

Buro Happold

021706 Kirkby, Liverpool
Ground Engineering Site Appraisal

December 2006

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Executive Summary

1 Introduction

Buro Happold Ground Engineering (BHGE) has undertaken a Site Appraisal for the Kirkby Redevelopment Project, Liverpool. The current development proposal consists of demolition of existing commercial, residential and school buildings and construction of a number of new build retail units as well as minor office and residential buildings in the eastern part of the site, and a football stadium in the western part.

The purpose of this report is to collate and summarize the information for the proposed development site and the immediate surrounding area, including:

- The general physical constraints of the site such as topography, landscape and existing structures.
- The generalized history of the site based on available historical maps.
- An assessment of the anticipated ground conditions in respect of geology, hydrology, hydrogeology, mining activity and geohazards, if any.
- An assessment of the environmental setting of the site, including the possibility of encountering land contamination and ground gas.

The principal source of information relied upon in this study is an Envirocheck® Report¹, which provides a database of information for the site and within a 800 m radius of the site boundaries as supplied by different statutory authorities and other relevant bodies. Other sources have included:

- British Geological Survey (BGS) boreholes and geological mapping.
- Ordnance Survey.
- Site walkover observations.
- Internet searches.
- Aerial photographs
- Consultations with the local authority and Environment Agency

A summary of the information sources used in this report is included in Appendix A.

¹ Envirocheck Report Reference 20401910-1-2 (25 Sept 2006) Kirkby, Liverpool. Landmark Information Group.

2 The Site

2.1 Site Location

The site is located in Kirkby Town Centre, Liverpool. The approximate Ordnance Survey (OS) National Grid Reference (NGR) for the centre of the site is 341090 mE, 398360 mN. The site location is shown in Figure 1.

2.2 Site Description

The current site layout and boundaries are shown in Figure 2 and an aerial photograph is included in Figure 3. The site is roughly rectangular in shape with site boundaries summarized as follows;

- To the north: Cherryfield Drive.
- To the northwest; Knowsley Community College
- To the west: A506 and Kirkby Brook.
- To the south: Bewley Drive and Whinberry Drive.
- To the east: Cherryfield Drive and Kirkby Leisure Centre (currently in construction).

The site area is approximately 28.50 hectares (285,000 m²).

A site specific topographic survey has been completed. The maximum elevation of the site is approximately 28 m AOD in the west of the site where a linear north-south area of raised topography is present. Kirkby Brook to the immediate west of the site is at an approximate elevation of 16 m AOD, and the land in the western part of the site falls towards the Kirkby Brook (at a slope of around 1 in 5.3 or 10-11°). The former school playing field in the centre of the site is at approximately 23 m AOD. In the north of the site Eagles Court is at an elevation of approximately 25 m AOD. In general the topography of the site decreases from northeast to southwest however a raised area of land exists in the western area of the site adjacent to Kirkby Brook.

2.3 Site Walkover

A site walkover was undertaken by a representative of Buro Happold Ground Engineering on Wednesday 4th October 2006. Observations collected during this walkover have been incorporated into the relevant sections of this report. Photographs taken during the walkover survey are included as Appendix B and photograph locations are indicated on the aerial photograph in Figure 3.

The site currently contains the following features;

- All Saints Catholic High School and Kirkby Sixth Form Centre.
- Former school playing field and open grassland (Photos 12, 17).

- An area of recently placed topsoil (Photo 14).
- An area of elevated topography covered by grass and trees (Photos 5, 6, 11, 17).
- Residential properties along Eagles Court and Cherryfield Crescent (Photos 23, 24).
- Various commercial properties along Cherryfield Drive, including a derelict garage (Photo 25), Royal Naval Association Club Kirkby (Photo 26), Knowsley Carers Centre, Lloyds Bank, Cherryfield/Golden Eagle Hotel (Photo 22), the Rooster Pub and Kirkby Young Woman's Centre.

Knowsley Community College is outside the north-western boundary of the site (Photos 8, 9). In addition, Kirkby Leisure Centre is currently being constructed immediately to the east of the site (Photos 20, 21) with an area of the site itself fenced off around this construction site. (Photos 16, 18, 19).

Elevated mounds, localised areas of patchy grass and a depressed area of longer brown grass are indications of previous filling, re-profiling and land-raising in the western area of the site.

An area of disturbed topsoil (Photo 14) was observed in the south of the site associated with construction of the recent Whinberry Drive residential development (constructed between 2001 – 2004).

A small outcrop of very weak red/brown sandstone was found during the site walkover in the base of a riverbank exposure in Kirkby Brook (Photo 3). The sandstone occurred approximately 1.10 m below the top of the riverbank, with organic rich topsoil and a surface covering of peaty material above the sandstone.

2.4 Site History

Historic Ordnance Survey (OS) maps covering the site were obtained with the Envirocheck Report and are presented in Appendix C. These have been studied to determine the historical development of the site and the immediate surrounding area.

In addition a number of historical aerial photographs (refer Appendix D) covering the site have been obtained from English Heritage National Monuments Record, in order to gain further information on the historical development of the site.

A summary of site history based on the above information is provided below, and a series of time sequence map excerpts are presented in Figure 4.

1850 Ordnance Survey Map (1:10,560)

The earliest available OS edition map indicates the majority of the site to be covered by fields, assumed to be for agricultural use. An area of woodland is located in the north central part of the site named '*Websters Pits*', although no identifiable 'pits' are shown in this area, and a smaller area of woodland is shown in the western central part of the site. A small '*Gravel Pit*' is indicated adjacent to the south of '*Websters Pits*'. A small drainage ditch/stream is indicated traversing the site from east to west, flowing through the small area of

woodland and then flowing southeast to join Kirkby Brook. The 75 foot contour line marked on the map suggests that this stream/ditch follows a minor tributary valley oriented east-west towards the main north-south trending valley of the Kirkby Brook.

The surrounding area is shown as agricultural fields, with 'Kirkby Station' and the railway line present approximately 700 m to the northwest of the site. Kirkby Brook is shown in its current position however includes a number of meanders not present today. 'Pear Tree Farm' is shown immediately to the south of the site in the present day position of Whinberry Drive.

1891/1893 Ordnance Survey Map (1:2,500)

A well ('W') is shown east of the site, adjacent to a small structure assumed to be a residential property. The 'Gravel Pit' shown on the 1850 map is no longer marked. The small drainage ditch is still indicated, but does not continue beyond the west end of the small area of woodland.

1894 Ordnance Survey Map (1:10,560)

No significant changes to the site or surrounding area are indicated.

1908 Ordnance Survey Map (1:2,500)

No significant changes to the site or surrounding area are indicated.

1909 Ordnance Survey Map (1:10,560)

No significant changes to the site or surrounding area are indicated.

1927 Ordnance Survey Map (1:2,500)

The well east of the site is no longer indicated.

1928 Ordnance Survey Map (1:10,560):

No significant changes to the site or surrounding area are indicated.

28 September 1954 aerial photograph

The site is shown to be undeveloped. Kirkby Brook has been straightened to its current route. An area of apparently hummocky topography is indicated in the western area of the site adjacent to Kirkby Brook. 'Websters Pits' and a second smaller area of woodland are visible on site. Two electricity pylons are shown present within agricultural fields in the centre of the site.

11 July 1955 aerial photograph

The current All Saints Catholic High School buildings are indicated to be in construction in the southeastern corner of the site. The small area of woodland shown on the 28th September 1954 photograph is now shown

as disturbed ground, possibly an area of filling. In addition a larger area of disturbed ground is shown in the eastern area of the site, in the area of the Kirkby Leisure Centre.

1956 Ordnance Survey Map (1:10,560)

'Websters Pits' woods have been cleared, however a small area of woodland in the centre of the site is still present. Overhead electricity lines and pylons are shown running in a northwest-southeast direction across the site. The southwest of the site is shown to be undeveloped.

1961/62 Ordnance Survey Map (1:2,500)

The southeast corner of the site has now been developed with 'St Gregory's RC Girls Comprehensive School', and 'Kirkby College of Further Education' is present in the northwest corner. Residential properties along Cherryfield Crescent are now present in the north of the site, with a 'Recreation Ground' indicated in the centre of the site. The small area of woodland in the central part of the site has been cleared, and in the near vicinity of its former location and to the northwest a feature is shown that from the map ornament used could either be a sand pit/quarry or a refuse tip. It is considered more likely to have been a sand pit/quarry based on other historic information discussed in Section 5.1.2 of this report.

To the east of the site residential properties are shown. A 'Bus Station', 'Car Park' and 'Fire Station' are shown to the north and northeast of the site.

1966/1967 Ordnance Survey Map (1:10,560) (Site on 1966 map)

The pit/refuse tip feature indicated in the western/central part of the 1962 edition map is now shown as a refuse or slag heap (landfill), with an access track leading from Bewley Drive. The small stream/ditch which flowed east-west through the central part of the site is no longer shown, and the 75 foot contour line has shifted, suggesting that the associated small east-west trending valley feature has also been infilled.

17 May 1970 aerial photograph

The landfill shown on the 1962 edition map is not evident, and appears to have been completed. Areas of disturbed ground are shown in the western area of the site and also in the northern area of the site (referred to as 'Recreation Ground' on the 1962 edition map).

8 May 1974 aerial photograph

The appearance of the land in the western area of the site has changed from the 17 May 1970 aerial photo, and it is possible that further filling operations and site re-profiling may have taken place. In addition the area of the Kirkby Leisure Centre (currently in construction) is shown to be occupied by a feature thought to be a tarmac(?) playground.

21 September 1975

The topography of the western area of the site is clear on this photograph, and shows significant land raising and re-profiling has taken place, to achieve profiles that appear similar to those currently present on site. In particular, the northern part of the landfilled area has been levelled to provide what appears to be a rectangular grassed playing field. This feature is still present on site and is discernable from the recent topographic survey contours.

1971/1973/1975/1976 Ordnance Survey Map (1:1,250)

A 'Running Track', 'Tennis Courts' and 'Playing Field' are now present on site to the west of St Gregory's RC Girls Comprehensive School buildings on the 1975 map. The 'Golden Eagle Hotel' and an adjacent electrical sub station ('el sub sta') is now indicated in the northeast of the site (1975/1977 map), and a 'Garage' and electrical sub station ('el sub sta') are shown in the northwest of the site (1977 map).

The landfill shown on the 1966/1967 map is no longer indicated on the 1971 map and is assumed completed.

The electricity lines first noted on the 1956 map are no longer indicated and are assumed to be removed.

1974/1978 Ordnance Survey Map (1:10,000) (Site on 1978 map)

The western area of the site is now shown as woodland. To the west of the site, the present day A506 road is shown as dotted, inferred to be in construction.

1988/1990 Ordnance Survey Map (1:10,000) (Site on 1990 map)

No significant changes to the site or surrounding area are indicated. The A506 is still dotted and may still be in construction although this is considered unlikely.

1993 Ordnance Survey Map (1:1,250)

No significant changes to the site or surrounding area are indicated.

1994/1995 Ordnance Survey Map (1:1,250)

No significant changes to the site or surrounding area are indicated.

1995 Ordnance Survey Map (1:1,250)

No significant changes to the site or surrounding area are indicated.

1999 Ordnance Survey Map (1:10,000)

No significant changes to the site or surrounding area are indicated.

2004 Ordnance Survey Map (1:10,000)

An area of residential housing immediately to the south of the site is now present (Whinberry Drive).

A comparison of topographic contours on current and historical OS maps indicates that significant land raising has occurred in the western area of the site, along with infilling of a minor valley extending from east to west across the site (see Figure 5).

2.5 Site Utilities

Service plans have been requested from the relevant utility companies in order to obtain information on the expected position and extent of buried and overground cables, pipes, wires etc, which may present constraints on future site development works. Available utility plans at the time of writing are included as Appendix E.

It should be noted that the service plans issued by the various utility companies will only record the public mains locations and do not generally include individual private supply routes. As such, the information available for most development sites is usually restricted to the periphery (unless public roads or rights of way cross the site) and, therefore, the absence of service routes beneath the footprint of the proposed development site on such drawings is not confirmation that the site is clear of services. Any private service routes connecting the mains to any existing buildings thus need to be identified and located.

Given the foregoing, it is normally recommended that a full utilities survey (typically including ground penetrating radar techniques) is undertaken prior to the commencement of any site works. Such a survey not only improves the health and safety aspects of any site works subsequently undertaken but also has the added advantage of the early identification of site specific service routes that may need to be diverted. Such early identification allows suitable provisions to be made in the scheme specific cost plan and also avoids delay and disruption of the future construction works which could arise from the presence of an unforeseen service route. A full utilities survey thus facilitates improvements in respect of health and safety, cost planning and project/construction management.

Guidance issued by the individual service providers should be followed at all times when excavating in the vicinity of buried services. Where appropriate, the service providers should be consulted to mark their equipment in the vicinity of any proposed excavation works.

3 Site Geology

3.1 General

The anticipated ground conditions underlying the site have been assessed on the basis of both published and unpublished data. The available data has been summarized in the following sections and has been combined to establish as accurate a ground model as possible prior to undertaking a site specific ground investigation.

3.2 Published Geology

British Geological Survey (BGS) Map Sheet 84 'Wigan' and Regional Guide 'The Pennines and adjacent areas' (Fourth Edition, 2002) have been obtained to determine the anticipated ground conditions underlying the site.

3.2.1 Drift Geology

British Geological Survey (BGS) Map Sheet 84 'Wigan' (1:63,360, Solid and Drift) indicates the drift geology underlying the majority of the site to be Glacial Boulder Clay. In the northeast of the site Recent Shirdley Hill Sand is indicated and in the southwest of the site an area of Glacial Sand and Gravel is shown. The geological map indicates the relative ages of these drift deposits from youngest to oldest are; Shirdley Hill Sand, Glacial Sand and Gravel, Glacial Boulder Clay.

British Geological Survey Regional Guide 'The Pennines and adjacent areas' (Fourth Edition, 2002) describes the Shirdley Hill Sand as yellow, brown or white glass sands with features showing evidence of terrestrial, windblown deposition. The deposits are commonly more than 3 m in thickness and were deposited by ablation of fine-grained material on exposed glacial till and outwash surfaces.

Outcrops of Sherwood Sandstone bedrock are indicated on the geological map in the vicinity of the site, as such it is considered likely that the natural drift deposits may not be present in significant thicknesses underlying the site.

Made Ground is not recorded within the site boundary on the published geological map; however it is considered likely that Made Ground deposits will be present in the vicinity of existing buildings, hardstanding areas, school sports pitches and filled areas.

3.2.2 Solid Geology

British Geological Survey (BGS) Map Sheet 84 'Wigan' (1:50,000, Solid) indicates the solid geology underlying the site to be Permian and Triassic Sherwood Sandstone. A dip arrow in the vicinity of the site indicates this stratum dips towards the northwest at 5 degrees. The geological map section is not located in the vicinity of the site, but indicates that the Sherwood Sandstone is continuous to significant (>500 m) depths below the surface in this area. The Carboniferous Westphalian A (undifferentiated) Coal Measures outcrop approximately 3.5 km to the east of the site, separated from the Sherwood Sandstone by a major north-south fault named the

Boundary Fault. In addition the Westphalian Coal Measures also outcrop 2.5 km south of the site, although the dotted line on the geological map indicates this is an uncertain boundary.

No faults are indicated to be present within the site boundary or immediate surrounding area. The nearest indicated fault is the Croxteth Fault located 1.5 km west of the site.

3.3 British Geological Survey boreholes

As part of this study the BGS Geoscience Database has been consulted to ascertain whether any exploratory hole records exist for the site or the immediate surrounding area. The database indicates that no borehole records exist within the site boundaries however a number of borehole records are available from the surrounding area. Borehole records which are considered to be of use in assessing the ground conditions underlying the site have been obtained and evaluated as part of this study, details of which are summarized in Table 1 below, and the positions of which are indicated in Figure 5.

Exploratory Hole BGS Reference	Name/ Information	Grid reference	Location	Depth (m BGL)
SJ49NW27	Kirkby P.O. and C.B. (1960). 3 No. boreholes all located to same position. Exploratory plan available with logs.	341300, 398700	Approx. 60 m to the north-northeast of the site	3.51 – 6.40
SJ49NW30	Kirkby Crown Building, Subsoil Surveys (1976). 5 No. boreholes all located to same position. No exploratory plan available.	341300, 398600	Approx. 15m to the north/northeast of the site	4.00 – 4.50
SJ49NW19-22	Kirkby North Sewer Scheme (1953) 4 No. trial pits. Exploratory plan available with logs.	Various	Various positions along current A506 to the west and southwest of the site	2.13 - 4.27

Table 1: Summary of Exploratory Hole Records obtained from BGS Geoscience Database

A summary of the ground conditions encountered in these exploratory holes is provided in Table 2. Full records of the exploratory holes are included in Appendix F. It should be noted the BGS borehole records are old and do not generally conform to current industry practice regarding soil and rock descriptions for

engineering purposes (BS5930:1999 refers). As such, a degree of interpretation regarding geological strata type has been undertaken in accordance with the sequence summarized in Section 3.2.

Depth to Top of Strata (m BGL)	Thickness (m)	Generalized Description [Interpreted Stratum from Published Geology]
0.00	0.30 – 1.52 (not encountered in SJ49NW30)	Dark brown sandy topsoil. [TOPSOIL]
	1.10 – 2.30 (not encountered in SJ49NW27 or SJ49NW19-22)	Concrete and steel matting over fill material consisting of hardcore, brick and stone with organic odour. [MADE GROUND]
0.30 – 2.30	0.80 – 3.96	Red to brown to grey clayey sand with stone inclusions / soft to firm light grey sandy clay/ firm red to brown sandy marl [SHIRDLEY HILL SAND/GLACIAL BOULDER CLAY]
2.13 – 4.27	> 3.50 (thickness unproven)	Red/brown sandstone with occasional pebbles / very hard red cemented clayey sand [WEATHERED SHERWOOD SANDSTONE]

Table 2: Summary of BGS Borehole Records

The BGS borehole information generally agrees with the published geology, with comments as follows.

Sherwood Sandstone bedrock was encountered in all exploratory holes, with the description of 'very hard red cemented clayey sand' in SJ49NW27 considered to represent highly weathered sandstone.

Made Ground was encountered in SJ49NW30 (all 5 No. boreholes). Descriptions of the natural drift material underlying the Made Ground or topsoil vary considerably with both granular and cohesive material encountered. Reference to the published geological map indicates all exploratory holes in Table 1 are located in areas of Shirdley Hill Sand with Glacial Boulder Clay expected underlying this stratum. This anticipated sequence of sand overlying boulder clay is generally not reflected in the borehole log descriptions, and it is likely the drift deposits in the area are both laterally and vertically heterogeneous.

Groundwater observations included on the borehole records are included in Section 4.3.

Standard Penetration Test (SPT) results are included on borehole log ST49NW27 (3 No. boreholes), and are summarized as follows;

- SPTs in the mixed drift deposits range from 3 to 10 blows per 10 inches.
- SPTS in 'very hard red cemented clayey sand' (considered to represent weathered Sherwood Sandstone) range from 60 blows in 2 inches to 60 blows in 10 inches in borehole 2, and 100 blows in 4 inches to 100 blows in 9 inches in borehole 3.

It should be noted that the above SPT N values are reported per 10 inches penetration and are thus not to current industry practice (refer BS5930:1999) which is per 300 mm penetration (or 9.14 inches).

4 Environmental Setting

4.1 General

The environmental setting of the proposed development site has been reviewed on the basis of data contained within the Envirocheck Report (presented in Appendix G) and other sources and is summarized in the following sections.

4.2 Hydrology

Kirkby Brook (tributary of the River Alt) is the nearest surface watercourse to the site, forming the site's western boundary, and flows in a general southerly direction. The Envirocheck Report indicates that the Kirkby Brook in the vicinity of the site has a River Quality C rating (according to the General Quality Assurance Scheme (GQA)) measured in 1990. Information provided within the Envirocheck Report on River Quality Chemistry indicates Kirkby Brook in the vicinity of the site was given a GQA Grade F rating in 2004 (most recent rating), indicating a 'Significant Failure' in relation to the 'Fair Quality' objective. Site walkover observations indicate Kirkby Brook contains clear apparently unpolluted water however various litter and rubbish was observed in the channel (Photos 2, 4).

It is understood a flood risk assessment is being carried out by others and is not within the scope of this report.

4.3 Hydrogeology

The Envirocheck Report indicates that the aquifer underlying the site is a '*Major Aquifer (Highly Permeable)*' described as '*highly permeable formations usually with a known or probable presence of significant fracturing*'. This classification relates to the Sherwood Sandstone described in Section 3.2.

The Soil Classification (for the near surface soils) is '*Soils of High Leaching Potential (U)*', however '*soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) is assumed, until proved otherwise.*' It is anticipated that the made ground and granular materials, such as the Shirdley Hill Sand deposits will have a high leaching potential, however the Boulder Clay is of very low permeability and is essentially an aquiclude, protecting the underlying Major Aquifer against downward migration of contaminants.

The site is not indicated to be within a Groundwater Source Protection Zone (SPZ) on the Environment Agency database. A Zone III Total Catchment SPZ is located 84 m northwest of the site, defined as 'the total area needed to support the discharge from the protected groundwater source'. In addition a Zone II (Outer Protection Zone) SPZ is present 201 m southeast of the site, described as 'either 25% of the source area or a

400 day travel time whichever is greater'. No Groundwater Source Protection Zones are located down hydraulic gradient (assumed to be towards the southwest) within 1 km.

The Envirocheck Report records no groundwater abstractions within the site boundary or within 800 m of the site.

The topography of the locality based on the current OS map indicates that the direction of local shallow groundwater flow is likely to be towards and in the direction of the Kirkby Brook, to the southwest.

The British Geological Survey Hydrogeological 'Map of Clwyd and the Cheshire Basin' (1:100,000, dated 1989) indicates the potentiometric surface of the Sherwood Sandstone Group underlying the site is between +10 and +20 m AOD (ground surface of site is between approximately 16 and 28 m AOD, refer Section 2.2). Based on the potentiometric surface contours on this map, the direction of regional (deep) groundwater flow in the Sherwood Sandstone aquifer is considered to be towards the south in the direction of a regional cone of depression associated with a Public Supply Pumping Station.

The Metropolitan Borough of Knowsley 'Contaminated Land Inspection Strategy' (revised June 2004) contains the following information in respect to the general hydrogeology of the area;

'Poor drainage of the glacial till has favoured the development of extensive areas of peat moss at Kirkby'

'Generally, across north Merseyside, groundwater levels are rising with implications for potential pollution'.

'The drift is often thin and sandy and there are localised exposures of sandstone...where drift deposits are thin, absent or sandy the vulnerability of the groundwater pollution will be increased'.

Groundwater conditions anticipated in the geological succession described in Section 3.2 can be summarized as follows:

- Made Ground/Topsoil – Variable permeability expected, localized perched water in granular fill materials where interbedded with cohesive made ground.
- Shirdley Hill Sand – Unclassified aquifer, high permeability, unconfined groundwater expected to be closely related to the level of the Kirkby Brook where in its near vicinity. Possibly perched over underlying Glacial Boulder Clay elsewhere.
- Glacial Sand and Gravel – Unclassified aquifer, high permeability, unconfined groundwater expected to be closely related to the level of the Kirkby Brook, possibly perched over underlying Glacial Boulder Clay.
- Glacial Boulder Clay - Low permeability (aquiclude/aquitard) although possible permeable sand and gravel lenses.

- Sherwood Sandstone (Major Aquifer) - High permeability, though dependant on degree of fracturing. Groundwater possibly confined by overlying Glacial Boulder Clay.

Groundwater observations from previous site specific ground investigations indicate that shallow perched groundwater occurs locally within the Made Ground/natural drift, however is not continuous across site, with a number of trial pits and boreholes encountering no groundwater.

The groundwater regime beneath the site should be confirmed as part of a site specific ground investigation.

4.4 Pollution Incidents/Hazardous Substances

The Envirocheck Report records 2 No. Pollution Incidents to Controlled Waters within the site boundary, summarized as follows;

- Envirocheck Map ID 4: Receiving water: Unknown, Pollutant: Heating Oil, Incident Date: 17th September 1991, Severity of Incident: Category 3 – Minor Incident.
- Envirocheck Map ID 5: Receiving water: Kirkby Brook, Pollutant: Chemicals – Paints/Dyes (white liquor), Incident Date: 27th January 1998, Severity of Incident: Category 3 – Minor Incident.

In addition to the above a further 14 No. Pollution Incidents to Controlled Waters are recorded within a 800 m buffer of the site boundaries. Of these, only one is located up hydraulic gradient (north east of the site) with this incident recorded as 'Boots Catalogues' located 446 m from the site and therefore not considered to affect the site.

4.5 Contemporary Trade Directory and Fuel Station Entries

The Envirocheck Report records no Contemporary Trade Directory Entries within the site boundary, but 21 No. within an 800 m buffer of the site.

There is one Fuel Station Entry within the site boundary, named as 'Cherryfield Drive Service Station' with status recorded as 'Obsolete'. A further 3 No. Fuel Station Entries are recorded within an 800 m buffer of the site boundary.

4.6 Landfill Entries

The Envirocheck Report identifies 2 No. Local Authority Recorded Landfill Sites within the site boundary. These entries are both located to the same position and as such are considered to represent a single landfill which has been recorded in the Envirocheck Report as separate entries by the Merseyside Waste Disposal Authority and Knowsley Metropolitan Borough Council. Knowsley Metropolitan Borough Council indicates the landfill is pre-licensing with GDO number 205, and report the date of closure for the landfill to be 31 December 1974. No information is provided in either entry on the type or quantity of waste disposed. Further information on the history of this landfill is provided in Sections 5.1.2 and 6.1.

In addition a further 2 No. landfills are located within an 800 m buffer of the site boundary (included in the Envirocheck Report as 3 No. separate entries). These landfills are both greater than 250 m from the site and located to the southwest and south of the site which is down hydraulic gradient and therefore not considered to affect the site.

4.7 Ground Gas

Ground gas typically consists of methane and carbon dioxide generated by the decomposition of organic materials. Although other gases are often associated with gas generation, methane and carbon dioxide are those which are typically measured during ground investigations, along with measurements for oxygen concentrations (to assess oxygen depletion) and flow rate. Ground gas is generally generated by and associated with the following ground conditions:

- Made Ground – typically non-engineered and poorly sorted material containing an organic component including soil, vegetation and timber.
- Alluvium/Peat – natural drift deposits often associated with river floodplains and generally having a high organic content sometimes with peat inclusions or peat layers.
- Coal Measures – ‘mine’ gas is often generated in such strata and can permeate through old workings and rock masses disturbed by mining activities.
- Landfill – ‘landfill’ gas is often generated by the decomposition of organic materials placed in landfills. ‘Inert’ waste is similar to the Made Ground described above with the degree of gas generation dependent upon the amount of organic material present. Domestic waste, however, has a very high organic content and generates great quantities of gas over a sustained period (decades).

Given the foregoing and the information available at this time it is considered that general Made Ground and the landfilled material on site, and also possibly alluvium associated with the Kirkby Brook, are sources of ground gas that may reasonably affect the site.

4.8 Mining and Quarrying Activity

A Coal Authority Mining Report has not been obtained for the site after an assessment of the published and unpublished geology, which indicates no coal-bearing strata within 250 m of the ground surface of the site. Furthermore the Envirocheck Report indicates the site is ‘In an area which may not be affected by Coal Mining’.

The 1961 edition OS map indicates a shallow cutting in the western area of the site (refer Figure 5) and it is probable that this was a gravel pit.

4.9 Ground Instability and Geo-Hazard

Details on potential ground stability and geohazards are included in the Envirocheck Report and summarized in Table 3 below.

Hazard Type	Hazard Applicable to this Site?		Hazard Potential for site recorded in Envirocheck Report
	No	Yes	
Collapsible Ground Stability	✓		'No hazard'
Compressible Ground Stability	✓		'No hazard'
Ground Dissolution Stability	✓		'No hazard'
Landslide Ground Stability	✓		'Very Low'
Running Sand Ground Stability		✓	'Low'
Shrinking or Swelling Clay Ground Stability	✓		Very Low

Table 3: Summary of Geohazards

On the basis of the desk study work undertaken and the nature of the strata likely to be encountered on site, collapsible ground, compressible ground, ground dissolution, landslip and shrinking/swelling clay are not considered to be issues for the proposed development. It is considered possible that running sand may be a potential issue due to the inferred presence of the Shirdley Hill Sand in areas of the site together with the anticipated shallow water table (refer Section 4.3). In addition it should be noted that the engineering properties of any Made Ground and landfilled material present on site are anticipated to be highly variable. Ground conditions should be confirmed during a site specific ground investigation.

4.10 Radon Affected Areas

The Envirocheck Report indicates the site is in an area where less than 1% of homes are above the Action Level for radon affected areas, as such no radon protective measures are necessary in the construction of new dwellings or extensions.

The Metropolitan Borough of Knowsley 'Contaminated Land Inspection Strategy' (revised June 2004) contains the following information on radon potential, *'there is a moderate radon potential over the central eastern part of the Borough coinciding with the Carboniferous Westphalian Rocks, the radon potential of the remainder of the Borough is low'*.

4.11 Unexploded Ordnance

The site history indicates the site was undeveloped during World War II. Internet searches indicate a Royal Ordnance Factory was present in Kirkby during WWII, with relevant information on this factory summarized as follows;

- 10% of all ammunition produced in Britain during World War II was made at Kirkby.
- The Royal Ordnance Factory site covered 743 acres and when completed consisted of over 1000 buildings.
- Production of shells commenced in 1940.

(Source: http://history.knowsley.gov.uk/show_photo.msql?reference=KB103&search=12Kirkby)

It is considered likely the Royal Ordnance Factory was a German bombing target.

The Kirkby Bombing Map (Ref M889, obtained from Kirkby Library) records all known locations of World War II bomb hits in the local area. This map indicates that 2 No. bomb hits are located within the site boundaries, with a further bomb hit close to the site's northern boundary (refer Figure 5 for positions).

Anecdotal information from local library sources indicates there have been no known instances of unexploded ordnance being discovered in the local area.

4.12 Sensitive Land Uses

The Envirocheck Report indicates the site lies within a Nitrate Vulnerable Zone although this is not considered pertinent to the proposed development. In addition an Area of Unadopted Green Belt and Area of Adopted Green Belt are present to the southwest of the site, although these are not considered to affect the site.

4.13 Archaeology

The scope of this report does not include consideration of archaeological issues.

5 Review of Previous Investigations

5.1 Previous ground investigations

A number of ground investigations have been completed in the vicinity of the site to inform recent development. Reports and correspondence relating to these investigations have been made available for review by Knowsley M.B.C (KMBC) Environmental Health and Knowsley Community College and are summarized in the following sections.

5.1.1 Kirkby Leisure Centre (immediately to east of the site)

KMBC provided a report by Arup (dated April 2005) entitled 'Kirkby Leisure Centre: Site Risk Assessment and Remediation Strategy' has been obtained and reviewed as part of this study. Information on ground conditions presented in the Arup report is based upon a Sub Soil Surveys 2005 investigation and a Sub Surface North West 2002 investigation. At the time of reporting it had not been possible to obtain the factual investigation reports for either of these investigations, so detailed exploratory hole logs were not available. The figures included in the Arup report suggest that nine boreholes and 24 trial pits were excavated on or near the leisure centre site during the 2005 investigation, and 14 trial pits and trenches were excavated during the 2002 work. The Arup report summarises the findings as follows:

- Topsoil: present in thicknesses between 0.20 – 0.60 m.
- Made Ground: to a maximum depth of 3.80 m BGL, predominantly sandy gravels and gravelly sand of stone and brick. Localised pockets of landfilled domestic-type waste including glass, wood, timber, pottery, bottles, metal and leather with hydrocarbon and organic odours.
- Boulder Clay: Thicknesses between 0.30 – 4.20 m. Stiff and very stiff brown sandy clay with some clayey sand (with gravel, cobbles and boulders).
- Sandstone: Weak to moderately weak sandstone (and mudstone) at depths between 2.10 – 6.10 m BGL, with depth to rockhead generally increasing towards the east.

The ground investigations completed as part of this development encountered a number of areas of domestic-type fill (described as 'extraneous material') containing textiles, bottles, metal and plastic, which was distinct from the general Made Ground across the site which consisted of predominantly sandy gravel or gravelly sand of stone and brick. This extraneous material is considered to be from landfilling activities that occurred concurrently with the main area of landfilling in the west of the site. Evidence for this is indicated on the aerial photograph from 11 July 1955 (refer Appendix D).

Post-fieldwork monitoring of 8 No. borehole installations (5 No. visits) across the Kirkby Leisure Centre site indicated locally elevated gas concentrations (maximum methane concentration 25% by volume, maximum

carbon dioxide concentration 14% by volume), although it should be noted no gas flows were detected in any installations during the monitoring.

The Remediation Strategy proposed in the Arup report comprised the following elements;

- Excavation and disposal offsite of 2 No. hotspots of hydrocarbon contaminated soils.
- Clean topsoil imported for landscaped areas.
- Gas protection measures to Characteristic Situation 3 (refer CIRIA 149:1995 – ventilation of confined spaces within the building, well-constructed ground slab, low-permeability gas membrane, minimum penetration of ground slab by services, passive venting to building) incorporated into the Leisure Centre building design.
- Appropriate health and safety and site management during construction works.

Waterman Environmental subsequently prepared a Detailed Contamination Remediation Strategy Report (dated February 2006), which reviewed the work by Arup and made further the remediation recommendations for the site. Relevant information from this report is summarized below,

- Identified sources of contamination include organic and inorganic Made Ground (including landfilled) contaminants, hydrocarbons in shallow groundwater and elevated methane and carbon dioxide in the near surface soils.
- The risk to the underlying aquifer from contaminants in shallow (perched) groundwater is stated to be low due to the presence of Boulder Clay underlying the Made Ground.
- The current risk posed by ground gas is stated to be high.

5.1.2 Proposed redevelopment of All Saints School (central part of site)

Two documents have been provided by KMBC relating to a proposed redevelopment of the All Saints School site, which relate to the central part of the site, which is occupied by the school's playing field. A desk study by Gleeds (Desktop study for Knowsley Council, Kirkby Roman Catholic Learning Centre, Bewley Drive, Kirkby, Liverpool, Merseyside, L32 1TX, September 2005) and a ground investigation interpretative report by Abatech Consulting Engineers (Site 2 – All Saints School, Kirkby, Merseyside – Phase 2 Geo-environmental Investigation for KMBC, April 2006).

The desktop study is essentially based on the same information as has been obtained for this Site Appraisal and is therefore not discussed further.

The Phase 2 investigation report presents the findings of a ground investigation in the central part of the study site, just to the east of the GDO 205 landfill, which comprised 6 boreholes, 12 trial pits, and 3 soakaway tests.

The investigation revealed topsoil over made ground present in most locations (not present in some exploratory holes near the southern boundary of the site) varying in thickness from 0.5-4.3m. The thickest made ground was found in BH4 and TP 5 in the central part of the site, although thicknesses of up to 3.1m were encountered along the western site boundary adjacent to the landfill. Two types of made ground were recorded: a clay/sand soil-based mixed fill with occasional wood, stone and brick; and an ash and clinker based material with metal, pottery fragments, wood, glass and paper. The latter material was generally encountered in the holes where thicker made ground was encountered, although this was not always the case, and was associated with exploratory holes in the western and central part of the site.

Beneath the made ground, deposits of clay (glacial till) and/or sand (Shirdley Hill Sand?) were encountered in most cases, underlain by sandstone at depths ranging from 1.2m to 3.7m. In BHs 3 and 4, and TPs 1, 2 and 3 the made ground was directly underlain by sandstone at 0.5-4.3m depth. In TP11, 0.4m of topsoil directly overlaid sandstone.

Gas monitoring on two occasions indicated maximum methane concentrations of 14% and carbon dioxide of 4%, but with zero flow rates. This was considered by Abatech to fall into Characteristic Situation 4 of CIRIA 149, with the possible requirement for the following protective measures for new developments:

- Ventilation of confined spaces within building
- Well - constructed ground slab
- Low – permeability gas membrane
- Minimum penetration of ground floor slab by services
- Passive in-ground venting
- Active venting to building.

Contaminant testing was carried out on 16 soil samples, and 6 soil leachate and groundwater samples. The soil data was compared against the CLEA thresholds for residential development without plant uptake, and indicated generally low contaminant concentrations other than occasionally elevated arsenic concentrations. The soil leachate and groundwater testing data was compared against UK drinking water standard thresholds and freshwater EQS thresholds, and indicated slight exceedences for PAHs and benzo(a)pyrene (a PAH), but these were not considered significant. The risk assessment concluded that the site posed a generally low contaminant risk, but a moderate risk was identified for sulphate attack on buried concrete, and for groundworkers during the development works. The report noted that should made ground materials require off site disposal to landfill, they were likely to be classified as 'contaminated'.

5.1.3 Whinberry Drive residential development (immediately to south of the site)

Information on ground conditions in this area is based upon various ground investigations commissioned by Cooper Associates, the majority of which are described in the following reports;

- Cooper Associates (July 1998) Ground Gas Investigation Report for land at Bewley Drive, Kirkby
- Cooper Associates (August 2001) Detailed Site Investigation Report for land at Bewley Drive, Kirkby

A total of 32 No. trial pits and 7 No. boreholes were completed between May 1997 and December 2001, including 5 No. boreholes within the GDO 205 landfill boundaries. A further 8 No. boreholes were completed in 2002 in the area of the current residential development. Generalized ground conditions encountered during these investigations are summarised below;

- Topsoil: present in thicknesses between 0.20 – 0.35 m.
- Made Ground: Predominantly granular fill with occasional timber and bricks in the current Whinberry Drive area, maximum thickness 1.30 m. Domestic type waste (including paper, plastic, rags and a slight hydrocarbon odour) was encountered in trial pits along the eastern edge of the GDO 205 landfill boundaries, thought to be overspill from this landfill site.
- Boreholes within the southern part of the GDO 205 landfill, west of the Whinberry Drive site indicated 4-5m of made ground comprising silty sandy clay with gravel including brick. Although it should be noted that the boreholes were not drilled at the highest points of the landfill in this area. The geological cross section presented in the Cooper Associates 1998 report suggests that no gravel/sand extraction took place in the southern part of the GDO 205 landfill and that the waste tip was formed by land raise in this area.
- Boulder Clay: Firm to stiff sandy clay/silt with occasional gravel.
- Sandstone: Loose to medium dense reddish brown, clayey/silty sand with occasional gravel (Completely Weathered Sherwood Sandstone). Very weak, red brown highly weathered sandstone was encountered in 2 No. trial pits (at 1.50 and 1.80 m BGL).

A detailed history of the landfilling activities on site is provided in the Coopers Associates report (dated July 1998) and summarized below;

- A former council refuse disposal tip was located in the western area of the site (refer Figure 5) and was closed prior to 1969 and left to settle. This was previously a (sand/gravel?) pit.
- During storm periods the water level in Kirkby Brook flooded over the tip site.
- In 1969 the local authority (Kirkby Urban District Council) decided to develop the areas adjacent to the (then) newly constructed A506 road for useable public open space.

- To mitigate the risk from flooding, fill was imported to the site to raise levels. Predominantly inert material from construction of the Kingsway Tunnel as well as other sources were imported. Tipping operations lasting approximately 2 ½ years at a peak tipping rate of 250 to 350 lorry loads per day. Information from the Mersey Travel website indicates that construction on the Kingsway Tunnel commenced in 1966 and the tunnel was opened in 1971, suggesting that filling using these materials would most likely have occurred prior to 1970.
- This area of land raising is considered to be defined by the GDO 205 landfill boundaries (refer to Figure 5).
- Based on available information, the site was used for disposal of both domestic refuse and inert material over a period of five to ten years.

Ground gas monitoring of 7 No. borehole installations was undertaken between January and May 1998, with 5 No. of these installations within the GDO 205 landfill boundaries. In addition a further 8 No. borehole installations were constructed in April 2002 in the current Whinberry Drive area, and a second phase of monitoring of the (total) 15 No. installations was undertaken between May and August 2002.

Monitoring results from the borehole installations within the GDO 205 landfill boundary show consistently elevated carbon dioxide (maximum 14.6%) and methane (maximum 89.6%) concentrations. Maximum gas flow rate was 0.5 litres/hour. Gresham tube samples were taken on 2 No. occasions with laboratory testing generally validating the field monitoring results. A shallow gas spike survey carried out in May 1998 within the GDO 205 boundaries produced gas readings significantly lower than the site monitoring (maximum carbon dioxide 0.8%, maximum methane 2.1%), however this is considered to be less representative of the true ground gas regime due to the temporary nature of this exploratory method. Monitoring results in installations outside the GDO 205 boundary showed generally much reduced gas concentrations (maximum carbon dioxide 7.1% and maximum methane 0.4%).

Available correspondence relevant to this development indicates that Characteristic Situation 3 gas protection measures were originally proposed for the residential housing scheme, as well as a gas vent trench between the houses and the landfill. Subsequent correspondence (dated 2 September 2002, apparently during construction of the housing) indicates that based on the second phase of monitoring Characteristic Situation 3 measures were considered unnecessary, so installation of these measures was discontinued and Characteristic Situation 2 measures were adopted. Furthermore the gas vent trench was also not considered necessary and it is believed this was not constructed.

5.1.4 Knowsley Community College (immediately northwest of site)

Engineering Design Partnership Project Management has provided a copy of a report prepared by Jon Walton Associates on behalf of Knowsley Community College, 'Risk assessment on the effects of landfill gas on existing and proposed buildings at Knowsley Community College, Kirkby Campus', September 1997, which

reviews the findings of four ground investigations on the college site and assess the landfill gas risk posed to development on the college site.

The investigations indicated that made ground was present on the college site, but only within 25m of its southern boundary, adjacent to the GDO 205 landfill. The depths of made ground were not great (<1.5m), however, it was considered that they linked back to the GDO 205 landfill and therefore posed a risk of gas migration onto the site. The made ground was generally recorded as ashy, although in one instance 'wet domestic refuse' was observed. In several instances strong hydrocarbon odours were recorded in the made ground. Gas monitoring revealed a maximum methane concentration in one borehole of 54%. The report concluded that the site should be regarded as Characteristic Situation 4 of CIRIA 149, as recommended in the Abatech report for the All Saints College site.

5.2 Summary information

Figure 5 provides a summary plan of anticipated ground conditions based on published geology, unpublished geology and site observations. Figure 6 shows the approximate positions of the various exploratory holes carried out previously on or near the site, along with the thickness of made ground recorded, where the exploratory hole logs are available.

6 Consultations

6.1 Knowsley Metropolitan Borough Council

The site falls within Knowsley Metropolitan Borough Council's (M.B.C) administrative boundaries.

The Metropolitan Borough of Knowsley 'Contaminated Land Inspection Strategy' (revised June 2004) has been obtained to gather information on anticipated ground conditions and potential contaminated land, with relevant extracts included in previous sections of this report.

Anecdotal information obtained from discussions with Knowsley M.B.C Environmental Health are summarized below;

- Historical landfilling activity on site may be more widespread than the area delineated by the GDO 205 landfill boundaries.
- It is understood that pockets of domestic-type landfill material were encountered during ground investigations for the Kirkby Leisure Centre (immediately to east of the site) and also the Whinberry Drive residential development (immediately to south of the site).
- Knowsley M.B.C. indicates that gas monitoring was carried out during these investigations, and as a result gas protection measures were included in these developments.
- Gas monitoring wells are understood to be still present on site although their condition is unknown.
- It is understood that landfilling at the western edge of the site was undertaken mainly to protect the site (specifically a council tip) from flooding by the Kirkby Brook. This council tip is thought to have been located within a former (gravel?) pit shown on historical maps (also refer Figure 5). The landfill is considered unlikely to contain fill at depths significantly below surrounding existing ground level.

A data search of the Knowsley M.B.C. geographic information system (GIS) has been carried out, with relevant information obtained on the GDO 205 landfill on site summarized as follows;

- Date opened: Unknown. Date Closed: Pre 1974.
- Fill/raise: Possibly filling of former clay pit, then raising to present level (it should be noted this information is now considered erroneous and the pit is thought to have been a sand or gravel pit).
- No leachate monitoring, treatment or discharge to the sewer system is recorded.
- No gas monitoring, flaring or vegetation stress is recorded.
- The GDO 205 landfill area is recorded as 5.75 hectares.

- No information is available on type of waste, waste volumes, or engineering details (presence of a liner, cap etc).

6.2 Environment Agency

Preliminary enquiries have been made to the Environment Agency with regard to the proposal to use waste materials from the landfill as part of the overall cut/fill strategy (Ian Battersby, EA Waste Regulation, Leutra House, Preston), and also with regard to contaminated land aspects (Sarah Corbishley, EA Groundwater Contaminated Land Team, Leutra House, Preston).

The outcome of these enquiries is summarised below:

- The landfilled materials can be re-used as fill within the proposed development provided that to do so results in no environmental harm, or risk of harm to humans.
- As the desk study information indicates that at least part of the waste is gassing, the re-use of actively gassing waste materials, such as domestic refuse or materials intermixed with refuse, would not meet this criterion as the gases produced would pose a risk of harm to human receptors. In such circumstances, the re-use on site would be subject to a waste management licence (effectively it would constitute the development of a new landfill), or the material would have to be disposed of to suitably licensed tip.
- The use of inert imported materials to the site to facilitate the re-profiling for the development could be carried out under an exemption from a waste management licence.
- The EA confirmed that the site overlies a major aquifer and therefore a significant concern would be any potential contaminated land impacts on groundwater quality, and also on the water quality in Kirkby Brook.

7 Proposed Development

The Kirkby Redevelopment Project currently consists of the following elements:

- Demolition of the existing school buildings in the southeast of the site and the residential and commercial properties in the north of the site.
- Site levelling to form a general development platform level of around 24.5mOD. This is intended to result in a cut/fill balance across the site to minimise the need for off site disposal of surplus materials. The most significant cut will be in the western area of the site, where the GDO 205 landfill area has a maximum elevation of around 28mOD.
- Construction of a new football stadium plus 80 coach spaces in the west of the site.
- Retail stores including a Tesco and Ikea, with associated car parking spaces.
- Construction of office buildings (minor site use).
- Construction of semi-detached and detached houses and flats (minor site use).

An architect's drawing showing current development proposals is included as Appendix H.

8 Preliminary Conceptual Site Model

8.1 Ground Model

The anticipated ground conditions underlying the proposed development site based on the desk study research undertaken can be summarized as follows:

- Topsoil / General Made Ground.
- Shirdley Hill Sand (predominantly in northern area of site).
- Glacial Sand and Gravel (localised occurrence in southwest of site).
- Glacial Boulder Clay.
- Sherwood Sandstone bedrock (anticipated generally at 2 – 4 m BGL, and deeper in the land-raised western area of site, but outcropping in the banks of Kirkby Brook).
- Groundwater is anticipated to be at 1 – 2 m BGL (perched in Made Ground/natural drift over the underlying boulder clay aquiclude (where present)) with a deeper main groundwater table (possibly confined beneath the overlying boulder clay aquiclude) in the Sherwood Sandstone bedrock, probably at a level at or above the Kirkby Brook water level.
- Flow in the groundwater within the Sherwood Sandstone is anticipated to be towards the southwest. The perched groundwater in the superficial soils is anticipated to flow from east to west towards the Kirkby Brook valley, most likely following the fall of the original topography, possibly with flow concentrated in the central part of the site, where a small east-west trending tributary valley was located.
- A closed landfill (GDO 205) is present in the west of the site, thought to contain a mixture of inert, ashy and domestic/putrescible waste materials. This landfill is unlikely to have incorporated any lining or collection system to prevent leachate or gas migration, or an engineered cap to limit rainfall infiltration.
- The site ground levels are at around 24mOD in the eastern part of the site. The levels rise in the western central area, on the GDO 205 landfill area, with maximum ground levels of 28mOD, and then fall to around 16mOD in the vicinity of Kirkby Brook. It is anticipated that the former site levels fell gently from the eastern area to the west and the valley of the Kirkby Brook, however the valley side was first quarried for sand (probably only to shallow depth), and then overfilled with waste, resulting in raised topography in this area, with relatively steep side slopes. The historical mapping and evidence from investigations in the central and eastern parts of the site indicates that waste was also deposited in these parts of the site, albeit perhaps localised, possibly with the greatest thickness being in the infilled former stream valley which ran east to west across the central part of the site.

- The site is bounded to the Kirkby Brook surface water body to the west
- Existing residential areas are located adjacent to the site

8.2 Source Pathway Receptor Assessment under current conditions

8.2.1 Potential contaminant sources

The following are considered potential sources of contamination that may reasonably affect the site based on the findings of this study:

- General Made Ground underlying areas of the site may contain locally elevated concentrations of contaminants dependent on the origin of this material. Toxic and phytotoxic heavy metals and polycyclic aromatic hydrocarbons (PAHs) are commonly found in these types of materials, amongst other contaminants.
- Landfilled material predominantly in the western area of the site, however localised pockets in other areas. Potential for solid phase contaminants (metals and PAHs) and generation of contaminated leachate.
- Leached contaminants from the landfilled material or general made ground within shallow perched groundwater or deeper groundwater within the Sherwood Sandstone major aquifer.
- Ground gas generation from the landfill, Made Ground and possibly also alluvium/peat associated with the Kirkby Brook adjacent to the site.
- Former Total Fina Elf Service Station in the north of the site. Potential for historical leakage/spills of petroleum hydrocarbons amongst other contaminants.
- Vapours from fuel hydrocarbons or PAHs within the made ground or landfilled materials.
- Electrical sub station adjacent to the Golden Eagle Hotel in the northeast of the site. Potential for oil/polychlorinated biphenyl contamination.
- It is considered possible that contaminants from off-site sources may have migrated to the site. Kirkby Town Centre is up hydraulic gradient of the site (to the northeast) and it is possible contaminants from various sources may have migrated to site in the shallow groundwater in the Made Ground/natural drift or the Sherwood Sandstone major aquifer.

In addition to the above it is considered possible asbestos may be present in the existing buildings on site.

8.2.2 Potential pathways

The following potential pathways for pollutant linkages have been identified:

- Direct/dermal contact and ingestion of contaminated soil ingestion/inhalation of contaminated soil dust
- Inhalation of gases or vapours – asphyxiation and toxic effects
- Contact of contaminated soils with water supply pips resulting in contamination of drinking water supplies
- Leaching of contaminants from made ground and landfilled materials into shallow groundwater and migration
- Leaching of contaminants from made ground and landfilled materials into deeper groundwater within the Sherwood Sandstone major aquifer and migration
- Migration of contaminated shallow groundwater into deeper groundwater within the Sherwood Sandstone major aquifer and migration
- Migration of contaminated shallow groundwater/surface water into the Kirkby Brook
- Uptake of contaminants by landscaping plants
- Ground gas/vapour accumulation beneath/within existing structures on the site
- Ground gas/vapour migration off site
- Migration of contaminants from off site sources into site via migrating shallow groundwater

8.2.3 Potential receptors

The following principal receptors of concern have been identified:

- Current site users (general public open space or within buildings)
- Off site receptors (residential and commercial land uses)
- Kirkby Brook (controlled surface water body)
- Kirkby Brook ecology
- Perched groundwater within the made ground and other superficial deposits
- Groundwater in the Sherwood Sandstone (major aquifer)
- Drinking water supplies/pipes (if present)
- Structures on site
- Plants and trees on site

8.3 Preliminary conceptual site model under current conditions

A Preliminary Conceptual Site Model illustrating anticipated ground conditions and potential source-pathway-receptor pollutant linkages for the current site condition is included as Figure 7.

9 Preliminary Contamination Risk Assessment

9.1 General

In the UK, the assessment of risk from contamination follows the source-pathway-receptor approach. If one of these three elements is absent it is considered that there is no risk of harm. If, however, there is considered to be a linkage between any given source and any given receptor then a risk-based approach is used to assess the significance or impact of any such linkage.

Risks are defined as the probability of an event occurring combined with the severity of the consequence of that event occurring. Particularly for site end users, assessment of the risk posed to a receptor by any given source necessarily includes consideration of the sensitivity of that receptor. For example, the concentration of contamination acceptable at a site to be developed as a residential property with a garden used to grow vegetables and accessible to young children is set lower than that for a commercial site where soil is exposed in minor areas of landscaping and the only long-term users of the site are adults. Similarly a site overlying a major aquifer supplying potable water to a large population will be considered more stringently than a site overlying an impermeable geology with only minor seepages of groundwater.

The proposed development is essentially commercial in form and the risks posed by soil contaminants to end users are lower than for residential development. In commercial developments the critical receptor is taken as a female adult site employee. Whilst younger people might visit the site they would not experience long term exposure to any soil contaminants present. Minor residential land use is proposed in certain areas of the site and these areas will need to be assessed more stringently modelling a female child residing on site. Based on the foregoing discussion the site user sensitivity is therefore generally considered 'medium'.

The site overlies a Major Aquifer (Sherwood Sandstone), and a stream (Kirkby Brook) is located adjacent to the site. The permeability of near surface soils is likely to be variable across the site with areas of granular and cohesive deposits expected. A layer of Glacial Boulder Clay may locally be protecting the underlying Major Aquifer from contaminant migration from the near surface soils although the investigations available indicate that in some locations made ground rests directly on Sherwood Sandstone. Any contaminants in the near surface soil could potentially migrate to Kirkby Brook depending on their solubility/mobility. The controlled waters sensitivity is considered 'high' given the presence of a major aquifer beneath the site and the brook immediately adjacent to the site.

9.2 Risk evaluation

The source-pathway-receptor linkages identified in Section 8 have been evaluated by means of a qualitative risk assessment following procedures outlined in CIRIA C552 'Contaminated Land Risk Assessment: A guide to good practice' (Rudland D.J., Lancefield R.M. and Mayell P.N., 2001). Risks to human receptors and natural

environment receptors are considered separately. Risks have been considered for during construction, and in the post-development condition. The preliminary conceptual site model for the post-construction condition is presented in Figure 8. The risk assessment is presented in Appendix I, and should be read in conjunction with Figures 7 and 8. The risk assessment has identified moderate to high risks to human receptors in relation to ground gas, and moderate risks in relation to contaminants in the made ground and from other sources, and high risks to controlled water receptors from the landfill in the west of the site.

The proposed development will introduce new potential receptors onto the site in the short term and long term as it involves a change of site use from public open space to commercial development, and may also introduce new exposure pathways or enhance exiting pathways. These aspects are considered in outline below. It should be noted that the contaminated land assessment for the site beyond this report stage should continue to follow the recommendations of DEFRA/Environment Agency Contaminated Land Report 11 'Model Procedures for the Management of Land Contamination', September 2004, which requires a staged approach to the risk assessment, as indicated in the flow chart (see Figure 9) reproduced from the guidance. At this point, very limited investigation data is available, and therefore, only a preliminary risk assessment can be made.

Potentially unacceptable risks identified in the preliminary risk assessment are summarized as follows:

- Direct contact with solid phase contaminants and inhalation of contaminated soil dust and ground gases/vapours by construction workers during site development, particularly in the landfilled area, electrical sub station and former service station.
- Direct contact with solid phase contaminants and inhalation of contaminated soil dust and ground gases/vapours associated with landfilled materials or made ground by site end users in soft landscaped areas of proposed development. It should however be noted that these risks are reduced by the proposed development as it will be predominantly hardstanding, and as such exposure areas for this pollutant linkage will be minimal.
- Pollution of controlled waters (Kirkby Brook and Sherwood Sandstone Major Aquifer) through contaminant leaching (and surface runoff during construction). Highest risk in landfilled area due to proximity to Kirkby Brook and presence of landfilled materials in what is expected to be an un-engineered landfill, with no measures incorporated to limit infiltration and the offsite dispersal of leachate. These risks exist in the current condition and remain in the post-development condition but may be marginally reduced by the proposed development due to the extensive hard cover proposed.
- Indirect pathways to site end users by ingestion of contaminated water supplies.
- Ground gas accumulation and asphyxiation/toxicity and explosion hazard within existing and proposed structures particularly in the landfilled area, but also across the remainder of the site to the east. These

risks are increased in the completed development by the proposed extensive commercial development as the site is currently occupied by only a limited number of structures.

- Off site migration of ground gas/vapours to offsite receptors such as the residential developments to the northeast and southeast of the landfilled area, and the college to the north. Without remedial measures these risks would not be reduced, and may be enhanced by the development in the short term due to disturbance of the landfilled materials temporarily increasing the biodegradation processes that generate landfill gasses.

A site specific exploratory ground investigation is essential as the next step in the investigation of the site in order to allow the contaminant sources to be better identified and characterised, the pollutant linkages to be investigated, the conceptual site model to be updated and refined and a Generic Quantitative Risk Assessment to be completed as outlined in CLR11. The final stage of risk assessment under CLR11, which is considered likely to be necessary for this site, is detailed ground investigation followed by detailed quantitative risk assessment and further refinement of the conceptual site model.

9.3 Implications for the proposed development

9.3.1 Introduction

The preliminary risk assessment indicates potentially unacceptable risks to human health or the natural environment and therefore there is a probable need for measures to mitigate these risks, which will need to be incorporated into the proposed development. The objectives of remedial options can generally be summarized as follows:

- Risk reduction
- Risk removal

These can be achieved by:

- Removal of the contaminant source, e.g. contaminant removal by excavation and disposal off site
- Contaminant reduction/removal through physical, chemical and biological remediation technologies
- Breaking the exposure pathway, e.g. providing hardstanding layers, clean capping layers, in-ground barriers, gas protection measures
- Removing the receptor, e.g. adjusting the proposed development layout or form to relocate the more sensitive receptors.

All remediation proposals/strategies developed for the proposed development will require approval from the local authority and Environment Agency, including full method statements for the implementation of the remediation strategy and validation, including long term monitoring requirements. The final remediation

completion/validation report will also require regulatory sign off. The process is likely to be controlled through planning conditions attached to any grant of planning permission for the site.

These regulatory requirements are common to most brownfield site developments, and can lead to programme delays and uncertainties due to the timescales required for regulatory responses/approvals and any further work/assessment required by the regulatory authorities in support of the proposals, and these factors should be borne in mind.

Initial remedial options and other pertinent aspects are considered below to assist with development of the concept design and preliminary cost plan.

9.3.2 Issues associated with the landfilled area

- Uncertainty over the nature of the materials likely to arise from the proposed levelling/cut works in the GDO 205 landfill area. Currently for cost plan purposes an assumption has been made that the materials arising from above the proposed general cut level will be inert, and can therefore be re-used as fill within the development. There is a considerable risk that domestic refuse, or actively gassing materials will be encountered, which would not be permitted by the EA for re-use. If the latter situation occurs, a potentially significant volume of the cut materials would require disposal to a licensed landfill off site, with a corresponding requirement for imported inert fill to make up the shortfall, with significant impacts on cost.
- The available information indicates that the wastes are gassing significantly (only the southern part has been investigated to date) and therefore the full stadium footprint will require active gas protection measures – the PAGeotechnical clean air blanket system coupled with a foil-cored gas-resistant membrane has been assumed for costing purposes. Careful consideration will need to be given to protection at service penetrations beneath the slab etc. Gas protection measures may also be required for the proposed coach park.
- Gas protection measures may also be required to manholes etc within the drainage and/or services network for the structure
- Complete excavation (i.e. below the proposed building platform level) and off site disposal of the landfilled materials in this part of the site is not essential on technical grounds, and would be prohibitively costly, however, the remnant landfill beneath the stadium area will represent a significant potential liability to the owner of the site.
- The proposed stadium will significantly reduce rainfall infiltration into the landfill, reducing leachate generation, however, any areas not covered by hard development will require an engineered cap system to prevent end user contact and limit infiltration.

- Gas venting measures are likely to be required in the external works around the stadium to vent the gasses resisted by the stadium clean air blanket system and to reduce the possibility of off site migration. Venting wells and or trenches may be necessary.
- Landfill leachate is expected to be breaking out or migrating to the adjacent Kirkby Brook and underlying Sherwood Sandstone major aquifer. The extent of any impact on surface water or groundwater quality is unknown at present. Further investigation and risk assessment is required. Leachate control measures may need to be installed, possibly in the form of a leachate interceptor trench adjacent to the brook, and/or measures to reduce the leachate elevations within the landfill to reduce the rate of downward migration to the Sherwood Sandstone aquifer. If leachate control measures are required the collected leachate will require collection and disposal to sewer, possibly after a treatment stage. The need for such measures will depend on the concentrations of contaminants in the leachate and risk assessment to determine the potential impacts.
- On completion of the development, installation of standpipes for long term monitoring of ground gases and leachate is likely to be necessary to confirm the adequacy of the installed measures and to assess any ongoing contaminant or gas migration issues. The duration and scope of any long term monitoring programme would be subject to agreement with the local authority and the Environment Agency.

9.3.3 Issues associated with the remainder of the site

- Made ground is present across the site and includes areas or pockets of domestic refuse. Investigations have indicated elevated gas concentrations and the leisure centre construction includes gas protection measures. It is anticipated that gas protection will be required to the proposed commercial development. The PAGeotechnical clean air blanket system with a standard DPM has been assumed at present within the cost plan. It is probable that protection measures would not need to extend beneath areas of ground level car parking within the development as these will be well ventilated to deal with exhaust gases, although some local protection may be necessary in these areas.
- Only very limited soft landscaping is envisaged. Given the extensive cover of made ground and localised domestic refuse it is anticipated that a clean cover system would be necessary in any soft landscape areas to prevent end user contact and mitigate any adverse effects on the health of landscaping plants and trees.
- Given the extensive cover of made ground and localised domestic refuse at present an allowance should be made for clean backfill to be used to all trenches for buried services to reduce the risk of contamination of water supplies and reduce risks to future maintenance workers.
- The available investigation data for the leisure centre indicates that the made ground/refuse is locally contaminated by hydrocarbons. Localised removal and off site disposal of such hotspots may be

necessary to eliminate any associated risks, however, given the extensive hard cover nature of the development and the allowance for gas protection measures, this is considered unlikely unless unacceptable groundwater impacts are also occurring.

9.3.4 Construction issues

- Odours during the earthworks in the landfill area – nuisance to neighbours, daily cover, or use of scented sprays may be required.
- Offsite dust migration – nuisance, perceived hazard – dust control measures are likely to be required, in the form of damping down exposed soils, use of wheel washes at site exits, sheeted lorries, keeping site access roads clean etc.
- Site worker health and safety – appropriate personal protective equipment will be necessary, such as overalls and gloves etc, and vigilance should be maintained during the groundworks for unusual ground conditions. Higher levels of worker and environmental protection may be required when working in contaminant hotspot areas (if identified) or in the landfill area, possibly including use of a decontamination unit.
- There is a risk of gas/vapour build up in confined spaces and excavations – monitoring of the atmosphere in excavations and other confined spaces should be carried out prior to entry.
- Depending on the working sequence adopted the bulk dig earthworks may expose significant areas of landfilled materials to rainfall – depending on the nature of the landfill materials involved, run off collection is likely to be required, with disposal of the collected water to sewer.
- Associated with the point raised above, there is a potential for surface water run off contaminated by fine material, or spoil loss, directly into Kirkby Brook during the works in the stadium area – the materials involved may also be contaminated –control measures will be required during the construction work in this area to minimise risks and prevent uncontrolled discharges to the brook.

9.3.5 Waste disposal

The spoil arisings from the landfilled area and made ground etc are expected to classify as non-hazardous waste generally, although some might be hazardous in contaminant hotspot areas. Testing is required to confirm this, which should be carried out as part of the investigations of the site. WAC testing for solid and leachable parameters will be required. Where disposal of material to landfill is not the result of remediation activities, such as hotspot removal, clean backfilling to services, or installation of clean capping layers, the full rate of landfill tax would apply (currently £21/tonne, but likely to increase in April 2007). An application for an exemption from Landfill Tax would need to be applied for in relation to any remediation-related disposal of materials. The exemption is not available retrospectively and should be applied for at least a month in advance of any cut/fill/disposal work on site.

10 Preliminary geotechnical discussion

10.1 Proposed Stadium

The proposed stadium is currently located in the west of the site on the area of the GD205 landfill. The coach parking area associated with the stadium is to be located on the southern part of the GD205 landfill. The landfilled materials in this area could be up to 10-12m thick (thickness of 4.8m proved to date in the southern part, although this borehole was not located in the area of highest landraise), or extending around 6-8m below the proposed construction platform level of 24.5mOD.

The made ground in boreholes in the south of the GDO205 landfill was described as a dark grey sandy silty clay with gravel including brick fragments. The boreholes were for gas assessment purposes and did not include any SPT testing, and hence there is no indication of the strength or density of the made ground, although it is unlikely to have been compacted to any degree. It is also anticipated that the materials will be variable, and domestic refuse and ash fill may be encountered in some areas. The expected nature of these materials is such that the bearing capacity for foundations will be low and unpredictable, but high settlements would be expected.

Because of the anticipated conditions, piled foundations are assumed, coupled with a suspended slab. The piles would be socketed into the underlying Sherwood Sandstone rock. The design of the piles will need to take account of negative skin friction from long term settlement of the landfill materials. There is likely to be regulatory concern over installation of piles through the landfill materials into the underlying major aquifer; potential contamination pathways to the aquifer would need to be considered, although with good standards of installation and control on site these concerns can usually be dealt with satisfactorily. Bored piles or low displacement continuous helical displacement piles are recommended. The latter generate very little spoil for disposal.

For the pitch area, depending on the nature of the landfilled materials there may be a possible need to specially engineer or support the pitch on improved ground to minimise long term total and differential settlements. Such methods would most likely to be needed where a high proportion of domestic refuse is present, or the materials are very loosely tipped and variable. Dynamic compaction could be considered (and could be sensibly extended to beneath the full footprint of the structure to minimise long term settlement of the fill around the piles) to compact the underlying waste and limit settlements. Dynamic compaction has the advantage of crushing down voids to 4-5m depth which might otherwise collapse over time due to degradation of the materials. Such measures would also limit the effect of long term settlement on buried services. Allowance should be made currently for provision of measures such as rocker pipes etc to minimise the impacts of settlement.

In the proposed coach park area long term total and differential settlements are also a potential issue, again depending on the composition of the landfill materials. If adopted for the stadium area, dynamic compaction could be considered for the coach park.

The formation of the construction platform involves significant cut and fill, with fill being placed at the western margins of the site. Retaining structures are expected to be required in some areas. Crib or gabion walls are currently under consideration. It should be noted that these sometimes require significant excavation to form and should be constructed during the placement of the fill to avoid this. The existing side slopes to the landfill are not significantly steep and are likely to be stable, subject to analysis and assessment. Steeper slopes formed as part of the development may need to be engineered to achieve adequate factors of safety, for example through the use of soil reinforcement. The design of any capping system to the landfilled area will need to take account of the side slopes, and reinforcing geogrids may be required to reduce the risk of long term erosion/slippage of the capping layer.

Ground investigation is required throughout this area to ascertain the nature of the landfilled materials and their likely performance under load. The investigation requirements are discussed further in Section 11 below.

10.2 Proposed commercial development

In the central and eastern part of the site the made ground appears to be between 0.5m and 5m thick, but could be thicker locally. The made ground is underlain by boulder clay over sandstone generally, although in some areas it directly overlies the sandstone. The sandstone is around 2-6m below ground level, but could be shallower or deeper locally. The boulder clay is described as firm to stiff, although in some areas it is recorded as soft in its upper levels. Allowable bearing pressures of 100-150kN/m² for strip and pad foundations might be achieved on the glacial deposits, subject to further investigation and geotechnical assessment. Higher bearing pressures would be available on the rock, but its variable depth means that these could not be relied upon. Because of the presence of made ground across much of this part of the site, some instability might be expected in foundation excavations, and this should be assessed further during the ground investigation. The Abatech trial pits generally remained stable, apart for in TP05, where the sides were collapsing below 2m depth during the excavation. During the Abatech work groundwater was not encountered on many occasions, and generally only within the Sherwood Sandstone. Perched water might however be encountered during foundation excavations in some areas, and some allowance should be made for sump pumping from excavations.

For structures with column loads of less than 1500kN the cost plan currently assumes deep pads/trench foundations on the boulder clay or rock at depths of 1-4m. It should be noted that the cost plan assumptions were developed prior to receipt of the Abatech investigation, the information in which suggests that the allowable bearing pressure of 200kN/m² assumed was higher than might be achievable, as noted above, and some reassessment may be required. For greater column loads piled foundations have been assumed, as

discussed above, bored or CHD piles are anticipated, socketed into the rock. All floor slabs are currently assumed as suspended given the presence of made ground across much of the site, but this would be reassessed in the light of the investigation findings.

10.3 Roads and hard standings

Because of the extensive presence of made ground across the site design CBRs would be expected to be low. No CBR testing has been carried out to date. A design CBR of 2% could be adopted for preliminary purposes at present (to be reassessed in the light of follow-on investigations), however there is likely to be a need for localised removal of soft spots, or deep compaction of the formation to facilitate construction. All formations should be proof rolled with a heavy roller and any soft spots removed prior to placing the construction build up. The construction build-ups may need to incorporate geogrids to control the effects of settlement on the roads and hard standings.

10.4 Use of soakaways

The use of soakaways on the site might be considered. Because of the extensive made ground, there may be issues with this, depending on the contaminant concentrations. Should high concentrations of contaminants be found the design of the soakaways will need to preclude discharge of water from the soakaway into the made ground, probably via ensuring that the perforated section is located below the based of the made ground. Such measures will be subject to EA approval.

11 Further Investigations

11.1 Ground Investigation

A site specific ground investigation is required to obtain further information in respect of the ground conditions beneath the proposed development site, to gain information on the degree of contamination present as well as allow foundation and other geotechnical design recommendations to be made.

11.1.1 Objectives

Based on the anticipated ground conditions and the nature of the geo-environmental and geotechnical considerations of the proposed development, issues that need to be resolved include the following:

- Prove the distribution, depth and thickness of Made Ground, landfilled material, natural drift deposits and bedrock.
- Determine if the landfilled materials will be permissible/suitable for re-use on the site
- Characterize groundwater levels and the hydrogeological regime underlying the site.
- Investigate potential contamination – assess in relation to the proposed development end use, health and safety of workforce, waste disposal of arisings as appropriate and groundwater/surface water impacts.
- Characterize ground gas generation across the site, especially from GDO 205 landfill footprint.

11.1.2 Methodology

A ground investigation to satisfy the objectives outlined above is anticipated to comprise the following elements:

- Boreholes to assess the nature and thickness of the Made Ground, landfilled material, natural drift deposits and bedrock in addition to insitu testing and obtaining samples for geotechnical and geo-environmental laboratory testing and allow installation of standpipes for gas and groundwater monitoring.
- Machine excavated trial pitting to assess the thickness, nature, characteristics and distribution of any Made Ground, landfilled material, natural drift deposits and bedrock, and to allow samples to be obtained for geotechnical and geo-environmental laboratory testing.
- Soakaway testing in trial pits to assess feasibility of soakaway drainage.
- Geophysical investigation to delineate the horizontal and vertical extents of landfilling activities, and also to possibly differentiate between areas of inert fill and areas of domestic-type putrescible waste.

- Geotechnical laboratory testing, to include rock strength testing, shear strength testing of clays, particle size grading tests, index testing, oedometer testing for compressibility parameters etc.
- Geo-environmental laboratory testing, to include analysis of soil, soil leachate and ground- and surface water samples for a range of typical contaminants including heavy metals, pH and sulphates, hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and a range of other anticipated or potential contaminants.
- Programme of monitoring in installations (including existing installations from previous investigations if present/possible) to allow the ground gas and groundwater regimes underlying the site to be characterized.

It is considered that a phased approach comprising an exploratory stage investigation and main stage investigation will be most cost effective and will enable issues identified in the exploratory ground investigation to be evaluated and targeted in the main stage investigation.

In addition to the above ground investigation, an asbestos survey of existing structures on site is recommended.

11.1.3 Constraints and Issues

The positions of all exploratory holes will need to be agreed with the relevant landowners and/or occupiers to minimize damage and disruption and also to allow, as far as possible, the identification of any services associated with individual premises that are not recorded on the statutory service providers plans. Reinstatement of exploratory hole positions will need to be agreed with individual landowners.

A health and safety risk assessment should be undertaken by the contractor prior to any intrusive investigation works in order to mitigate short term human health risks associated with any exposure to ground contamination. The investigation of the site will most likely fall within the scope of the CDM Regulations, and therefore a planning supervisor will need to be appointed in advance (if not already appointed), and the ground investigation contractor will take on the role of Principal Contractor during the site work.

12 Conclusions

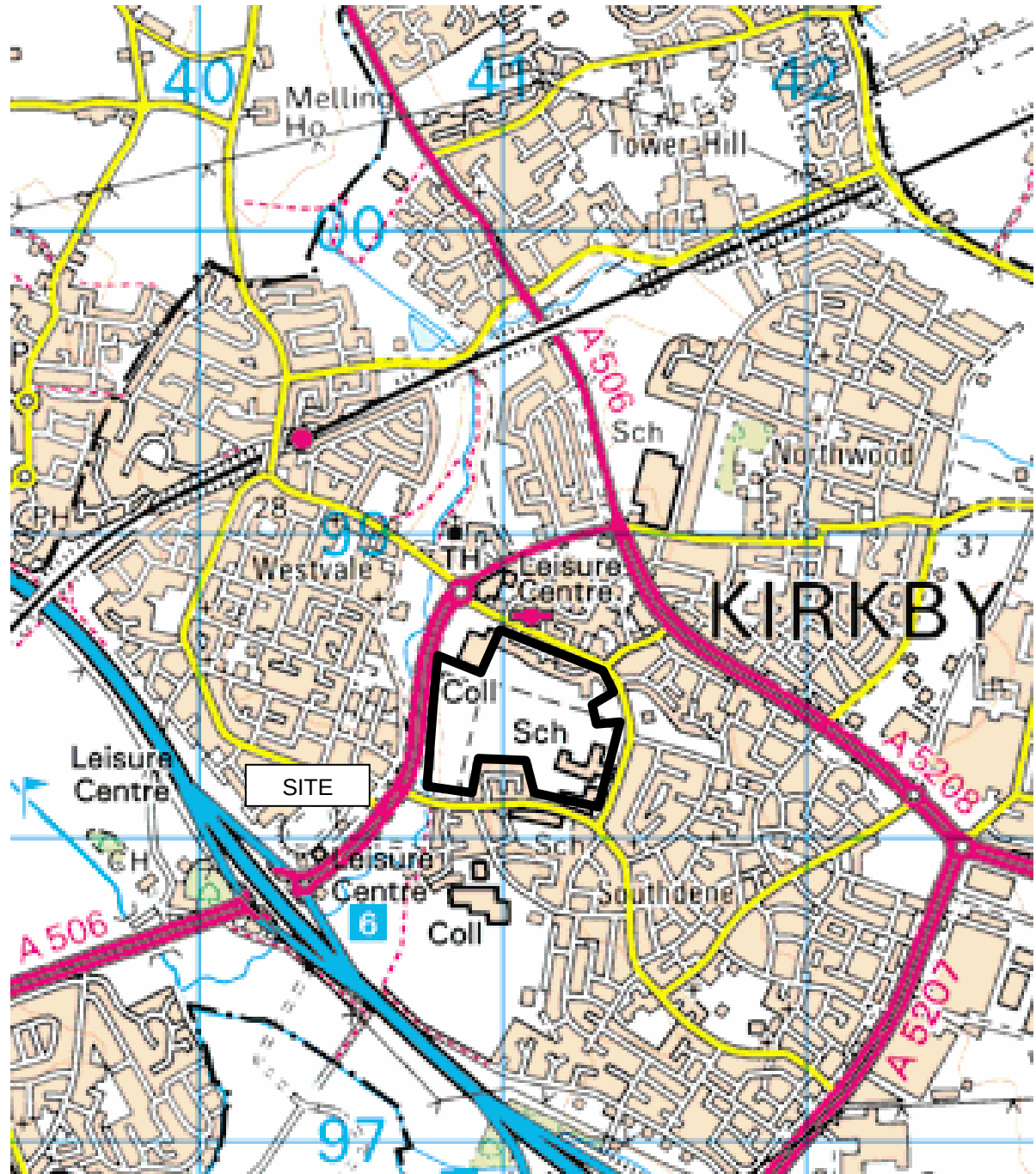
The site appraisal work has identified some significant potential constraints to the proposed development. In particular, the western part of the site was formerly a landfill site and 10-12m of waste material might be present, of unknown composition, but possibly including domestic refuse. The presence of this landfill poses risks both in terms of contaminated land and geotechnical issues.

From the contaminated land viewpoint, a moderate to high risk has been evaluated associated with ground gas and potential impacts on the proposed structures and end users, and a high risk associated with leaching of contaminants from the landfill waste and their migration to the Kirkby Brook, which forms the western boundary of the site, and the Sherwood Sandstone, which is a major aquifer for potable supply, and is thought to directly underlie the landfill. The landfill materials appear to be actively gassing, and may contain contaminants. There is a high risk that material arising from the proposed cut to form the construction platform will not be permitted for re-use as fill without a waste management licence, which would effectively mean constructing a new landfill, with all the associated long term liabilities. If this is the case, off site disposal to licensed landfill will be required, which will have significant cost impacts and will generate a need to import fill.

In geotechnical terms, the landfill materials pose a risk of long term total and differential settlement and therefore structures in this area will require piled foundations, with suspended slab. A stadium is proposed in this area. Depending on the nature of the landfill wastes there may be a need for ground improvement, by dynamic compaction for example, to overcome long term total and differential settlements. Such methods may also be needed to control settlement of the proposed coach park in this area.

Elsewhere on the site,

Figures



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Project Name: Kirkby Redevelopment, 021706

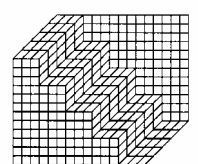
Report Title: Ground Engineering Site Appraisal

Figure Title: Site Location Plan

Scale: NTS

Date: October 2006

Fig No: 1

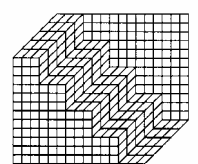


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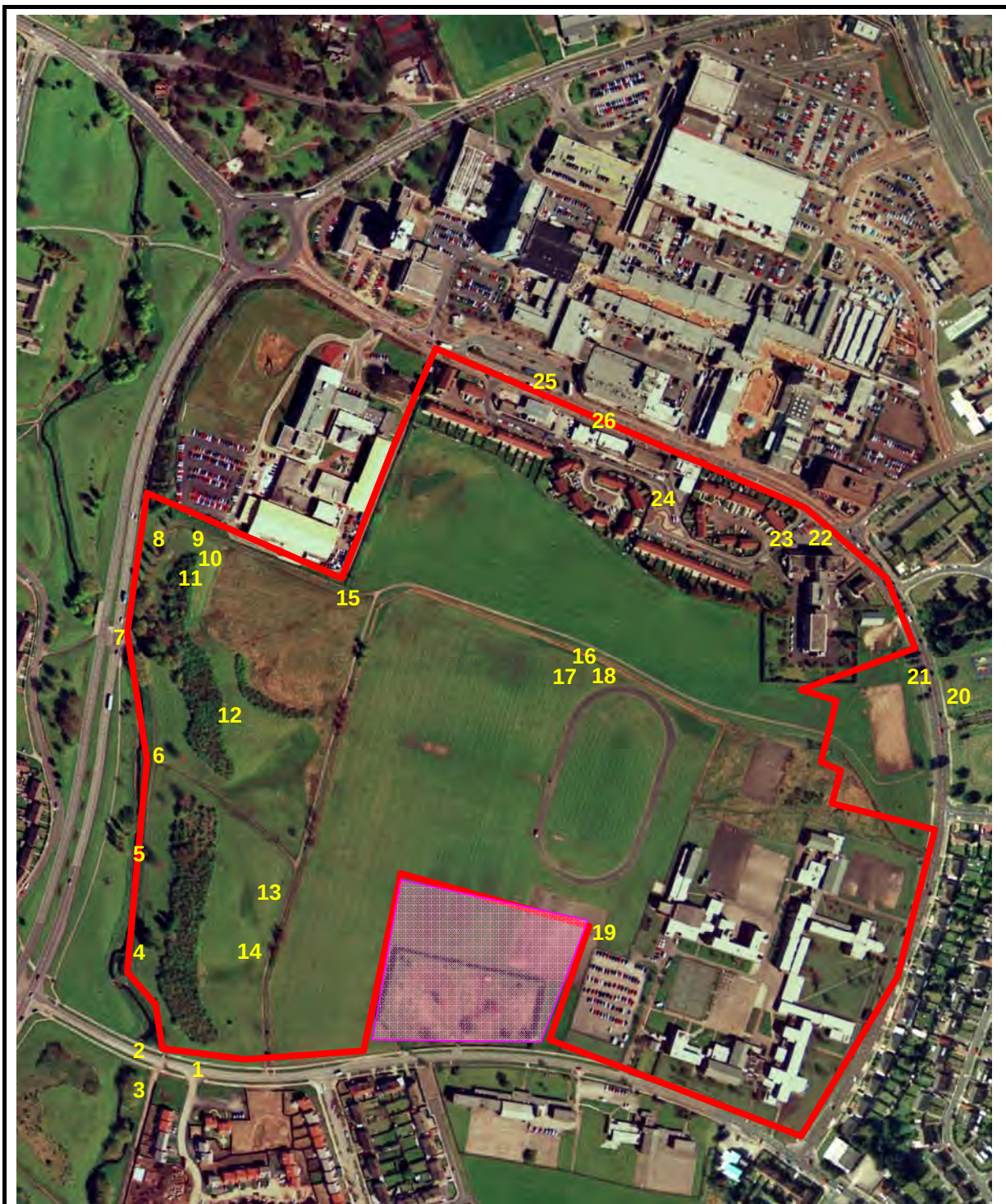


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Red line indicates site boundaries



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Ground Engineering



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Red line delineates site boundaries. Yellow numbers refer to photographs in Appendix B.

Note: Image taken in May 2001 before development of residential housing now present in pink shaded area.

Project Name: Kirkby Redevelopment

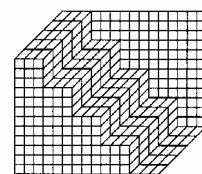
Report Title: Ground Engineering Site Appraisal

Figure Title: Recent Aerial Photograph

Scale: NTS

Date: October 2006

Fig No: 3



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Ground Engineering

Notes
— APPROX. SITE BOUNDARY

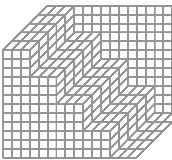
Rev Description/Date Drn/Chk

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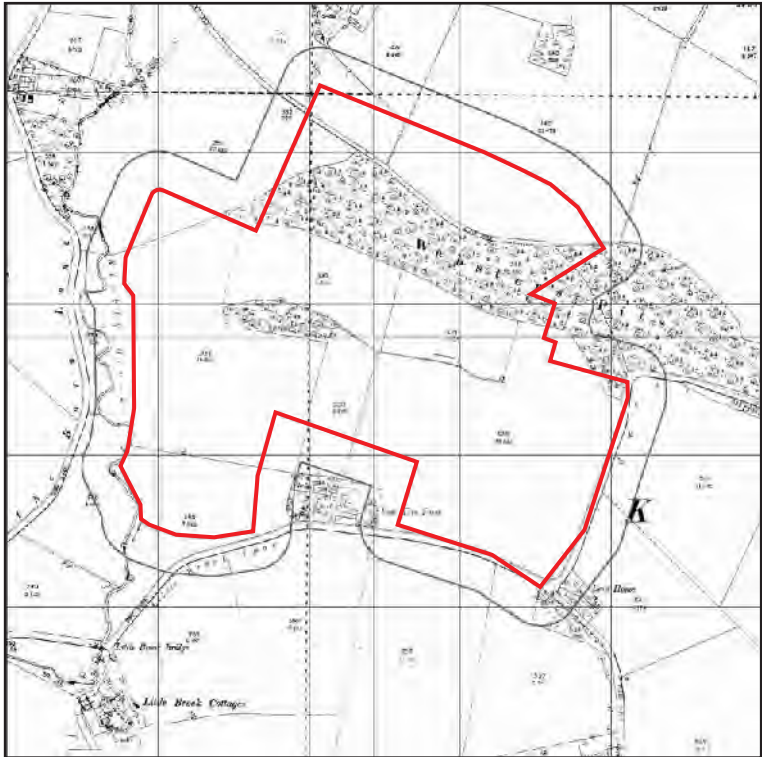
Architect

Project **Kirkby Regeneration**
HISTORICAL MAPPING

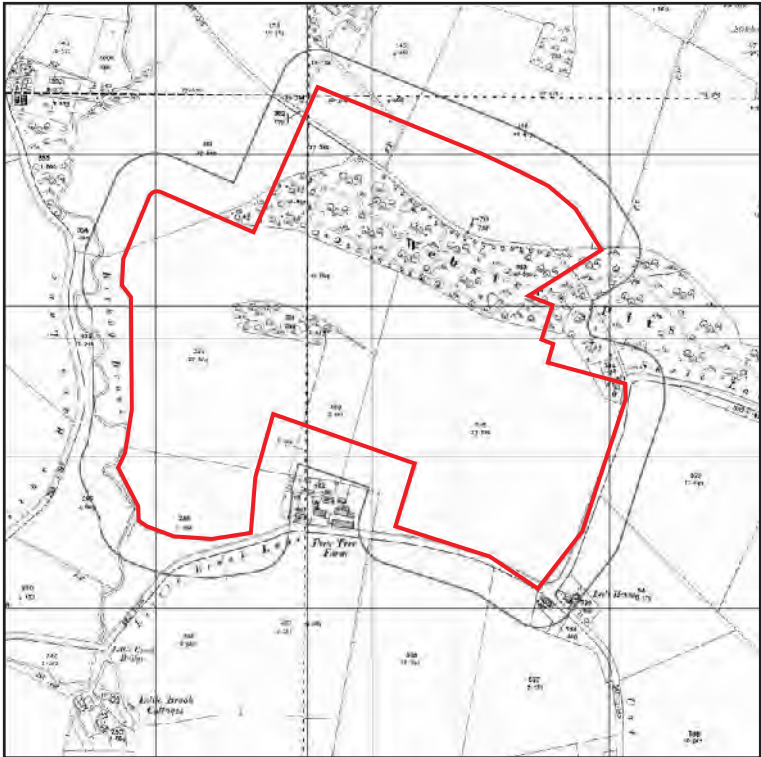
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Drawn by NG
Checked by TRS
Date 13/12/06

Job No. 021706
Drg No. FIGURE 4

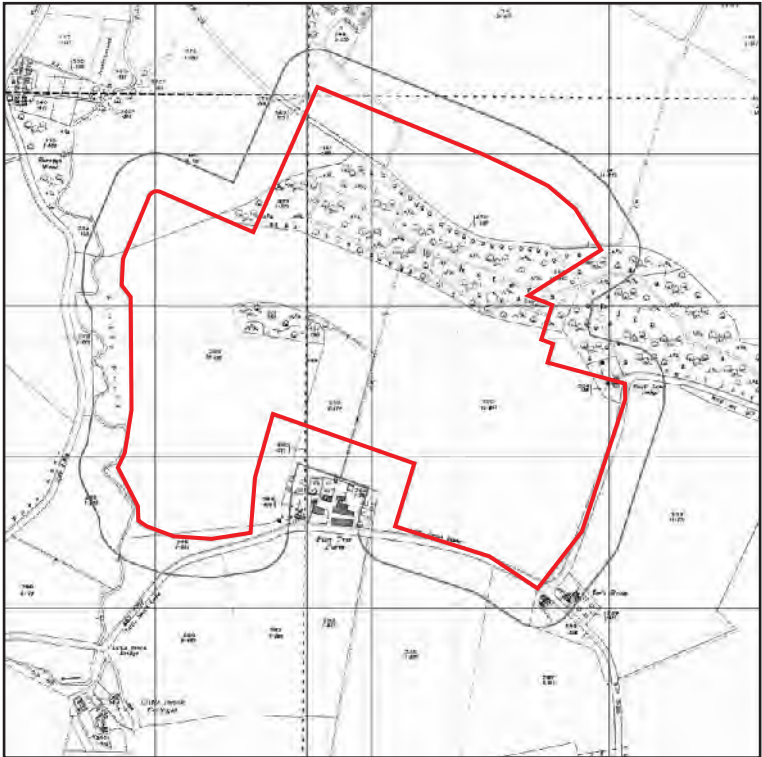
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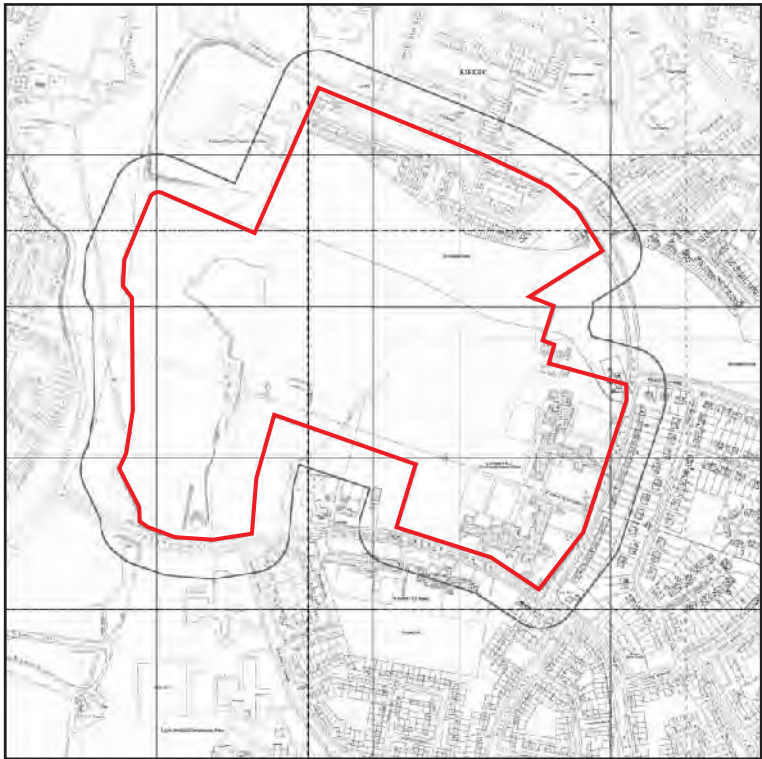
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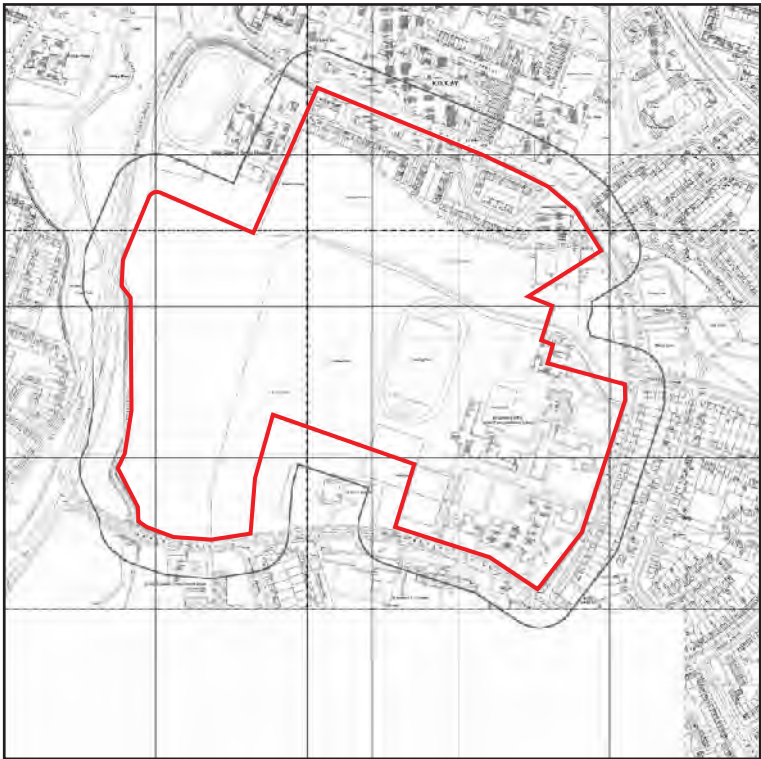
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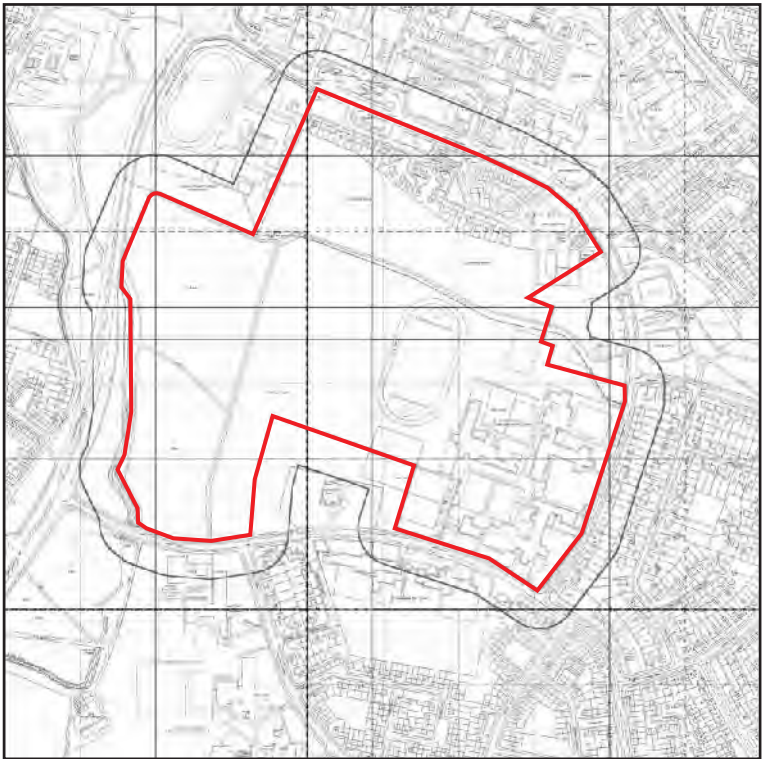
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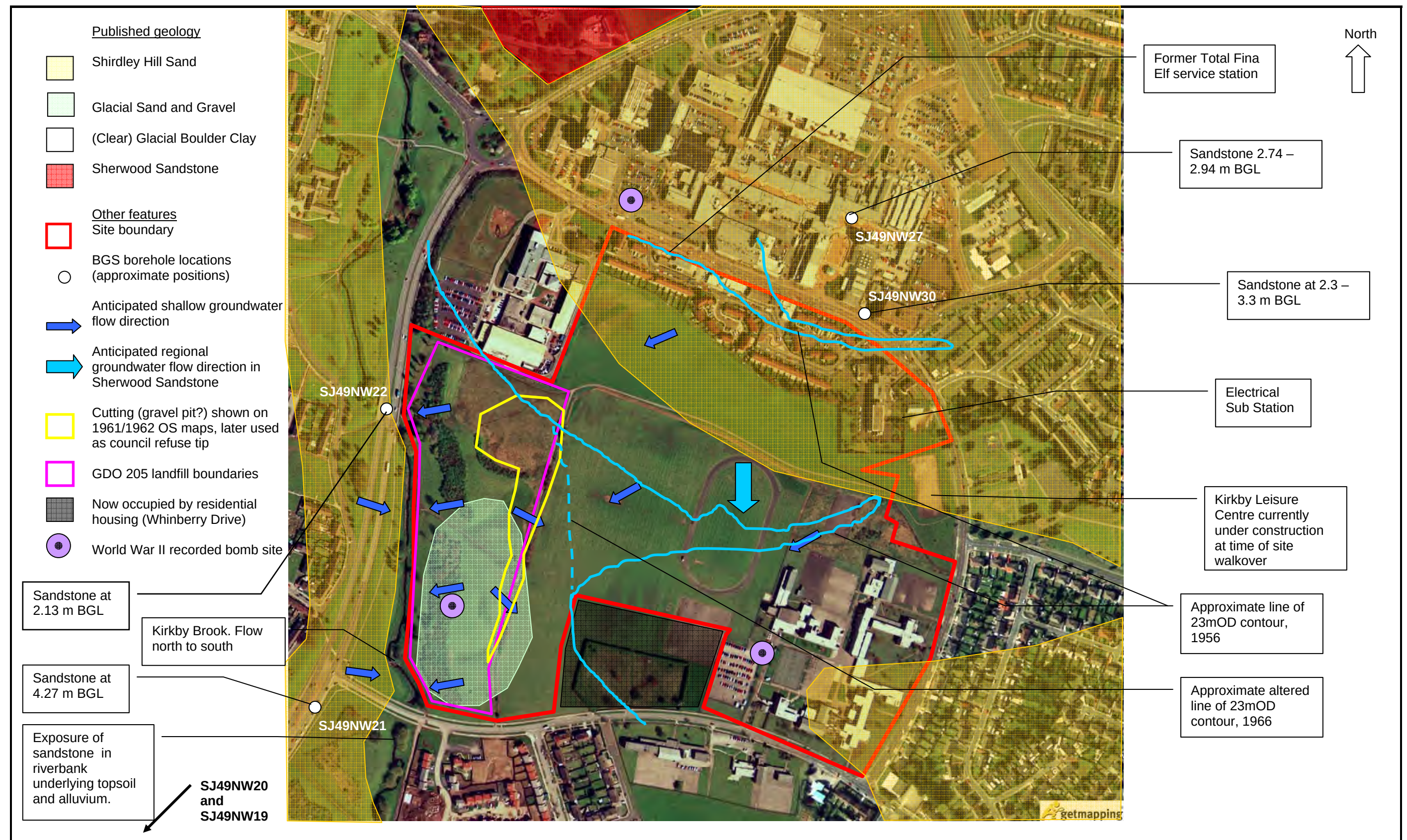
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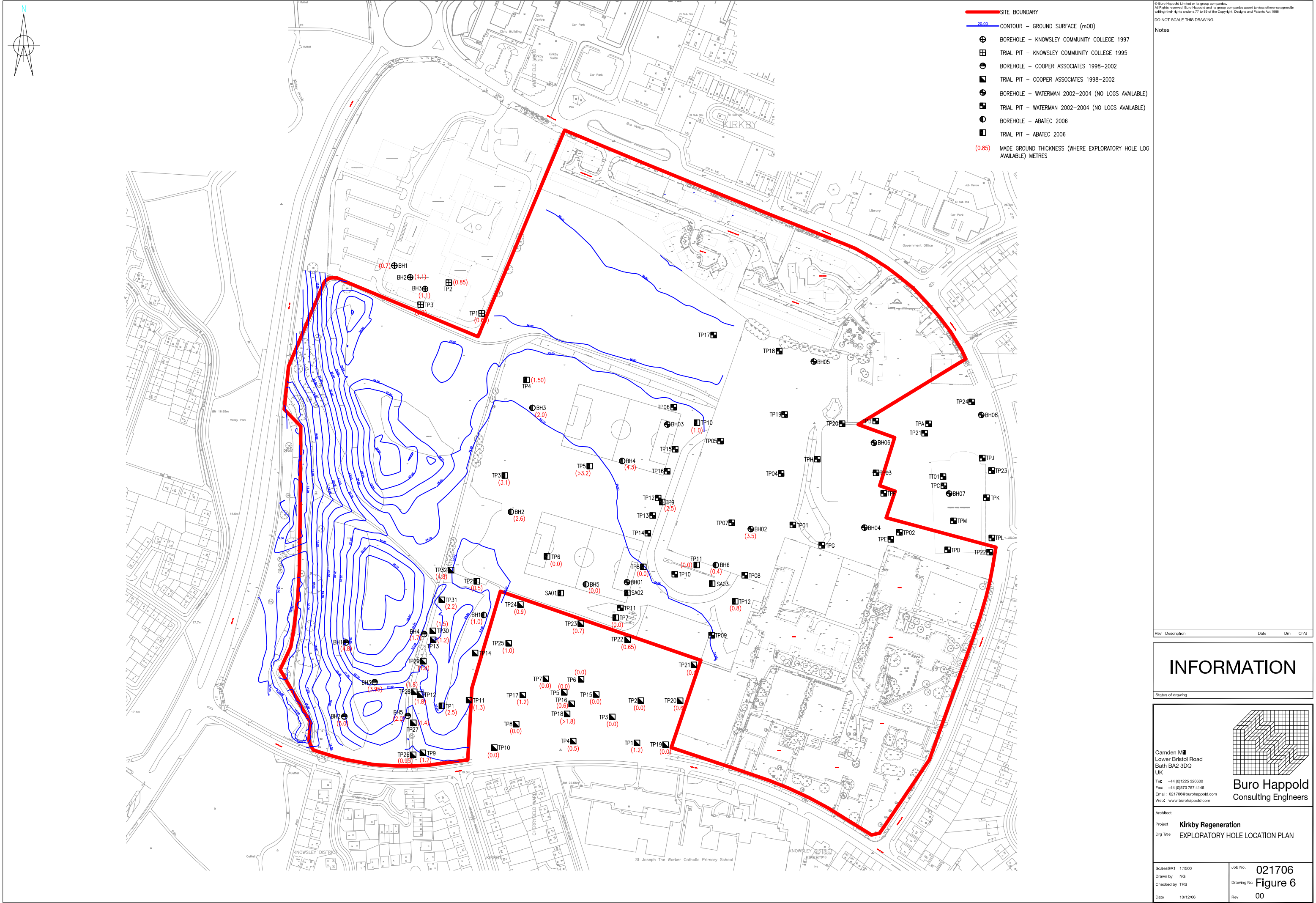
1966 - 1977



1993



Project: Kirkby Redevelopment			
Report title: Ground Engineering Site Appraisal			
Plan title: Anticipated Ground Conditions and Geo-environmental Constraints			
Scale: NTS	Date: October 2006	Fig No: 5	Job No: 021706



- SITE BOUNDARY**
- 20.00 CONTOUR - GROUND SURFACE (mOD)**
- ⊕ BOREHOLE - KNOWSLEY COMMUNITY COLLEGE 1997
 - ⊞ TRIAL PIT - KNOWSLEY COMMUNITY COLLEGE 1995
 - ⊖ BOREHOLE - COOPER ASSOCIATES 1998-2002
 - ⊞ TRIAL PIT - COOPER ASSOCIATES 1998-2002
 - ⊕ BOREHOLE - WATERMAN 2002-2004 (NO LOGS AVAILABLE)
 - ⊞ TRIAL PIT - WATERMAN 2002-2004 (NO LOGS AVAILABLE)
 - ⊖ BOREHOLE - ABATEC 2006
 - ⊞ TRIAL PIT - ABATEC 2006
 - (0.85) MADE GROUND THICKNESS (WHERE EXPLORATORY HOLE LOG AVAILABLE) METRES

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Notes

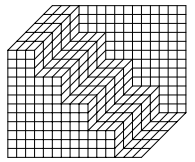
Rev	Description	Date	Dm	Ch'd
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Architect
Project **Kirkby Regeneration**
Orig Title **EXPLORATORY HOLE LOCATION PLAN**

Scales@A1 1:1500
Drawn by NO
Checked by TRS
Date 13/12/06

Job No. **021706**
Drawing No. **Figure 6**
Rev **00**

Notes

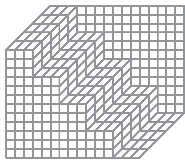
Vertically exaggerated to illustrate ground profile

Contaminant sources, pathways & receptors relate to existing site condition

Rev Description/Date Dm/Chk

INFORMATION

Status of drawing



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Consulting Engineers

Architect

Project **Kirkby Regeneration**

Preliminary Conceptual
Ground Model For Existing
Site Condition

Scales@A3 NOT TO SCALE

Drawn by NG

Checked by TRS

Date 13/12/06

Job No. 021706

Drg No. **FIGURE 7**

Rev 00

Approximate extent of Site boundaries

SW

NE

Shallow groundwater anticipated (1-2m BGL), possibly perched on Boulder Clay

Preferential flow of perched water westwards along infilled tributary valley

Electrical Substation & former service station - potential contamination remaining insitu including PCBs & fuel hydrocarbons

G00 205 Landfill boundaries

Possible original ground surface profile

Former school playing field

Localised landfilling possible

Cherryfield Drive

Kirkby Town Centre

Sandstone exposed in base of channel

A506 road

Kirkby Brook

Direct recharge to Major Aquifer

Regional deep groundwater flow to south

Groundwater possibly confined by Boulder Clay

Former gravel pit (depth/extent not known) and subsequently a Council refuse tip

Water supply pipe

Sandstone bedrock anticipated at 2 - 6 mBGL, profile uncertain

Bedrock dips 5° to NW

SHERWOOD SANDSTONE (MAJOR AQUIFER)

Key to Ground Conditions

- Topsoil/Made Ground - potentially containing contaminants related to its source
- Landfill material - potentially containing contaminants related to its source (inert & domestic waste anticipated)
- Alluvium
- Shirdley Hill Sand
- Glacial Sand & Gravel (possibly extracted prior to landfilling)
- Glacial Boulder Clay
- Sherwood Sandstone (weathered to sand in upper 1-2m)

- Groundwater flow
- Groundwater level
- Localised perched water in Made Ground & Shirdley Sandstone

Potential Sources

- S1** Landfill materials - various contaminants, source of gas and contaminant vapours
- S2** Pockets of landfill materials - various contaminants, source of gas and contaminant vapours
- S3** Made Ground - potential contaminants
- S4** Contaminants in solution/landfill leachate

Potential Contaminant Pathways

- P1** Soil & soil dust ingestion & skin contact (soft landscaped areas)
- P2** Gas vapour inhalation
- P3** Ingestion via contaminated water supplies (permeation of supply pipes)
- P4** Leaching of contaminants into shallow groundwater
- P5** Leaching/transport of contaminants into Major Aquifer
- P6** Leaching/transport of contaminants into Kirkby Brook
- P7** Plant uptake & phytotoxic effects
- P8** Ground gas/vapour accumulation in existing structures
- P9** Transport of offsite contaminants in groundwater to site from northeast
- P10** Off site migration of ground gas/vapours

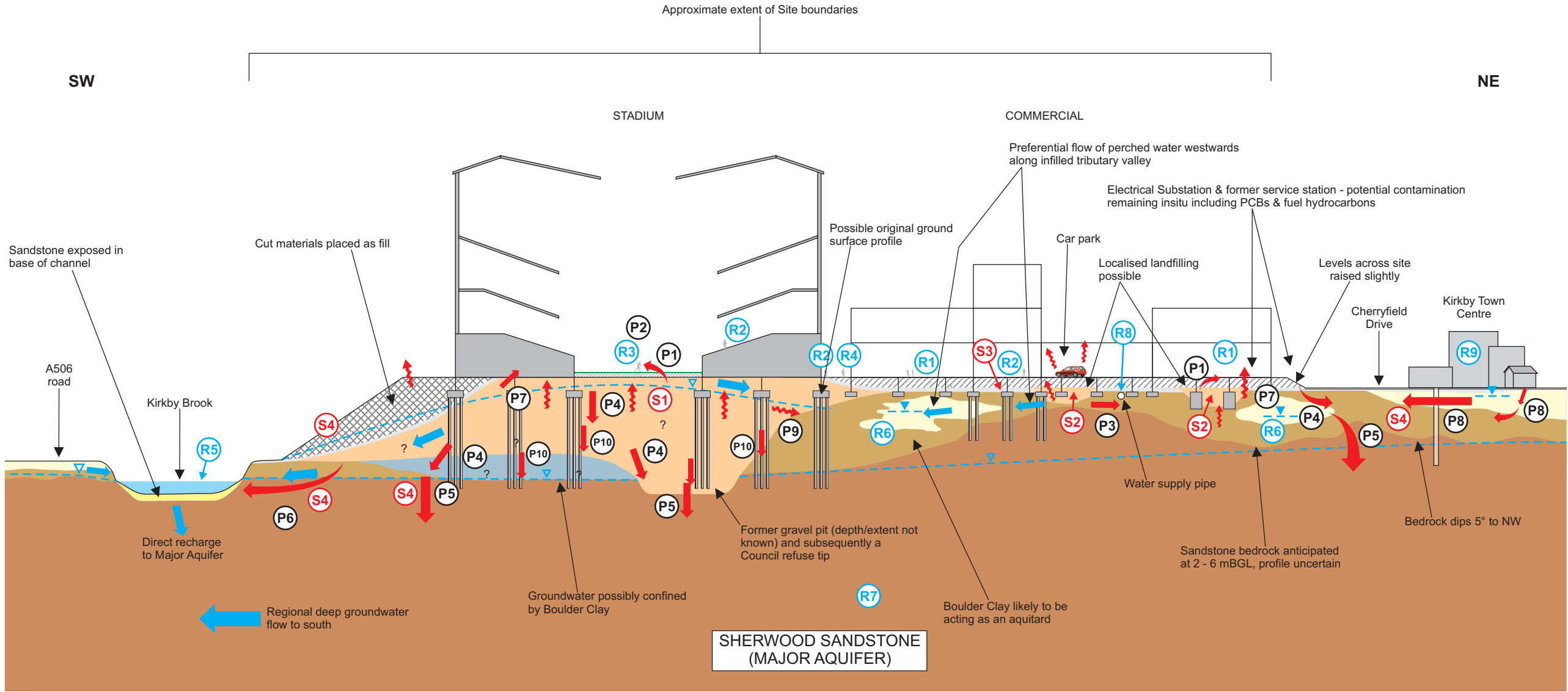
Possible Receptors

- R1** Current site users
- R2** Kirkby Brook - controlled surface water/ecology
- R3** Perched water in Made Ground/Shirdley Hill Sand - unclassified aquifer (?)
- R4** Groundwater in Sherwood Sandstone Major Aquifer
- R5** Water supplies - pipe materials (and drinking water ?)
- R6** Structures on site
- R7** Plants/trees
- R8** Off site occupants of residential/commercial properties

Notes

Vertically exaggerated to illustrate ground profile

Contaminant sources, pathways & receptors relate to existing site condition



Rev Description/Date Drn/Chk

INFORMATION

Status of drawing

Key to Ground Conditions

- Topsoil/Made Ground - potentially containing contaminants related to its source
- Landfill material - potentially containing contaminants related to its source (inert & domestic waste anticipated)
- Alluvium
- Shirdley Hill Sand
- Glacial Sand & Gravel (possibly extracted prior to landfilling)
- Glacial Boulder Clay
- Sherwood Sandstone (weathered to sand in upper 1-2m)

- Groundwater flow
- Groundwater level
- Localised perched water in Made Ground & Shirdley Sandstone

Potential Sources

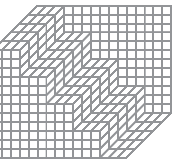
- S1 Landfill materials - various contaminants, source of gas and contaminant vapours
- S2 Pockets of landfill materials - various contaminants, source of gas and contaminant vapours
- S3 Made Ground - potential contaminants
- S4 Contaminants in solution/landfill leachate

Potential Contaminant Pathways

- P1 Soil & soil dust ingestion & skin contact (soft landscaped areas)
- P2 Gas vapour inhalation
- P3 Ingestion via contaminated water supplies (permeation of supply pipes)
- P4 Leaching of contaminants into shallow groundwater
- P5 Leaching/transport of contaminants into Major Aquifer
- P6 Leaching/transport of contaminants into Kirkby Brook
- P7 Ground gas/vapour accumulation in existing structures
- P8 Transport of offsite contaminants in groundwater to site from northeast
- P9 Offsite migration of ground gasses/vapours
- P10 Potential migration pathway for contamination along piles

Possible Receptors

- R1 Staff in commercial development
- R2 Current site users
- R3 Players/staff at stadium
- R4 Maintenance staff
- R5 Kirkby Brook - controlled surface water/ecology
- R6 Perched water in Made Ground/Shirdley Hill Sand - unclassified aquifer (?)
- R7 Groundwater in Sherwood Sandstone Major Aquifer
- R8 Water supplies - pipe materials (and drinking water ?)
- R9 Off site occupants of residential/comercial properties



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Buro Happold
Consulting Engineers

Architect

Project Kirkby Regeneration

Preliminary Conceptual
Ground Model

Post Construction

Scales@A3 NOT TO SCALE

Drawn by NG

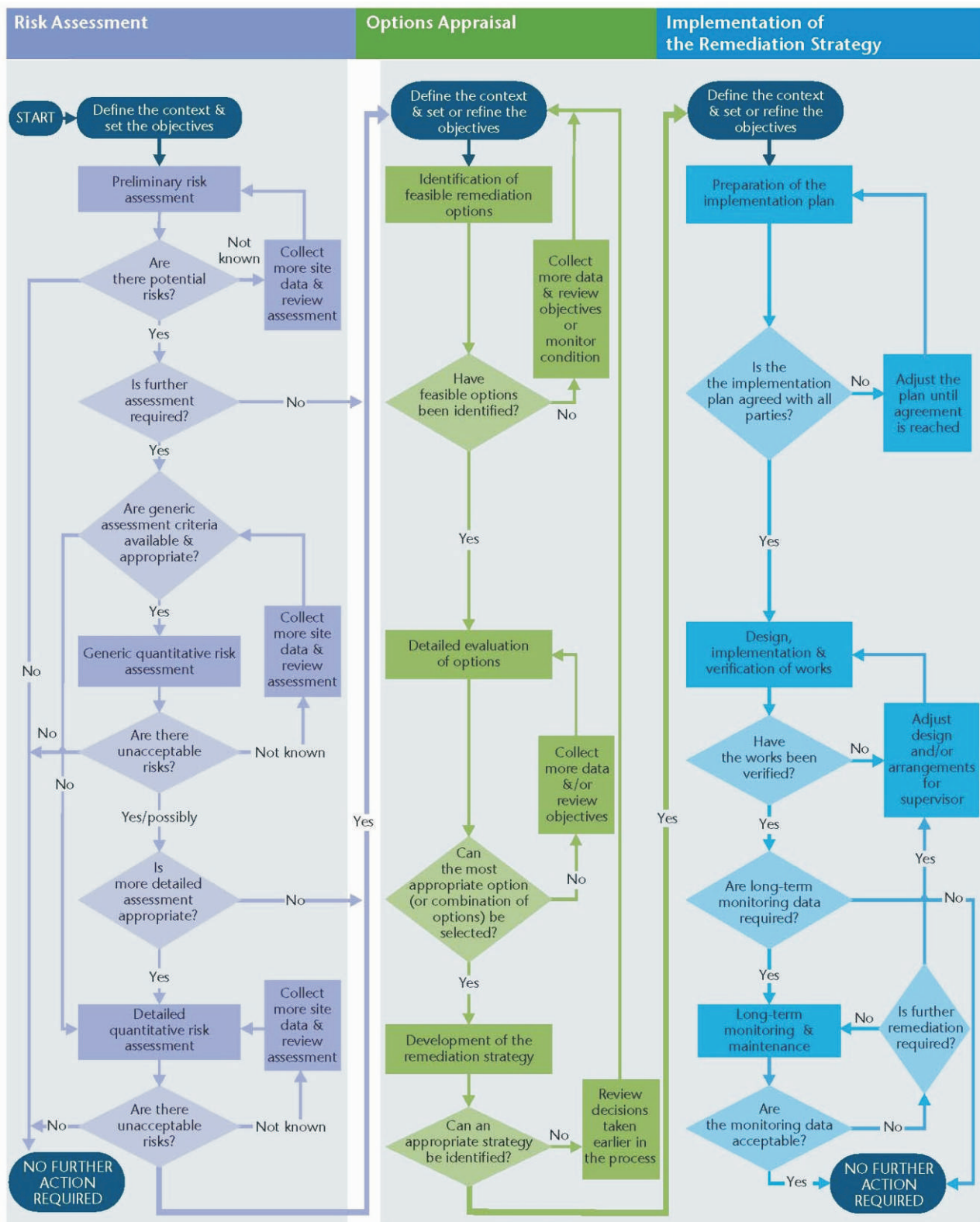
Checked by TRS

Date 13/12/06

Job No. 021706

Drng No. FIGURE 8

Rev 00



Project: Kirkby Regeneration

MANAGING SITE CONTAMINATION

Scale: NTS

Drawn: NG

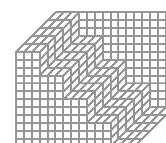
Chk: TRS

Date: 13/12/06

Job No: 021706

Drawing No: FIGURE 9

Rev: 00



Buro Happold
Consulting Engineers

Appendix A – Information Source Summary

Information Sources	Information Obtained?		Comments
	YES	NO	
Environment Agency (e.g. for information on landfill sites, water abstractions, pollution incidents)	✓		Envirocheck Report Initial consultation
The Local Authority (e.g. for information on environmental health, planning and previous ground investigations)	✓		Knowsley Metropolitan Borough Council (M.B.C.) Environmental Health
Archaeological records		✓	
Local history sources (e.g. libraries, museums, societies)	✓		Internet search. Kirkby library
Unexploded Ordnance	✓		Internet search Historical maps. Kirkby library
Coal Authority (coal mining records)		✓	Not considered necessary after assessment of geology.
British Geological Survey (maps and information about the geology of the area)	✓		BGS Map Sheet 84 Wigan (Solid 1:50,000, Solid and Drift 1:63,330) BGS Regional Geology Guide 'Pennines and adjacent areas'
Historical borehole information	✓		BGS Geoscience Database

Hydrogeology (major and minor aquifers, groundwater vulnerability,)	✓		Envirocheck Report.
Hydrology (water quality, watercourses, flooding)	✓		Envirocheck Report
Ordnance Survey (current & previous editions of plans and aerial photographs)	✓		Ordnance Survey website. Historical maps contained in Envirocheck Report. Promap
Newspaper reports		✓	
Aerial photographs	✓		Get Mapping website. English Heritage National Monuments Record
Waste, Hazardous Substances	✓		Envirocheck Report. Knowsley Metropolitan Borough Council
Service/Utility Companies	✓		Relevant utility companies
Existing desk top studies/site investigations		✓	Various reports obtained from Kirkby M.B.C Environmental Health

Appendix B – Site photographs



Photo 1: View north showing access track onto site from Bewley Drive



Photo 2: View south from Bewley Drive showing Kirkby Brook



Photo 3: View southwest showing outcrop of sandstone in Kirkby Brook



Photo 4: View south along path adjacent to Kirkby Brook



Photo 5: View north showing raised topography of completed landfill to right



Photo 6: View east showing path over completed landfill



Photo 7: View southeast showing Kirkby Brook emerging from under A506 road



Photo 8: View north of Knowsley Community College



Photo 9: View north of Knowsley Community College



Photo 10: View east showing grassland



Photo 11: View south showing open grassland and trees.



Photo 12: View east towards All Saints Catholic High School.



Photo 13: View south along access track leading to Bewley Drive



Photo 14: View east showing recently placed topsoil adjacent to new housing development



Photo 15: View southwest showing elevated topography of former landfilled area



Photo 16: View northeast along fence towards houses on Eagles Court



Photo 17: View southwest across former school playing field, with former landfill in distance



Photo 18: View east through railings showing construction site



Photo 19: View north towards fenced off construction site



Photo 20: View west of site entrance to construction site



Photo 21: Close up of sign shown in Photo 20



Photo 22: View southwest of Golden Eagle hotel from Cherryfield Drive



Photo 23: View southwest along Eagles Court from Cherryfield Drive



Photo 24: View northwest along Cherryfield Crescent

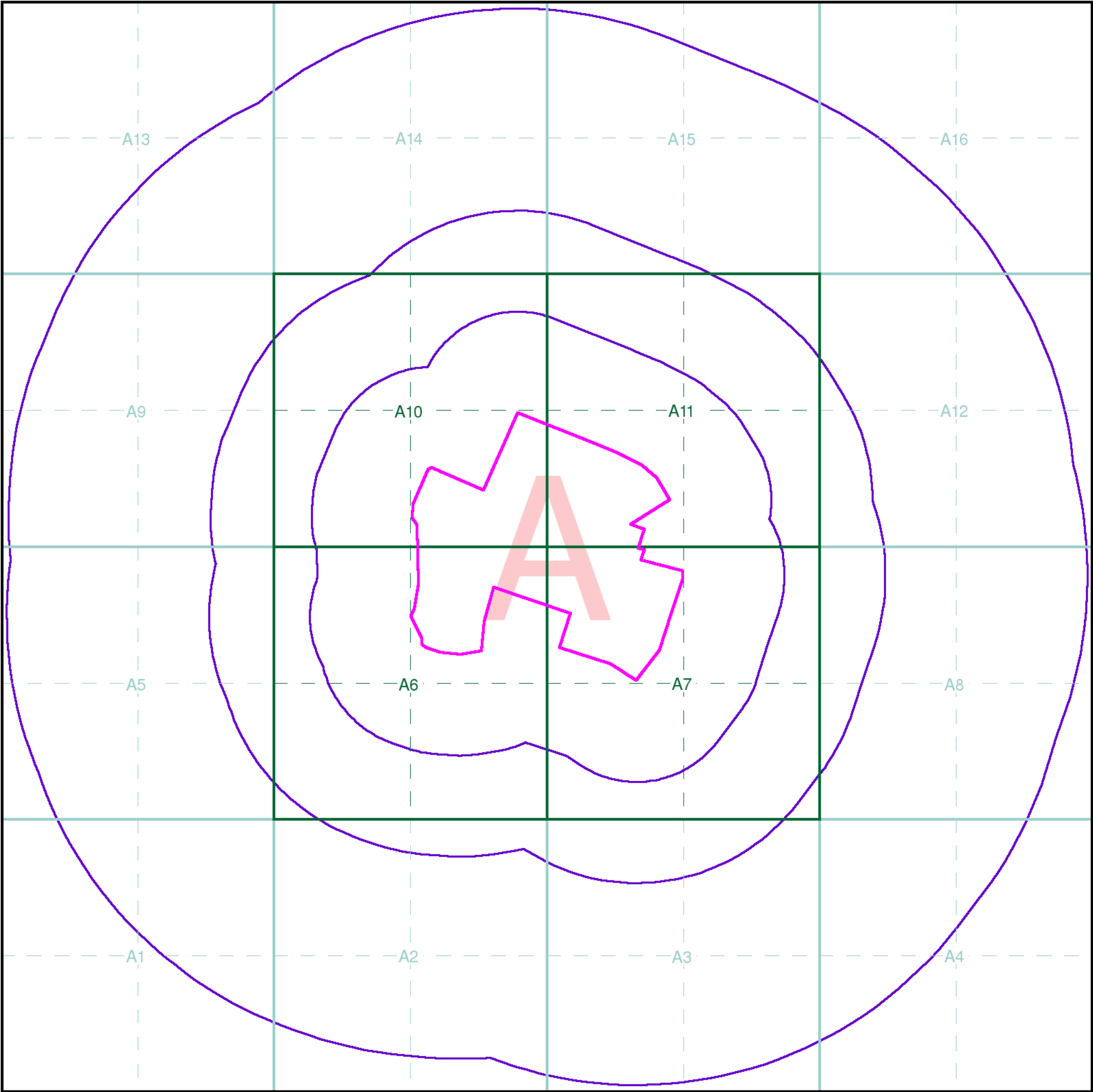


Photo 25: View southwest of derelict garage building off Cherryfield Drive



Photo 26: View southeast along Cherryfield Drive

Appendix C – Historic OS maps



Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details:

Mr P Hazlehurst, Buro Happold, 17 Newman Street, London, W1P 3HD

Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398350
Site Area (Ha): 27.67
Search Buffer (m): 1000

Site Details

Site at 341090, 398360

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 - b. Subject always to these Terms You may, without further charge, make the Services available to;
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 - ii. any person who purchases the whole of the Property Site,
 - iii. any person who provides funding secured on the whole of the Property Site,
 - iv. any person for whom You act in a professional or commercial capacity,
 - v. any person who acts for You in a professional or commercial capacity; and
 - vi. prospective buyers of the Property Site as part of an Information Pack but for the avoidance of doubt, Landmark shall have no liability to such prospective buyer unless the prospective buyer subsequently purchases the Property Site, and the prospective (or actual) buyer shall not be entitled to make the Service available to any other third party.Accordingly Landmark shall have the same duties and obligations to those persons in respect of the Services as it has to You.
 - c. Each of those persons referred to in clause 3.b. shall have the benefit and the burden of Your rights and obligations under these Terms. The limitations of Landmark's liability as set out in clause 6 shall apply to all users of the Service in question in aggregate and Landmark shall not be liable to any other person.
 - d. All parties given access to the Services agree that they will treat as strictly private and confidential the Services and all information which they obtain from the Services and shall restrict any disclosure to employees or professional advisors to enable the relevant party to conduct its internal business. The requirement in this clause to treat the Services as confidential shall include a requirement to maintain adequate security measures to safeguard the Services from unauthorised access, use or copying.
 - e. Each recipient of the Services agrees (and agrees it will cause its employees, agents or contractors who may from time to time have access to the Services to agree) it will not, except as permitted herein or by separate agreement with Landmark:-
 - i. effect or attempt to effect any modification, merger or change to the Service, nor permit any other person to do so; or
 - ii. copy, use, market, re-sell, distribute, merge, alter, add to or carry on any redistribution, reproduction, translation, publication, reduction to any electronic medium or machine readable form or commercially exploit or in any other way deal with or utilise or (except as expressly permitted by applicable law) reverse engineer, decompile or disassemble the Services, Content or Website; or
 - iii. remove, alter or in any way change any trademark or proprietary marking in any element of the Services and You shall acknowledge the ownership of the Content, where such Content is incorporated or used into Your own documents, reports, systems or services whether or not these are supplied to any third party.
 - iv. create any product which is derived directly or indirectly from the data contained in the Services
 - f. The mapping contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services or as specifically provided by these Terms.
 - g. You are permitted to make five copies of any Report, but are not authorised to re-sell the Report, any part thereof or any copy thereof unless you are an Authorised Reseller. Further copies may not be made in whole or in part without the prior written permission of Landmark who shall be entitled to make a charge for each additional copy.
4. Charges
- a. VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.
 - b. An individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such invoices. Landmark reserve the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.
 - c. We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.
 - d. Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services

shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

- a. Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:-
 - i. You fail to make any payment due in accordance with clause 4;
 - ii. You repeatedly breach or commit or cause to be committed any material breach of these Terms; or
 - iii. You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so; additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.
 - b. If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.
 - c. Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.
6. Liability
- a. We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.
 - b. Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or wilful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.
 - c. As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or wilful default and neither Landmark nor any person providing information contained in any Services shall in any other circumstances be liable for any inaccuracies, faults or omissions in the Services nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.
 - d. Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark.
 - e. In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the complaint is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.
 - f. Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.
 - g. You acknowledge that:-
 - i. You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts of omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Service) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us;
 - ii. Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;
 - iii. no physical inspection of the Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude actual fitness or unfitness of a Property Site for any particular purpose nor should it be relied upon for determining saleability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.
 - iv. Landmark shall not be responsible for error or corruption in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding,

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- v. Landmark will not be held liable in any way if a Report on residential property is used for commercial property or more than the one residential property for which it was ordered.
 - vi. the Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content;
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 - j. In any event no person may rely on a Service more than 12 months after its original date.
 - k. If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.
 - l. Time shall not be of the essence with respect to the provision of the Services.
 - m. Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.
 - n. Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently, in which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the remainder of the Report and should not take or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6i above.
7. Contribution
- a. Save where expressly provided, this clause 7 shall apply solely to Envirosearch Residential Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.
 - b. Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution")
 - c. In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out

under the Notice subject to the provisions of this clause 7 and on the following terms:

- i. the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report;
- ii. the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
- iii. the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
- iv. the Contribution will not be paid in respect of any of the following:
 - Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
 - Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures. Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.
 - Intentional non-compliance arising from the intentional disregard of or knowing wilful or deliberate non-compliance by any owner or occupier of the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.
 - Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.
 - Any condition which is caused by acts of War or an Act of Terrorism.
 - Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.
 - Any fines liquidated damages punitive or exemplary damages.
 - Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.
 - Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.
 - Any losses incurred following a material change in use of, alteration or development of the Property Site.
- d. The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £50,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.
- e. Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.
- f. Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.
- g. In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 2 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or complying with any other reasonable request by Landmark, Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.
- h. In the event that the First Purchaser or First Purchaser's Lender receives any communication from a statutory authority to the effect that there is an intent to serve a notice received under PartII(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 e and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7e.
- i. Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions

without further notice.

8. Events Beyond Our Control

- a. You acknowledge that Landmark shall not be liable for any delay, interruption or failure in the provision of the Services which are caused or contributed to by any circumstance which is outside our reasonable control including but not limited to, lack of power, telecommunications failure or overload, computer malfunction, inaccurate processing of data, or delays in receiving, loading or checking data, corruption of data whilst in the course of conversion, geo-coding, processing by computer in the course of electronic communication, or printing.

9. Severability

- a. If any provision of these Terms are found by either a court or other competent authority to be void, invalid, illegal or unenforceable, that provision shall be deemed to be deleted from these Terms and never to have formed part of these Terms and the remaining provisions shall continue in full force and effect.

10. Governing Law

- a. These terms shall be governed by and construed in accordance with English law and each party agrees irrevocably submit to the exclusive jurisdiction of the English courts If any dispute arises out of or in connection with this agreement (a "Dispute") the parties undertake that, prior to the commencement of Court proceedings, they will seek to have the Dispute resolved amicably by use of an alternative dispute resolution procedure acceptable to both parties with the assistance of the Centre for Dispute Resolution (CEDR) if required, by written notice initiating that procedure. If the Dispute has not been resolved to the satisfaction of either party within 60 days of initiation of the procedure or if either party fails or refuses to participate in or withdraws from participating in the procedure then either party may refer the Dispute to the Court.

11. General

- a. Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.
- b. Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.
- c. No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.
- d. Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and all notices from Landmark to You will be displayed on our Websites from time to time.
- e. A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.
- f. Landmark's Privacy Policy as displayed on the Website governs the use made of any information You supply to Landmark.

Historical Mapping Legends

Ordnance Survey County Series and
Ordnance Survey Plan 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

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

Coppice

Bracken

Heath

Rough Grassland

Marsh

Reeds

Saltings

Building

Glasshouse

Sloping Masonry

Pylon

Electricity Transmission Line

Pole

Cutting

Embankment

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
Shown only when not coincident with other boundaries

Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS

Ch

CH

F E Sta

FB

Fn

GP

MP

MS

Boundary Post or Stone

Church

Club House

Fire Engine Station

Foot Bridge

Fountain

Guide Post

Mile Post

Mile Stone

Pol Sta

PO

PC

PH

SB

Spr

TCB

TCP

W

Police Station

Post Office

Public Convenience

Public House

Signal Box

Spring

Telephone Call Box

Telephone Call Post

Well

1:10,000 Raster Mapping

Gravel Pit

Rock

Boulders

Shingle

Sand

Slopes

General detail

Overhead detail

Multi-track railway

County boundary (England only)

District, Unitary, Metropolitan, London Borough boundary

Area of wooded vegetation

Non-coniferous trees (scattered)

Coniferous trees (scattered)

Orchard

Rough Grassland

Scrub

Water feature

MHW(S) Mean high water (springs)

Telephone line (where shown)

Bench mark (where shown)

Point feature (e.g. Guide Post or Mile Stone)

Site of (antiquity)

General Building

Refuse tip or slag heap

Rock (scattered)

Boulders (scattered)

Mud

Sand Pit

Top of cliff

Underground detail

Narrow gauge railway

Single track railway

Civil, parish or community boundary

Constituency boundary

Non-coniferous trees

Coniferous trees

Positioned tree

Coppice or Osiers

Heath

Marsh, Salt Marsh or Reeds

Flow arrows

MLW(S) Mean low water (springs)

Electricity transmission line (with poles)

Triangulation station

Pylon, flare stack or lighting tower

Glasshouse

Important Building

Envirocheck®

A Landmark service

Ordnance Survey mapping included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:10,560	1850	2
Lancashire And Furness	1:10,560	1894	3
Lancashire And Furness	1:10,560	1909	4
Lancashire And Furness	1:10,560	1928	5
Ordnance Survey Plan	1:10,560	1956	6
Ordnance Survey Plan	1:10,560	1966 - 1967	7
Ordnance Survey Plan	1:10,000	1974 - 1978	8
Ordnance Survey Plan	1:10,000	1988 - 1990	9
10K Raster Mapping	1:10,000	1999	10
10K Raster Mapping	1:10,000	2004	11

Historical Map - Slice A

Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 1000

Site Details

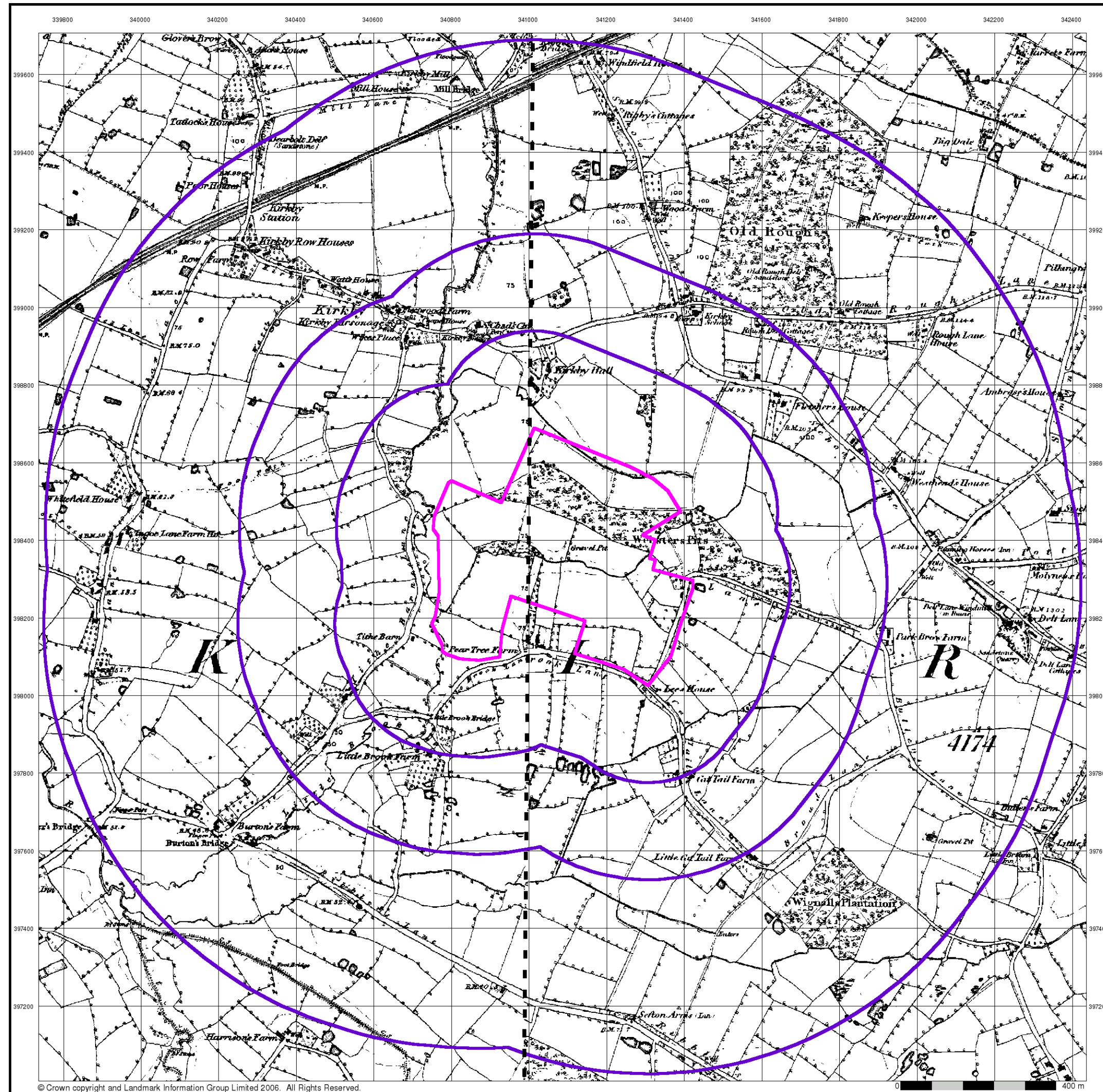
Site at 341090, 398360

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A Landmark Information Group Service v17.0 27-Oct-2006 Page 1 of 11



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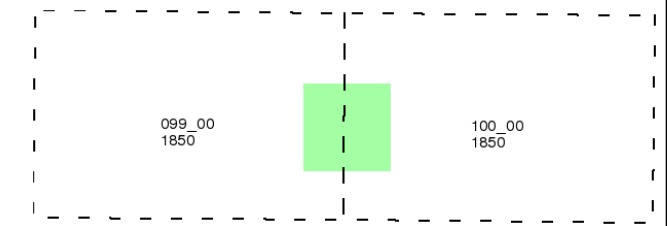
Lancashire And Furness

Published 1850

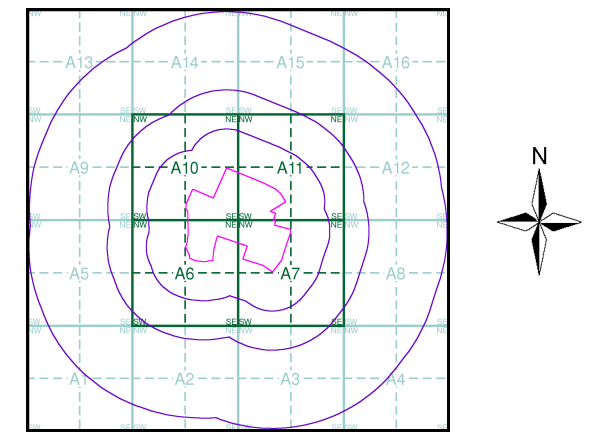
Source map scale - 1:10,560

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

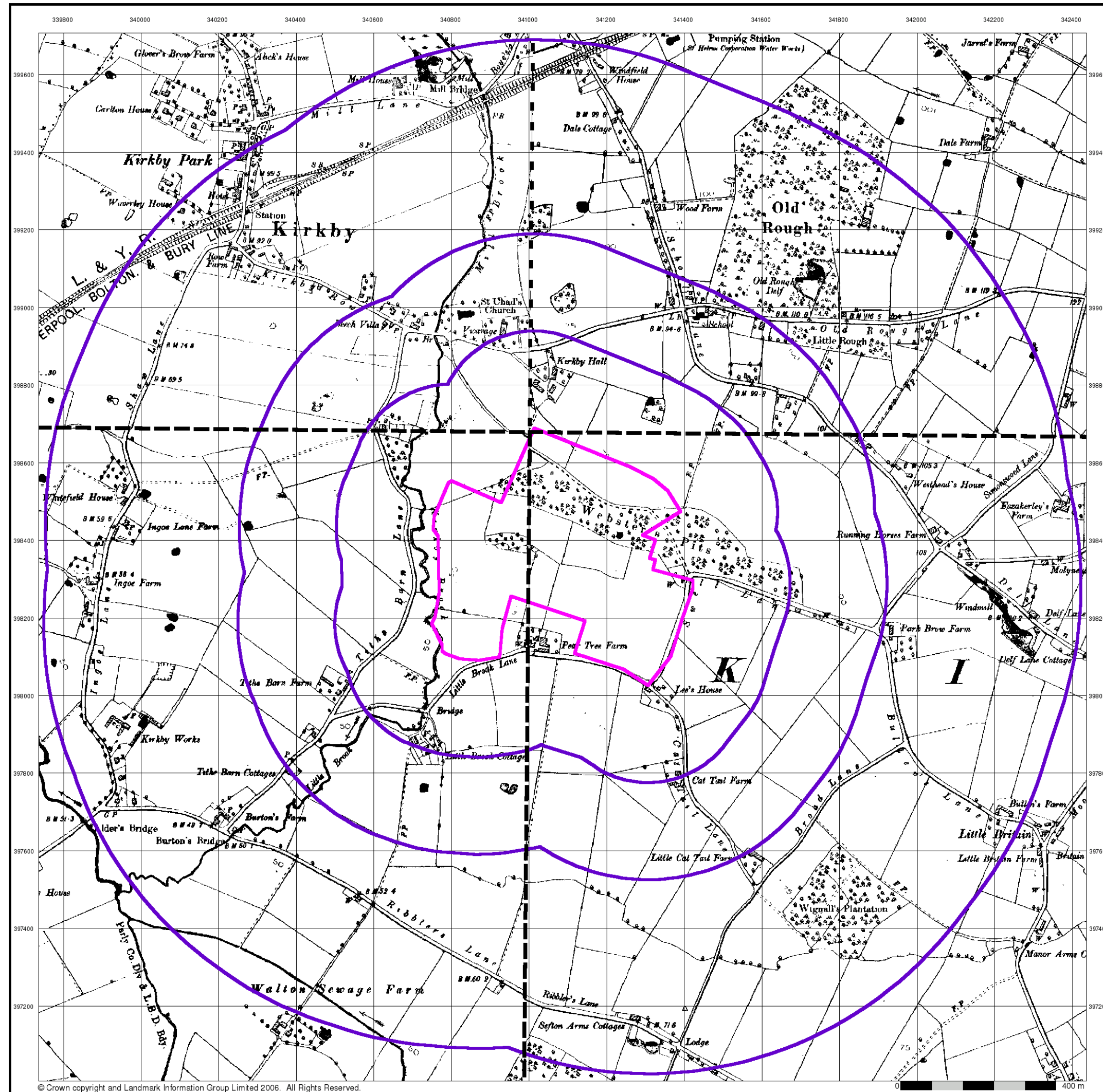


Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 1000

Site Details

Site at 341090, 398360



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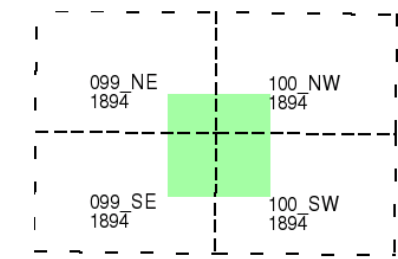
Lancashire And Furness

Published 1894

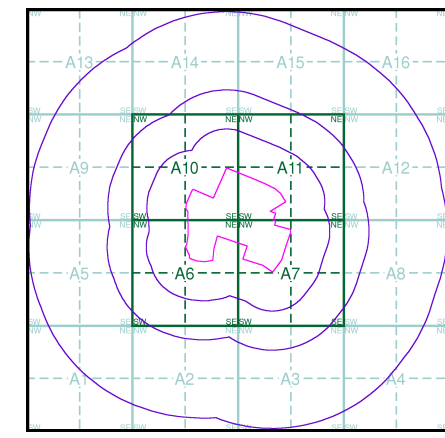
Source map scale - 1:10,560

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

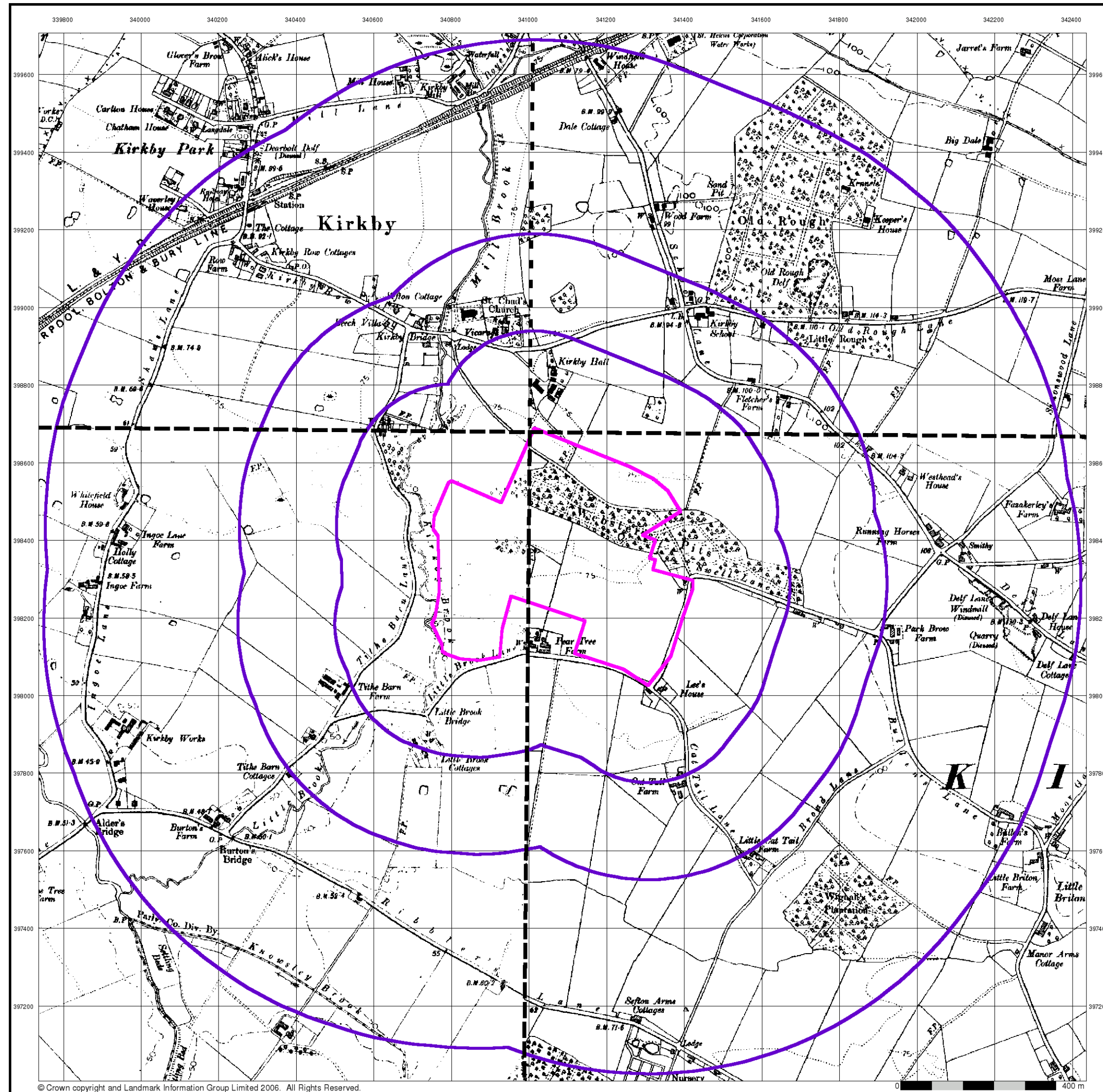
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Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 1000

Site Details

Site at 341090, 398360



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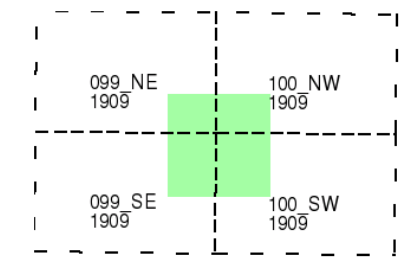
Lancashire And Furness

Published 1909

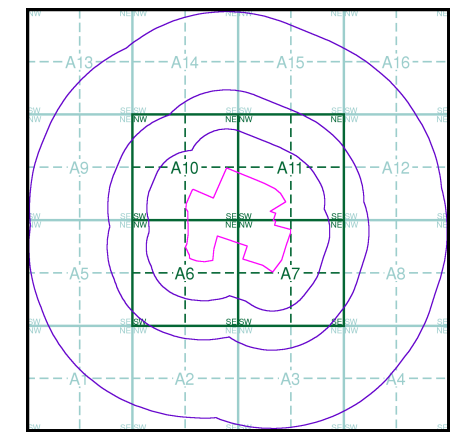
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

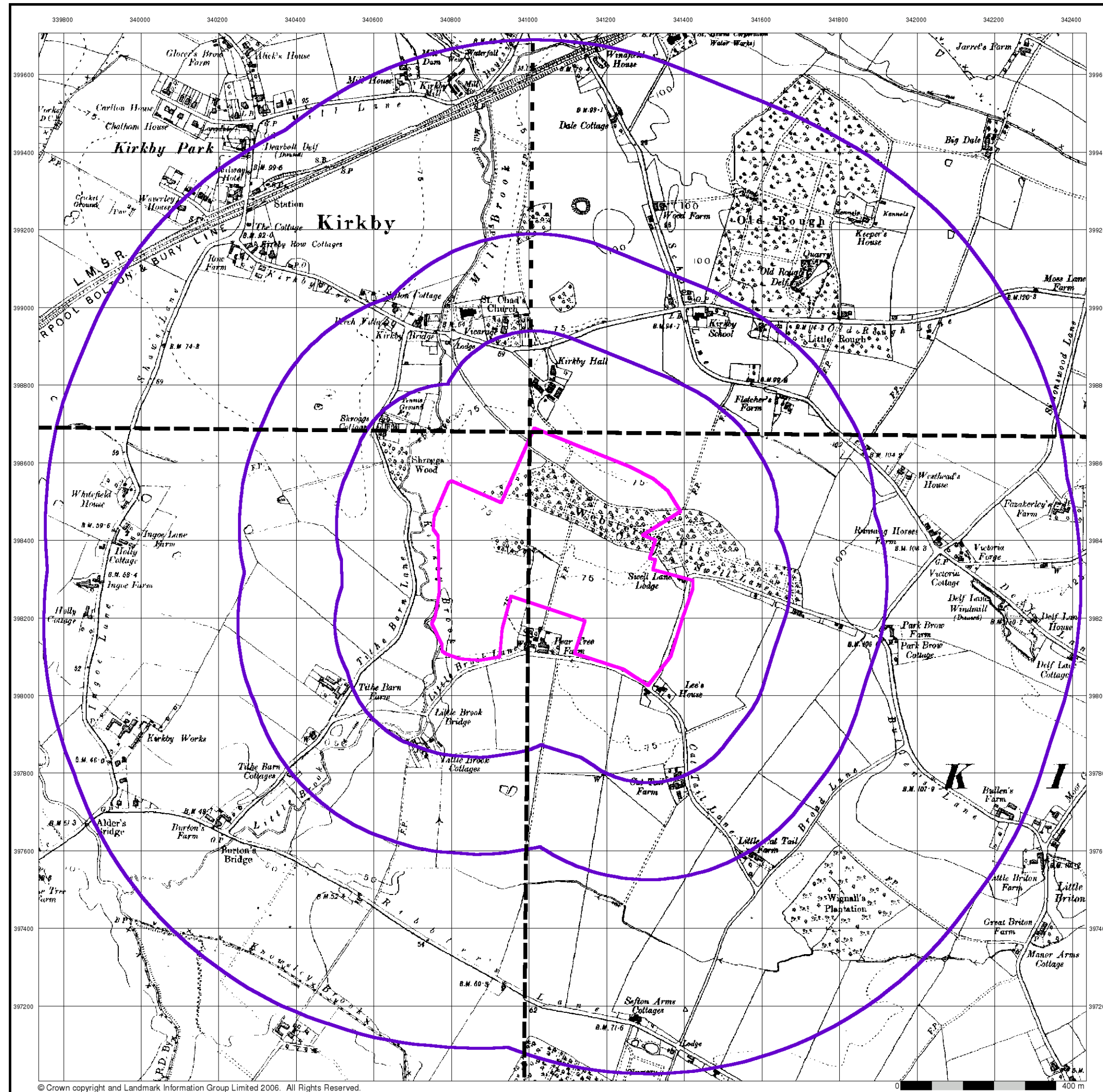
Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
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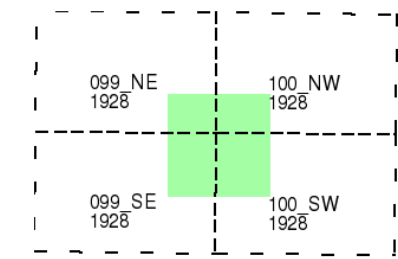
Lancashire And Furness

Published 1928

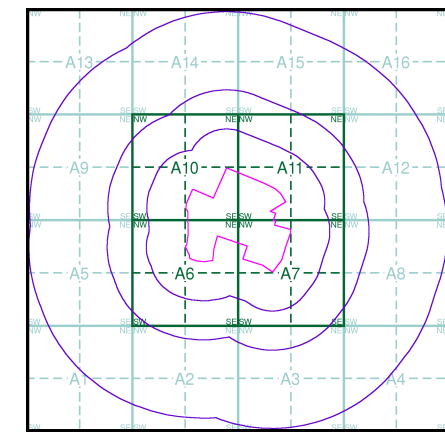
Source map scale - 1:10,560

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

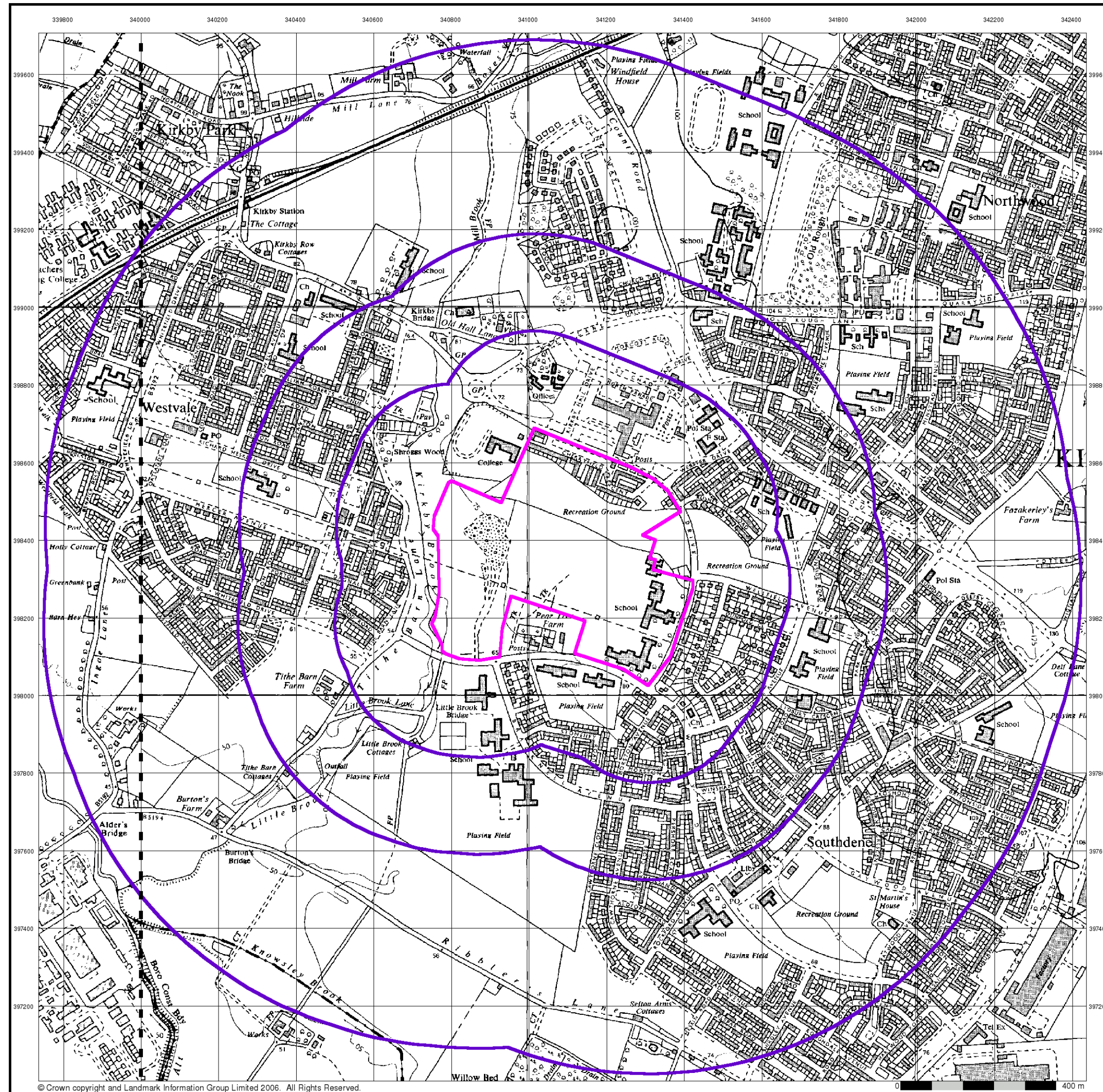
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Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
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Site Details

Site at 341090, 398360



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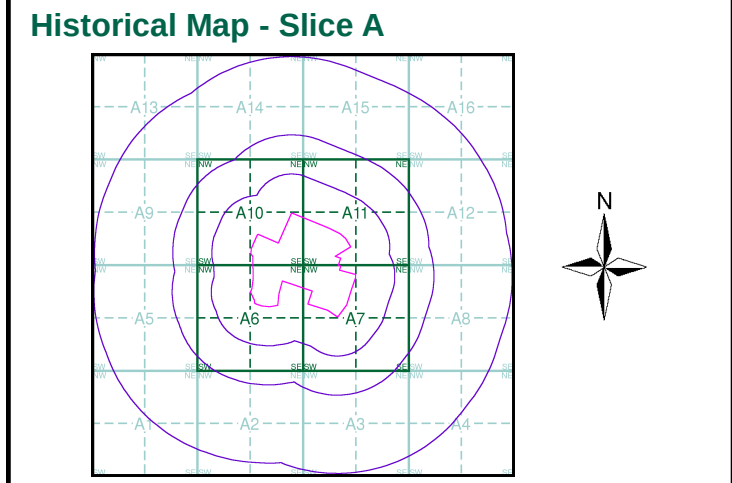
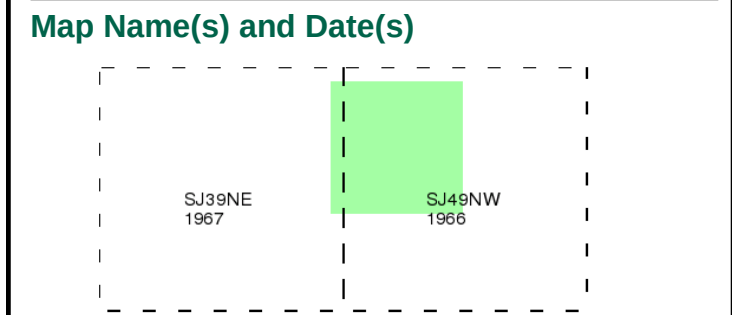
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Ordnance Survey Plan

Published 1966 - 1967

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.

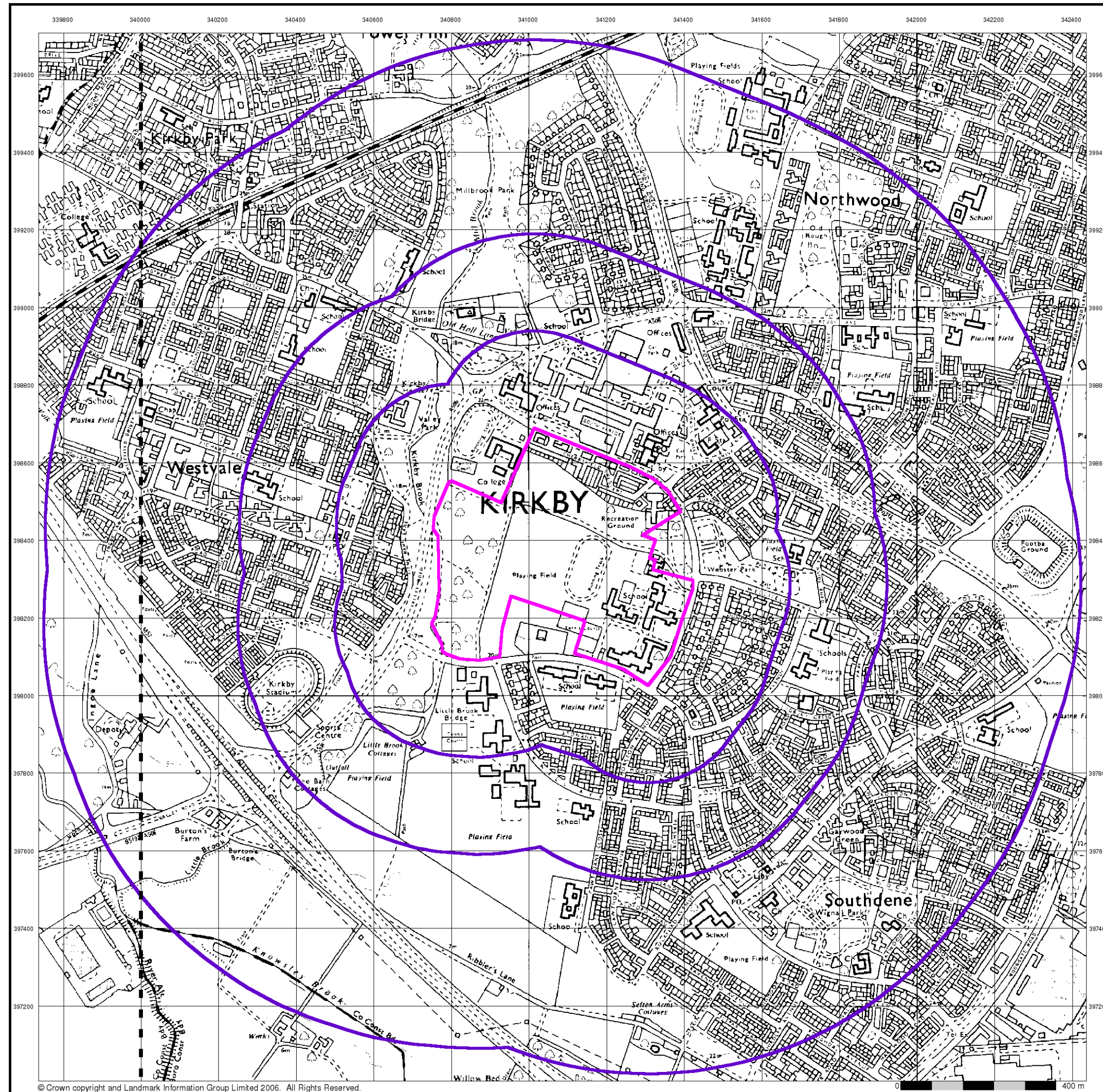


Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	1000

Site Details

Site at 341090, 398360

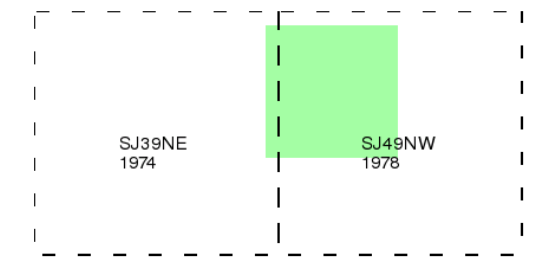


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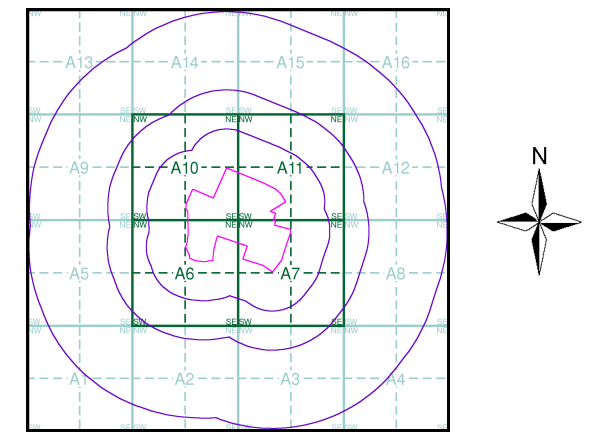
Ordnance Survey Plan
Published 1974 - 1978
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

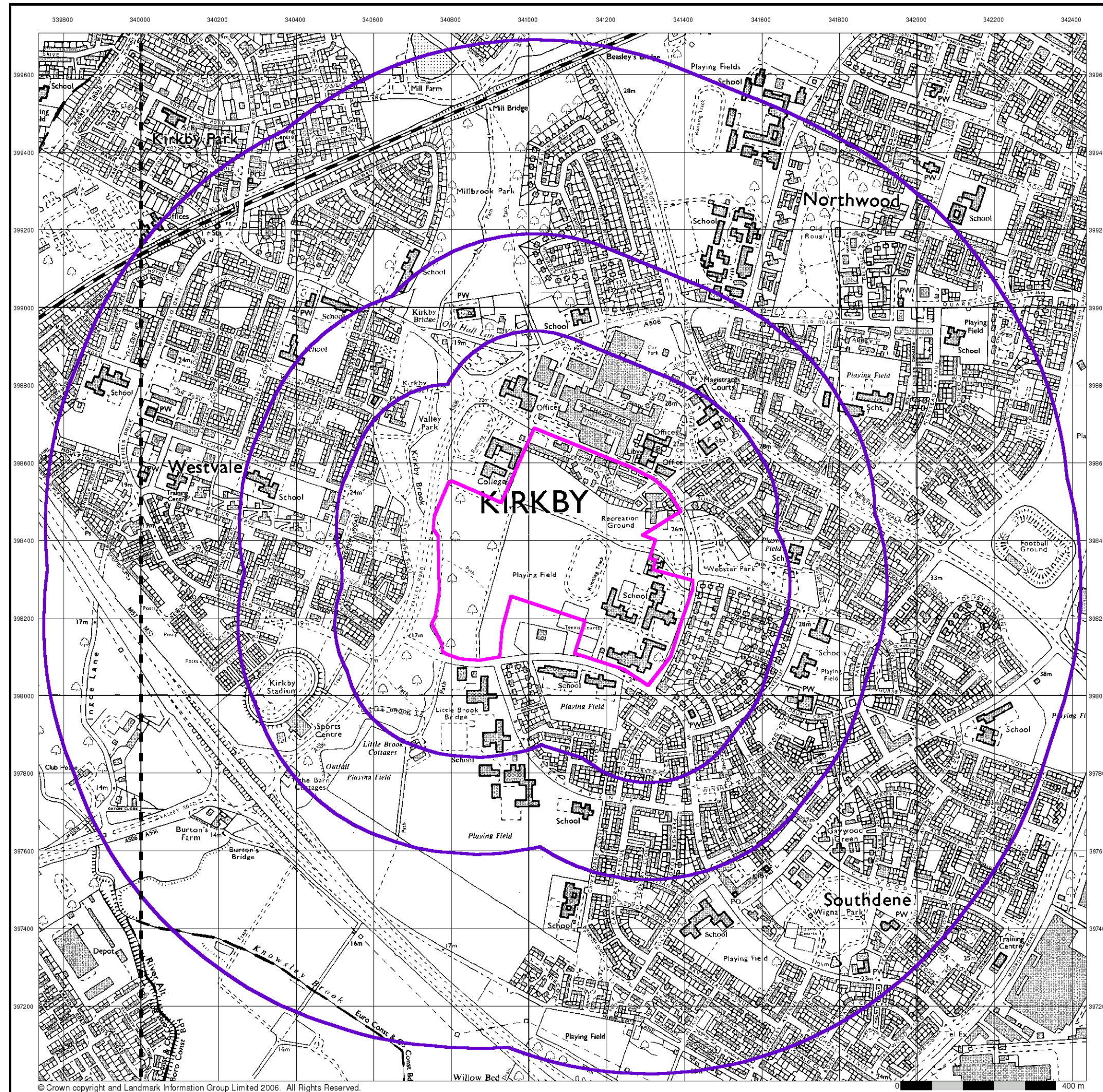


Historical Map - Slice A



Order Details
Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 1000

Site Details
Site at 341090, 398360

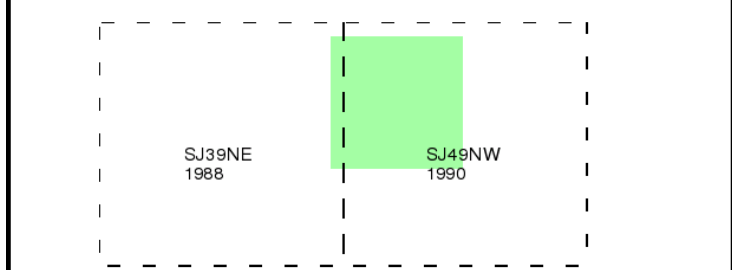


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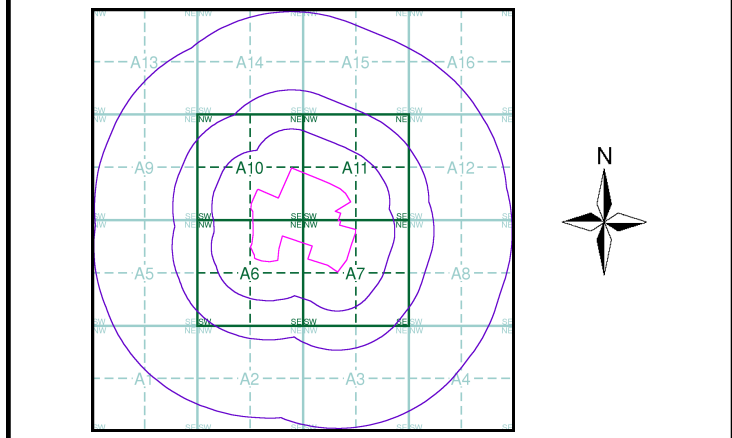
Ordnance Survey Plan
Published 1988 - 1990
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	1000

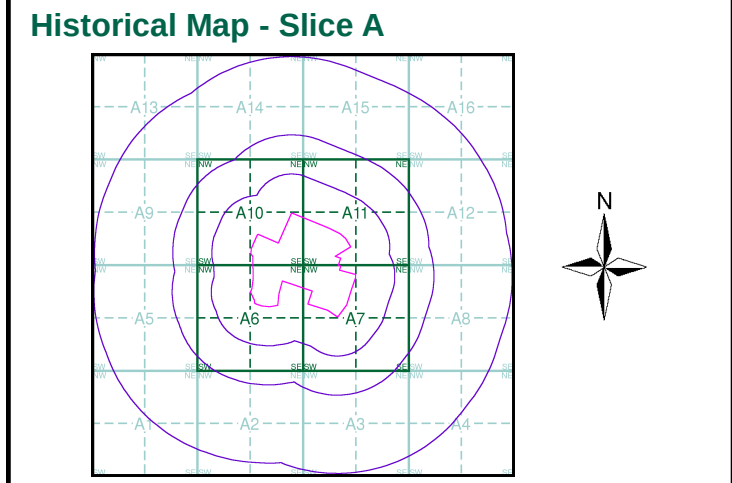
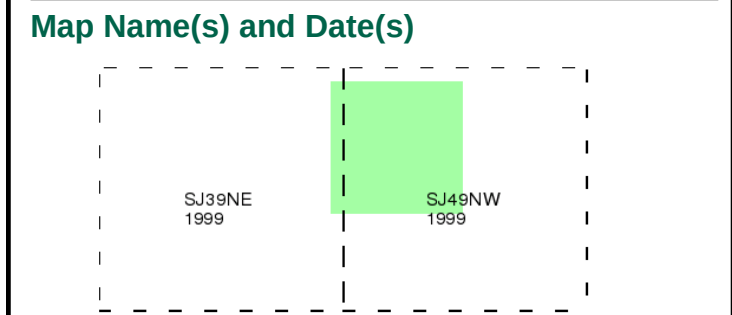
Site Details
Site at 341090, 398360



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10K Raster Mapping
Published 1999
Source map scale - 1:10,000

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



Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	1000

Site Details
Site at 341090, 398360

Historical Mapping Legends

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



County Boundary (Geographical)

County & Civil Parish Boundary

Administrative County & Civil Parish Boundary

County Borough Boundary (England)

County Burgh Boundary (Scotland)

B.P. B.S. Boundary Post or Stone

B.R. Bridle Road

E.P. Electricity Pylon

F.B. Foot Bridge

F.P. Foot Path

G.P. Guide Post or Board

M.S. Mile Stone

M.P. M.R. Mooring Post or Ring

P.C.B. Police Call Box

P. Pump

S.P. Signal Post

SL Sluice

Sp. Spring

T.C.B. Telephone Call Box

Tr. Trough

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

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

Electricity Transmission Line

County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

Admin. County or County Bor. Boundary

London Borough Boundary

Symbol marking point where boundary mereing changes

BH Beer House

BP, BS Boundary Post or Stone

Cn, C Capstan, Crane

Chy Chimney

D Fn Drinking Fountain

EI P Electricity Pillar or Post

FAP Fire Alarm Pillar

FB Foot Bridge

GP Guide Post

H Hydrant or Hydraulic

LC Level Crossing

MH Manhole

MP Mile Post or Mooring Post

MS Mile Stone

NTL Normal Tidal Limit

P Pillar, Pole or Post

PO Post Office

PC Public Convenience

PH Public House

Pp Pump

SB, S Br Signal Box or Bridge

SP, SL Signal Post or Light

Spr Spring

Tk Tank or Track

TCB Telephone Call Box

TCP Telephone Call Post

Tr Trough

Wr Pt, Wr T Water Point, Water Tap

W Well

Wd Pp Wind Pump

Bks Barracks

Bty Battery

Cemy Cemetery

Chy Chimney

Cis Cistern

Dismtd Rly Dismantled Railway

El Gen Sta Electricity Generating Station

El P Electricity Pole, Pillar

El Sub Sta Electricity Sub Station

FB Filter Bed

Fn / D Fn Fountain / Drinking Ftn.

Gas Gov Gas Valve Compound

GVC Gas Governor

GP Guide Post

MH Manhole

MP, MS Mile Post or Mile Stone

P Pillar, Pole or Post

PO Post Office

PC Public Convenience

Pp Pump

Ppg Sta Pumping Station

PW Place of Worship

Sewage Ppg Sta Sewage Pumping Station

SB, S Br Signal Box or Bridge

SP, SL Signal Post or Light

Spr Spring

Tk Tank or Track

Tr Trough

Wd Pp Wind Pump

Wr Pt, Wr T Water Point, Water Tap

Wks Works (building or area)

W Well

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)

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

Bty Battery

Cemy Cemetery

Chy Chimney

Cis Cistern

Dismtd Rly Dismantled Railway

El Gen Sta Electricity Generating Station

El P Electricity Pole, Pillar

El Sub Sta Electricity Sub Station

FB Filter Bed

Fn / D Fn Fountain / Drinking Ftn.

Gas Gov Gas Valve Compound

GVC Gas Governor

GP Guide Post

MH Manhole

MP, MS Mile Post or Mile Stone

P Pillar, Pole or Post

PO Post Office

PC Public Convenience

Pp Pump

Ppg Sta Pumping Station

PW Place of Worship

Sewage Ppg Sta Sewage Pumping Station

SB, S Br Signal Box or Bridge

SP, SL Signal Post or Light

Spr Spring

Tk Tank or Track

Tr Trough

Wd Pp Wind Pump

Wr Pt, Wr T Water Point, Water Tap

Wks Works (building or area)

W Well

Bks Barracks

Bty Battery

Cemy Cemetery

Chy Chimney

Cis Cistern

Dismtd Rly Dismantled Railway

El Gen Sta Electricity Generating Station

El P Electricity Pole, Pillar

El Sub Sta Electricity Sub Station

FB Filter Bed

Fn / D Fn Fountain / Drinking Ftn.

Gas Gov Gas Valve Compound

GVC Gas Governor

GP Guide Post

MH Manhole

MP, MS Mile Post or Mile Stone

P Pillar, Pole or Post

PO Post Office

PC Public Convenience

Pp Pump

Ppg Sta Pumping Station

PW Place of Worship

Sewage Ppg Sta Sewage Pumping Station

SB, S Br Signal Box or Bridge

SP, SL Signal Post or Light

Spr Spring

Tk Tank or Track

Tr Trough

Wd Pp Wind Pump

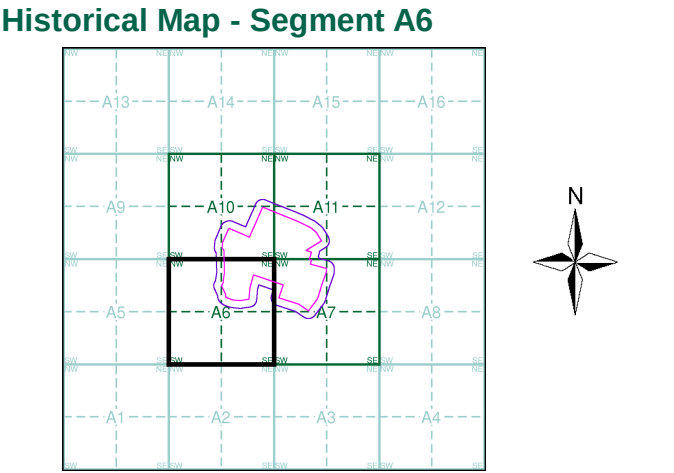
Wr Pt, Wr T Water Point, Water Tap

Wks Works (building or area)

W Well

Ordnance Survey mapping included:

Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1891 - 1893	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1927	4
Lancashire And Furness	1:2,500	1937	5
Ordnance Survey Plan	1:2,500	1961 - 1962	6
Ordnance Survey Plan	1:1,250	1961	7
Ordnance Survey Plan	1:1,250	1967 - 1975	8
Ordnance Survey Plan	1:1,250	1974	9
Additional SIMs	1:1,250	1984 - 1988	10
Supply of Unpublished Survey Information	1:1,250	1973	11
Large-Scale National Grid Data	1:1,250	1993	12
Large-Scale National Grid Data	1:1,250	1994	13
Large-Scale National Grid Data	1:1,250	1995	14



Order Details

Order Number: 20523631_1_1

Customer Ref: 021706

National Grid Reference: 341080, 398330

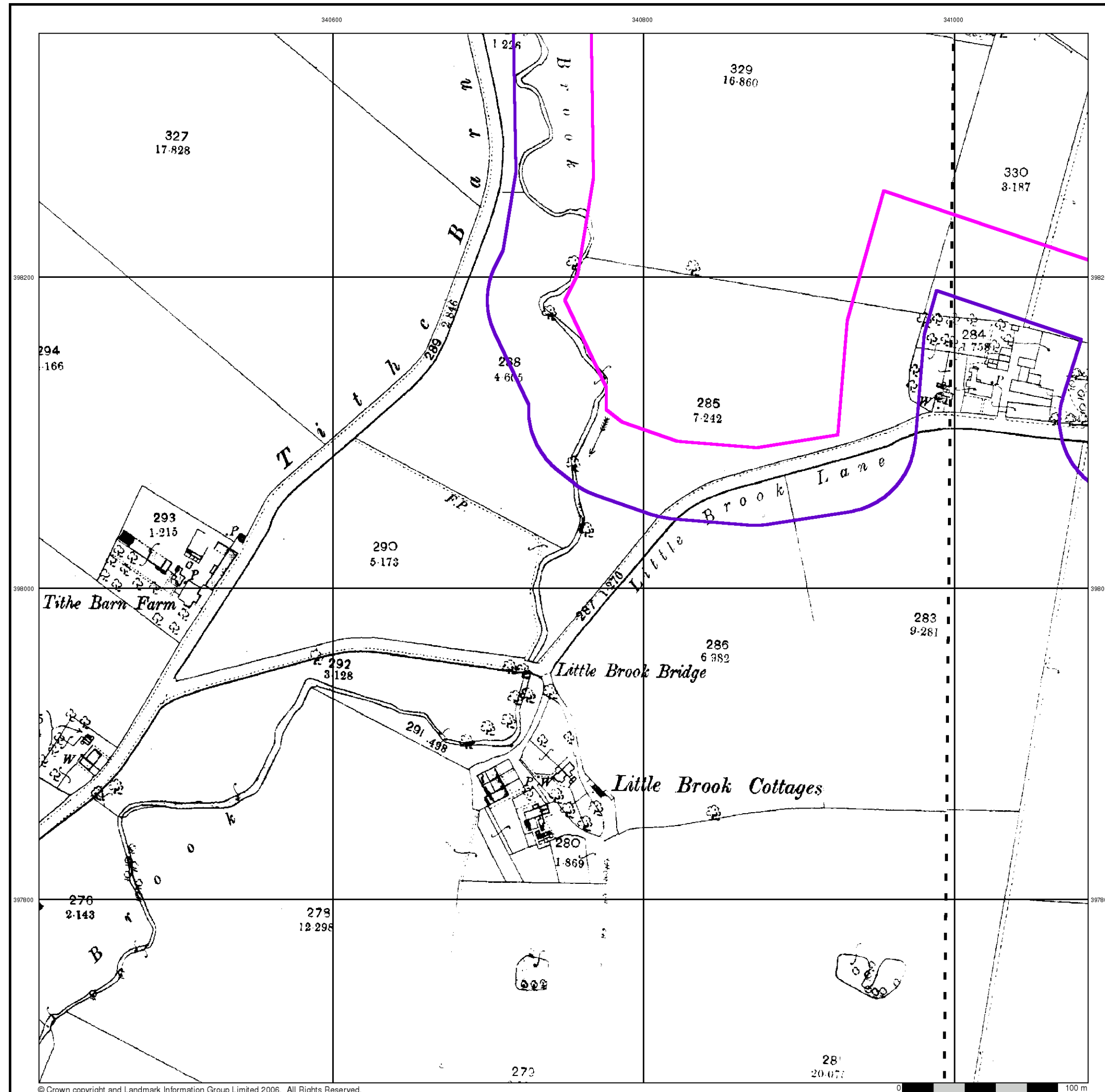
Sheet: A

Site Area (Ha): 27.67

Search Buffer (m): 50

Site Details

Site at 341090, 398360



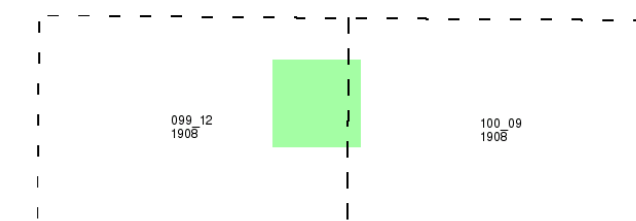
Lancashire And Furness

Published 1908

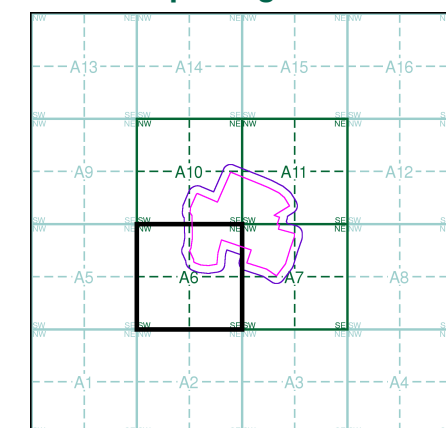
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A6

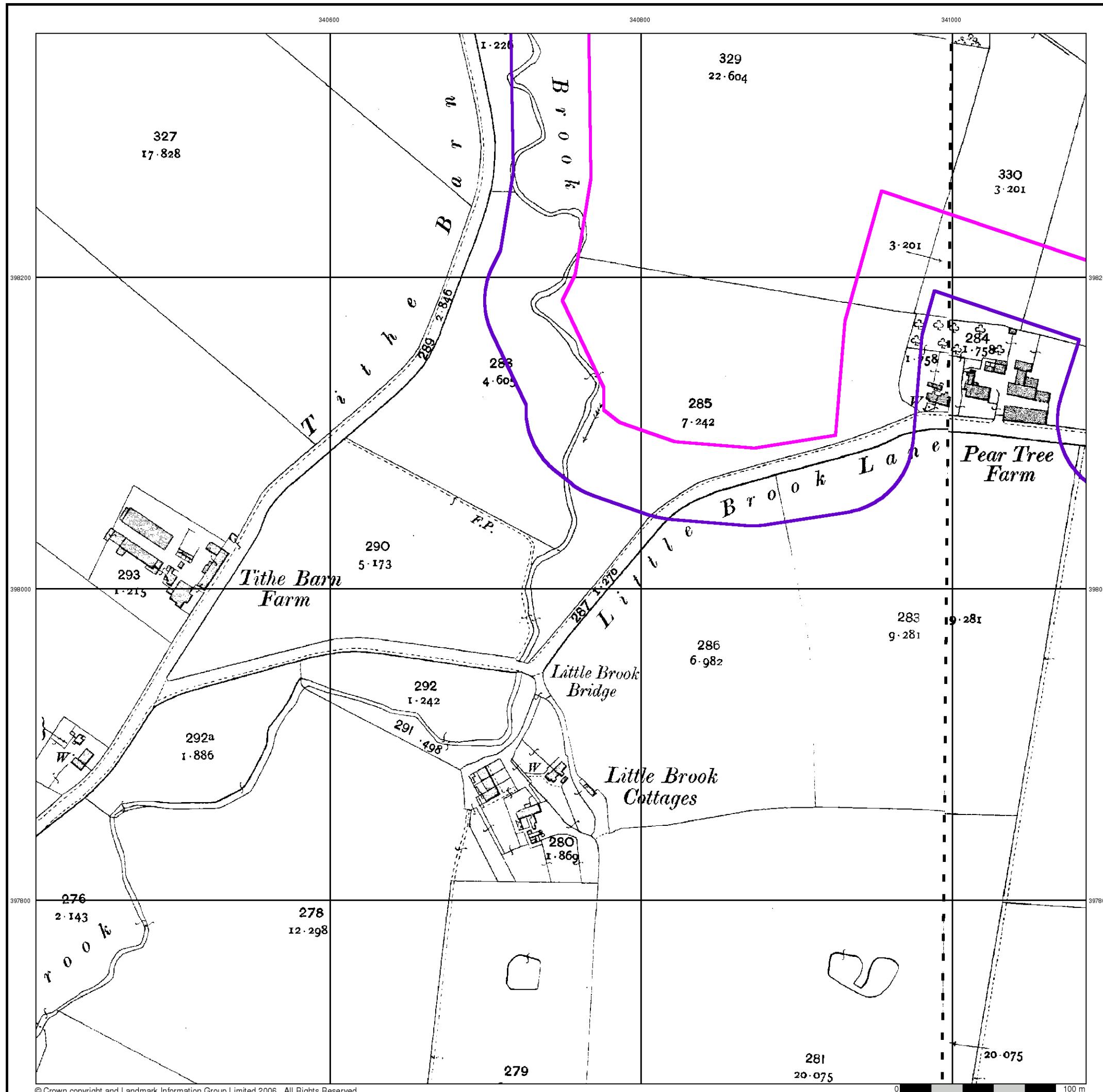


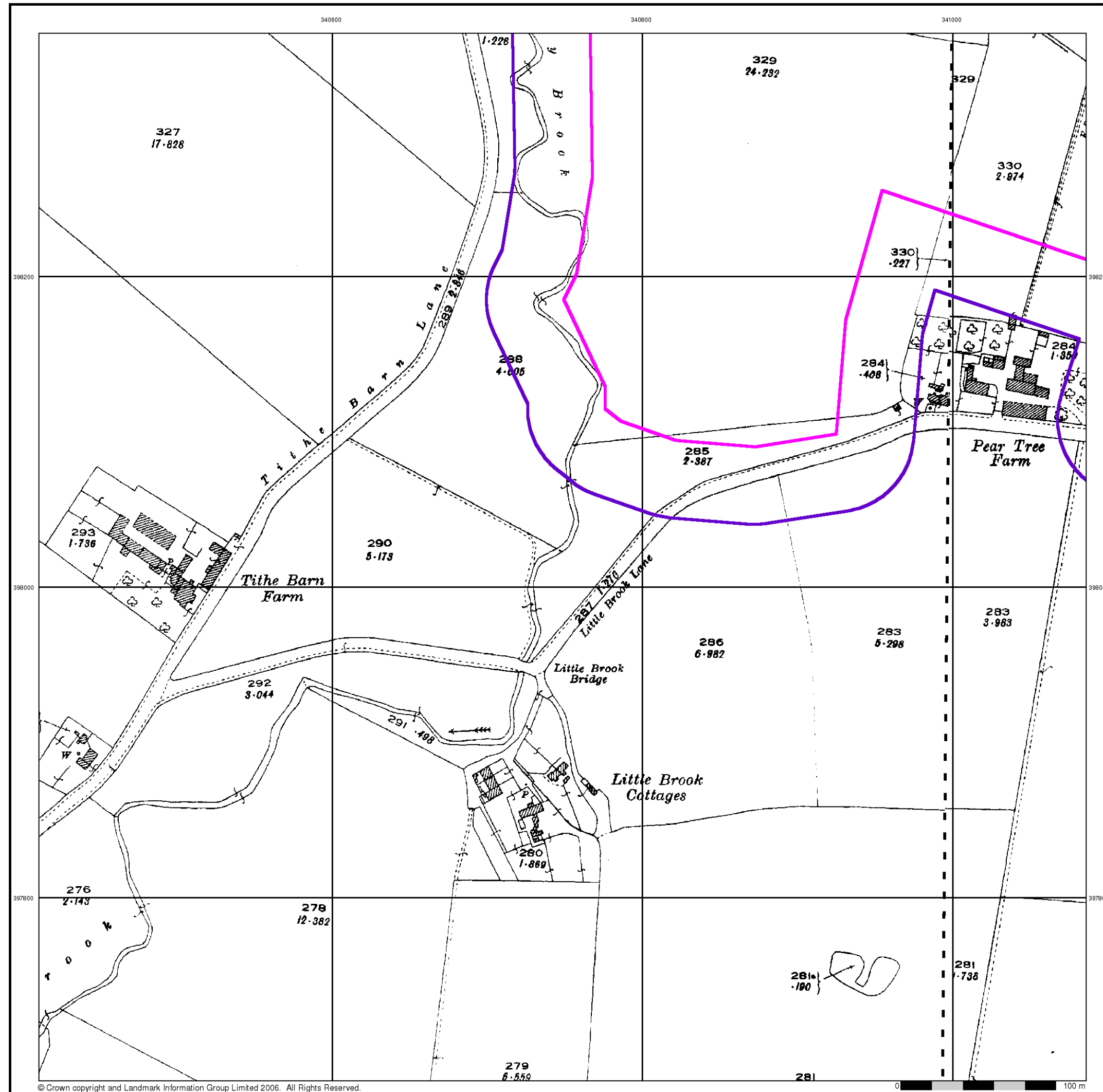
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



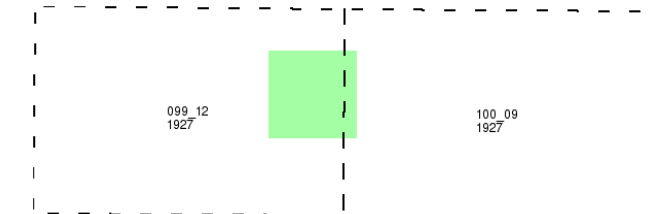


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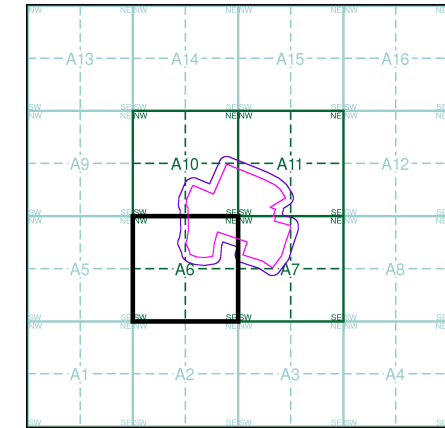
Lancashire And Furness
Published 1927
Source map scale - 1:2,500

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 A6



Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

Site at 341090, 398360

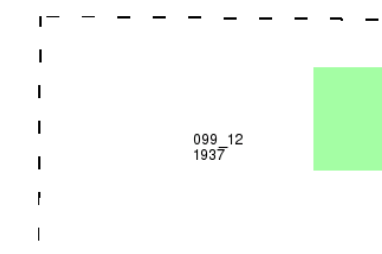
Lancashire And Furness

Published 1937

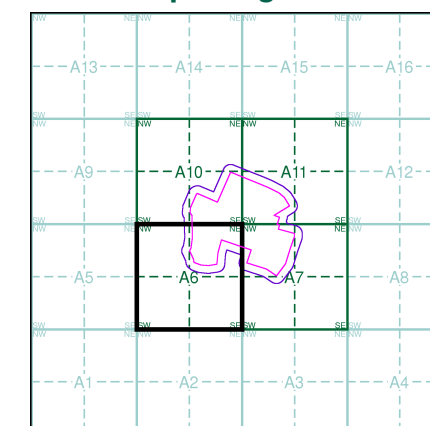
Source map scale - 1:2,500

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 A6

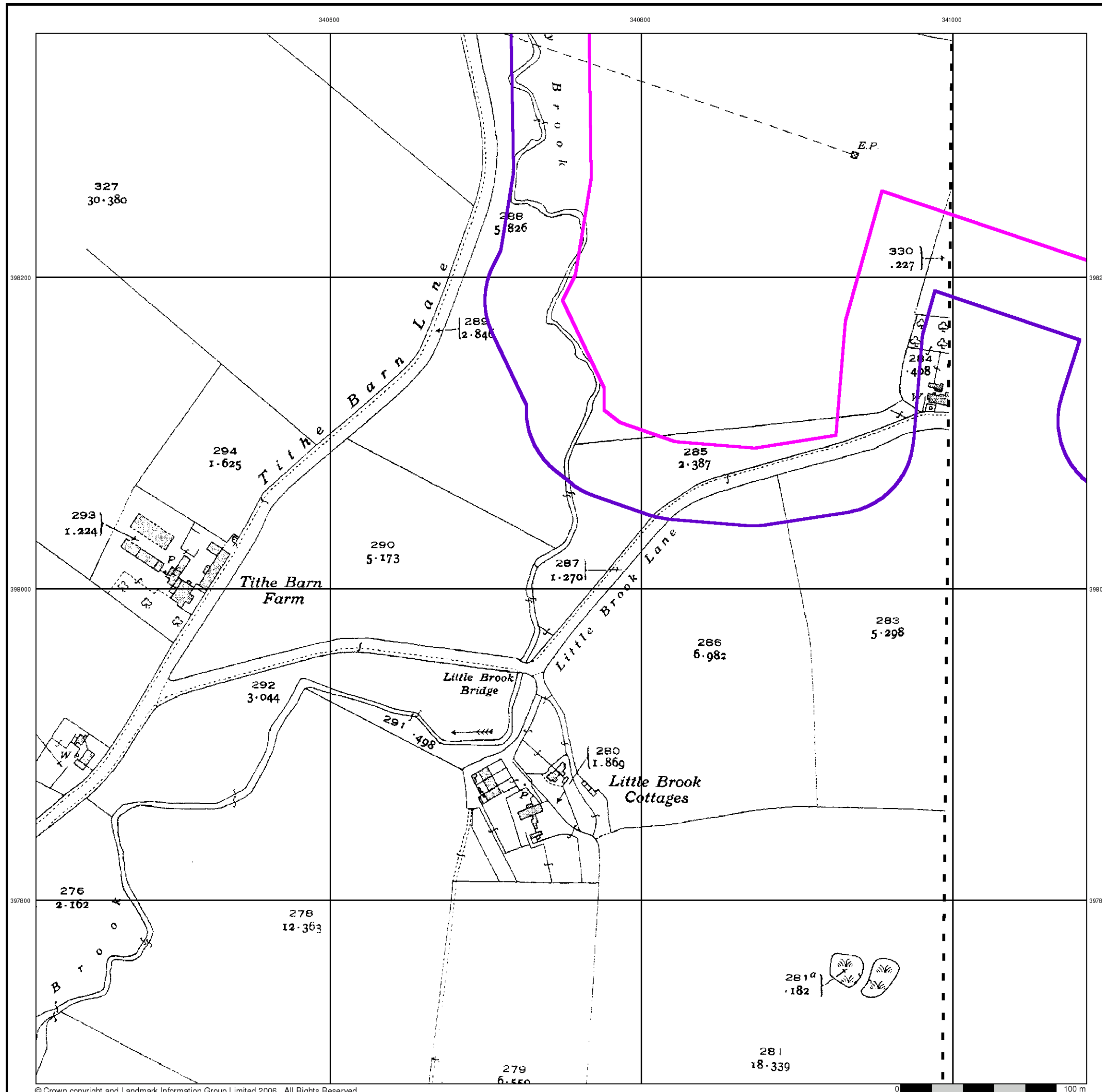


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1961 - 1962

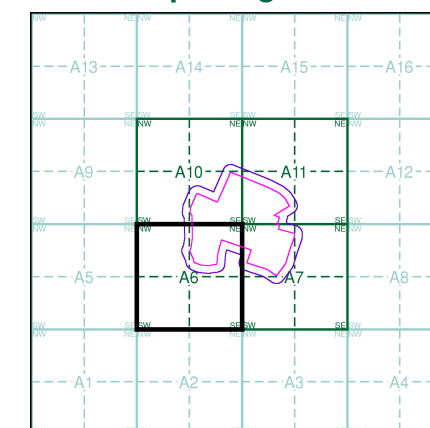
Source map scale - 1:2,500

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)

SJ4098 1962	SJ4198 1962
SJ4097 1961	SJ4197 1961

Historical Map - Segment A6

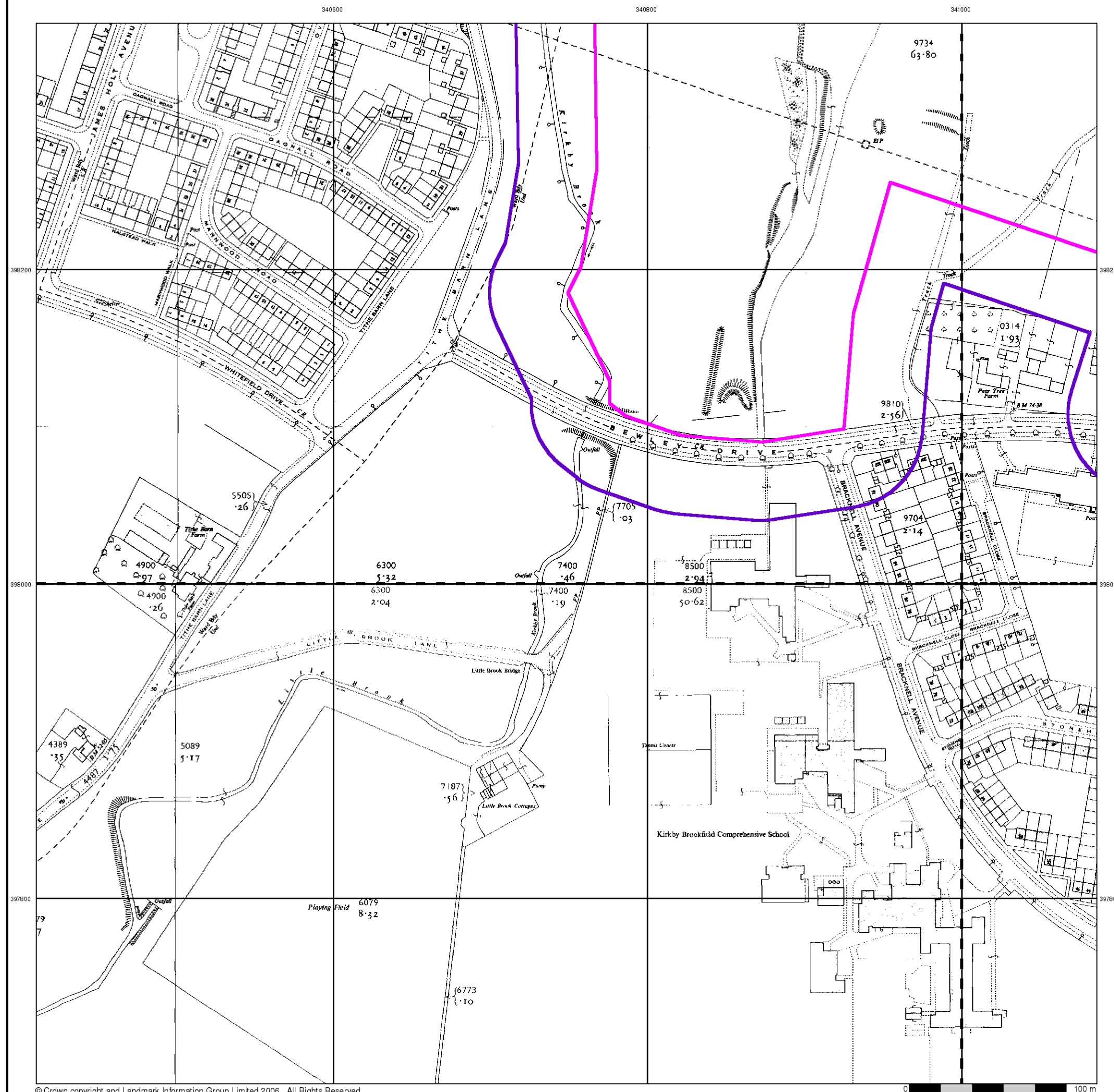


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1967 - 1975

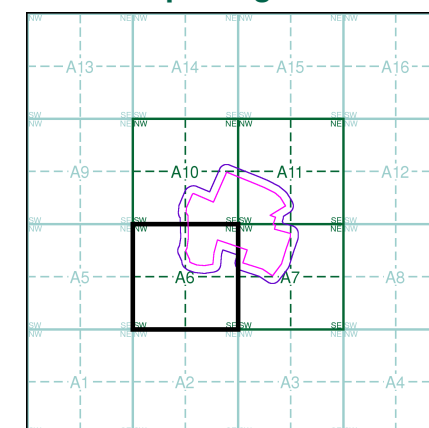
Source map scale - 1:1,250

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

Map Name(s) and Date(s)

SJ4098SW 1974	SJ4098SE 1971	SJ4198SW 1975
SJ4097NW 1967		

Historical Map - Segment A6

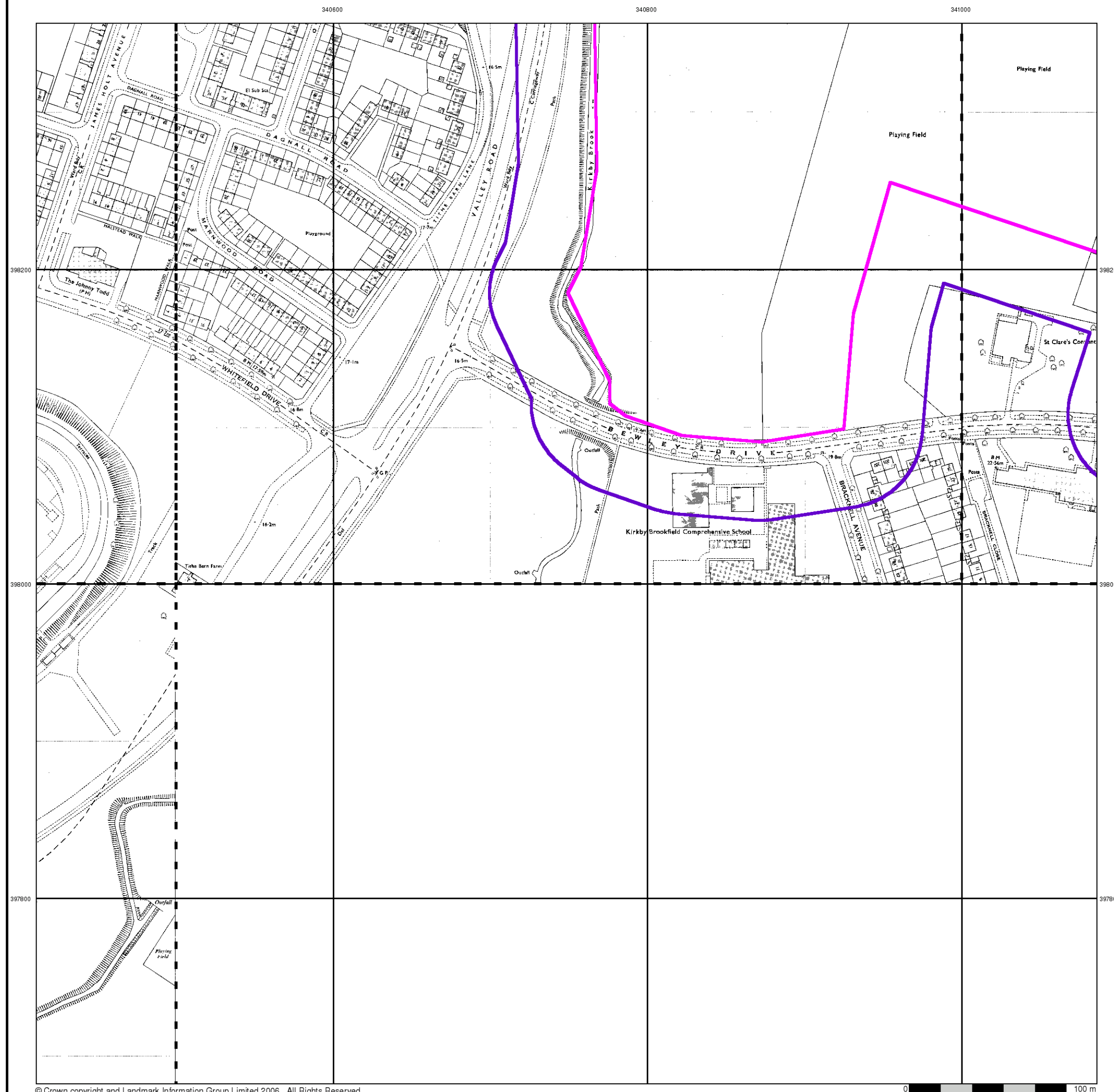


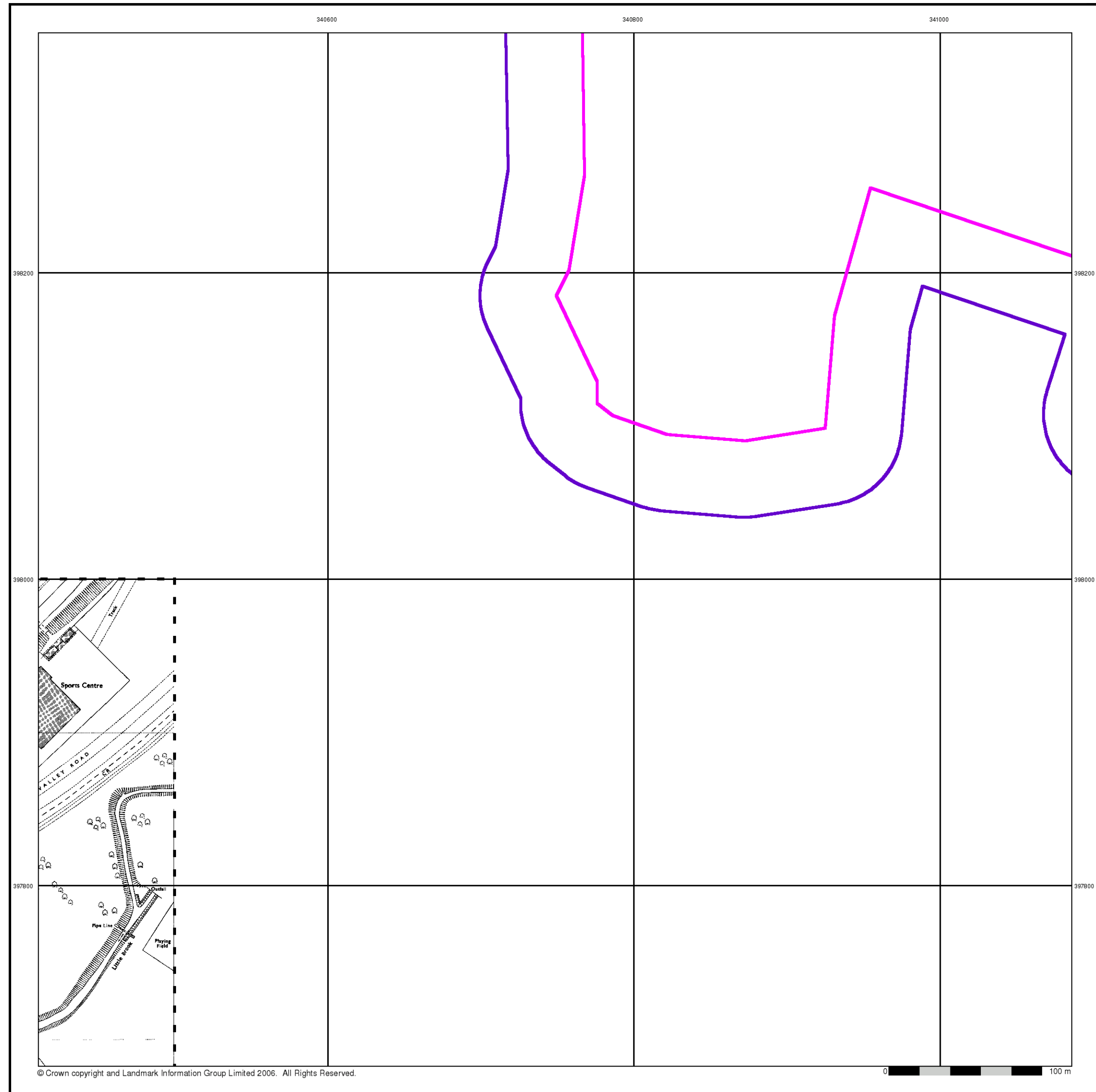
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360

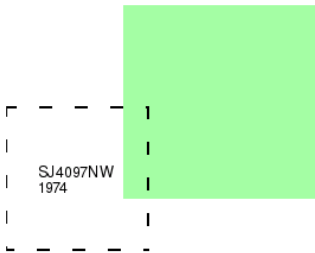




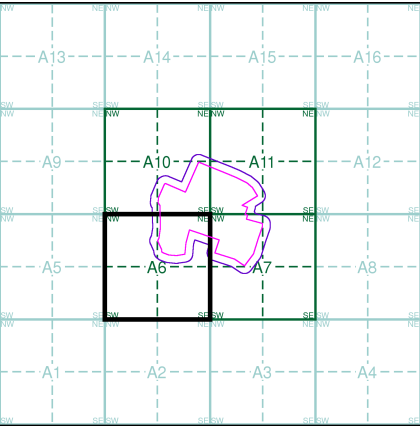
Ordnance Survey Plan
Published 1974
Source map scale - 1:1,250

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 A6



Order Details
Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details
Site at 341090, 398360

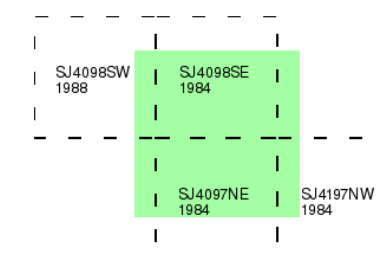
Additional SIMs

Published 1984 - 1988

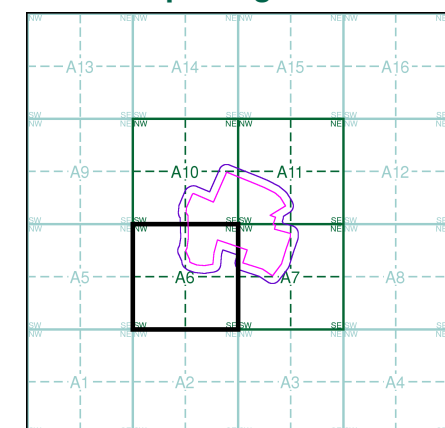
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, 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 A6

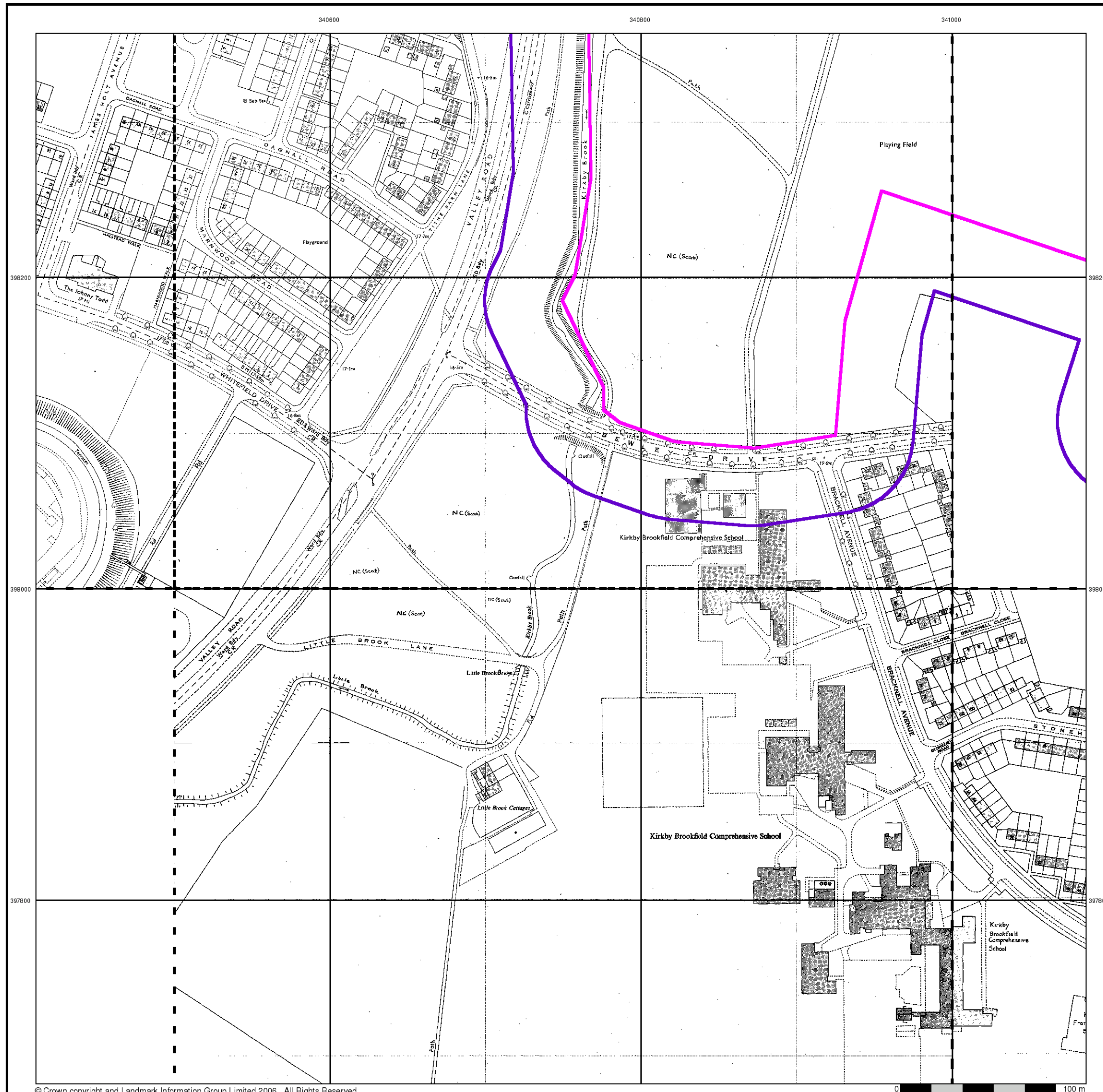


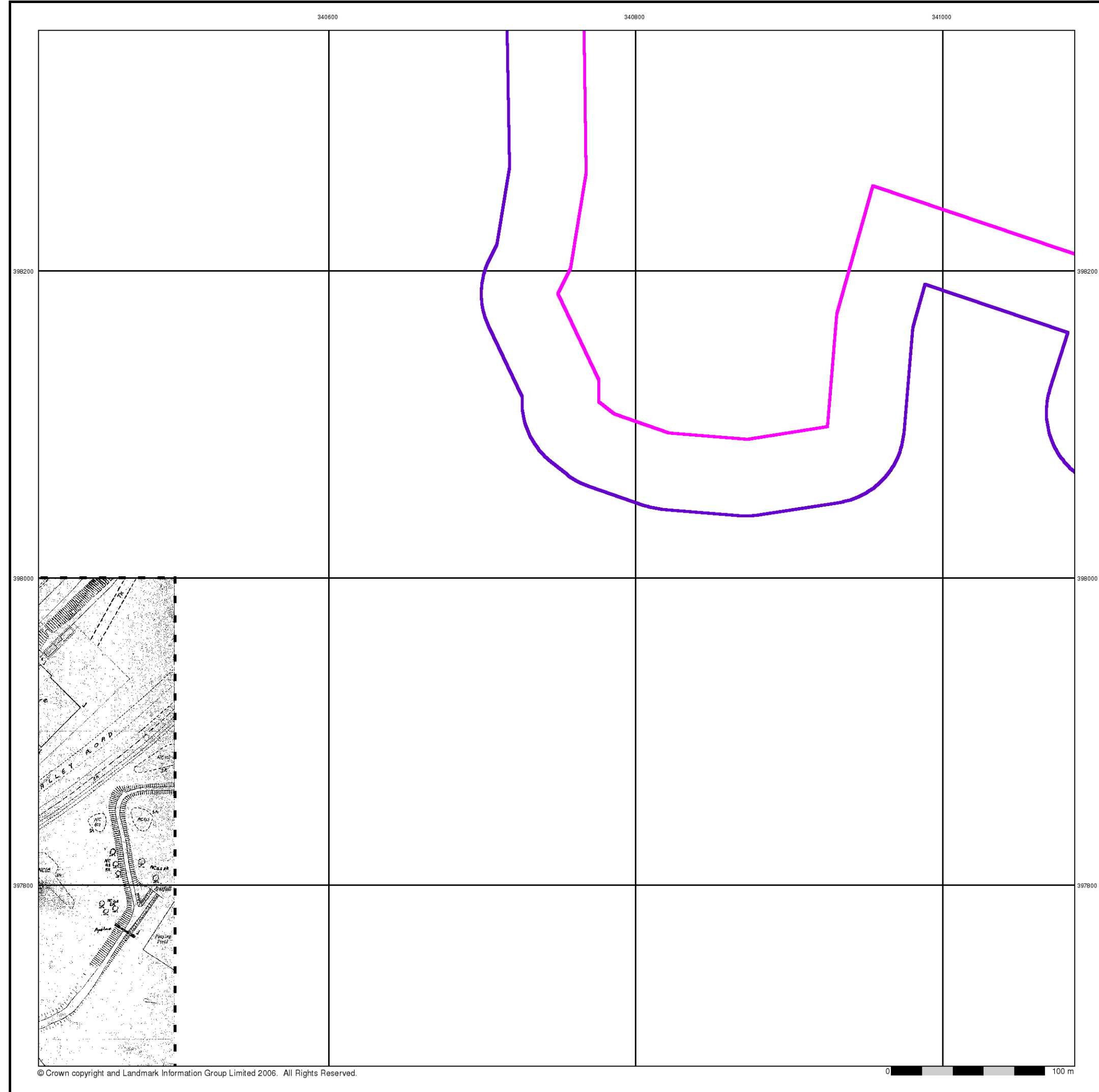
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



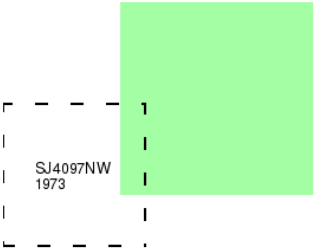




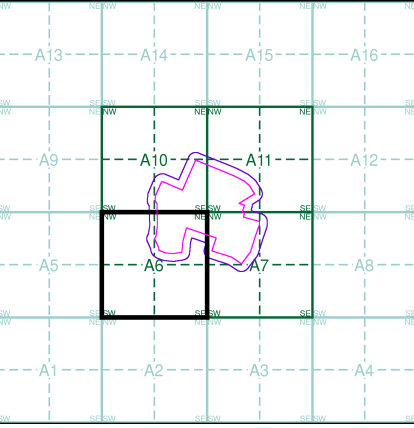
Supply of Unpublished Survey Information
Published 1973
Source map scale - 1:1,250

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 A6



Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	50

Site Details
Site at 341090, 398360



Tel: 0870 850 6670
Fax: 0870 850 6671
Web: www.envirocheck.co.uk

A Landmark Information Group Service v17.0 27-Oct-2006 Page 11 of 14

Large-Scale National Grid Data

Published 1993

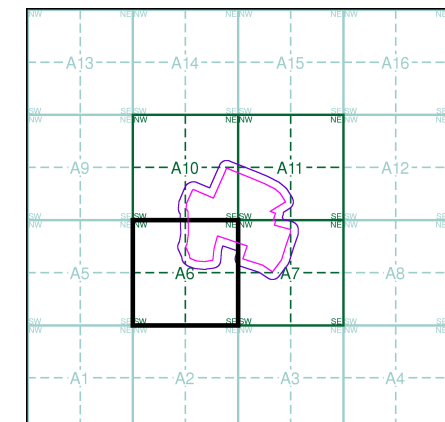
Source map scale - 1:1,250

'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)

SJ4098SW 1993	SJ4098SE 1993	SJ4198SW 1993
SJ4097NW 1993	SJ4097NE 1993	SJ4197NW 1993

Historical Map - Segment A6

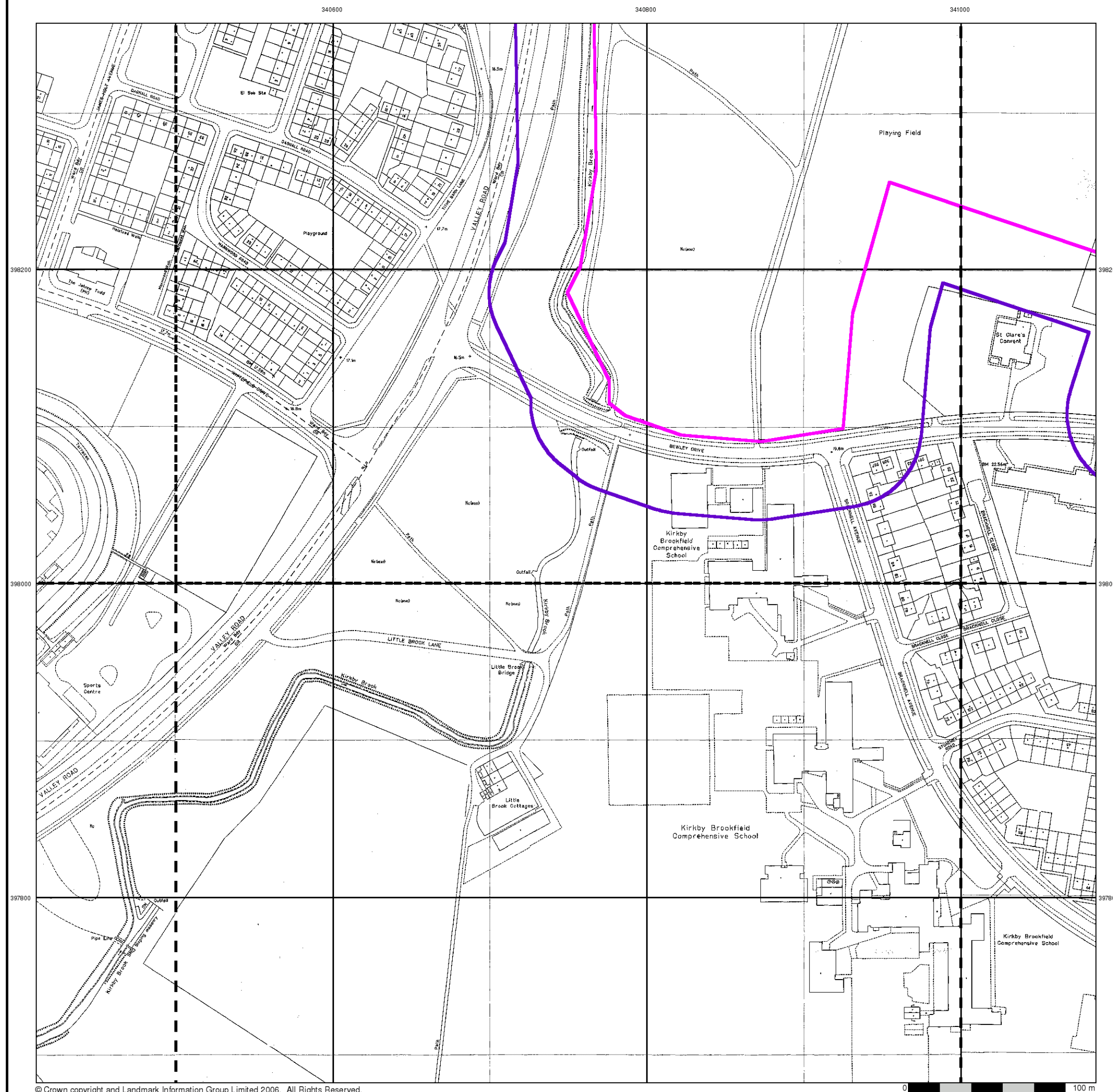


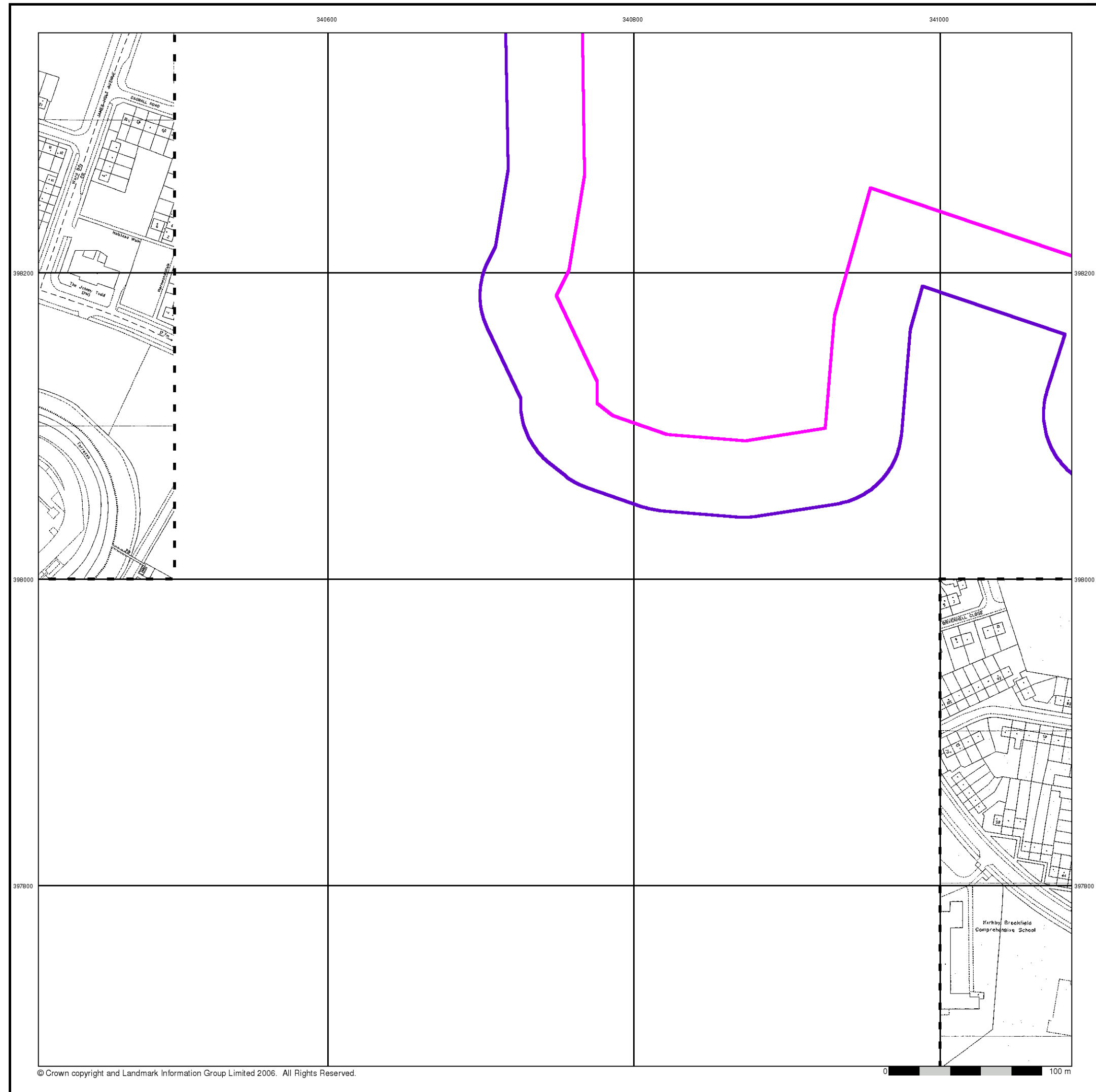
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360

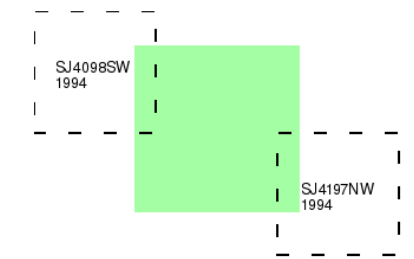




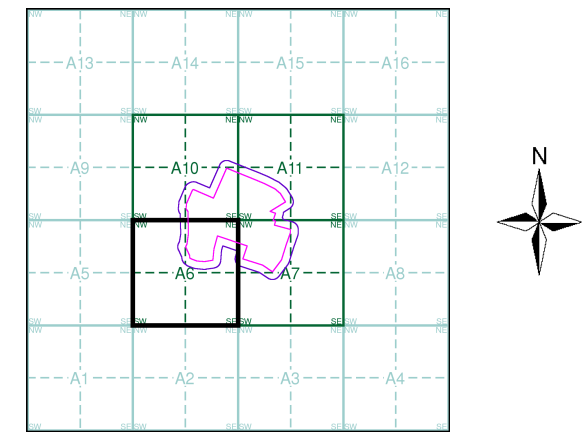
Large-Scale National Grid Data
Published 1994
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



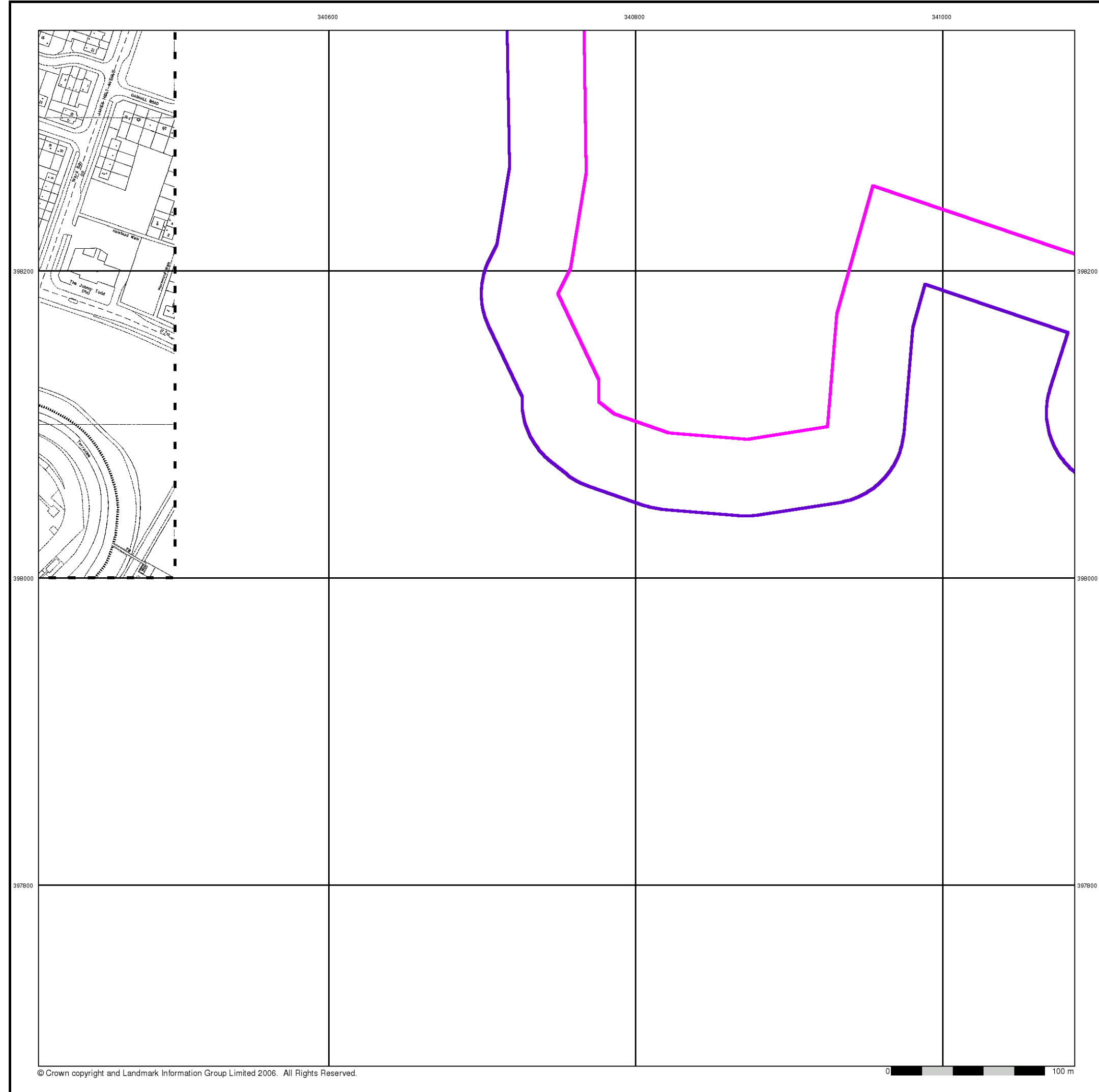
Historical Map - Segment A6



Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	50

Site Details
Site at 341090, 398360



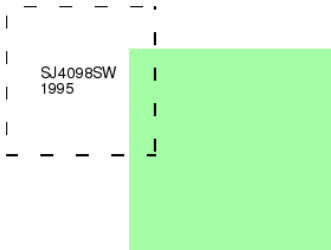
Large-Scale National Grid Data

Published 1995

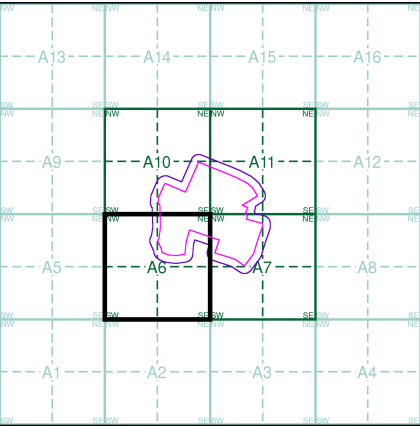
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A6



Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

Site at 341090, 398360



Tel: 0870 850 6670
Fax: 0870 850 6671
Web: www.envirocheck.co.uk

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

	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
<i>B.M. 325-9</i> 	Bench Mark	342 +	Surface Level
	Arrow denotes flow of water		Antiquities (site of)

Railway crossing
Road

Level Crossing

Road crossing
Railway

Diagram illustrating three types of crossings:

- 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
-----	County Borough Boundary (England)
-----	County Burgh Boundary (Scotland)

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

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information

The diagram shows six symbols arranged in two rows. The top row contains two symbols: on the left, a solid irregular shape with radiating lines and the text 'Inactive Quarry, Chalk Pit or Clay Pit'; on the right, a dashed irregular shape with radiating lines and the text 'Active Quarry, Chalk Pit or Clay Pit'. The bottom row contains two symbols: on the left, several small solid irregular shapes and the text 'Rock'; on the right, several small solid circles and the text 'Boulders'.

The diagrams show four types of masonry:

- Roofed Building:** A rectangular block with a cross-hatched pattern.
- Glazed Roof Building:** A rectangular block with a pattern of small circles, representing glass panes.
- Top:** A cross-section of a wall showing a top layer of bricks.
- Sloping Masonry:** A cross-section of a wall showing a sloping layer of bricks.
- Archway:** A cross-section of a wall showing an archway structure.

	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

ETL Electricity Transmission Line

	County Boundary (Geographical)
	County & Civil Parish Boundary
	Civil Parish Boundary
	Admin. County or County Bor. Boundary
	London Borough Boundary
	Symbol marking point where boundary merging changes

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

	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)

— ETL — Electricity Transmission Line ☒ Electricity Pylon

 BM 291.60m Bench Mark
  Buildings with Building Seed

• • • • •	Civil parish/community boundary
— — — — —	District boundary
— • — — —	County boundary
○	Boundary post/stone
⌘	Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

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



Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1893	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1927	4
Ordnance Survey Plan	1:2,500	1961 - 1962	5
Ordnance Survey Plan	1:1,250	1961	6
Ordnance Survey Plan	1:1,250	1974 - 1976	7
Additional SIMs	1:1,250	1984	8
Large-Scale National Grid Data	1:1,250	1993	9
Large-Scale National Grid Data	1:1,250	1994	10



Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site at 341090, 398360



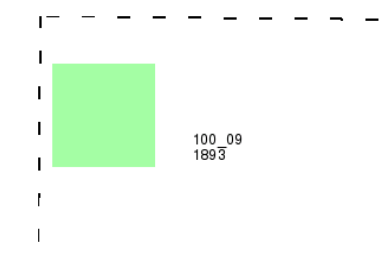
Lancashire And Furness

Published 1893

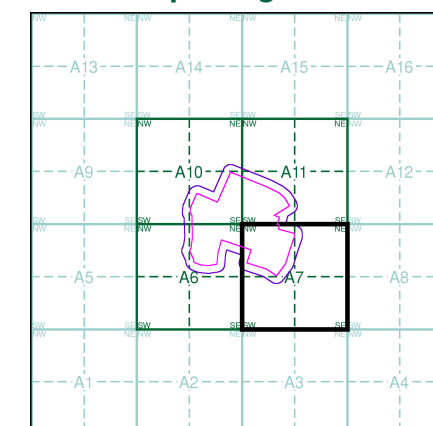
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A7

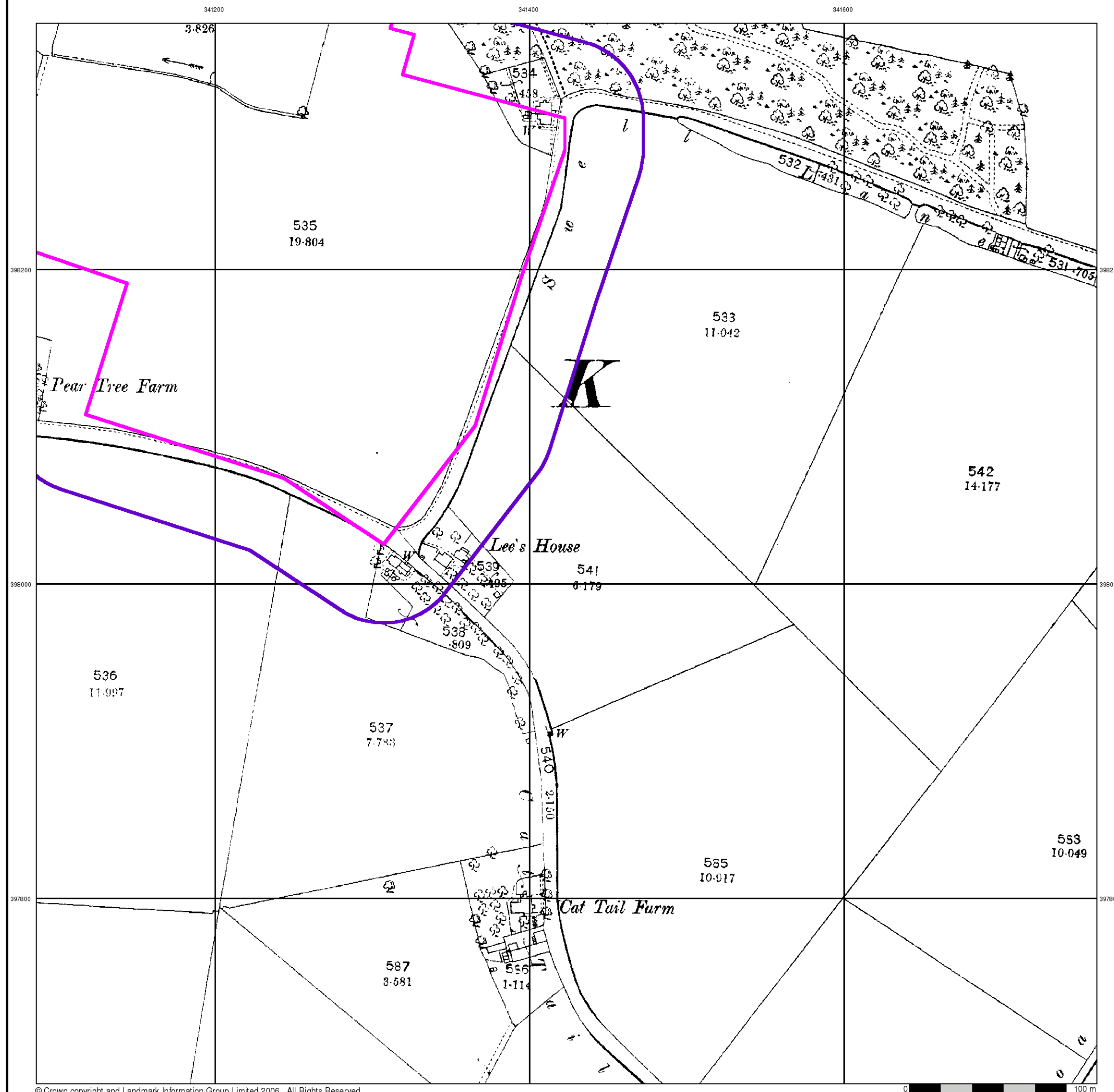


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



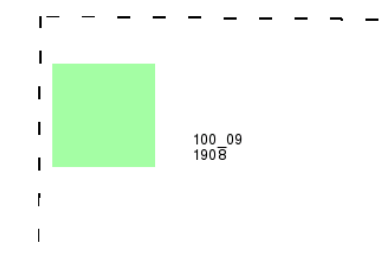
Lancashire And Furness

Published 1908

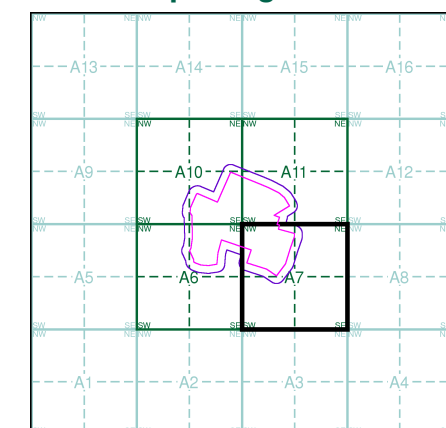
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A7

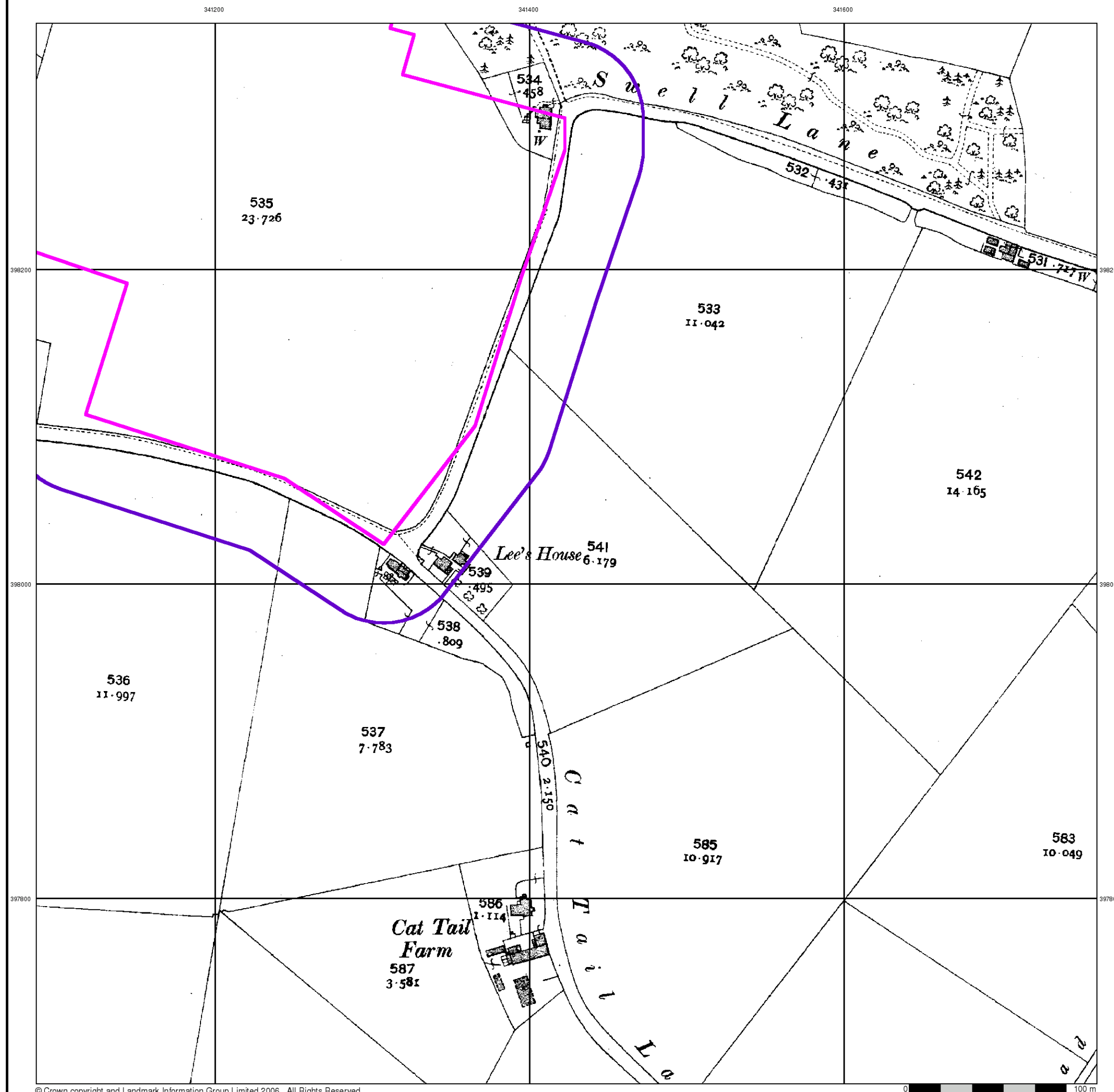


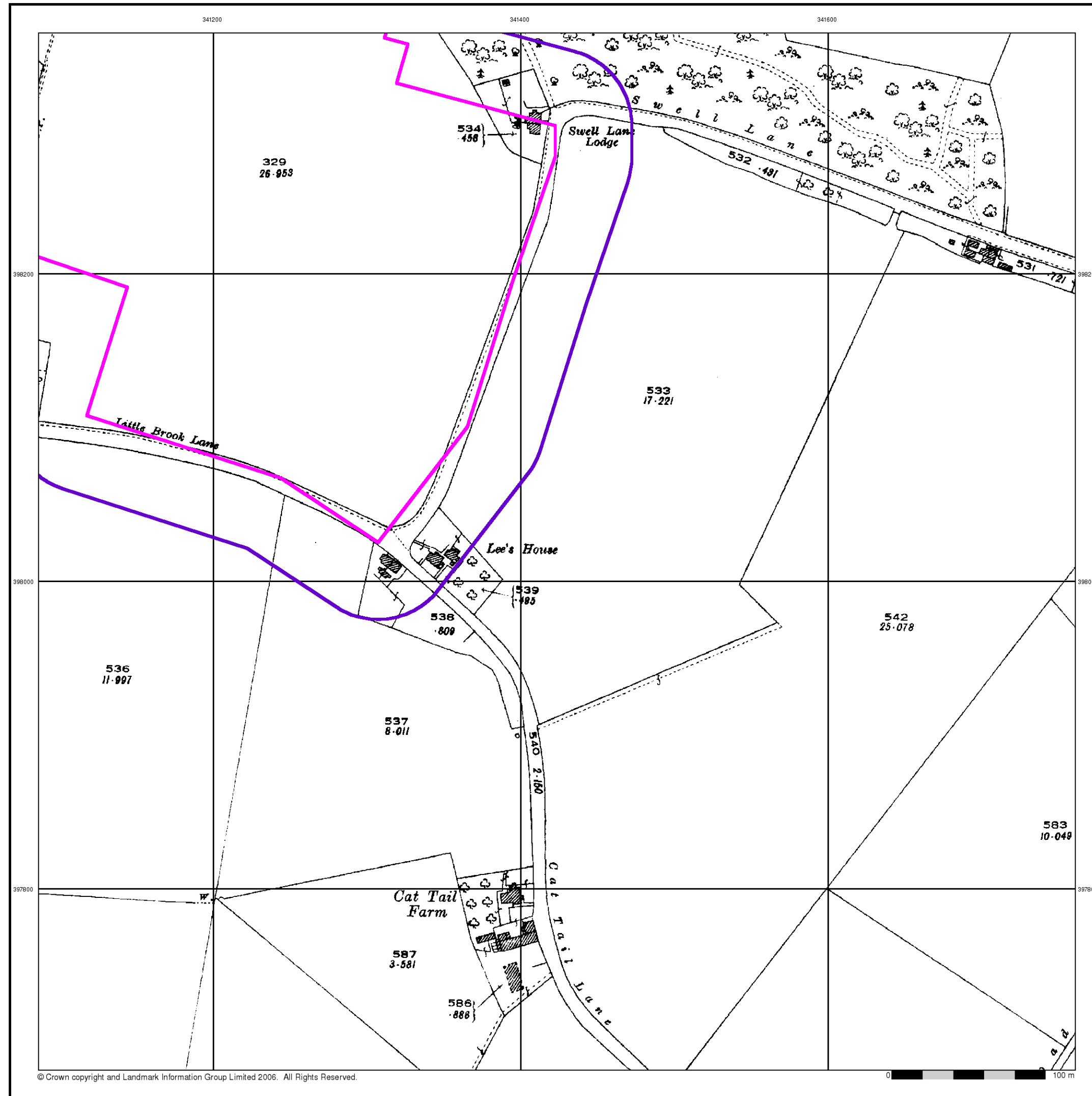
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360





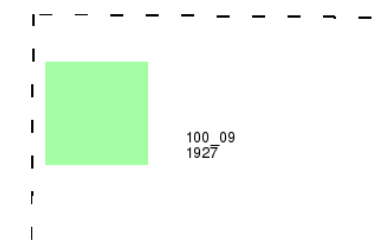
Lancashire And Furness

Published 1927

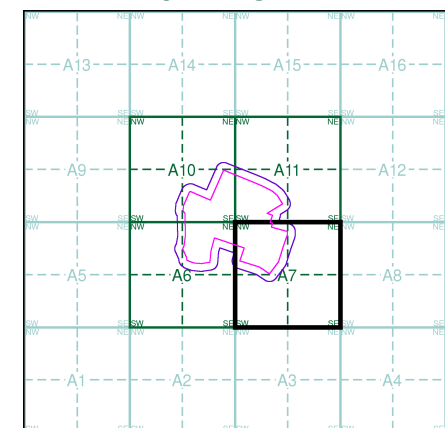
Source map scale - 1:2,500

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 A7



Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

Site at 341090, 398360

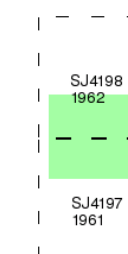
Ordnance Survey Plan

Published 1961 - 1962

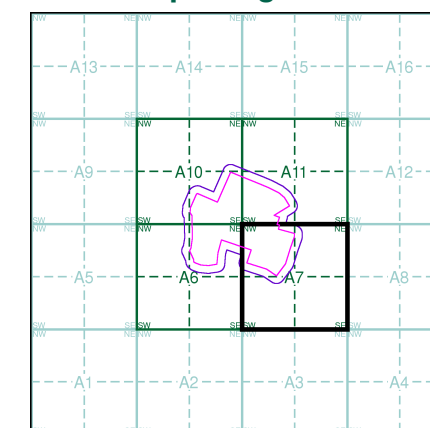
Source map scale - 1:2,500

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 A7

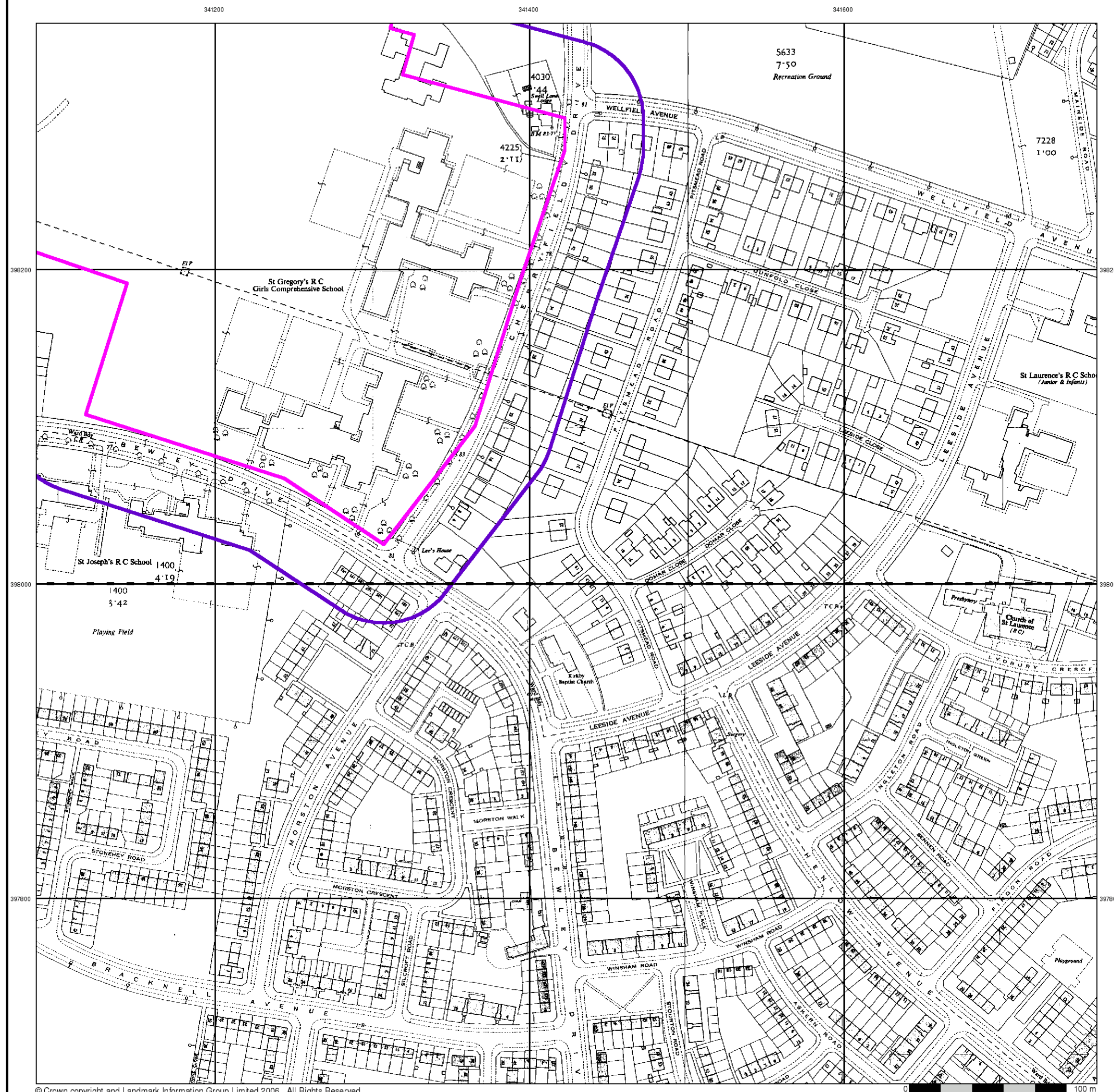


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1961

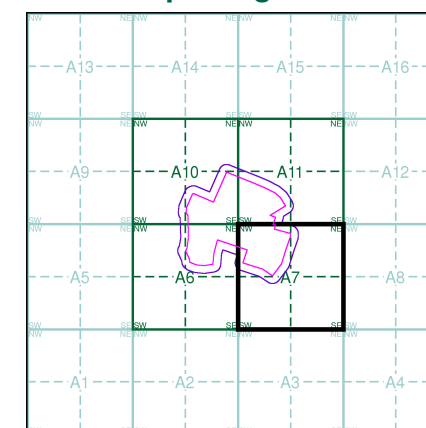
Source map scale - 1:1,250

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)

SJ4198SW 1961	SJ4198SE 1961
SJ4197NW 1961	SJ4197NE 1961

Historical Map - Segment A7

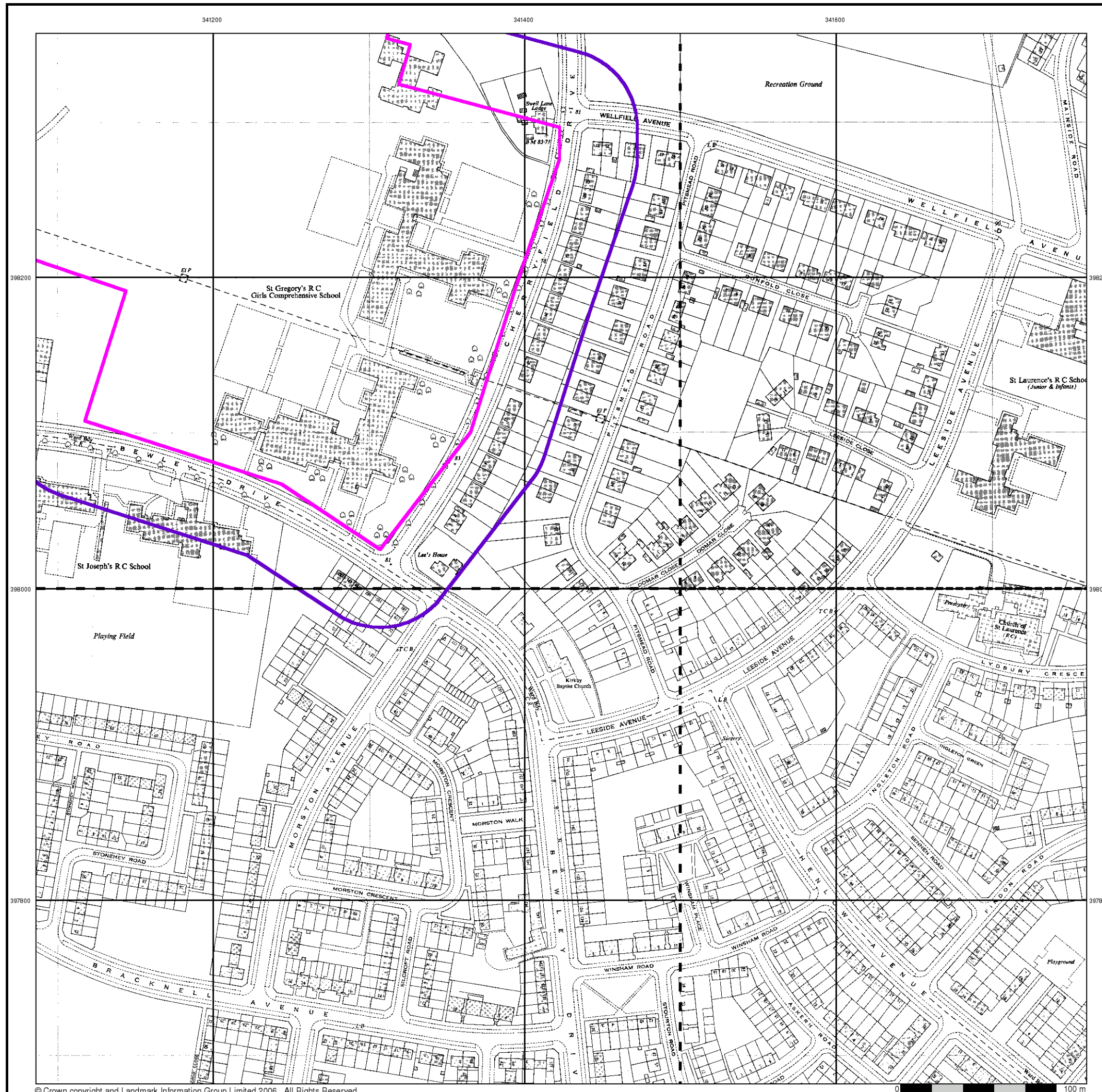


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1974 - 1976

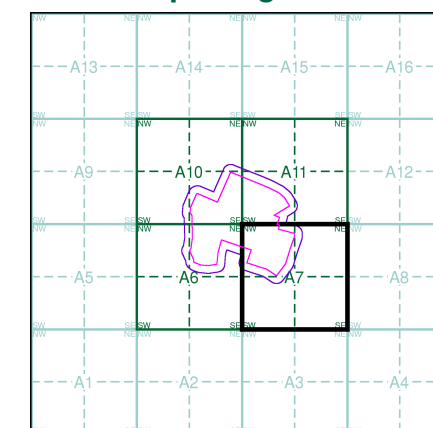
Source map scale - 1:1,250

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)

SJ4198SW 1975	SJ4198SE 1976
	SJ4197NE 1974

Historical Map - Segment A7

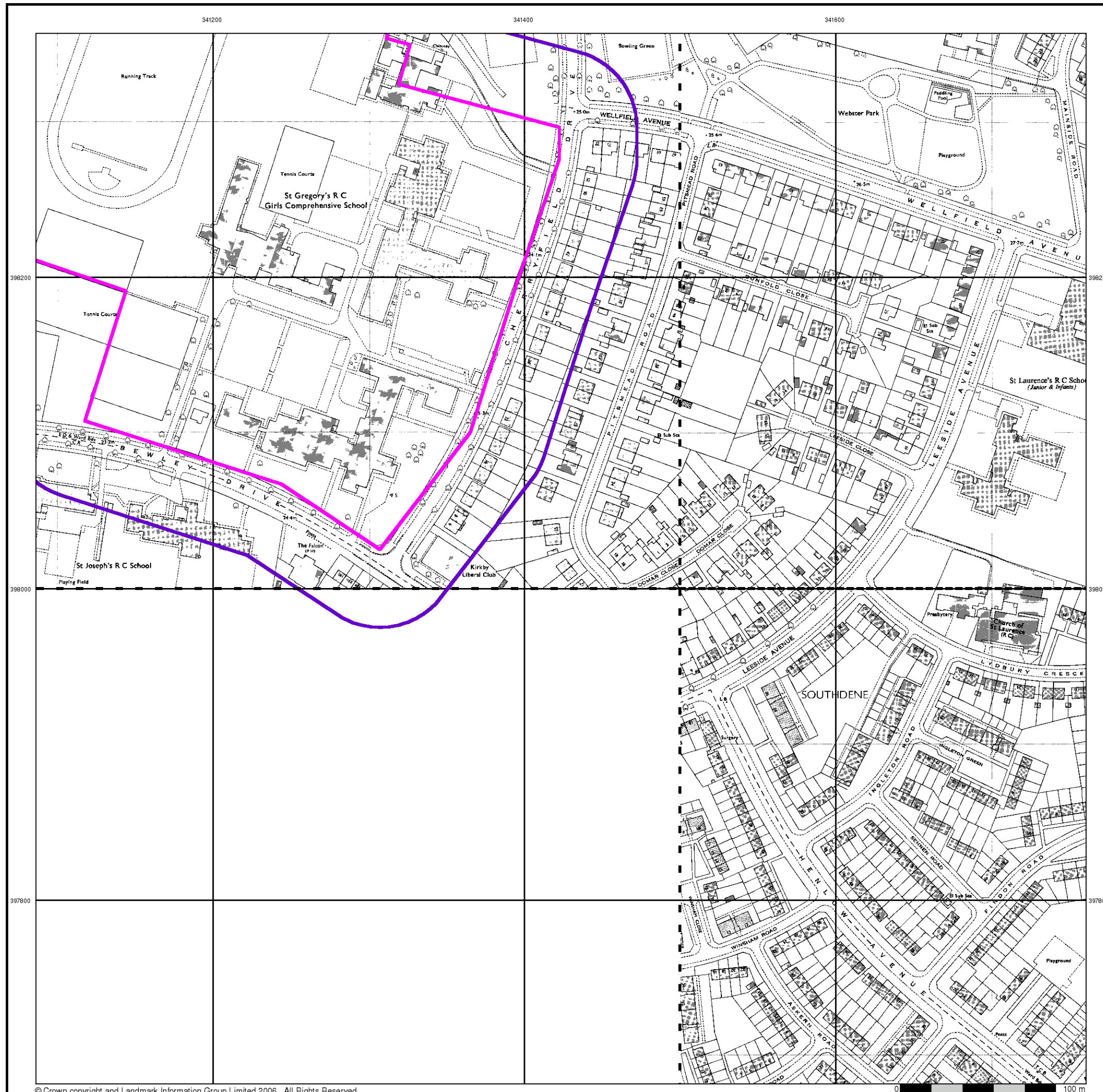


Order Details

Order Number: 20523631_1_1
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Site Details

Site at 341090, 398360







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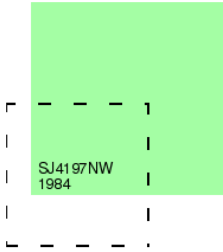
Additional SIMs

Published 1984

Source map scale - 1:1,250

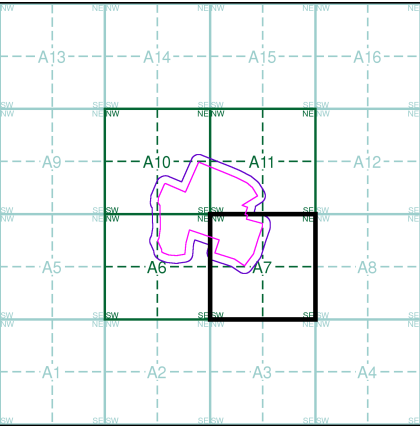
The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



SJ4197NW
1984

Historical Map - Segment A7



Order Details

Order Number:	20523631_1_1
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National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	50

Site Details

Site at 341090, 398360



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Large-Scale National Grid Data

Published 1993

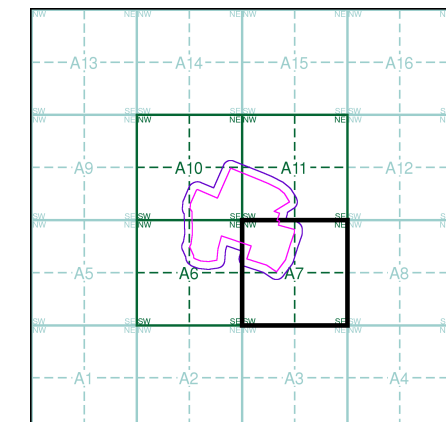
Source map scale - 1:1,250

'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)

SJ4198SW 1993	SJ4198SE 1993
SJ4197NW 1993	SJ4197NE 1993

Historical Map - Segment A7



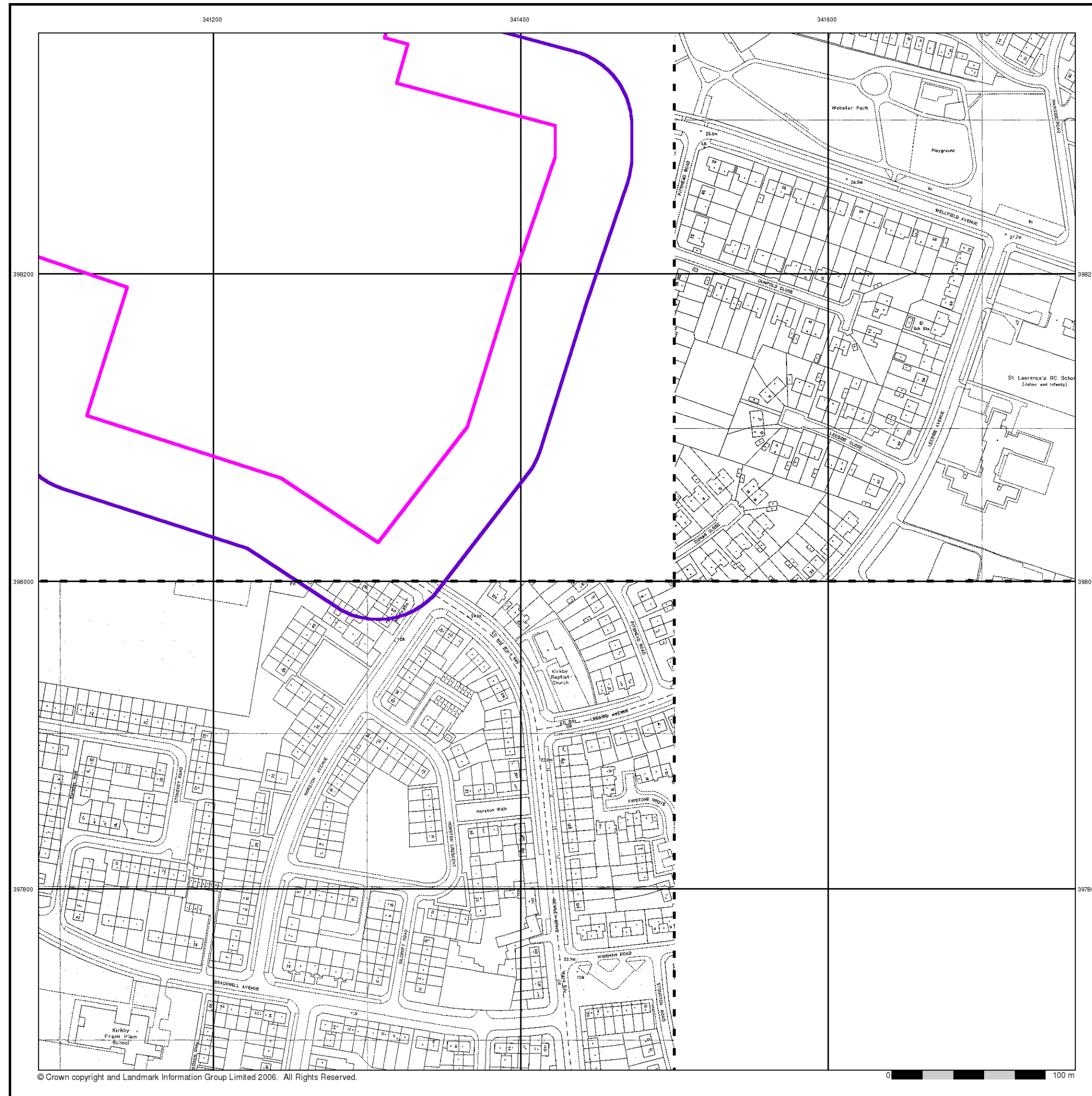
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360

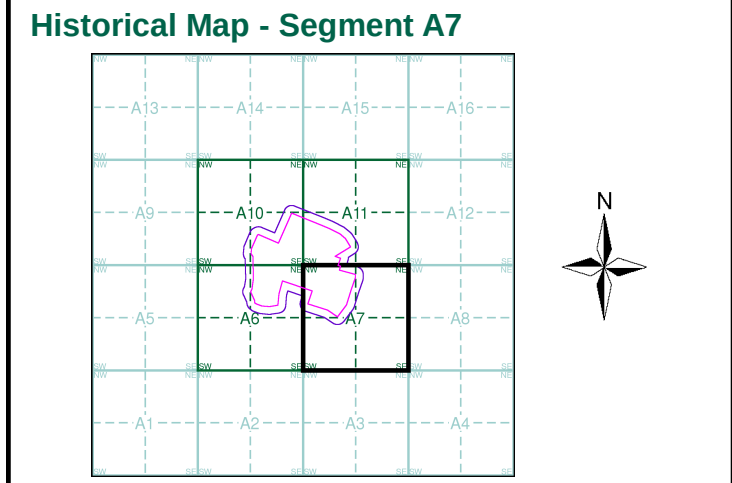
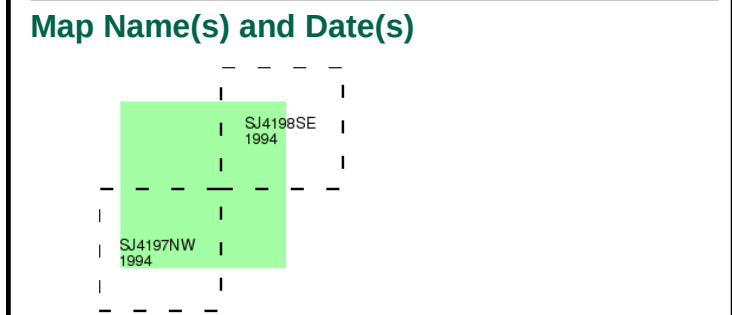




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Large-Scale National Grid Data
Published 1994
Source map scale - 1:1,250
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were 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.



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Sheet: A
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Site Details
Site at 341090, 398360



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, Altitude at Trig. Station, Bench Mark, 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, County Borough Boundary (England), County Borough Boundary (Scotland), Boundary Post or Stone, Police Call Box, Bridle Road, Pump, Electricity Pylon, Signal Post, Foot Bridge, Sluice, Foot Path, Spring, Guide Post or Board, Telephone Call Box, Mile Stone, Trough, Mooring Post or Ring, Well

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

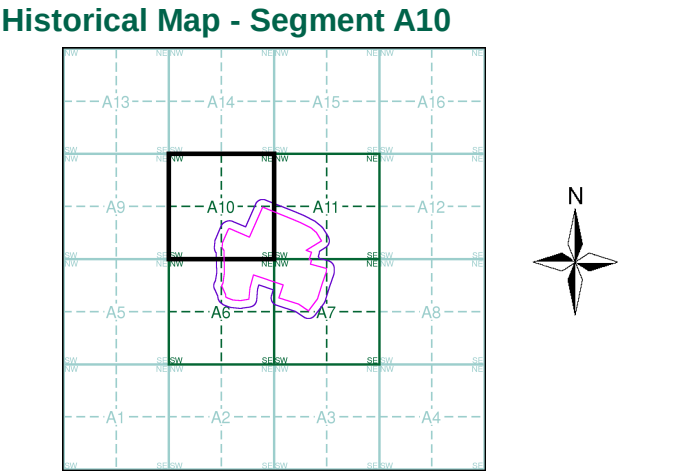
Inactive Quarry, Chalk Pit or Clay Pit, Active Quarry, Chalk Pit or Clay Pit, Rock, Boulders, Slopes, Top, Cliff, Roofed Building, Glazed Roof Building, Sloping Masonry, Archway, Non-Coniferous Tree (surveyed), Coniferous Tree (surveyed), Non-Coniferous Trees (not surveyed), Coniferous Trees (not surveyed), 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, Electricity Transmission Line, County Boundary (Geographical), County & Civil Parish Boundary, Civil Parish Boundary, Admin. County or County Bor. Boundary, London Borough Boundary, Symbol marking point where boundary mereing changes, Beer House, Pillar, Pole or Post, Boundary Post or Stone, Post Office, Capstan, Crane, Public Convenience, Chimney, Public House, Drinking Fountain, Pump, Electricity Pillar or Post, Signal Box or Bridge, Fire Alarm Pillar, Signal Post or Light, Foot Bridge, Spring, Guide Post, Tank or Track, Hydrant or Hydraulic, Telephone Call Box, Level Crossing, Telephone Call Post, Manhole, Trough, Mile Post or Mooring Post, Water Point, Water Tap, Mile Stone, Well, Normal Tidal Limit, 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), 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), Barracks, Pillar, Pole or Post, Battery, Post Office, Cemetery, Public Convenience, Chimney, Pump, Cistern, Pumping Station, Dismtd Rly, Place of Worship, Electricity Generating Station, Sewage Ppg Sta, Sewage Pumping Station, Electricity Pole, Pillar, Signal Box or Bridge, Electricity Sub Station, Signal Post or Light, Filter Bed, Spring, Fountain / Drinking Ftn., Tank or Track, Gas Valve Compound, Trough, Gas Governor, Wind Pump, Guide Post, Water Point, Water Tap, Manhole, Works (building or area), Mile Post or Mile Stone, Well

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Table with 4 columns: Mapping Type, Scale, Date, Pg. Rows include Lancashire And Furness (1:2,500, 1891-1893, 2), Ordnance Survey Plan (1:2,500, 1962, 6), Additional SIMs (1:1,250, 1971-1989, 10), Large-Scale National Grid Data (1:1,250, 1993, 12), etc.



Order Details: Order Number: 20523631_1_1, Customer Ref: 021706, National Grid Reference: 341080, 398330, Sheet: A, Site Area (Ha): 27.67, Search Buffer (m): 50. Site Details: Site at 341090, 398360.

LANDMARK Information Group. Tel: 0870 850 6670, Fax: 0870 850 6671, Web: www.envirocheck.co.uk

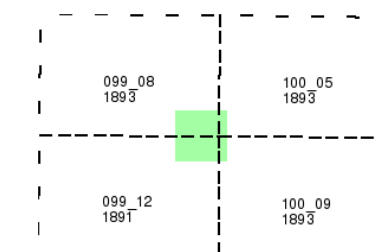
Lancashire And Furness

Published 1891 - 1893

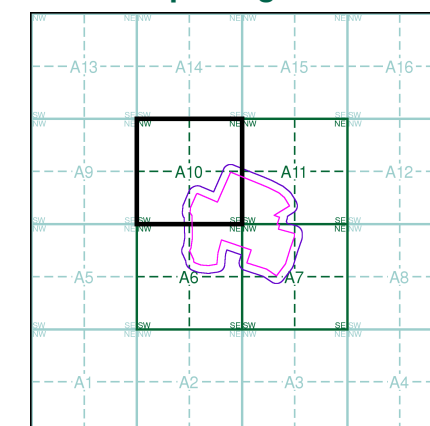
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A10

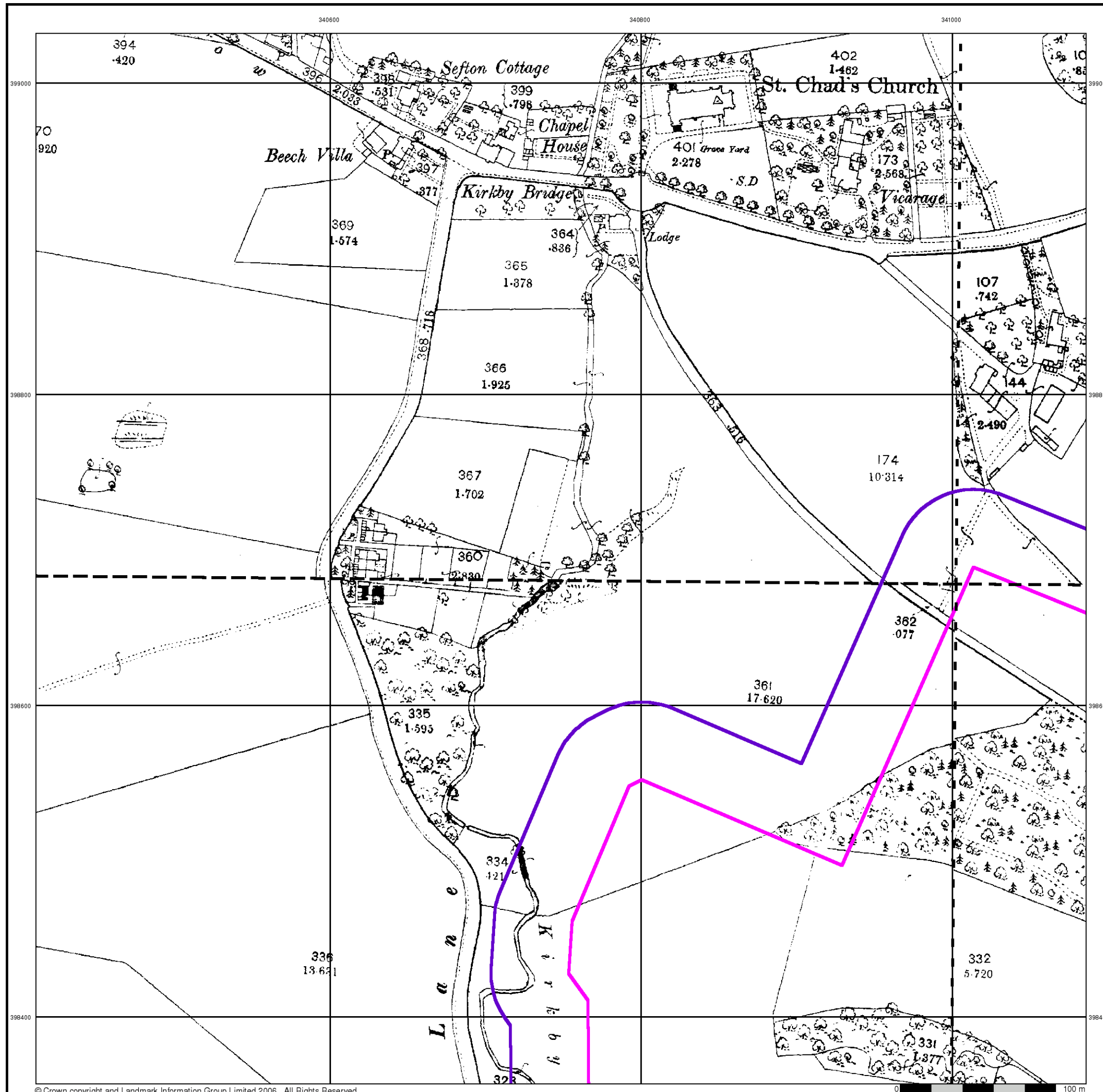


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



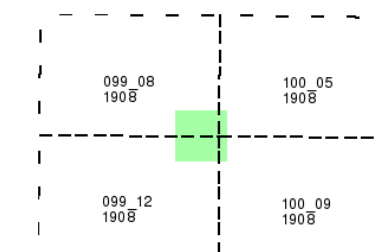
Lancashire And Furness

Published 1908

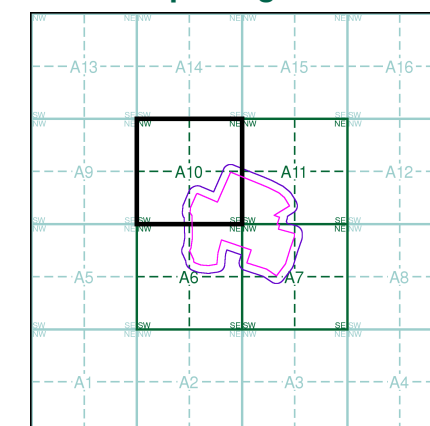
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A10

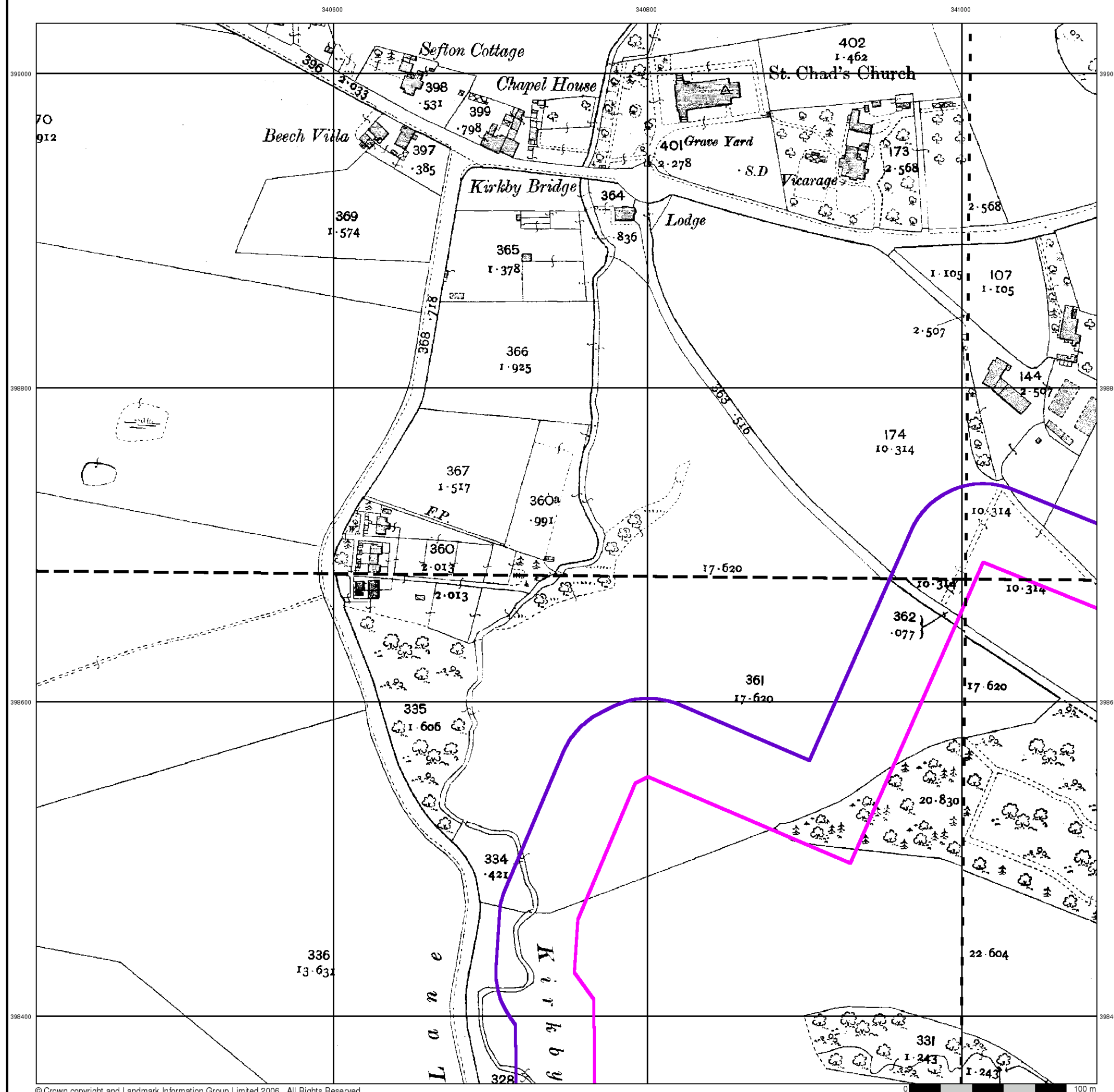


Order Details

Order Number: 20523631_1_1
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 Sheet: A
 Site Area (Ha): 27.67
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Site Details

Site at 341090, 398360



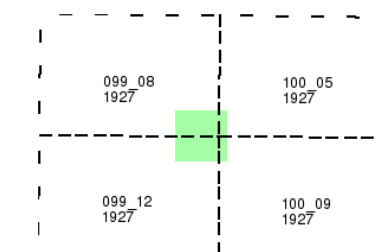
Lancashire And Furness

Published 1927

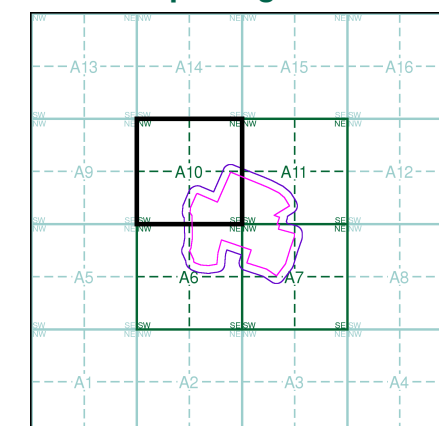
Source map scale - 1:2,500

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 A10

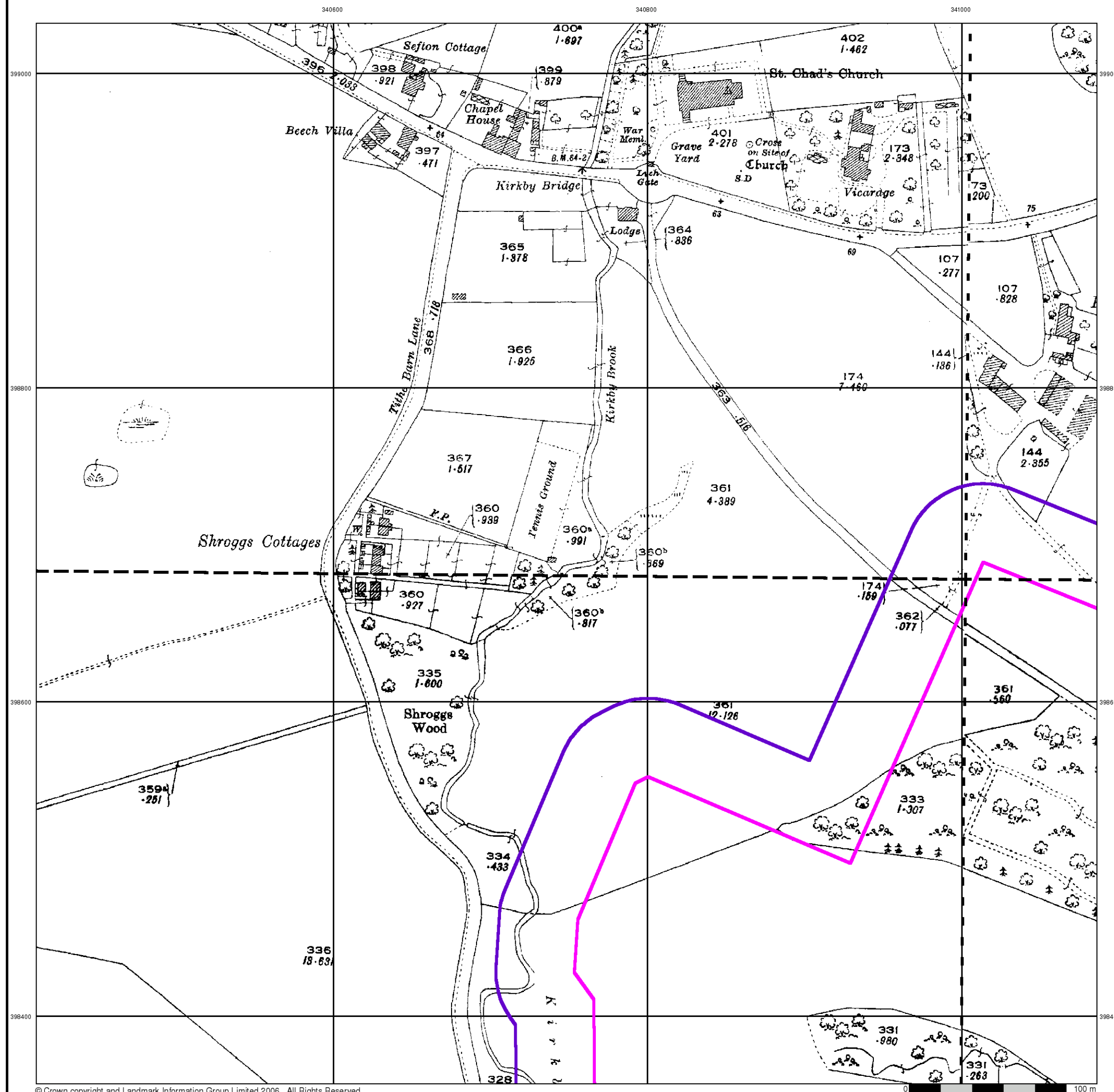


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



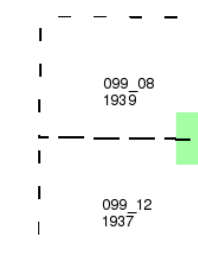
Lancashire And Furness

Published 1937 - 1939

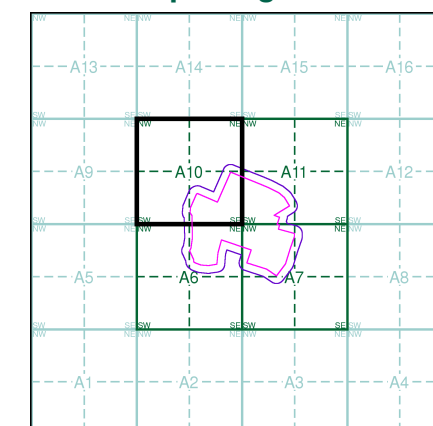
Source map scale - 1:2,500

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 A10

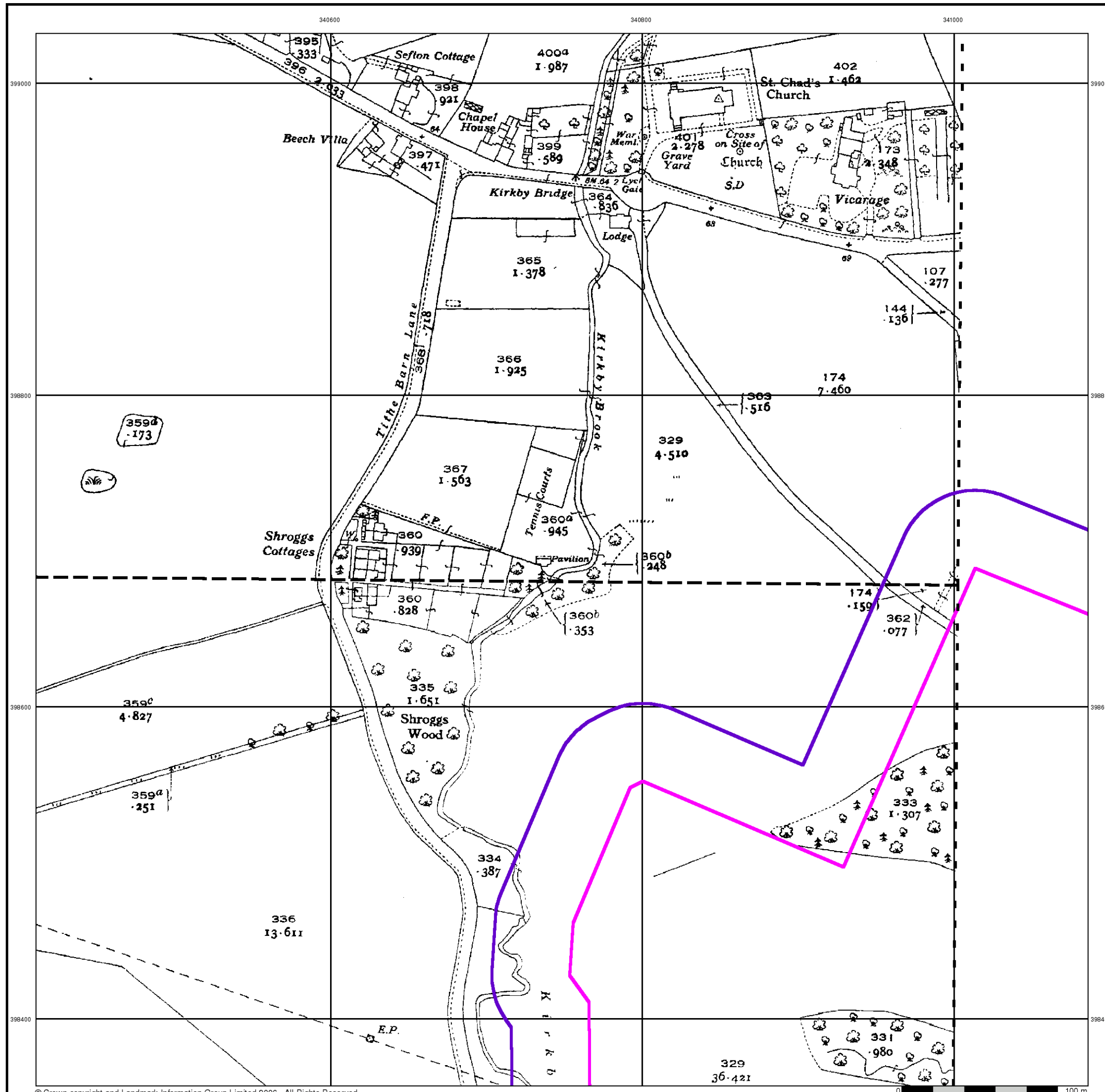


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1962

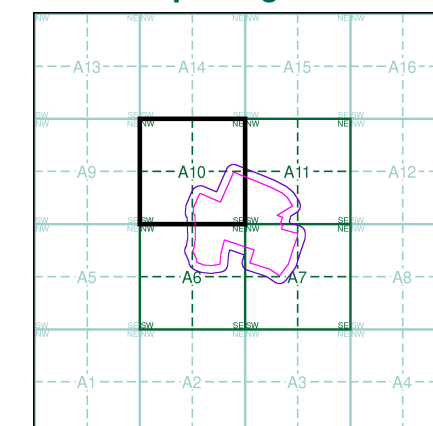
Source map scale - 1:2,500

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)

SJ4099 1962	SJ4199 1962
SJ4098 1962	SJ4198 1962

Historical Map - Segment A10

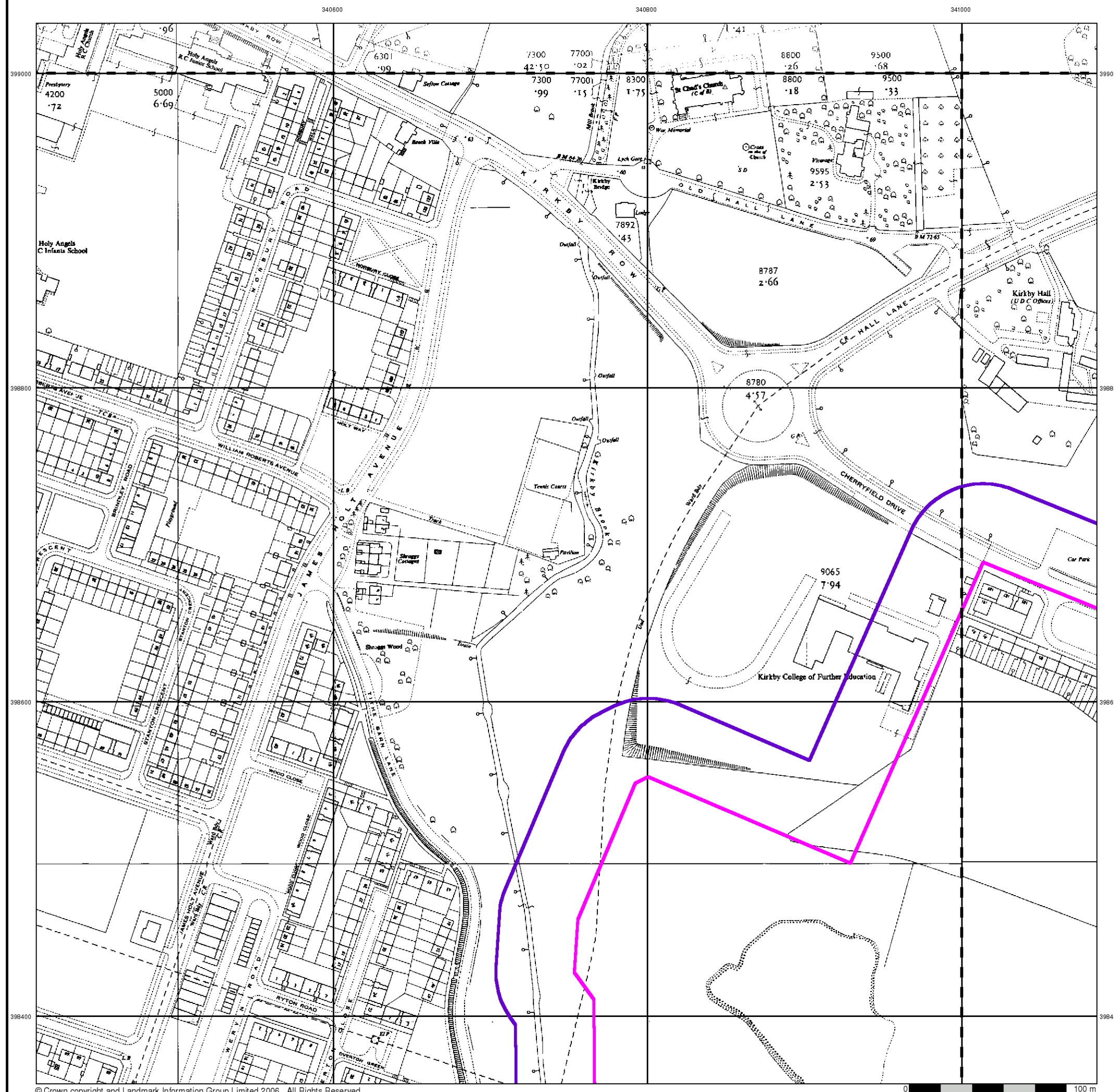


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1961 - 1962

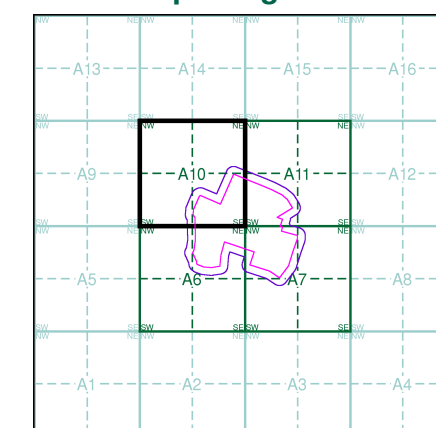
Source map scale - 1:1,250

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)

SJ4099SW 1962	SJ4099SE 1962	SJ4199SW 1962
SJ4098NW 1961	SJ4098NE 1961	SJ4198NW 1961
SJ4098SE 1961	SJ4198SW 1961	

Historical Map - Segment A10

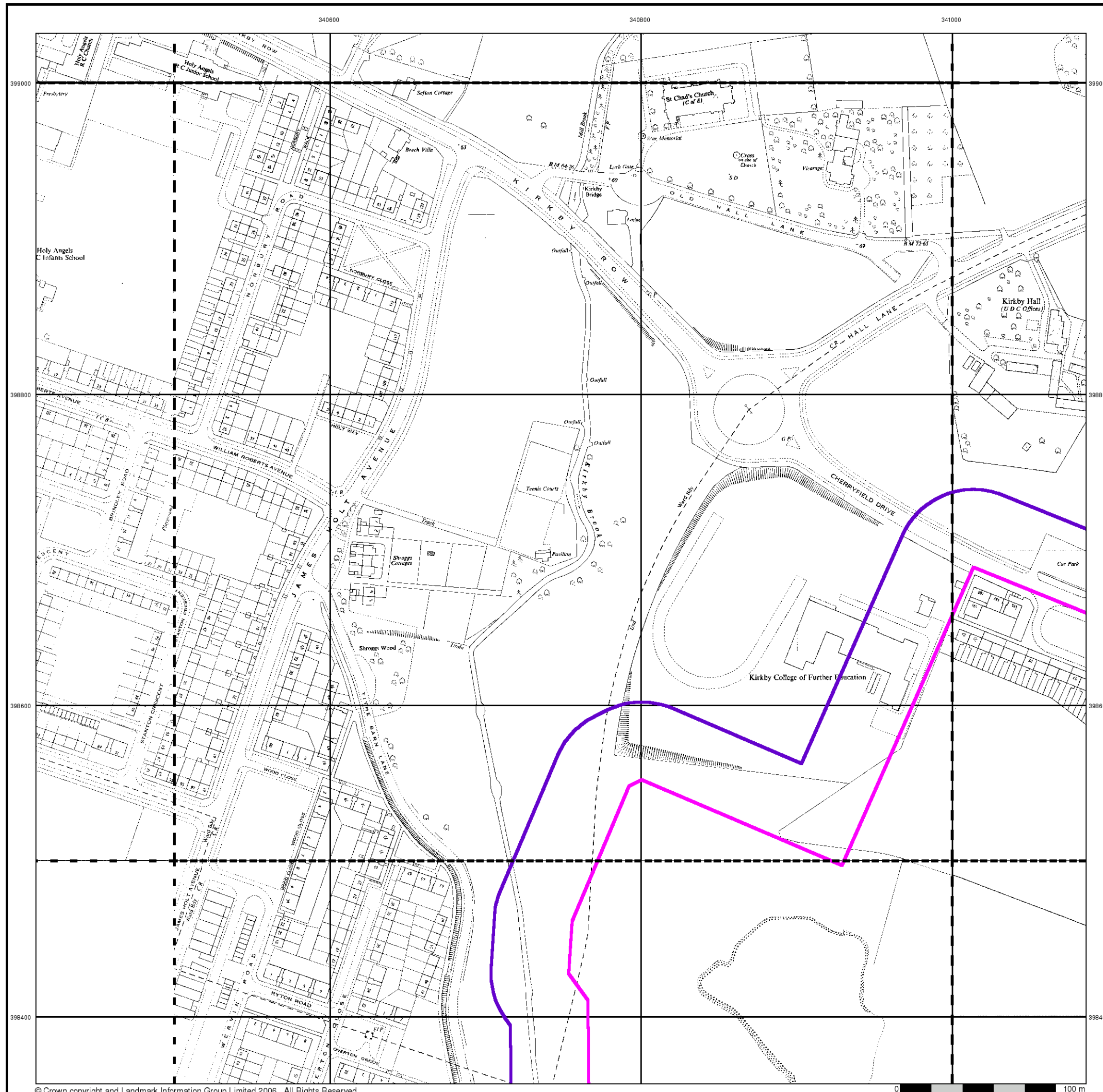


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
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 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1966 - 1977

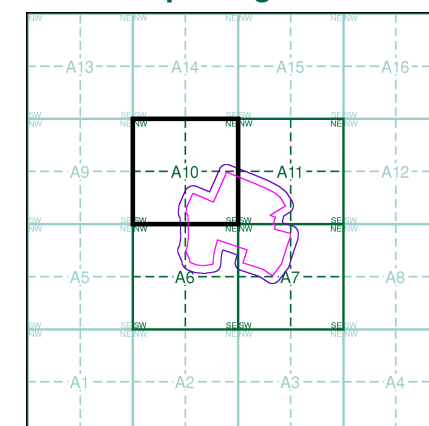
Source map scale - 1:1,250

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)

SJ4099SW 1968	SJ4099SE 1968	SJ4199SW 1966
SJ4098NW 1971	SJ4098NE 1971	SJ4198NW 1977
SJ4098SW 1974	SJ4098SE 1971	SJ4198SW 1975

Historical Map - Segment A10

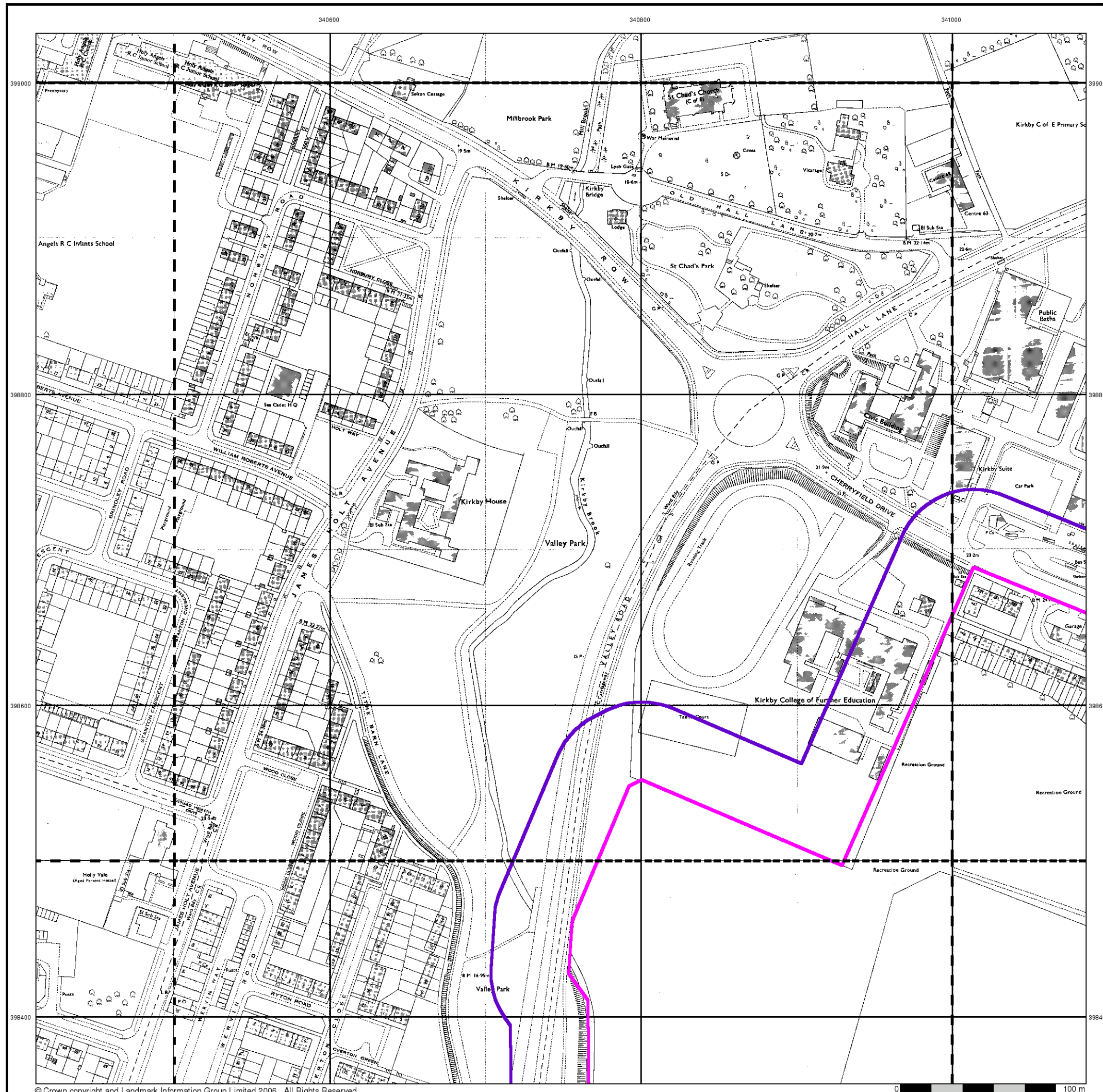


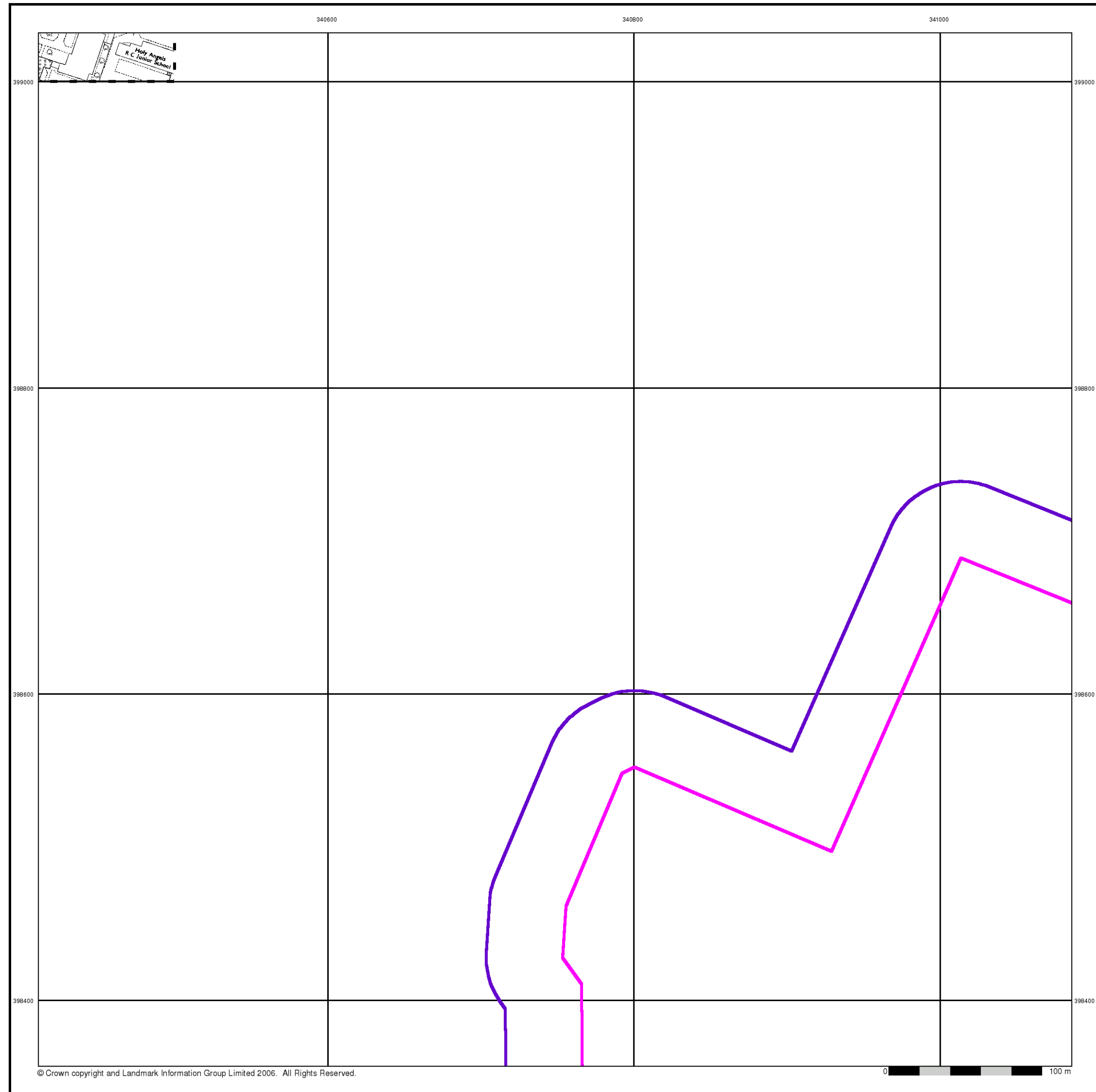
Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360





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Ordnance Survey Plan

Published 1975

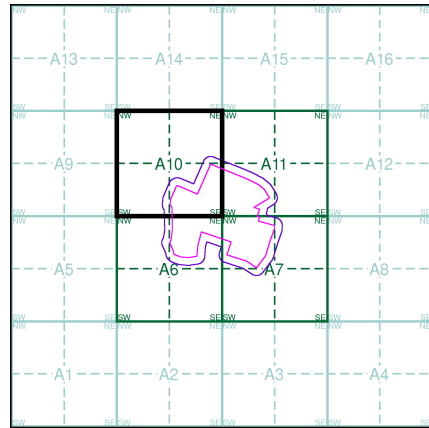
Source map scale - 1:1,250

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

Map Name(s) and Date(s)

SJ4099SW
1975

Historical Map - Segment A10



Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	50

Site Details

Site at 341090, 398360

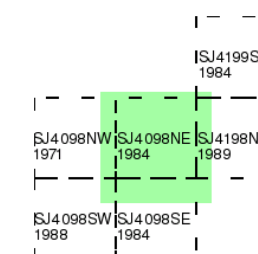
Additional SIMs

Published 1971 - 1989

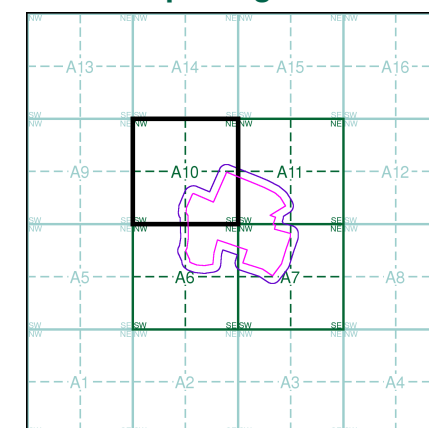
Source map scale - 1:1,250

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 1991, 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 A10

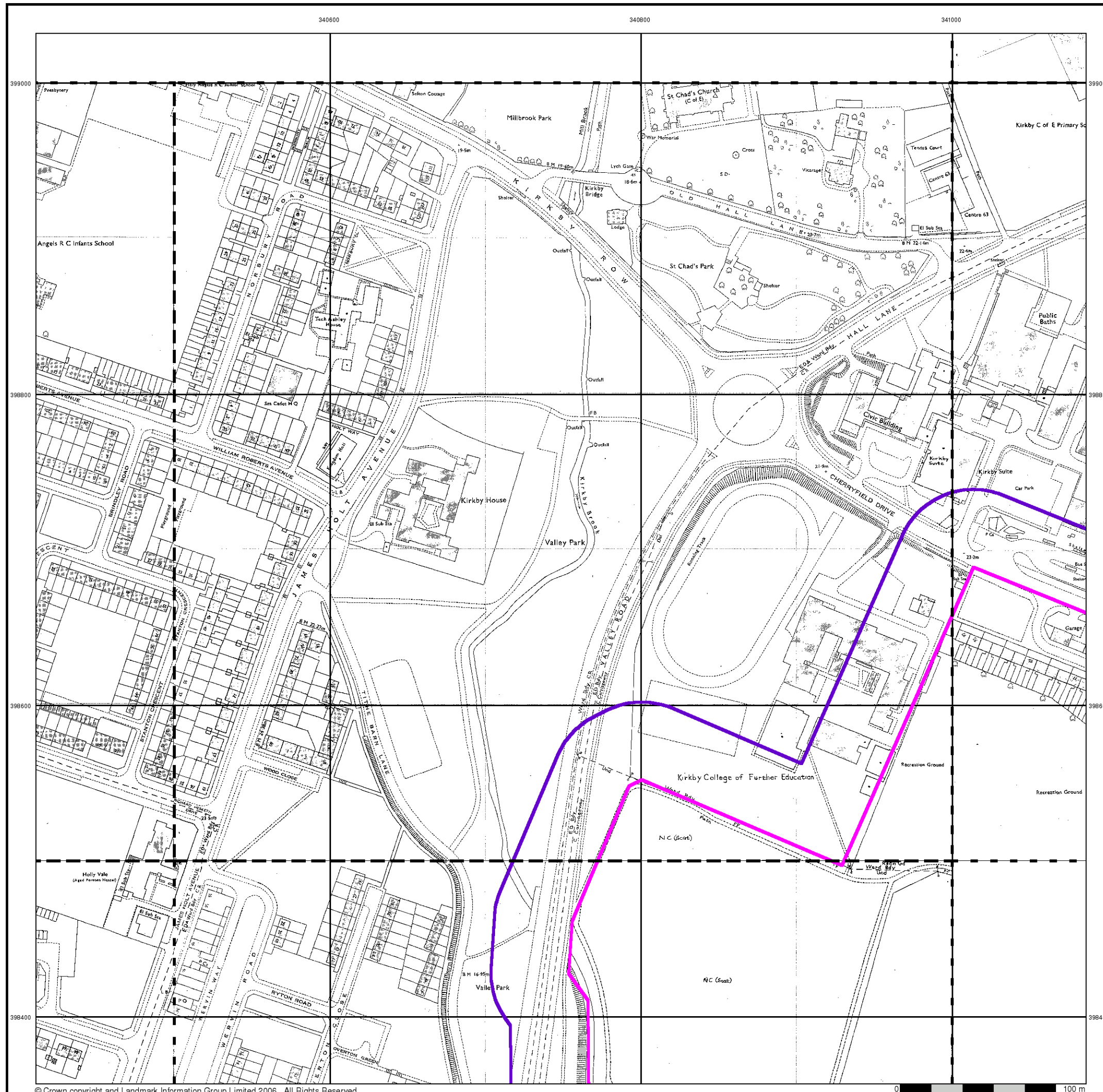


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



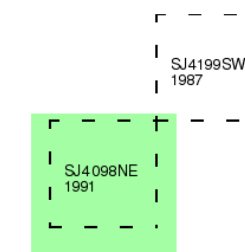
Additional SIMs

Published 1987 - 1991

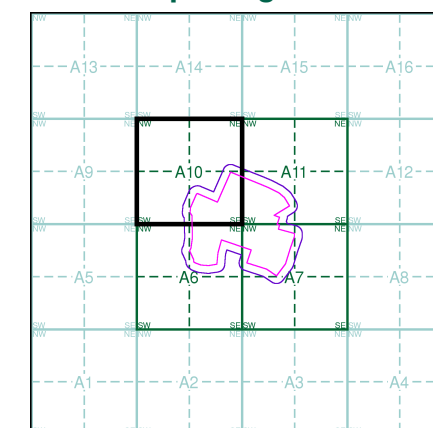
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, 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 A10

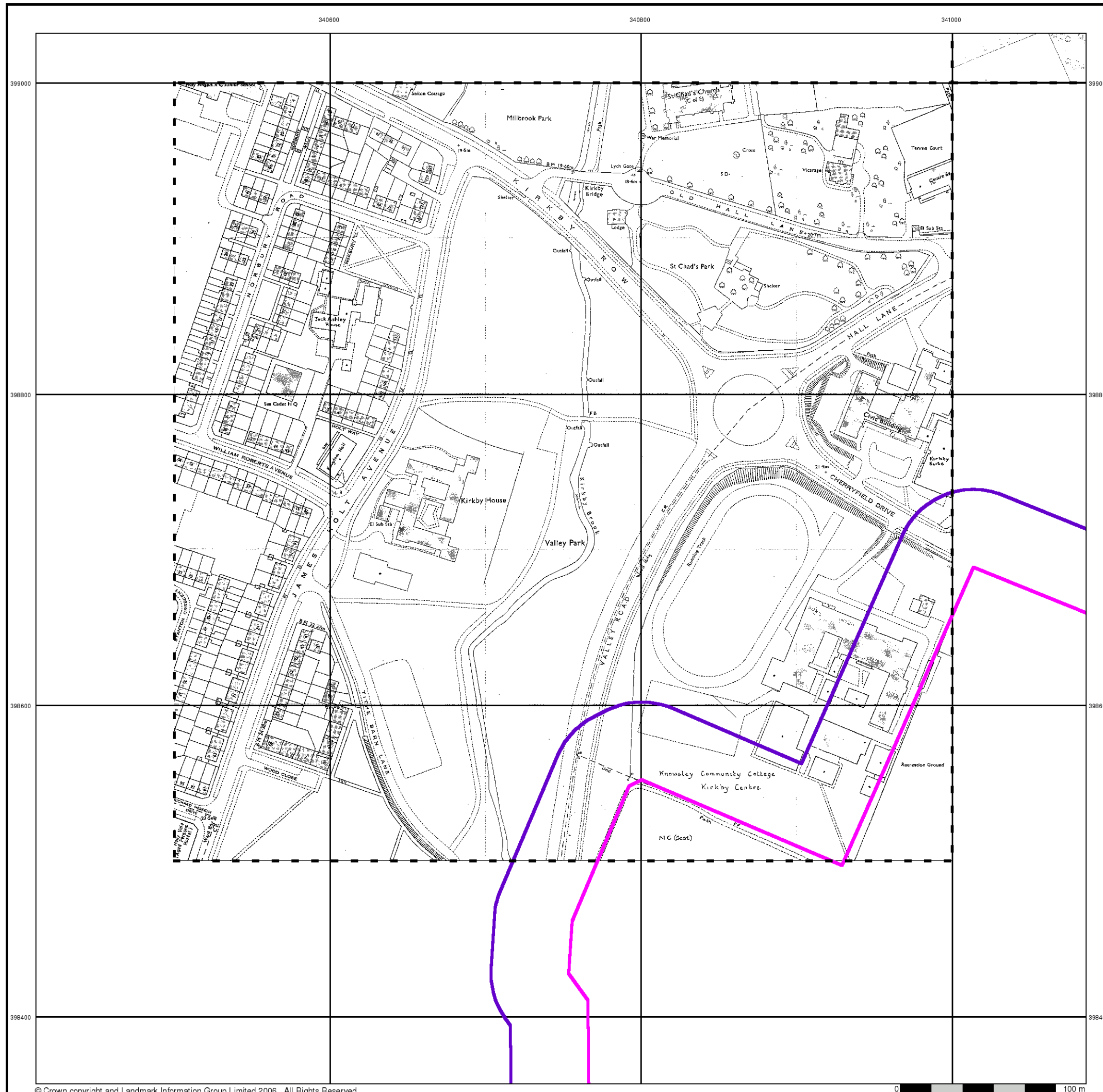


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Large-Scale National Grid Data

Published 1993

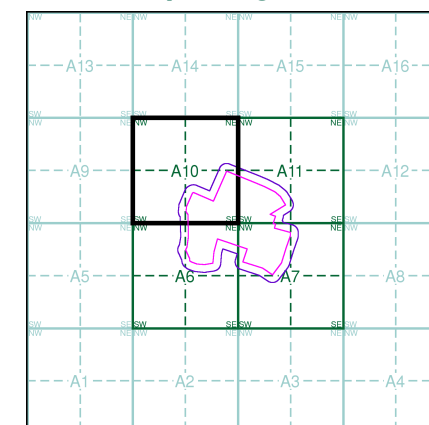
Source map scale - 1:1,250

'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)

SJ4099SW 1993	SJ4099SE 1993	SJ4199SW 1993
SJ4098NW 1993	SJ4098NE 1993	SJ4198NW 1993
SJ4098SW 1993	SJ4098SE 1993	SJ4198SW 1993

Historical Map - Segment A10

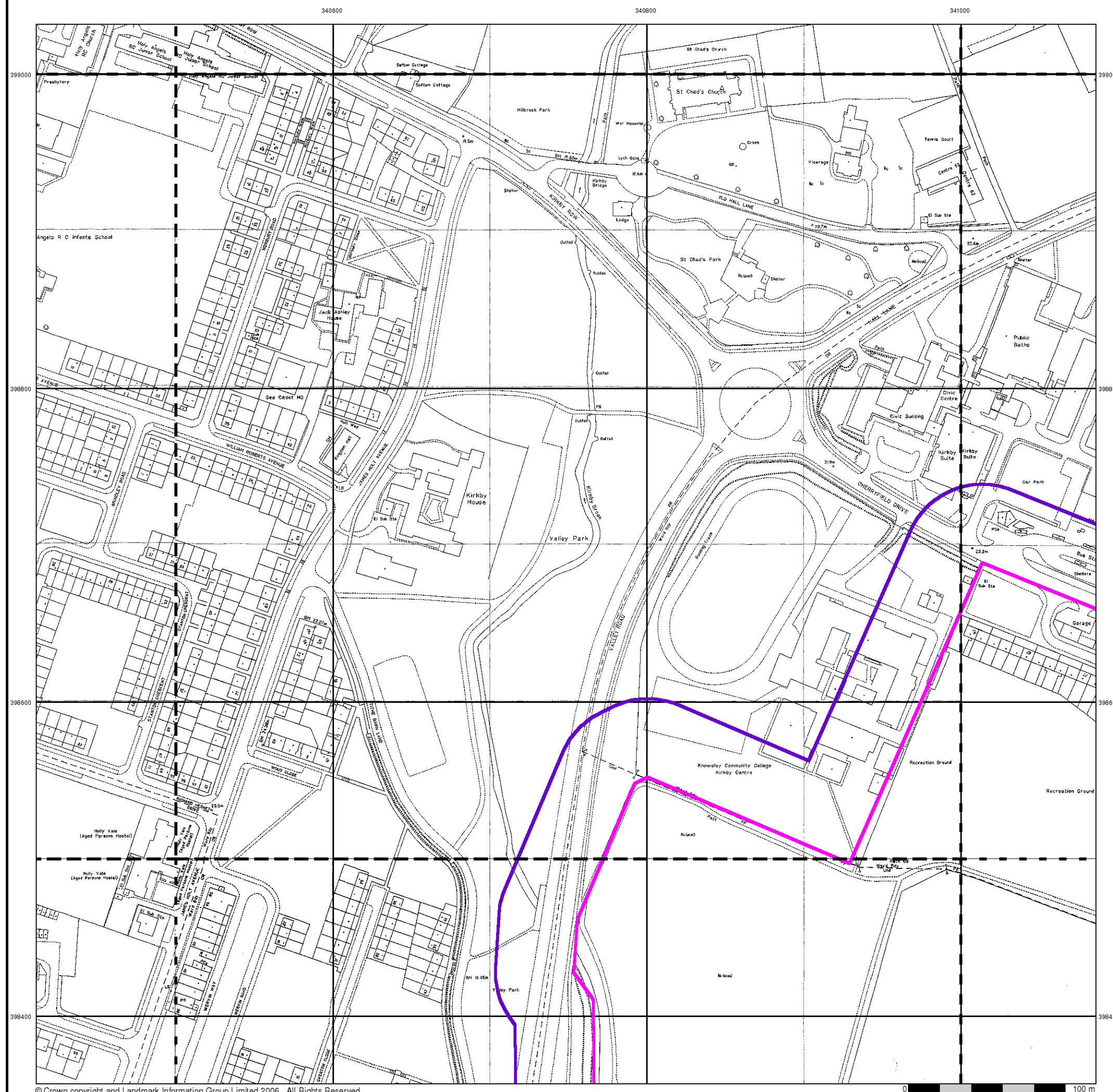


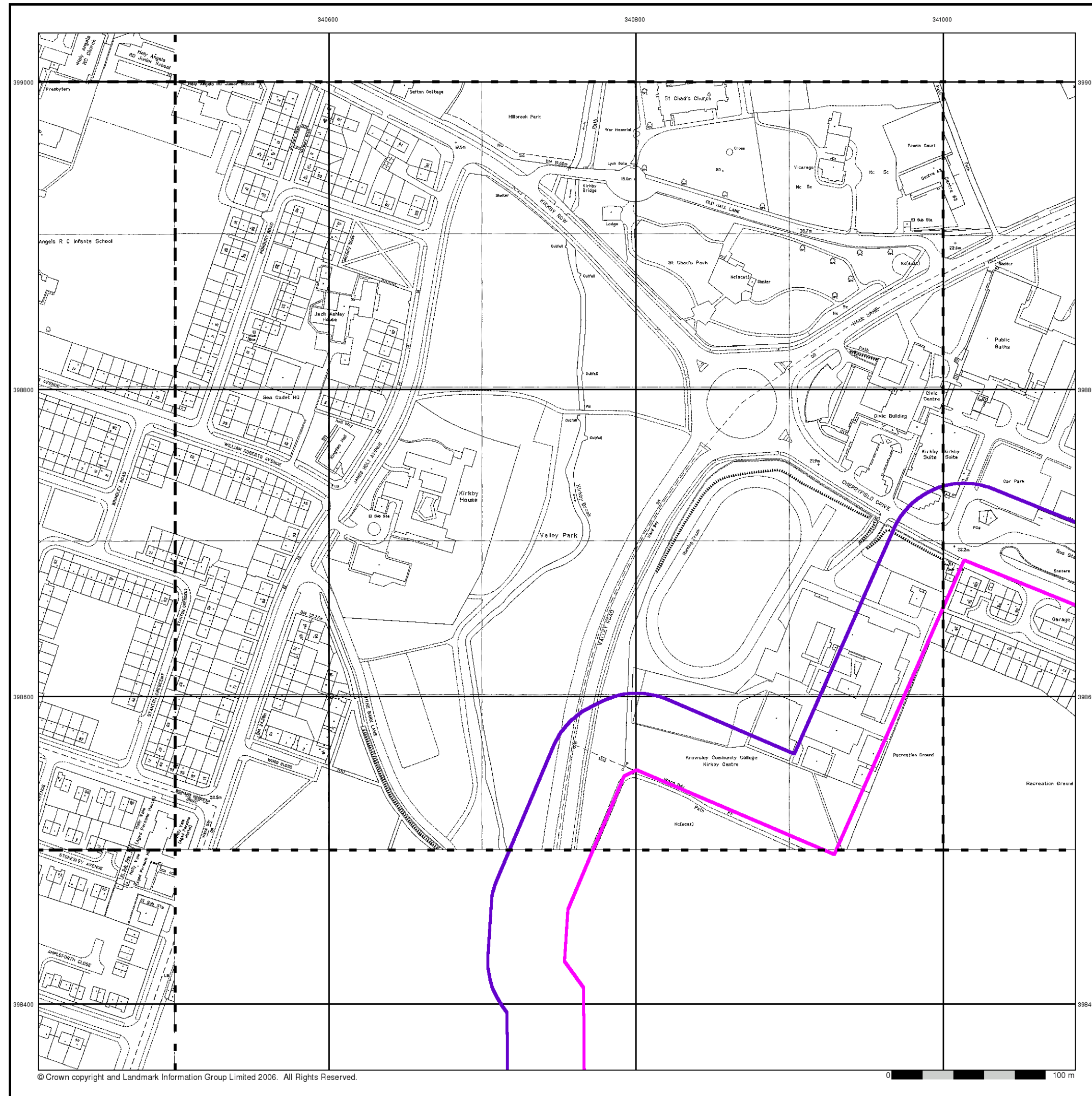
Order Details

Order Number: 20523631_1_1
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 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360





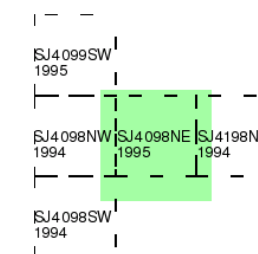
Large-Scale National Grid Data

Published 1994 - 1995

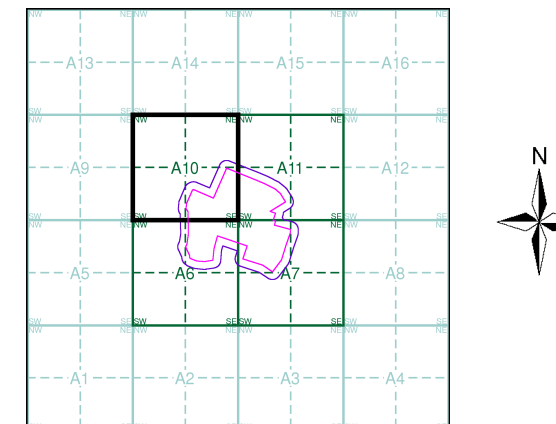
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A10

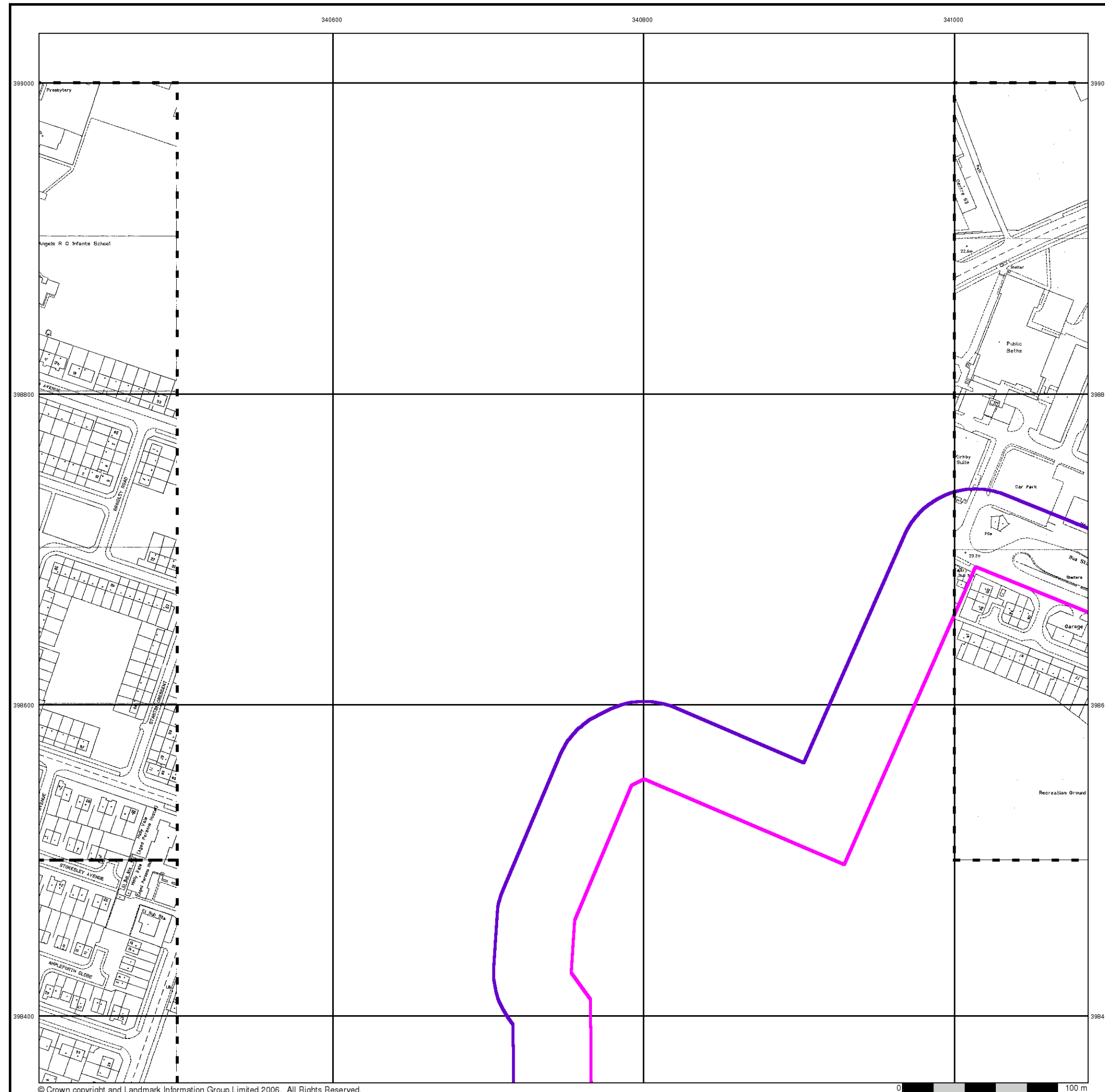


Order Details

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Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

Site at 341090, 398360



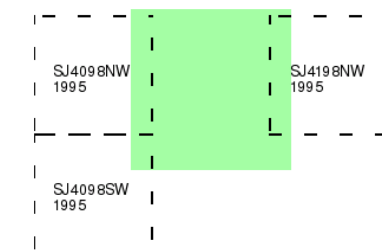
Large-Scale National Grid Data

Published 1995

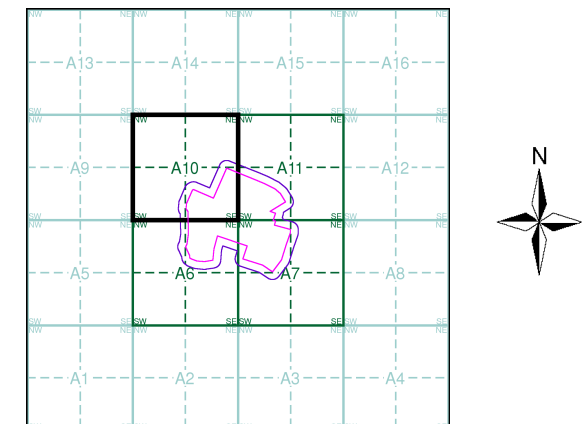
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

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National Grid Reference: 341080, 398330
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Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

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Tel: 0870 850 6670
Fax: 0870 850 6671
Web: www.envirocheck.co.uk

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, Altitude at Trig. Station, Bench Mark, 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, County Borough Boundary (England), County Borough Boundary (Scotland), Boundary Post or Stone, Police Call Box, Bridle Road, Pump, Electricity Pylon, Signal Post, Foot Bridge, Sluice, Foot Path, Spring, Guide Post or Board, Telephone Call Box, Mile Stone, Trough, Mooring Post or Ring, 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, Slopes, Top, Cliff, 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, Electricity Transmission Line, County Boundary (Geographical), County & Civil Parish Boundary, Civil Parish Boundary, Admin. County or County Bor. Boundary, London Borough Boundary, Symbol marking point where boundary mereing changes, Beer House, Pillar, Pole or Post, Boundary Post or Stone, Post Office, Capstan, Crane, Public Convenience, Chimney, Public House, Drinking Fountain, Pump, Electricity Pillar or Post, Signal Box or Bridge, Fire Alarm Pillar, Signal Post or Light, Foot Bridge, Spring, Guide Post, Tank or Track, Hydrant or Hydraulic, Telephone Call Box, Level Crossing, Telephone Call Post, Manhole, Trough, Mile Post or Mooring Post, Water Point, Water Tap, Mile Stone, Well, Normal Tidal Limit, Wind Pump

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

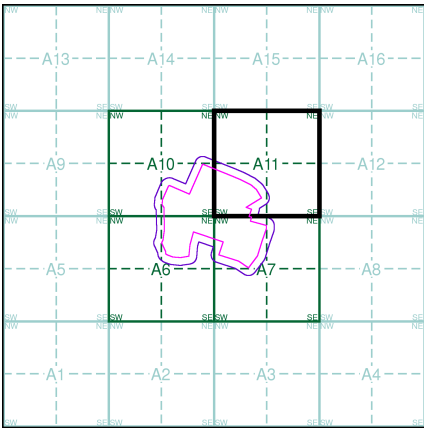
Slopes, Top, Cliff, Rock, Rock (scattered), Boulders, Boulders (scattered), Positioned Boulder, Scree, Non-Coniferous Tree (surveyed), Coniferous Tree (surveyed), Non-Coniferous Trees (not surveyed), Coniferous Trees (not surveyed), Orchard Tree, Scrub, Bracken, Coppice, Osier, Reeds, Marsh, Saltings, Rough Grassland, Heath, Culvert, Direction of water flow, Triangulation Station, Antiquity (site of), 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), Barracks, Pillar, Pole or Post, Battery, Post Office, Cemetery, Public Convenience, Chimney, Pump, Cistern, Pumping Station, Dismtd Rly, Place of Worship, Electricity Generating Station, Sewage Ppg Sta, Sewage Pumping Station, Electricity Pole, Pillar, Signal Box or Bridge, Electricity Sub Station, Signal Post or Light, Filter Bed, Spring, Fountain / Drinking Ftn., Tank or Track, Gas Valve Compound, Trough, Gas Governor, Wind Pump, Guide Post, Water Point, Water Tap, Manhole, Works (building or area), Mile Post or Mile Stone, Well



Ordnance Survey mapping included:

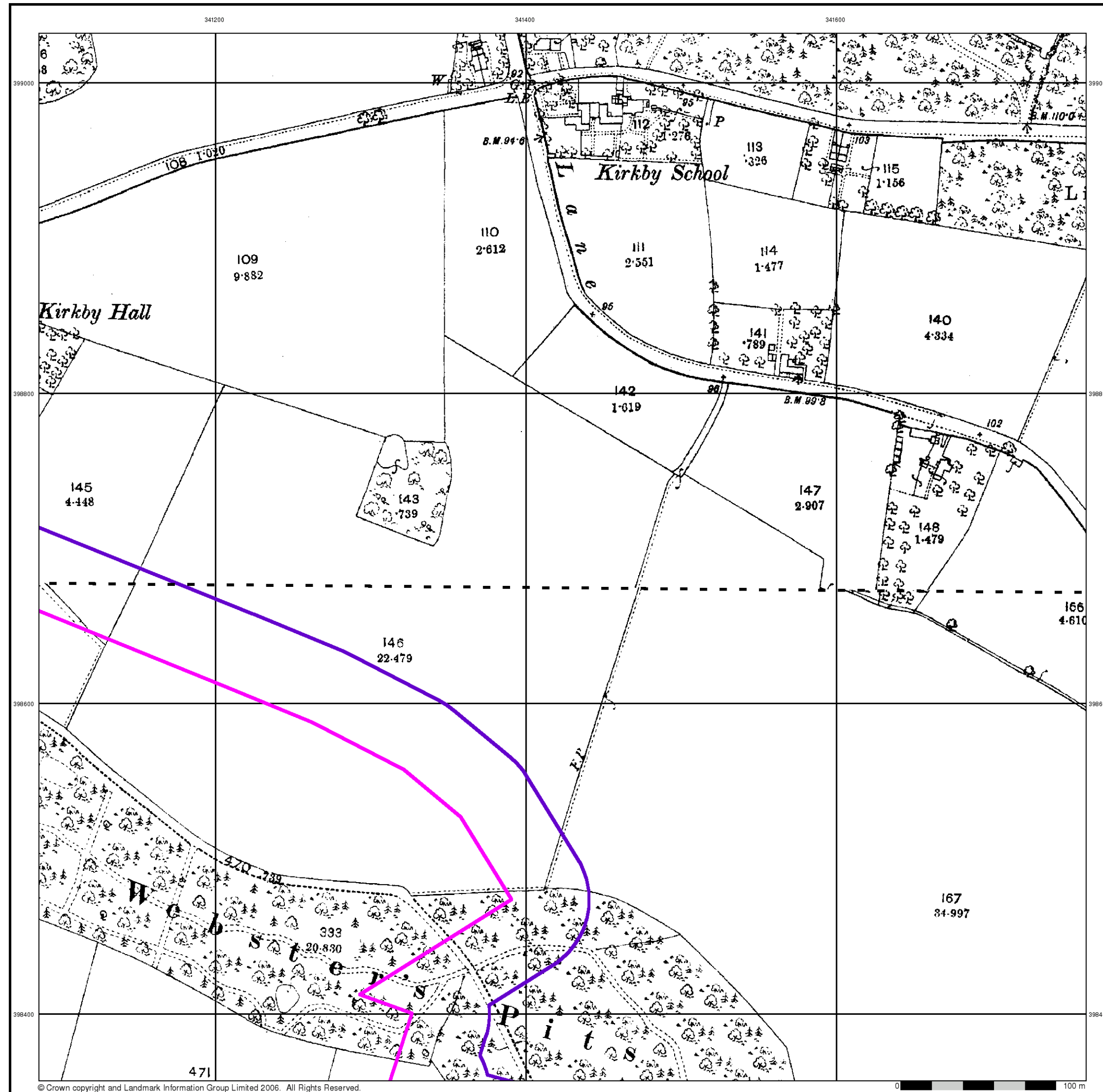
Mapping Type	Scale	Date	Pg
Lancashire And Furness	1:2,500	1893	2
Lancashire And Furness	1:2,500	1908	3
Lancashire And Furness	1:2,500	1927	4
Ordnance Survey Plan	1:2,500	1962	5
Ordnance Survey Plan	1:1,250	1961 - 1962	6
Ordnance Survey Plan	1:1,250	1966 - 1977	7
Additional SIMs	1:1,250	1984 - 1989	8
Additional SIMs	1:1,250	1986 - 1987	9
Large-Scale National Grid Data	1:1,250	1993	10
Large-Scale National Grid Data	1:1,250	1994	11
Large-Scale National Grid Data	1:1,250	1994 - 1995	12
Large-Scale National Grid Data	1:1,250	1995	13

Historical Map - Segment A11



Order Details
Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50
Site Details
Site at 341090, 398360

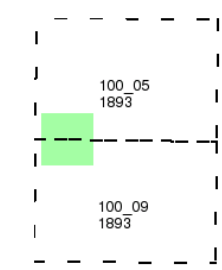
LANDMARK Information Group
Tel: 0870 850 6670
Fax: 0870 850 6671
Web: www.envirocheck.co.uk



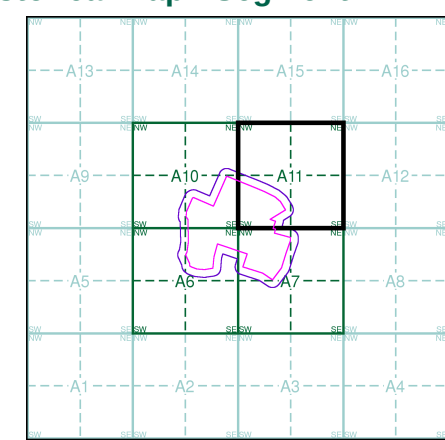
Lancashire And Furness
Published 1893
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	50

Site Details
Site at 341090, 398360

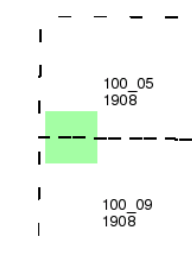
Lancashire And Furness

Published 1908

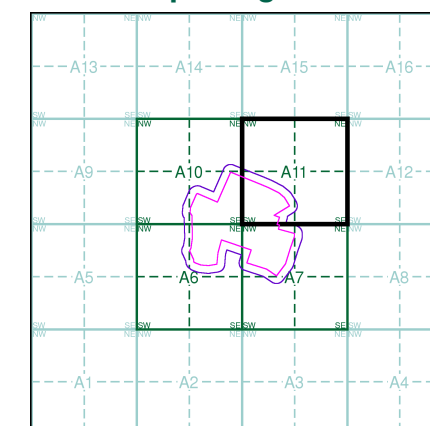
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A11

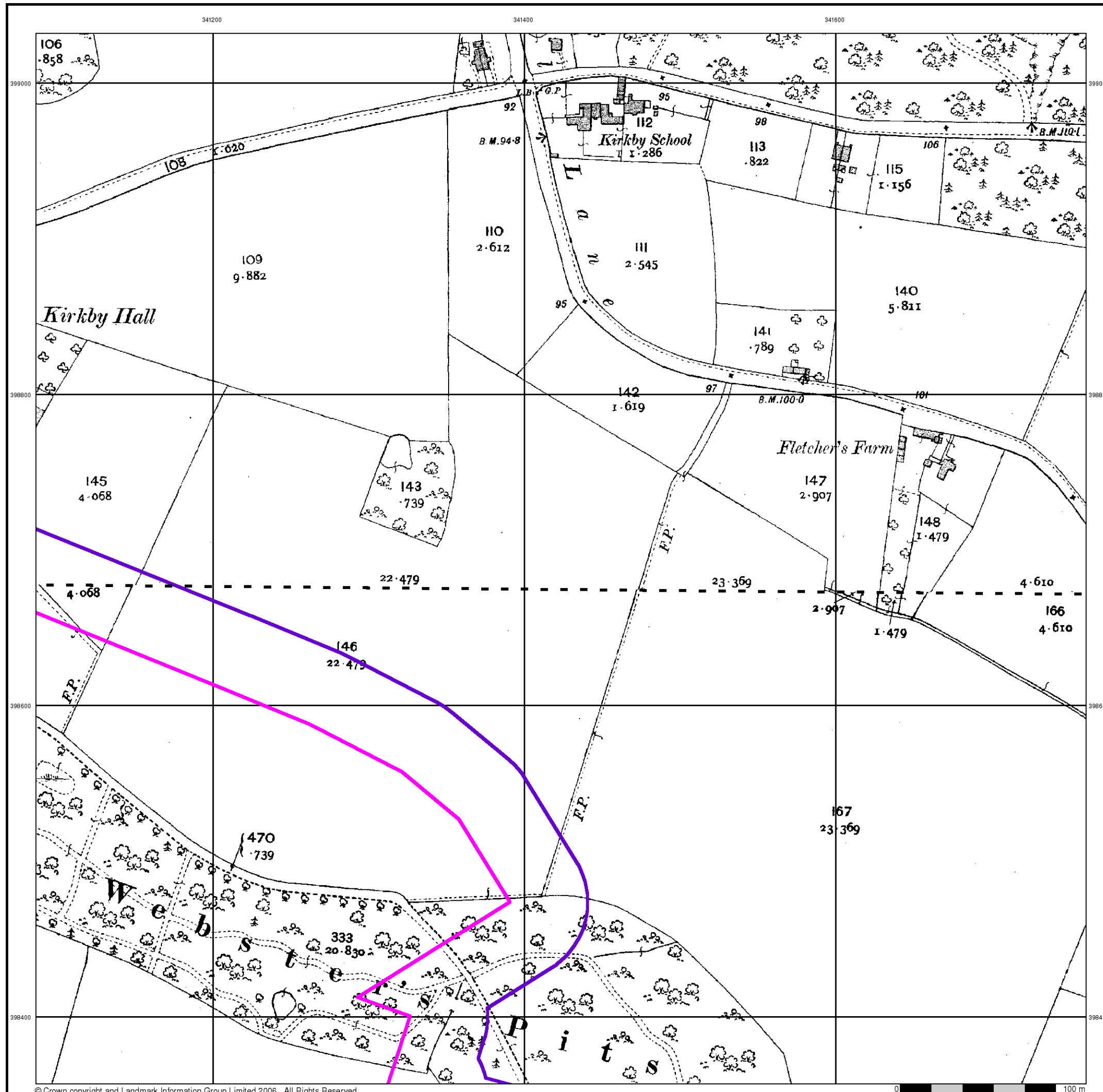


Order Details

Order Number: 20523631_1_1
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 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



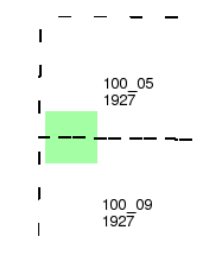
Lancashire And Furness

Published 1927

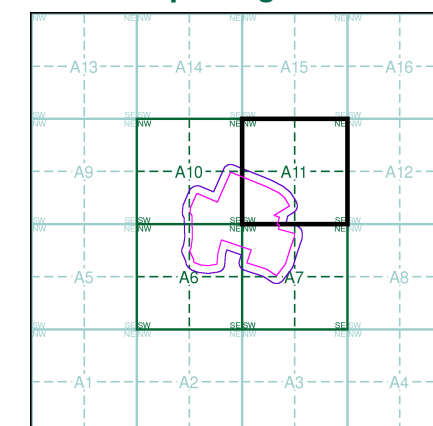
Source map scale - 1:2,500

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 A11

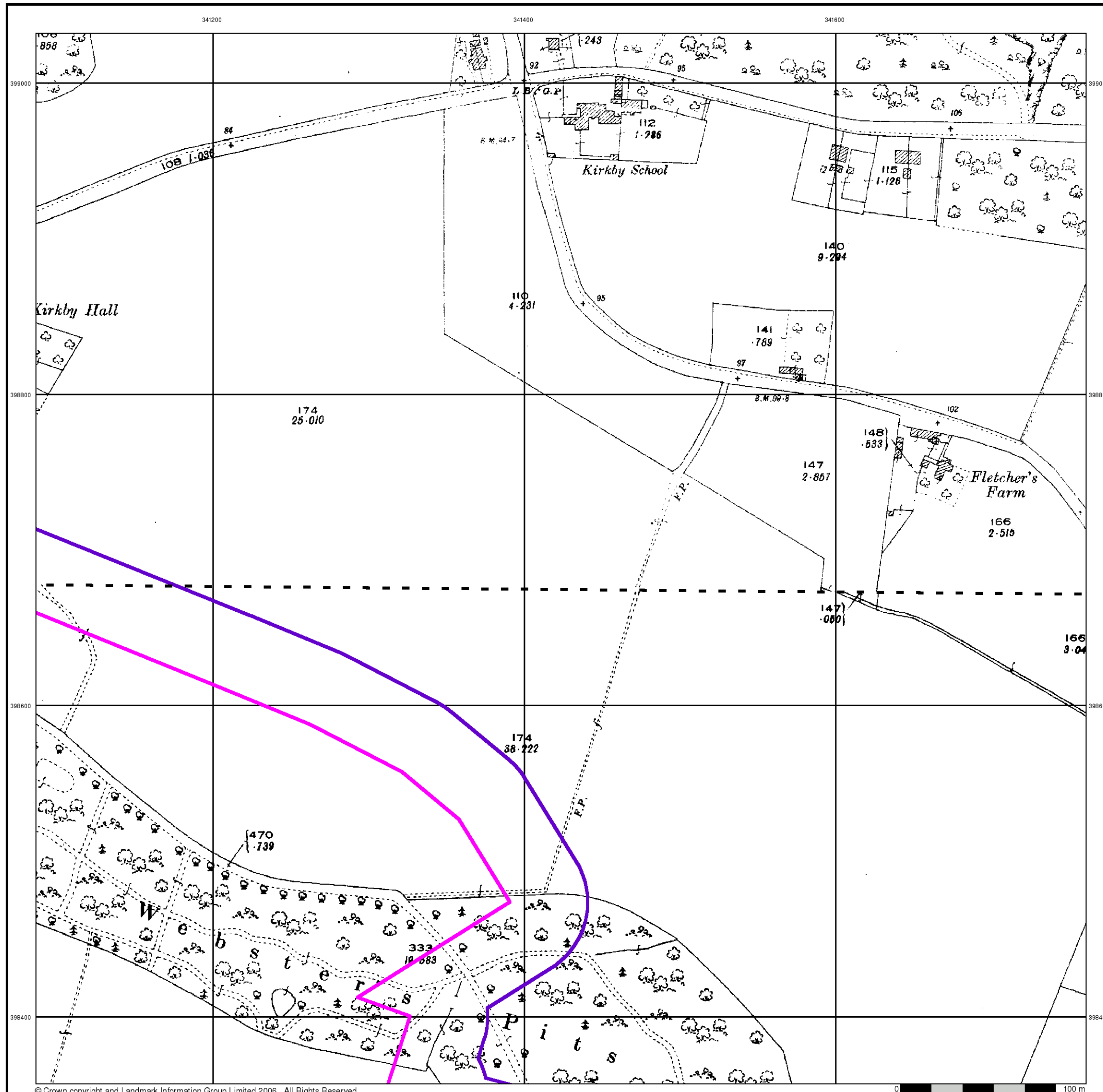


Order Details

Order Number: 20523631_1_1
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 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



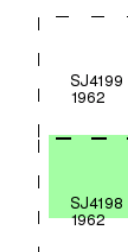
Ordnance Survey Plan

Published 1962

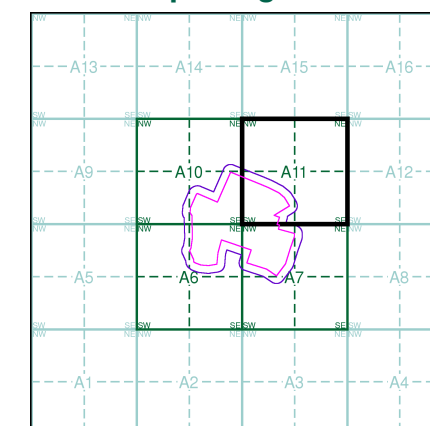
Source map scale - 1:2,500

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 A11

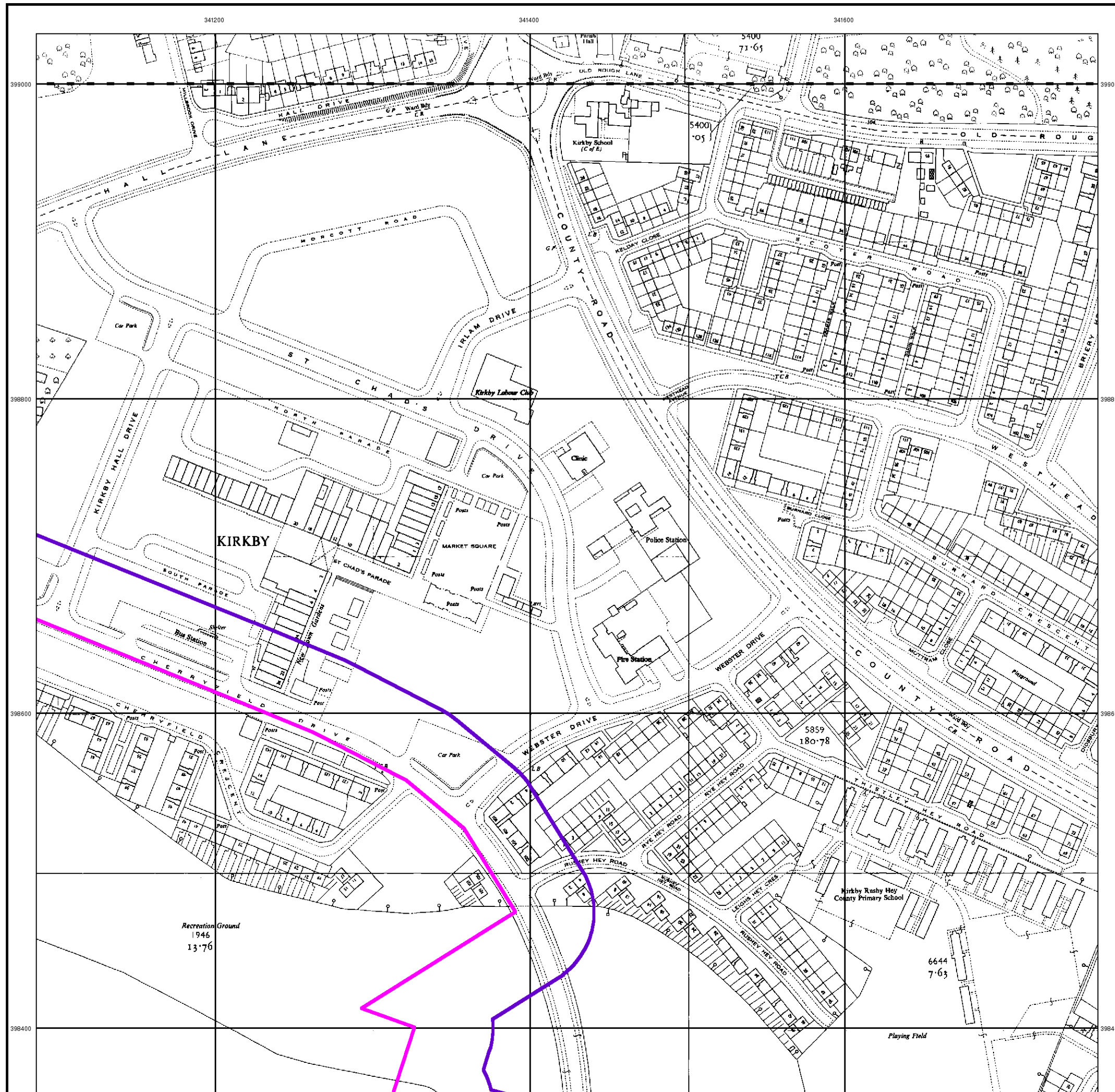


Order Details

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 Customer Ref: 021706
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 Sheet: A
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 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1961 - 1962

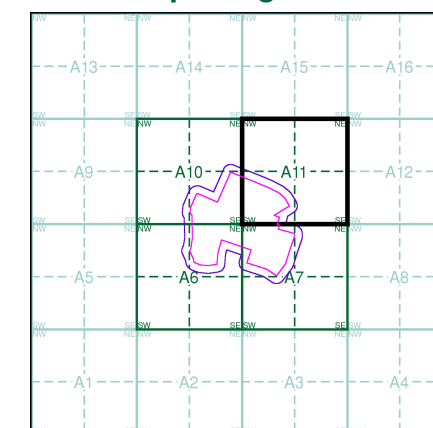
Source map scale - 1:1,250

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)

SJ4199SW	SJ4199SE
1962	1962
SJ4198NW	SJ4198NE
1961	1961
SJ4198SW	SJ4198SE
1961	1961

Historical Map - Segment A11

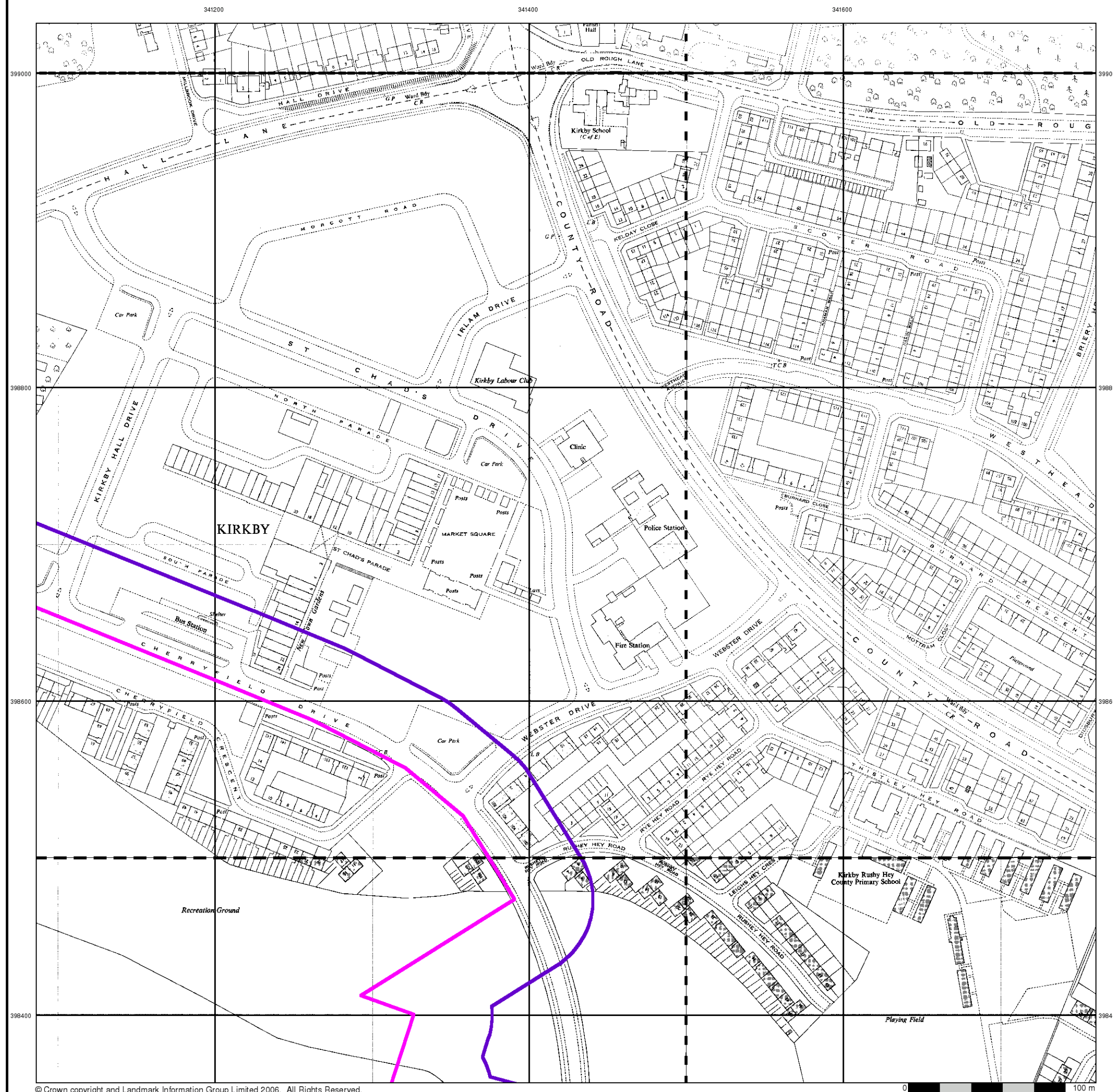


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



Ordnance Survey Plan

Published 1966 - 1977

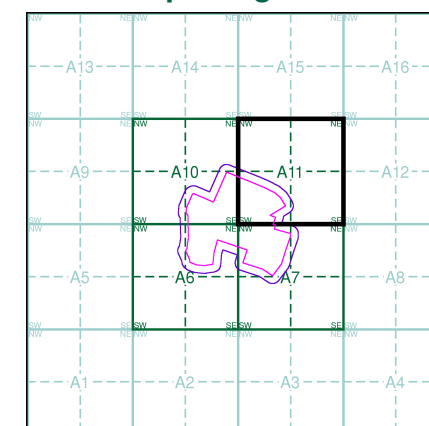
Source map scale - 1:1,250

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)

SJ4199SW	SJ4199SE
1966	1968
SJ4198NW	SJ4198NE
1977	1973
SJ4198SW	SJ4198SE
1975	1976

Historical Map - Segment A11



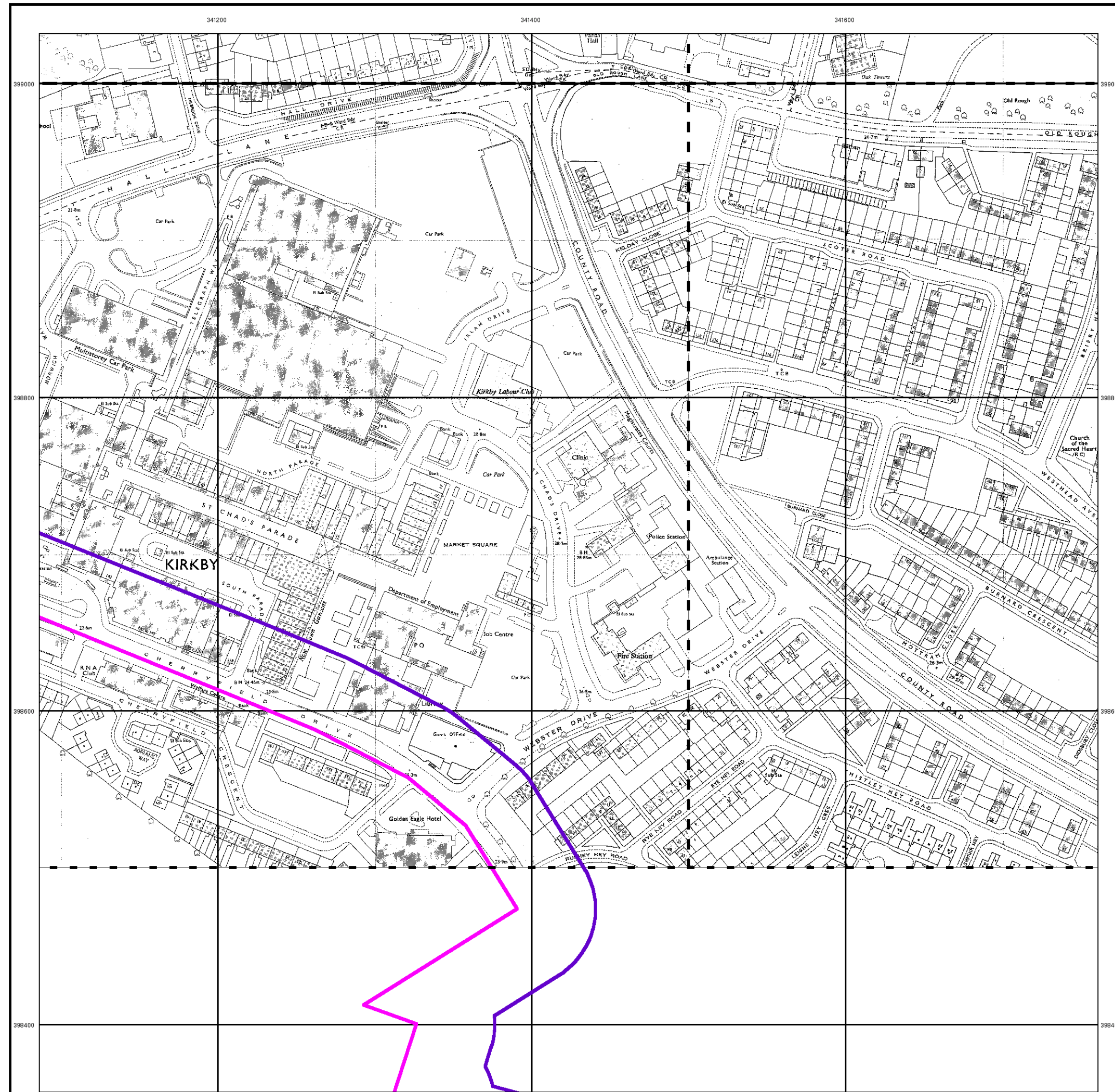
Order Details

Order Number: 20523631_1_1
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 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360





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Additional SIMs
Published 1984 - 1989
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 1991, 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)

SJ4199SW 1984	SJ4199SE 1984
SJ4198NW 1989	SJ4198NE 1984

Historical Map - Segment A11

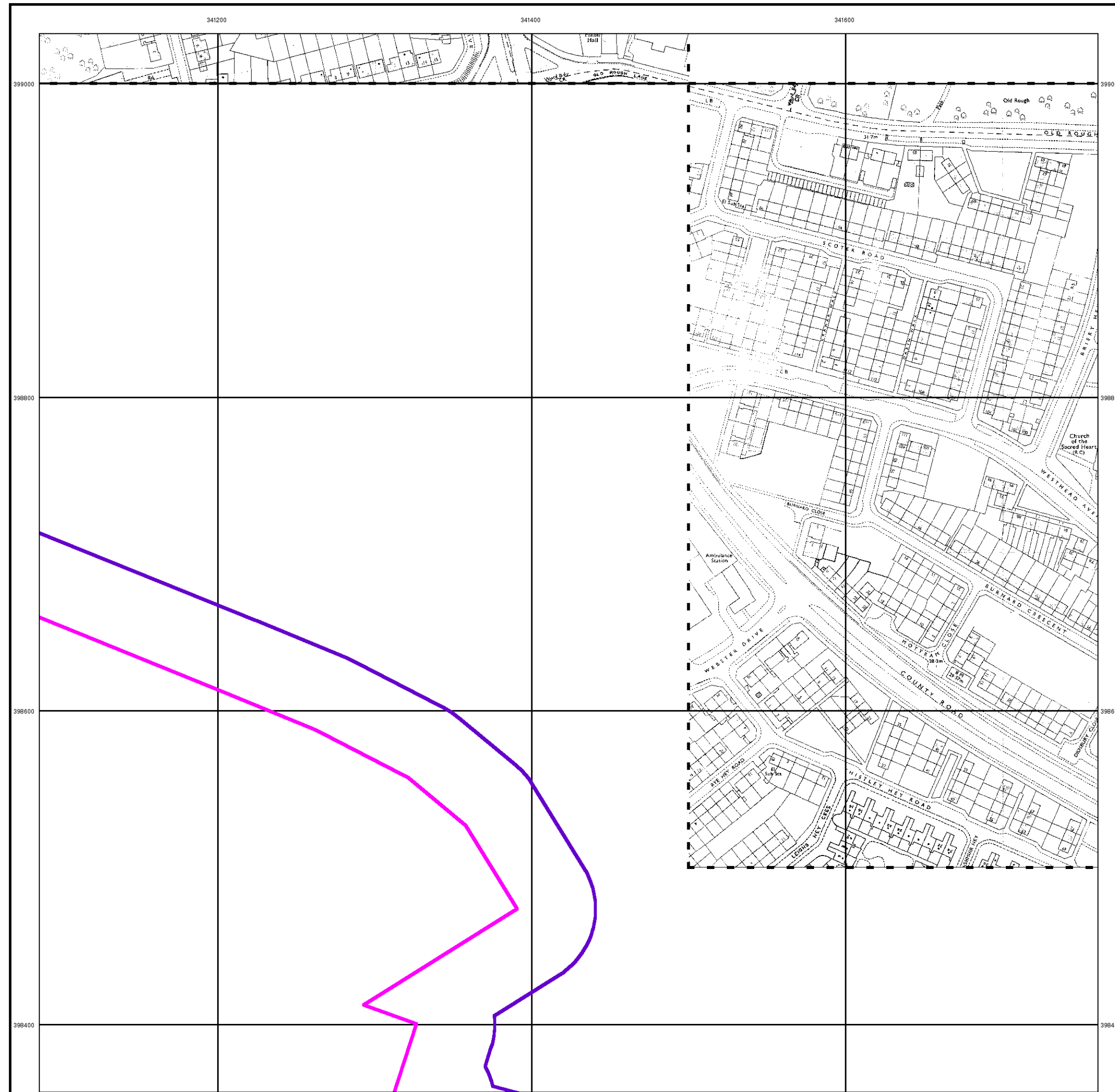
Grid labels: A1-A6, A7-A12

Order Details
Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details
Site at 341090, 398360

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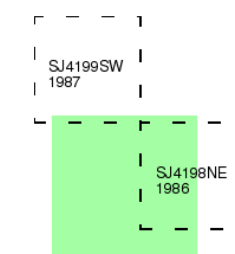
Additional SIMs

Published 1986 - 1987

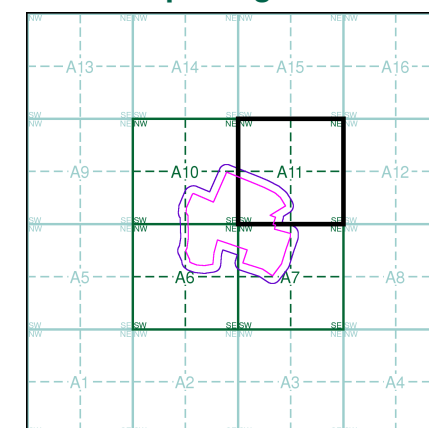
Source map scale - 1:1,250

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 1991, 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 A11



Order Details

Order Number: 20523631_1_1
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Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

Site at 341090, 398360

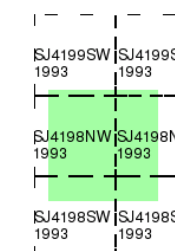
Large-Scale National Grid Data

Published 1993

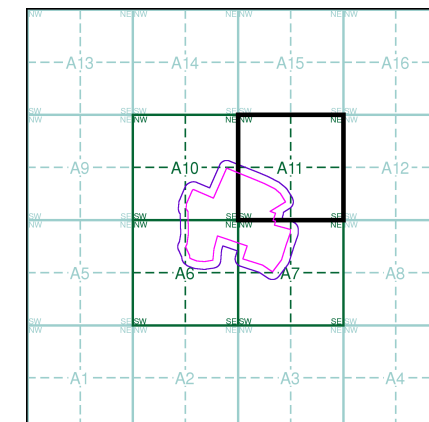
Source map scale - 1:1,250

'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 A11

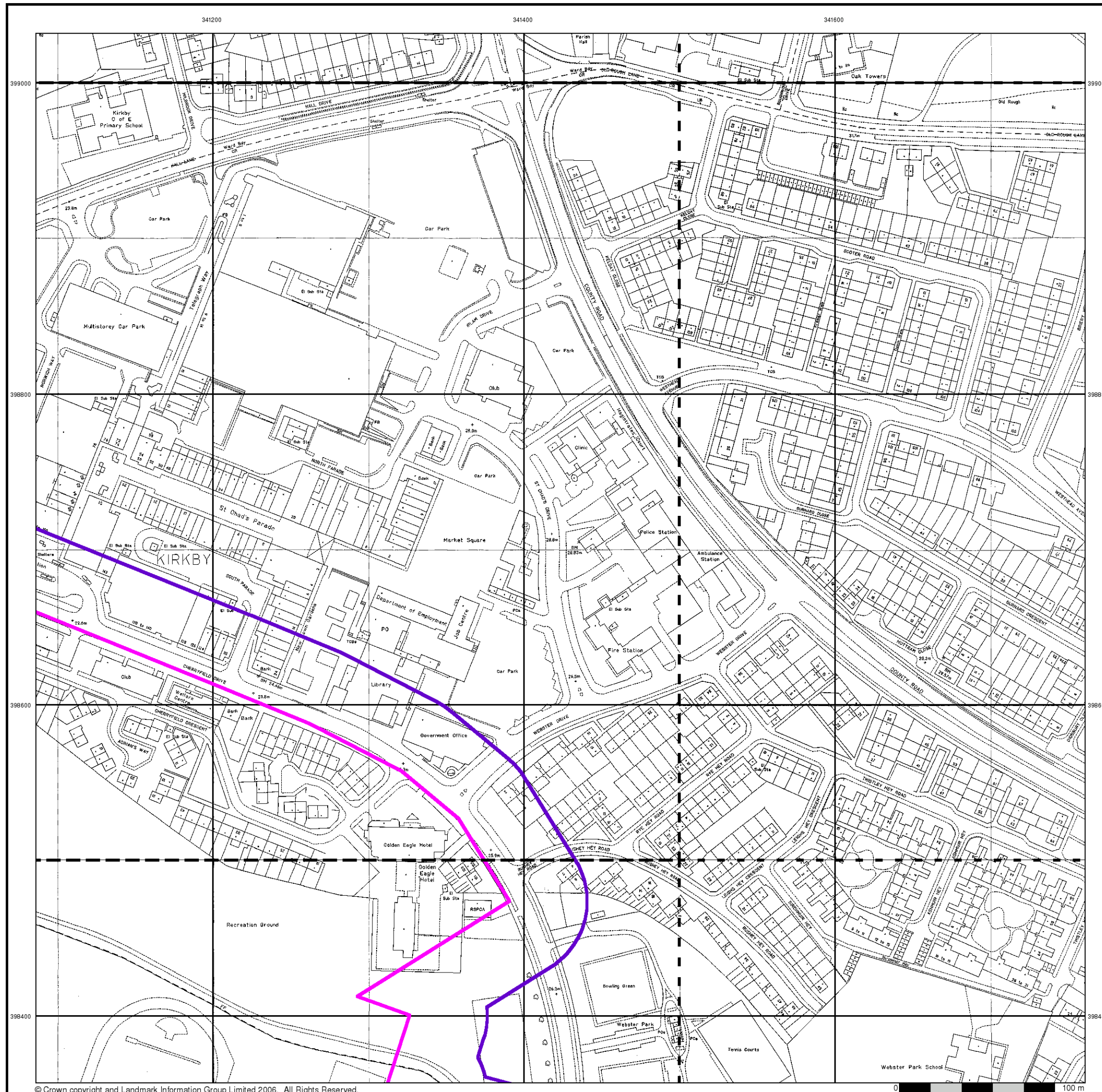


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360



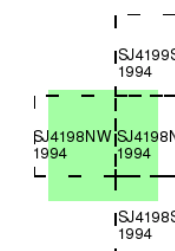
Large-Scale National Grid Data

Published 1994

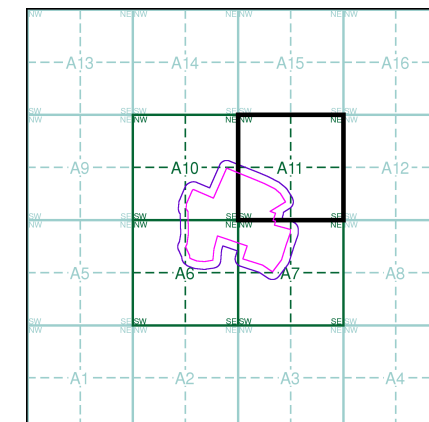
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A11

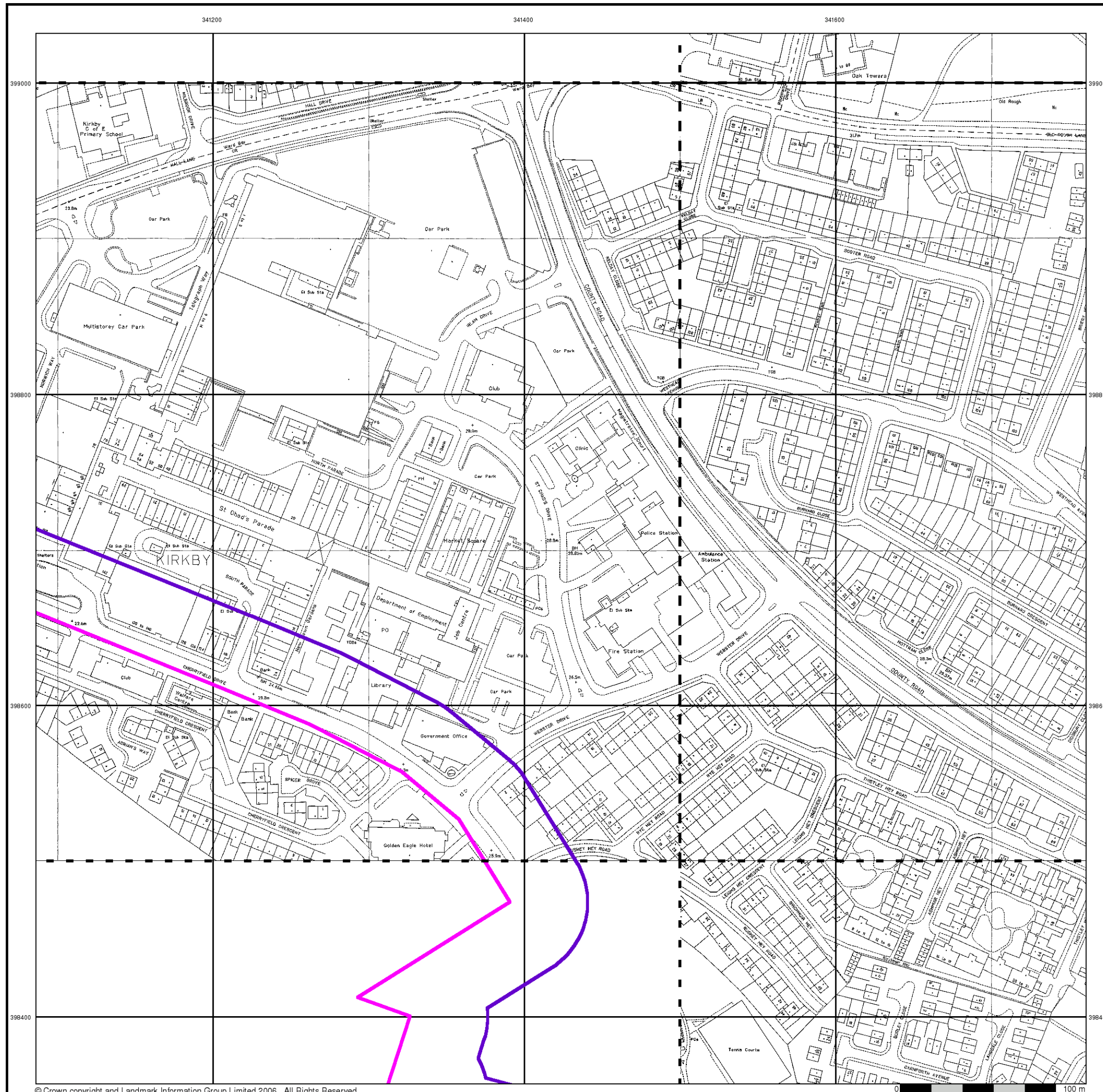


Order Details

Order Number: 20523631_1_1
 Customer Ref: 021706
 National Grid Reference: 341080, 398330
 Sheet: A
 Site Area (Ha): 27.67
 Search Buffer (m): 50

Site Details

Site at 341090, 398360

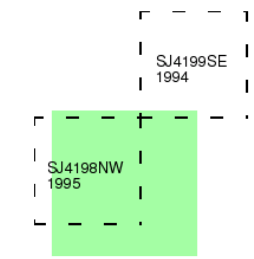




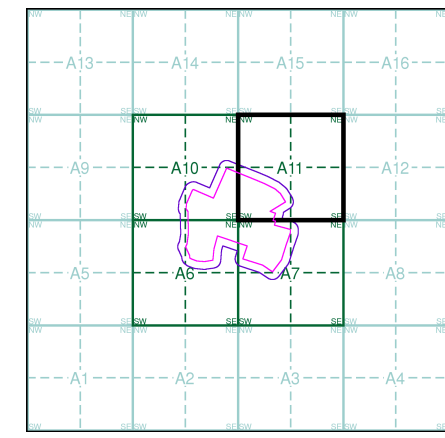
Large-Scale National Grid Data
Published 1994 - 1995
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A11

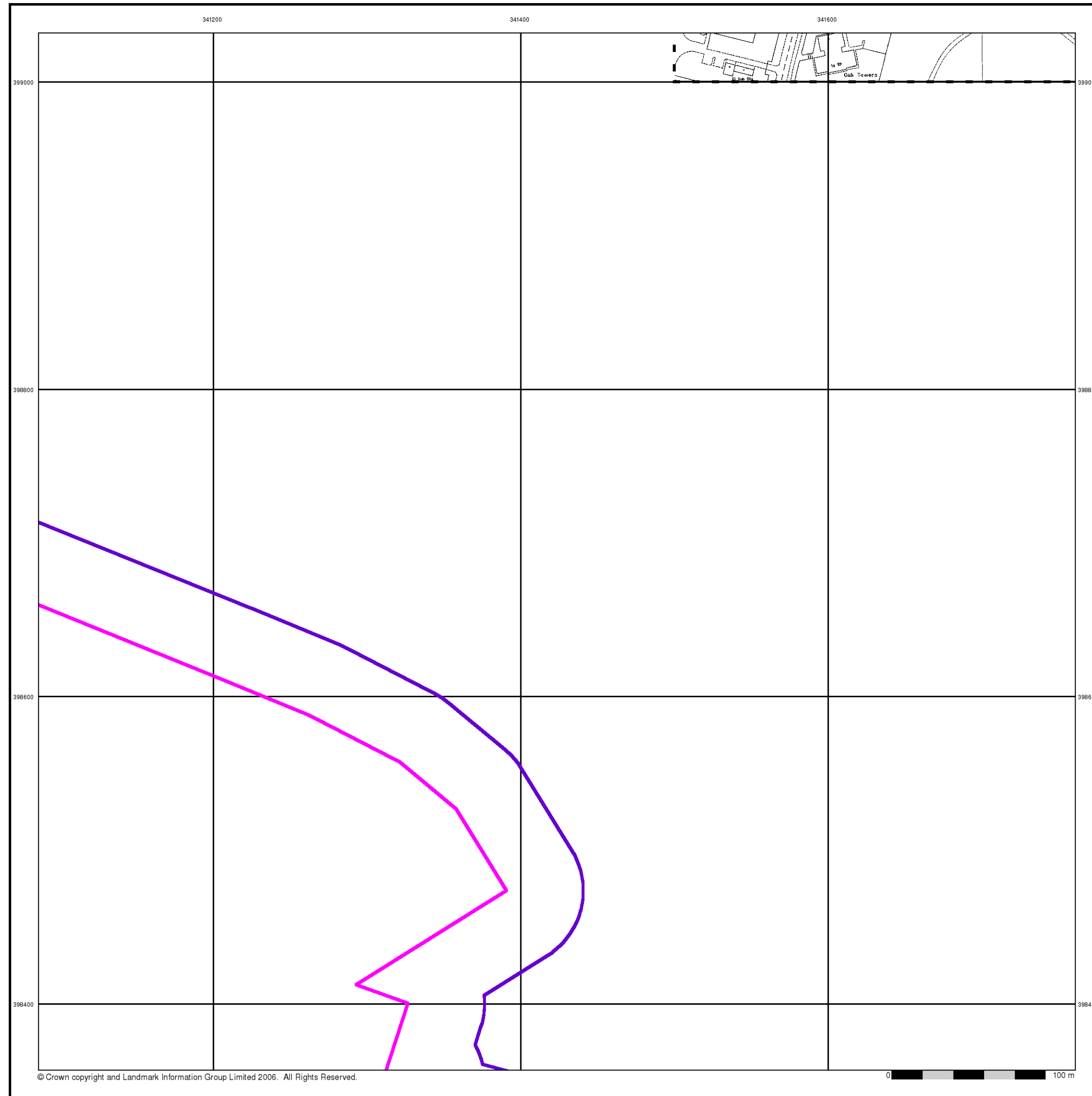


Order Details

Order Number: 20523631_1_1
Customer Ref: 021706
National Grid Reference: 341080, 398330
Sheet: A
Site Area (Ha): 27.67
Search Buffer (m): 50

Site Details

Site at 341090, 398360



Large-Scale National Grid Data
Published 1995
Source map scale - 1:1,250

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

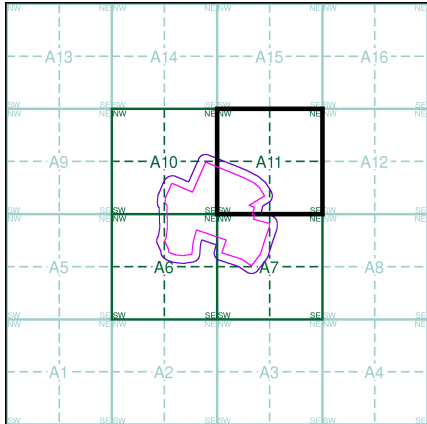
Map Name(s) and Date(s)

SJ4199SE

1995



Historical Map - Segment A11



Order Details

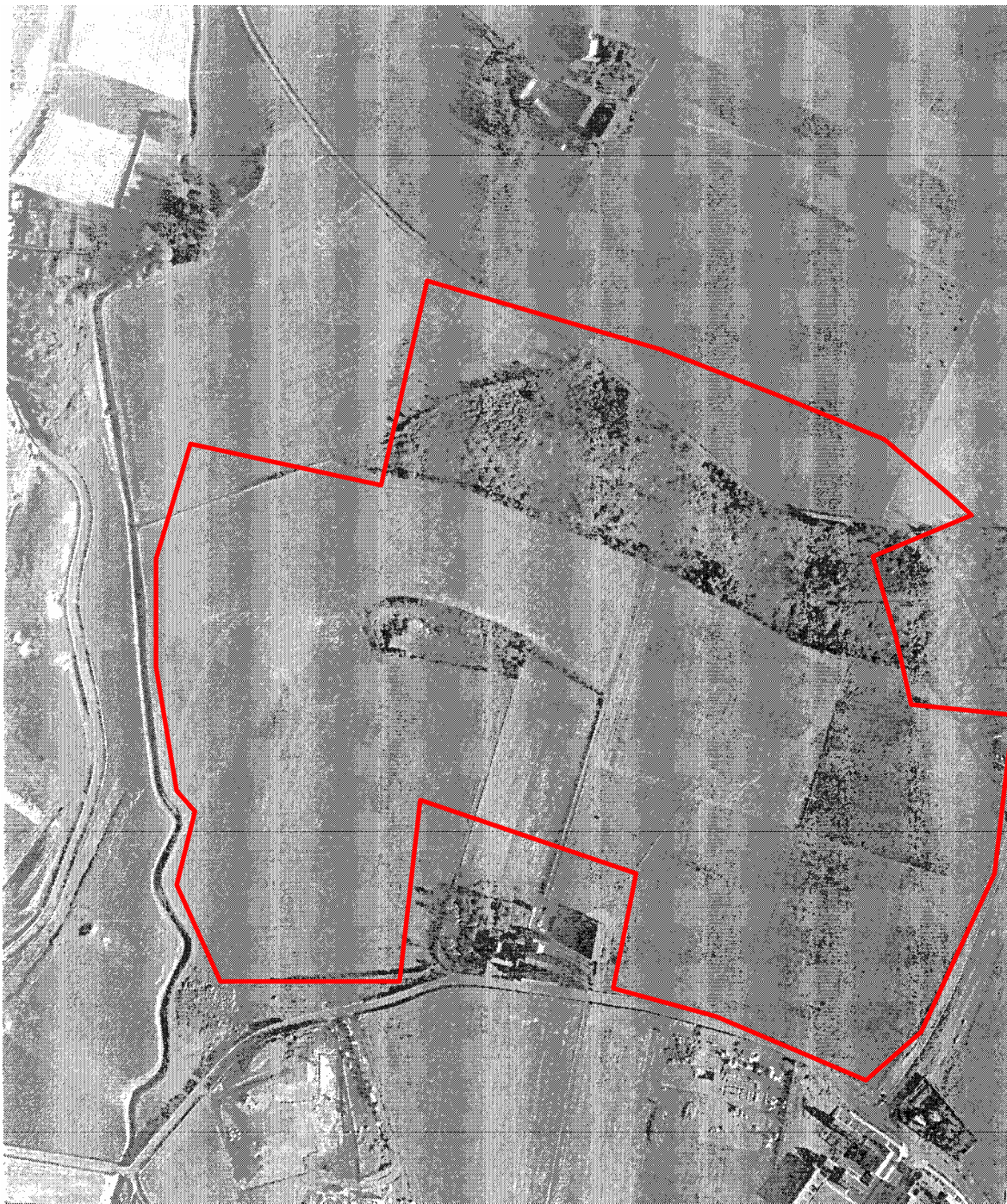
Order Number:	20523631_1_1
Customer Ref:	021706
National Grid Reference:	341080, 398330
Sheet:	A
Site Area (Ha):	27.67
Search Buffer (m):	50

Site Details

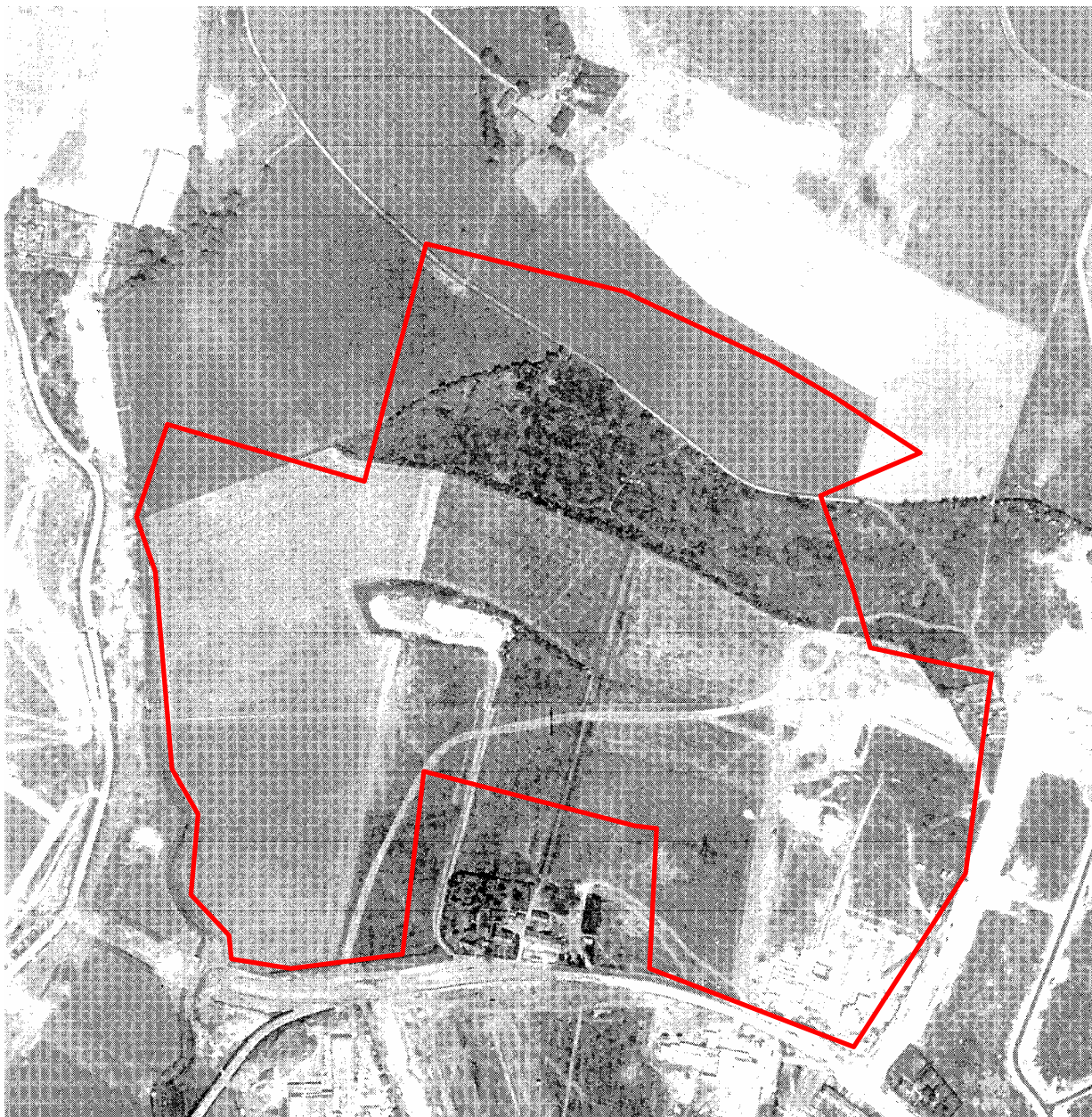
Site at 341090, 398360

Appendix D – Historical aerial photographs

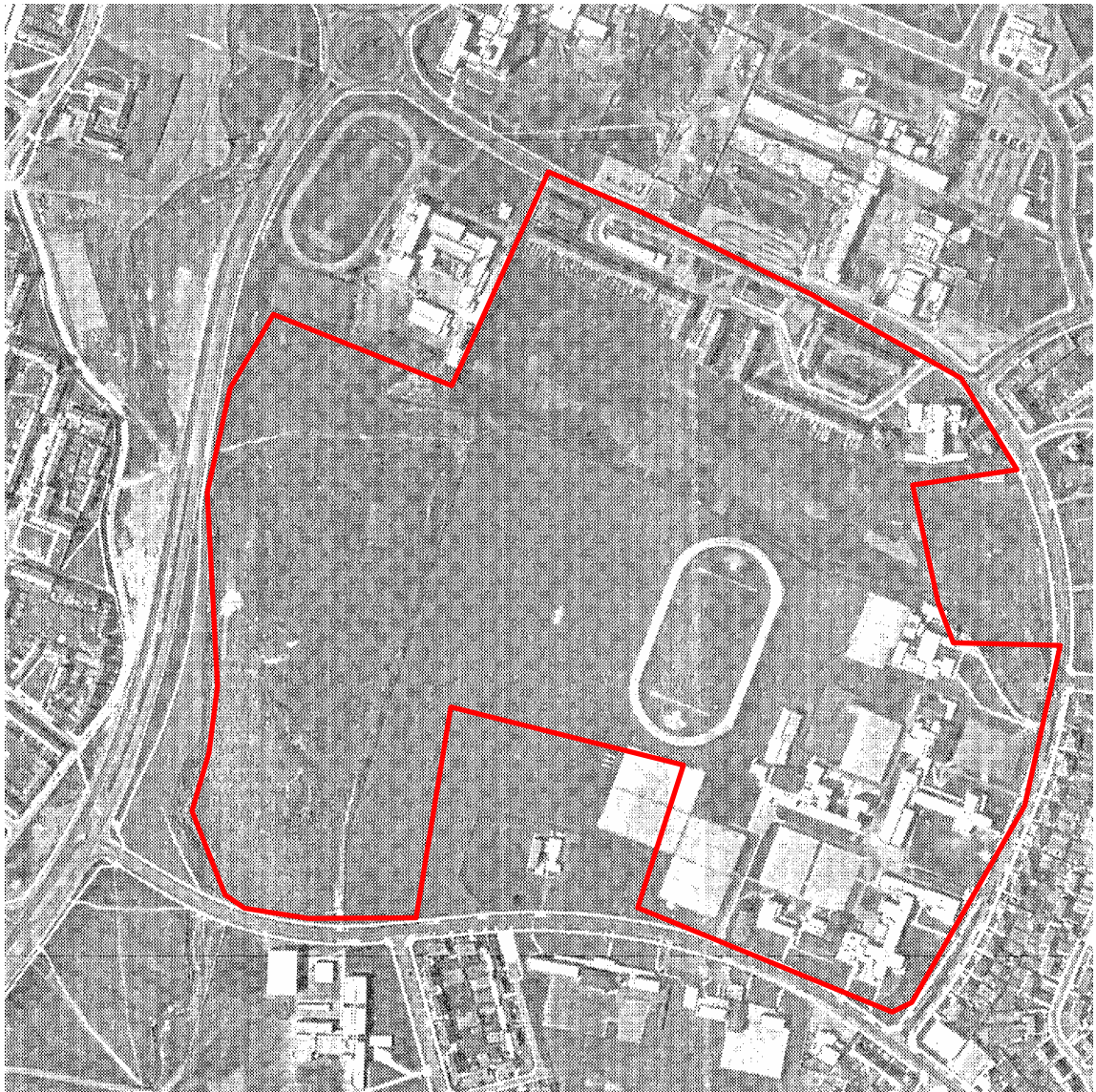
26 Sept 1954



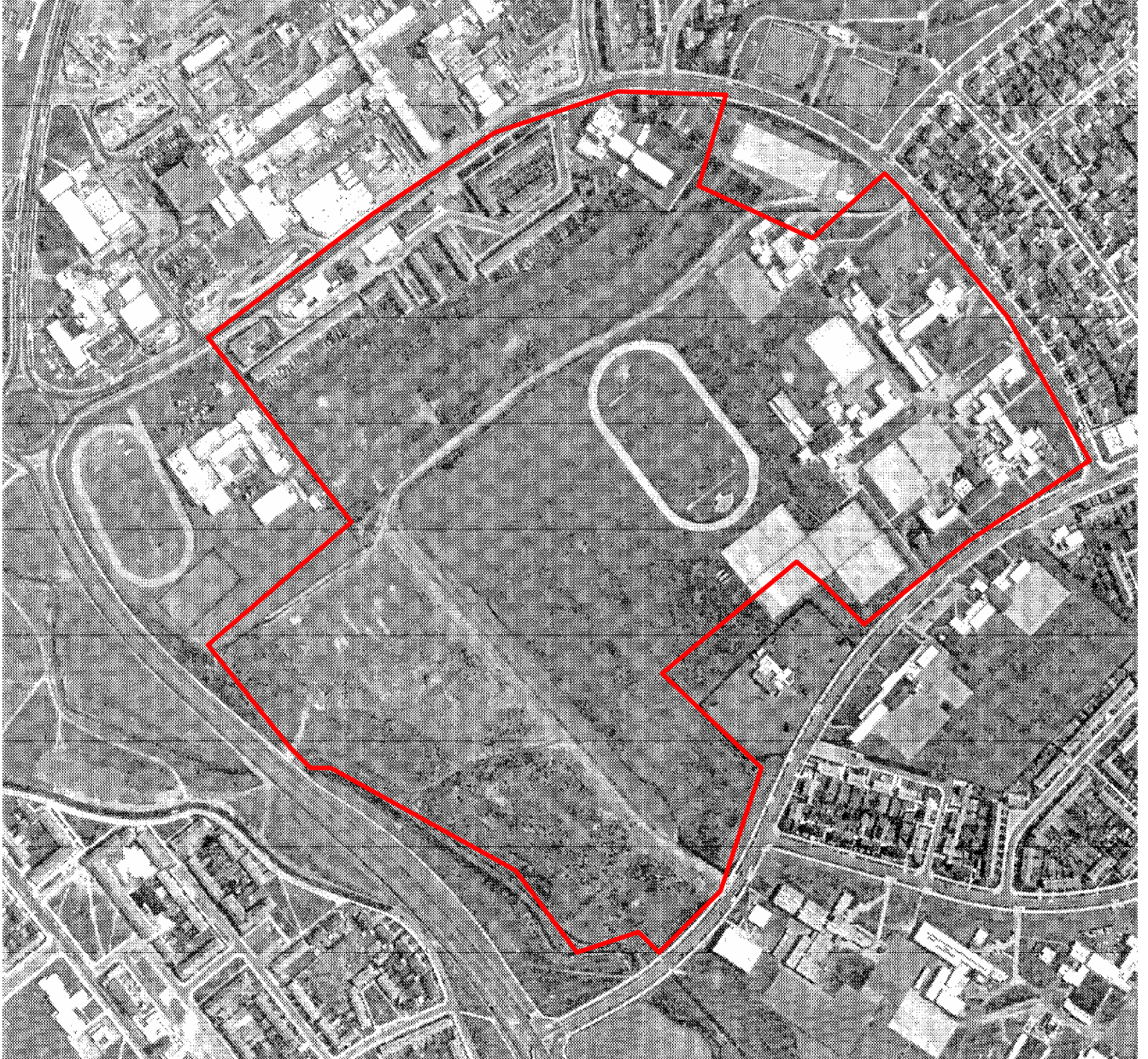
11 July 1955



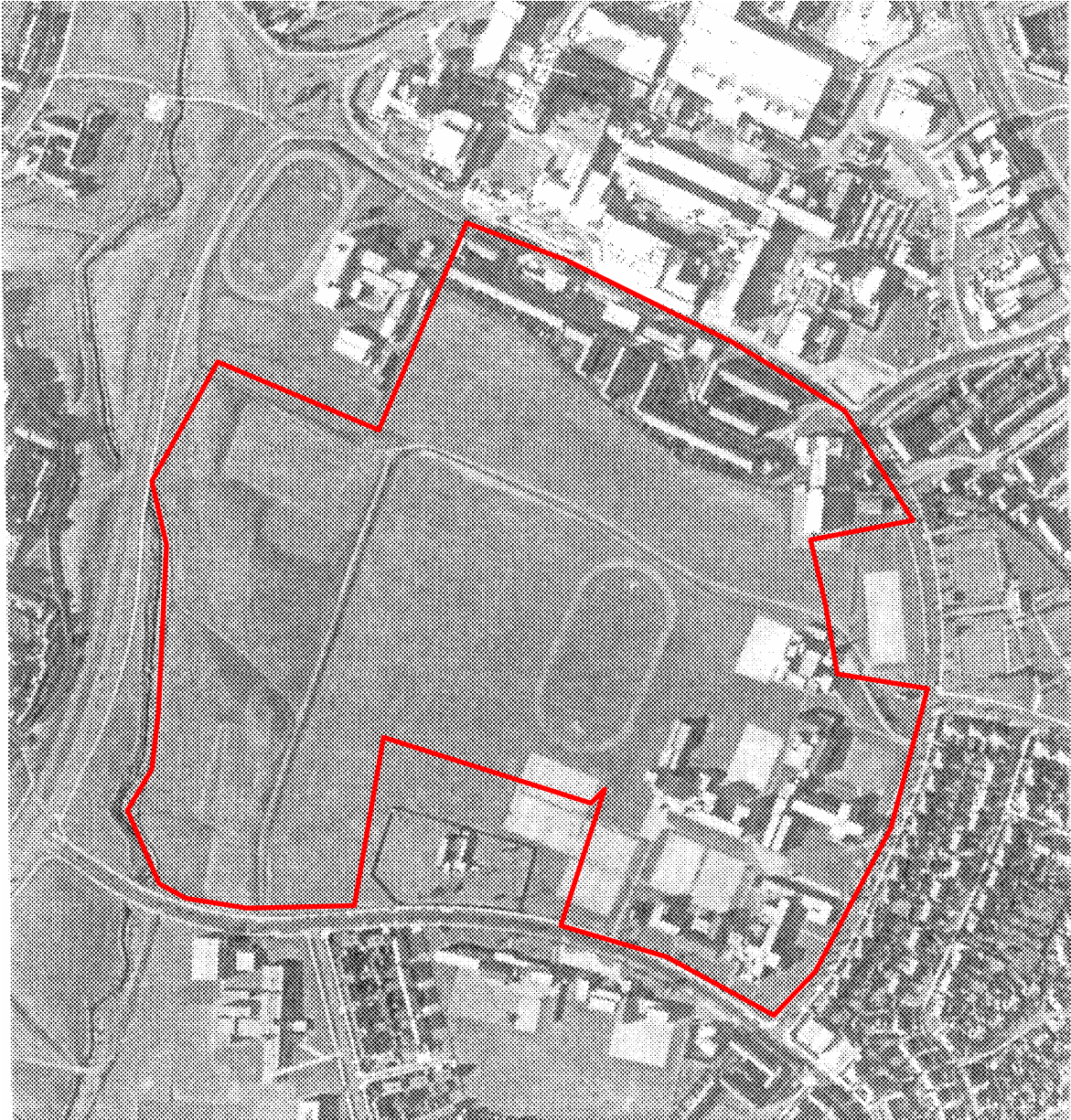
17 May 1970



6 May 1974



21 Sept 1975



Appendix E – Available Utility Plans

ALL VOLTAGES

© Crown Copyright



The position and depths of underground and overhead apparatus as indicated on this plan are approximate and are intended for guidance only. The depths may have changed if the land surface levels have altered. You are also informed that the plan may not show, or may inaccurately show, individual property services and services to street lighting installations. The onus of locating the apparatus precisely before commencing any excavations or other works in the immediate vicinity therefore rests entirely upon the person undertaking or responsible for those works. Before any such works are undertaken the precise location of the apparatus and cables should therefore be ascertained by suitable means. This plan is reproduced from (or based upon) the Ordnance Survey map by SP Manweb plc with the sanction of the controller of HMSO. (c) Crown Copyright Reserved. OS Licence EL273112.



PowerSystems
On Behalf of SP Manweb plc

SP Manweb plc
Registered Office: c/o PowerSystems
3 Prenton Way, Prenton, CH43 3ET
Registered in England and Wales No 2366937

Overhead Line	---
Underground Cables	---
In Use	---
Out of Use	---
	<i>Tone and thickness of lines may vary</i>
Underground Cables	
EHV	132kV
HV	33kV
LV	
	BLUE
	GREEN
	RED
	BROWN

Where cables have been laid SINCE 1 OCTOBER 1988, the following depths in mm apply (to the tops of cables or ducts) UNLESS OTHERWISE SHOWN, but see comments. (TO TOP OF CABLE, ADD 75mm FOR BOTTOM OF TRENCH)

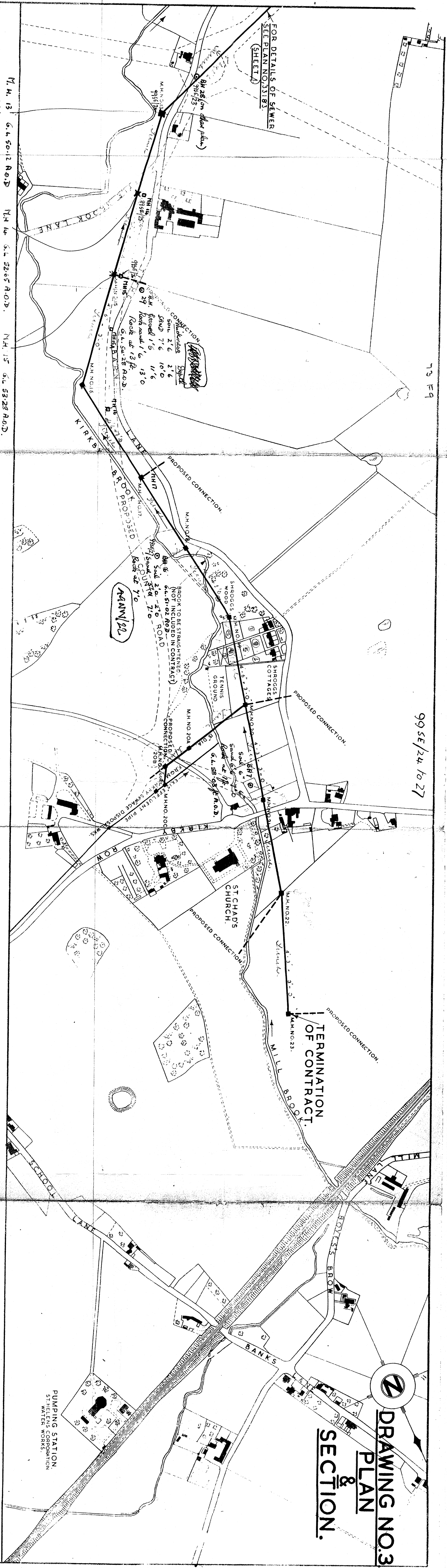
	EHV	HV	LV
IN FOOTPATHS	775	600	450
ACROSS ROADS	775	700	600
ALONG ROADS	775	700	600
AGRICULTURAL	910	910	910

Your attention is drawn to the Health and Safety Executive Booklet HS(0)47, available from HMSO.

Date : 16/08/06 08:56:03
Scale 1:3250
Coordinates : 341091,398424
SJ4075098250 | SJ4100098250
SJ4075098000 | SJ4100098000
0m 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

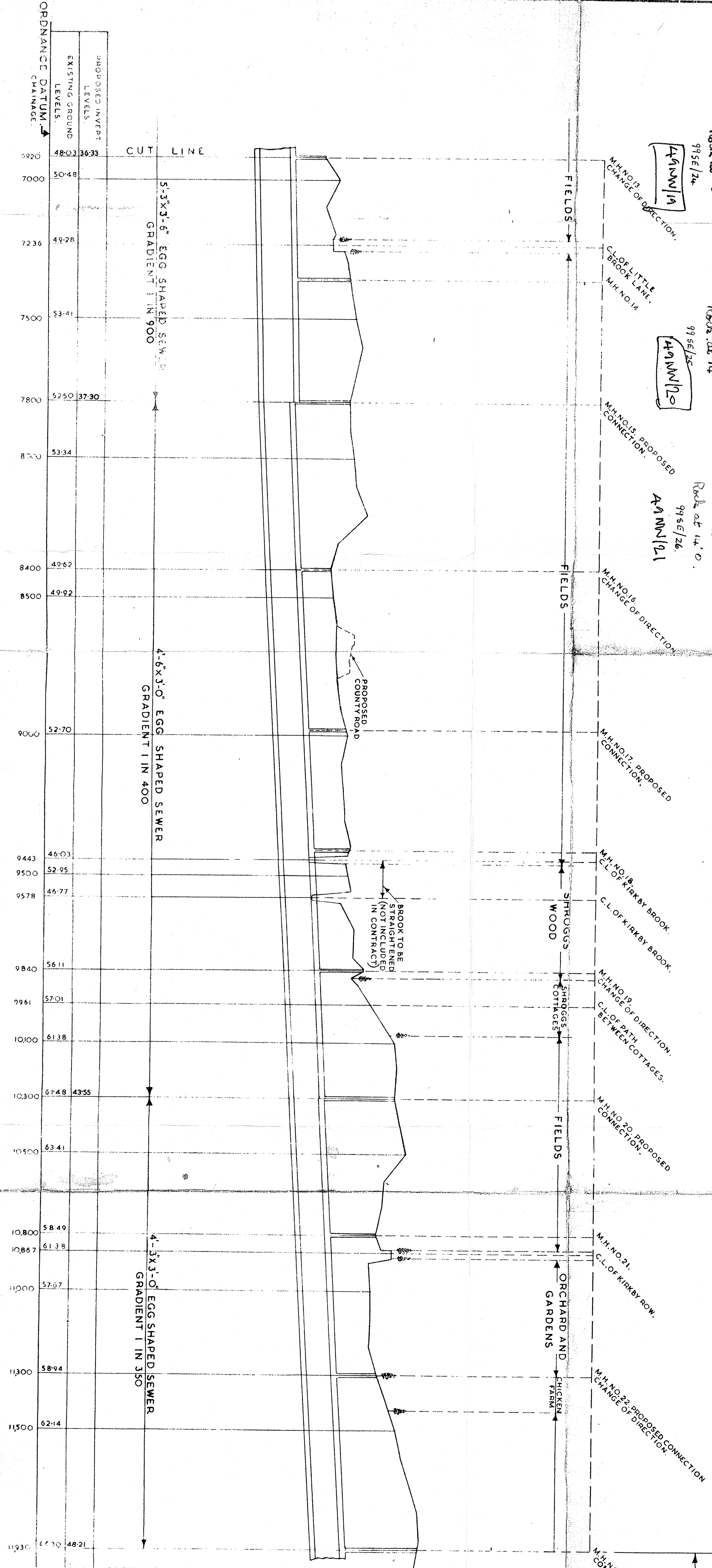
Appendix F – BGS Exploratory Hole Records

DRAWING NO.3
PLAN
&
SECTION.



PLAN.
SCALE: 1"=2500'

ST 49 NW 19-22



LONGITUDINAL SECTION.

HORIZONTAL SCALE: 1"=2500'

VERTICAL SCALE: 1"=10 FEET

PLAN NO. 33183.
SHEET 2.

DRAWN BY C.S.A.
TRACED BY S.R.

CITY OF LIVERPOOL.
KIRKBY MAIN DRAINAGE.
CONTRACT NO. 1.—KIRKBY NORTH SEWER.—PART I.

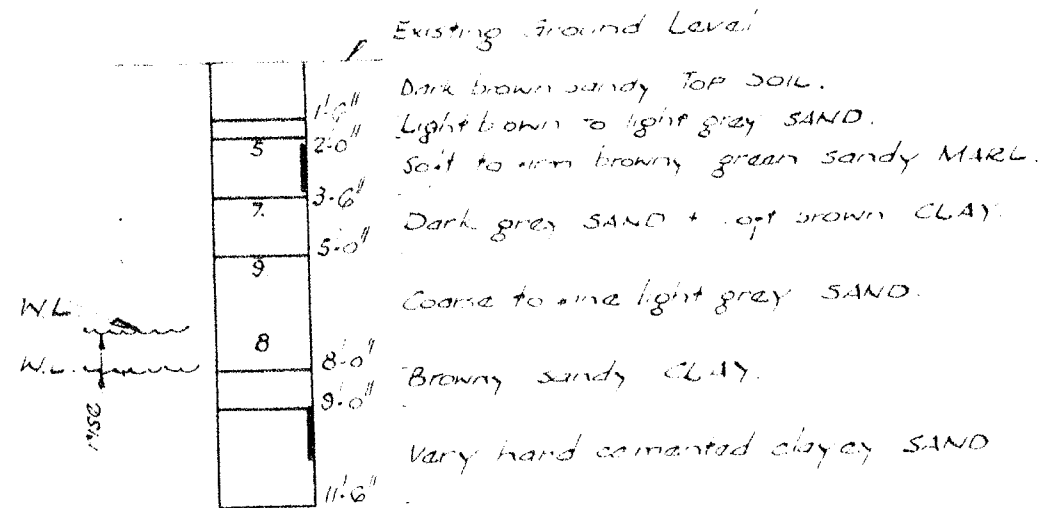
HENRY T. HOUGHMICE, M.P.I.
CITY ENGINEER & SURVEYOR.

JUNE 1953.

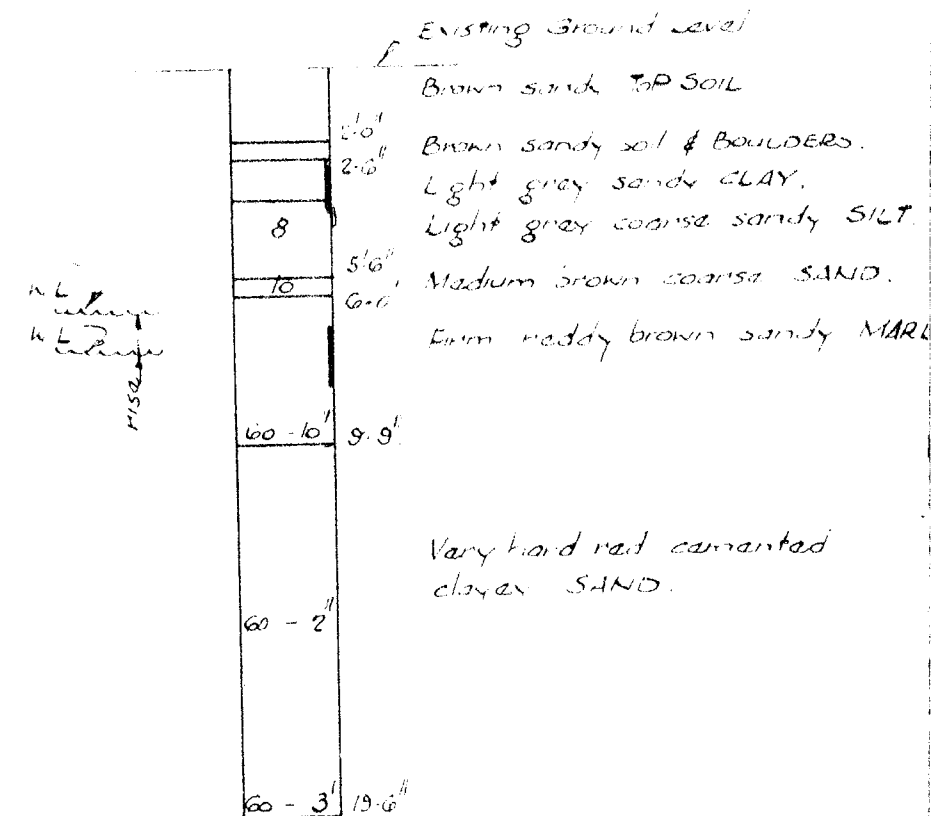
NOTE: INVERT LEVELS TO BE FINALLY AGREED WITH CITY ARCHITECT & DIRECTOR OF HIGHWAYS DEPT. BEFORE CONSTRUCTION.

STATION	INVERT	DIAMETER	LENGTH	GRADIENT
1	52.45	15"	100'	1/165
2	52.45	15"	100'	1/165
3	52.45	15"	100'	1/165
4	52.45	15"	100'	1/165
5	52.45	15"	100'	1/165
6	52.45	15"	100'	1/165
7	52.45	15"	100'	1/165
8	52.45	15"	100'	1/165
9	52.45	15"	100'	1/165
10	52.45	15"	100'	1/165
11	52.45	15"	100'	1/165
12	52.45	15"	100'	1/165
13	52.45	15"	100'	1/165
14	52.45	15"	100'	1/165
15	52.45	15"	100'	1/165
16	52.45	15"	100'	1/165
17	52.45	15"	100'	1/165
18	52.45	15"	100'	1/165
19	52.45	15"	100'	1/165
20	52.45	15"	100'	1/165
21	52.45	15"	100'	1/165
22	52.45	15"	100'	1/165
23	52.45	15"	100'	1/165
24	52.45	15"	100'	1/165
25	52.45	15"	100'	1/165
26	52.45	15"	100'	1/165
27	52.45	15"	100'	1/165
28	52.45	15"	100'	1/165
29	52.45	15"	100'	1/165
30	52.45	15"	100'	1/165

B.H. 1



B.H. 2



NOTE 1

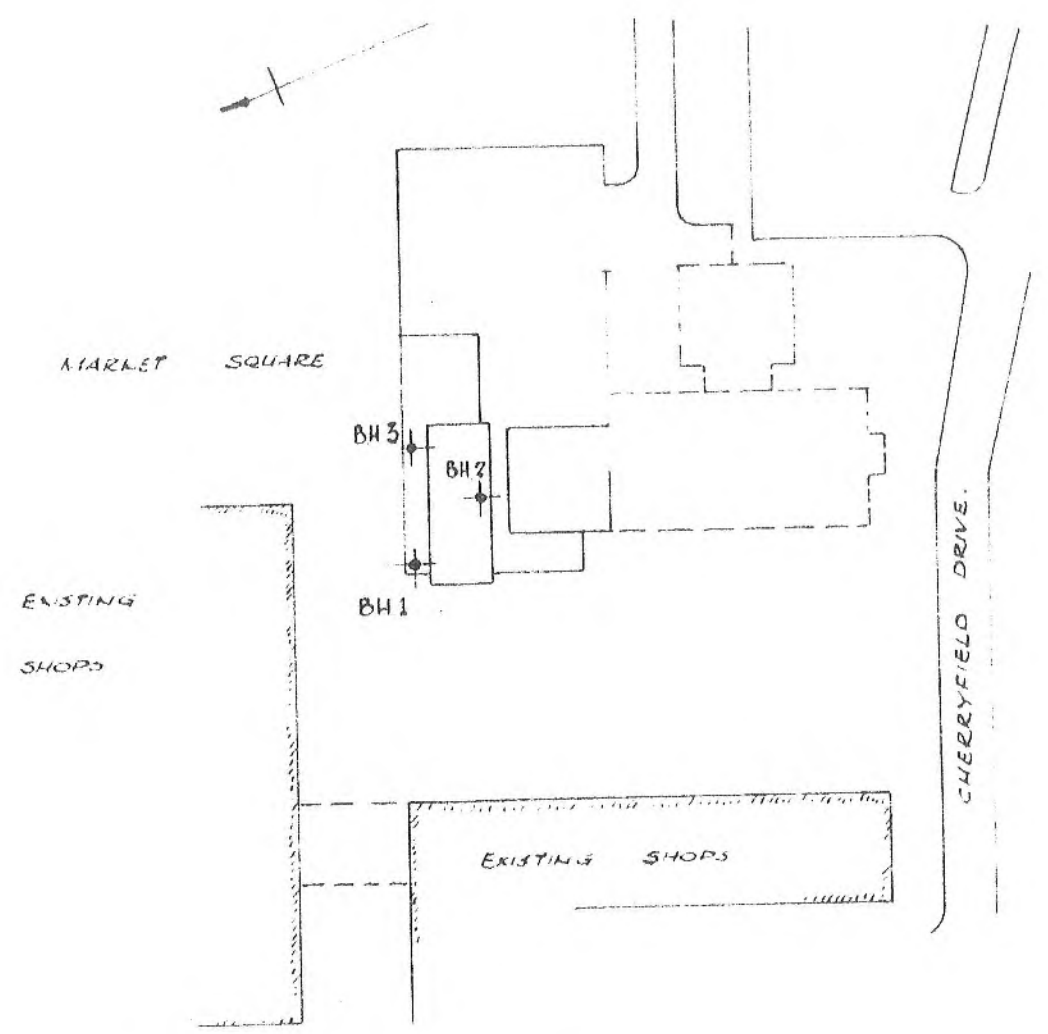
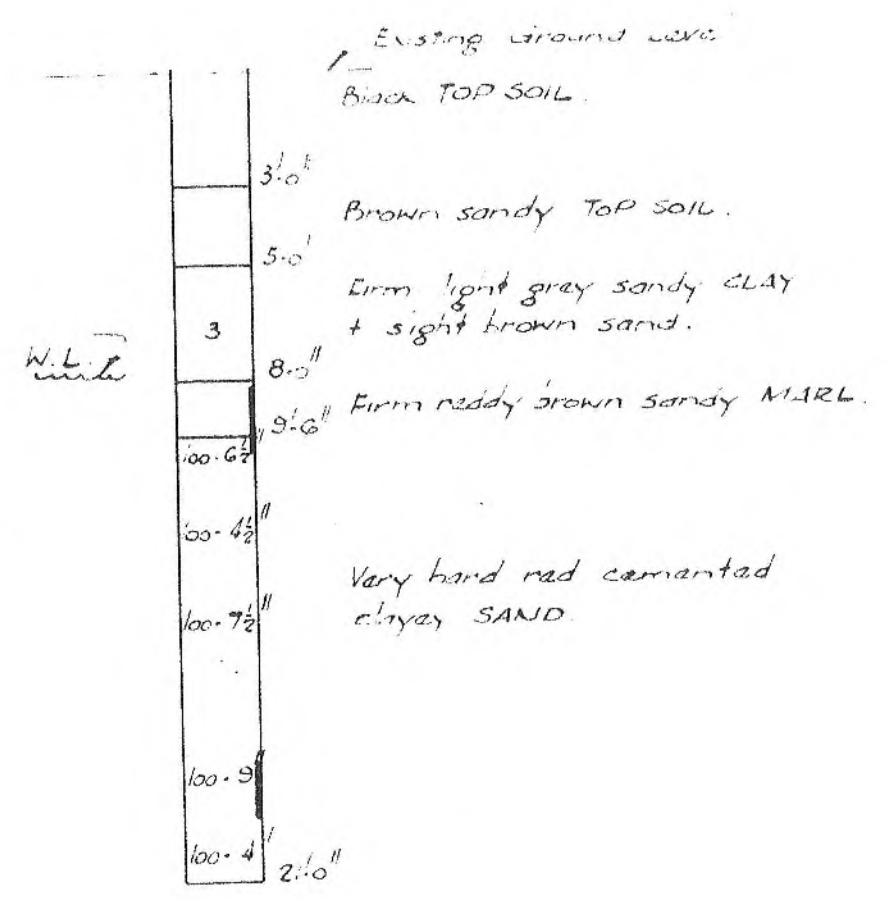
1 Indicates a 4" undisturbed sample.

5 Indicates a Standard Penetration Test and NP of blows per 10" Penetration.
 100-4 1/2" do do do and down to 10.

WL do. Water Level

No orance datum levels were available at time of boring. The existing ground level is approximately the level of the Market Square.

BH 3.



SITE PLAN

- 9 OCT 2006

Job No. 021706

KIRKBY (Lancs) P.O. & C.B.		CIVIL ENGINEER IN CHARGE R. P. MILNER B.Sc. (Tech) M.I.E.	
BOREHOLE LOCATIONS AND SECTIONS			
Vertical Scale 1" rep 5-0"	Horizontal Scale 1" rep 1250	DATE AUG. 1960.	NAT. GRID REF. SJ 413987
JOB NO. 900 IDENT NO. 1		MINISTRY OF WORKS SOIL MECHANICS SECTION	

SJ 49 NW/27

Page

Name and Number of Shaft or Borehole :

National Grid Reference

C. 4130 9870

Kirkby P.O. & C.B. Boreholes 1 - 3

Geological Classification	Description of Strata	Thickness metres	Depth metres
<u>Borehole 1</u>	Brought Forward		
	Dark brown sandy top soil	0.46	0.46
	Light brown to light grey sand	0.15	0.61
	Soft to firm brown green sandy marl	0.45	1.06
	Dark grey sand and soft brown clay	0.46	1.52
	Coarse to fine light grey sand	0.90	2.44
	Brown sandy clay	0.30	2.74
<u>Borehole 2</u>	Very hard cemented clayey sand	0.77	3.51
	Brown sandy top soil	0.61	0.61
	Brown sandy soil and boulders	0.15	0.76
	Light grey sandy clay	0.92	1.68
	Light grey coarse sandy silt	0.15	1.83
	Medium brown coarse sand	1.14	2.97
	Firm reddy brown sandy marl		
<u>Borehole 3</u>	Very hard red cemented clayey sand	2.97	5.94
	Black topsoil	0.91	0.91
	Brown sandy top soil	0.61	1.52
	Firm light grey sandy clay and slight brown sand	0.92	2.44
	Firm reddy brown sandy marl	0.46	2.90
<u>Borehole 4</u>	Very hard red cemented clayey sand	3.50	6.40



British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

BJ 49 NW 30
BOREHOLE No 1 413 986
Ref:

SITE Kirkby Site Ref: 76/71
Boring Method Shell Ground Level 24.822

Samples shown thus:							
	Disturbed D.	Undisturbed U	Standard Pen. Test X	Water W	Bulk B		
Water Observed at the Following Depths - overnight seepage	Depth of Casing when Sealed (N.B. Not Sealed)	Estimate Seepage	Wate. Added at Following Depth to Assist Boring	Water added in Cased/Uncased Bore hole or Completion		Date	Depth of Casing
<u>1.6</u>	<u>2.8</u>	<u>fast</u>		<u>6.5</u>	<u>.76</u>	<u>1.3</u>	NII
			DIA OF CASING	<u>150mm</u> m. to depth of	<u>3.5</u>	meters	
				_____ mm to depth of _____		meters	
				_____ mm to depth of _____		meters	

EMARKS

Chiselling required in fill material - 1 hour
Standpipe inserted to 3m below ground level



**British
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SUB SOIL SURVEYS LTD.
MANCHESTER

BOREHOLE No. 2

Ref: _____

SJ 49 NW 130
2 43 986

EXPLORATORY BORING RECORD

SITE Kirkby

Site Ref: 76/71

Boring Method Shell

Ground Level 24.922 O.D.

Date	Depth of Casing Below G.L. (m)	Water Level Morning & Evening	Depth of Strata Below G.L.	STRATA APPROX. SCALE	No. of Samp	Type of Samp	Penetration of Sampler or Core Barrel (metres)		No. of Blows	Core Recovery
							From	To		
3.5.76			0.2	Concrete and steel matting	1	D	0.6			
			0.6	Hardcore and sandy FILL						
			2.3	Dark brown clayey SAND, bricks, stones, mortar etc - FILL MATERIAL (organic odour)	2	D	1.0	2.55	28	
					3	D	2.0			
					4	X	2.25			
					5	X	3.15			
			3.30	Compact red brown silty fine/medium SAND with hard sandstone pieces and occ. pebbles	6	X	4.0	4.1	89	
					7	W	1.4			
					8	B	0.2			
					9	B	1.5			
					10	B	2.3			
							4.0			
3.5.76										
4.5.76		2.2								
4.5.76	3.0	1.4	4.0	Soft to firm weathered red brown silty fine grained SANDSTONE						

Samples shown thus: Disturbed D. Undisturbed U. Standard Pen. Test X. Water W. Bulk B.

Water Observed at the Following Depths * - overnight seepage	Depth of Casing when Sealed (N.B. - Not Sealed)	Estimated Seepage	Water Added at Following Depths to Assist Boring	Water Level in Cased/Uncased Borehole on Completion		
				Date	Water Level	Depth of Casing
1. 1.5	2.0	slight		5.5.76	1.4	NIL
2.						
3.						
4.						
5.						
6.						

DIA. OF CASING 150 m m. to depth of 3.0 metres
 _____ m m. to depth of _____ metres
 _____ m m. to depth of _____ metres

REMARKS:

Breaking out concrete with compressor BH's 2,3 and 1 - 6 hours
 Chiselling required in sandstone - 1 hour



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SUB SOIL SURVEYS LTD.
MANCHESTER

BOREHOLE No. 3

Ref:-

5J 49 NW130
413-986

EXPLORATORY BORING RECORD

SITE Kirkby

Site Ref:- 76/1

Boring Method Shell and Chisel

Ground Level 25.042 O.D.

Date	Depth of Casing Below G.L. (m)	Water Level Morning & Evening	Depth of Strata Below G.L.	STRATA APPROX. SCALE	No. of Samp	Type of Samp	Penetration of Sampler or Core Barrel (metres)		No. of Blows	Core Recovery
							From	To		
5.5.76			0.2	Concrete and steel matting						
			1.9	Dark brown fine-medium SAND, topsoil, bricks, stones etc - fill material (organic odour)	1	D	0.6			
					2	X	1.15	1.45	7	
					3	D	1.9			
			2.5	Firm brown very sandy CLAY with stone inclusions and lenses of sand	4	U	1.9	2.4	31	NR
			2.7	Red brown and grey silty fine SAND	5	D	2.4			
					6	D	2.5			
				Soft to firm weathered red brown silty fine grained SANDSTONE with occasional pebbles, clayey in upper zone	7	X	2.85	3.15	75	
					8	X	3.8	3.9	82	
					9	B	0.6	1.5		
					10	B	1.5	1.9		
					11	B	2.5	4.0		
5.5.76	3.5		4.0							

Samples shown thus: Disturbed D. Undisturbed U. Standard Pen. Test X. Water W. Bulk B.

Water Observed at the Following Depths * - overnight seepage	Depth of Casing when Sealed (N.B. Not Sealed)	Estimated Seepage	Water Added at Following Depths to Assist Boring	Water Level in Cased/Uncased Borehole on Completion		
				Date	Water Level	Depth of Casing
1. None				6.5.76	1.3	NII
2.						
3.						
4.						
5.						
6.						

DIA. OF CASING 150 m m. to depth of 3.5 metres
m m. to depth of metres
m m. to depth of metres

REMARKS:

Chiselling required in Sandstone - 1½ hours



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NATURAL ENVIRONMENT RESEARCH COUNCIL

ST 49 NW/30
413.986
4

BOREHOLE No. _____

Ref:- _____

SITE Kirkby Site Ref: 76/71

Ground Level 25.182 O.D.

30	4.76	3.0	3.7	4.2
----	------	-----	-----	-----

Water Observed at the Following Depths - overnight seepage	Depth of Casing when Sealed (N.B. - Not Sealed)	Estimated Seepage	Water Added at Following Depths to Assist Boring	Water Level in Cased/Uncased Borehole on Completion		
				Date	Water Level	Depth of Casing
1. 4	1. 7	slight		3. 5. 76	1. 3	Nil
3. 7	N.S.					
			DIA. OF CASING 150	m m. to depth of	3. 0	metres
				m m. to depth of		metres
				m m. to depth of		metres

Time spent chiselling - $1\frac{1}{2}$ hours



NATURAL ENVIRONMENT RESEARCH COUNCIL

SUB SOIL SURVEYS LTD.
MANCHESTER

BOREHOLE No. _____

Ref:- _____

SJ 49 NW 130
5 413. 986

EXPLORATORY BORING RECORD

Site Kirkby

Site Ref:- 76/71

Boring Method Shell and Chisel

Ground Level 25.272 O.D.

Date	Depth of Casing Below G.L. (m)	Water Level Morning & Evening	Depth of Strata Below G.L.	STRATA APPROX. SCALE	No. of Samp	Type of Samp	Penetration of Sampler or Core Barrel (metres)		No. of Blows	Core Recovery
							From	To		
9. 4. 76			0. 2	Concrete and steel matting	1	D	0. 6		14	NR
			1. 1	Brown sand, bricks, shale hardcore etc. -FILL MATERIAL	2	D	1. 1			
				Soft to firm brown and grey sandy CLAY with stone and root inclusions and lenses of sand	3	U	1. 1	1. 6		
					4	D	1. 6			
					5	U	2. 1	2. 6		
					6	B	2. 1	2. 6		
				2. 9	Soft to firm weathered red brown silty fine grained SANDSTONE with occasional pebbles	6	D	2. 6		
			7			D	2. 9			
			8			X	3. 15	3. 3		
			9			D	4. 0			
			10			X	4. 2	4. 3		
9. 4. 76	3. 0	2. 7	4. 5	11	W	2. 7		88		
				12	B	0. 2	1. 1			
				13	B	2. 9	4. 5			

Samples shown thus: Disturbed D. Undisturbed U. Standard Pen. Test X. Water W. Bulk B.

Water Observed at the Following Depths - overnight seepage	Depth of Casing when Sealed (N.B. - Not Sealed)	Estimated Seepage	Water Added at Following Depths to Assist Boring	Water Level in Cased/Uncased Borehole on Completion		
				Date	Water Level	Depth of Casing
2.0	2.9	slow		3.5.76	1.4	NIL
3.5	N.S			4.5.76	1.4	NIL
				5.5.76	1.3	NIL
DIA. OF CASING 150 m.m. to depth of 3.0 metres						
m.m. to depth of _____ metres						
m.m. to depth of _____ metres						

REMARKS: Standpipe Inserted to 3m below ground level
Excavating by hand - 2 hours (with compressor)
No initial penetration for SPT sample No 10
Standing waiting access to BH position in Car Park - 5 hours



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Appendix G – Envirocheck Report

Envirocheck[®] Report:

Datasheet

Report on:

Kirkby, Liverpool

National Grid Reference :

341090, 398360

Site Area (Ha) :

28.46

Prepared For :

Buro Happold
17 Newman Street
London
W1P 3HD

Your Reference:

Mr P Hazlehurst,021706

Summary

Agency & Hydrological

Waste

Hazardous Substances

Geological

Industrial Land Use

Sensitive Land Use

Data Currency

Data Suppliers & Copyright Statements

Useful Contacts

BGS Borehole Order Form

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity Data Sheet places great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency; it also incorporates data from English Nature (and the Scottish and Welsh equivalents), the Environment Agency (and the Scottish equivalent) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the legend database to a distance defined by the client from a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers

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Data Type	On Site	800m from site
Agency & Hydrological		
Local Authority Pollution Prevention and Controls	1	1
Local Authority Pollution Prevention and Control Enforcements		
Contaminated Land Register Entries and Notices		
Discharge Consents		1
Enforcement and Prohibition Notices		
Integrated Pollution Controls		
Integrated Pollution Prevention And Control		
Local Authority Integrated Pollution Prevention And Control		
Nearest Surface Water Feature	Yes	
Pollution Incidents to Controlled Waters	2	14
Substantiated Pollution Incident Register		
Prosecutions Relating to Authorised Processes		
Prosecutions Relating to Controlled Waters		
Water Industry Act Referrals		
Registered Radioactive Substances		
River Quality		1
River Quality Biology Sampling Points		
River Quality Chemistry Sampling Points		1
Water Abstractions		
Groundwater Vulnerability	Yes	
Source Protection Zones		3
Extreme Flooding from Rivers or Sea without Defences	Yes	
Flooding from Rivers or Sea without Defences	Yes	
Areas Benefiting from Flood Defences		
Flood Water Storage Areas		
Flood Defences		
River Flood Data (Scotland)		
Waste		
BGS Recorded Landfill Sites		
Integrated Pollution Control Registered Waste Sites		
Licensed Waste Management Facilities (Landfill Boundaries)		
Licensed Waste Management Facilities (Locations)		
Local Authority Recorded Landfill Sites	2	2
Registered Landfill Sites		1
Registered Waste Transfer Sites		
Registered Waste Treatment or Disposal Sites		

Data Type	On Site	800m from site
Hazardous Substances		
Control of Major Accident Hazards Sites (COMAH)		
Explosive Sites		
Notification of Installations Handling Hazardous Substances (NIHHS)		
Planning Hazardous Substance Consents		
Planning Hazardous Substance Enforcements		
Geological		
BGS Boreholes		45
BGS Recorded Mineral Sites		
BGS 1:625,000 Solid Geology	Yes	
Brine Compensation Areas		
Coal Mining Affected Areas		
Shallow Mining Hazards		
Potential for Collapsible Ground Stability Hazards		
Potential for Compressible Ground Stability Hazards		Yes
Potential for Ground Dissolution Stability Hazards		
Potential for Landslide Ground Stability Hazards	Yes	Yes
Potential for Running Sand Ground Stability Hazards	Yes	Yes
Potential for Shrinking or Swelling Clay Ground Stability Hazards	Yes	Yes
Mining Instability		
Natural and Mining Cavities		
Radon Affected Areas		
Radon Protection Measures		
Industrial Land Use		
Contemporary Trade Directory Entries		21
Fuel Station Entries	1	3

Data Type	On Site	800m from site
Sensitive Land Uses		
Areas of Adopted Green Belt		1
Areas of Unadopted Green Belt		1
Areas of Outstanding Natural Beauty		
Environmentally Sensitive Areas		
Forest Parks		
Local Nature Reserves		
Marine Nature Reserves		
National Nature Reserves		
National Parks		
National Scenic Areas		
Nitrate Sensitive Areas		
Nitrate Vulnerable Zones	1	
Ramsar Sites		
Sites of Special Scientific Interest		
Special Areas of Conservation		
Special Protection Areas		

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Local Authority Pollution Prevention and Controls					
1	Name: Total Fina Elf, Cherryfield Drive Service Station Location: Cherryfield Drive, LIVERPOOL, Merseyside, L32 8SE Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: Pet/1298/1.4/02 Dated: 29th January 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Authorised Positional Accuracy: Manually positioned to the address or location	N	0	1	341100 398640
Local Authority Pollution Prevention and Controls					
2	Name: Total Westvale Service Station Location: Whitefield Drive, Westvale, Kirkby, LIVERPOOL, Merseyside, L32 0UX Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: 04/02017/Epa Dated: 29th January 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Authorised Positional Accuracy: Automatically positioned to the address	W	779	1	339990 398670
Discharge Consents					
3	Operator: Liverpool Corporation Property Type: Sewage Disposal Works - Other Location: Kirkby Trading Estate Stp, Kirkby, Merseyside Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 01m/544 Permit Version: 1 Effective Date: 26th March 1993 Issue Date: Not Supplied Revocation Date: 26th March 1993 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Mersey Status: Authorisation revoked Positional Accuracy: Located by supplier to within 100m	E	596	2	342000 398500
Nearest Surface Water Feature					
-		W	0	-	340770 398370
Pollution Incidents to Controlled Waters					
4	Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Heating Oil Note: Not Supplied Incident Date: 17th September 1991 Incident Reference: 91440080 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SE	0	2	341200 398300
Pollution Incidents to Controlled Waters					
5	Property Type: Schools/Universities Location: Kirby Brook Authority: Environment Agency, North West Region Pollutant: Chemicals - Paints / Dyes Note: White Liq Flowing To Kirby Brook Incident Date: 27th January 1998 Incident Reference: CE980091 Catchment Area: Alt Receiving Water: Freshwater Stream/River Cause of Incident: Wrong Connection Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	0	2	340800 398100

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Pollution Incidents to Controlled Waters					
6	Property Type: Water Company Sewage: Sewage Treatment Works Location: Near Bewley Road Off ,Valley Road Authority: Environment Agency, North West Region Pollutant: Crude Sewage Note: Kirkby Brook; Crude Sewage Incident Date: 10th January 1997 Incident Reference: 97440002 Catchment Area: Alt Receiving Water: Freshwater Stream/River Cause of Incident: Blocked Sewer Severity of Incident: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	W	61	2	340700 398200
Pollution Incidents to Controlled Waters					
7	Property Type: Private Sewage (Non-PLC): Sewerage Systems Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Crude Sewage Note: Kirkby Brook; Crude Sewage Incident Date: 16th April 1996 Incident Reference: 96440054 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Blocked Sewer Severity of Incident: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	SW	207	2	340600 398000
Pollution Incidents to Controlled Waters					
8	Property Type: Schools/Universities Location: Kirkby Brook Authority: Environment Agency, North West Region Pollutant: Chemicals - Paints / Dyes Note: Blue/White Liquer From Sewage Water Drain; Kirkby Bk; Emulsion Paint Incident Date: 7th November 1997 Incident Reference: 97440132 Catchment Area: Alt Receiving Water: Freshwater Stream/River Cause of Incident: Wrong Connection Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	221	2	340700 397900
Pollution Incidents to Controlled Waters					
9	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Unknown Note: None Pollution Found Incident Date: 18th January 1996 Incident Reference: 96440007 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	NW	240	2	340700 398800
Pollution Incidents to Controlled Waters					
9	Property Type: Private Sewage (Non-PLC): Sewerage Systems Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Crude Sewage Note: Kirkby Brook; Crude Sewage Incident Date: 24th June 1996 Incident Reference: 96440090 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	NW	245	2	340700 398800

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Pollution Incidents to Controlled Waters					
10	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Oils - Other Fuel Oil Note: River Alt; Heating Oil Incident Date: 22nd August 1996 Incident Reference: 96440122 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Not Given Severity of Incident: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	SW	289	2	340800 397800
Pollution Incidents to Controlled Waters					
11	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Vehicle Washings And De Waxing Note: Kirkby Brook; Vehicle Washings Incident Date: 22nd August 1996 Incident Reference: 96440128 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	316	2	340700 397800
Pollution Incidents to Controlled Waters					
12	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Not Given Note: Not Supplied Incident Date: 31st July 1992 Incident Reference: 92440102 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	346	2	340500 397900
Pollution Incidents to Controlled Waters					
13	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Not Given Note: Kirkby Brook; None Pollution Found Incident Date: 17th August 1993 Incident Reference: 93450105 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	NW	374	2	340800 399000
Pollution Incidents to Controlled Waters					
14	Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Rubble/Litter Or Solids Note: Boots Catalogues Incident Date: 31st December 1992 Incident Reference: 92450036 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	NE	446	2	341600 398900

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Pollution Incidents to Controlled Waters					
15	Property Type: Water Company Sewage: Sewerage Location: Kirby Brook, Valley Road Sewage Water Overflow Authority: Environment Agency, North West Region Pollutant: Sewage - Wrong Connection Note: Kirkby Bk; Crude Sewage Incident Date: 23rd July 1997 Incident Reference: 97440100 Catchment Area: Alt Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	486	2	340400 397800
Pollution Incidents to Controlled Waters					
16	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Not Given Note: Not Supplied Incident Date: 9th April 1992 Incident Reference: 92440043 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Not Given Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	N	550	2	340800 399200
Pollution Incidents to Controlled Waters					
17	Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Unknown Note: Not Supplied Incident Date: 6th June 1996 Incident Reference: 96440076 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Miscellaneous/Other Pollution Type Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	555	2	340400 397700
Pollution Incidents to Controlled Waters					
18	Property Type: Road Location: Road Traffic Accident On ,Valley Road,KIRBY Authority: Environment Agency, North West Region Pollutant: Oils - Diesel (Including Agricultural) Note: Kirby Bk; Diesel Incident Date: 27th May 1997 Incident Reference: 97440071 Catchment Area: Alt Receiving Water: Freshwater Stream/River Cause of Incident: Road Traffic Accident Severity of Incident: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	SW	567	2	340300 397800
River Quality					
-	Name: Simonswood Bk GQA Grade: River Quality C Reach: Kirkby Bk To Alt Estimated Distance of Reach (km): 3 Flow rate: Flow less than 0.62 cumecs Flow Type: River Year: 2000	W	20	2	340720 398360

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
River Quality Chemistry Sampling Points					
19	Name: Simonswood Bk Reach: Kirkby Bk To Alt Estimated Distance: 3.00 Objective: River Ecosystem Class 4: Fair Quality Positional Accuracy: Located by supplier to within 10m Year: 1990 GQA Grade: River Quality Chemistry GQA Grade F - Bad Compliance: Not Supplied Year: 1993 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Significant Failure Year: 1994 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Marginal Year: 1995 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Marginal Year: 1996 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Marginal Year: 1997 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Marginal Year: 1998 GQA Grade: River Quality Chemistry GQA Grade E - Poor Compliance: Marginal Year: 1999 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Compliant Year: 2000 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Compliant Year: 2001 GQA Grade: River Quality Chemistry GQA Grade C - Fairly Good Compliance: Compliant Year: 2002 GQA Grade: River Quality Chemistry GQA Grade F - Bad Compliance: Significant Failure Year: 2003 GQA Grade: River Quality Chemistry GQA Grade F - Bad Compliance: Significant Failure Year: 2004 GQA Grade: River Quality Chemistry GQA Grade F - Bad Compliance: Significant Failure	SW	697	2	340260 397640
Groundwater Vulnerability					
-	Geological Classification: Major Aquifer (Highly permeable) - These are highly permeable formations usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public water supply and other purposes Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 16 West Cheshire Scale: 1:100,000	-	0	2	341090 398360
Drift Deposits					
-	Drift Deposit: Low permeability drift deposits occurring at the surface and overlying Major and Minor Aquifers are head, clay-with-flints, brickearth, peat, river terrace deposits and marine and estuarine alluvium Map Sheet: Sheet 16 West Cheshire Scale: 1:100,000	-	0	2	341090 398360
Source Protection Zones					
-	Name: Various Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	NW	84	2	340830 398710
Source Protection Zones					
-	Name: Various Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	SE	201	2	341380 397840

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
	Source Protection Zones				
-	Name: Various Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	NE	246	2	341310 398830
	Extreme Flooding from Rivers or Sea without Defences				
-	Flood Plain Type: Fluvial Summary: Environment Agency, Head Office Boundary Accuracy: As Supplied	W	0	2	340780 398350
	Flooding from Rivers or Sea without Defences				
-	Flood Plain Type: Fluvial Summary: Environment Agency, Head Office Boundary Accuracy: As Supplied	W	0	2	340780 398350
	Areas Benefiting from Flood Defences				
-	Description: None	-	-	-	-
	Flood Water Storage Areas				
-	Description: None	-	-	-	-
	Flood Defences				
-	Description: None	-	-	-	-
	River Flood Data (Scotland)				
-	Description: None	-	-	-	-

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Local Authority Landfill Coverage					
-	Name: Knowsley Metropolitan Borough Council - Has supplied landfill data	-	0	3	341090 398360
Local Authority Landfill Coverage					
-	Name: Merseyside Waste Disposal Authority - Has supplied landfill data	-	0	4	341090 398360
Local Authority Recorded Landfill Sites					
20	Location: Bewley Road/ Cherryfield Drive, Knowsley Reference: K011 Authority: Merseyside Waste Disposal Authority Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	W	0	4	340900 398300
Local Authority Recorded Landfill Sites					
21	Location: Land Bounded By Bewley Road, Cherryfield Drive, Valley Road, Kirby, Knowsley Reference: GDO205 Authority: Knowsley Metropolitan Borough Council Last Reported Status: Closed Types of Waste: Not Supplied Date of Closure: 31/12/1974 Positional Accuracy: Positioned by the supplier Boundary Quality: Good	W	0	3	340940 398400
Local Authority Recorded Landfill Sites					
22	Location: Brookfield School, Bewley Drive, Knowsley Reference: K014 Authority: Merseyside Waste Disposal Authority Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	SW	411	4	340700 397700
Local Authority Recorded Landfill Sites					
23	Location: Ingoe Lane Reference: GDO234 Authority: Knowsley Metropolitan Borough Council Last Reported Status: Closed Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	W	737	3	340060 397950

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Registered Landfill Sites					
24	Licence Holder: Knowsley M.B.C. Licence Reference: 319/01 Site Location: Brookfield School, Bewley Drive, Kirkby, Liverpool, Merseyside Site Easting: 340700 Site Northing: 397700 Operator Location: P O Box 26 Municipal Buildings, Archway Road, Huyton, Merseyside, L36 9fb Authority: Environment Agency - North West Region, South Area Site Category: Landfill Maximum Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Licence lapsed/cancelled/defunct/not applicable/surrendered Status: 1st August 1990 Dated: Not Given Preceded By: Not Given Licence: Not Given Superseded By: Not Given Licence: Manually positioned to the address or location Positional Accuracy: Not Applicable Boundary Accuracy: Alternative Max.Waste Permitted By Lic Authorised Waste: Brick, Stone, Concrete, Etc. Inert Spoil, Soils, Clays Household + Commercial Waste Prohibited Waste: Leachable Contamination Liquid/Sludge Wastes Special Wastes	SW	411	2	340700 397700

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
25	BGS Boreholes BGS Reference: Sj49nw748 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station Tp 2	N	12	5	341050 398690
26	BGS Boreholes BGS Reference: Sj49nw747 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station Tp 1	N	18	5	341110 398670
26	BGS Boreholes BGS Reference: Sj49nw743 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station 1	N	31	5	341120 398680
27	BGS Boreholes BGS Reference: Sj49nw22 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme	W	23	5	340730 398490
28	BGS Boreholes BGS Reference: Sj49nw746 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station 4	N	23	5	341030 398710
29	BGS Boreholes BGS Reference: Sj49nw30 Drilled Length: 4 Borehole Name: Kirkby Crown Building, 5 Bh'S	NE	28	5	341300 398600
30	BGS Boreholes BGS Reference: Sj49nw744 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station 2	N	28	5	341090 398690
30	BGS Boreholes BGS Reference: Sj49nw749 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station Tt 1	N	42	5	341100 398700
31	BGS Boreholes BGS Reference: Sj49nw745 Drilled Length: Not Supplied Borehole Name: Kirkby Bus Station 3	N	39	5	341070 398710
32	BGS Boreholes BGS Reference: Sj49nw27 Drilled Length: 6.4 Borehole Name: Kirby P.O. & C.B	NE	120	5	341300 398700
33	BGS Boreholes BGS Reference: Sj49nw21 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme	SW	179	5	340600 398070
34	BGS Boreholes BGS Reference: Sj49nw20 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme	SW	282	5	340530 397970
35	BGS Boreholes BGS Reference: Sj49nw19 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme	SW	434	5	340430 397850
36	BGS Boreholes BGS Reference: Sj49nw18 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme	SW	502	5	340370 397820
37	BGS Boreholes BGS Reference: Sj49nw781 Drilled Length: 2.43 Borehole Name: Liverpool Outer Ring Road 54	SW	517	5	340350 397820
38	BGS Boreholes BGS Reference: Sj49nw61 Drilled Length: 4.8 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5769/1	SW	548	5	340400 397710

Map ID	Details		Compass Direction	Estimated Distance From Site	Contact	NGR
	BGS Boreholes					
39	BGS Reference: Sj49nw784 Drilled Length: 1.82 Borehole Name: Liverpool Outer Ring Road 61		SW	569	5	340400 397680
	BGS Boreholes					
40	BGS Reference: Sj49nw57 Drilled Length: 5.26 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5768/1		SW	582	5	340320 397750
	BGS Boreholes					
40	BGS Reference: Sj49nw58 Drilled Length: 5.3 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5768/2		SW	582	5	340330 397740
	BGS Boreholes					
41	BGS Reference: Sj49nw54 Drilled Length: 9.52 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5767/2		SW	595	5	340250 397830
	BGS Boreholes					
41	BGS Reference: Sj49nw53 Drilled Length: 8.98 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5767/1		SW	601	5	340240 397850
	BGS Boreholes					
42	BGS Reference: Sj49nw778 Drilled Length: 3.65 Borehole Name: Liverpool Outer Ring Road 50		SW	599	5	340220 397900
	BGS Boreholes					
43	BGS Reference: Sj49nw782 Drilled Length: 4.94 Borehole Name: Liverpool Outer Ring Road 59		SW	599	5	340350 397690
	BGS Boreholes					
44	BGS Reference: Sj49nw785 Drilled Length: 6.17 Borehole Name: Liverpool Outer Ring Road 62		SW	608	5	340410 397620
	BGS Boreholes					
45	BGS Reference: Sj49nw60 Drilled Length: 5.48 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5768/4		SW	613	5	340290 397730
	BGS Boreholes					
46	BGS Reference: Sj49nw59 Drilled Length: 7.69 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5768/3		SW	618	5	340300 397720
	BGS Boreholes					
47	BGS Reference: Sj49nw17 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme		SW	619	5	340270 397760
	BGS Boreholes					
48	BGS Reference: Sj49nw786 Drilled Length: 5.32 Borehole Name: Liverpool Outer Ring Road 63		SW	632	5	340470 397550
	BGS Boreholes					
49	BGS Reference: Sj49nw783 Drilled Length: 2.58 Borehole Name: Liverpool Outer Ring Road 60		SW	633	5	340360 397640
	BGS Boreholes					
50	BGS Reference: Sj49nw55 Drilled Length: 7.84 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5767/3		SW	635	5	340220 397810
	BGS Boreholes					
50	BGS Reference: Sj49nw56 Drilled Length: 9.06 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5767/4		SW	639	5	340210 397820
	BGS Boreholes					
51	BGS Reference: Sj49nw777 Drilled Length: 7.23 Borehole Name: Liverpool Outer Ring Road 49		SW	651	5	340150 397920

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
BGS Boreholes					
52	BGS Reference: Sj49nw62 Drilled Length: 5.28 Borehole Name: Liverpool Outer Ring Road M57, Phase 1. 5769/2	SW	658	5	340290 397670
BGS Boreholes					
53	BGS Reference: Sj49nw779 Drilled Length: 3.65 Borehole Name: Liverpool Outer Ring Road 51	SW	663	5	340170 397850
BGS Boreholes					
54	BGS Reference: Sj49nw787 Drilled Length: 3.8 Borehole Name: Liverpool Outer Ring Road 64	SW	665	5	340530 397490
BGS Boreholes					
55	BGS Reference: Sj49nw776 Drilled Length: 5.17 Borehole Name: Liverpool Outer Ring Road 48	W	680	5	340110 397980
BGS Boreholes					
56	BGS Reference: Sj49nw780 Drilled Length: 2.43 Borehole Name: Liverpool Outer Ring Road 53	SW	688	5	340190 397760
BGS Boreholes					
57	BGS Reference: Sj49nw788 Drilled Length: 2.43 Borehole Name: Liverpool Outer Ring Road 65	SW	705	5	340600 397430
BGS Boreholes					
58	BGS Reference: Sj49nw12 Drilled Length: 3.66 Borehole Name: Liverpool Corp. Sewage Borehole	SW	709	5	340440 397480
BGS Boreholes					
59	BGS Reference: Sj49nw775 Drilled Length: 2.43 Borehole Name: Liverpool Outer Ring Road 47	W	717	5	340050 398080
BGS Boreholes					
60	BGS Reference: Sj49nw4 Drilled Length: 1.66 Borehole Name: Liverpool Corp. Shallow Bores	S	740	5	341130 397310
BGS Boreholes					
61	BGS Reference: Sj49nw789 Drilled Length: 2.43 Borehole Name: Liverpool Outer Ring Road 66	SW	745	5	340670 397360
BGS Boreholes					
62	BGS Reference: Sj39ne465 Drilled Length: 3 Borehole Name: Liverpool Ring Road A59 To A580 Bh 46	W	768	5	339990 398140
BGS Boreholes					
63	BGS Reference: Sj49nw16 Drilled Length: Not Supplied Borehole Name: Kirkby Sewage Scheme	SW	787	5	340100 397700
BGS Boreholes					
64	BGS Reference: Sj49nw790 Drilled Length: 2.43 Borehole Name: Liverpool Outer Ring Road 67	S	793	5	340740 397300
BGS 1:625,000 Solid Geology					
-	Description: Permian and Triassic sandstones, undifferentiated, including Bunter and Keuper	-	0	5	341090 398360
Coal Mining Affected Areas					
-	Description: In an area which may not be affected by coal mining	-	-	-	-
Shallow Mining Hazards					
-	Description: No Data Available	-	-	-	-

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
-	Potential for Collapsible Ground Stability Hazards Description: No Hazard	-	-	-	-
-	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	-	0	5	341090 398360
-	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	SW	167	5	340670 397980
-	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	W	751	5	340000 398360
-	Potential for Ground Dissolution Stability Hazards Description: No Hazard	-	-	-	-
-	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	-	0	5	341090 398360
-	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	W	751	5	340000 398360
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	N	0	5	341130 398550
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	-	0	5	341090 398360
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	N	67	5	341090 398750
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	W	140	5	340630 398320
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	N	307	5	341090 399000
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	NW	372	5	340680 398920
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	E	479	5	341900 398220
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	NE	558	5	341700 398970
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	N	710	5	340950 399400
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	W	751	5	340000 398360
-	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	SE	765	5	341550 397300
-	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	NE	0	5	341170 398540

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Potential for Shrinking or Swelling Clay Ground Stability Hazards					
-	Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	-	0	5	341090 398360
Potential for Shrinking or Swelling Clay Ground Stability Hazards					
-	Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	SW	0	5	340800 398220
Potential for Shrinking or Swelling Clay Ground Stability Hazards					
-	Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	W	142	5	340620 398340
Potential for Shrinking or Swelling Clay Ground Stability Hazards					
-	Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	N	300	5	341090 398990
Potential for Shrinking or Swelling Clay Ground Stability Hazards					
-	Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	W	751	5	340000 398360
Radon Affected Areas					
-	Description: Less than 1% of homes are above the Action Level Source: Health Protection Agency	W	0	6	341000 398360
Radon Affected Areas					
-	Description: Less than 1% of homes are above the Action Level Source: Health Protection Agency	-	0	6	341090 398360
Radon Protection Measures					
-	Type: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	-	0	5	341090 398360

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
65	Name: Heron Frozen Foods Location: Cherryfield Drive,Liverpool,L32 8RX Classification: Frozen Food Processors & Distributors Status: Active Positional Accuracy: Automatically positioned to the address	N	51	-	341170 398680
Contemporary Trade Directory Entries					
66	Name: Iceland Frozen Foods Location: 31,St. Chads Parade,Liverpool,L32 8UG Classification: Frozen Food Processors & Distributors Status: Active Positional Accuracy: Automatically positioned to the address	N	70	-	341120 398720
Contemporary Trade Directory Entries					
66	Name: Klick Location: 29a,St. Chads Parade,Liverpool,L32 8UG Classification: Photographic Processors Status: Active Positional Accuracy: Automatically positioned to the address	N	85	-	341140 398730
Contemporary Trade Directory Entries					
67	Name: Brighthouse Location: 82-84,St. Chads Parade,Liverpool,L32 8UG Classification: Electrical Goods Sales, Manufacturers & Wholesalers Status: Active Positional Accuracy: Automatically positioned to the address	N	81	-	341100 398740
Contemporary Trade Directory Entries					
68	Name: Johnson Cleaners (Uk) Ltd Location: 11b,St. Chads Parade,Liverpool,Merseyside,L32 8RD Classification: Dry Cleaners Status: Active Positional Accuracy: Automatically positioned to the address	N	84	-	341190 398710
Contemporary Trade Directory Entries					
69	Name: Kirkby Blinds Ltd Location: St. Chads Pde,Liverpool,Merseyside,L32 8RH Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	N	109	-	341220 398720
Contemporary Trade Directory Entries					
70	Name: Lazer Electrics Location: 46,St. Chads Parade,Liverpool,L32 8RH Classification: Electrical Goods Sales, Manufacturers & Wholesalers Status: Active Positional Accuracy: Automatically positioned to the address	N	127	-	341180 398760
Contemporary Trade Directory Entries					
71	Name: Classic Colour Centres Ltd Location: 18,St. Chads Parade,Liverpool,L32 8RH Classification: Wallpapers & Wall Coverings Status: Active Positional Accuracy: Automatically positioned to the address	NE	133	-	341260 398730
Contemporary Trade Directory Entries					
72	Name: Kirkby Blinds Ltd Location: 8,St. Chads Parade,Liverpool,L32 8RH Classification: Blinds, Awnings & Canopies Status: Active Positional Accuracy: Automatically positioned to the address	NE	147	-	341300 398730
Contemporary Trade Directory Entries					
73	Name: Material Girls Location: 11,Market Square,Kirkby,Liverpool,L32 8RG Classification: Recycling Centres Status: Inactive Positional Accuracy: Automatically positioned to the address	NE	159	-	341320 398730
Contemporary Trade Directory Entries					
74	Name: Solarshade Location: Unit 33,In Shops,Telegraph Way,Liverpool,L32 8US Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Automatically positioned to the address	NE	216	-	341290 398810

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Contemporary Trade Directory Entries					
75	Name: Telegraph Service Stations Ltd Location: Irlam Drive, Liverpool, L32 8RJ Classification: Petrol Filling Stations Status: Inactive Positional Accuracy: Automatically positioned to the address	NE	386	-	341360 398960
Contemporary Trade Directory Entries					
76	Name: End Stop Roller Shutters Location: 15, Daresbury Close, Liverpool, L32 0XH Classification: Roller Shutter Manufacturers Status: Active Positional Accuracy: Automatically positioned to the address	W	405	-	340360 398560
Contemporary Trade Directory Entries					
77	Name: George Boyd Location: 47, Park Brow Drive, Liverpool, L32 9RF Classification: French Polishing Status: Inactive Positional Accuracy: Automatically positioned to the address	E	449	-	341830 398080
Contemporary Trade Directory Entries					
78	Name: A P W Electrical Supplies Location: A, 2, Church Green, Kirkby, Liverpool, Merseyside, L32 1TB Classification: Electrical Goods Sales, Manufacturers & Wholesalers Status: Active Positional Accuracy: Automatically positioned to the address	N	499	-	341330 399100
Contemporary Trade Directory Entries					
79	Name: Rts The Print & Copy Centre (Uk) Ltd Location: Roughwood Drive, Liverpool, L33 8XF Classification: Copying & Duplicating Services Status: Inactive Positional Accuracy: Automatically positioned to the address	NE	599	-	341550 399110
Contemporary Trade Directory Entries					
80	Name: Able Waste Location: 10, Retford Walk, Liverpool, L33 5YH Classification: Waste Disposal Services Status: Active Positional Accuracy: Automatically positioned in the proximity of the address	NE	686	-	341990 398830
Contemporary Trade Directory Entries					
81	Name: Westvale Service Station Location: Whitefield Drive, Liverpool, L32 0UX Classification: Petrol Filling Stations - 24 Hour Status: Active Positional Accuracy: Automatically positioned to the address	W	780	-	339990 398670
Contemporary Trade Directory Entries					
81	Name: Vauxhall Cab Centre Ltd Location: Whitefield Drive, Liverpool, L32 0UX Classification: Gearboxes Status: Active Positional Accuracy: Automatically positioned to the address	W	780	-	339990 398670
Contemporary Trade Directory Entries					
82	Name: Auto Respray Location: Bigdale Drive, Liverpool, L33 6XG Classification: Car Body Repairs Status: Inactive Positional Accuracy: Automatically positioned to the address	NE	786	-	341960 399040
Contemporary Trade Directory Entries					
82	Name: Bigdale Service Station Location: Bigdale Drive, Liverpool, L33 6XG Classification: Petrol Filling Stations - 24 Hour Status: Active Positional Accuracy: Automatically positioned to the address	NE	786	-	341960 399040
Fuel Station Entries					
83	Name: Cherryfield Drive Service Station Location: Cherryfield Drive, Kirkby, LIVERPOOL, Merseyside, L32 8SE Brand: Obsolete Premises Type: Not Applicable Status: Obsolete Positional Accuracy: Approximate location provided by supplier	N	0	-	341180 398610

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Fuel Station Entries					
84	Name: Kirkby Service Station Location: Irlam Drive, Kirkby, LIVERPOOL, Merseyside, L32 8US Brand: OBSOLETE Premises Type: Not Applicable Status: Obsolete Positional Accuracy: Automatically positioned to the address	N	288	-	341280 398890
Fuel Station Entries					
85	Name: West Vale Service Station Location: Whitefield Drive, Richard Hesketh Drive, Kirkby, LIVERPOOL, Merseyside, L32 0UX Brand: Total Premises Type: Petrol Station Status: Open Positional Accuracy: Automatically positioned to the address	W	780	-	339990 398670
Fuel Station Entries					
86	Name: Bigdale Service Station Location: Bigdale Drive, Kirkby, LIVERPOOL, Merseyside, L33 6XG Brand: UNBRANDED Premises Type: Petrol Station Status: Open Positional Accuracy: Automatically positioned to the address	NE	786	-	341960 399040

Map ID	Details	Compass Direction	Estimated Distance From Site	Contact	NGR
Areas of Adopted Green Belt					
-	Authority: Knowsley Metropolitan Borough Council Plan Name: Knowsley Metropolitan Borough Unitary Development Plan Status: Adopted Plan Date: 3rd June 1998	SW	421	3	340450 397840
Areas of Unadopted Green Belt					
-	Authority: Knowsley Metropolitan Borough Council Plan Name: Knowsley Unitary Development Plan Revised Draft Replacement Plan Status: Revised Draft Plan Date: 31st December 2004	SW	426	3	340460 397820
Nitrate Vulnerable Zones					
-	Name: Not Supplied Description: Surface Water Source: Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	-	0	7	341090 398360

Data Type	Version	Update Cycle
Agency & Hydrological		
Local Authority Pollution Prevention and Controls Knowsley Metropolitan Borough Council Environmental Health and Consumer Protection Division	January-2006	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Knowsley Metropolitan Borough Council Environmental Health and Consumer Protection Division	January-2006	Annual Rolling Update
Contaminated Land Register Entries and Notices Knowsley Metropolitan Borough Council Department of Planning and Development	April-2006	Annual Rolling Update
Discharge Consents Environment Agency North West Region	July-2006	Quarterly
Integrated Pollution Controls Environment Agency North West Region	July-2006	Quarterly
Integrated Pollution Prevention And Control Environment Agency North West Region	July-2006	Quarterly
Local Authority Integrated Pollution Prevention And Control Knowsley Metropolitan Borough Council Environmental Health and Consumer Protection Division	January-2006	Annual Rolling Update
Nearest Surface Water Feature Ordnance Survey	April-2006	Quarterly
Pollution Incidents to Controlled Waters Environment Agency North West Region	January-2000	Not Applicable
Substantiated Pollution Incident Register Environment Agency - North West Region South Area	July-2006	Quarterly
Water Industry Act Referrals Environment Agency North West Region	July-2006	Quarterly
Registered Radioactive Substances Environment Agency North West Region	July-2006	Quarterly
River Quality Environment Agency Head Office	November-2001	Not Applicable
River Quality Biology Sampling Points Environment Agency Head Office	February-2006	Annually
River Quality Chemistry Sampling Points Environment Agency Head Office	January-2006	Annually
Water Abstractions Environment Agency North West Region	July-2006	Quarterly
Groundwater Vulnerability Environment Agency Head Office	January-1999	Not Applicable
Drift Deposits Environment Agency Head Office	January-1999	Not Applicable
Source Protection Zones Environment Agency Head Office	April-2005	Variable
Extreme Flooding from Rivers or Sea without Defences Environment Agency Head Office	July-2006	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency Head Office	July-2006	Quarterly

Data Type	Version	Update Cycle
Agency & Hydrological		
Areas Benefiting from Flood Defences Environment Agency Head Office	July-2006	Quarterly
Flood Water Storage Areas Environment Agency Head Office	July-2006	Quarterly
Flood Defences Environment Agency Head Office	July-2006	Quarterly
River Flood Data (Scotland) Centre for Ecology and Hydrology	September-1999	Not Applicable
Waste		
BGS Recorded Landfill Sites British Geological Survey National Geoscience Information Service	June-1996	Not Applicable
Integrated Pollution Control Registered Waste Sites Environment Agency North West Region	July-2006	Quarterly
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - North West Region South Area	May-2006	Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - North West Region South Area	August-2006	Quarterly
Local Authority Landfill Coverage Knowsley Metropolitan Borough Council Merseyside Waste Disposal Authority	May-2000	Not Applicable
	May-2000	Not Applicable
Local Authority Recorded Landfill Sites Knowsley Metropolitan Borough Council Merseyside Waste Disposal Authority	May-2000	Not Applicable
	May-2000	Not Applicable
Registered Landfill Sites Environment Agency - North West Region South Area	March-2003	Not Applicable
Registered Waste Transfer Sites Environment Agency - North West Region South Area	March-2003	Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - North West Region South Area	March-2003	Not Applicable
Hazardous Substances		
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	May-2006	Bi-Annually
Explosive Sites Health and Safety Executive	September-2006	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November-2000	Not Applicable
Planning Hazardous Substance Consents Knowsley Metropolitan Borough Council	March-2005	Annual Rolling Update
Planning Hazardous Substance Enforcements Knowsley Metropolitan Borough Council	September-2006	Annual Rolling Update

Data Type	Version	Update Cycle
Geological		
BGS Boreholes British Geological Survey National Geoscience Information Service	July-2006	Quarterly
BGS Recorded Mineral Sites British Geological Survey National Geoscience Information Service	April-2006	Bi-Annually
BGS 1:625,000 Solid Geology British Geological Survey National Geoscience Information Service	August-1996	Not Applicable
Brine Compensation Areas Cheshire Brine Subsidence Compensation Board	November-2002	As notified
Coal Mining Affected Areas The Coal Authority Mining Report Service	January-2006	As notified
Shallow Mining Hazards British Geological Survey National Geoscience Information Service	August-2002	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey National Geoscience Information Service	November-2005	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey National Geoscience Information Service	May-2005	Annually
Mining Instability Ove Arup & Partners	October-2000	Not Applicable
Natural and Mining Cavities Peter Brett Associates	December-2005	Variable
Radon Affected Areas Health Protection Agency	January-2003	Not Applicable
Radon Protection Measures British Geological Survey National Geoscience Information Service	August-2002	Variable
Industrial Land Use		
Contemporary Trade Directory Entries Thomson Directories	August-2006	Quarterly
Fuel Station Entries Catalist Ltd (Fuel Station Data)	May-2006	Quarterly

Data Type	Version	Update Cycle
Sensitive Land Uses		
Areas of Adopted Green Belt		
West Lancashire District Council	December-1999	As notified
St Helens Metropolitan Borough Council	July-1998	As notified
Knowsley Metropolitan Borough Council	June-1998	As notified
Sefton Metropolitan Borough Council	May-1995	As notified
Liverpool City Council	November-2002	As notified
Areas of Unadopted Green Belt		
Sefton Metropolitan Borough Council	April-2003	As notified
Knowsley Metropolitan Borough Council	December-2004	As notified
West Lancashire District Council	January-2005	As notified
Areas of Outstanding Natural Beauty		
The Countryside Agency	October-2004	Annually
Environmentally Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	June-2006	Annually
Forest Parks		
Forestry Commission	April-1997	Not Applicable
Local Nature Reserves		
Liverpool City Council	September-1999	Variable
Marine Nature Reserves		
English Nature	May-2006	Bi-Annually
National Nature Reserves		
English Nature	May-2006	Bi-Annually
National Parks		
The Countryside Agency	October-2004	Annually
Nitrate Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December-2003	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	May-2006	Annually
Ramsar Sites		
English Nature	May-2006	Bi-Annually
Sites of Special Scientific Interest		
English Nature	May-2006	Bi-Annually
Special Areas of Conservation		
English Nature	May-2006	Bi-Annually
Special Protection Areas		
English Nature	May-2006	Bi-Annually

Some of the organisations who provide data which is used within the report

Ordnance Survey	 Licensed Partner
Environment Agency	 Environment Agency
Scottish Environment Protection Agency	 Scottish Environment Protection Agency
The Coal Authority	
British Geological Survey	 British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Countryside Council for Wales	 CYNGOR CEFN GWLAD CYMRU COUNTRYSIDE COUNCIL FOR WALES
Scottish Natural Heritage	
English Nature Site of Special Scientific Interest, National Nature Reserve, Ramsar, Special Protection Area, Special Conservation Area, Marine Nature Reserve data (derived from Ordnance Survey 1:10000 raster) is provided by, and used with the permission of, English Nature who retain the copyright and Intellectual Property Rights for the data	
Health Protection Agency	
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Peter Brett Associates The cavity data presented has been extracted from the PBA enhanced version of the original DEFRA national cavity databases. PBA/DEFRA retain the copyright & intellectual property rights in the data. Whilst all reasonable efforts are made to check that the information contained in the cavity databases is accurate we do not warrant that the data is complete or error free. The information is based upon our own researches and those collated from a number of external sources and is continually being augmented and updated by PBA. In no event shall PBA /DEFRA or Landmark be liable for any loss or damage including, without limitation, indirect or consequential loss or damage arising from the use of this data.	

Contact Name and Address

1	Knowsley Metropolitan Borough Council Environmental Health and Consumer Protection Division Municipal Buildings Cherryfield Drive Kirkby Knowsley Merseyside L32 1TX www.knowsley.gov.uk	Telephone 0151 443 4731 Fax 0151 289 7488
2	Environment Agency National Customer Contact Centre (NCCC) PO Box 544 Templeborough Rotherham S60 1BY enquiries@environment-agency.gov.uk	Telephone 08708 506 506
3	Knowsley Metropolitan Borough Council Archway Road Huyton Liverpool Merseyside L36 9YU www.knowsley.gov.uk	Telephone 0151 489 6000 Fax 0151 443 2298
4	Merseyside Waste Disposal Authority 2nd Floor North House 17 North John Street Liverpool Merseyside L2 5QY enquiries@merseysidewda.gov.uk	Telephone 0151 2551444 Fax 0151 2271848

Contact Name and Address

5	British Geological Survey Enquiry Service British Geological Survey Kingsley Dunham Centre Keyworth Nottingham Nottinghamshire NG12 5GG enquiries@bgs.ac.uk www.bgs.ac.uk	Telephone 0115 936 3143 Fax 0115 936 3276
6	Health Protection Agency Chilton Didcot Oxfordshire OX11 0RQ	Telephone 01235 831600 Fax 01235 833891
7	Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) Government Buildings Otley Road Lawnswood Leeds West Yorkshire LS16 5QT	Telephone 0113 2613333 Fax 0113 230 0879
	Catalist Ltd (Fuel Station Data) Richmond House 22 Richmond Hill Clifton Bristol Avon BS8 1BA Mark@catalist-uk.com	Telephone 0117 923 7113 Fax 0117 923 7166

Please note that the Environment Agency/SEPA have a charging policy for enquiries



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

Borehole Records Order Form

Name:	Your Ref/Order no:
Company:	Our Ref: ISGR/
Address:	Tel: Fax:
Postcode:	

Quarter Sheet (eg. SE5ONE)	Number (eg. 21)	Suffix (if given) (eg. A-Z)	Name (eg. Bentley Village Sewer TP 1)

Please note: More than 10 records can be ordered, but it is advisable to discuss your requirements first with NGIS staff, as interpreted geological reports are also available.

RESPONSE TIMES MAY VARY DUE TO CUSTOMER DEMAND AND STAFF AVAILABILITY

Level of Service: (Please tick)

☐ **Standard Service (variable within 5 days)**

☐ **Premium Service (24 hour response, £30 additional charge)**

Delivery Method: (Please tick) ☐ **Post** ☐ **Special Delivery £4.25** ☐ **Fax 50p (per sheet)** ☐ **Digital CD £2 (per CD)** ☐

Borehole unit price is £13 + VAT, Minimum charge £26 + VAT **(includes 1st class postage)**.

Special Requirements or comments:

Please return form to: Records & Data Enquiries, British Geological Survey, Keyworth, Nottingham NG12 5GG.
 Tel: 01159363143 Fax: 01159363276 E-mail: enquiries@bgs.ac.uk

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 - copy, use, market, re-sell, distribute, merge, alter, add to or carry on any redistribution, reproduction, translation, publication, reduction to any electronic medium or machine readable form or commercially exploit or in any other way deal with or utilise or (except as expressly permitted by applicable law) reverse engineer, decompile or disassemble the Services, Content or Website; or
 - remove, alter or in any way change any trademark or proprietary marking in any element of the Services and You shall acknowledge the ownership of the Content, where such Content is incorporated or used into Your own documents, reports, systems or services whether or not these are supplied to any third party.
 - create any product which is derived directly or indirectly from the data contained in the Services
 - The mapping contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services or as specifically provided by these Terms.
- ## 4. Charges
- VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.
 - An individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such invoices. Landmark reserve the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.
 - We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.
 - Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of

Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

- Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:-
 - You fail to make any payment due in accordance with clause 4;
 - You repeatedly breach or commit or cause to be committed any material breach of these Terms; or
 - You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so; additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.
 - If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.
 - Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.
- ## 6. Liability
- We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.
 - Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or wilful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.
 - As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or wilful default and neither Landmark nor any person providing information contained in any Services shall in any other circumstances be liable for any inaccuracies, faults or omissions in the Services nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.
 - Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark. In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the complaint is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.
 - Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.
 - You acknowledge that:-
 - You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts of omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Service) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us;
 - Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;
 - no physical inspection of the Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land

uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude actual fitness or unfitness of a Property Site for any particular purpose nor should it be relied upon for determining saleability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.

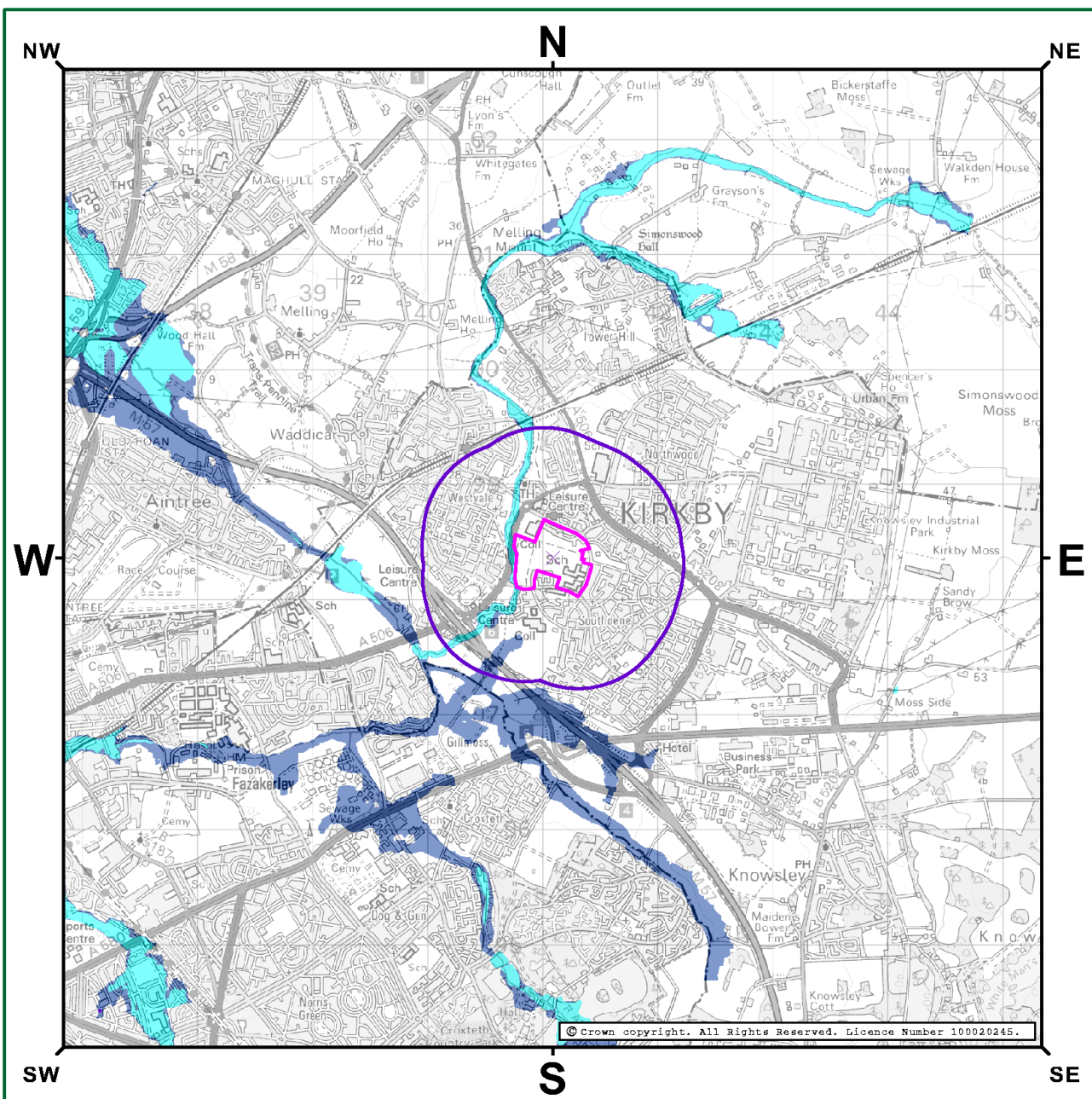
- iv. Landmark shall not be responsible for error or corruption in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link, or printing.
- v. Landmark will not be held liable in any way if a Report on residential property is used for commercial property or more than the one residential property for which it was ordered.
- vi. the Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content;
- vii. Landmark offer no warranty for the performance of any linked internet service not operated by Landmark;
- viii. You will on using the Services make a reasonable inspection of any results to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify us in writing of such defect within seven days of its discovery;
- ix. Any support or assistance provided to You in connection with these Terms is at Your risk;
- h. All liability for any insurance products purchased by You rests solely with the insurer. Landmark does not endorse any particular product or insurer and no information contained within the Services should be deemed to imply otherwise. You acknowledge that if You Order any such insurance Landmark will deem such as Your consent to forward a copy of the Report to the insurers. Where such policy is purchased, all liability remains with the insurers and You are entirely responsible for ensuring that the insurance policy offered is suitable for Your needs and should seek independent advice. Landmark does not guarantee that an insurance policy will be available on a Property Site. All decisions with regard to the offer of insurance policies for any premises will be made solely at the discretion of the insurers and Landmark accepts no liability in this regard. The provision of a Report does not constitute any indication by Landmark that insurance will be available on the property.
- i. If Landmark provides You with any additional service obtained from a third party, including but not limited to any professional opinion, interpretation or conclusion, risk assessment or environmental report or search carried out in relation to a Report on Your Property Site, Landmark will not be liable in any way for any information contained therein or any issues arising out of the provision of those additional services to You. Landmark will be deemed to have acted as an agent in these circumstances and the supply of these additional services will be governed by the terms and conditions of those Third Parties. For the avoidance of doubt, those parties providing assessments or professional opinions on Landmark products include RPS Plc & Wilbourn Associates Limited. Copies of their terms and conditions are available on request from Landmark.
- j. In any event no person may rely on a Service more than 12 months after its original date.
- k. If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.
- l. Time shall not be of the essence with respect to the provision of the Services.
- m. Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.
- n. Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently, in which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the

remainder of the Report and should not take or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6i above.

7. Contribution

- a. Save where expressly provided, this clause 7 shall apply solely to Envirosearch Residential Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.
- b. Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution")
- c. In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out under the Notice subject to the provisions of this clause 7 and on the following terms:
 - i. the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report;
 - ii. the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
 - iii. the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
- iv. the Contribution will not be paid in respect of any of the following:
 - Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
 - Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures.
 - Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.
 - Intentional non-compliance arising from the intentional disregard of or knowing wilful or deliberate non-compliance by any owner or occupier of the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.
 - Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.
 - Any condition which is caused by acts of War or an Act of Terrorism.
 - Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.
 - Any fines liquidated damages punitive or exemplary damages.
 - Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.
 - Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.
 - Any losses incurred following a material change in use of, alteration or development of the Property Site.
- d. The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £50,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.
- e. Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.
- f. Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.

- g. In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 2 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or complying with any other reasonable request by Landmark, Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.
 - h. In the event that the First Purchaser or First Purchaser's Lender receives any communication from a statutory authority to the effect that there is an intent to serve a notice received under PartII(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 e and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7e.
 - i. Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions without further notice.
- #### **8. Events Beyond Our Control**
- a. You acknowledge that Landmark shall not be liable for any delay, interruption or failure in the provision of the Services which are caused or contributed to by any circumstance which is outside our reasonable control including but not limited to, lack of power, telecommunications failure or overload, computer malfunction, inaccurate processing of data, or delays in receiving, loading or checking data, corruption of data whilst in the course of conversion, geo-coding, processing by computer in the course of electronic communication, or printing.
- #### **9. Severability**
- a. If any provision of these Terms are found by either a court or other competent authority to be void, invalid, illegal or unenforceable, that provision shall be deemed to be deleted from these Terms and never to have formed part of these Terms and the remaining provisions shall continue in full force and effect.
- #### **10. Governing Law**
- a. These terms shall be governed by and construed in accordance with English law and each party agrees irrevocably submit to the exclusive jurisdiction of the English courts If any dispute arises out of or in connection with this agreement (a "Dispute") the parties undertake that, prior to the commencement of Court proceedings, they will seek to have the Dispute resolved amicably by use of an alternative dispute resolution procedure acceptable to both parties with the assistance of the Centre for Dispute Resolution (CEDR) if required, by written notice initiating that procedure. If the Dispute has not been resolved to the satisfaction of either party within 60 days of initiation of the procedure or if either party fails or refuses to participate in or withdraws from participating in the procedure then either party may refer the Dispute to the Court.
- #### **11. General**
- a. Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.
 - b. Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.
 - c. No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.
 - d. Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and all notices from Landmark to You will be displayed on our Websites from time to time.
 - e. A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.
 - f. Landmark's Privacy Policy as displayed on the Website governs the use made of any information You supply to Landmark.



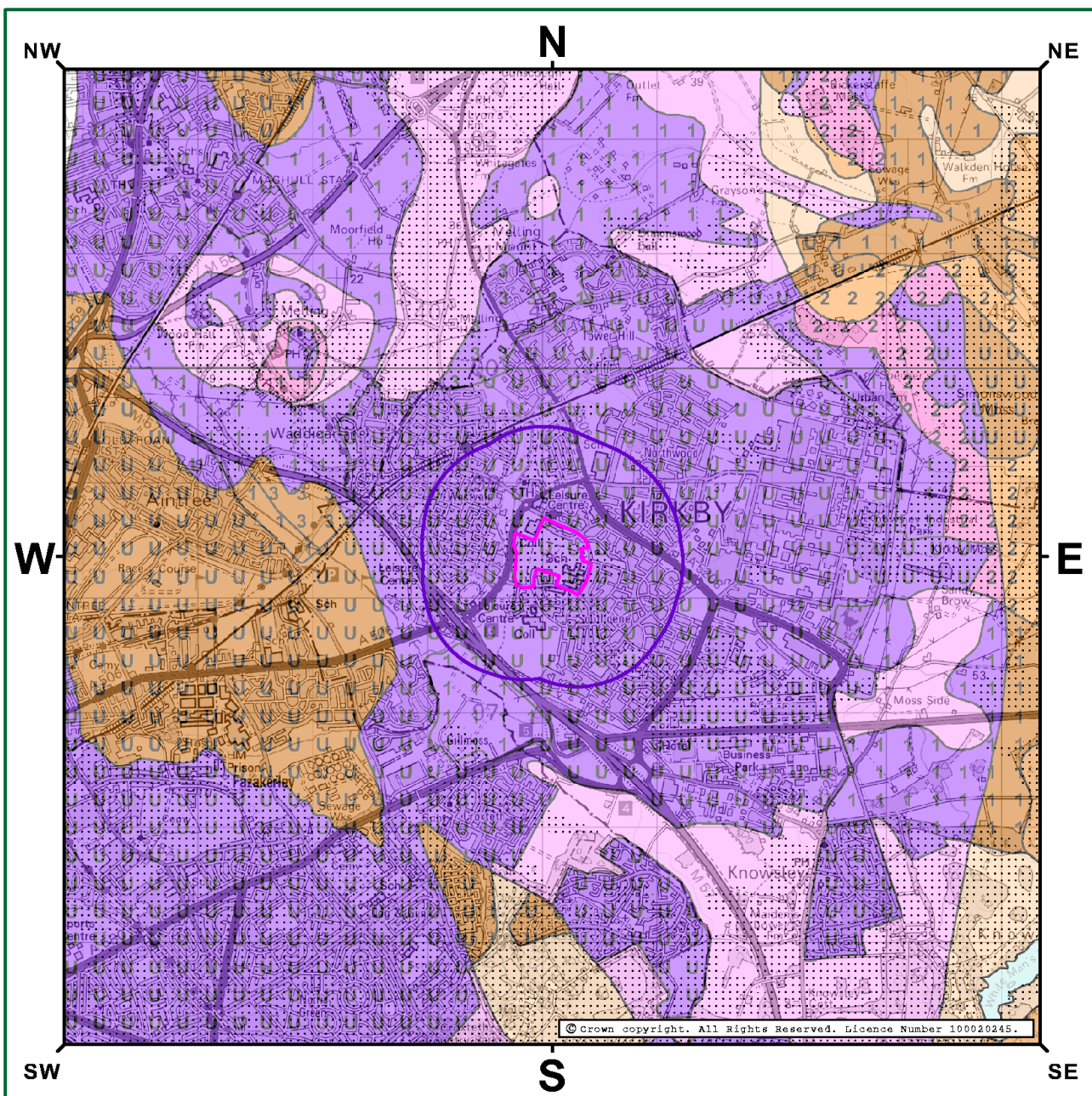
KEY

General

- Specified Site
- X Bearing Reference Point
- Buffer

Agency & Hydrological Environment Agency

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defences
- Flood Water Storage Areas
- Flood Defences



KEY

General

- Specified Site
- Bearing Reference Point
- Buffer

Groundwater Vulnerability

Geological Classes

Major Aquifer
(High Permeable)

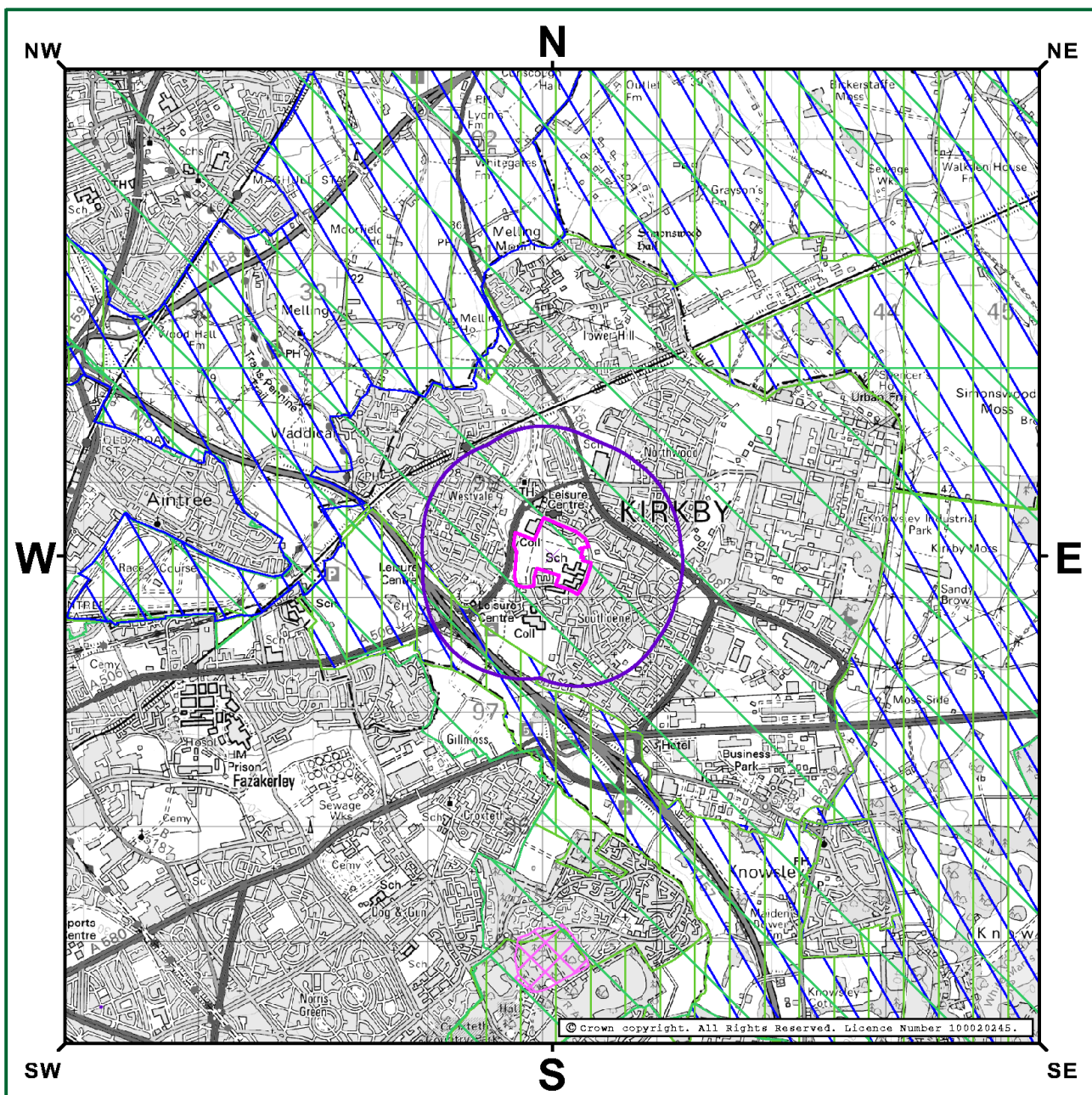
Minor Aquifer
(Variable Permeable)

Non Aquifer
(Negligibly Permeable)

Soil Classes

- High (H) 1, 2, 3, U
- Intermediate (I) 1, 2
- Low
- High (H) 1, 2, 3, U
- Intermediate (I) 1, 2
- Low

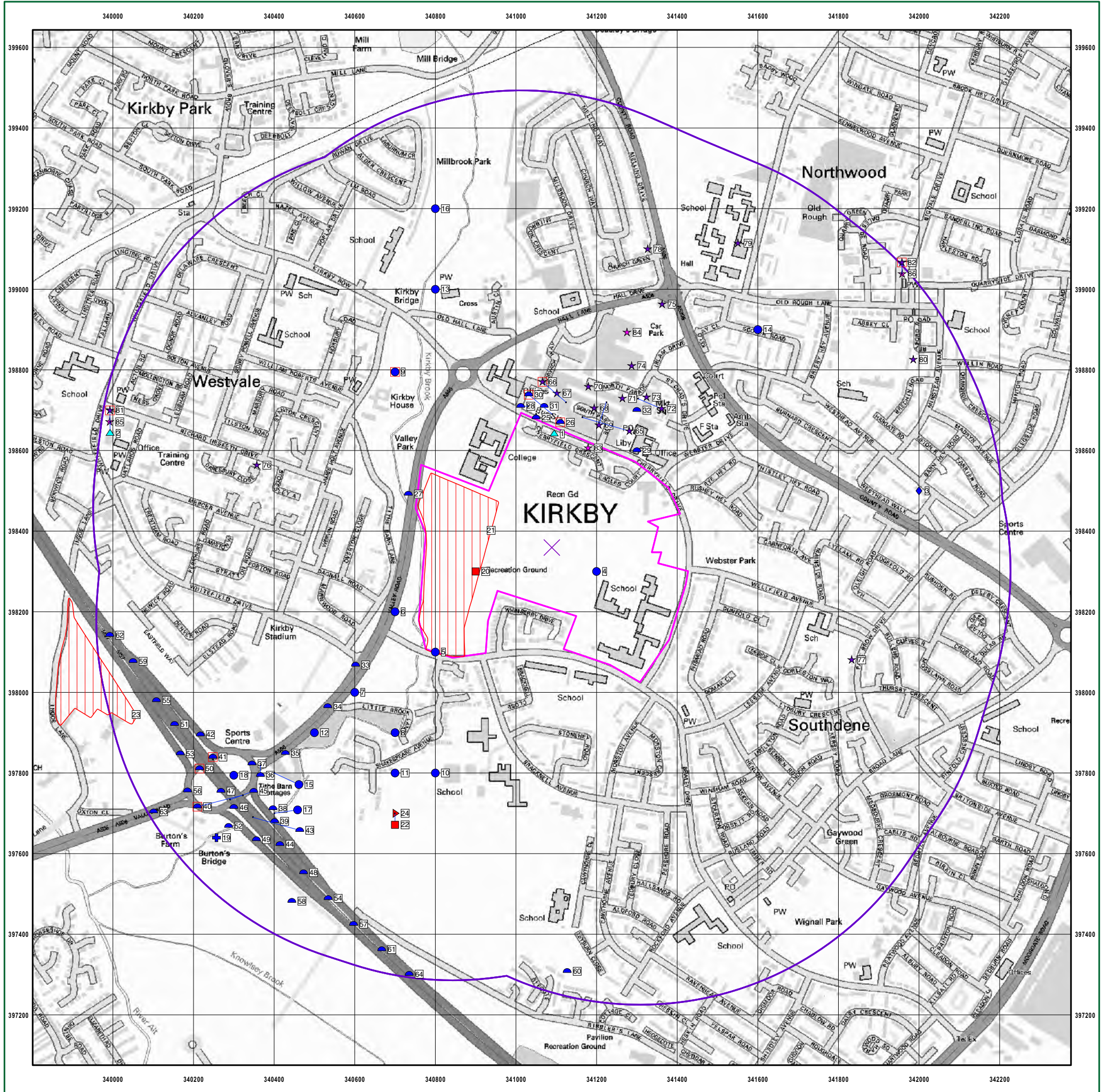
Drift Deposit



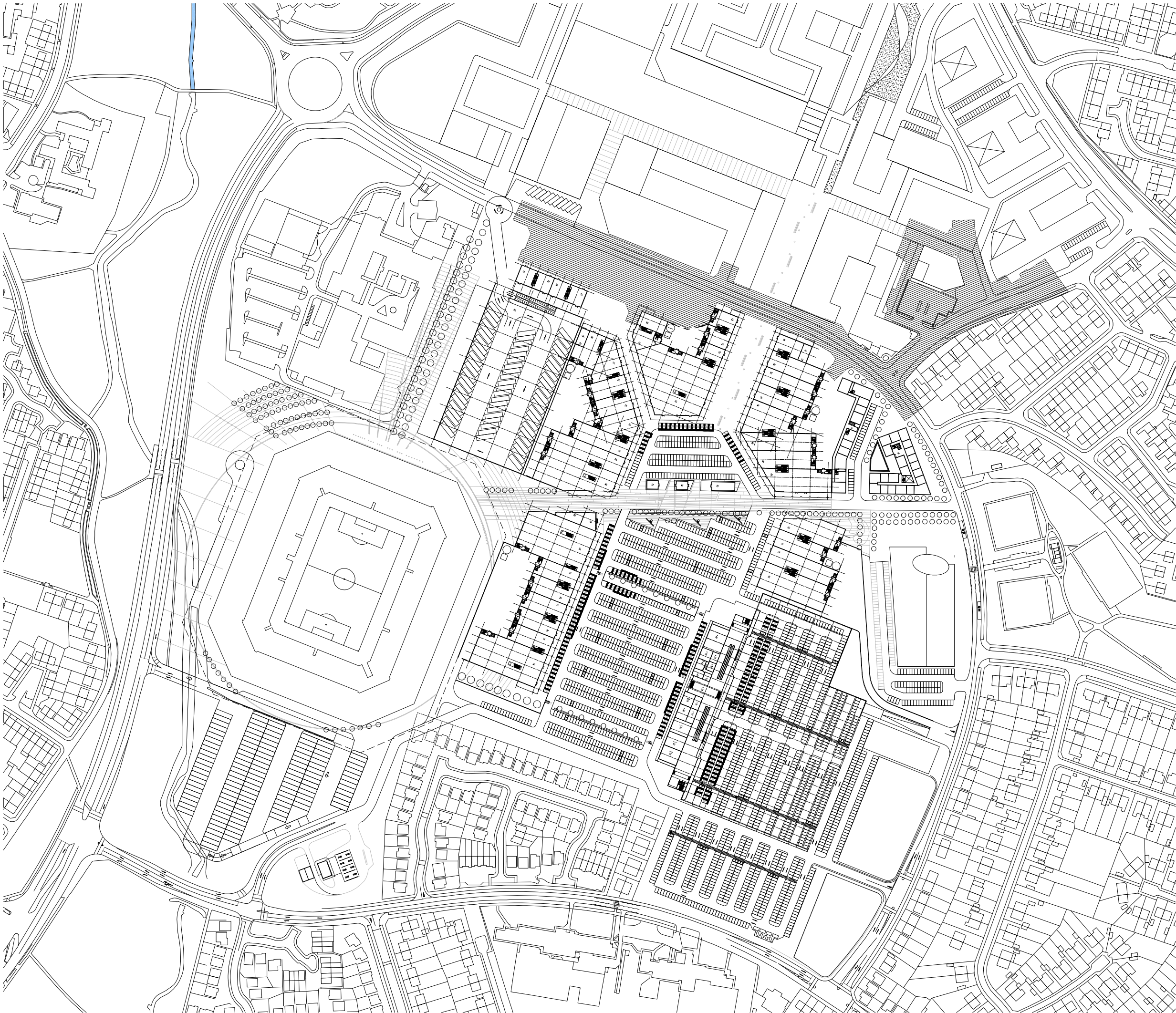
KEY

General

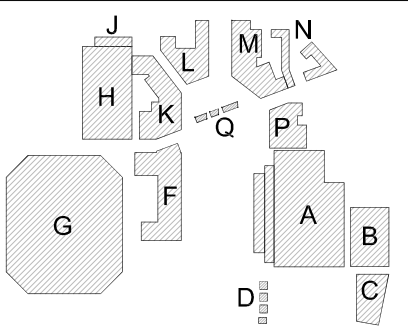
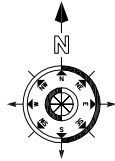
- | | | |
|------------------------------------|--------------------------------|-------------------------------------|
| Specified Site | Environmentally Sensitive Area | Nitrate Sensitive Area |
| Bearing Reference Point | Forest Park | Nitrate Vulnerable Zone |
| Buffer | Local Nature Reserve | Ramsar Site |
| Sensitive Land Uses | | |
| Area of Adopted Green Belt | Marine Nature Reserve | Site of Special Scientific Interest |
| Area of Unadopted Green Belt | National Nature Reserve | Special Area of Conservation |
| Area of Outstanding Natural Beauty | National Park | Special Protection Area |
| | National Scenic Area | |



Appendix H – Master plan drawing



Contractors are not to scale dimensions from this drawing



Building Key

Rev.	Description	Date	Intl.
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BroadwayMalyan

Riverside House
Southwark Bridge Road
London SE1 9HA
T: +44(0)20 7261 4200
F: +44(0)20 726 4300
E: lon@broadwaymalyan.com

Client

Tesco

Project
**Kirkby Town Centre
Regeneration**
Description

**Proposed
Site Plan**

Status

Preliminary

Scale
1:1500 @ A1

Drawn

Date

09-11-06

Job number

24400

Drawing number

AP-02-00

Revision

Original size 100mm

Copyright Broadway Malyan Limited

Appendix I – Risk evaluation tables

Definition of Severity (Consequence) and Likelihood (Probability)

Source: CIRIA 552(2001)

Classification of consequence

Classification	Definition	Examples
Severe	Short-terms (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/property. A short-terms risk to a particular ecosystem or organism forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem (note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentrations of a contaminant from site exceed the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the <i>Draft Circular on Contaminated Land</i> , DETR, 2000). Damage to sensitive buildings/structures/ services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (eg foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

Classification of probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probably that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Definition of Risk

Source: CIRIA 552(2001)

Comparison of consequence against probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Description of the classified risks and likely action required

Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

HUMAN RECEPTORS: PRELIMINARY RISK ASSESSMENT

Source			Pathway/Receptor	Risk assessment following CIRIA C552			Actions required for acceptable risk
Name	Reason for concern	Contaminants of concern		Consequence	Probability	Risk	
General Made Ground across site	Potentially containing contaminants related to its source.	Typically arsenic, PAHs, heavy metals.	Direct contact, dust and vapour inhalation (construction workers)	Minor	Low likelihood	Very Low	Assumes appropriate use of PPE during construction works.
			Soil and soil dust ingestion, skin contact and vapour inhalation (site end users of soft landscaped areas, maintenance workers)	Medium	Low likelihood	Moderate/low	Site specific ground investigation to clarify risk. Possible need for clean cap, hardstanding, gas protection measures.
			Ingestion of contaminated water supplies via permeation of water supply pipes (site end users)	Medium	Low likelihood	Moderate/low	Site specific ground investigation to clarify risk. Possible need for clean backfill around new utilities.
Landfill (predominantly in west of site)	Solid phase contaminants and leachate generation	Dependent on waste type.	Direct contact, dust and vapour inhalation (construction workers)	Minor	High likelihood	Moderate/low	Assumes appropriate use of PPE during construction works.
			Soil and soil dust ingestion, skin contact and vapour inhalation (site end users of soft landscaped areas, maintenance workers)	Medium	Likely	Moderate	Site specific ground investigation to clarify risk. Possible need for clean cap, hardstanding, gas protection measures.
			Ingestion of contaminated water supplies via permeation of water supply pipes (site end users)	Medium	Likely	Moderate	Site specific ground investigation to clarify risk. Possible need for clean backfill around new utilities.
Landfill, Made Ground and alluvium	Potential to generate gases	CO ₂ , CH ₄	Migration and accumulation in excavations and other confined spaces (construction workers).	Severe	Likely	High	Site specific ground investigation to clarify risk. Possible need for gas monitoring and additional PPE during construction phase, and gas protection measures in new structures.
			Migration and accumulation in sub floor cavities in new structures (site maintenance workers, site end users)	Severe	Low likelihood	Moderate	
Former Total Fina Elf service station in north of site	Potential for remaining insitu contamination.	Petroleum hydrocarbons	Direct contact, dust and vapour inhalation (construction workers)	Minor	Likely	Low	Assumes appropriate use of PPE during construction works.
			Soil and soil dust ingestion, skin contact and vapour inhalation (site end users of soft landscaped areas, maintenance workers)	Medium	Likely	Moderate	Site specific ground investigation to clarify risk. Possible need for clean cap, hardstanding, gas protection measures.
			Ingestion of contaminated water supplies via permeation of water supply pipes (site end users)	Medium	Likely	Moderate/	Site specific ground investigation to clarify risk. Possible need for clean backfill around new utilities.
Electrical Sub Station in northeast of site	Potential for remaining insitu contamination.	PCBs, oils	Direct contact, dust and vapour inhalation (construction workers)	Minor	Likely	Low	Assumes appropriate use of PPE during construction works.
			Soil and soil dust ingestion, skin contact and vapour inhalation (site end users of soft landscaped areas, maintenance workers)	Medium	Low likelihood	Moderate/low	Site specific ground investigation to clarify risk. Possible need for clean cap, hardstanding, gas protection measures.
			Ingestion of contaminated water supplies via permeation of water supply pipes (site end users)	Medium	Low likelihood	Moderate/low	Site specific ground investigation to clarify risk. Possible need for clean backfill around new utilities.
Offsite sources	Variety of commercial land uses to northeast of site (up hydraulic gradient)	Mobile contaminants e.g. fuel oils, chlorinated hydrocarbons	Direct contact, dust and vapour inhalation (construction workers)	Minor	Unlikely	Very Low	Assumes appropriate use of PPE during construction works.
			Soil and soil dust ingestion, skin contact and vapour inhalation (site end users of soft landscaped areas, maintenance workers)	Medium	Unlikely	Low	Site specific ground investigation to clarify risk. Possible need for clean cap, hardstanding, gas protection measures.
			Ingestion of contaminated water supplies via permeation of water supply pipes (site end users)	Medium	Unlikely	Low	Site specific ground investigation to clarify risk. Possible need for clean backfill around new utilities.

NATURAL ENVIRONMENT RECEPTORS: PRELIMINARY RISK ASSESSMENT

Source			Pathway/Receptor	Risk assessment following CIRIA C552			Actions required for acceptable risk
Name	Reason for concern	Contaminants of concern		Consequence	Probability	Risk	
General Made Ground across site	Potentially containing contaminants related to its source.	Typically arsenic, PAHs, heavy metals.	Leaching into shallow groundwater in Made Ground/natural drift	Mild	Low likelihood	Low	Site specific ground investigation to clarify risk. Possible need for appropriate mitigation during construction, and hardstanding in proposed development. Potential need for solid phase contaminant removal (dig and dump).
			Leaching/migration into Sherwood Sandstone Major Aquifer	Medium	Low likelihood	Moderate/low	
			Groundwater transport to Kirkby Brook	Medium	Low likelihood	Moderate/low	
			Surface runoff to Kirkby Brook (construction phase)	Medium	Likely	Moderate	
			Plant uptake and phytotoxic effects(soft landscaped areas of proposed development)	Minor	Unlikely	Very low	
Landfill (predominantly in west of site)	Solid phase contaminants and leachate generation	Dependent on waste type.	Leaching into shallow groundwater in Made Ground/natural drift	Mild	Likely	Moderate/low	Site specific ground investigation to clarify risk. Possible need for appropriate mitigation during construction, and hardstanding in proposed development. Potential need for solid phase contaminant removal (dig and dump) or other remedial treatment.
			Leaching/migration into Sherwood Sandstone Major Aquifer	Medium	High Likelihood	High	
			Groundwater transport to Kirkby Brook	Medium	High likelihood	High	
			Surface runoff to Kirkby Brook (construction phase)	Medium	High likelihood	High	
			Plant uptake and phytotoxic effects(soft landscaped areas of proposed development)	Minor	Low likelihood	Very low	
Landfill, Made Ground and alluvium	Potential to generate gases	CO ₂ , CH ₄	Phytotoxic effects/vegetation distress (soft landscaped areas of proposed development)	Minor	Low likelihood	Very low	Possible need for hardstanding in proposed development
Former Total Fina Elf service station in north of site	Potential for remaining insitu contamination.	Petroleum hydrocarbons	Leaching into shallow groundwater in Made Ground/natural drift	Mild	Low likelihood	Low	Site specific ground investigation to clarify risk. Possible need for appropriate mitigation during construction, and hardstanding in proposed development. Potential need for solid phase contaminant removal (dig and dump).
			Leaching/migration into Sherwood Sandstone Major Aquifer	Medium	Low likelihood	Moderate/low	
			Groundwater transport to Kirkby Brook	Medium	Unlikely	Low	
			Surface runoff to Kirkby Brook (construction phase)	Medium	Unlikely	Low	
			Plant uptake and phytotoxic effects(soft landscaped areas of proposed development)	Minor	Low likelihood	Very low	
Electrical Sub Station in northeast of site	Potential for remaining insitu contamination.	PCBs, oils	Leaching into shallow groundwater in Made Ground/natural drift	Mild	Low likelihood	Low	Site specific ground investigation to clarify risk. Possible need for appropriate mitigation during construction, and hardstanding in proposed development. Potential need for solid phase contaminant removal (dig and dump).
			Leaching/migration into Sherwood Sandstone Major Aquifer	Medium	Low likelihood	Moderate/low	
			Groundwater transport to Kirkby Brook	Medium	Unlikely	Low	
			Surface runoff to Kirkby Brook (construction phase)	Medium	Unlikely	Low	
			Plant uptake and phytotoxic effects(soft landscaped areas of proposed development)	Minor	Low likelihood	Very low	
Offsite sources	Variety of commercial land uses to northeast of site (up hydraulic gradient)	Mobile contaminants e.g. fuel oils, chlorinated hydrocarbons	Leaching into shallow groundwater in Made Ground/natural drift	Mild	Low likelihood	Low	Site specific ground investigation to clarify risk.
			Leaching/migration into Sherwood Sandstone Major Aquifer	Medium	Low likelihood	Moderate/low	
			Groundwater transport to Kirkby Brook	Medium	Unlikely	Low	
			Surface runoff to Kirkby Brook (construction phase)	Medium	Unlikely	Low	
			Plant uptake and phytotoxic effects(soft landscaped areas of proposed development)	Minor	Low likelihood	Very low	

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