

Phase 1: Desk Study

The Bell Inn, Pinchbeck, Spalding

Allenby Commercial

M25-083/DS

Solmek Ltd

12 Yarm Road
Stockton-on-Tees
TS18 3NA
Tel: 01642 607083

www.solmek.com

info@solmek.com

PHASE 1 DESK STUDY

THE BELL INN, PINCHBECK, SPALDING

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY	1
2	INTRODUCTION AND SCOPE OF INVESTIGATION	2
3	SITE WALKOVER AND DESCRIPTION	2
4	SITE HISTORY	3
5	ENVIRONMENTAL SETTING	5
6	CONCEPTUAL SITE MODEL.....	7
7	PROPOSED PHASE 2 INTRUSIVE WORKS	12
TABLE 1: SUMMARY OF SITE HISTORY		4
TABLE 2: SUMMARY OF BGS ESTIMATED SOIL CHEMISTRY		6
TABLE 3: POTENTIAL PRIORITY CONTAMINANTS		8
TABLE 4: POTENTIAL GROUND GAS POLLUTION LINKAGES		9
TABLE 5: PRELIMINARY CONCEPTUAL MODEL		11
TABLE 6: SITE INVESTIGATION RECOMMENDATIONS		13

APPENDICES

Appendix A	-	Drawings and Photographs
Appendix B	-	Historical Maps
Appendix C	-	Envirocheck Reports
Appendix D	-	Contamination Guidelines & Notes on Limitations

Revision	Date	Prepared By	Signed
Final	July 2025	Archie Crane <i>Engineering Geologist</i>	
		Checked By	
		L Richards <i>Associate Director</i>	
		Approved By	
		R Woods <i>Managing Director</i>	

1 EXECUTIVE SUMMARY

Site Address	The Bell Inn, Pinchbeck, Spalding, PE11 3UB
Site Description	The site is irregular in shape with a mostly flat and even topography with a very slightly decline eastward from the west of the site. The site mostly consists of open soft scaped land, however to the northwest there is a large derelict building (the former Bell Inn) with associated areas of tarmacked hard scaping which looked to formally be an associated car park. The building on site is a large two-storey building with a single-storey offshoot to the southeast.
Site History <i>On Site</i>	The earliest maps (1887) show that the site was mostly open land with the Bell Inn located in the northwestern corner with a smaller associated building. This building was later demolished by 1906. A drainage ditch is marked on the sites eastern border by 1982; the site then remains unchanged until present.
<i>Offsite</i>	From the earliest mapping the area around the site was predominantly agricultural land and the village of pinchbeck. To the south of the site is St Marys Church with associated graveyard. The graveyard was no longer marked on the maps by 1906 and by 1956 the land immediately west of the site had been developed with residential properties. A filling station was located immediately southwest of the site from 1968 to 1990. The area surrounding the site has remained largely unchanged since 1995.
Proposed End Use	The proposed development is outlined to be the construction of residential units comprising of eight, two-to-three-bedroom bungalows with associated parking, access road and soft landscaping. The existing Bell Inn on site is due to be converted into a retail unit with associated parking.
Environmental Setting <i>Landfill & Waste</i>	There are no Landfills or any facilities handling or managing waste within 250m of the site. There are five areas of infilled land noted within 250m of the site, the nearest being 78m west of the site.
<i>Regulated Industries</i>	There are five contemporary trade directory entries within 250m of the site. There are no fuel station entries within 250m of the site.
<i>Geology</i>	The solid geology beneath the site is likely to mostly comprise the Oxford Clay Formation. The drift deposits on site are likely to comprise of clayey, silty, possibly sandy Tidal Flats deposits.
<i>Hydrogeology</i>	Using the Environment Agency's Policy and Practice for the Protection of Groundwater both the solid and drift geology located on site are considered unproductive strata. The site does not lie within a source protection zone. There are no Groundwater Abstractions located within 1km of the site.
<i>Hydrology</i>	The nearest surface water feature is a drainage ditch located on the site's eastern border. There are three Surface Water Abstractions within 1km of the site. The nearest of which is 381m northwest of the site.
<i>Flooding</i>	The Envirocheck Report states the site is at risk of Flooding from Rivers and the Seas without defences, and there are no flood defences, flood water storage areas or areas benefiting from flood defences and flood storage present within 250m of the site.
<i>Radon Gas</i>	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No radon protection measures are necessary for new buildings or extensions on the site.
Preliminary Mining Assessment	The site is not located within a coal mining affected area. No further investigation into coal workings is considered necessary.
Preliminary Geotechnical Assessment	Given the proposed development and expected ground conditions, the use of strip or pad foundations is anticipated at present. Should considerable loose silt deposits be present, a piled option should be anticipated.
Preliminary Contamination Assessment	The desk study has shown that the site may have been exposed to some contamination, with construction/demolition waste and possibly oils or fuel from vehicle spills the most likely source local to the structures. Asbestos may also be present on the site from previous/existing building materials used on-site.
Potential Sources of Ground Gas	Made ground is expected on site; infilled ground and, burial grounds are recorded in the vicinity of the site therefore ground gas assessment is recommended due to the nature of the development.
Phase 2 Recommendations	• A series of cable percussive boreholes with insitu testing and samples. • A series of hand dug trial pits to expose the existing foundations • Gas monitoring comprising six visits over three months. • A series of machine dug trial pits for sampling and CBRs. • Geotechnical testing. • Chemical testing.

2 INTRODUCTION AND SCOPE OF INVESTIGATION

Solmek were instructed by Allenby Commercial to undertake a desk study on a parcel of land at The Bell Inn, Pinchbeck, Spalding, PE11 3UB (Figure 1).

The proposed development is outlined to be the construction of residential units comprising of eight, two-to-three-bedroom bungalows with associated parking, access road and soft landscaping. The existing Bell Inn on site is due to be converted into a retail unit with associated parking (Figure 3).

The following steps may be required in the investigation and remediation of potentially contaminated land:

- Phase 1: Desk Study
- Phase 2: Intrusive Investigation
- Phase 3: Remediation Statement
- Phase 4: Validation Reports

Phases 1 and 2 are generally required in the redevelopment of most sites. Phases 3 and 4 are subject to the findings of the initial stages. This report represents Phase 1 of the site investigation.

The purpose of this Phase 1 Desk Study is to evaluate likely ground conditions and significant environmental issues at the site, and to plan the scope of subsequent phases of investigation.

This report may be regarded as a Preliminary Risk Assessment in accordance with respect to the Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*.

This Phase 1 Desk Study has been undertaken with due regard to current contaminated land guidance issued by the Royal Institution of Chartered Surveyors (RICS) together with BS 10175:2011+A1:2013, "*Investigation of Potentially Contaminated Land - Code of Practice*" and relevant sections of BS 5930:2015+A1:2020, "*Code of Practice for Ground Investigations*".

The objectives of the investigation are as follows:

- Determine the land use history of the site from an inspection of available Historical Maps
- Determine the environmental setting of the site from available sources
- Determine whether past mining may have had an influence on the site
- Determine whether the site has previously been used for purposes that may have given rise to significant ground contamination
- Provide recommendations for further investigation.

3 SITE WALKOVER AND DESCRIPTION

3.1 General

The centre of the site is located at OS Grid Ref 524210, 325710 and covers an area of approximately 0.61Ha. The area is located at.

The preliminary site inspection was undertaken on the 21st of July 2025 and site photographs are presented in Appendix A.

3.2 Site Description

The desk study area is located on a parcel of land including the site of the former Bell Inn and the adjoining land to the east.

The site is irregular in shape with a mostly flat and even topography with a very slightly decline eastward from the west of the site (Figure 2). The site mostly consists of open soft scaped land, however to the northwest there is a large derelict building (the former Bell Inn) with associated areas of tarmacked hard scraping which looked to formally be an associated car park. The building on site is a large two-storey building

with a single-storey offshoot to the southeast. The building is showing signs of significant damage with trees rooting within the building and emerging from the roof. Furthermore, the structure looks to have potential to house potential asbestos containing materials such as roof cladding. Towards the entrance to along the sites northeastern border there are two service covers that look to house water and gas utilities, there are also several covers for drainage that surround the property.

A few mature deciduous and coniferous trees are located within the central northern portion of the site, with mature deciduous trees also bordering the site on all sides.

The site is not secure with parts of the border being open into neighbouring gardens. Other parts of the site are bordered by a combination of wooden and metal wire fencing as well as hedgerow and treeline.

3.3 Off Site Features

The areas surround the site are mostly residential. However, there is a church immediately southwest of the site and the neighbouring property to the south is a fish and chips shop. Agricultural fields are located immediately east of the site.

4 SITE HISTORY

4.1 Map Descriptions

In order to determine the history of the site, previous editions of Historical Maps, Aerial Photography, and Ordnance Survey Plans were inspected. The Historical Maps and Aerial Photographs are presented in Appendix B.

Table 1 presents a summary of the history of the area which includes plots from 1887 to 2025. The summary focuses on the historical land uses and changes relevant to the site and the proposed end use. Measurements are taken from the nearest boundary of the site and all distances quoted are approximate.

TABLE 1: SUMMARY OF SITE HISTORY

OS Map Edition	On-site Features	Off-site Features (within 500m)
1887 1:10,560 1888-1889 1:2,500	The site is shown to be mostly open with the Bell Inn located in the northwest of the site. A small building is shown to the southeast of main building.	A graveyard associated with St Mary's Church is located immediately south of the site as well as a smithy located 50m north of the site. Some residential development within 250m to the north of the site including schools and chapels. Road immediately adjacent to the west of the site labelled as church street.
1904 1:2,500	No significant change.	Continued residential development 100m to the north.
1906 1:10,560	Small building no longer shown on maps.	Graveyard to the south no longer marked on maps.
1956-1959 1:10,000	No significant change.	Land immediately west of the site now looks to have been developed with residential properties.
1968-1969 1:2,500	No significant change.	Filling station now located immediately southwest of the site. Significant development to the west and south of the site within 150m, including builders' yard 110m to the west and pond 150m to the south.
1971-1975 1:10,000 1973 (partial) 1:2,500	No significant change.	Significant residential development to the west and north of the site.
1982-1988 1:2,500	A drain is marked on the sites eastern border.	Smithy to the north no longer marked on the maps.
1990-1992 (partial) 1:10,000	No significant change.	Filling station no longer marked on maps.
1995 1:2,500	No significant change.	Builders yard to the west no developed into residential units.
2000 1:10,000	No significant change.	No significant change.
2006 1:10,000	No significant change.	No significant change.
2025 1:10,000	No significant change.	No significant change.
Aerial Photography Edition	On-site Features	Off-site Features (within 500m)
1999 1:2,500	Site is shown to be occupied by a large building in the northwest (Bell Inn) with an associated tarmac car park. The rest of the site looks to be a field, possibly an associated garden.	The site is shown to be surrounded by residential properties to the north and southwest, a church to the south and agricultural fields to the east.

4.2 Potential Contamination Sources Identified via Historical Plans

Possible contamination from historical land uses which may have impacted the site have been identified:

Made ground from materials used to infill depressions and form a level area for access or building. This may include brick, concrete, timber, ash, slag, coal and metals.

Construction/demolition waste from construction and demolition immediately around the site over the documented history. This may include brick, concrete, timber, asbestos and metals.

Burial Sites have potential for ground gas generation, as well as biological contamination.

5 ENVIRONMENTAL SETTING

5.1 Information Sources

The environmental setting of the site was determined through reference to the following:

- Envirocheck Report (including historical map extracts)
- British Geological Survey (BGS): 1:50 000 geological map series sheet 144 Spalding Solid and Drift Edition (1992)
- BGS Borehole Record TF22NW35
- BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings

5.2 Landfill and Waste

There are no Landfills or any other facilities handling or managing waste located within 250m of the site.

The Envirocheck Report indicates that there are five areas of Potentially Infilled Land within 250m of the site. The nearest of which is 78m to west of the site and is noted as unknown filled ground (pond, marsh, river, stream, dock etc). The area is noted to have been filled around 1956.

5.3 Regulated Industries

The Envirocheck Report indicates that there are five Contemporary Trade Directory Entries located within 250m of the site, all of which are now inactive. The nearest is MS Wetherill a car body repair shop that was located 33m north of the site.

The Envirocheck Report indicates that there are no Recorded Fuel Sites located within 250m of the site.

The Envirocheck Report indicates that there are no records of any Pollution controls located within 500m of the site.

The Envirocheck Report indicates that there are no sites dealing with Hazardous, Explosive or Radioactive Substances located within 500m of the site.

The Envirocheck Report indicates that there are no Substantiated Pollution Incidents located within 500m of the site.

The Envirocheck Report indicates that there are no Sites Determined as Contaminated Land under Part 2A EPA 1990 entries located within 500m of the site.

5.4 Geology

The drift deposits on site are likely to consist of Tidal Flats deposits likely to consist of interbedded silt and clay (Figure 4).

The site is shown to be underlain by solid geology of Oxford Clay Formation (OxC) most likely comprising grey silicate-mudstone with a silty component (Figure 5).

BGS borehole record TF22NW35 located approximately 270m west of the site shows topsoil to 0.20m bgl underlain by interbedded silt and fine sand deposits. The silt is recorded to be medium dense with occasional roots towards the surface and decayed organic material with depth. The sands are recorded as being loose to medium dense with depth with occasional decayed organic material.

A moderate risk of compressible ground and running sands on site has been identified in the Envirocheck Report.

5.5 Mining & Quarrying

The site is not located within a Coal Mining Affected Area; therefore, no further investigation is required to mitigate against risks from Coal Mining.

The Envirocheck Report indicates that there are no BGS recorded Mineral Sites located within 1km of the site.

The site is not within 1km of a Non-Coal mining area of Great Britain, a Man-Made Mining Cavity, a Natural Cavity or a Brine Compensation area.

5.6 BGS Estimated Soil Chemistry

The Envirocheck report sets out the BGS Estimated Soil Chemistry for several metals on-site. These are summarised below in Table 2, with specific reference to the proposed end-use threshold of the site, utilising LQM derived Suitable for Use Levels (S4ULs), whilst the lead value relates to the Category 4 Screening Level (March 2014) developed by Contaminated Land: Applications In Real Environments (CL:AIRE).

TABLE 2: SUMMARY OF BGS ESTIMATED SOIL CHEMISTRY

Contaminant	Estimated Concentration (mg/kg)	Residential with Home Grown Produce threshold (mg/kg)
Arsenic	<15	37
Cadmium	<1.8	11
Chromium	60-90	910
Lead	<100	200
Nickel	15-30	180

It can be seen from Table 2 that none of the metals are estimated to be above the relevant thresholds for the site, however site-specific contamination testing would be required to verify this.

5.7 Hydrogeology

Using the Environment Agency's Policy and Practice for the Protection of Groundwater the solid geology beneath the site is classified as Unproductive Strata. The overlying drift is classified as Unproductive Strata.

There is no groundwater vulnerability as both the superficial and solid geology on site is considered unproductive.

The site does not lie within a Source Protection Zone.

The Envirocheck Report indicates that there are no Groundwater Abstractions located within 1km of the site.

5.8 Hydrology

The nearest surface water feature is a drainage ditch located on the sites eastern border.

The Envirocheck report states the Water Framework Directive catchment of the site is the Glen within the Glens operational catchment.

The Envirocheck Report states there is one Licensed Discharge Consents entry within 500m of the site. This is an emergency sewerage discharge operated by Anglian Water Services Ltd, located 239m southwest of the site.

The Envirocheck Report states there are no Records of Water Industry Act Referrals (potentially harmful discharges to the public sewer) located within 500m of the site.

The Envirocheck Report indicates that there are three Surface Water Abstractions located within 1km of the site. The nearest of which is located 381m northwest of the site and is operated by Lincolnshire Field Products Ltd.

5.9 Flooding

The Envirocheck Report states the site is at risk of Flooding or Extreme Flooding from Rivers and the Seas without defences, based on fluvial models.

The Envirocheck Report indicates that there are no flood defences, flood water storage areas or areas benefiting from flood defences and flood storage present within 250m of the site.

The Envirocheck Report does not state what risk is posed to the site from groundwater flooding.

A comprehensive flood risk assessment should be sought from a specialist to quantify the existing risk of flooding on the site.

5.10 Sensitive Land Use

The site is within the boundaries of the Glen Nitrate Vulnerable Zone.

The site does not lie within 2km of any other form of Designated Environmentally Sensitive Sites or Protected Areas.

5.11 Radon Gas

The site is not in a Radon Affected Area, as less than 1% of properties are estimated to be at or above the Action Level.

In accordance with the procedure described in BRE Publication BR211 Radon: Guidance on Protective Measures for New Dwellings, no radon protection measures are necessary for new buildings or extensions on the site.

5.12 Unexploded Ordnance (UXO)

An Unexploded Bomb Risk Map has been obtained from ZeticaUXO to provide an initial assessment of UXO risks to the site. The map is appended as Figure 6.

The map indicates the site is within an area of low risk, defined as an area having 15 bombs per 1000acre or less

6 CONCEPTUAL SITE MODEL

6.1 General

Based on the information presented in the preceding Sections, and in accordance with the LCRM guidance noted in Section 1, a Preliminary Conceptual Site Model has been produced.

The main features of the model are discussed in the following sections together with preliminary recommendations where appropriate.

6.2 Likely Ground Conditions

It is expected that, based on available information, ground conditions are likely to be made ground comprising areas of both topsoil and hardstanding. The surface deposits may be underlain by further made ground, likely to consist of construction/demolition waste. Made ground likely to be deepest around the area of the existing Bell Inn building. The drift deposits on site are likely to comprise tidal flat (clay & silt) deposits overlying a mudstone bedrock.

With respect to the likely groundwater regime of the site, based on the information gathered, and subject to confirmation via intrusive works, this can be characterised as limited and likely insignificant.

Both superficial and solid geology on site are classified as being unproductive strata. This combined with the generally low permeability of clay and silt means that any groundwater encountered is likely to be little and

perched.

6.3 Potential Buried Obstructions

Based on the site history, buried obstructions are unlikely but cannot be wholly discounted. Cobbles, bricks and historic drainage are the most likely obstructions.

6.4 Coal Mining Risk Assessment

The site is not located within a Coal Mining Affected Area; therefore, no further investigation is required to mitigate against risks from Coal Mining.

6.5 Preliminary Geotechnical Assessment

The proposed development is understood to comprise eight new residential units consisting of bungalows, with associated parking, access road and soft landscaping. The existing Bell Inn building on site is due to be converted into a retail unit with associated parking, as shown on Figure 3.

Given the expected ground conditions noted in the sections above, the use of shallow foundations for the new development is anticipated at present. Where deep made ground or soft/loose natural deposits are encountered, foundations will need to be taken through the made ground/disturbed ground into underlying natural strata of adequate bearing capacity.

Tidal Flat deposits have the possibility of consisting of very loose, water-logged, silt deposits of considerable thickness. These deposits may be unsuitable to bear even lightly loaded structures; in this scenario a piled option should be adopted.

Trees are present both on site and around the site perimeter and therefore, foundations may need deepening in accordance with NHBC Standards Chapter 4.2.

Given that the existing Bell Inn structure is to be converted, the foundations should be assessed so as to ascertain their current condition and suitability of providing adequate bearing capacity. The foundations will require exposing and sampling of underlying soil to ascertain whether deeper foundations may be required. Additionally, small percussive boreholes would be prudent should foundations need underpinning.

Given the flood risk potential for the site (Section 5.9) allowance for possibility of shallow or surface groundwater needs to be considered during foundation design and construction.

For the proposed new access road, the foundations will consist of suitably compacted and graded fill to be used to form a sub-base, base and binding course beneath the road surface course. The road design and choice of materials should be undertaken in line with the guidance "Specification for Highway Works".

The above suggestions should be regarded as tentative until Phase 2 intrusive works are undertaken and information is available regarding design loads and development layout.

6.6 Preliminary Contamination Assessment

The desk study has shown that the site may have been exposed to some contamination, with construction/demolition waste and possibly oils or fuel from vehicle spills the most likely source local to the structures. Asbestos may also be present on the site in and around the existing Bell Inn building.

In view of the historic, current and future site use, chemical contamination testing is considered necessary. The following chemical testing suite should be considered for selected soil samples:

TABLE 3: POTENTIAL PRIORITY CONTAMINANTS

Inorganic Contaminants	Organic Contaminants
Arsenic, Boron, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc, Selenium, Free Cyanide, Soluble Sulphate, pH, Asbestos	Phenol, Organic Matter, speciated PAH, TPH CWG.

It should be noted that the above potential contaminants are considered to be commonly associated with the

specified past land uses of the site, and adjacent land use. Risk assessment should be undertaken for contamination identified during intrusive investigation.

Potential pathways which link the potential contaminants to end users of the site and controlled waters (receptors) include the following:

- Ingestion of soil (outdoors) / dust (indoors)
- Skin contact with soil (outdoors) / dust (indoors)
- Inhalation of dust (outdoors and indoors)
- Contamination via buried water pipes
- Surface water run-off, including via existing drainage infrastructure
- Downward infiltration of leachable contaminants to groundwater

6.7 Potential Sources of Ground Gas

Ground gases such as carbon dioxide and methane can be classed as a form of contamination. Potential sources of ground gases include:

- Made Ground
- Burial Grounds
- Quarries, Infilled Clay Pits & Infilled Ponds
- Underlying Natural Strata (alluvium, peat and chalk)
- Petrol re-fuelling sites (which also includes Volatile Organic Compounds)
- Landfill (on and off-site)
- Coal measures

Based on historical map evidence and consideration of the sites environmental setting the table below shows a preliminary comparison of *consequence* against *probability* where ground gas is considered a potential threat to human health.

TABLE 4: POTENTIAL GROUND GAS POLLUTION LINKAGES

Potential Sources	Potential Pathway	Receptor
Made ground (CO₂, CO and CH₄). Historic Petrol Filling Station for Which Tanks may Still be Present (Hydrocarbons, SVOCs and VOCs). Burial Grounds (CO₂ and CH₄).	Ingress and Accumulation into buildings from vertical and horizontal migration	Future users of site are likely to include adults and children. Construction workers (in particular utility workers).
Preliminary Comparison of Consequence versus Probability		
Probability	Classification	Justification
Probability (Based on Table 8.1, CIRIA C665, 2007)	LIKELY	Ground gas from made ground.
		Ground gas from burial grounds immediately south of the site.
		Ground gas from possible historic tanks immediately southwest of the site.
Consequence (Based on Table 8.2, CIRIA C665, 2007)	MEDIUM	Residential development.
	Risk	Details
Consequence vs. Probability (Based on Table 8.3, CIRIA C665, 2007)	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 long term. (Based on Table 8.4, CIRIA C665, 2007)

Given the conditions noted above a ground gas assessment is considered necessary for the site to observe standing groundwater levels and to allow measurements to be made of hazardous gases and/or contamination levels in groundwater. Monitoring should be undertaken following site works on a minimum of six occasions over three months.

6.8 Risk Assessment for Contaminated Land

As part of this Phase 1 Desk Study, a preliminary conceptual model and risk assessment is produced. This assessment should be revised following the Phase 2 Site Investigation outlining a qualitative risk assessment. Should there be unacceptable risks to the various receptors/end-users following the Phase 2 works, then a remediation strategy may be required to outline measures to satisfy Part 2A of the Environmental Protection Act (1990). The above measures are in line with Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn Contaminated Land Report 11 – *Model Procedures for the Management of Land Contamination* (2004).

The results of the chemical contamination testing as part of the Phase 2 investigation should be compared to a current Land Quality Management (LQM) – Suitable 4 Use Levels (S4UL) December 2014.

6.9 Conceptual Site Model

The proposed development is understood to comprise eight new residential units consisting of bungalows, with associated parking, access road and soft landscaping. The existing Bell Inn building on site is due to be converted into a retail unit with associated parking, as shown on Figure 3.

The conceptual model collates the salient aspects of the site to form a model which should enable comparison after fieldwork and testing. This model identifies the potential pollution linkages that may influence the proposed development and geotechnical considerations.

The risk ratings are based on the current potential liabilities and likely potential future liabilities. The risks posed by the geotechnical and contamination aspects of the site will be revised following site works, and any mitigating action required added.

The Preliminary Conceptual Model has been undertaken in accordance with CIRIA C552. The Preliminary Conceptual Model assesses the consequence and the likelihood of a risk being realised to provide a risk classification, which is then used to produce the Preliminary Conceptual Model. Full details of the tables used to assess consequence, likelihood and risk classification are presented in Appendix D.

TABLE 5: PRELIMINARY CONCEPTUAL MODEL

Source	Pathway	Receptor	Risk Rating	Comments
Asphyxiating or explosive ground gases - Made ground - Burial ground immediately south of the site - Possible tanks from historic petrol station immediately southwest of the site - Not in Radon Affected Area	Ground gas migration - Migration through permeable soils - Inhalation	Future site users Transient adult workers and adult and infant residents	Moderate	Gas monitoring recommended. Six visits over three months proposed.
		Users during development Construction workers	Low	
Areas of contamination - Potential contaminants in made ground - Potential demolition/construction waste	- Inhalation - Dust ingestion - Dermal contact	Future site users Transient adult workers and adult and infant residents	Moderate /Low	Soft landscaping proposed providing a pathway – contamination testing required to quantify risks.
		Users during development Construction workers	Moderate /Low	Contamination testing required to determine risks posed during construction. Consideration to be given to Health and Safety Executive Guidance. <i>Protection of Workers and the General Public During the Development of Contaminated Land.</i>
	- Inhalation - Dust ingestion	Users of surrounding sites Transient adult workers and adult and infant residents	Moderate /Low	Potential moderate/low risk during construction from dust generation. Contamination testing required to quantify the risks.
		Drift geology Unproductive Strata	Very Low	Low sensitivity aquifer unlikely to contain significant groundwater.
	Leaching of mobilised contaminants	Solid geology Unproductive Strata	Very Low	High sensitivity Aquifer located beneath low permeability drift deposits.
		Surface water features Drainage ditch located on the sites eastern border.	Moderate /Low	Potential for contamination within the soil to reach the proximal surface water via surface-runoff or lateral migration.
	Uptake via roots and leaf surfaces	Vegetation Soft landscaping proposed	Moderate /Low	Soft landscaping proposed, contamination results to be assessed against phytotoxic thresholds.
Areas of contamination above service fabric or BRE Special Digest 1 thresholds	Direct contact	Construction Materials Concrete	Moderate /Low	pH and sulphates to be assessed during Site Investigation.
	Direct contact	Construction Materials Service Fabric	Moderate /Low	Consideration to be given to Pipe Material Table (Appendix E) during Site Investigation.

7 PROPOSED PHASE 2 INTRUSIVE WORKS

A Phase 2 Site Investigation should be undertaken to verify the assumptions made in the Preliminary Conceptual Site Model and to provide data for foundation design.

An outline ground investigation strategy is summarised below, based on the preliminary conceptual site model and information obtained during the desk study.

7.1 Site Investigation Rationale

The Conceptual Model highlights that there is potential for contamination on the site. Therefore, an intrusive investigation should be undertaken with the sampling strategies outlined within BS10175:2011 +A1:2013 and CLR4:1994. These strategies can be considered as:

- Non targeted (BS10175) – If no obvious hotspots or potential sources of contamination have been outlined in the desk study, it would be recommended to utilise a stratified random pattern of sampling locations.
- Targeted (CLR4) – If a possible hotspot is suspected on the site, it is recommended to adopt a targeted approach to sample the immediate vicinity of the hotspot. Highly focussed sampling consisting of several samples within the area of the hotspot may be necessary to delineate the extent of the hotspot.

These strategies can be employed either separately or in conjunction and any site investigation should be individually tailored to each site.

The density of sampling required is defined within BS10175 which notes that the density required is dependent on a number of factors including confidence and robustness required, and contaminants, pathways and receptors present.

7.2 Site Specific Sampling Rationale

The analysis of historical maps and the Conceptual Model did not highlight any defined contamination sources or geotechnical areas of concern on the site. Therefore, a non-targeted approach should be utilised, with sample locations arranged evenly across the site in a defined pattern, in order to provide maximum site coverage.

The chemical testing proposed for the site is outlined in Section 6.6.

7.3 Proposed Methods of Investigation

The methods of investigation outlined within Table 6 are considered necessary to address the risks outlined within the Conceptual Model. The locations of these investigation positions will be set out in line with the proposed sampling methodology outlined in Section 7.2.

TABLE 6: SITE INVESTIGATION RECOMMENDATIONS

Proposed method of investigation	Purpose	Comments
Hand dug trial pits	Hand dug trial pits to 1.20mbgl to ensure positions are clear of underground services.	To be undertaken prior to the drilling of all boreholes and following CAT scanning and service plan inspection.
Foundation exposure hand dug trial pits	Hand dug trial pits to expose existing foundations and ascertain their condition and thickness.	Care to be taken not to cause damage to the foundations while working.
A series of cable percussive boreholes to ca. 15-20.00mbgl.	• To determine shallow ground conditions. • To collect soil samples for geotechnical and chemical testing. • To observe soils profile, localised variations in materials and presence of groundwater.	• Ensure positions are CAT scanned and service plans inspected prior to any excavation. • Hand vanes to be taken in cohesive deposits. • SPT samples in granular strata and rock head. • Disturbed and jar samples to be undertaken for chemical testing.
Trial pitting to ca. 2.00mbgl	• To assess the shallow ground conditions and obtain samples for chemical testing. • To undertake insitu hand shear vanes. • To undertake soakaway tests and insitu CBR testing.	• Ensure positions are CAT scanned and service plans inspected prior to investigation.
Gas/groundwater monitoring wells	To observe standing groundwater levels and to allow measurements to be made of hazardous gases and/or contamination levels in groundwater.	Monitoring to be undertaken following site works on a minimum of six occasions.
Chemical testing	To allow the potential risks identified within the conceptual model to be addressed.	Chemical soils testing to cover potential priority contaminants from Table 2.
Geotechnical testing	To confirm material properties and to provide concrete classification of materials.	Tests may include sulphate analysis, pH, moisture content, Atterberg limit determination, particle size distribution tests and triaxial testing. Further tests may be required depending on the materials encountered.

SOLMEK

APPENDIX A



12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

Site Location Plan

Project Number

M25-083

Project Name

The Bell Inn, Pinchbeck, Spalding

Client

Allenby Commercial

Date

July 2025

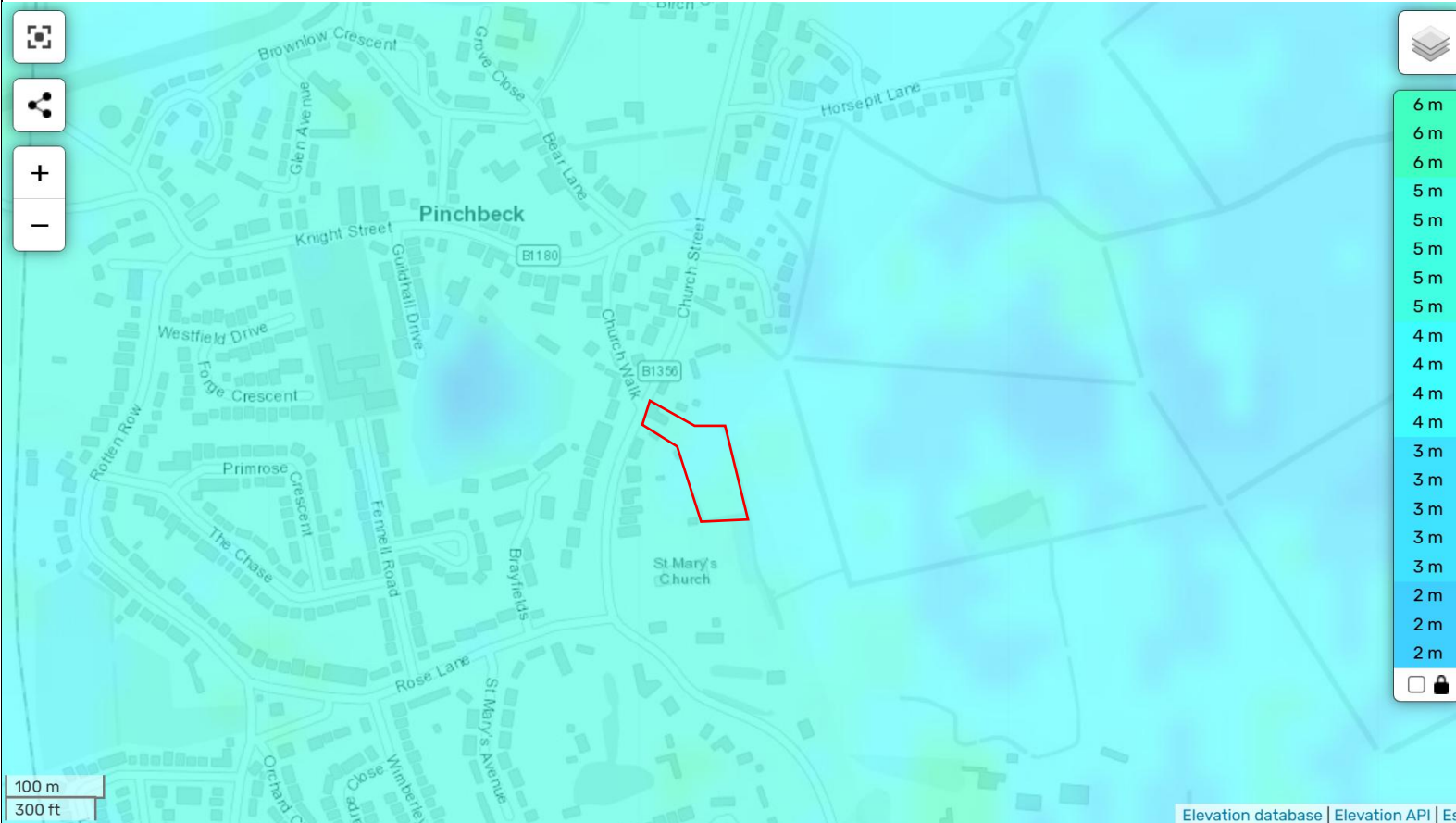
DRG Number

Figure 1

Scale

1:9000 @ A4 [DO NOT SCALE]

- Legend Key
- Locations By Type - Empty
 - ◆ Locations By Type - BH
 - ▭ Project Bounds - Project Bounds



Title
Site Topography Plan
Project
The Bell Inn, Pinchbeck
Client
Allenby Commercial
Date
July 2025
Fig No.
Figure 2
Scale
Do Not Scale
Key
Site Boundary
N
Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: south@solmek.com www.solmek.com SOLMEK



12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

Superficial Geology Plan

Project Number

M25-083

Project Name

The Bell Inn, Pinchbeck, Spalding

Client

Allenby Commercial

Date

July 2025

DRG Number

Figure 4

Scale

1:2000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - Empty
- ◆ Locations By Type - BH
- ▭ Project Bounds - Project Bounds



12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

Solid Geology Plan

Project Number

M25-083

Project Name

The Bell Inn, Pinchbeck, Spalding

Client

Allenby Commercial

Date

July 2025

DRG Number

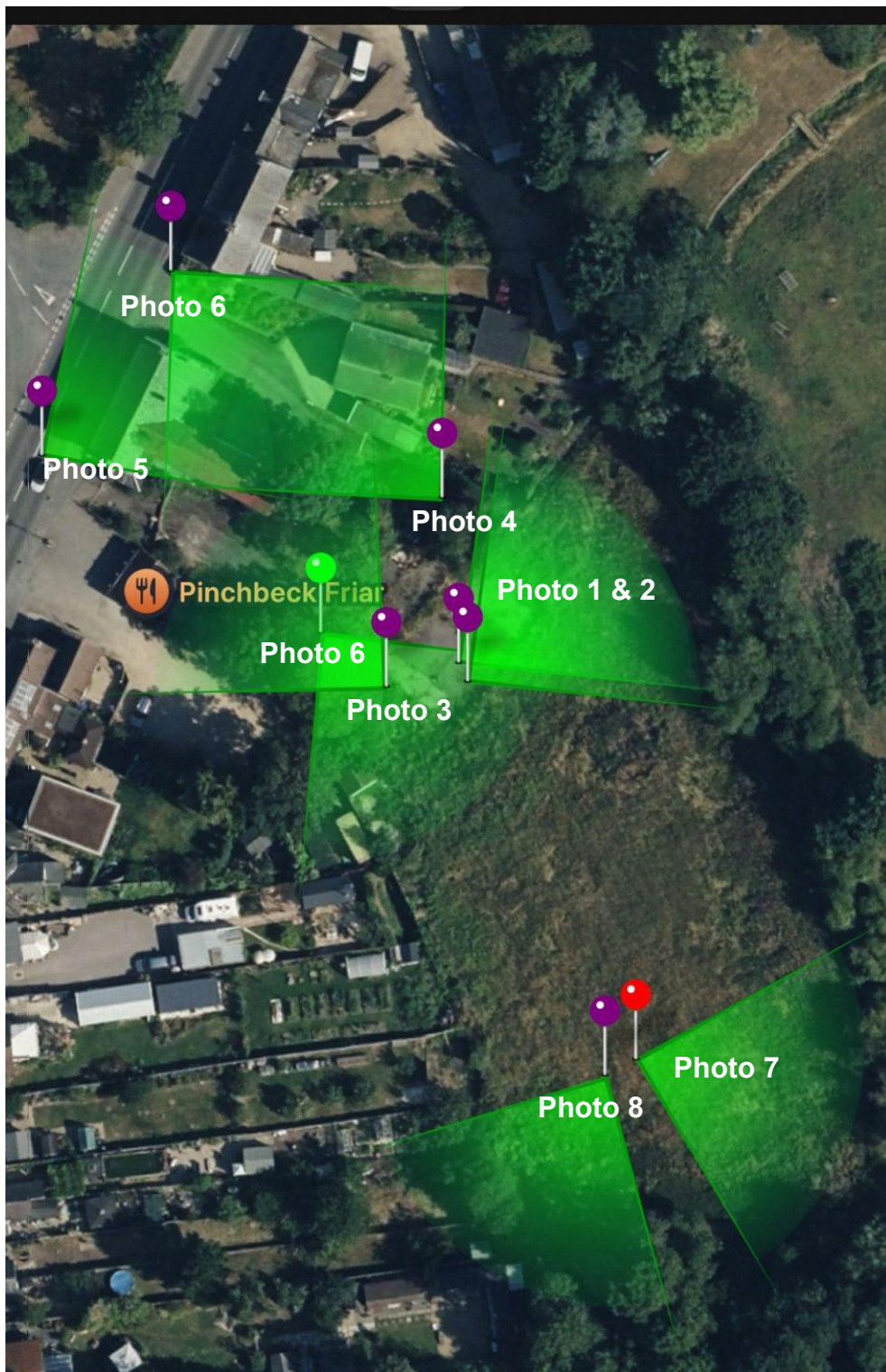
Figure 5

Scale

1:2000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - Empty
- ◆ Locations By Type - BH
- ▭ Project Bounds - Project Bounds



Title	Date
Site walkover Photos.	February 2025
Project	
The Bell Inn Pinchbeck	
Client	
Allenby Commercial	
Key	

Solmek Ltd.
12 Yarm Road
Stockton-on-Tees
TS18 3NA

Tel: +44 (0) 1642 607083
Fax: +44 (0) 1642 612355
e-mail: info@solmek.com
www.solmek.com





Photo 1



Photo 2

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: info@solmek.com www.solmek.com  SOLMEK
Site walkover Photos.	February 2025	
Project		
The Bell Inn Pinchbeck		
Client		
Allenby Commercial		
Key		



Photo 3



Photo 4

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: info@solmek.com www.solmek.com  SOLMEK
Site walkover Photos.	February 2025	
Project		
The Bell Inn Pinchbeck		
Client		
Allenby Commercial		
Key		



Photo 5



Photo 6

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: info@solmek.com www.solmek.com  SOLMEK
Site walkover Photos.	February 2025	
Project		
The Bell Inn Pinchbeck		
Client		
Allenby Commercial		
Key		



Photo 6



Photo 7

Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: info@solmek.com www.solmek.com  SOLMEK
Site walkover Photos.	February 2025	
Project		
The Bell Inn Pinchbeck		
Client		
Allenby Commercial		
Key		



Photo 8

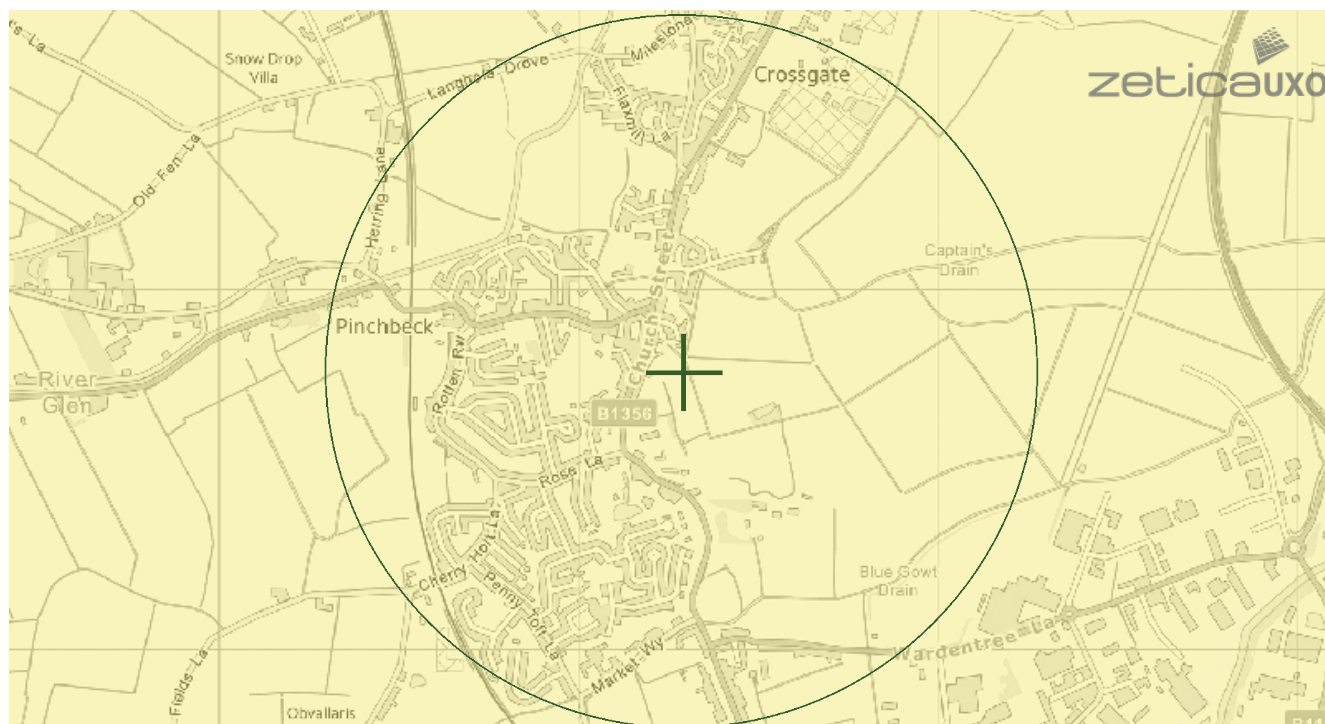
Title	Date	Solmek Ltd. 12 Yarm Road Stockton-on-Tees TS18 3NA Tel: +44 (0) 1642 607083 Fax: +44 (0) 1642 612355 e-mail: info@solmek.com www.solmek.com  SOLMEK
Site walkover Photos.	February 2025	
Project		
The Bell Inn Pinchbeck		
Client		
Allenby Commercial		
Key		

UNEXPLODED BOMB RISK MAP



SITE LOCATION

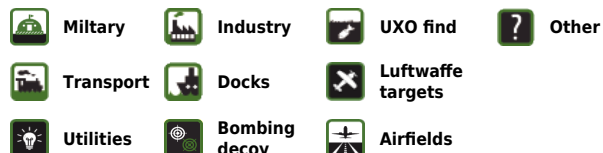
Map Centre: 524257,325778



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

LEGEND

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



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

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

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

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

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

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

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

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

If I have any questions, who do I contact?

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

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

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgement. The copyright remains with Zetica Ltd.

APPENDIX B



Lincolnshire

Published 1904

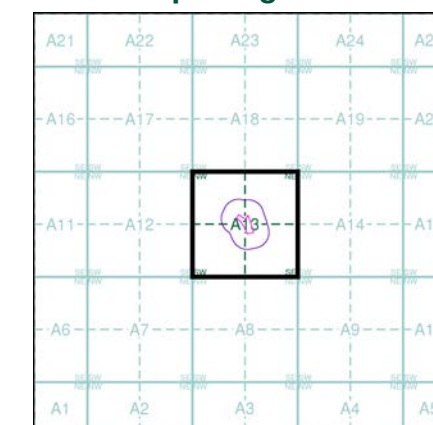
Source map scale - 1:2,500

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)

134_05 1904 1:2,500	134_06 1904 1:2,500
134_09 1904 1:2,500	134_10 1904 1:2,500

Historical Map - Segment A13



Order Details

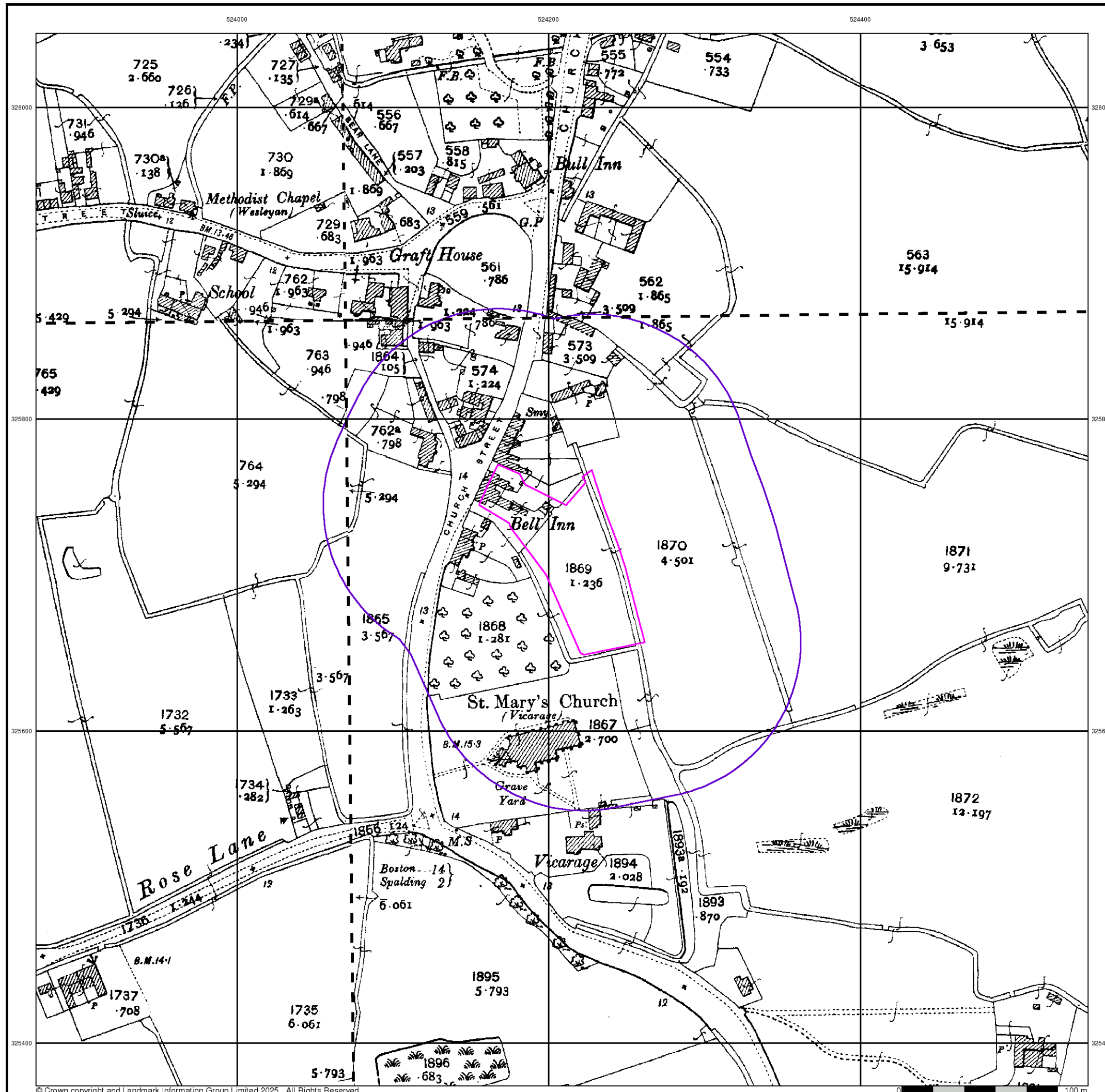
Order Number: 381732805_1_1
Customer Ref: M25-083
National Grid Reference: 524210, 325710
Slice: A
Site Area (Ha): 0.61
Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



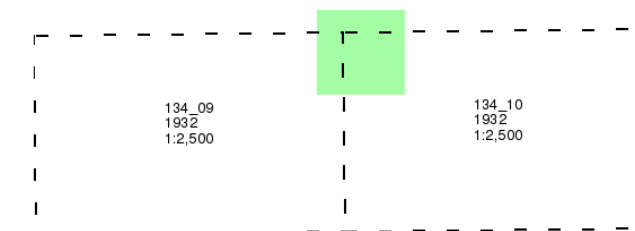
Lincolnshire

Published 1932

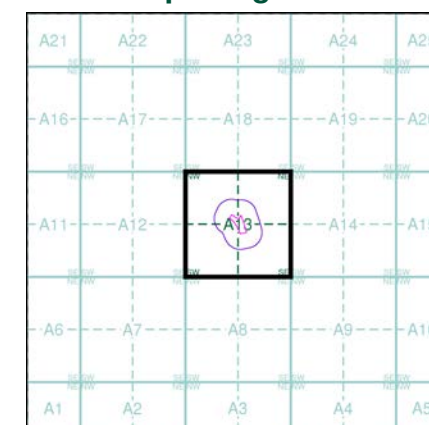
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13

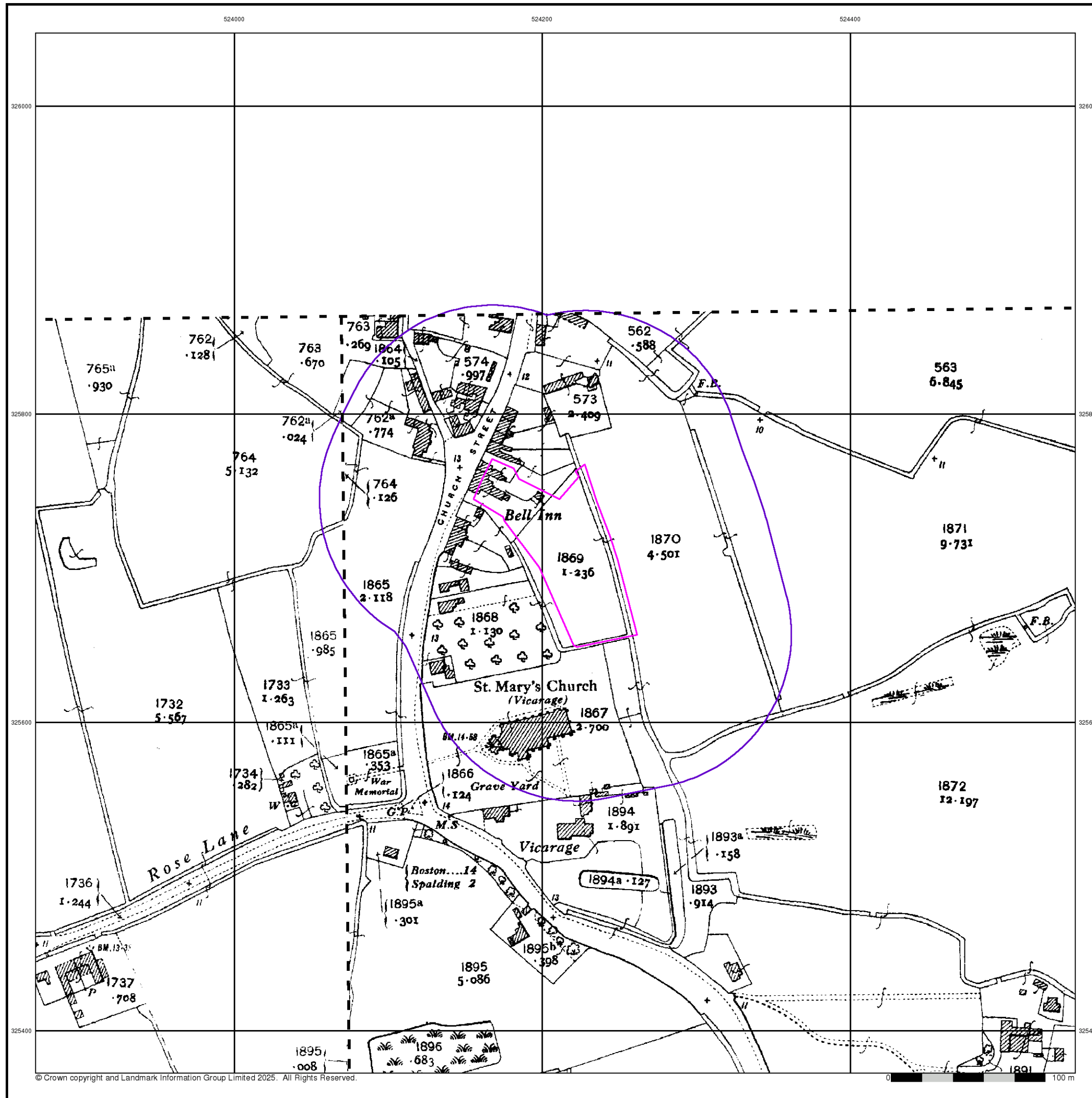


Order Details

Order Number: 381732805_1_1
Customer Ref: M25-083
National Grid Reference: 524210, 325710
Slice: A
Site Area (Ha): 0.61
Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB





Ordnance Survey Plan

Published 1968 - 1969

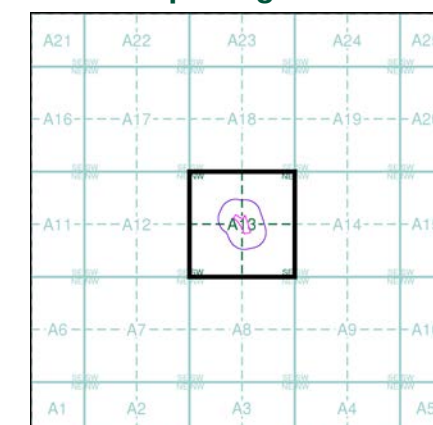
Source map scale - 1:2,500

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)

TF2326 1969 12,500	TF2426 1969 12,500
TF2325 1968 12,500	TF2425 1968 12,500

Historical Map - Segment A13



Order Details

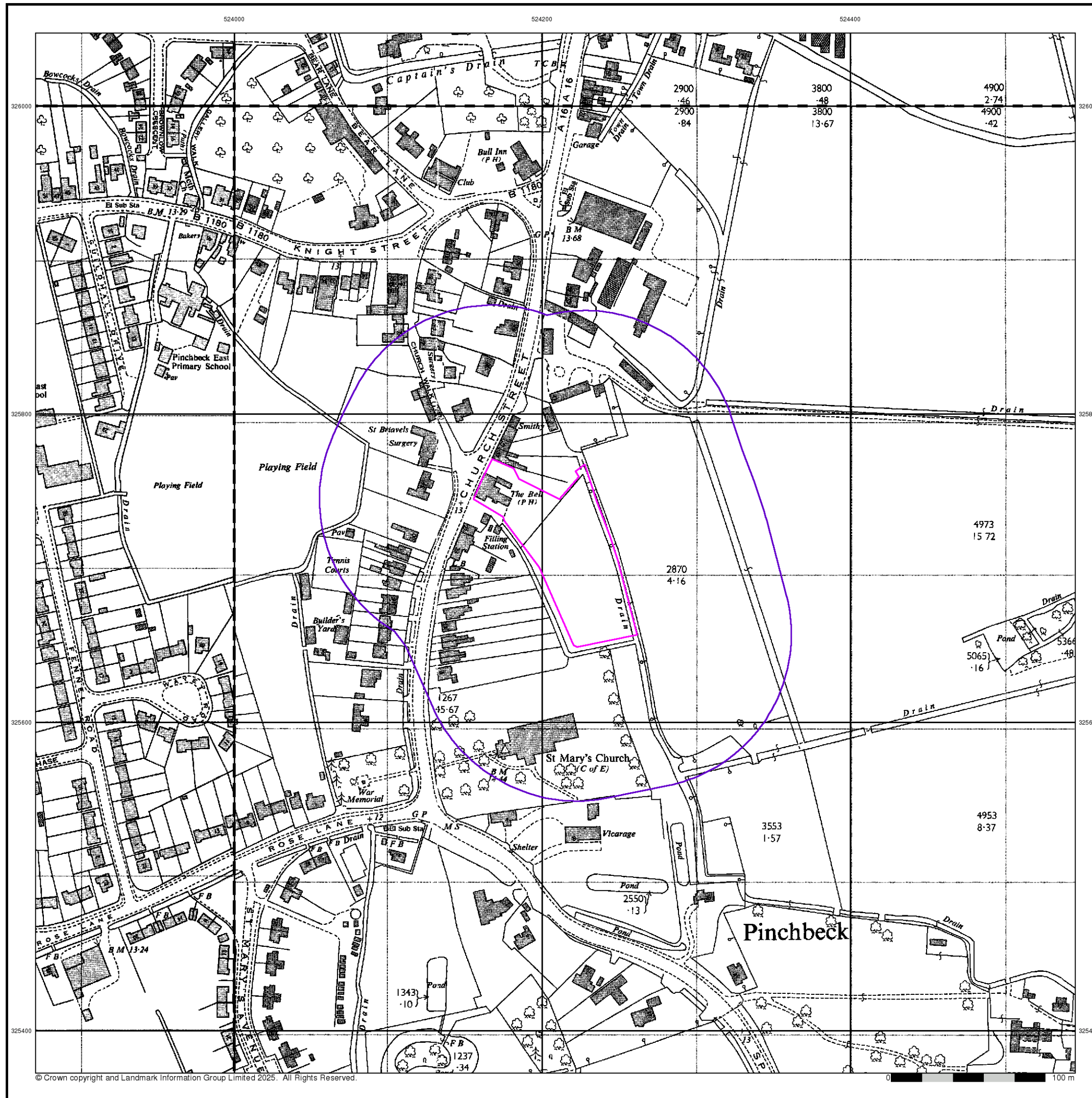
Order Number: 381732805_1_1
Customer Ref: M25-083
National Grid Reference: 524210, 325710
Slice: A
Site Area (Ha): 0.61
Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk





Additional SIMs

Published 1969 - 1982

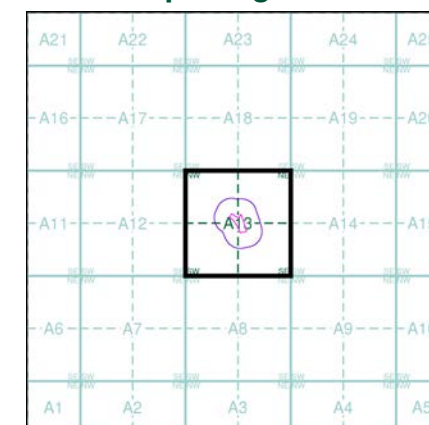
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TF2326 1969 12,500	TF2426 1982 12,500
TF2325 1978 12,500	TF2425 1982 12,500

Historical Map - Segment A13



Order Details

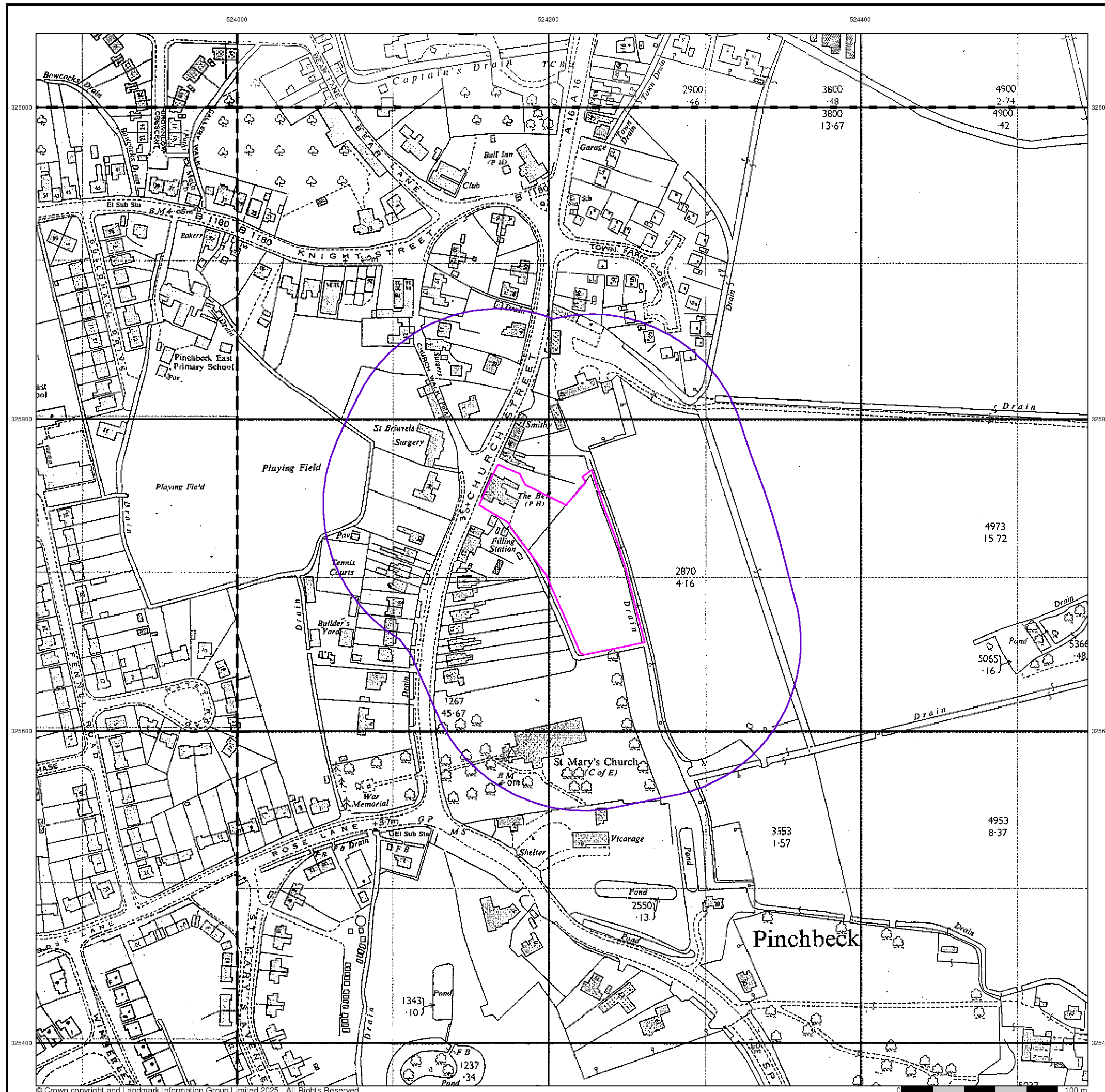
Order Number: 381732805_1_1
Customer Ref: M25-083
National Grid Reference: 524210, 325710
Slice: A
Site Area (Ha): 0.61
Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk





Supply of Unpublished Survey Information

Published 1973

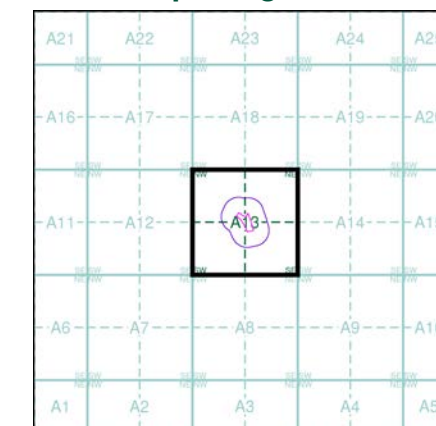
Source map scale - 1:2,500

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)

TF2426	1973	1:2,500
TF2425	1973	1:2,500

Historical Map - Segment A13



Order Details

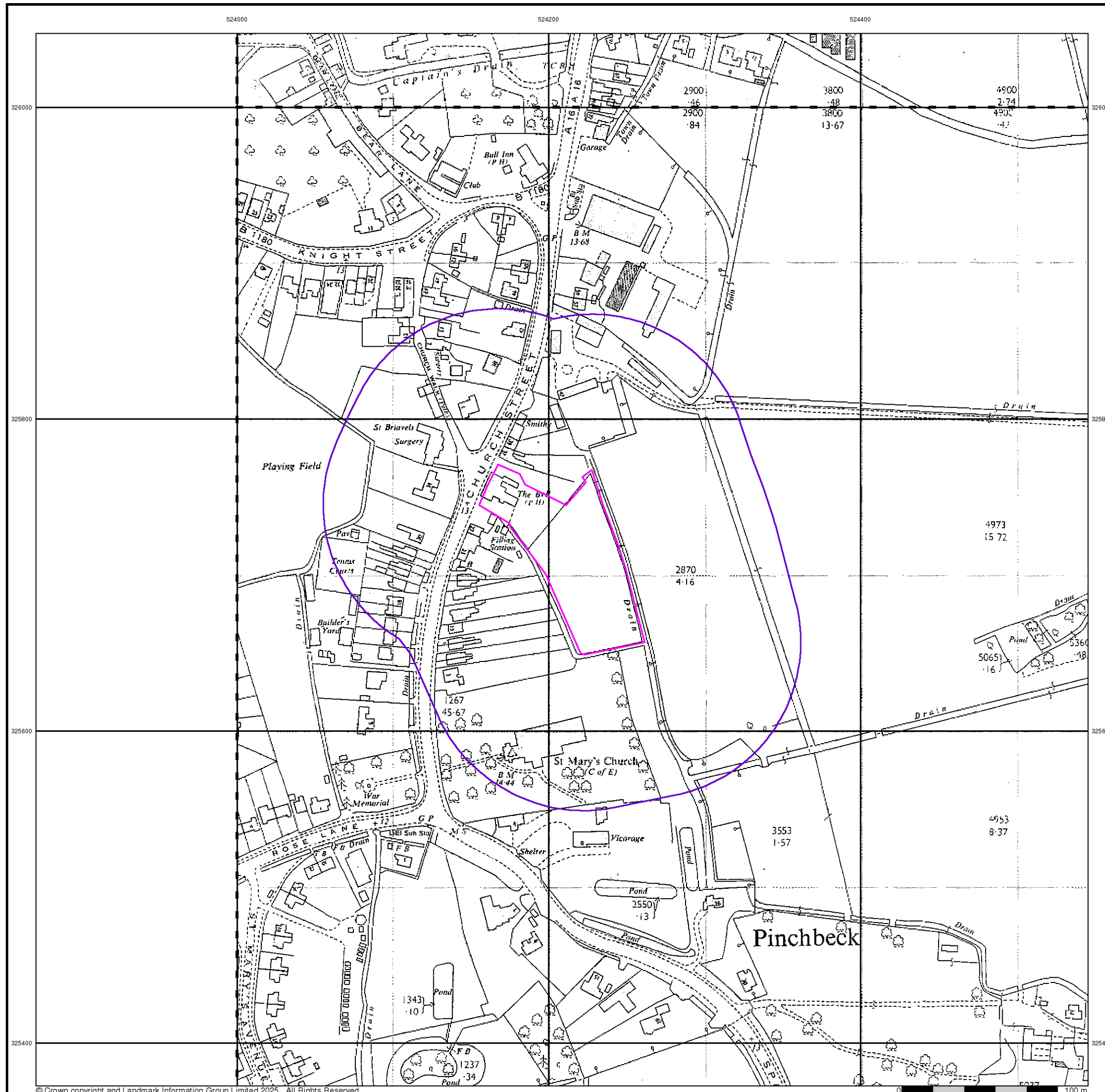
Order Number: 381732805_1_1
Customer Ref: M25-083
National Grid Reference: 524210, 325710
Slice: A
Site Area (Ha): 0.61
Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Ordnance Survey Plan

Published 1986 - 1988

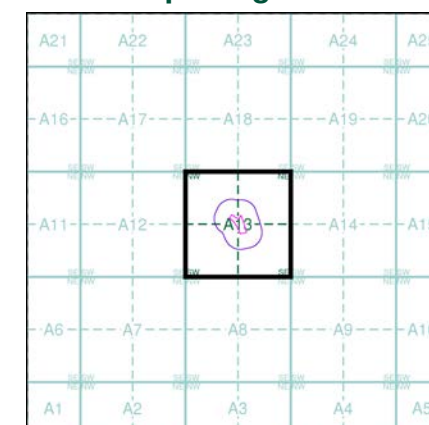
Source map scale - 1:2,500

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)

TF2325 1986 1:2,500	TF2425 1988 1:2,500
---------------------------	---------------------------

Historical Map - Segment A13

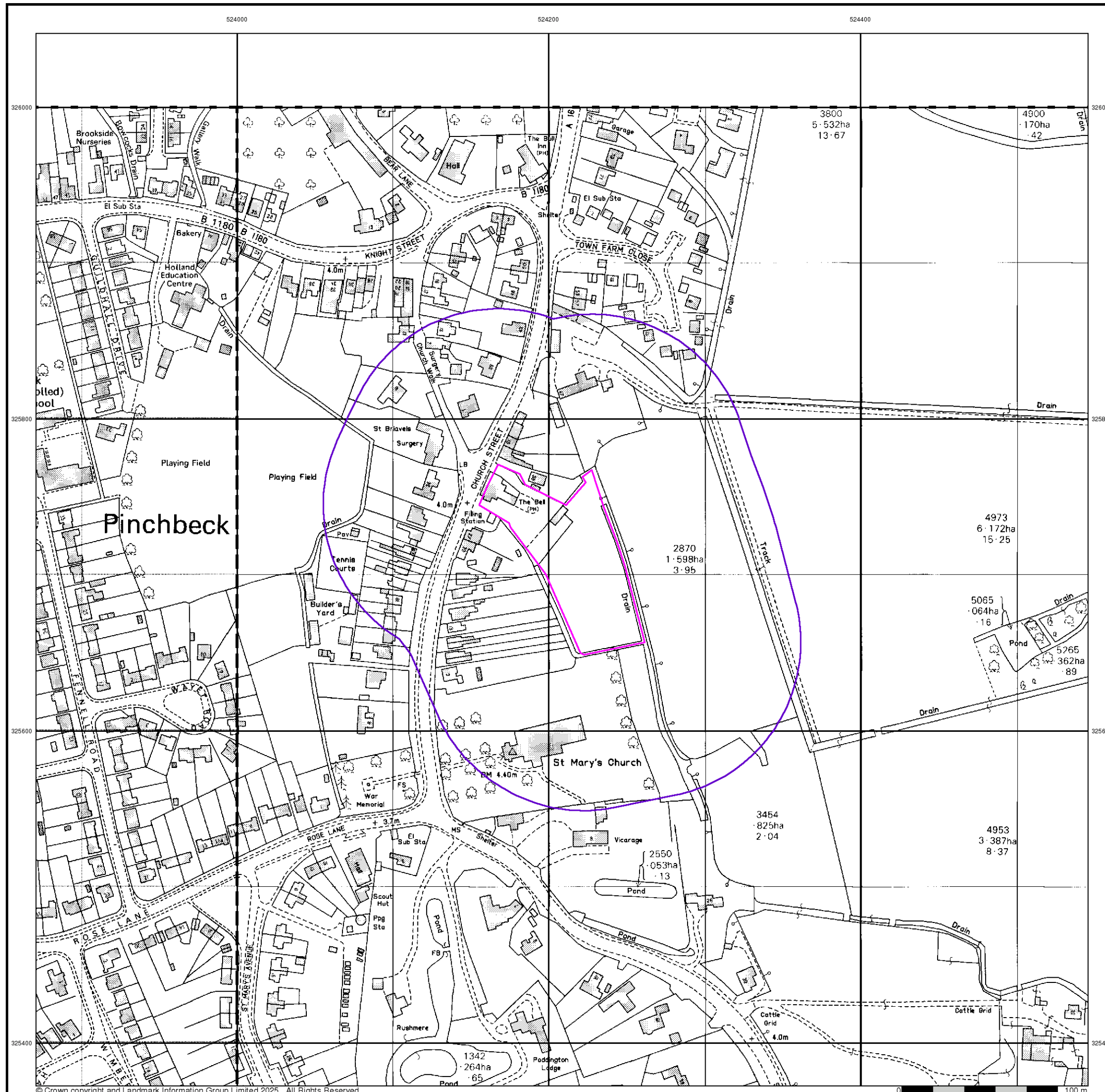


Order Details

Order Number: 381732805_1_1
 Customer Ref: M25-083
 National Grid Reference: 524210, 325710
 Slice: A
 Site Area (Ha): 0.61
 Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB





Large-Scale National Grid Data

Published 1995

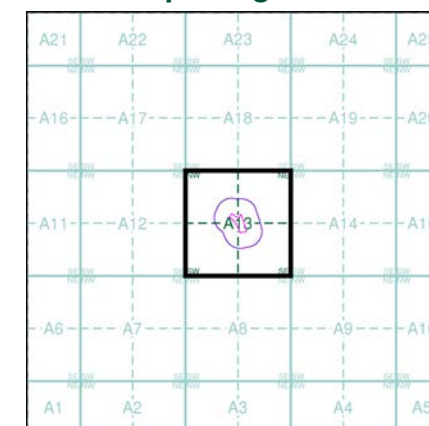
Source map scale - 1:2,500

'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)

TF2326 1995 12,500	TF2426 1995 12,500
TF2325 1995 12,500	TF2425 1995 12,500

Historical Map - Segment A13



Order Details

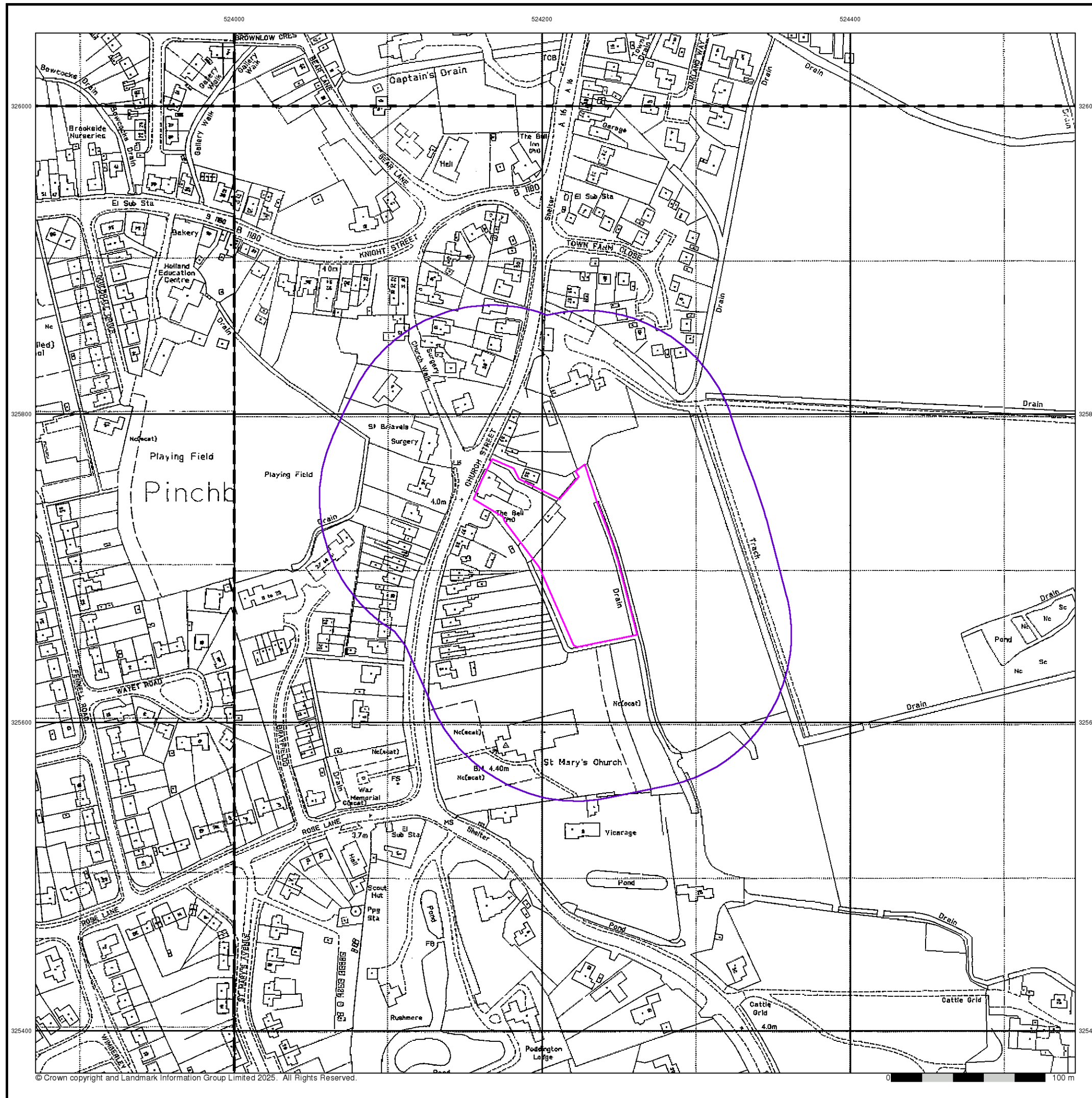
Order Number: 381732805_1_1
Customer Ref: M25-083
National Grid Reference: 524210, 325710
Slice: A
Site Area (Ha): 0.61
Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

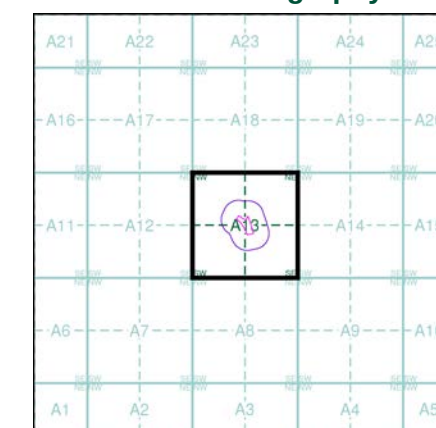


Historical Aerial Photography

Published 1999

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

Historical Aerial Photography - Segment A13



Order Details

Order Number: 381732805_1_1
 Customer Ref: M25-083
 National Grid Reference: 524210, 325710
 Slice: A
 Site Area (Ha): 0.61
 Search Buffer (m): 100

Site Details

33, Church Street, Pinchbeck, SPALDING, PE11 3UB

