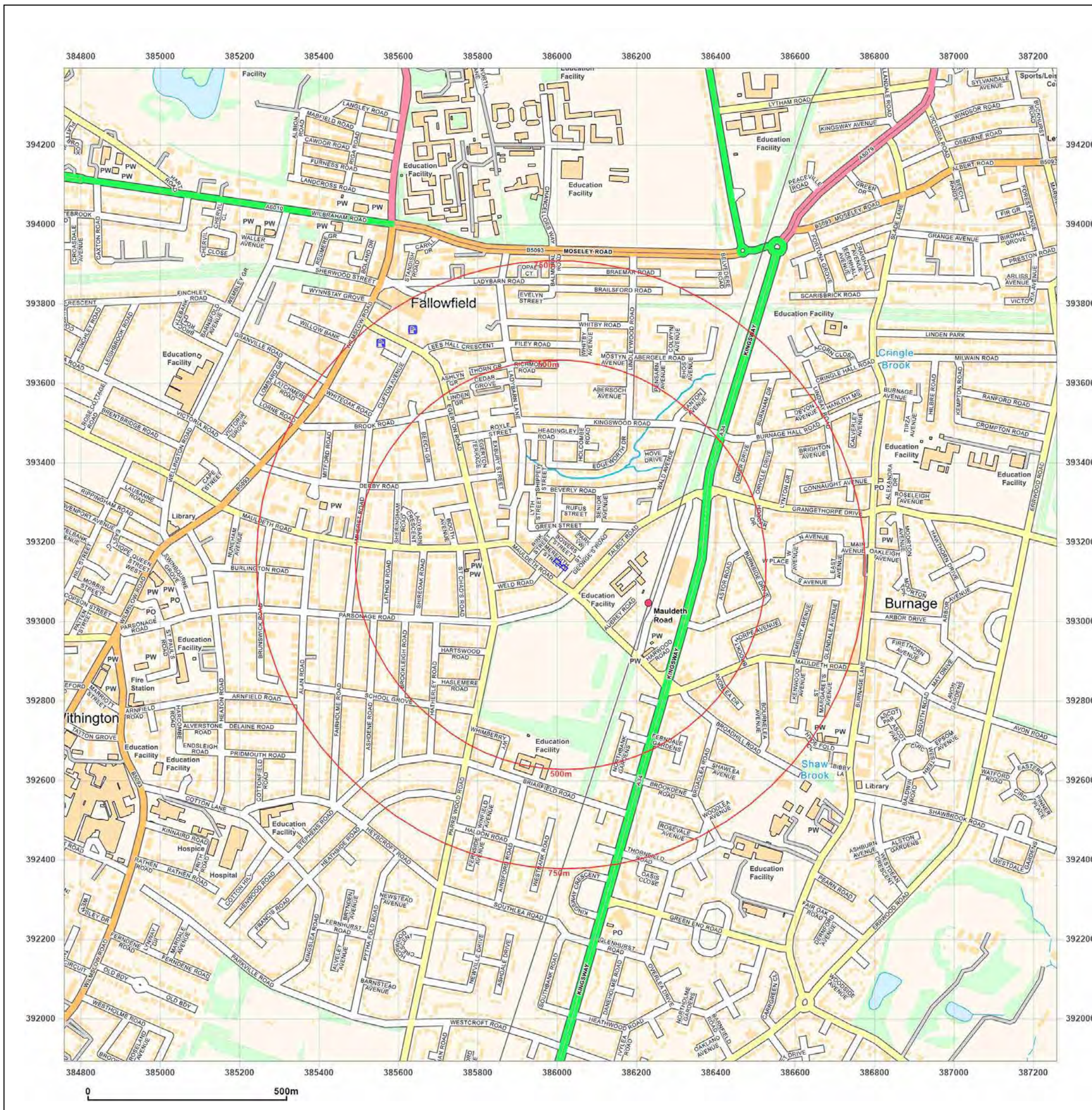


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APPENDIX 6

BGS BOREHOLE LOGS



Norwest Holst Soil Engineering Ltd.							Borehole No.
Contract No. E5441							1
Location Ladybarn Community Centre							
Client City of Manchester							
Method of Boring Percussion							
Diameter of Borehole 150mm							
BOREHOLE LOG							
SJ 89 SE - 231							
8584, 9349							
Sheet 1 of 1							
Chainage							
Ground Level							m.A.O.D.
Date 6/1/83							
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
MADE GROUND: Concrete and brick rubble.		1.40			0.50	22	
Soft brown mottled silty sandy CLAY with occasional fine gravel.		2.50			1.50		
Medium dense to dense red SAND with some gravel.		6.00			2.50	25	
					4.00	39	
					5.50	36	

Type of Sample	Remarks (Observations of Ground Water etc.)
S.P.T. Undisturbed	Borehole dry.
C.P.T. Vane	
Jar Water	
Bulk Piezometer	

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



Norwest Holst Soil Engineering Ltd.						Borehole No. 2	
Contract No. F5441		BOREHOLE LOG		Sheet 1 of 1			
Location Ladybarn Community Centre		ST 89 SE - 232		Chainage			
Client City of Manchester		8585, 9350		Ground Level m.A.O.D.			
Method of Boring Percussion				Date 4/1/83			
Diameter of Borehole 150mm							
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
MADE GROUND: Ash and clay.		0.20					
MADE GROUND: Concrete slab.		0.30			0.50		
MADE GROUND: Brick rubble.		1.30				34	
Firm to stiff brown mottled silty sandy CLAY with occasional fine gravel.		2.90			1.30		
					2.30		
Medium dense to very dense red SAND with some gravel.		5.10			2.90	20	
					4.40	86	
Highly weathered red coarse SANDSTONE		5.70			5.70		
Completely weathered and uncemented red coarse SANDSTONE.		6.20				29	

Type of Sample
Is S.P.T. Undisturbed
Ic. C.P.T. X Vane
O Jar Δ Water
● Bulk Piezometer

Remarks (Observations of Ground Water etc.)

Borehole dry.

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



Norwest Holst Soil Engineering Ltd.						Borehole No. 3	
Contract No. F5441		BOREHOLE LOG		Sheet 1 of 1			
Location Ladybarn Community Centre		SJ89SE -233		Chainage			
Client City of Manchester		8584, 9348		Ground Level		m.A.O.D.	
Method of Boring Percussion				Date 5/1/83			
Diameter of Borehole 150mm							
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D. %	Daily Progress
MADE GROUND: Concrete and brick rubble.		0.40					
Soft to firm light brown mottled silty sandy CLAY.		3.90			0.50 1.50 2.50		
Dense red SAND with some gravel.		6.00			3.70 5.40	39 45	

Type of Sample	Remarks (Observations of Ground Water etc.)
☒ S.P.T. ☐ Undisturbed ☒ C.P.T. ☒ Vane ☐ Jar ☐ Water ☒ Bulk ☒ Piezometer	Borehole dry. Water levels are subject to seasonal or tidal variations and should not be taken as constant



Norwest Holst Soil Engineering Ltd.							Borehole No. 4
Contract No. E5441		BOREHOLE LOG		Sheet 1 of 1			
Location Ladybarn Community Centre		SJ 89 SE 234		Chainage			
Client City of Manchester		8585, 9348		Ground Level m.A.O.D.			
Method of Boring Percussion				Date 7/1/83			
Diameter of Borehole 150mm							
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
MADE GROUND: Brick and concrete rubble.		1.50			0.50	82 for 222mm	
Firm brown sandy stony CLAY.		3.00			1.50 2.50 3.00	25	
Medium dense to dense red SAND with occasional fine gravel.		6.00			4.50 5.50	32 50	

Type of Sample	Remarks (Observations of Ground Water etc.)
Is S.P.T. Undisturbed Ic. C.P.T. Vane O Jar Water ● Bulk Piezometer	Borehole dry. Water levels are subject to seasonal or tidal variations and should not be taken as constant

APPENDIX 7

ZETICA UXO RISK MAP

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Location: M14 6ST,
Map Centre: 385998,393178



This map principally indicates a hazard from Unexploded Bombs (UXB) due to WWII bombardment. Other sources of Unexploded Ordnance (UXO) may be present. It should be noted that this map does not represent UXO risk and should not be reported as such when reproduced.

LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- Military
- Industry
- UXO find
- Other
- Transport
- Docks
- Luftwaffe targets
- Utilities
- Bombing decoy
- Airfields

How to use your Unexploded Bomb (UXB) risk map?

This map indicates the potential for UXBs to be present because of World War Two (WWII) bombing. It can be incorporated into a technical report, such as a Phase 1 Desk Study, or similar document as an indication of the potential for UXO encounter on a Site. Other sources of UXO may also be indicated, although note that these are not comprehensive and more detailed research is required to confirm their presence.

What if my Site is in a moderate or high density area?

We typically recommend that a detailed UXO desk study and risk assessment is undertaken for sites in an area with a moderate or high bombing density. Additionally, if your site is in close proximity to a strategic target, military establishment, airfield or bombing decoy, then [additional detailed research](#) is recommended.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirm that there is a low potential for UXO to be present on your site, then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

If you are unsure whether other sources of UXO may be present, you can request one of our [pre-desk study assessments \(PDSA\)](#) by emailing a site boundary and location to uxo@zetica.com.

You should never plan site work or undertake a risk assessment using these maps alone. More detail is required, to include an assessment of the likelihood of a source of UXO hazard from other military activity not reflected on these maps.

If I have any questions, who do I contact?

tel: [+44 \(0\) 1993 886682](tel:+441993886682) email: uxo@zetica.com web: www.zeticauxo.com

The information in this UXB risk map is derived from a range of sources and should be used with the [accompanying notes on our website](#).

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