



Phase 1 Preliminary Risk Assessment 70 Ringley Road West, Radcliffe

Prepared for TS Ringley Rd Ltd

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Document Origin

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Executive Summary

Client	TS Ringley Rd
Location	70 Ringley Road West, Radcliffe, Manchester, M26 1DN
Description	The forms a square parcel of land comprising a derelict single storey residential dwelling with associated soft landscaped area, driveway to the south west and a shipping container in the western site boundary. The site is located in an area generally occupied with residential properties and open agricultural and recreation land.
Development	It is proposed for the site to be cleared and redeveloped with 4 no. residential properties with associated access and soft landscaped areas.
Site History	The site was undeveloped until the 1960s, when a church was developed in the south central portion of the site and an associated church hall in the north western portion of the site. The hall was subsequently demolished in the 1990s and the site has remained generally unchanged since. The immediate surrounding area has had limited development with a number of churches, residential properties and a reservoir being developed over the years. In the wider surrounding area various activities have been recorded including brickworks, colliery, railway, reservoirs, refuse heaps and various industrial works recorded in general in excess of 500m from the site boundary.
Geology	British Geological Survey mapping for the area indicates the site to be underlain by Glaciofluvial deposits (sand and gravel) over Devensian Till deposits (clay, silt, sand and gravel) with bedrock comprising mudstone of the Manchester Marls Formation. There are no available historical borehole information or existing site investigation information for the site to confirm ground conditions or depths of anticipated formations.
Radon	The radon guidance on protective measures for new dwellings indicates that the site is in a 'low' probability radon area where less than 1% of homes are estimated to be at or above the Action Level. Radon gas protection measures are therefore not required in the construction of new dwellings or extensions.
Mining & Ground Stability	The site is located within a Coal Authority coal mining reporting area but not within a high risk development area. However, it is within 100m of a high risk development area associated with a potential mine shaft to the south of the site. It is therefore recommended that a Coal Authority report is procured for the site to further assess the risk from shallow coal mine working to the proposed development.
Flood Risk	According to the Flood Map for Planning, available on the gov.uk website, the site is located within Flood Zone 1, whereby there is less than a 0.1% (1 in 1000) chance of flooding from rivers or the sea occurring each year.
Environmental Setting	The Glaciofluvial Deposits underlying the site are classified by the Environment Agency (EA) as a Secondary A Aquifer, and the Devensian Till as an Unproductive Secondary Aquifer. The Manchester Marls Formation are classified as a Secondary B Aquifer. There are no recorded groundwater abstraction licenses within 500m of the site. The site is not located within a groundwater Source Protection Zone (SPZ).
UXO	The site lies within a low UXO risk area according to Zetica Bomb Risk Mapping. On this basis, no further assessment of the risk posed by UXO is considered to be required.
Further Works / Considerations	The following works are recommended for the proposed development: • Procurement of a Consultants Coal Mining Report from the Coal Authority to further assess the risk from historical mining in the area to the proposed development. • Carry out an intrusive site investigation to confirm ground conditions beneath the site.

- Soil samples should be recovered from selected exploratory holes and tested for potential contaminants of concern. This should include pH, metals, asbestos screening, speciated PAH and speciated TPH.
- Geotechnical testing should be carried out to provide information to enable preliminary foundation, floor slab, pavement and infiltration drainage design.
- Installation of boreholes with gas and groundwater monitoring wells and carry out a hazardous ground gas risk assessment for the site.

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1.0 Introduction

1.1 Background

Clancy Consulting Limited has been instructed by TS Ringley Rd Ltd to carry out a Preliminary Risk Assessment for 70 Ringley Road West, Radcliffe, Manchester, M26 1DN. The site is proposed to be redeveloped including the demolition of the existing building on site and construction of 4 no. five bedroom residential dwellings with associated communal access road, car parking and private gardens.

A site location plan and proposed development plan are included in Appendix I.

1.2 Objectives

The objectives of this investigation are summarised below:

- Provide a review of the site's land use history by reference to ordnance survey maps of the area.
- Assess the environmental setting, geology, hydrology, hydrogeology, mining and subsidence history of the site and surrounding area.
- Consider the potential risk from unexploded ordnance (UXO).
- Consider the potential risk to end users of the site from hazardous ground gas.
- Develop a preliminary risk assessment and a detailed 'conceptual site model' with regard to potential contamination sources, pathways and receptors.
- Provide recommendations regarding the requirement for further investigations, if required, to satisfy the Local Planning Authority and to inform detailed civil and structural design.

1.3 Limitations of the Study

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2.0 Desk Study

2.1 General

Background information was sought from the following sources:

- Ordnance Survey historical maps (selected copies included in Appendix II).
- Zetica Bomb Risk Mapping (Appendix III).
- British Geological Survey (BGS) sheets (Appendix IV).
- Environment Agency site sensitivity & flood risk maps (Appendix V).
- Environmental datasheets (Appendix VI).

2.2 Site Setting and Description

The site is located approximately 1.7km to the south west of Radcliffe tram stop at Ordnance Survey (OS) Grid Reference 378190, 405770. The site covers an area of approximately 0.17 hectares, forming a roughly square parcel of land. A single storey derelict building, comprising a former church building converted into a residential property, is present in the central south of the site, surrounded by soft landscaped areas. A shipping container is present in the central west of the site and a driveway in the south west. A wall separates the south of the site from the centre and north with wooden fencing present along the eastern, northern and western site boundaries. Bushes and small trees are present along the south eastern, north western, western and southern site boundaries and to the entrance way of the building on site.

The site is bound to the east, north and west by houses and gardens, with Ringley Road West to the south. A gas governor station is present immediately to the south west of the site. Further housing and undeveloped agricultural and recreational grounds are present within the wider surrounding area.

2.3 Site History

In order to investigate the development history and previous land uses at the site and surrounding area, historical OS maps were examined. Copies of the maps are presented in Appendix II.

Table 1 below is not intended to provide a comprehensive review of all the changes which have occurred at the site and instead provides a summary of the most salient points relating to the development history of the site. The most significant historical land uses are highlighted in bold text for ease of reference.

Table 1– Site History

Date(s)	Site	Surrounding Land
1850	The site was undeveloped , forming part of a field . A trackway ran along the western boundary and the south of the site was bound by a road.	The surrounding area is predominantly undeveloped . Unspecified buildings were present immediately to the south west of the site and 50m to the south west along with in the wider area. Issues were present 150m to the south with un-named watercourses 100m to the north and 150m to the south. Ponds were present in the wider surrounding area with the nearest located 120 to the north east and 220m to the north west. A sand pit was noted 480m to the east and a brick works and colliery from circa 500m to the west. Three ' pits ' or shafts were marked at the colliery. A second ' old coal pit ' and shaft was marked 940m to the north east. A railway with associated embankments ran 625m to the west of the site. An industrial area including bleach works, foundry, cotton mill, rope works and dye works with associated reservoirs and

Date(s)	Site	Surrounding Land
		infrastructure were present from c.850m to the north east.
1891 - 1893	No significant change.	Additional housing and a building marked as ' Alpha Finishing Works ' had been constructed 50m to the south west along with a reservoir . A reservoir had also been created with associated cuttings and embankments along the un-named water course 250m to the north with further reservoirs constructed within the wider area. A tramway had been constructed 385m to the north west, connecting the colliery to the west to a brick works and clay pit in the wider area. Several areas of cuttings , potentially associated with the brickworks were shown from 380m to the north. An air shaft was shown at the colliery to the west and two of the 'pits' had been covered by buildings. Sidings had also been constructed into the colliery and several areas of refuse were shown in the vicinity. Additional housing had been constructed around the industrial area to the north east.
1909 - 1910	No significant change.	The finishing works to the south west had been redeveloped as housing and the reservoir is no longer marked and assumed backfilled . An additional shaft was shown at the colliery to the west with another 'old shaft' shown 625m to the north. Additional buildings and sidings had also been constructed and the areas of refuse had expanded westward.
1928 – 1929	No significant change.	Churches had been constructed immediately to the east and 40m to the west. The colliery and brick works to the west had expanded with additional buildings, sidings / trackways, reservoirs, pits and areas of refuse . Other areas of refuse and sidings were shown from 520m to the north. The tramway to the north west had been dismantled . Additional housing had been constructed within the area including 130m to the south west and 300m to the north east.
1937	No significant change.	The majority of the buildings at the colliery to the west had been demolished along with the sidings. Embankments remained in the location of the air shaft and one of the shafts was marked as 'old shaft'. The claypit associated with the brick works to the west had expanded and the works marked as disused . The areas of refuse to the north had expanded, with the addition of ' sludge beds ' and tramways in excess of 600m. Some of the industrial buildings within the wider surrounding area had been demolished and additional housing constructed.

Date(s)	Site	Surrounding Land
1952 – 1957	Part of the church to the east was shown in the south west corner of the site.	Issues and sinks were shown along the unnamed water course from 80m to the north. Additional housing had been constructed from 115m to the west and within the wider surrounding area. The shafts at the former colliery to the west were no longer shown and the areas formally occupied by reservoirs were shown as refuse . A new brickworks had been constructed from c. 510m west along with new sidings . The former brick works clay pits were shown as a pond . One of the sand pits had expanded to 450m to the east.
1961 – 1980	A church had been constructed in the southern center portion of the site with an church hall constructed in the north east.	The church to the east had been demolished and the housing 50m to the south west reconfigured. The ponds at the brickworks to the west were no longer shown and potentially backfilled and the sidings had been dismantled . The railway to the west had also been dismantled . Several of the areas of refuse to the west and north and the sludge beds to the north were no longer marked. Some of the industrial buildings within the wider surrounding area to the north and north east had been demolished .
1990 – 1994	The church hall in the north of the site had been demolished .	Part of the church to the west had been demolished and additional buildings were shown at the residential properties to the southwest. Residential developments had been constructed immediately to the west, north and east. Disused workings were marked at the site of the former colliery to the west and the sand pit to the east. Areas of refuse were no longer shown to the west and north. Some of the former industrial sites to the north east had been redeveloped as housing.
2006	No significant change.	The remaining areas of refuse to the west were no longer marked. The majority of the remaining industrial buildings to the north east had been demolished and additional housing constructed.
2024	No significant change.	No significant change.

2.4 UXO Risk Assessment

A review of publicly available bomb risk mapping from Zetica (June 2024) indicates the site to be in an area of low UXO risk. Therefore, no further assessment of the risk posed by UXO is considered to be required.

Zetica bomb risk mapping for the site is included in Appendix III.

2.5 Geology

According to the British Geological Survey (BGS) map of the area (sheet 85 Manchester), the site is underlain by Glaciofluvial Deposits comprising sand and gravel, followed by Devensian Till (a mix of clay, silt sand and gravel). The underlying bedrock geology is indicated to comprise mudstone of the Manchester Marls Formation.

Given the limited development history of the site, a significant thickness of Made Ground is not anticipated to be present overlying natural strata however may be present locally in the south east and north east where historic structures were present. No previous site investigation information has been reviewed in order to confirm this.

No historical BGS boreholes are located within close proximity to the site.

Copies of the geological plans are provided in Appendix IV.

2.6 Mining and Ground Stability

The site is located within a coal mining reporting area and as per the Coal Authority Interactive Viewer (accessed June 2024) it is also located within 100m of a development high risk area associated with a potential historic mine shaft. A colliery and associated mine shafts were historically present from c.500m to the west with several other mine shafts indicated to be present from 600m to the north and 940m to the north east. On this basis, additional assessment is recommended and a Consultants Mining Report should be obtained to further assess the risk posed by historic coal mining beneath the site.

The environmental database report indicates that the site represents a very low risk with regard to ground stability issues relating to ground dissolution, collapsible ground, landslides, compressible ground, shrinking/swelling clay and running sand.

No BGS recorded mineral sites are indicated to be present within 250m of the site. However, several large clay pits associated with historic brick works, sand and or gravel pits were historically located within the wider area. The backfill of these large areas of worked ground could be viewed as a potential source of contamination which may have the potential to be mobile, posing a risk to the site.

2.7 Hydrogeology

The Glaciofluvial Deposits indicated to be present beneath the site are classified by the EA as a Secondary A Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The underlying Devensian Till is a Secondary Undifferentiated Aquifer. These are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type.

The Manchester Marls Formation is indicated to be a Secondary B Aquifer. These are mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks and openings or eroded layers

According to EA data, the site is not located within a groundwater Source Protection Zone (SPZ).

No groundwater abstractions are indicated to be present within 1km of the site.

Groundwater quality beneath the site has been classified as 'Poor' under an EA Local River Basin Management Plan.

2.8 Hydrology

An un-named stream is the closest surface water feature to the site, located approximately 100m to the north. The stream feeds into a reservoir approximately 220m to the north. A second un-named stream is located approximately 175m to the south east. Both of these streams emanate from issues / springs and flow away from the site. The chemical quality of these surface water features has not been classified under the EA River Basin Management Plan for the area. The River Irwell, 760m to the north of the site has been classified as 'Fail'.

There are no surface abstraction licences recorded within 500m of the site.

There is one recorded pollution incident to controlled waters located within 250m of the site. This is a category 3, minor incident, 179m to the south east and not is considered to pose a risk to the site. There are no records of significant or major incidents to controlled waters recorded within 500m of the site.

There are no records of potential active discharge consents within 500m of the site.

2.9 Soil Geochemistry

According to the BGS National Geoscience Information Service, the following background soil concentrations can be expected within natural soils at the site:

- Arsenic - <15 mg/kg
- Cadmium - <1.8 mg/kg
- Chromium - 40 - 60 mg/kg
- Lead - 100 - 200 mg/kg
- Nickel - 15 - 30 mg/kg

These concentrations are not considered to be elevated.

It should be noted that the soil geochemistry has been estimated solely on the basis of published geology and not empirical data.

2.10 Flood Risk

According to the environmental database report, the site is not indicated to be at risk of flooding from rivers or the sea and that there is limited potential for groundwater flooding to occur at the ground surface.

The site may be located within a critical drainage area. The appointed drainage engineer should consult with the Lead Local Flood Authority (LLFA) to confirm this.

Copies of the site sensitivity and flood risk maps are included in Appendix V.

2.11 Radon Risk Potential

The radon guidance on protective measures for new dwellings indicates that the site is in a 'low' probability radon area where less than 1% of homes are estimated to be at or above the Action Level.

Radon gas protection measures are therefore not necessary in the construction of new dwellings or extensions.

2.12 Landfill Sites

The environmental database report details several historical landfill sites, registered landfill sites and areas of potentially infilled land within 500m of the site. These are detailed in the below table. Additional large areas of potentially infilled land shown as refuse on historical maps of the area are also located within 1km of the site.

Table 2 – Landfill and infilled sites

Distance	Direction	Type	Details
74	South west	Infilled Land – Water	Site of a former small reservoir
122	North east	Infilled Land – Water	Shown as a pond on current OS mapping
206	North west	Infilled Land – Water	Site of a former pond
223	North west	Infilled Land – Water	Site of a former pond
302	West	Infilled Land – Non Water	Site of former colliery and brick works Shown as refuse on historical OS maps.
320	North	Historical Landfill Site	King George V Playing Fields No further information given
399	North west	Historical Landfill Site	Freightman Hillock Farm Not active (1934 to 1993) Authorised Waste – inert and industrial waste

Distance	Direction	Type	Details
405	South	Infilled Land – Water	Site of former gravel pit and pond
424	North	Infilled Land – Water	Site of a former pond
425	North	Infilled Land – Water	Site of a former pond
429	North	Infilled Land – Water	Site of a former pond
435	South west	Infilled Land – Non Water	Site of former brick works and clay pits
446	South west	Historical Landfill Site	Lower Heaps Farm Not active (1981 t 1985) Authorised Waste – inert and industrial waste
450	South west	Infilled Land – Water	Site of a former pond
468	South	Historical Landfill Site	Land south of Ringley Road Not active (1987 to 1994) Authorised Waste - Inert
472	North	Registered Landfill Site	Very small (<10,000 tonnes per year) Not active Authorised Waste – construction and demolition, non-haz.
479	South	Registered Landfill Site	Medium size (25,000 to 75,000 tonnes per year) Not active Authorised Waste – ceramics, construction waste, fibreglass, glass, metals, plastics, non leachable materials, soil, wood.
486	East	Infilled Land – Non Water	Site of a former sand pit
492	South west	Infilled Land – Water	Site of a former pond

No current or former waste management sites are indicated to be present within 500m of the site.

2.13 Industrial Land Uses

No active Local Authority Pollution Prevention and Control permits are recorded within 250m of the site.

There is one active Contemporary Trade Directory entries recorded within 250m of the site. This relates to a garage services 247m to the west. No petrol filling stations are indicated to be present within 250m of the site.

Full details of the waste management and industrial land uses are detailed in the environmental database presented in Appendix VI.

2.14 Sensitive Land Uses

An area of ancient woodland is located from 167m to the south of the site. Natural England data indicates that there are no other ecologically sensitive sites indicated within 500m of the site that constitute environmental receptors as defined within Table 1 of the DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012).

The site is not located within a nitrate vulnerable zone.

The land 14m to the south of the site is indicated to be an area of adopted green belt.

2.15 Potential Geotechnical Constraints

The table below summarises the potential geotechnical hazards associated with the development. The table provides an assessment of whether the site is likely to be affected by the hazard and the possible consequences and engineering considerations.

Table 3 – Geotechnical Risk Register

Hazard Description	Is hazard likely to be present / affect the site?	Comments/possible engineering requirements where hazard present
Sudden lateral/vertical changes in ground conditions	M	The site has been developed in the past however no previous site investigation info is available at this stage. It is considered that Made Ground may be present beneath parts of the site and the main variation is likely to be associated with the thickness of Made Ground and the composition and strength characteristics of the underlying superficial deposits.
Highly compressible/low bearing capacity soils, (including peat and soft clay)	M	Made Ground or wean natural deposits will not form suitable bearing layers for traditional foundations. The underlying natural deposits may represent suitably competent soils to support traditional foundations, if present at shallow depth. This would need to be confirmed by an intrusive site investigation.
Ground dissolution features/natural cavities	L	Strata indicated to be present at shallow depth beneath the site are not susceptible to these hazards.
Shrinking and swelling clays	L/M	Devensian Till deposits may be susceptible to volume change hazards.
Slope stability/Retaining wall issues	L	Significant slopes or retaining structures are not indicated to form part of the proposed development. However, any temporary or permanent slopes or retaining walls created as part of the development should be subject to appropriate geotechnical design based on site-specific site investigation information.
High groundwater table (including waterlogged ground)	M	There are no available information relating to the groundwater levels beneath the site and this would need to be confirmed by an intrusive site investigation.
Obstructions (including foundations, services, basements, tunnels and adjacent sub-structures)	M	The site has been developed in the past and it is considered that buried obstructions may be present. Their removal may require heavy plant in some cases. This should be programmed for.
Underground mining	M	The site is located within a coal mining reporting area but not within a High Risk development area. It is recommended that a Consultants Coal Mining report is obtained for the site to further assess the risk to the proposed development.
Concrete classification	L/M	Made Ground and natural soils beneath the site may contain elevated concentrations of sulphate potential harmful to buried structures.
Seismic Activity	L	The Eurocode 8 seismic hazard zoning maps for the UK (Musson and Sargeant, 2007) indicate that horizontal Peak Ground Acceleration (PGA) values with 10% probability of being exceeded in 50 years (475 year return period) are between 0.04g and 0.06g, which is considered very low.
NOTES: H – High Risk M – Medium Risk L – Low risk		

3.0 Phase 1 Risk Assessment

3.1 General

The “suitable for use” approach is adopted for the assessment of contaminated land and remedial measures are only undertaken where unacceptable risk to human health or the environment can be proven when taking into account the proposed use of the site and environmental setting.

A risk assessment process should be carried out to determine potential hazards to human health and the environment and be based on the “source” “pathway” “receptor” principal. For a potential risk to be present there must be a viable pollutant linkage whereby a contamination source may impact upon a receptor. The absence of one or more of these key components (source, pathway or receptor) prohibits a viable pollution linkage being formed.

3.2 Preliminary Conceptual Site Model

In accordance with the ‘Land Contamination Risk Management’ (LCRM) guidance on the gov.uk website (updated July 2024) and BSI 10175 “Code of Practice for Investigation of Potentially Contaminated Land” (2011), a Preliminary Conceptual Site Model was developed to identify potential contamination sources, migration pathways and receptors within the study area.

3.3 Potential Contaminant Sources

The site has not had a significant development history. However, Made Ground may be present from the construction of the existing and historical buildings on site, the construction of the adjacent properties and road network, which represents a potential source of contaminants of concern.

Historical surrounding land use was predominantly rural and residential in nature, with a number of churches in the vicinity of the site. Several areas of potentially contaminated land uses associated with infilled ponds, pits, reservoirs, brickworks, collieries, refuse heaps and various works were indicated to be present in the wider surrounding area, however, these were small in area and / or at sufficient distance from the site not to be considered a significant risk to the proposed development.

Current surrounding land use is predominantly residential and rural in nature. Potential sources of contamination associated with these land uses are likely restricted to runoff from roads and car parks.

With regards to hazardous ground gases, a number of potentially backfilled areas and historical landfilled sites have been recorded in the surrounding area. The site is also located in an area affected by coal mining, with a potential mine shaft indicated to be present to the south of the site. Historical mine workings, if present beneath the site, represent a potentially source of ground gases. Any deep Made Ground soils beneath the site would also form a potential source of ground gases.

The following potential sources of contamination have been identified at the site:

- Potential Made Ground and contamination associated with historic construction and demolition at the site (church, church hall and outbuilding).
- Migration of potential contamination associated with historic land uses and development around the site.
- Potential generation of hazardous ground gases associated with deep Made Ground and putrescible materials present at the site and surrounding area as well as from potential coal mine workings.

3.4 Potential Pathways

The site is proposed to be developed with 4 no. five bedroom residential dwellings with associated communal access road, car parking and private gardens. The following potential pathways are considered applicable at the site:

- Direct contact (within gardens and areas of soft landscaping at the site)
- Inhalation (dust / vapors)
- Ingestion
- Vertical / lateral migration (of both contamination and potentially hazardous ground gases)

3.5 Potential Receptors

Potential human health receptors include future site users and neighboring residential property occupiers, whilst the proposed new buildings at the site are also be considered as receptors.

The underlying Aquifers are considered the main environmental receptors of concern. Two small streams are the nearest surface water features to the site, located 100m and 175m from the site and these are also considered to be potential receptors.

3.6 Preliminary Risk Assessment

A preliminary risk assessment can be carried out using guidance outlined in Section 6.3 of CIRIA Document C552 "Contaminated Land Risk Assessment – A Guide to Good Practice" (2001). For a risk to be present there must be a viable pollutant linkage whereby a contamination source can impact on a receptor via a pathway. To carry out the risk assessment an estimate must be made of the potential severity of the risk and the likelihood of the risk occurring. The following Tables set out the criteria for this principal.

Table 4 - Severity of Risk

Severity	Description
Severe	Acute risk to human health likely to result in 'significant harm' i.e. very high concentrations of contamination or ground gases. Catastrophic damage to building i.e. by explosion from high gassing sites or VOC concentrations. Major pollution of controlled waters i.e. surface watercourses and Principal aquifers, source protection zones. Short term damage to ecosystems.
Medium	Long term risk to human health likely to result in 'significant harm' i.e. elevated concentrations of contaminants or ground gases. Pollution of sensitive controlled watercourses i.e. Principal or Secondary Aquifers. Significant effects on sensitive ecosystems or species.
Mild	Pollution of non-sensitive waters i.e. smaller surface watercourses or unproductive strata. Significant damage to crops, buildings, structures or services i.e. by explosion from sites with medium gassing potential, elevated concentrations of contaminants.
Minor	Non-permanent human health effects i.e. requirement for protective equipment during site works to mitigate health effects. Damage to non-sensitive ecosystems or species. Minor damage to buildings, structures or services.

Table 5 - Probability of Risk Occurring

Probability	Description
High Likelihood	Pollutant linkage may be present that appears very likely in the short term and risk is almost certain to occur in long term or evidence of harm to receptor exists.
Likely	Pollutant linkage may be present and is likely that the risk will occur over the long term.
Low Likelihood	Pollutant linkage may be present and there is a possibility of the risk occurring although no certainty that it will do so.
Unlikely	Pollutant linkage may be present but the circumstances under which harm would occur even in the long term are improbable.

Table 6 - Comparison of Risk & Probability

Probability	Severity			
	Severe	Medium	Mild	Minor
High Likelihood	Very High	High	Moderate	Moderate/Low
Likely	High	Moderate	Moderate/Low	Low
Low Likelihood	Moderate	Moderate/Low	Low	Very Low
Unlikely	Moderate/Low	Low	Very Low	Very Low

A summary of potential pollutant linkages and perceived risks for this site are outlined in the Table below:

Table 7 - Pollutant Linkages & Perceived Risk

Sources of Contamination	Pathways	Receptors	Severity	Probability	Risk	Justification	Further Action Required
On site: Made Ground	Inhalation, ingestion and dermal contact of soil	Future site users	Medium Long term risk to human health	Unlikely	Low	Contaminants of concern may be present beneath the site, associated with the Made Ground. Should contaminants of concern be present in soils beneath the site at concentrations in excess of residential assessment criteria, these would unlikely pose a risk to site users via direct contact in areas of hardstanding or building cover. Where soft landscaped areas are proposed, clean soil cover may be required to provide a suitable barrier between contaminants in soil and future site users.	Site investigation to confirm the contamination status of shallow soils beneath the site. And to determine whether identified potential pollutant linkages would be active following the proposed redevelopment of the site.
		Construction workers during development	Minor Non-permanent human health effects i.e. requirement for protective equipment during site works to mitigate health effects	Low Likelihood	Very Low	If construction workers come into contact with potential contaminated soils during the construction phase, such contact would be short term, limiting potential exposure. Construction workers are expected to undertake good working practices including regular hand washing and other hygiene techniques which would reduce the likelihood of long-term exposure to any contamination.	
	Acidic ground conditions affecting future site buildings	Building infrastructure	Minor Minor damage to buildings	Low Likelihood	Very Low	Made Ground and natural soils beneath the site may contain elevated concentrations of sulphates and low pH. Chemical testing for water soluble sulphate and pH should be undertaken to inform concrete classification.	
	Vertical and lateral migration	Neighbouring properties	Medium Long term risk to human health	Unlikely	Low	Neighbouring land use is predominantly residential in nature. Based on the historical and ongoing use of the site, the potential for significant concentrations of contamination to be present is considered to be limited. The risk posed to neighbouring site users is therefore not considered to be significant.	
		Controlled waters	Medium Pollution of sensitive controlled water receptors	Unlikely	Low	The site is underlain by a Secondary A and Secondary B Aquifers. However, there are no recorded groundwater abstraction points located within 500m of the site and the site does not lie within an SPZ. In addition, based on the historical use of the site, the potential for significant concentrations of contamination to be present is considered to be limited. The risk posed to groundwater resource receptors is therefore not considered to be significant.	
Off site: Made Ground, historical land uses and backfilled land	Lateral migration onto site with subsequent dermal contact of soils	Future site users	Medium Long term risk to human health	Low Likelihood	Moderate/Low	Current surrounding land use is predominantly residential in nature. Potential sources of contamination associated with these land uses are likely restricted to runoff from roads and car parks. Historically the wider surrounding area had a number of potentially contaminated land uses including colliery, brickworks, railway, refuse heaps, sludge beds and various industrial works. However, due to their distance from the site the risk for mobile contamination to reach the site is considered low.	
Potential hazardous ground gas and vapours from Made Ground, infilled land and historical coal mine workings and mine shafts.	Migration of ground gas	Future site users	Severe Acute risk to human health (asphyxiation)	Low Likelihood	Moderate	A significant thickness of Made Ground is not considered likely to be present beneath the site. However, Made Ground from the wider surrounding area in combination with the granular nature of the superficial deposits beneath the site, may represent potentially significant sources of ground gas. Historical mine workings may also represent a potentially significant source of ground gases. Ground gas monitoring is therefore required to assess the risk to the proposed development.	Monitoring wells should be installed as part of the site investigation and monitoring undertaken to assess the risk posed by ground gases.
		Building Infrastructure	Severe Significant damage to buildings (explosion)	Low Likelihood	Moderate		

4.0 Desk Study Conclusions

The site is located on 70 Ringley Road West in Radcliffe and is currently occupied by a derelict property with associated soft and hard landscaped areas. It is proposed to develop the site with 4 no. five bedroom residential properties with associated access and soft landscaped areas.

The site is located in a mainly residential area with agricultural and recreational land uses. Historically the site comprised rural fields until it was developed sometime in the 1960s with a church in the south central area and an associated church hall in the south west part of the site. The church hall was subsequently demolished in the 1990s and the site remained unchanged since. It is understood that the church building was converted to a residential property and is currently derelict.

Surrounding land use has been predominantly rural and residential in nature. A colliery, brickworks and railway were present in excess of 500m west from the site with areas of refuse heaps, reservoirs and various industrial works further to the north and north east. By 1960s most of the works were noted as disused and areas were redeveloping for residential purposes. By 1990s most commercial and industrial activities in the wider surrounding area had ceased and areas were redeveloped for residential or recreational purposes.

British Geological Survey mapping for the area indicates the suite to be underlain by Glaciofluvial deposits (sand and gravel) over Devensian Till deposits (clay, silt, sand and gravel), over mudstone bedrock of the Manchester Marls Formation, at unknown depth.

The site is underlain by Secondary A and Secondary Undifferentiated Aquifer, relating to the Glaciofluvial and Devensian Till deposits respectively. The Manchester Marl deposits are classified as a Secondary B Aquifer. However, the site is not located within a groundwater SPZ and there are no recorded groundwater abstractions within 500m of the site. Therefore, these aquifers are not considered to represent sensitive groundwater resource receptors.

The radon guidance on protective measures for new dwellings indicates that the site is in a 'low' probability radon area where less than 1% of homes are estimated to be at or above the Action Level. Radon gas protection measures are therefore not required in the construction of new dwellings or extensions.

According to the Flood Map for Planning, available on the gov.uk website, the site is located within Flood Zone 1, whereby there is less than a 0.1% (1 in 1000) chance of flooding from rivers or the sea occurring each year.

The site lies within a low UXO risk area according to Zetica Bomb Risk Mapping. On this basis, no further assessment of the risk posed by UXO is considered to be required.

Contaminants of concern may be present beneath the site, associated with Made Ground relating to the construction of the existing and historical buildings on site on immediate surrounding area as well as the adjacent road network. Made Ground beneath the site and surrounding area along with potential historical coal mine workings may also represent a potentially significant source of ground gas. A Phase 2 Environmental Site Investigation is therefore recommended to determine the contamination status of the site and to assess the potential risk poses by ground gas.

On the basis of the above, the following should be considered for the proposed development:

- Procurement of a Consultants Coal Mining Report from the Coal Authority to further assess the risk from historical mining in the area to the proposed development.
- Carry out an intrusive site investigation to confirm ground conditions beneath the site.
- Soil samples should be recovered from selected exploratory holes and tested for potential contaminants of concern. This should include pH, metals, asbestos screening, speciated PAH and speciated TPH.
- Geotechnical testing should be carried out to provide information to enable preliminary foundation, floor slab, pavement and infiltration drainage design.

- Installation of boreholes with gas and groundwater monitoring wells and carry out a hazardous ground gas risk assessment for the site.

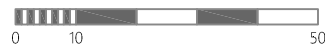
APPENDIX I
DRAWINGS



Location Plan Scale 1:1250

1:1250

SCALE



METRES

Rev	Amendment	Drawn	Check
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P02	-	---23	---23
P03	-	---23	---23

RA
Revival Architecture

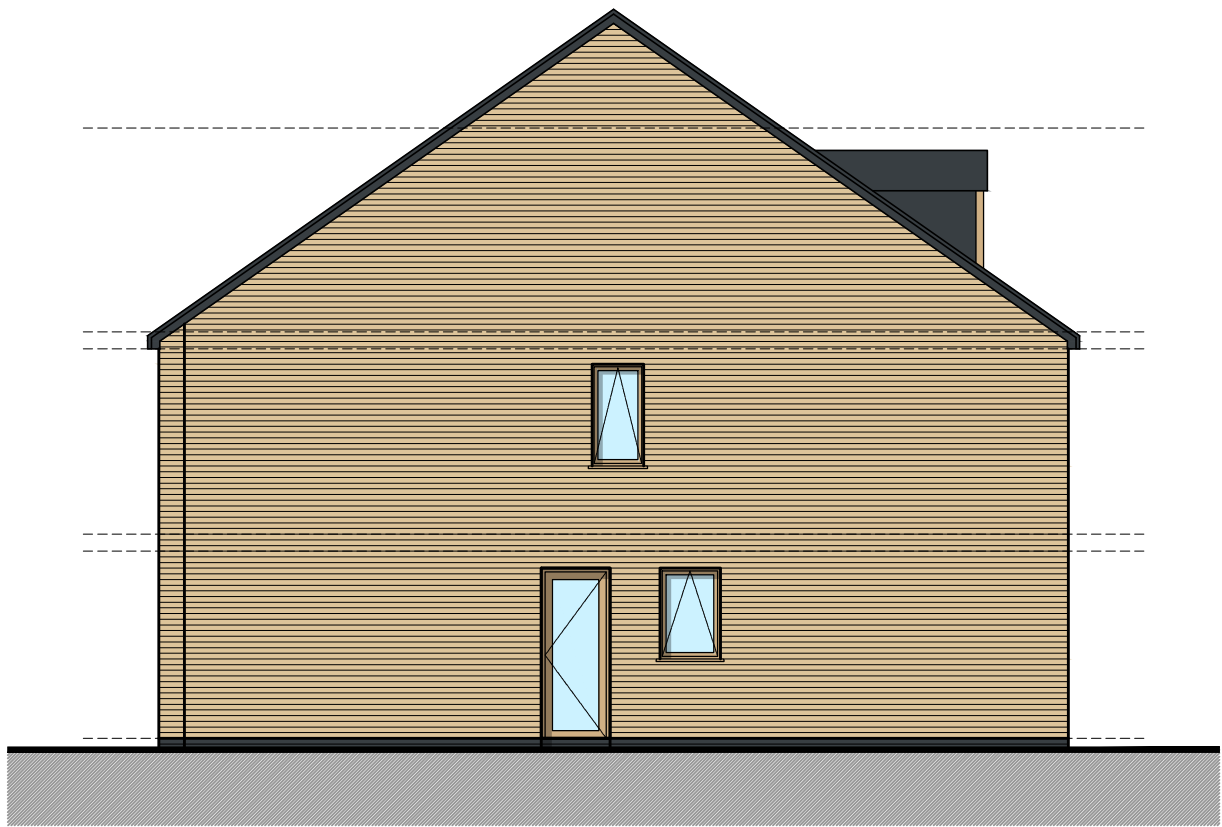
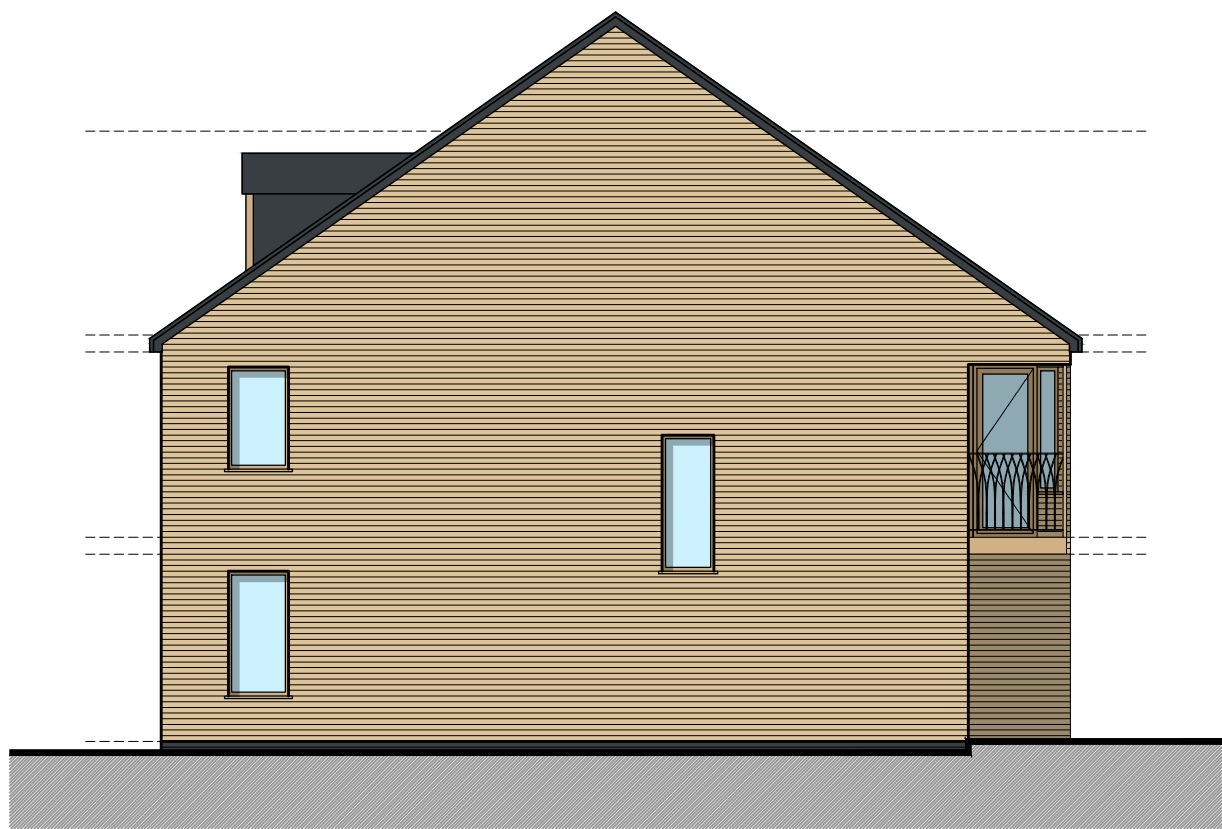
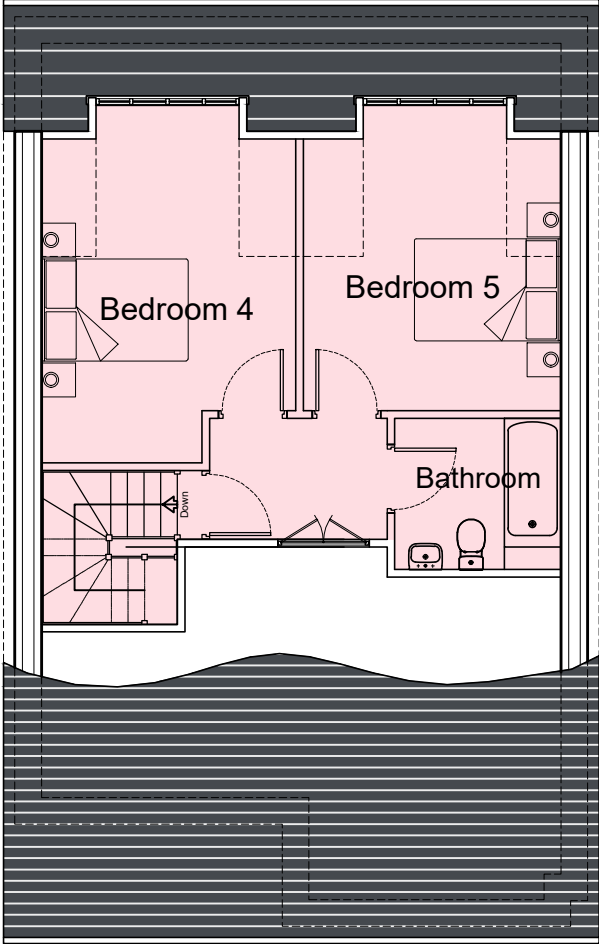
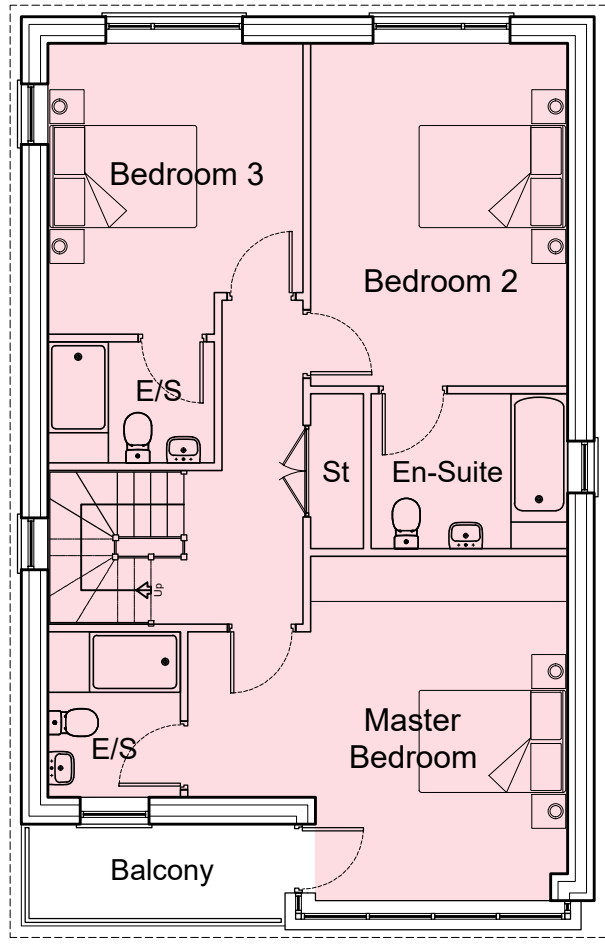
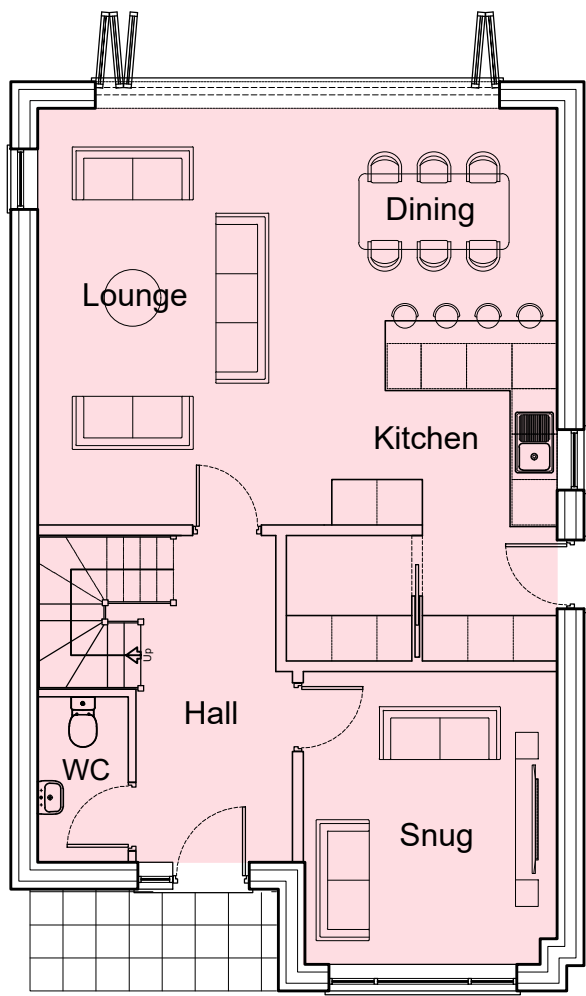
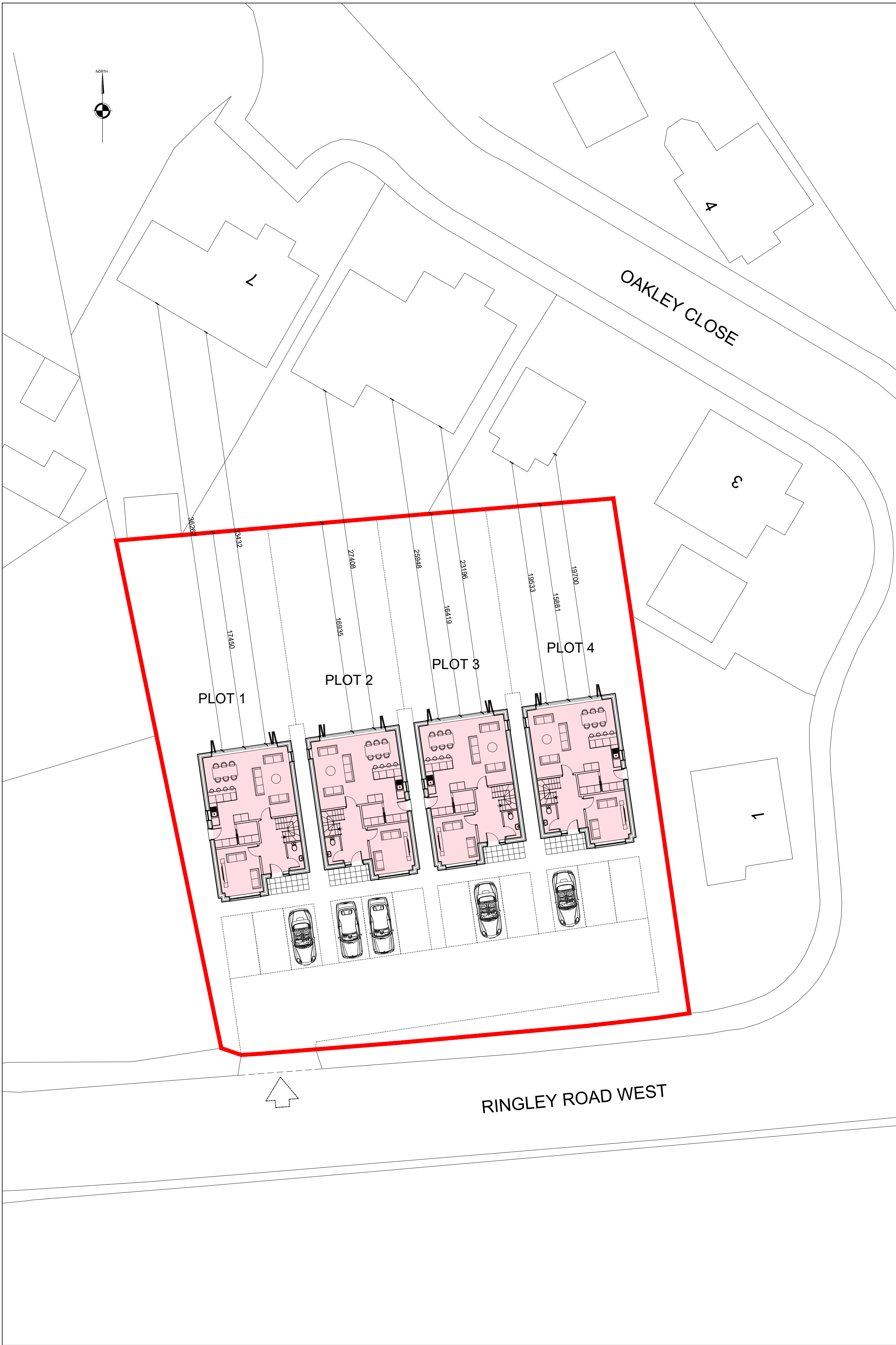
Dream. Plan. Begin.

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Check:	SRD
Scale@A4:	1:1250
Revision:	-
Status:	Planning
Drawing Number:	

0000-RA-XX-XX-DR-A-0000



Rev	Amendment	Drawn	Check
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P02	-	--:--:23	--:--:23
P03	-	--:--:23	--:--:23

RA
Revival Architecture

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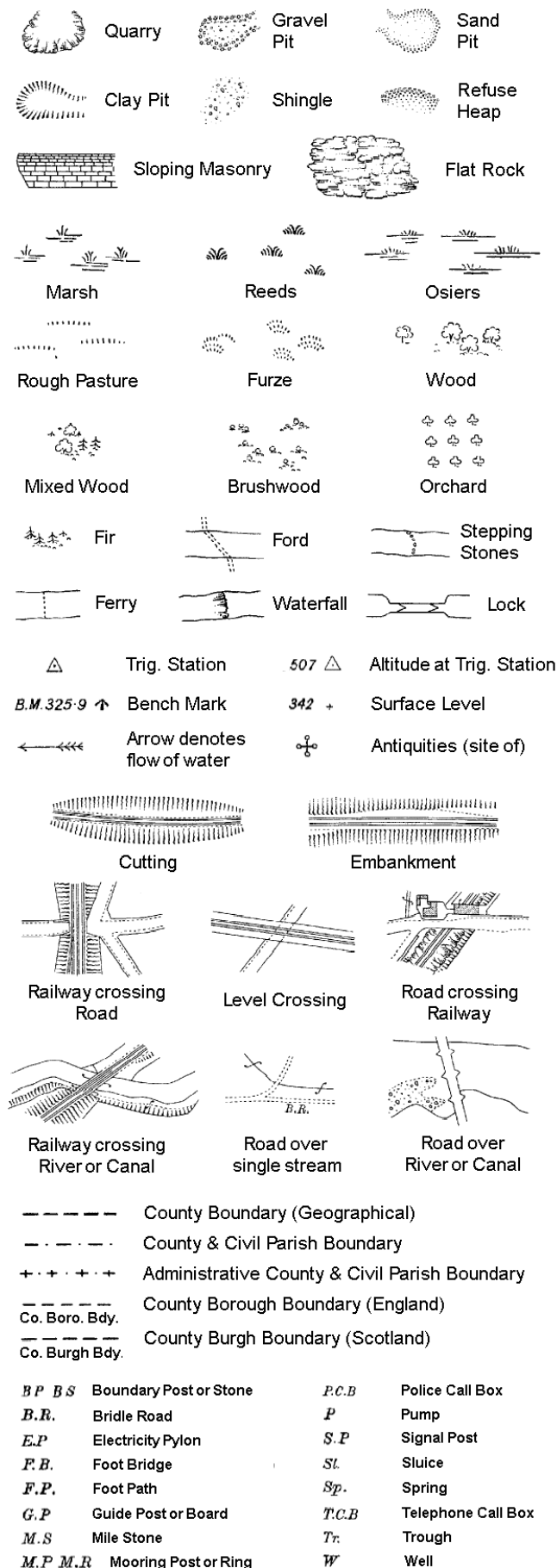
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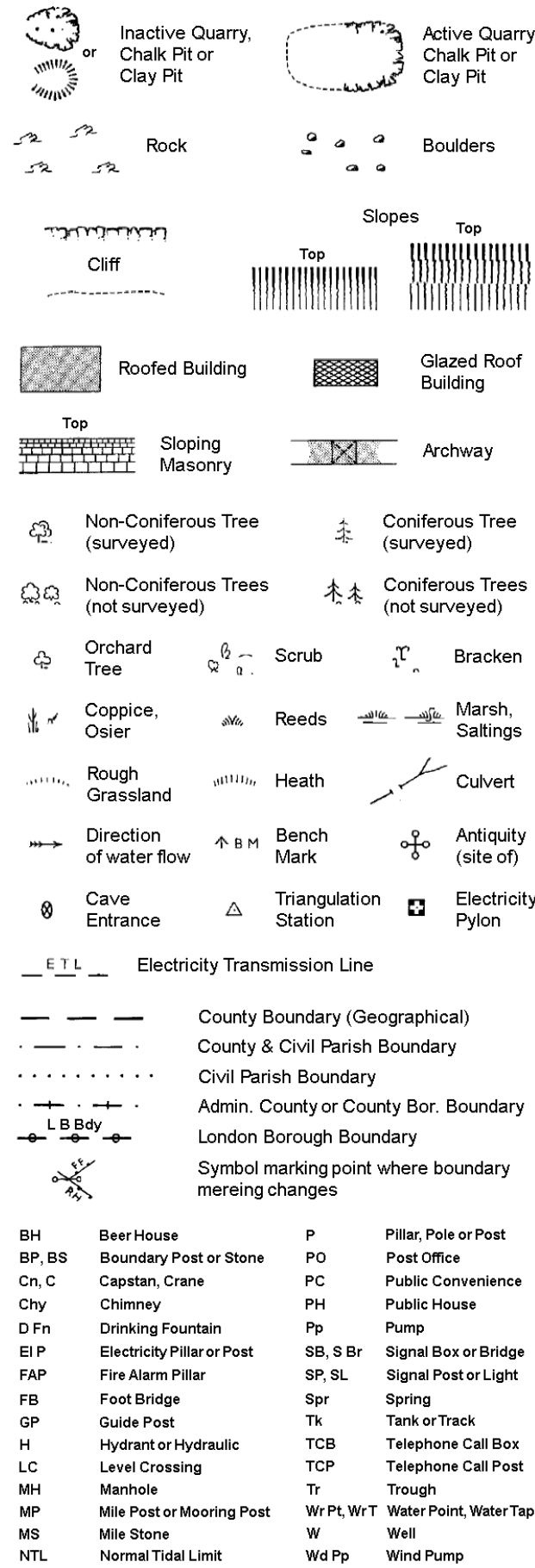
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HISTORICAL MAPS

Historical Mapping Legends

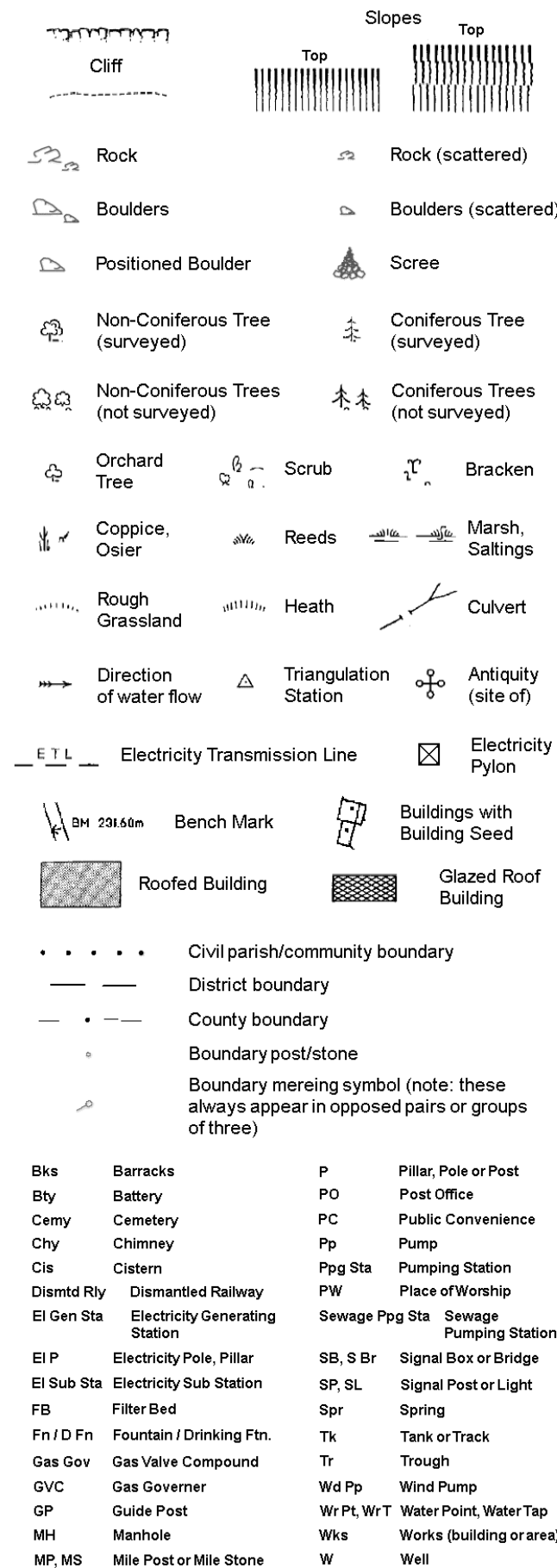
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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



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



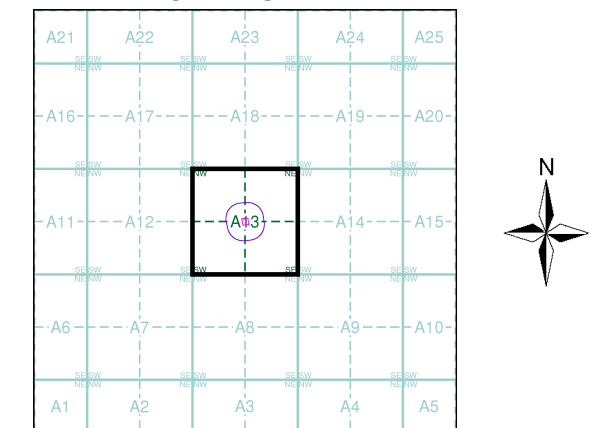
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Historical Mapping & Photography included:

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Lancashire And Furness	1:2,500	1929	4
Lancashire And Furness	1:2,500	1937	5
Ordnance Survey Plan	1:1,250	1955 - 1956	6
Additional SIMs	1:1,250	1955 - 1988	7
Ordnance Survey Plan	1:2,500	1956	8
Ordnance Survey Plan	1:1,250	1961 - 1975	9
Ordnance Survey Plan	1:2,500	1970	10
Additional SIMs	1:1,250	1987 - 1988	11
Large-Scale National Grid Data	1:1,250	1992	12
Large-Scale National Grid Data	1:1,250	1993 - 1994	13
Historical Aerial Photography	1:2,500	2000	14

Historical Map - Segment A13



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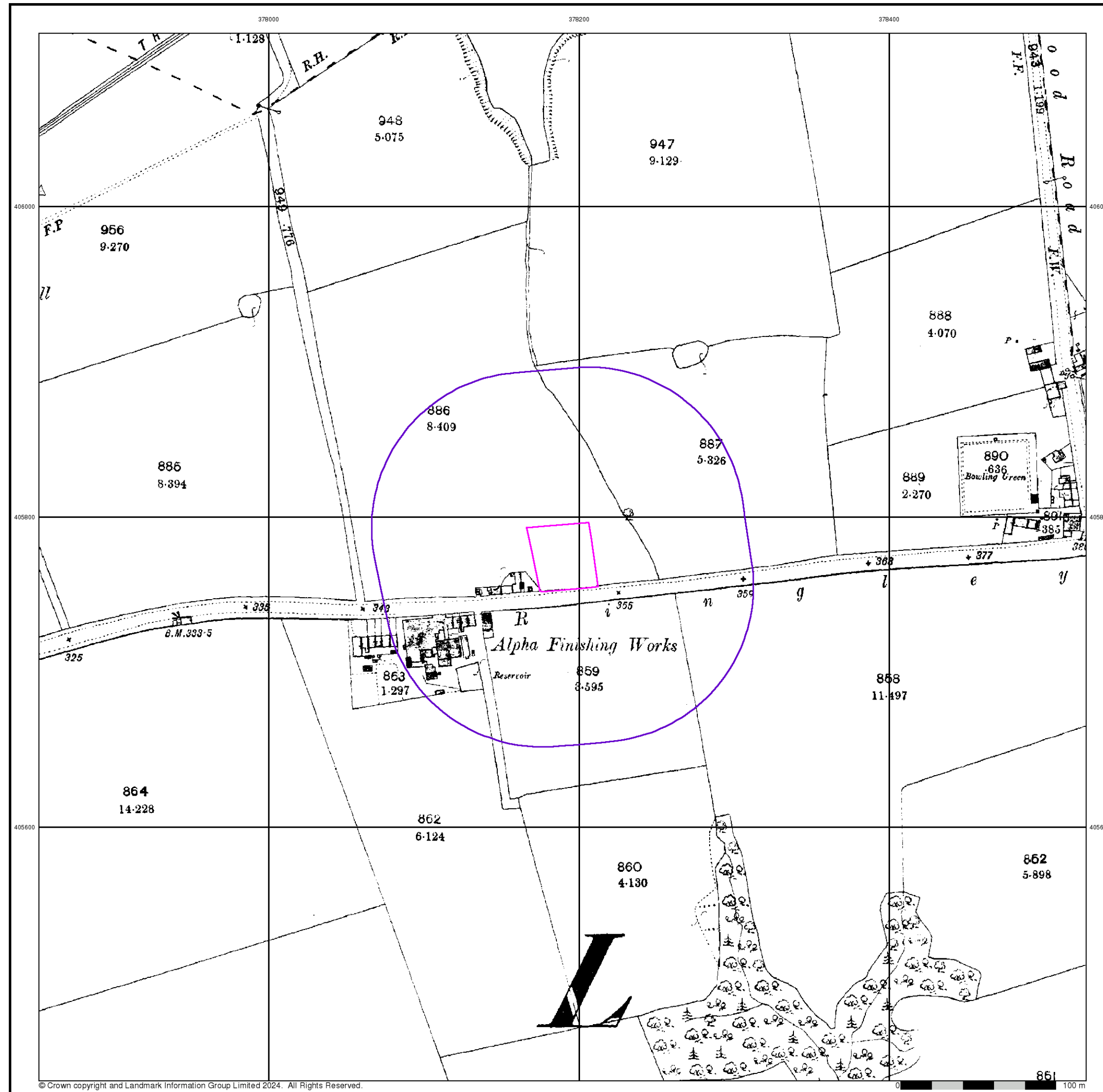
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Search Buffer (m): 100

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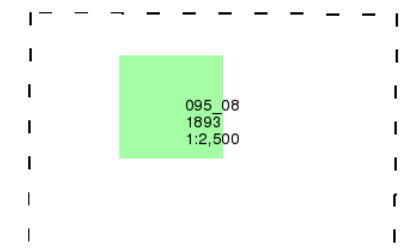
Lancashire And Furness

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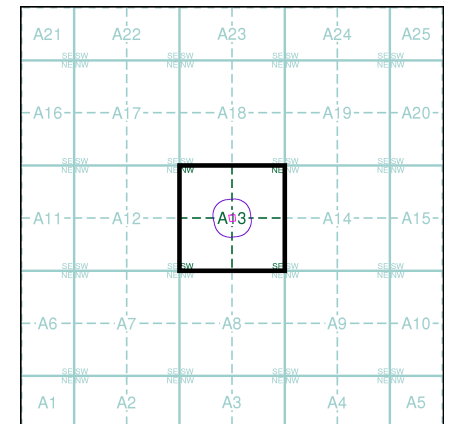
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Map Name(s) and Date(s)



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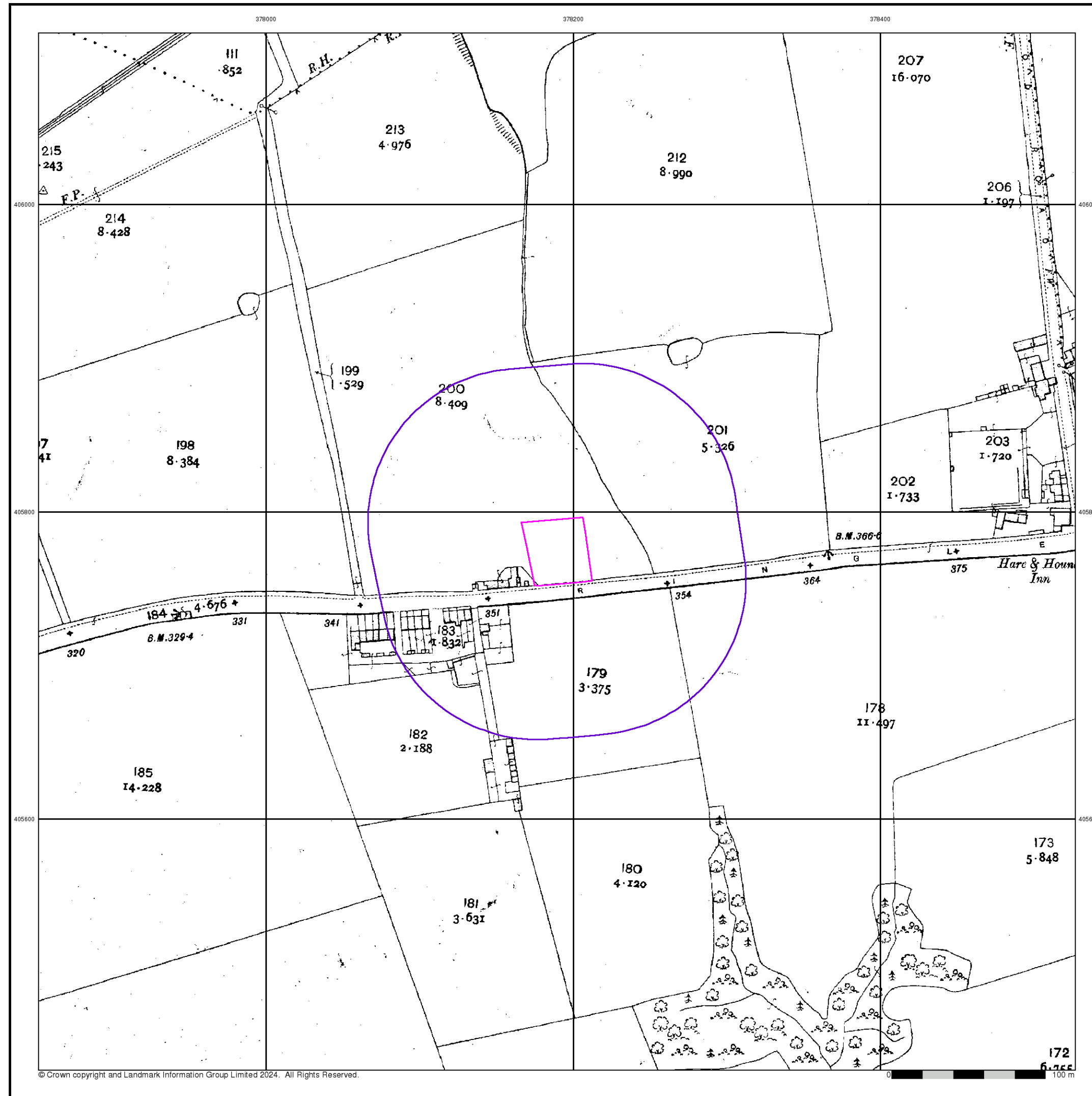


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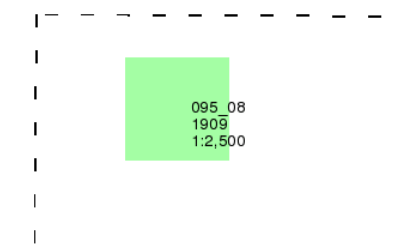
Lancashire And Furness

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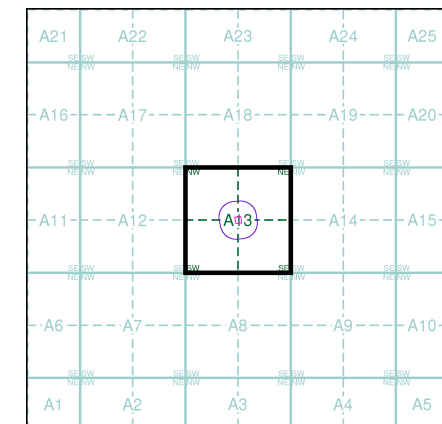
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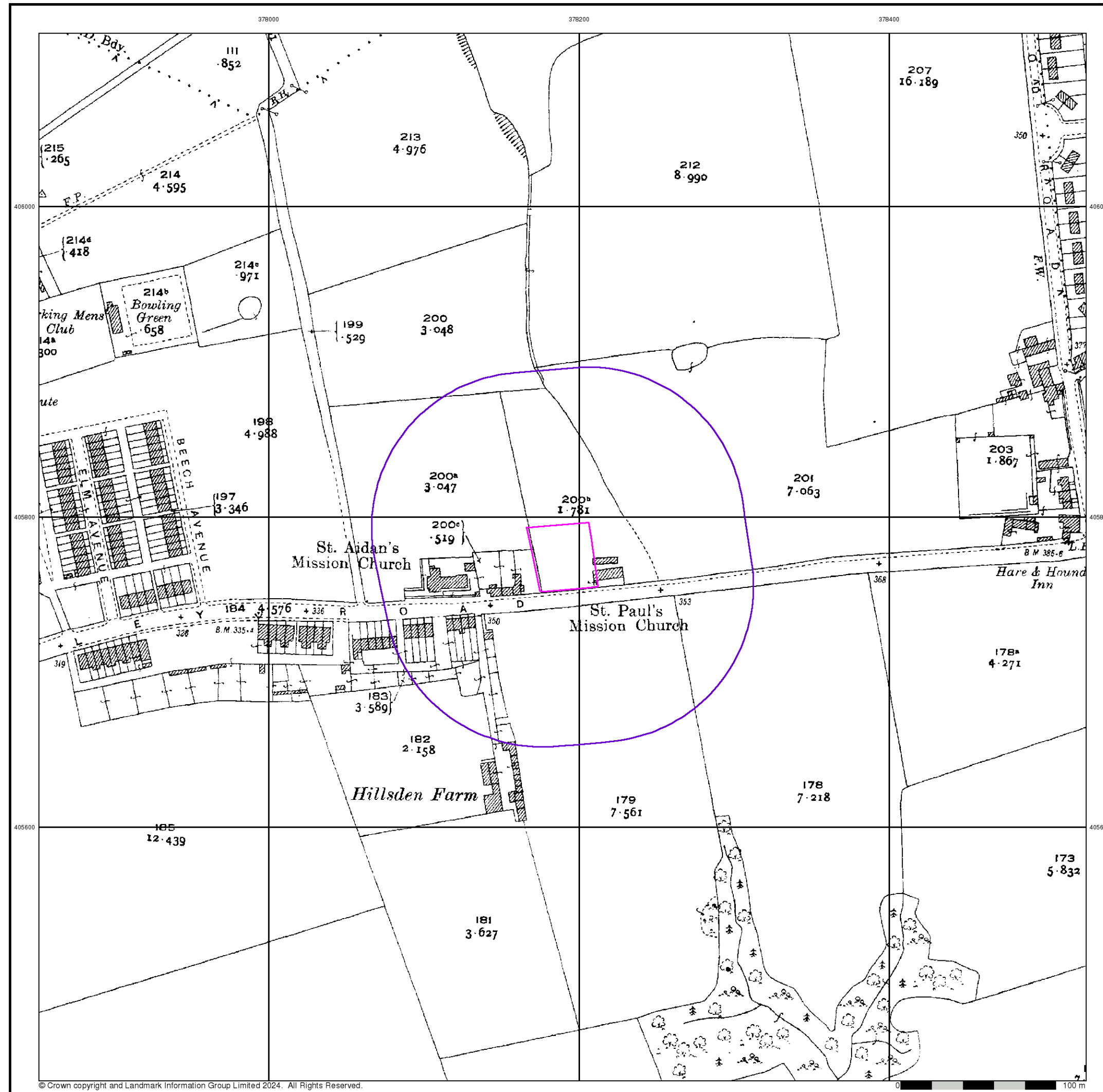


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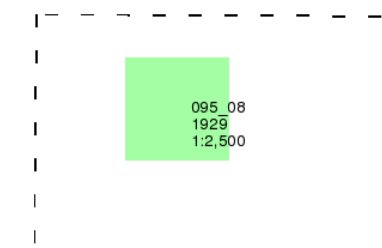
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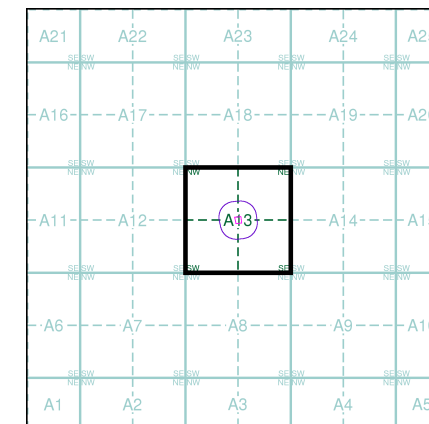
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Map Name(s) and Date(s)



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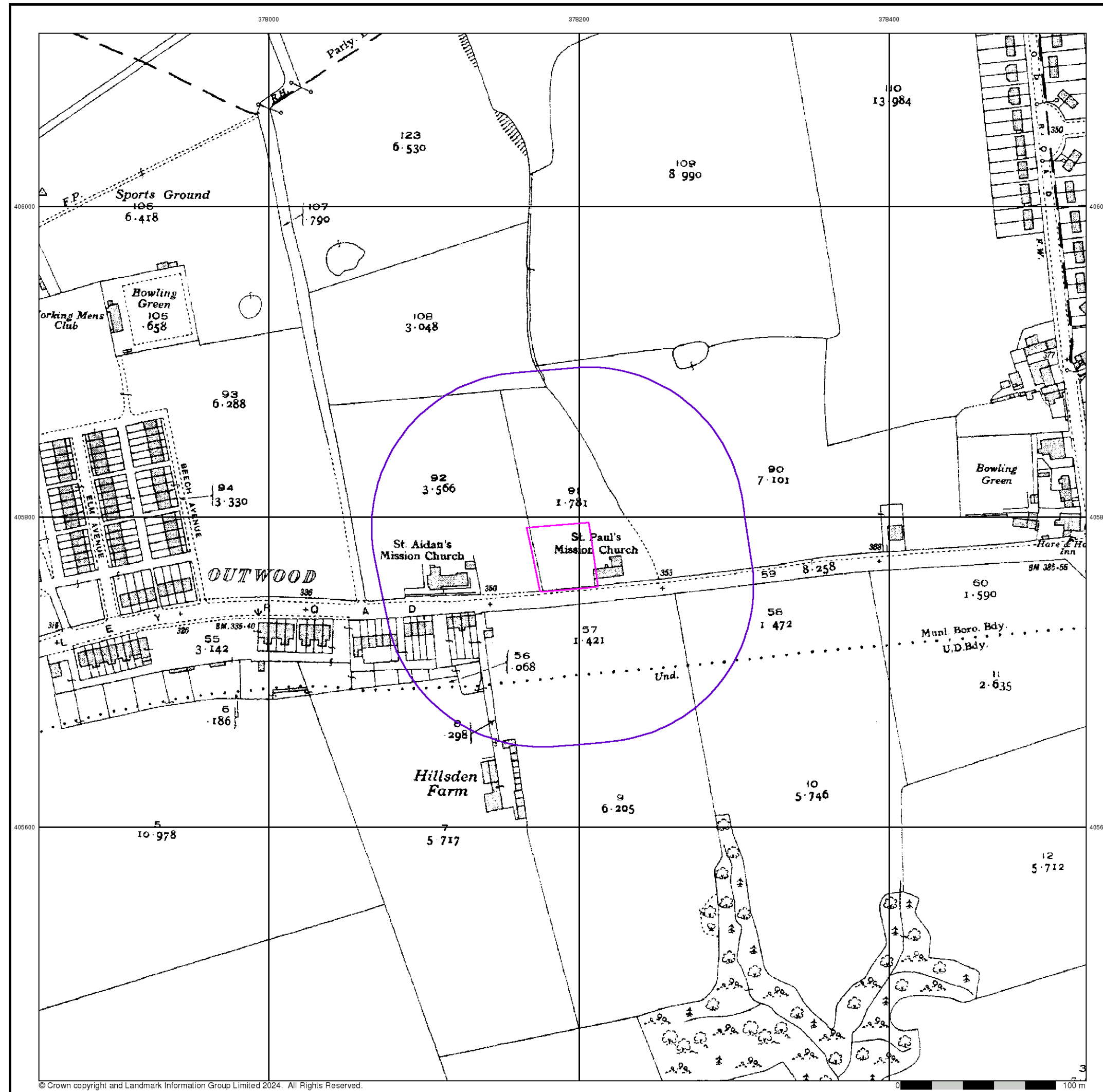
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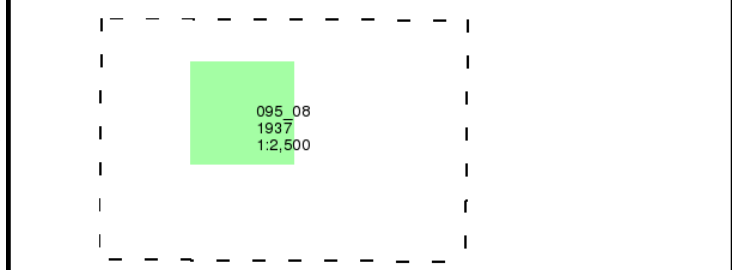
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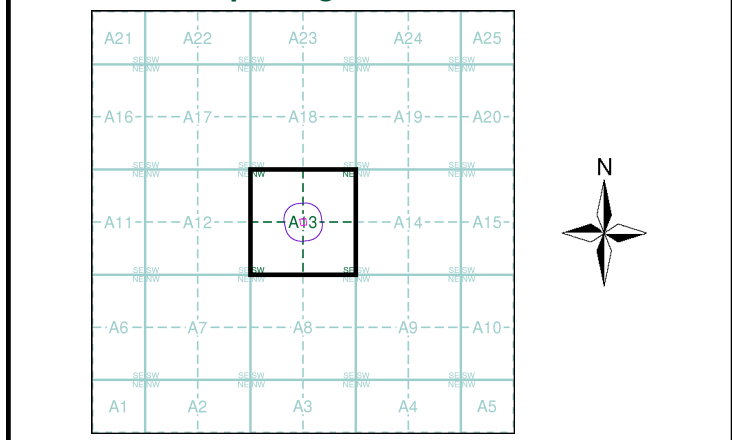
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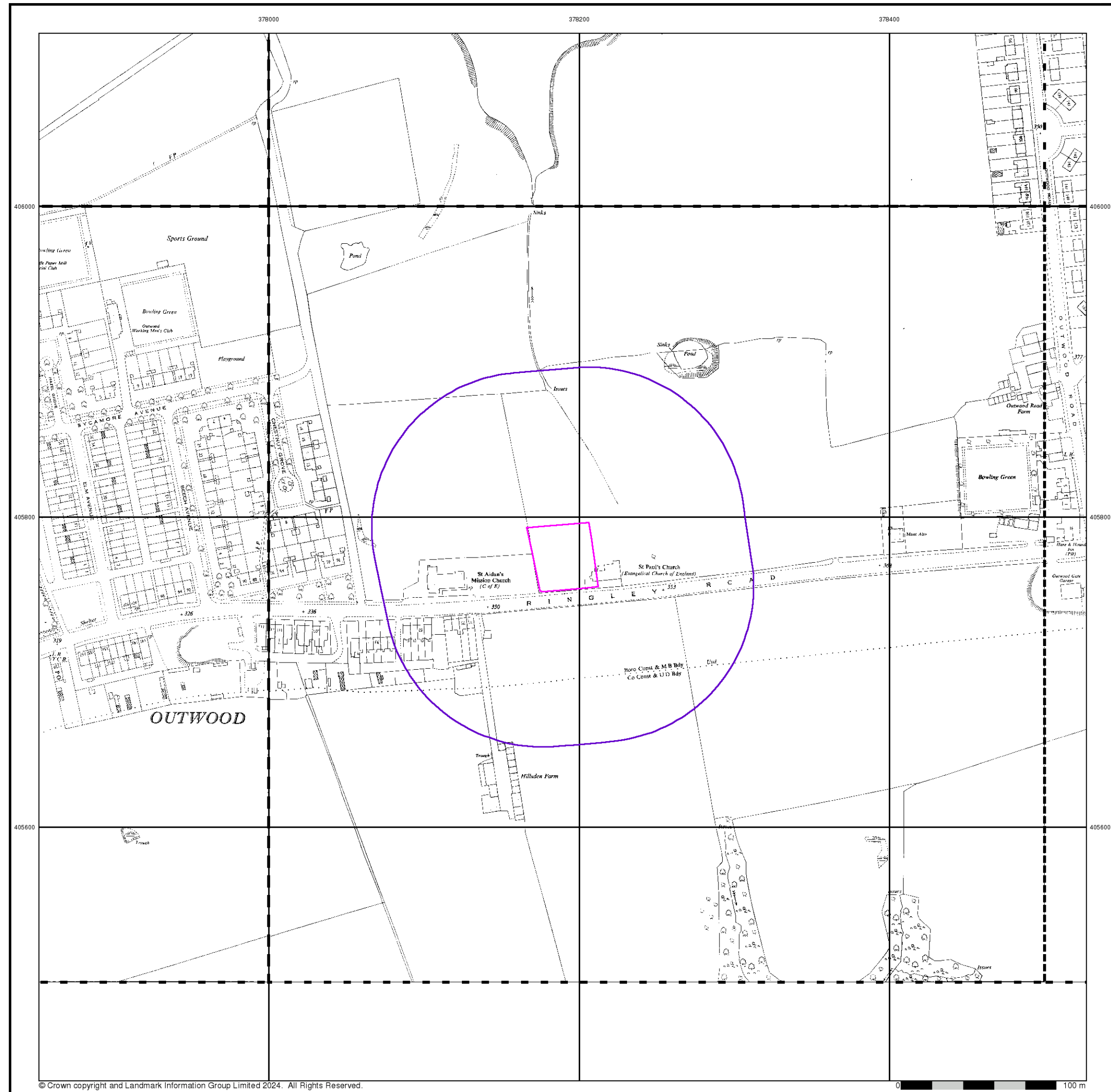


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Ordnance Survey Plan

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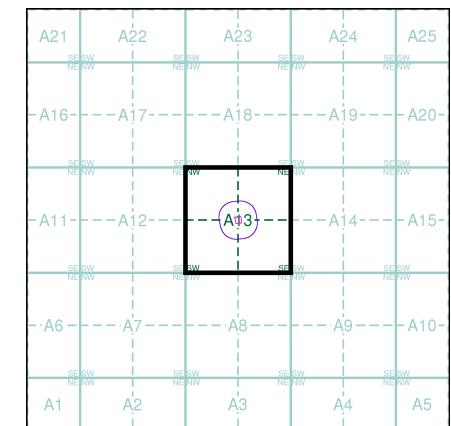
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Map Name(s) and Date(s)

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Historical Map - Segment A13



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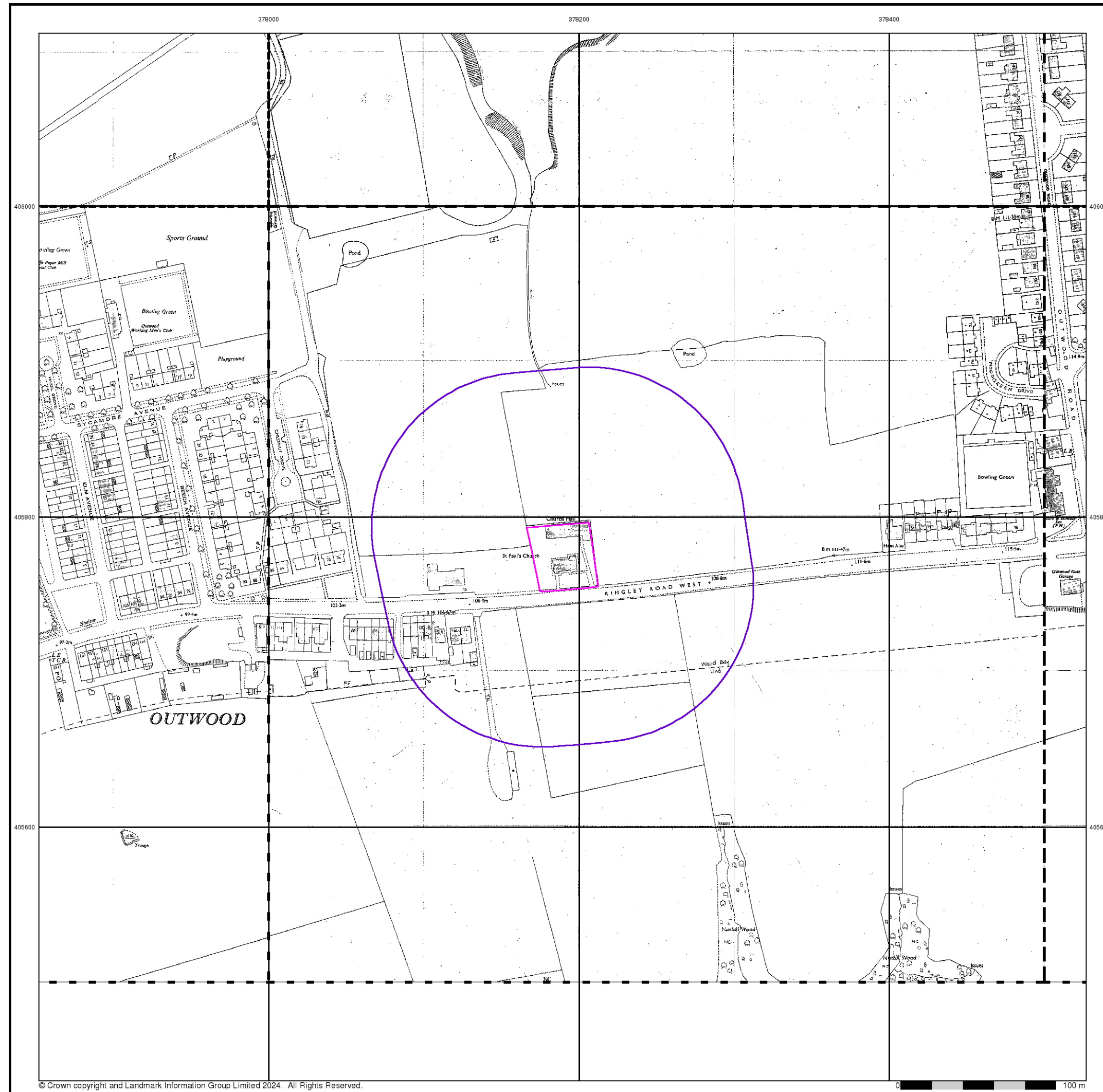
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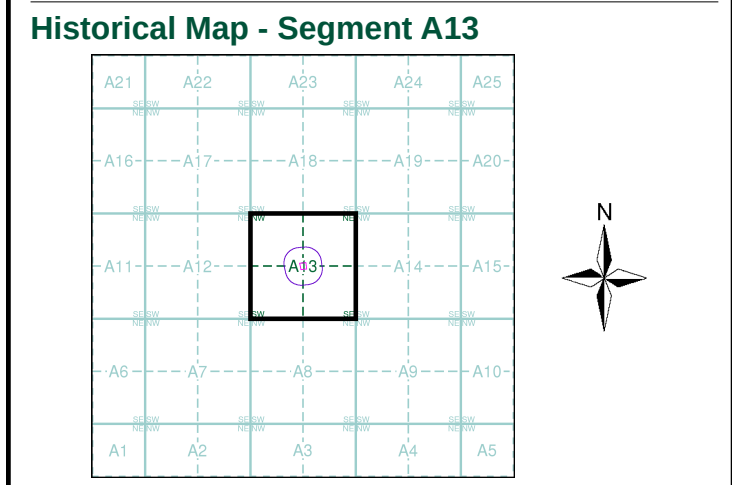
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Additional SIMs
Published 1955 - 1988
Source map scale - 1:1,250

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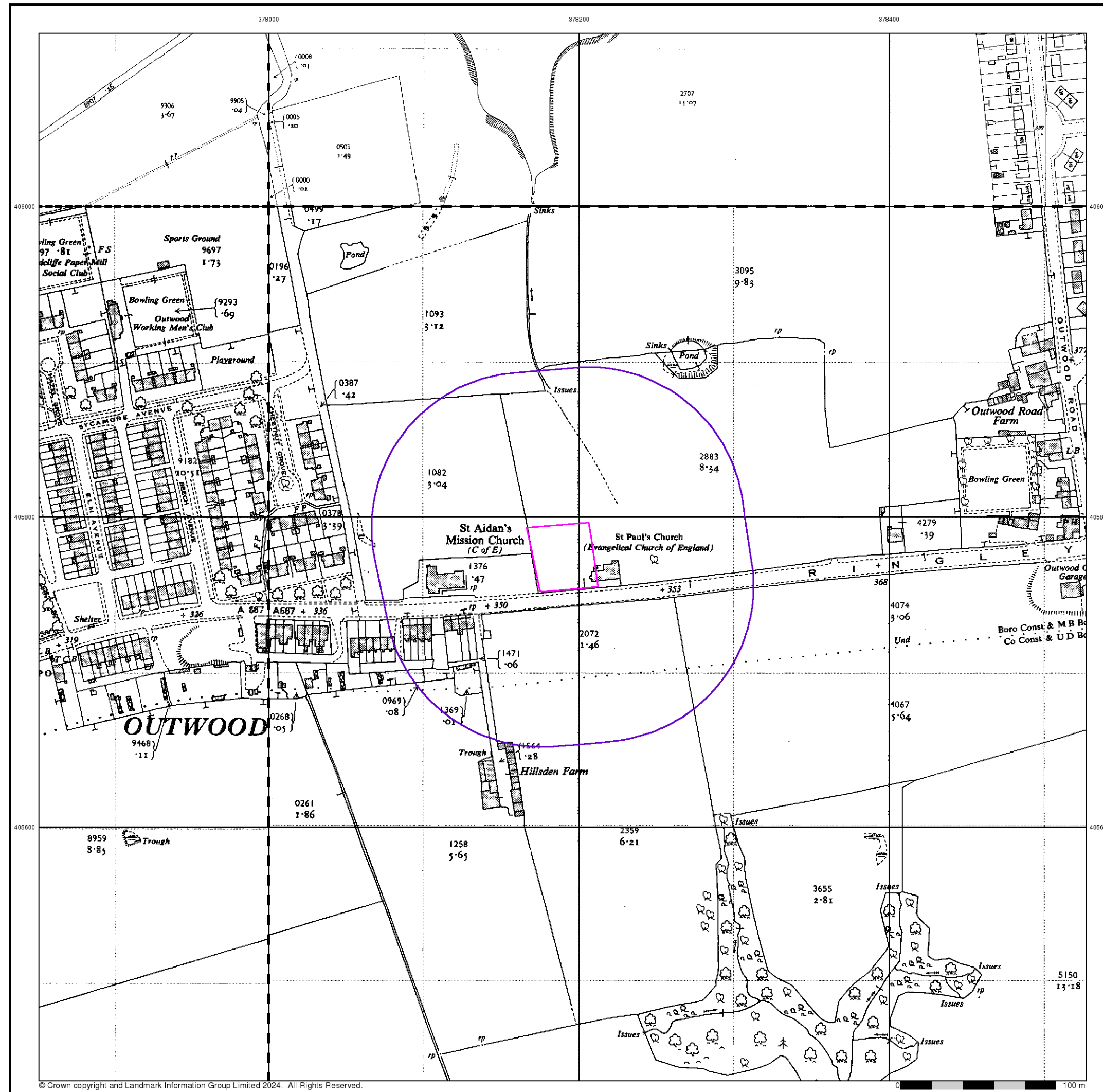
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Ordnance Survey Plan

Published 1956

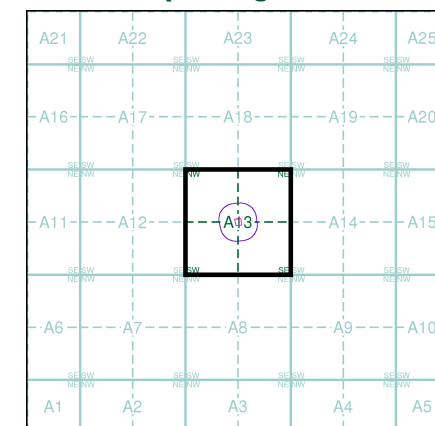
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Map Name(s) and Date(s)

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Historical Map - Segment A13

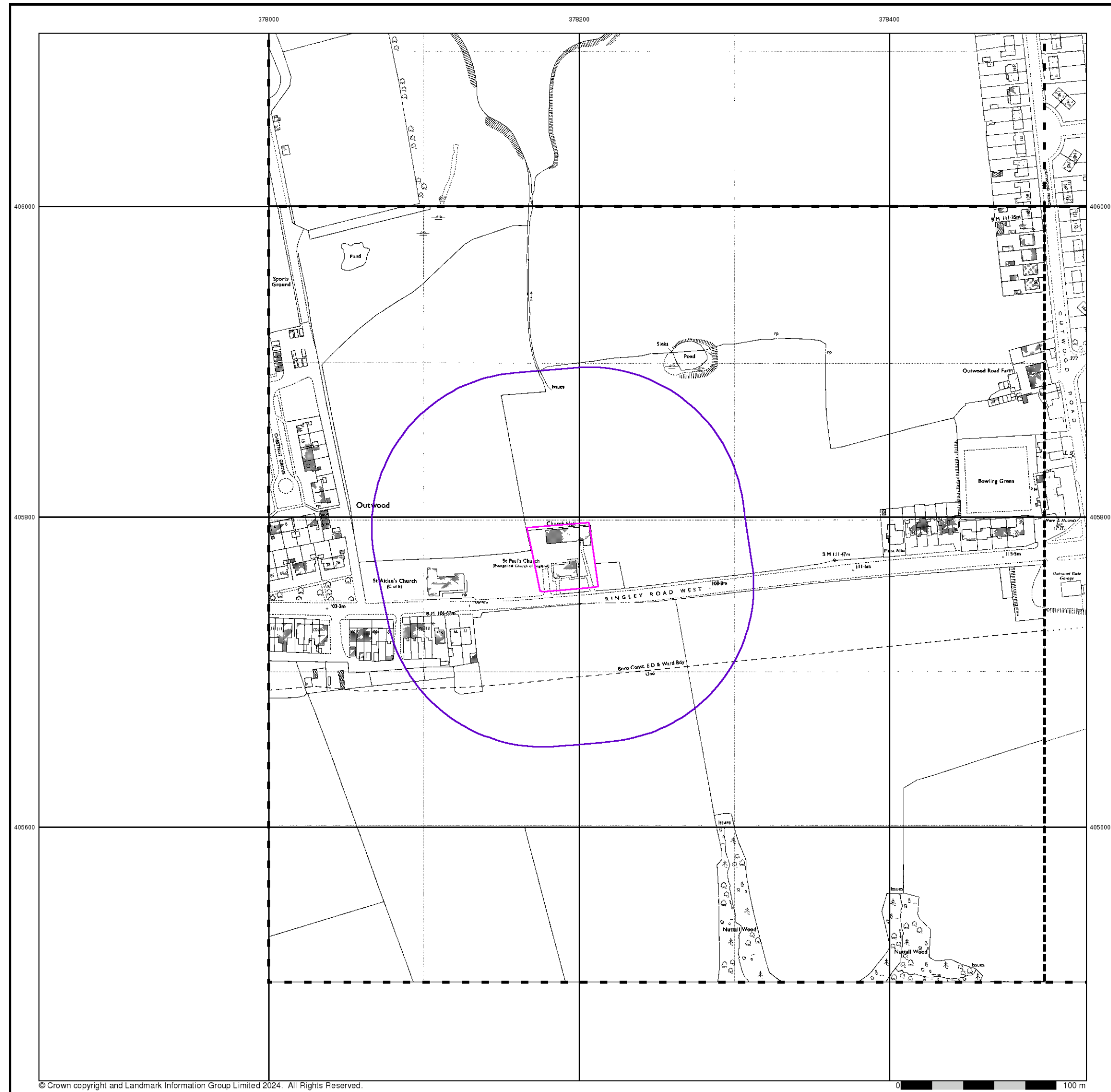


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Ordnance Survey Plan

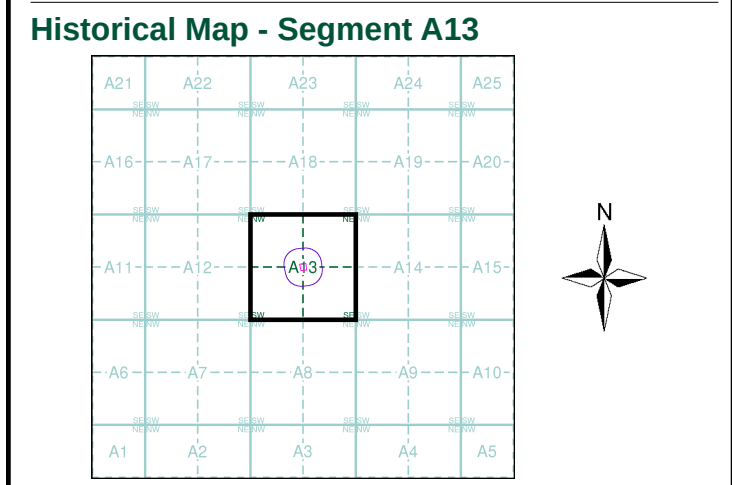
Published 1961 - 1975

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Map Name(s) and Date(s)

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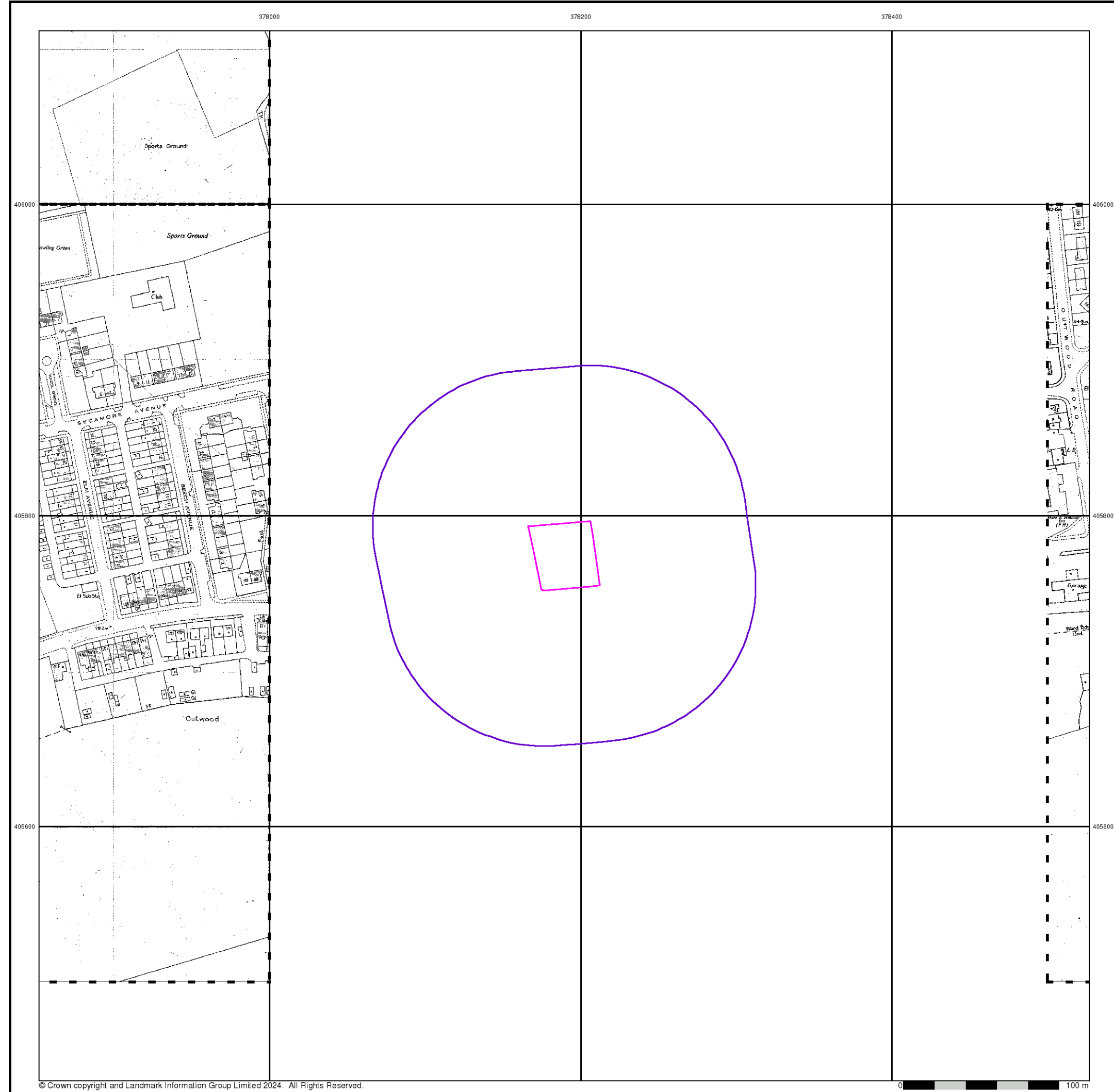
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Additional SIMs

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Source map scale - 1:1,250

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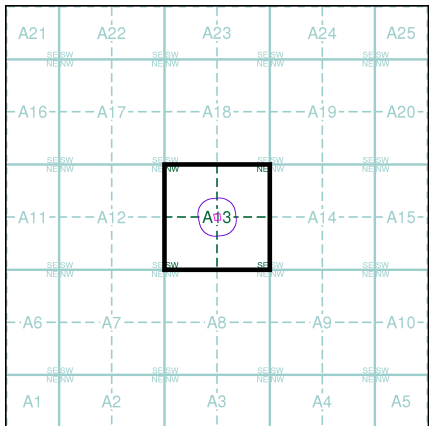
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Historical Map - Segment A13



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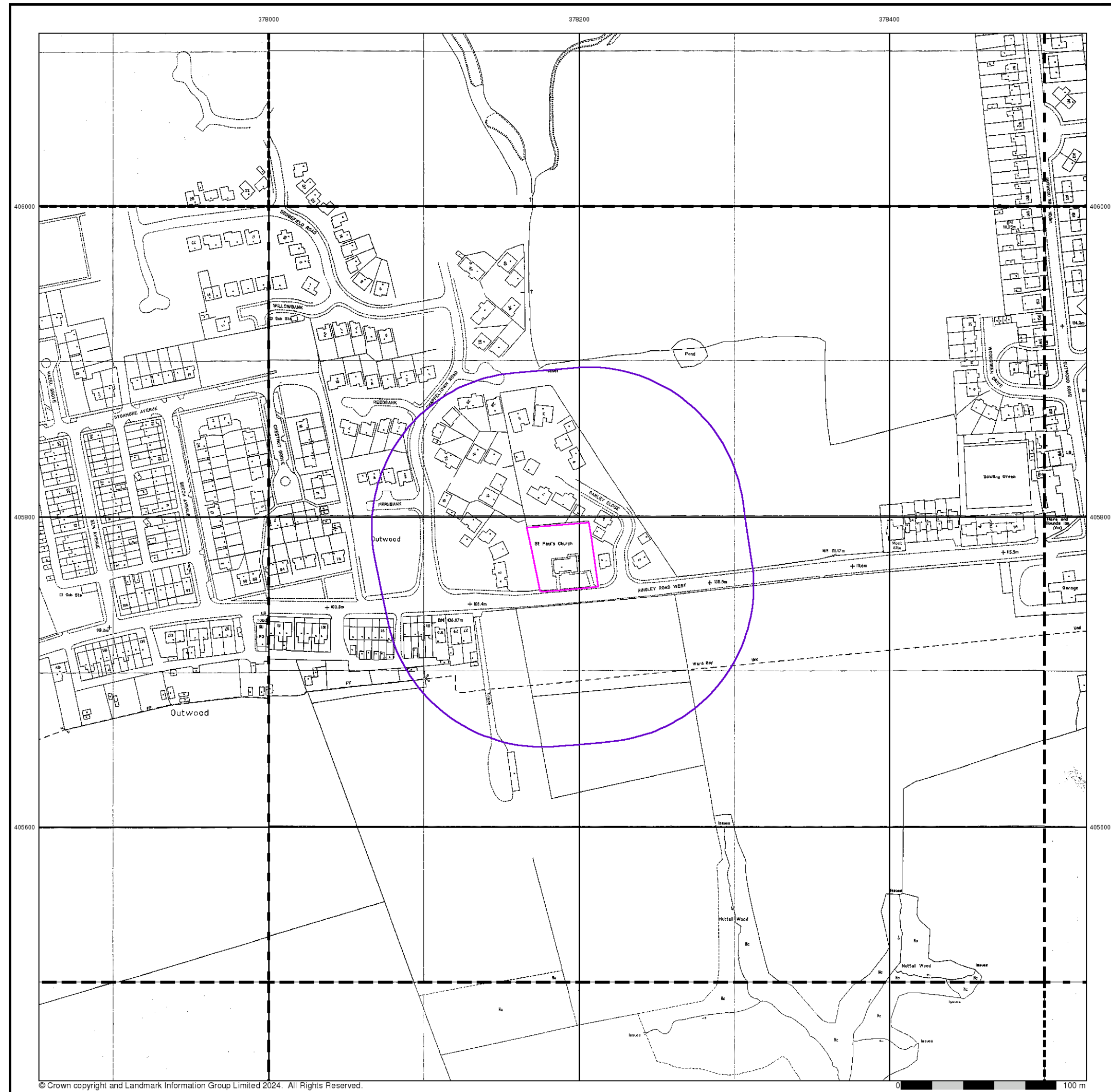
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Customer Ref: 10/2416
National Grid Reference: 378190, 405770
Slice: A
Site Area (Ha): 0.17
Search Buffer (m): 100

Site Details

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Large-Scale National Grid Data

Published 1992

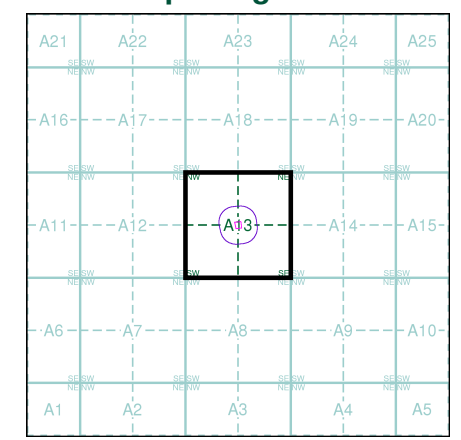
Source map scale - 1:1,250

'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)

SD7706SE	SD7806SW	SD7806SE
1992	1992	1992
1:1,250	1:1,250	1:1,250
SD7705NE	SD7805NW	SD7805NE
1992	1992	1992
1:1,250	1:1,250	1:1,250
SD7705SE	SD7805SW	SD7805SE
1992	1992	1992
1:1,250	1:1,250	1:1,250

Historical Map - Segment A13

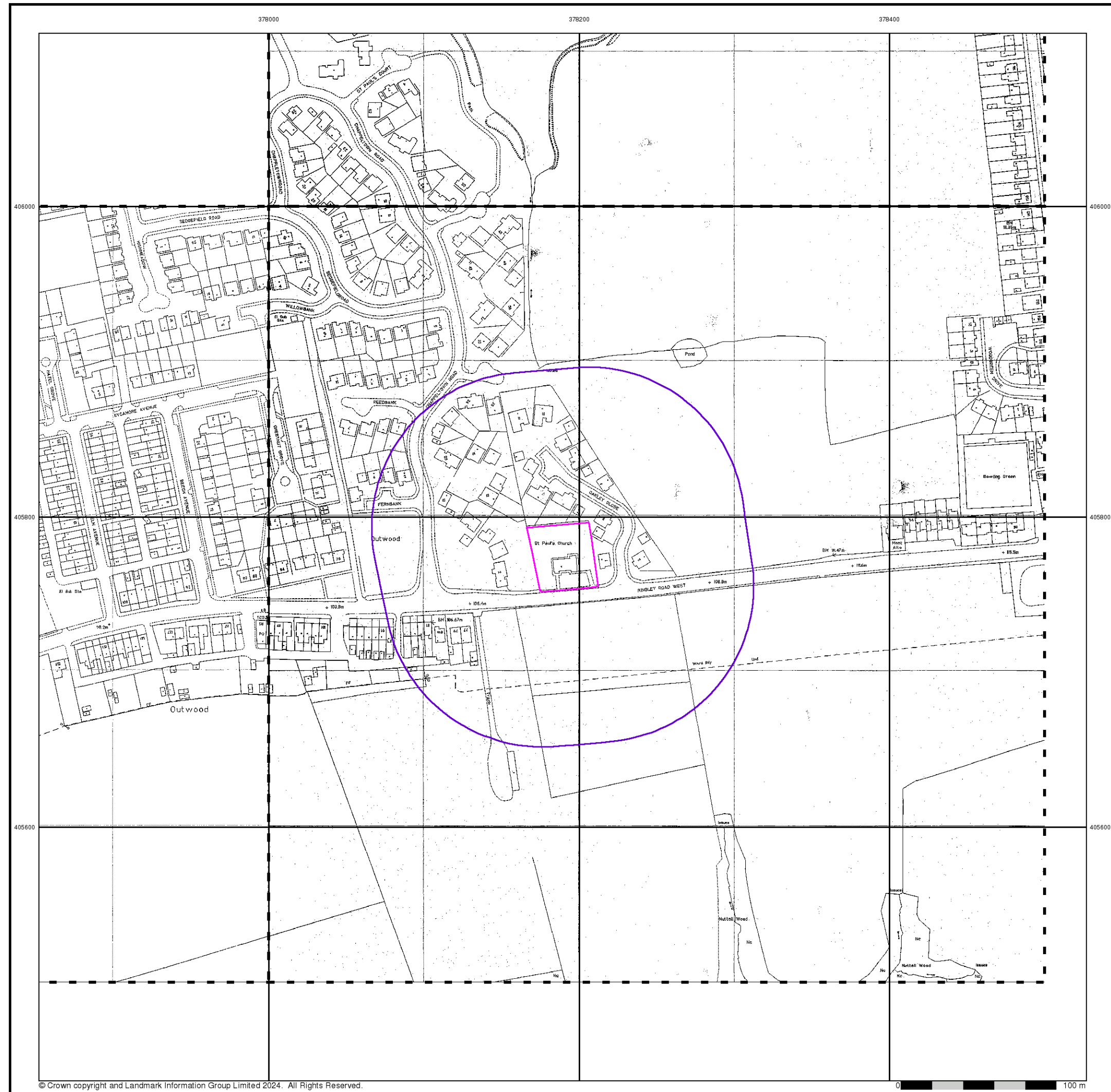


Order Details

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Site Details

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0 100 m

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Large-Scale National Grid Data

Published 1993 - 1994

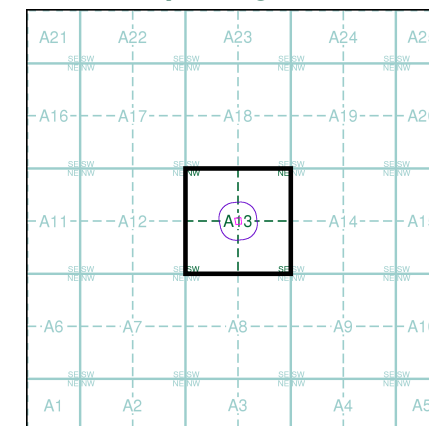
Source map scale - 1:1,250

'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)

SD7806SW	1993	1:1,250
SD7705NE	1993	1:1,250
SD7805NW	1994	1:1,250

Historical Map - Segment A13



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0 100 m

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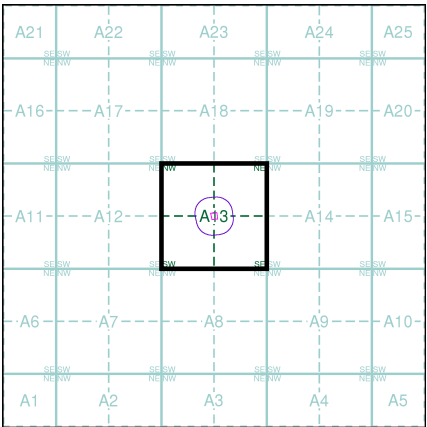
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Historical Aerial Photography

Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



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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		Minor Roads		
	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				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	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
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		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
	Civil Parish		
	BP, BS Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		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
	Mean high water (springs)		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

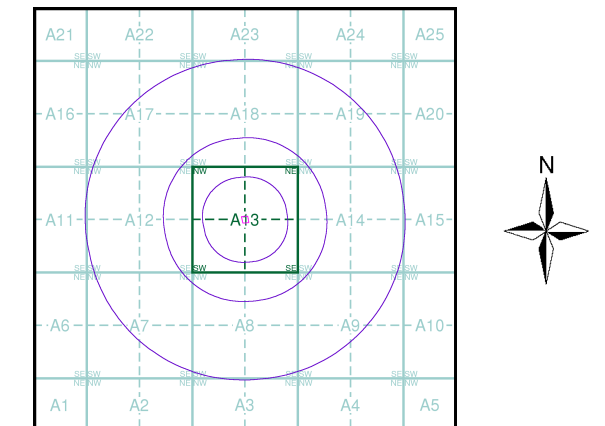
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1850	3
Lancashire And Furness	1:10,560	1894 - 1895	4
Lancashire And Furness	1:10,560	1910	5
Lancashire And Furness	1:10,560	1930	6
Lancashire And Furness	1:10,560	1937	7
Lancashire And Furness	1:10,560	1938	8
Ordnance Survey Plan	1:10,000	1955 - 1956	9
Ordnance Survey Plan	1:10,000	1965 - 1967	10
Ordnance Survey Plan	1:10,000	1975	11
Manchester	1:25,000	1975	12
Ordnance Survey Plan	1:10,000	1980	13
Ordnance Survey Plan	1:10,000	1989	14
Ordnance Survey Plan	1:10,000	1990 - 1992	15
10K Raster Mapping	1:10,000	1999	16
10K Raster Mapping	1:10,000	2006	17
VectorMap Local	1:10,000	2024	18

Historical Map - Slice A



Order Details

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings Military and Industrial Buildings

Military and Communication Areas Subway Entrance

Fireproof Building Prominent Fireproof Building

Non-fireproof Building Non-fireproof Building (non-dwelling)

Factory, mill, and flour mill, with chimneys Factory, mill, and flour mill, without chimneys

Power Station, drawn to scale Hydroelectric Power Station

Radio Station, drawn to scale Telephone Station, drawn to scale

Abandoned Open-pit Mine or Quarry Open-pit Salt Mine

Pit Oil Deposit or Well Oil Seepage

Tailings Pile Fuel Storage Tanks Natural Gas Tank

Bench Mark Drill Hole Burial Mound Triangulation Point on Burial Mound

Single-track Railroad Double-track Railroad and Station Building

Coniferous Forest Deciduous Forest Mixed Forest

Lawns Citrus Orchard Wet Ground Scattered Vegetation

243.8 Values for prominent elevations

186.0 Numbers for spot elevations, depth soundings, contour lines, etc.

0.2 Velocity of the current, width of river bed, depth of river

180/12 Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	Ъ (-)
Д д (D)	Л л (L)	У у (U)	Ы (Y)
Е е (E)	М м (M)	Ф ф (F)	Ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings Military and Industrial Buildings

Military and Communication Areas Subway Entrance

Partly Demolished Buildings Demolished Buildings

Built-Up Area with Fireproof Buildings Predominant Built-Up Area with Non-Fireproof Buildings Predominant

Individual Fireproof Building Prominent Industrial Building

Individual Dwelling, Fireproof Ruins of an Individual Dwelling

Factory or Mill Chimney Factory or Mill with Chimney Factory or Mill without Chimney Mine or Open Pit Mine

Operating Shaft or Mine Non-Operating Shaft or Mine Salt Mine Tailings Pile

Pit Stone Quarry Gas Pump or Service Station Fuel Storage or Natural Gas Tank

Oil or Natural Gas Derrick Small Hydroelectric Power Station Power Station Transformer Station

Cemetery Burial Mound (height in metres) Triangulation Point on Burial Mound Triangulation Point

Bench Mark Bench Mark (monumented) Telegraph Office Telephone Station

Radio Station Radio Tower Airfield or Seaplane Base Landing Strip

Telegraph/Telephone Lines Main Highway Highway under Construction Improved Dirt Road (former truck road)

Double-track Railroad with First Class Station Dismantled Railroad Railroad Under Construction

Shore Embankment River or Ditch with Embankment Direction and velocity of current Water Gauge Water Level Mark

Well Water Reservoir or Rain Water Pit Spring Isobath with value

Heavy (Index) Contour Line Contour Line and Value Half Contour Line Spot Elevation Value

Coniferous Deciduous Mixed Scrub

Key to Numbers on Mapping

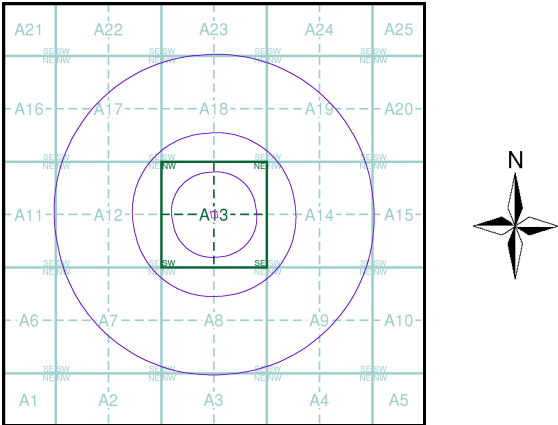
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1850	3
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Ordnance Survey Plan	1:10,000	1990 - 1992	15
10K Raster Mapping	1:10,000	1999	16
10K Raster Mapping	1:10,000	2006	17
VectorMap Local	1:10,000	2024	18

Russian Map - Slice A



Order Details

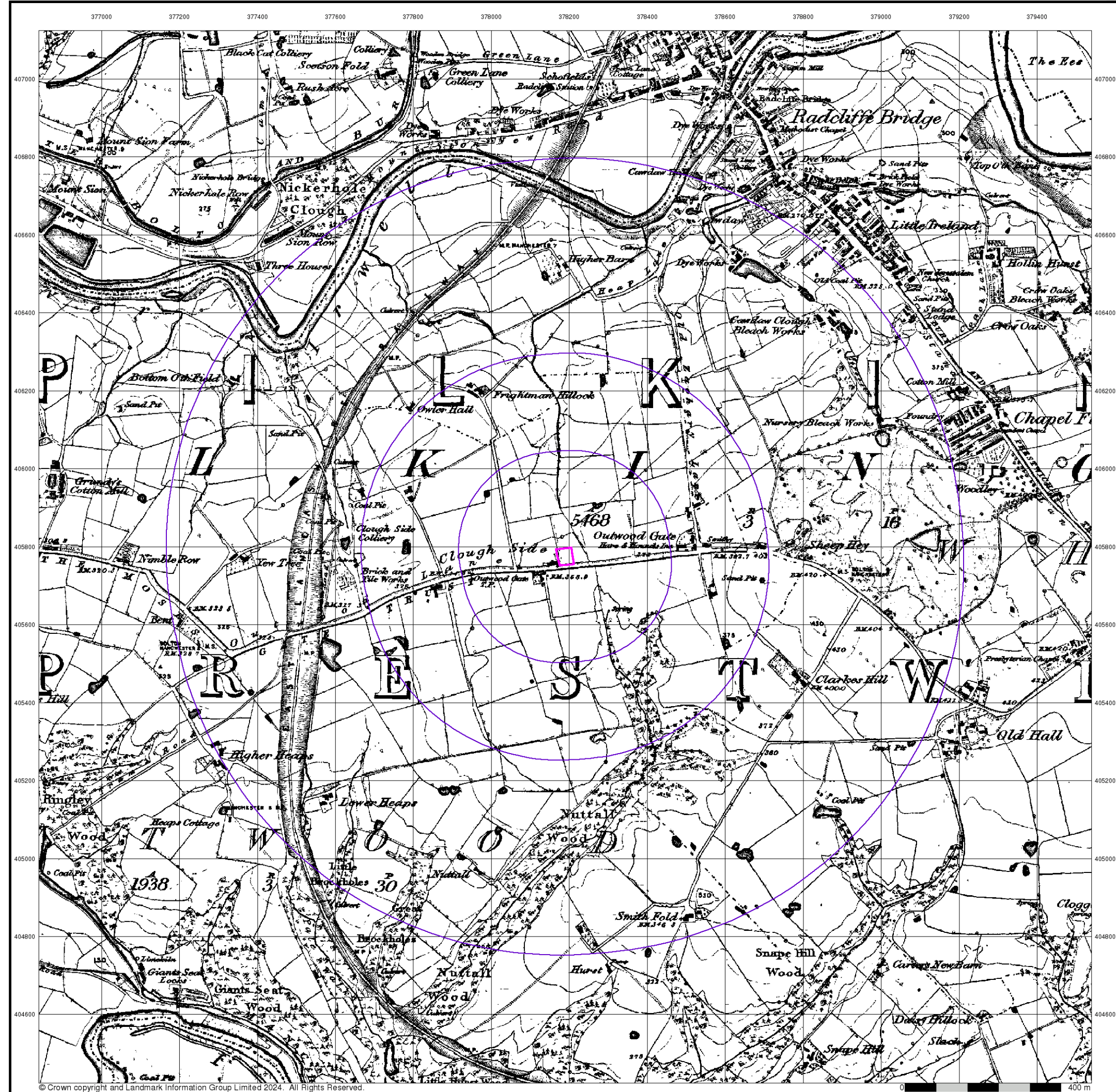
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Customer Ref: 10/2416
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Slice: A
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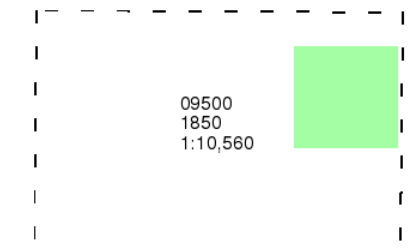
Lancashire And Furness

Published 1850

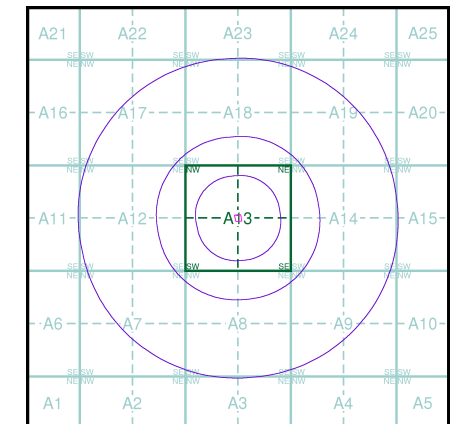
Source map scale - 1:10,560

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

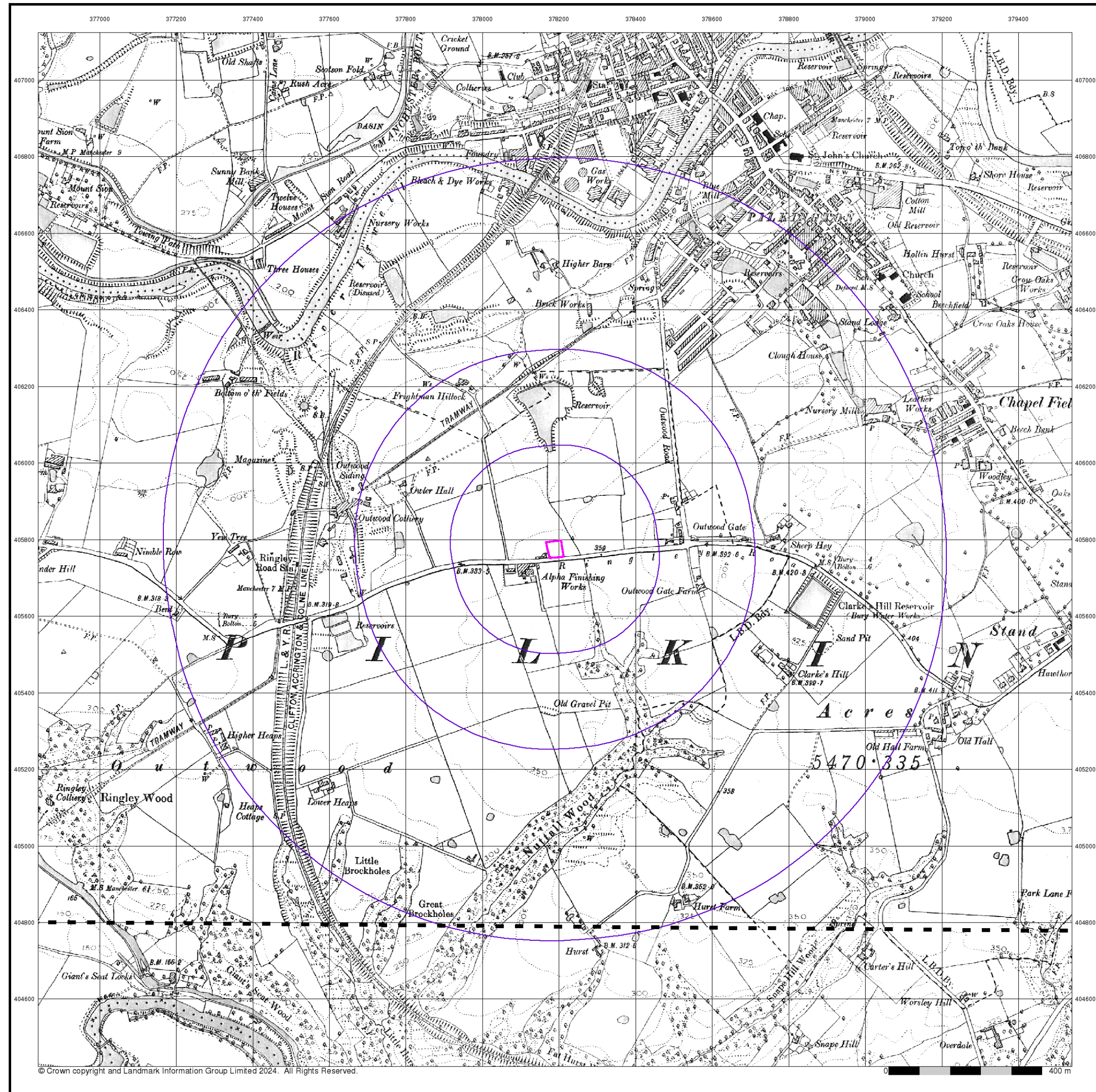
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Lancashire And Furness

Published 1894 - 1895

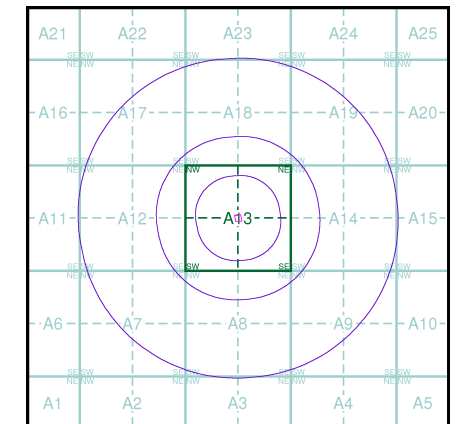
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Map Name(s) and Date(s)

095NE
1895
1:10,560
095SE
1894
1:10,560

Historical Map - Slice A



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