



Phase I Desk Study

at

**Land adjacent to Orchard Business Park, North End Road,
Yapton, West Sussex BN18 0GA**

for

Crayfern Homes

Reference: 16612/DS

November 2017

Control Document

Project

Land adjacent to Orchard Business Park, North End Road, Yapton, West Sussex BN18 0GA

Document Type

Phase I Desk Study

Document Reference

16612

Document Status

Final

Date

November 2017

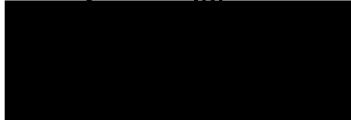
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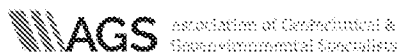
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Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.



Scope

Soils Limited was commissioned by Crayfern Homes to undertake a Phase I Desk Study on the site known as 'Land adjacent to Orchard Business Park, North End Road, Yapton, West Sussex BN18 0GA'. The scope of the investigation was outlined in the Soils Limited quotation reference Q19310 dated 30th October 2017.

Caveat

Whilst reasonable skill and care has been taken to determine the site history and the environmental setting within the time constraints applied by the project, it should be appreciated that uncertainties may occur owing to the natural variability of soil material within a defined area or as a result of unknowns that are associated with contaminated land assessment in general. The site conditions may be different from that indicated by this desk study, particularly on a site with a history of past development. No responsibility can be accepted should such conditions alter the recommendations made in this report.

This Desk Study does not include a detailed UXO risk assessment. In preparing a Phase I Desk Study reference is made to web based sources to assess the risk of the site potentially having been impacted by bombing during the World Wars. The data readily available is not necessarily definitive. Certain areas were bombed heavily, such as the areas of docklands or railways junctions. The assessment is based on the likely area risk, bomb patterns (i.e. lines of recorded bomb impacts with gaps where an impact would be anticipated) and the age of structures on and in close proximity to the site.

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Section I Introduction

I.1 Objective

The Phase I Desk Study was undertaken to advise the client on the risk pertaining to the site, with special reference to former and present-day potential contaminative uses. This also included their impact on sensitive receptors, such as, human health, controlled waters, ecological features, building structures and services.

I.2 Location

The site was located at land adjacent to Orchard Business Park, North End Road, Yapton, West Sussex BN18 0GA and had an O.S Land Ranger Grid Reference of SU 978037. The site location map is presented in Figure 1 and the full Site Walkover discussed in Section 3.1 of this report.

I.3 Proposed Development

At the time of reporting, November 2017, the proposed development comprised seven detached and semi-detached three to four bed houses. The development included hard landscaping such as access roads driveways and pavements and soft landscaping such as boarder planting and private gardens.

In compiling this report reliance was placed on drawing number Sk4_Siteplan_OrchardExtraLand_A2, dated September 2017 and was prepared by Crossley Design Architecture. Any change or deviation from the scheme outlined in the drawing could invalidate the recommendations presented within this report. Soils Limited must be notified about any such changes.

The proposed development plan has been provided in Figure 2.

I.4 Legislation and Liability

The primary legislative mechanism for contaminated land management in the UK is Part 2A of the Environmental Protection Act, 1990 (EPA). Part 2A was introduced into the EPA under Section 57 of the Environment Act 1995 to help deal with the substantial legacy of land contamination. The legislation provides powers in relation to the identification, remediation and apportionment of liability for contaminated land. Part 2A applies where there is unacceptable risk, assessed on the basis of the current use and the relevant circumstances of the land. It is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission.

Under Part IIA of the Environment Act 1995, Local Authorities are required to identify contaminated land and serve on every person who is an appropriate person a remediation notice setting out what is to be done by way of remediation and the period within which it must be done.

If the person who caused, or knowingly permitted, the contaminating substance cannot be found, the owner and/or, occupier for the time being, of the property can be the appropriate person.

Under the legislation, Contaminated Land is defined as: -

“Land which is in such a condition by reason of substances in, on or under the land that significant harm is being caused or that there is a significant possibility of such harm being caused or that pollution of controlled waters is being, or is likely to be caused.”

Where the Act defines harm as:

“harm to the health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property.”

and pollution of controlled waters is defined as: -

“the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter.”

In addition, The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 introduced the supplementary definition of harm to include: lasting exposure to any person resulting from the after-effects of a radiological emergency, past practice or past work activity.

With regard to contaminated waters, the Environment Act 1995 amends the Water Resources Act 1991 and provides the Environment Agency with the power to force clean-up of historical contamination by issuing a Works Notice, with remediation paid for by the responsible parties.

The Groundwater Regulations (1998) stated that entry of List 1 substances into groundwater must be prevented, and List II substances must be controlled.

1.5 Limitations and Disclaimers

This Phase I Desk Study Report relates to the site located at land adjacent to Orchard Business Park, North End Road, Yapton, West Sussex BN18 0GA and was prepared for the sole benefit of Crayfern Homes (The “Client”) for the brief described in the Commission of this report.

Soils Limited disclaims any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the contract with the Client, incorporation of our General

Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

The report is personal and confidential to the Client and Soils Limited accept no responsibility of whatever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report wholly at its own risk.

The Client may not assign the benefit of the report or any part to any third party without the written consent of Soils Limited.

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief. As such these do not necessarily address all aspects of ground behaviour at the site.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

There may be other sources of information not included in those listed that hold data relevant to the Phase I Desk Study undertaken at the site that could materially affect the conclusions made in this report.

Ownership of land brings with it onerous legal liabilities in respect of harm to the environment. "Contaminated Land" is defined in Section 57 of the Environment Act 1995.

Where a contaminative use is identified in the Phase I Desk Study this does not determine whether contamination has actually occurred, or if it has the degree to which it may have taken place. An intrusive investigation(s) and analysis is required to establish the nature and degree of any contamination present.

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Section 2 Site Conditions

2.1 Site Walkover

A site walkover was undertaken in November 2017, the notes are presented in Table 2.1 and Table 2.2.

Table 2.1 Site Walkover Record (On-site)

On-site	Use of site	Site comprises a residential garden (property situated offsite to the southeast)
	Structures	A concrete slab and scaffold-pole car port were located to the east
	Site topography	A gentle gradient sloping down to the southwest
	Site covering	A gravel driveway ran across the northern boundary, a concrete slab (car port) in the east. The remainder of the site was covered in grass with tree and hedge row boarders.
	Vegetation	Semi-mature to mature trees and bushes to the west, south and west boundaries. Notably large fir trees to on the western boundary. Scattered shrubs to the west of the site.
	Potential Contamination Sources	Car port in the east
	Odour	None noted
	Drainage	None noted

Table 2.2 Site Walkover Record (Off-Site)

Off-Site	Use of Land	Residential to the east. Arable farmland to the west. Directly to the north of the site is a small industrial site with several aluminum clad workshops – including furniture manufactures and environmental consultants. To the south lies a school and residential properties.
	Area topography	Gradual slope down to the southwest
	Vegetation	Arable farmland to the west and north. Private gardens and communal space to the south and east
	Potential Contamination Sources	Industrial site to the north. Businesses include furniture manufactures and environmental consultants.

2.2 Site Drainage

No drainage was noted on site which was considered to be self-draining.

2.3 Site Photographs

The site photographs have been included within Appendix D.

Section 3 Geology, Hydrogeology, Hydrology and Radon

3.1 Anticipated Geology

The 1:50,000 BGS Geology map showed the site to be situated on the bedrock formation of the Lewis Nodular Chalk Formation with superficial deposits of the River Terrace Deposits overlying.

3.1.1 River Terrace Deposits

River Terrace Deposits are superficial deposits of Quaternary age that lie along the margins of rivers and are predominantly found in the southern part of West Sussex, along the coastal plain and are typically less than 10m thick. The composition of the River Terrace Gravel varies greatly, depending on the source material available in the river's catchment. Deposits generally consist of sands and gravels of roughly bedded flint or chert gravels commonly in a matrix of silts and clays. In West Sussex the rivers flow mainly south over the Weald Clay, which contains some sandstones and limestone that could be incorporated into the river gravel.

3.1.2 Lewis Nodular Chalk Formation

The Lewes Nodular Chalk Formation is composed of hard to very hard nodular chalks and hardgrounds with interbedded soft to medium hard chalks (some grainy) and marls; some griotte chalks. The softer chalks become more abundant towards the top. Nodular chalks are typically lumpy and iron-stained. Brash is rough and flaggy or rubbly, and tends to be dirty. First regular seams of nodular flint, some large, commence near the base and continue throughout. Chalk formations are susceptible to ground dissolution, typically caused by water passing through soluble rocks producing underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Occasional erosional features, such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits, are found in the chalk. The features sometimes manifest themselves at the surface as shallow circular depressions. Solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. Reactivation may lead to surface collapse.

3.2 Hydrogeology

To assess the vulnerability of groundwater to contamination, consideration must be given to the leaching characteristics of the overlying soils and the characteristics of the strata in the unsaturated zone. Information on the geological strata, such as lithological type and permeability characteristics has been combined with the physical properties of the soil to produce varying degrees of vulnerability. Table 3.1 presents the hydrological data that is relevant to the site.

Table 3.1 Hydrogeological Assessment

Hydrogeological Data		Comment	Risk
On-site	Superficial	Secondary A Aquifer ¹	Low
Aquifers	Bedrock	Principal Aquifer ²	Low
Groundwater Vulnerability		Soils of Intermediate Leaching Potential ³	Low
Source Protection Zones (SPZ)		None within 1000m	
Abstraction	Potable	None within 1000m	
	Non-potable	Irrigation - 67m S	
Sensitive land uses		Nitrate vulnerable zone - Onsite	
Surface Water Features		180m S	
Flood Risk from Rivers or Seas		None	
Flood Risk from Surface Water		None	
Flood Risk from Groundwater		Potential for groundwater flooding below groundlevel ⁴	Low

Note: ✓ = Likely.

¹ Secondary A Aquifer' was defined as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'

² Principal Aquifer are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

³ Soils of intermediate leaching potential – soils which can possibly transmit a wide range of pollutants

⁴ Potential for groundwater flooding of property situated below ground level

Any works or development, which may have an impact on surface water, aquifer or groundwater quality, must be approved by the Environment Agency prior to implementation.

3.3 Hydrology

The approximate elevation of the site was ~6.0 m AOD (Above Ordnance Datum). The anticipated groundwater flow direction is given in Table 3.2.

Table 3.2 Hydrogeological Assessment

Type	Direction	Notes
Surface water	n/a	Not anticipated due to the permeable underlying geology
Groundwater	Southwest	In line with the wider topography

3.4 Radon Gas

The site **was not situated** within an area where protection or risk assessment against the ingress of radon was required. Radon protection measures **will not be required** within the proposed new development. It is not possible in the course of a survey or inspection to determine whether radon gas is present as the gas is colourless and odourless. Tests can be undertaken to assess the concentration of radon in existing structures.

Section 4 Site History

4.1 Historic Map Study

The object of this study was to report on the evidence of site history and redevelopment of the site and its environs from available County Series and Ordnance Survey Maps dating from the mid to late 19th Century to the present day as downloaded from Landmark Environmental.

Maps only represent a “snap shot” of the site and its environs at the date of the survey. Changes that had occurred either to the site and/or the environs may well not have been recorded on the maps and could represent a hazard to the site. Any distances quoted for features remote from the site have been scaled from the maps and are only approximate. Where dates have been noted in brackets, these are the actual dates applicable to the map editions.

The information reported might not represent all pertinent information that could be obtained. The interpretation of the maps and/or other data commented on in this report is subjective.

In the following sections dealing with individual maps, only features considered to have a potential contaminative impact on the site and usually within a notional 250m radius are discussed. The north point and approximate extent of the site are indicated on each figure. The historic maps referred to are appended to this report (Appendix A). The potential onsite and offsite sources have been presented in Table 4.1 and Table 4.2.

Table 4.1 Potential Sources of Pollution Indicated from Historic Maps

Source	Direction	Distance (m)	Date Range	
			From	To
Large glazed roofed nursery	NE	5	1975	2009
Tank	SE	25	1975	2009
Tank	E	20	1975	2009
Telephone exchange	SW	30	1975	2017
Electrical sub-station	W	50	1975	2017

Table 4.2 Historic Development of the Site

Site Development	Date Range	
	From	To
Situated within a field. The western boundary runs adjacent to a roadway (now Northend Road)	1875	1939
Orchard now present in the south	1839	1975
Glazed roofed nursery now situated in the southeast	1975	1992
Nursery buildings have undergone works, change in location and size. Still occupying the southeast of the site	1992	2009
Nursery building has been demolished. No structures onsite	2009	2017

Section 5 Environmental Records and Consultation

5.1 Dataset Information

The Landmark Envirocheck Report was obtained by Soils Limited and includes site specific information. A copy of the report is appended to this report, Appendix B, and a summary is given in Table 5.1, Table 5.2 and Table 5.3.

Table 5.1 Environmental Significance of Data

Source	Direction	Distance (m)	Maximum Radius (m)
Contaminated Land Register Entries and Notices	None	None	250
Discharge Consents	"	"	250
Integrated Pollution Prevention and Control	"	"	250
Local Authority Pollution Prevention and Controls	"	"	250
Local Authority Pollution Prevention and Control Enforcements	"	"	250
Nearest Surface Water Feature	S	180	250
Pollution Incidents to Controlled Waters (Significant Incidents only)	None	None	250
Prosecutions Relating to Authorized Processes	"	"	250
Registered Radioactive Substances	"	"	250
Substantiated Pollution Incident Register	"	"	250
Nearest Potable Abstraction Point	"	"	250
Nearest Non-Potable Abstraction Point	NW	70	250
Water Industry Act Referrals	None	None	250
Source Protection Zones	"	"	250
Extreme Flooding from Rivers or Sea Without Defences	"	"	250
Flooding from Rivers or Sea Without Defences	"	"	250
Areas Benefiting from Flood Defences	"	"	250
Flood Water Storage Areas	"	"	250
Flood Defences	"	"	250
BGS Recorded Landfill Sites	"	"	250
Historical Landfill Sites	"	"	250
Licensed Waste Management Facilities	"	"	250
Local Authority Recorded Landfill Sites	"	"	250
Registered Landfill Sites	"	"	250
Registered Waste Transfer Sites	"	"	250
Registered Waste Treatment or Disposal Sites	"	"	250
Control of Major Accident Hazards Sites (COMAH)	"	"	250
Notification of Installations Handling Hazardous Substances	"	"	250
Planning Hazardous Substance Consents	"	"	250

Table 5.2 Contemporary Trade Directory

Contemporary Trade Directory within 250m ¹	Direction	Distance (m)	Status
Barnham Car Centre – Used car dealers	E	5	Inactive
Classic Perfections – Classic car specialists	E	5	Active
Pptek – Commercial Cleaning	E	15	Inactive
Orchard Classics - Classic car specialists	E	25	Active
V & C Car Sales – Used car dealers	E	45	Inactive
Littlehampton Scaffolding – builders	E	50	Active
Mailtec Ltd – Printers	NE	50	Active
Revolution Machine Werks – engineering machine services	E	50	Active
C & W Seals – Seal and Joint manufacturers	NE	55	Inactive
Arun Ltd – Waste disposal services	NE	55	Inactive
V Dubz R Us – Car body repairs	NE	55	Inactive
E M S Animal Feeds – Animal Feeds	E	60	Active
B P S Garden Machinery – sales and service	E	65	Active
Arun Meat and Livestock	NW	80	Inactive

Note: ¹ Those likely to impact the underlying soil and/or groundwater, date not supplied.

Table 5.3 Geological Hazards

Source	Onsite Hazard Potential
Coal Mining Affected Areas	None
Mining Instability	None
Natural and Mining Cavities	None
Potential for Collapsible Ground Stability Hazards	Low
Potential for Compressible Ground Stability Hazards	No Hazard
Potential for Ground Dissolution Stability Hazards	Very Low
Potential for Landslide Ground Stability Hazards	Very Low
Potential for Running Sand Ground Stability Hazards	Low
Potential for Shrinking or Swelling Ground Stability Hazards	Low
Shallow Mining Hazards	Unknown

5.2 Site Sensitivity Maps

No other significant potential sources of contamination were shown on the Landmark Envirocheck Site Sensitivity Maps, which have not been listed in Table 5.1, Table 5.2 and Table 5.3, and copies of which are appended to this report (Appendix C).

5.3 Regulatory Enquires

As part of the Phase I Desk Study, Arundel District Council was contacted and asked to provide any information on potential risks pertaining the site. At the time of reporting no response had been received.

5.4 Soil Geochemistry

Potential levels of metals including lead, arsenic, cadmium, chrome and nickel as contoured on the Landmark Environmental check report (Appendix B) were assessed against the appropriate environmental quality standards (e.g. SGV) for the sites purposed end use. The results are indicated in Table 5.4.

Table 5.4 Soil Geochemistry

Determinand	Proposed Land Use	Indicated Soil Geochemistry (mg kg ⁻¹)	Guideline for Residential (mg kg ⁻¹)	Potential Hazard
Arsenic	Residential	<15	37	
Cadmium		<1.8	11	
Chromium		60-90	910	
Lead		<100	200	
Nickel		15-30	130	

Note: ✓ = Likely. ¹ Soil guideline value for 1% and 6% SOM respectively. Other soils guidelines presented in the table are based on soils with 6% SOM.

The results show no significant risk to identified receptors for contaminants presented. If the proposed land use changes, then the recommendations given in the report would be likely to change.

Please note that there are only a limited number of land uses for which data on determinands have been published or can be readily determined.

Section 6 Discussion and Conclusions

6.1 General

The findings of the Phase I Desk Study are summarised below:

1. The 1:50,000 BGS Geology map showed the site to be situated on the bedrock formation of the Lewis Nodular Chalk Formation with superficial deposits of the River Terrace Deposits overlying.
2. The Environment Agency Hydrogeological Maps showed that the Lewis Nodular Chalk Formation had a Principal Aquifer Designation and the River Terrace Deposits had a Secondary A Aquifer Designation. The overall groundwater vulnerability was soils of intermediate leaching potential (L1), soils which can possibly transmit a wide range of pollutants.
3. Surface water flow was not expected due to the permeable soils of the River Terrace deposits. Groundwater was anticipated to flow down to the southwest in line with the wider topography.
4. Radon protection measures will not be required within the proposed new development.
5. Environment Agency records showed that the site was not at risk of flooding from rivers or seas. However, the site does have potential for groundwater flooding of property situated below ground level.
6. As part of the Phase I Desk Study the Arundel District council had been contacted and asked to provide any information on potential risks pertaining the site. At the time of reporting the data was not available.
7. Any suspicious ground conditions encountered during groundworks must be reported to a competent person for further inspection.
8. Summary of potential on-site contamination sources identified during the study of the historic maps, the Dataset Information and Landmark Envirocheck Report and the Site Walkover are outlined in Table 6.1.

Table 6.1 Summary of Potential Contamination Sources

Sources/Environmental Impact	Direction ¹	Distance (m)	Date Range		Source
			From	To	
On Site					
Glazed roofed nursery	Onsite	Onsite	1975	2009	HM
Demolished buildings (potential for Made Ground)	Onsite	Onsite	2009	2017	HM
Car Port	Onsite	Onsite	-	2017	SW
Off-Site					
Glazed roofed nursery	NE	5	1975	2009	HM

Sources/Environmental Impact	Direction ¹	Distance (m)	Date Range		Source
			From	To	
Tank	SE	25	1975	2009	HM
Tank	E	20	1975	2009	HM
Telephone exchange	SW	30	1975	2017	HM
Electrical sub-station	W	50	1975	2017	HM
Industrial site	N	10	2009	2017	HM /SW
Barnham Car Centre – Used car dealers	E	5	-	-	DS
Classic Perfections – Classic car specialists	E	5	-	-	DS
Pptek – Commercial Cleaning	E	15	-	-	DS
Orchard Classics - Classic car specialists	E	25	-	-	DS
V & C Car Sales -Used car dealers	E	45	-	-	DS
Littlehampton Scaffolding – builders	E	50	-	-	DS
Mailtec Ltd – Printers	NE	50	-	-	DS
Revolution Machine Works–engineering machine services	E	50	-	-	DS
C & W Seals – Seal and Joint manufacturers	NE	55	-	-	DS
Arun Ltd – Waste disposal services	NE	55	-	-	DS
V Dubz R Us – Car body repairs	NE	55	-	-	DS
E M S Animal Feeds - Animal Feeds	E	60	-	-	DS
B P S Garden Machinery – sales and service	E	65	-	-	DS
Arun Meat and Livestock	NW	80			DS

Section 7 Preliminary Conceptual Site Model

7.1 General

Environment Agency guidance provided in CLR11 indicates the Conceptual Site Model should identify those contaminants, pathways and receptors which are 'likely' to represent an 'unacceptable' risk either to human health or the surrounding environment. The following sections present potential contaminants, pathways and receptors based on the information collected during the desktop study. Pathways have been established on scientific knowledge of the behaviour of the contaminants in the ground.

7.2 Sources of Contamination

The Landmark Site Specific Envirocheck Report and Site Walkover has been used to identify potential contaminative sources, the sources have been presented in Table 6.1. An initial assessment of the likelihood of each contaminative source that was considered a risk has been presented in Sections 7.2.1 – 7.2.3.

7.2.1 Onsite Potential Contamination Sources

A study of Landmark Envirocheck Report and Site Walkover has shown a number of potentially onsite contaminative sources. The sources have been given in Table 7.1.

Table 7.1 Onsite Potential Contamination Sources

Sources	Likely ¹	Reasoning
Glazed roofed nursery	✓	Contamination associated with tanks, heaters and fertilizers
Demolished buildings (potential for Made Ground)	✓	Made Ground associated with historical change in usages.
Car Port		Light use and concrete in good condition

Notes: ✓ = Likely. ¹ Sources that are not ticked were considered negligible. These considerations are based on type of contamination, age of source and anticipated significance.

7.2.2 Offsite Potential Contamination Sources

A study of Landmark Envirocheck Report and Site Walkover has shown a number of potentially offsite contaminative sources. The sources have been given in given in Table 7.2.

Table 7.2 Offsite Potential Contamination Sources

Sources	Direction	Distance (m)	Likely ¹	Reasoning
Glazed roofed nursery	NE	5	✓	Contamination associated with tanks, heaters and agro-chemicals
Tank	SE	25	✓	Associated with the nursery
Tank	E	20	✓	
Telephone exchange	SW	30		No contamination onsite

Sources	Direction	Distance (m)	Likely ¹	Reasoning
Electrical sub-station	W	50		Immobile contaminate
Barnham Car Centre – Used car dealers	E	5	✓	Proximal source of TPH / PAH up hydraulic gradient.
Classic Perfections – Classic car specialists	E	5	✓	
Pptek – Commercial Cleaning	E	15		Environmental consultancy, no source of contamination
Orchard Classics - Classic car specialists	E	25	✓	Proximal source of TPH / PAH up hydraulic gradient.
V & C Car Sales -Used car dealers	E	45	✓	
Littlehampton Scaffolding – builders	E	50		Not up hydraulic gradient
Mailtec Ltd – Printers	NE	50	✓	Proximal source of organic solvents and compounds located up hydraulic gradient.
Revolution Machine Werks – engineering machine services	E	50		Not up hydraulic gradient
C & W Seals – Seal and Joint manufacturers	NE	55	✓	Proximal source of organic solvents and compounds located up hydraulic gradient.
Arun Ltd – Waste disposal services	NE	55	✓	Proximal source of organic solvents and compounds, TPH/PAHs and metals located up hydraulic gradient.
V Dubz R Us – Car body repairs	NE	55	✓	Proximal source of organic solvents and compounds located up hydraulic gradient.
E M S Animal Feeds - Animal Feeds	E	60		Not up hydraulic gradient
B P S Garden Machinery – sales and service	E	65		Not up hydraulic gradient
Arun Meat and Livestock	NW	80		Not up hydraulic gradient

Note: ✓ = Likely. ¹ Sources that are not ticked were considered negligible. These considerations are based on type of contamination, age of source, anticipated significance and taking account of the source distance from the site.

7.3 Potential Pathways

A pathway is a route by which a receptor is exposed to a contamination source. Pathways can also determine the likelihood of the contamination source reaching a receptor.

Anthropogenic (or artificial) pathways of contaminant migration can be present in the form of land drains etc. Leaking sewage supply pipes, site drainage, granular backfill to service trenches can also provide pathways for potential contaminant migration.

The potential geological pathways are given in Table 7.3.

Table 7.3 Potential Soil Migration Pathways

Strata	Pathway
River Terrace Deposits	✓
Lewis Nodular Chalk Formation	✓

Note: ✓ = Likely

In Table 7.4 the site-specific sources and pathways are given.

Table 7.4 Site Specific Sources and Pathways

Type of Attack	Standard Exposure Pathways	Source	Site Assessment	
			Likely	Comment
Oral	Direct soil and dust ingestion	Contaminants in soft landscaping areas	Yes	Potential sources of solvents, VOC's, metal and semi-metals, TPH and PAH, pesticides and herbicides from nearby tanks, garages and large nursery. Proposed development comprises soft landscaping and private gardens.
	Consumption of home-grown produce	Contaminants in gardens areas	Yes	
Dermal	Dermal contact	Contaminants in soft landscaping areas	Yes	
Inhalation	Inhalation of dust (indoor and outdoor)	Contaminants in soft landscaping areas	Yes	
	Inhalation of vapours (indoor and outdoor)	Volatile compounds & Soft landscaping areas	Yes	
	Inhalation of soil gases	Soil gases (e.g. CH ₄ and CO ₂ , VOC) within 0-250m	Yes	Sources of VOC's and associated vapours from tanks and garages
Physical	Fire and explosion ¹	UXO (e.g. Bombs or projectile sites) (0-250m) ²	Yes	No evidence of UXO
		Combustible material in soil	Yes	Sources of VOC's and associated vapours from tanks and garages
		Soil gases (VOC) within 0-250m	Yes	
	Via anthropogenic pathways (services trenches)	Contaminants & Trenches or drainage onsite	Yes	Service trenches anticipated due to previous land usage
	Others physical pathways ³	Degradation of fills, blast... etc...	Yes	No sources identified
Chemical	Location of service supply pipes in contaminated soils	Hydrocarbons & Pipes	Yes	Organic compounds, solvents from offsite tanks and garages.
	Direct contact of concrete with concrete aggressive soils	Sulphate, Acids & Concrete	Yes	Sulphates present within Made Ground and natural strata.
Others	Irradiation ⁴	Radon	Yes	Not anticipated
		Radioactive materials	Yes	No sources identified
		UXO within 0-250m	Yes	No evidence of UXO
		Contaminants & Gradient (Area)	Yes	No surface water anticipated due to underlying geology
	Migration downwards via granular soils	Contaminants & RTD: Secondary A	Yes	Underlying geology has a Secondary A Aquifer designation
	Migration downwards via permeable soils and Lewis Nodular Chalk Formation	Contaminants & LNCF: Principal	Yes	Underlying bedrock geology has a Principal Aquifer designation
	Plant uptake and phytotoxicity ⁵	Contaminants & Groundwater vulnerability: Principal/secondary	Yes	Soils of intermediate leaching potential
		Metallic contaminants	Yes	From previous site usage of a nursery and associated demolition
	Plant uptake and ecotoxicological effects ⁶	Soil gases within 0-250m	Yes	Sources of VOC's and associated vapours from tanks and garages
		Contaminants	Yes	From previous site usage of a nursery and associated demolition

Notes: ✓ = Likely

¹ Both underground fires and biodegradable may produce toxic or flammable gases;

² UXO= Unexploded Ordnance: Although risk is generally low in the UK, a risk assessment (i.e. using Find map for example) may be needed if an UXO is found onsite,;

³ Blast-furnace and steel-making slag may expand. Degradation of fills may cause settlement and voids in buried tanks and drums may collapse as corrosion occurs or under loading;

⁴ Radioactive materials emitting gamma rays that can be inhaled and absorbed through the skin and also cause a radiation response;

⁵ Prevention or inhibition of plant growth;

⁶ Contaminants in soil may affect microbial, animal and plant populations. Ecosystems or individual species on the site, in surface waters or areas affected by migration from the site may be indirectly affected.

Table 7.5 Off-site Potential Pathways

Receptors	Off-Site Potential Pathways	Risk
Human Health Building Materials	Migration via surface water runoff (Surface flow)	
Human Health Building Materials	Migration via air	High
Groundwater Human Health Building Materials	Migration via groundwater flows	High
Human Health Buildings	Migration of soil gas via permeable soils	High

Notes: ✓ = Likely

7.4 Potential Receptors

The presence of potential receptors has been evaluated from our understanding of the current and planned land use of the site, an assessment of surrounding land uses and currently available information pertaining to the site. The assessment for potential receptors has been included in Table 7.6.

Table 7.6 Potential Receptors

Potential Receptor		Risk
Human Health	Future users of the site	High
	Visitors to the site	High
	Construction workers on site	High
	Service and maintenance workers	High
	Site neighbours and wider public	High
Groundwater/Controlled Waters	Groundwater/Future Potable Water Supply	High
	Surface Water	
Buildings & Materials	Construction materials	High
	Buildings and confined spaces	High
Ecosystems	Flora and fauna in surface water	

Notes: ✓ = Likely

7.5 Preliminary Risk Assessment

A preliminary risk assessment has been undertaken relating to the proposed development based on a qualitative assessment of the likely presence of a pollutant linkage. A pollutant linkage is the relationship between a contaminant source, a pathway and a receptor. Unless all three elements of a pollutant linkage are present, a risk is not considered to exist. Each of the three elements was considered in Sections 7.2, 7.3 and 7.4. The approach adopted was to screen the site based on assigning a risk category. The preliminary risk assessment is presented in Table 7.7 with the classification tables presented in Appendix E, which have been modified from, 'Contaminated land risk assessment: A guide to good practice, 2001, CIRIA C552'.

Table 7.7 Risk Assessment

Source	Direction	Distance (m) ¹	Pathway	Receptor	Risk	Reasoning
Glazed roofed nursery	Onsite	Onsite			Low to Moderate	Contamination associated tanks, heaters and agro-chemicals
Demolished buildings (potential for Made Ground)	Onsite	Onsite			Low to Moderate	Made Ground associated with historical change in usage.
Glazed roofed nursery	NE	5			Low	Contamination associated tanks, heaters and agro-chemicals
Tank	SE	25			Low to Moderate	Proximal source of TPH / PAH up hydraulic gradient.
Tank	E	20			Low to Moderate	Proximal source of TPH / PAH up hydraulic gradient.
Barnham Car Centre – Used car dealers	E	5			Low	Proximal source of TPH / PAH up hydraulic gradient.
Classic Perfections – Classic car specialists	E	5			Low	Proximal source of TPH / PAH up hydraulic gradient.
Orchard Classics - Classic car specialists	E	25			Low	Proximal source of TPH / PAH up hydraulic gradient.
V & C Car Sales -Used car dealers	E	45			Low	Proximal source of TPH / PAH up hydraulic gradient.
Mailtec Ltd – Printers	NE	50			Low	Proximal source of organic solvents and compounds located up hydraulic gradient.
C & W Seals – Seal and Joint manufacturers	NE	55			Low	Proximal source of organic solvents and compounds located up hydraulic gradient.
Arun Ltd – Waste disposal services	NE	55			Low	Proximal source of organic solvents and compounds, TPH/PAHs and metals located up hydraulic gradient.
V Dubz R Us – Car body repairs	NE	55			Low	Proximal source of organic solvents and compounds located up hydraulic gradient.

Notes: ||||| = Likely. ¹ Approximately from boundary of the site. There can only be a risk if there is both a pathway and a receptor present

7.6 Potential Contamination

From the Risk Assessment presented in Table 7.7, the main groups of associated contaminants are presented in Table 7.8. The associated contaminants have been based on DOE industry profiles or on knowledge of the processes involved in the activity carried out onsite.

Table 7.8 Potential Contaminants or Properties

Contaminants/Chemical Properties		Potential Contaminative Sources
P1	Asbestos	Made Ground
P2	Pesticides	Nursery (agro-chemicals)
P3	Metals and semi-metals	Waste disposal services and Made Ground
P4	Organic compounds	Used car garages, nursery tanks, Made Ground
P5	Organic Solvents	Car body repairs, printers
P6	Non-chlorinated Solvents	Car body repairs, printers, used car garages
P7	Soil Gas	VOC's from tanks and garages.

Note: P=Properties

7.7 Preliminary Conceptual Site Model

The preliminary conceptual site model, including linkages that require further action, are presented in Table 7.9.

Table 7.9 Preliminary Conceptual Site Model and Risk Assessment Methodology

Potential Contaminants (Table 7.8)	Pathway (See Tables 7.3, 7.4 & 7.5)	Receptor (See Table 7.6)	Risk Assessment Methodology (plus anticipated quantitative risk assessment methods)	Site specific settings	Risk Classification: Based on Desk Study	Pollutant Linkage & Action Required
P2, P3, P4, P5, P6	Uptake (root and stomata), ingestion, inhalation and dermal	Ecological features (i.e. Flora and Fauna)	Presence of SSSI, Nature reserves and others within 0- 250m to the site.	Residential development with plant uptake.	Low to moderate	Further Action Required. Phase II intrusive investigation
P4, P5, P6	Chemical attack	Building structures/services	BRE SD1 2005 for risk assessment. Water UK (2014) for pipes. Use Anglian Water trigger for services risk assessment	Residential development	Low	Further Action Required. Phase II intrusive investigation
P1, P2, P3, P4, P5, P6	Inhalation, ingestion and dermal contact	Human health Site residents	Use CLEA for human risk assessment	Residential development with plant uptake	Low to moderate	Further Action Required. Phase II intrusive investigation
		Human Health Workers	Assessment not within the scope of this Desk study (responsibility of building contractor). Ground workers should follow regulations on health and safety during development (HSE, 1991)	Workers and the general public should follow regulation on health and safety during development (HSE, 1991)	Low to moderate	Follow HSE Procedures
P2, P3, P4, P5, P6	Leaching (direct precipitation, overland flow and through flow)	Shallow groundwater	Assess distance from watercourse and direction of flow – Consider use of R&D 20 publication and EA remediation target for risk assessment	RTD has Secondary A Aquifer designation. Surface water present 180m S	Low to moderate	Further Action Required. Phase II intrusive investigation
P2, P3, P4, P5, P6	Leaching (direct precipitation, overland flow, through and groundwater flow)	Deep groundwater	Undertake groundwater or leachate testing depending on site specific ground conditions. Consider use of R&D 20 publication and EA remediation target for risk assessment if contamination is identified.	LNCK has a Principal Aquifer designation.	Low	Further Action Required. Phase II intrusive investigation
P7	Through fissures, shafts, high permeability strata and inhalation	Human and Building Structures	Current or former Landfill sites within 0-250m to the site. Assess nature/age/size of site for Risk Assessment. Use CIRIA I49 & 665 to assess need for gas protection measures where necessary following ground gas testing	VOC's from tanks and garages.	Low	Further Action Required. Phase II intrusive investigation

Note: P1: Asbestos, P2: Pesticide, P3: Metals and semi-metals P4: Organic compounds P5: Organic Solvents P6: non-chlorinated Solvents P7: Soils gas HSE = Health and Safety Executive

Section 8 Recommendations

8.1 General

Based on the information obtained during the compilation of this Phase I Desk Study and the preliminary conceptual site model, an intrusive investigation is required to quantify the risks. The intrusive investigation may reveal on site sources of contamination that were not identified in the Phase I Desk Study and Site Walkover that could modify the Conceptual Site Model.

8.2 Impact of Construction Activities on Controlled Water and Site Neighbours

A construction risk assessment must be undertaken and appropriate measures taken to mitigate against mobilisation and to monitor impact to groundwater and surface waters.

8.3 Proposed Further Site Works

An intrusive investigation was required to quantify the risks that have been identified within the preliminary CSM. The preliminary CSM identifies the test parameters relevant to the sources that have a pathway to a receptor. Dependant on the findings of an intrusive investigation the test parameters may be modified. The intrusive investigation will investigate and assess pollutant linkages identified in the preliminary Conceptual Site Model.

The required further environmental investigation has been presented in Table 8.1.

Table 8.1 Required Further Environmental Investigation

Potential Further works	General Purpose	Required
Investigatory Holes	Collect sufficient samples for a robust assessment	Yes
Laboratory Testing	Quantify the risks identified in the Conceptual Site Model	Yes
Risk Assessment	Assess pollutant linkages based on current contaminated land guidance and screening criteria's	Yes
Borehole well installation	To allow for continued groundwater and/or gas monitoring	Yes
Remediation	If the site-specific risk assessment reveals that the site was contaminated	
Validation & Verification	To validate and verify the remedial objectives based on the site-specific risk assessment	

8.4 Discovery Strategy

There may be areas of contamination not identified during the course of the investigation. Such occurrences may also be discovered during the demolition and construction phases for the redevelopment of the site.

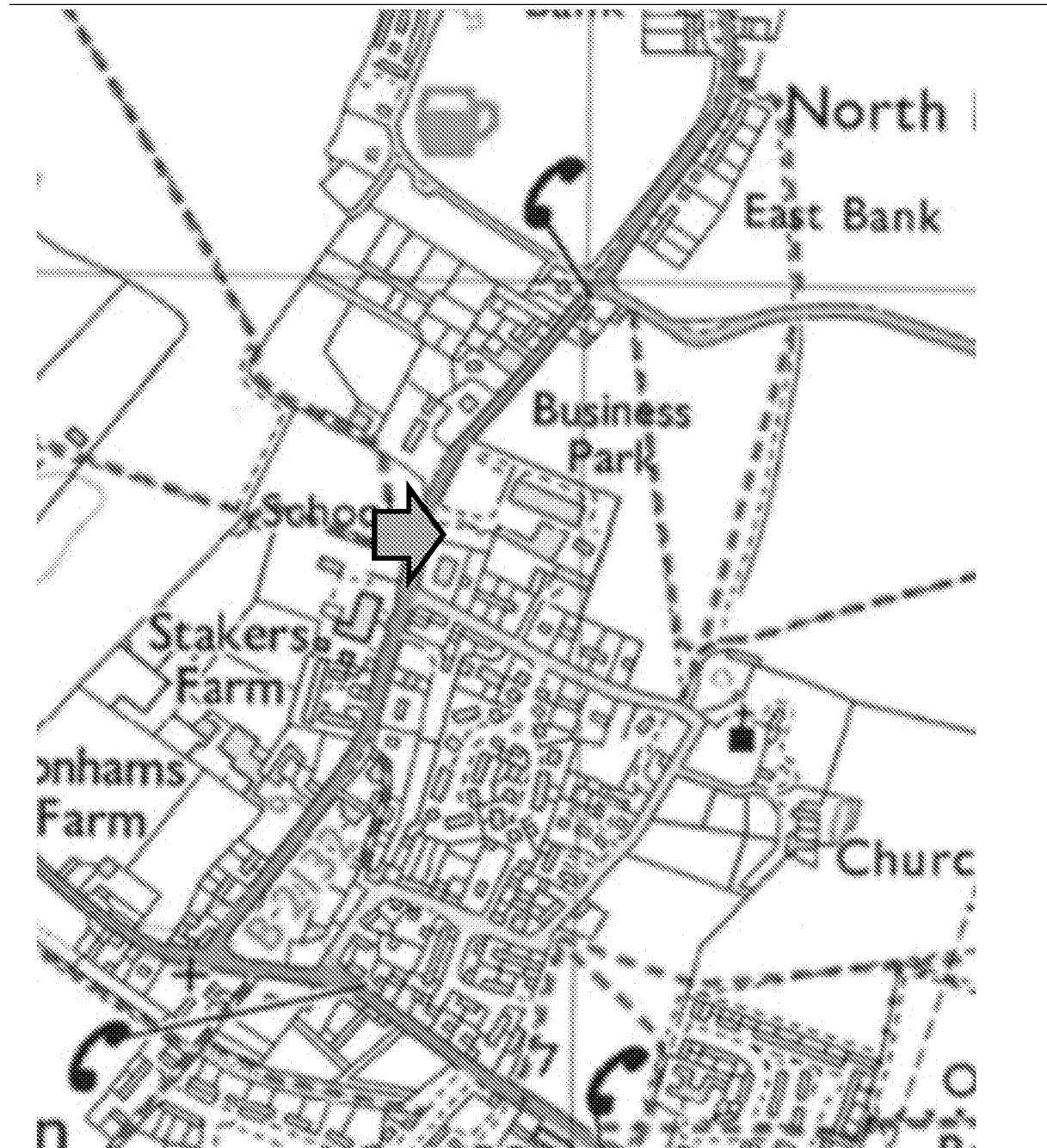
Care should be taken during excavation works especially to investigate any soils, which appear by eye (e.g. such as fibrous materials, large amounts of ash and unusual

discolouration), odour (e.g. fuel, oil and chemical type odours or unusual odours such as sweet odours or fishy odours) or wellbeing (e.g. light headedness and/or nausea, burning of nasal passages and blistering or reddening of skin due to contact with soil) to be contaminated or of unusual and/or different character to standard soils or those analysed.

In the event of any discovery of potentially contaminated soils or materials, this discovery should be quarantined and reported to the most senior member of site staff or the designated responsible person at the site for action. The location, type and quantity must be recorded and the Local Authority, a competent and appropriate third-party Engineer/Environmental consultant notified immediately. An approval from the Local authority must be sought prior to implementing any proposed mitigation action.

The discovery strategy must remain on site at all times and must demonstrate a clear allocation of responsibility for reporting and dealing with contamination. A copy of the strategy must be placed on the health and safety notice board and /or displayed in a prominent area where all site staff are able to take note of and consult the document at any time. Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the discovery strategy.

Figure 1 - Site Location Plan



Project
Land adjacent to Orchard Business Park, North End
Road, Yapton, West Sussex BN18 0GA

Date
November 2017

Client
Crayfern Homes

Reference
16612

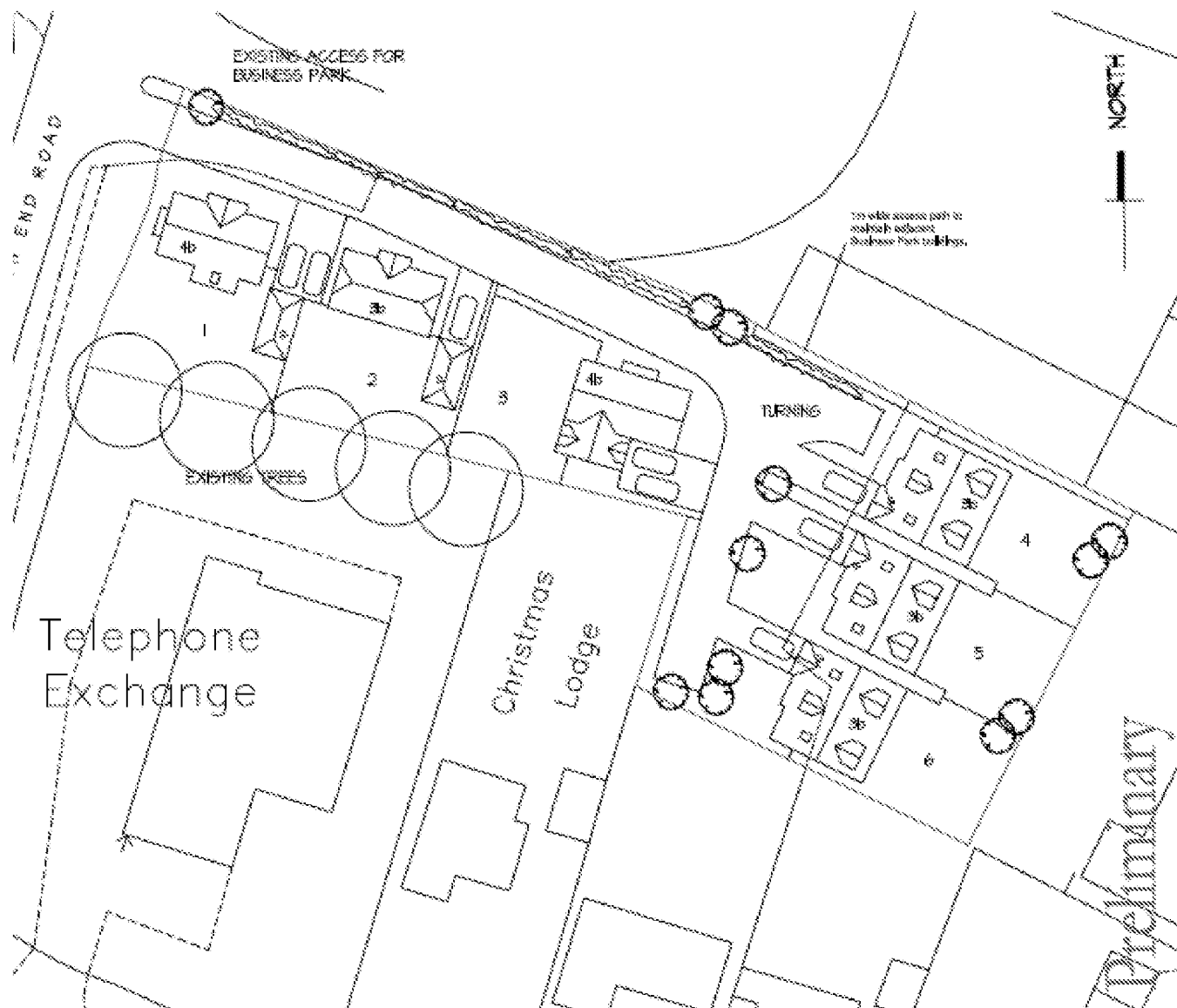


Figure 2 - Proposed Development

Project
Land adjacent to Orchard Business Park, North End Road, Yapton, West Sussex BN18 0GA

Client
Crayfern Homes

Title
Proposed Development

Date
November 2017

Job Number
16612

Appendix A Country Series and Ordnance Survey Maps

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		Administrative County, County Borough or County of City
	Municipal Borough, Urban or Rural District, Burgh or District Council		Borough, Burgh or County Constituency
	Civil Parish		
	Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		Well

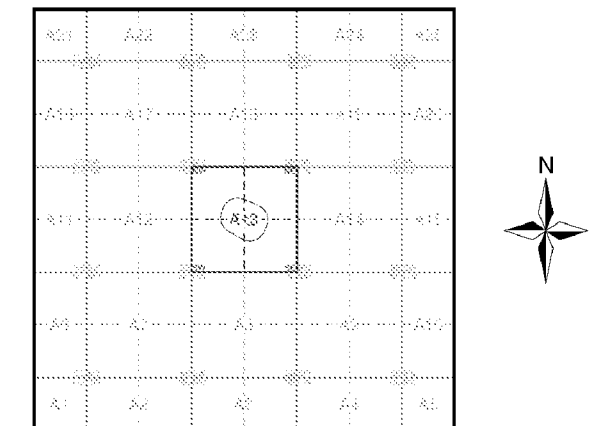
1:10,000 Raster Mapping

	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:10,560	1880	2
Sussex	1:10,560	1899	3
Sussex	1:10,560	1913 - 1914	4
Sussex	1:10,560	1913 - 1914	5
Sussex	1:10,560	1913 - 1914	6
Sussex	1:10,560	1914	7
Historical Aerial Photography	1:10,560	1947	8
Sussex	1:10,560	1951	9
Ordnance Survey Plan	1:10,000	1961 - 1962	10
Ordnance Survey Plan	1:10,000	1967	11
Ordnance Survey Plan	1:10,000	1979	12
Ordnance Survey Plan	1:10,000	1980	13
Ordnance Survey Plan	1:10,000	1992	14
10K Raster Mapping	1:10,000	2000	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2017	17

Historical Map - Slice A

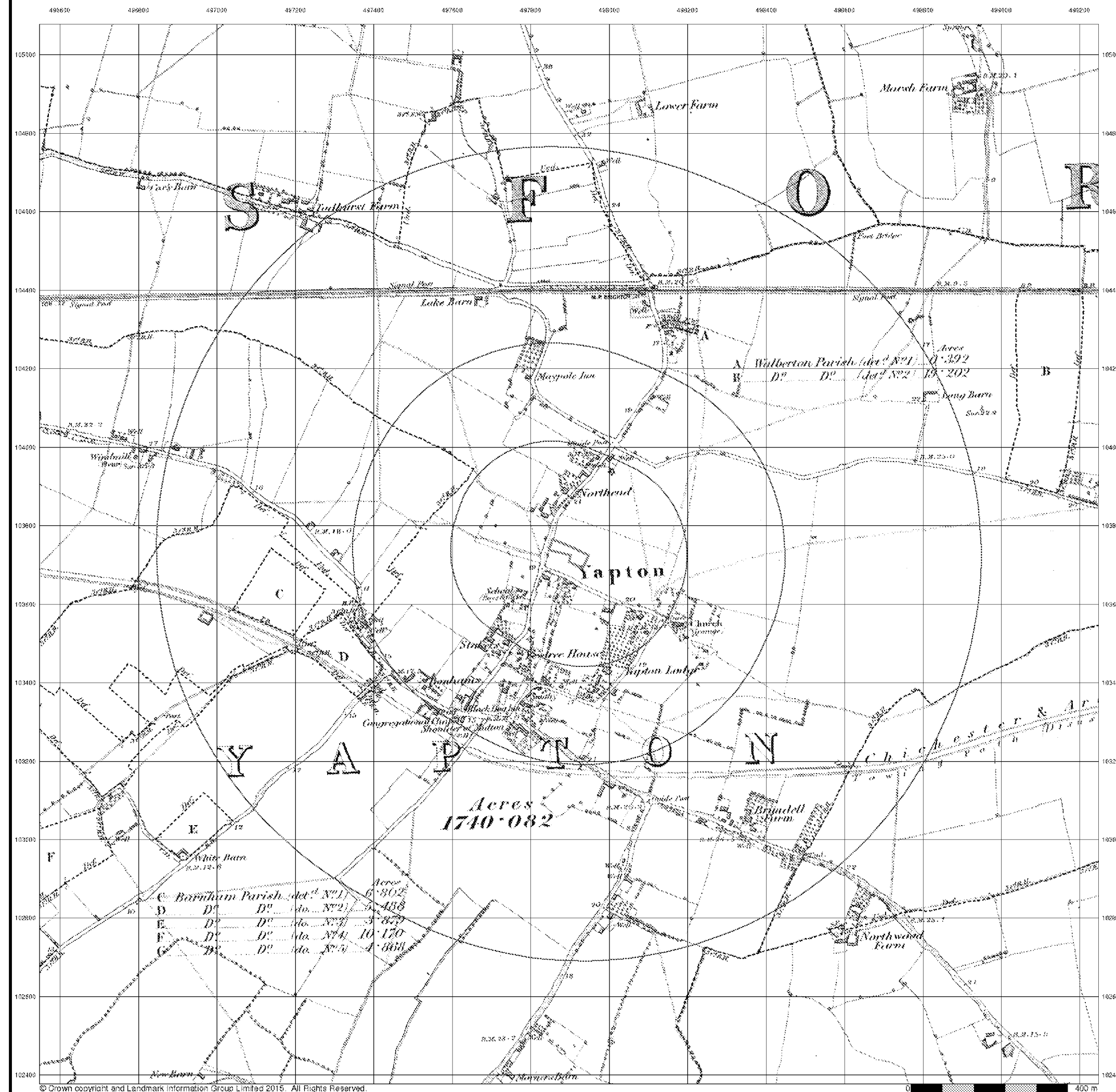


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Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road, Yapton, ARUNDEL, BN18 0GA



soils
LIMITED
Geotechnical & Environmental
Consultants

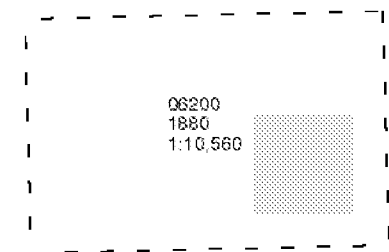
Sussex

Published 1880

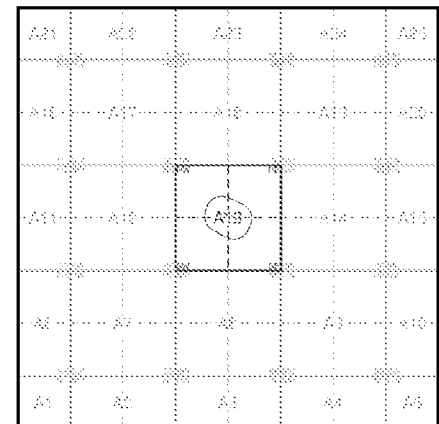
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. 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



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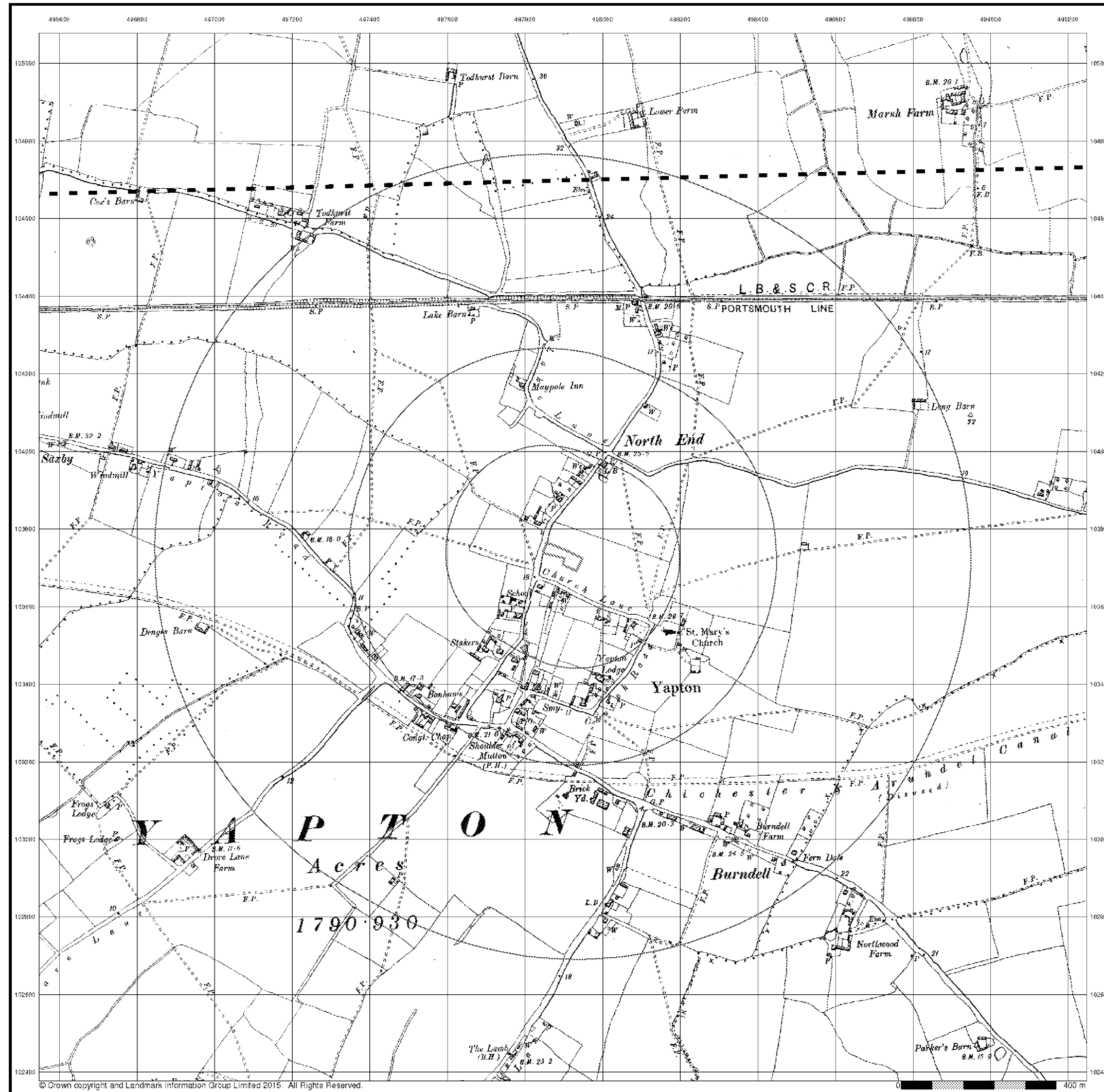
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Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA

Landmark
INFORMATION GROUP

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



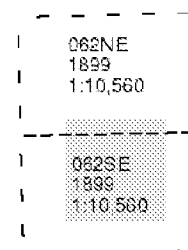
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Published 1899

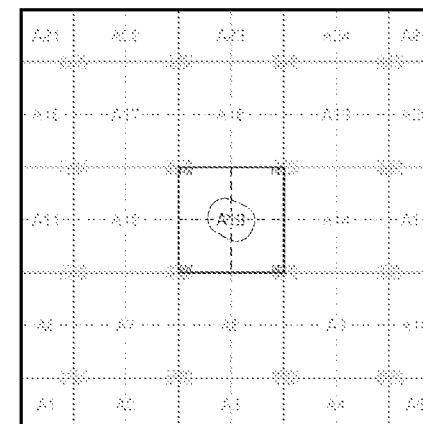
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Map Name(s) and Date(s)



Historical Map - Slice A



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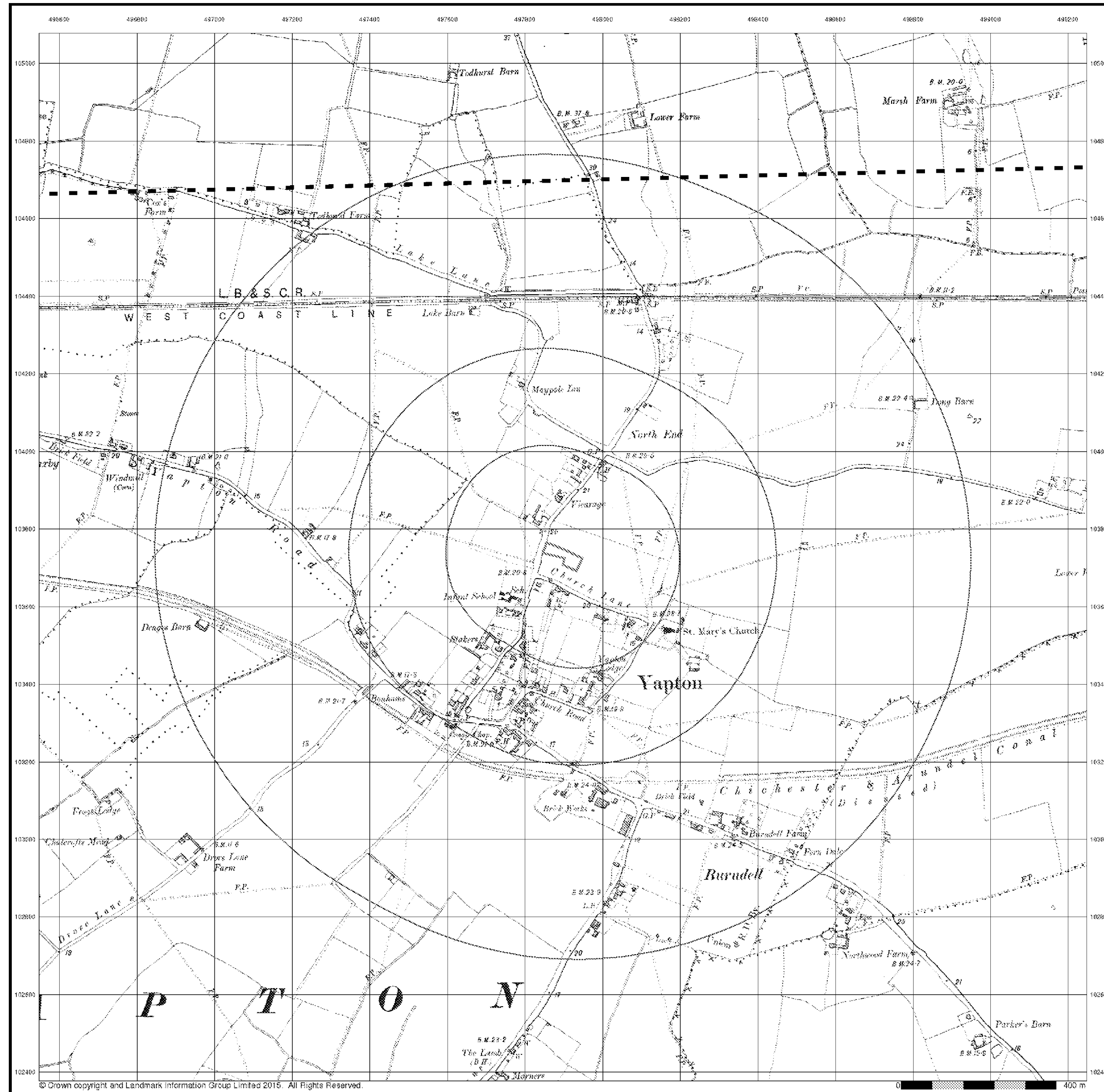
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Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

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Yapton, ARUNDEL, BN18 0GA



Tel: 0844 844 9852
Fax: 0844 844 9951
Web: www.smwirocheck.co.uk



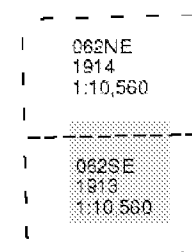
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Published 1913 - 1914

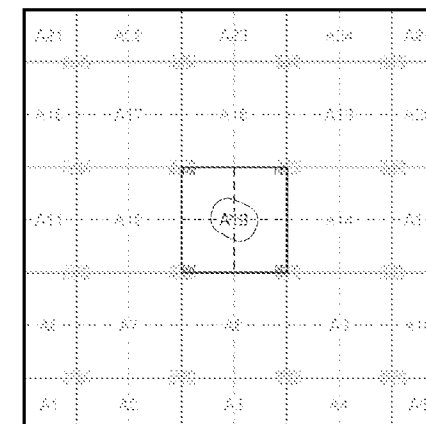
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

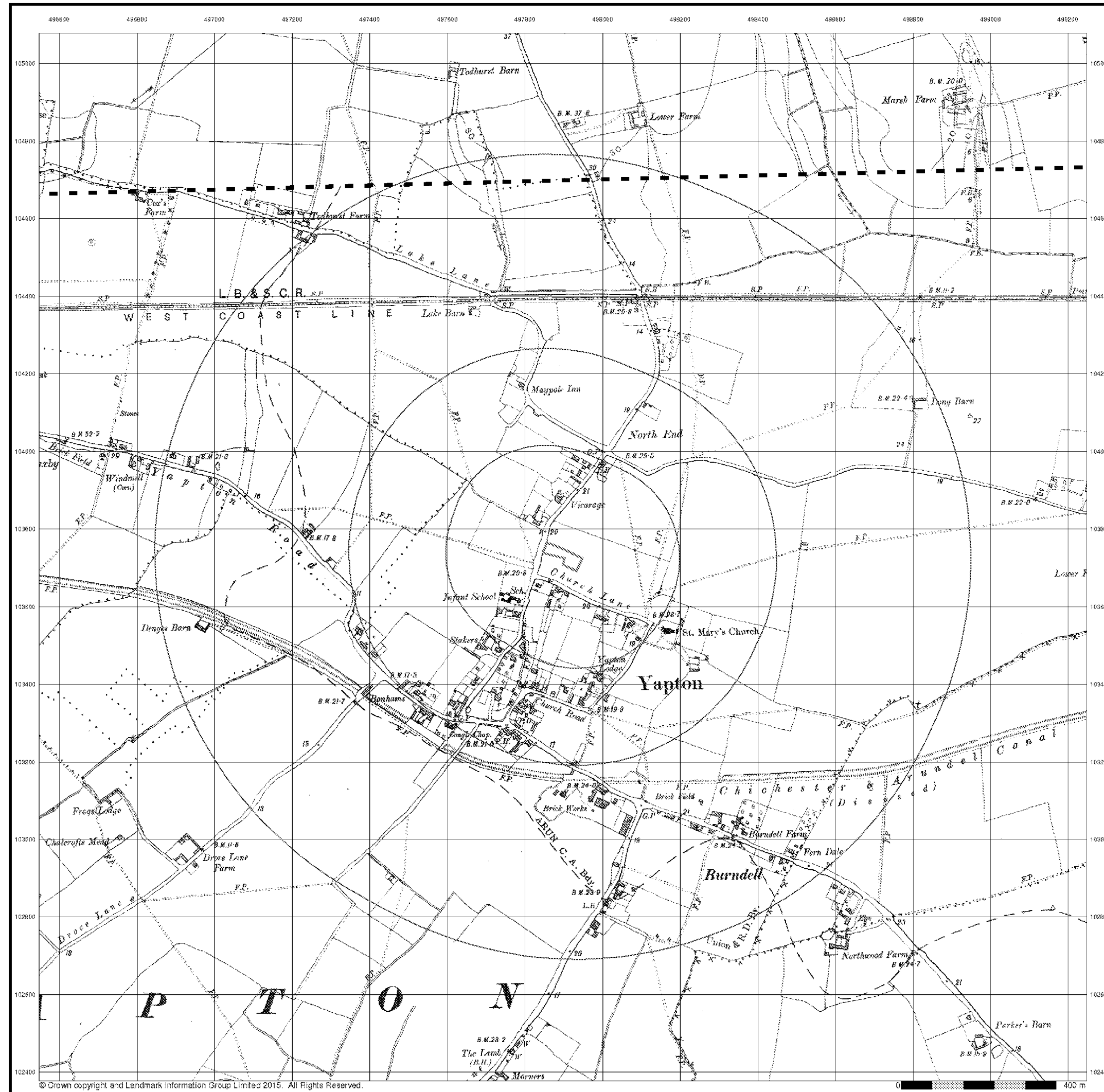
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Site Area (Ha): 0.3
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Tel: 0844 844 9852
Fax: 0844 844 9951
Web: www.enwirocheck.co.uk



Sussex

Published 1913 - 1914

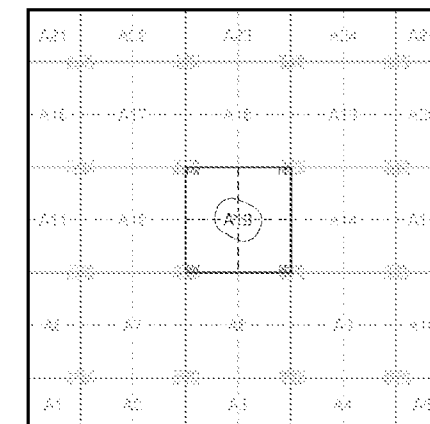
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Map Name(s) and Date(s)

062NE
1914
1:10,560
062SE
1913
1:10,560

Historical Map - Slice A



Order Details

Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA

Sussex

Published 1913 - 1914

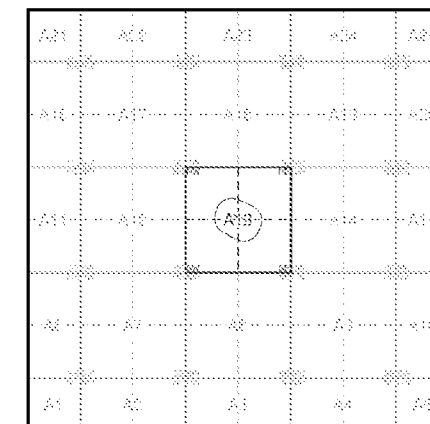
Source map scale - 1:10,560

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)

062NE
1914
1:10,560
062SE
1913
1:10,560

Historical Map - Slice A

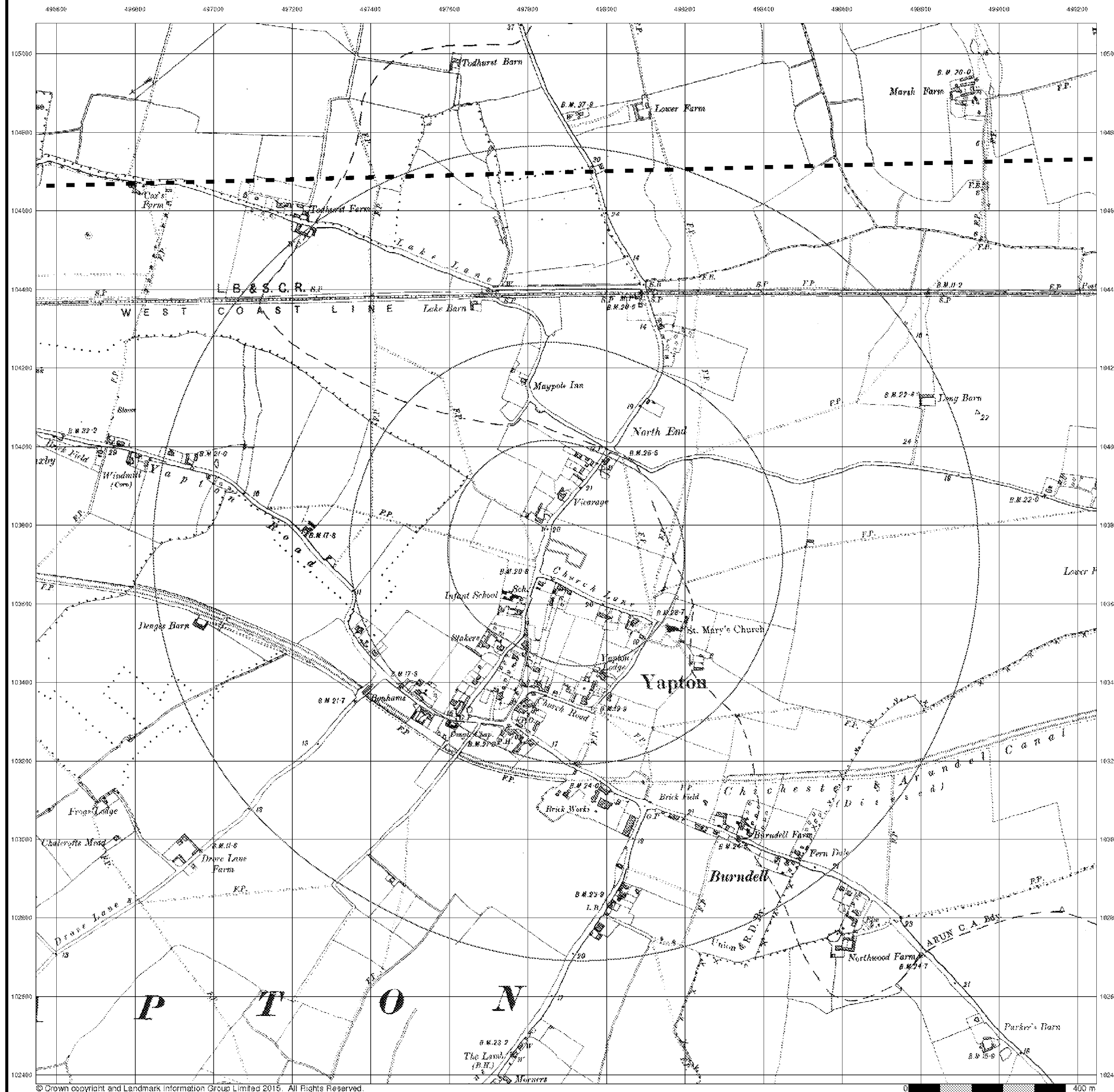


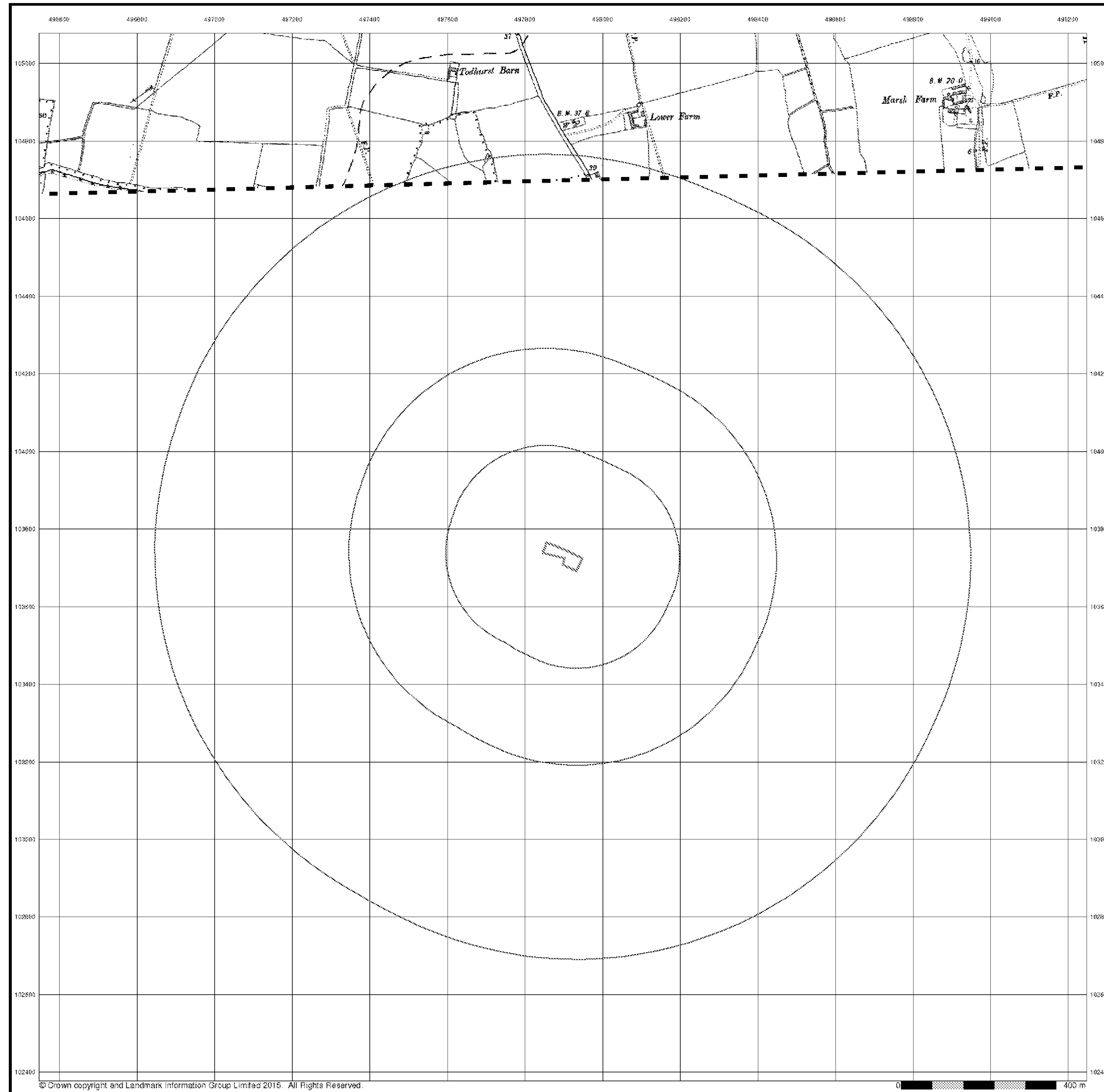
Order Details

Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA





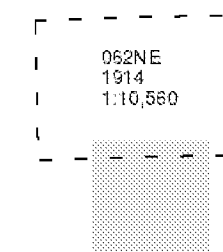
Sussex

Published 1914

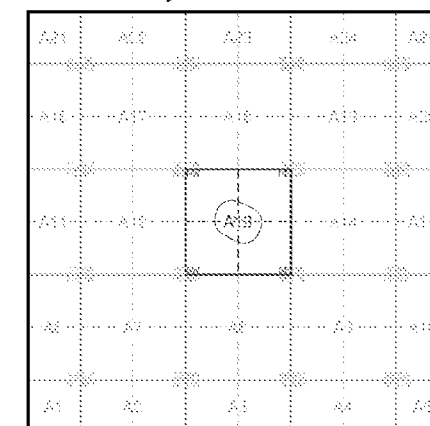
Source map scale - 1:10,560

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: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA



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Historical Aerial Photography

Published 1947

Source map scale - 1:10,560

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

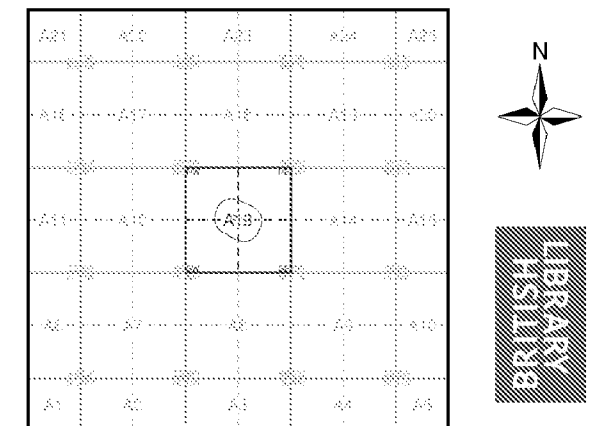
© Landmark Information Group and/or Data Suppliers 2010.

Map Name(s) and Date(s)

SU90NE
1947
1:10,560

SU90SE
1947
1:10,560

Historical Aerial Photography - Slice A



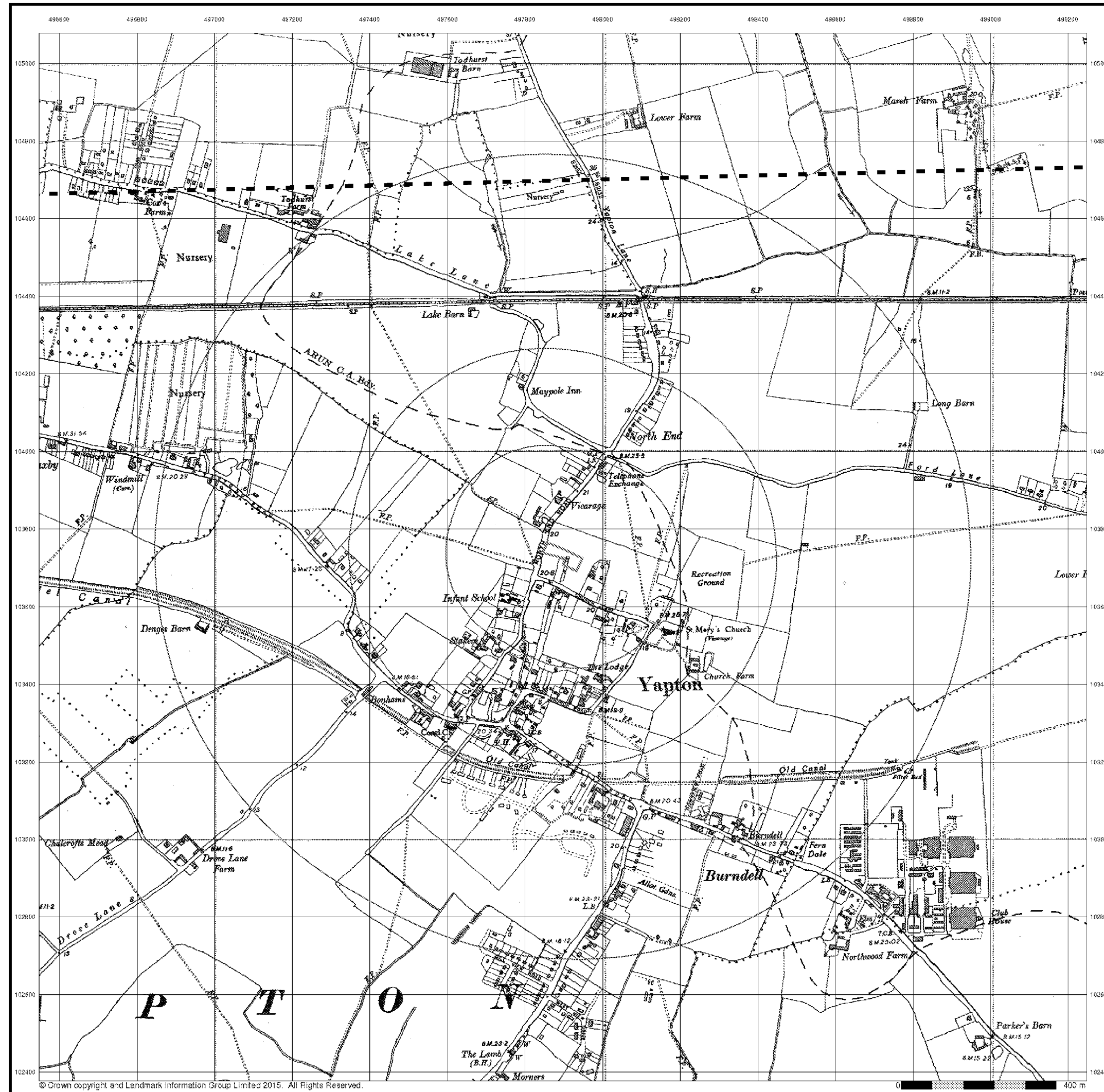
Order Details

Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA





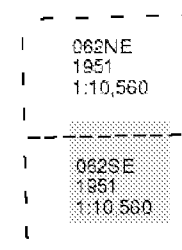
Sussex

Published 1951

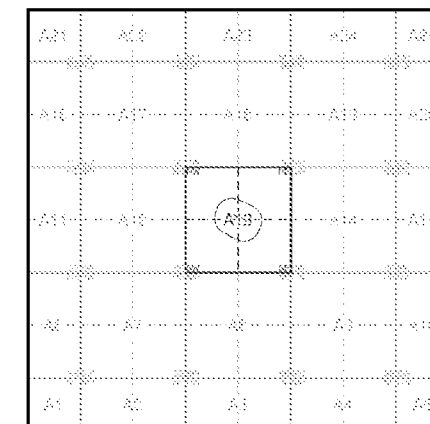
Source map scale - 1:10,560

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

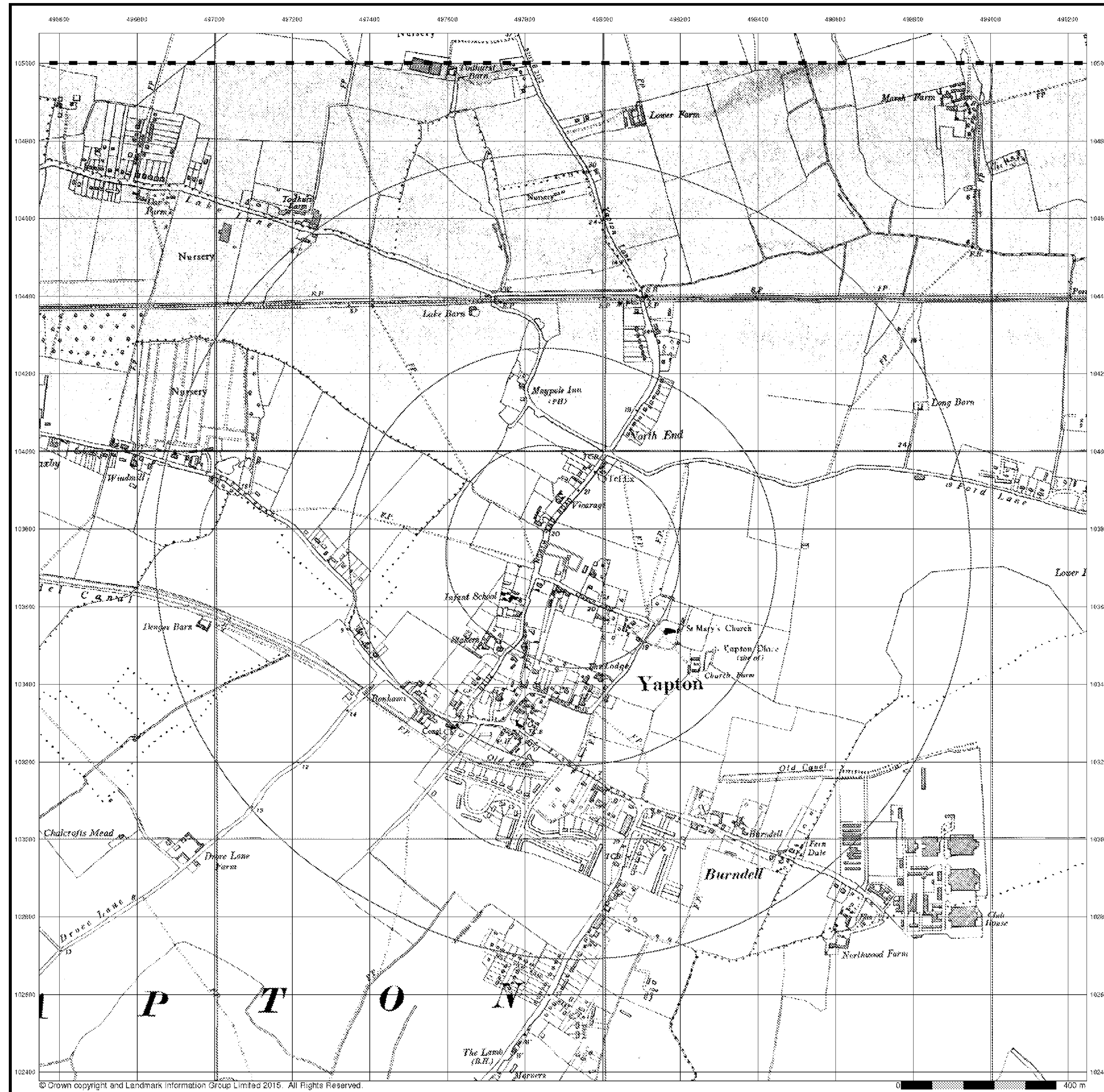
Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road, Yapton, ARUNDEL, BN18 0GA



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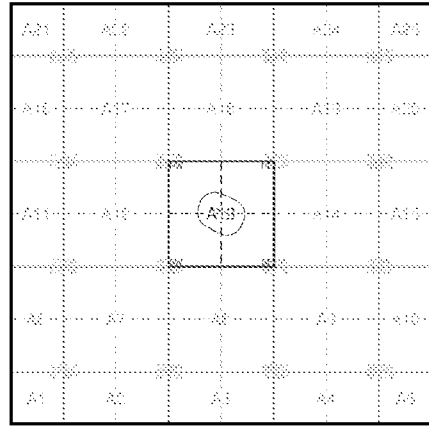
Ordnance Survey Plan
Published 1961 - 1962
Source map scale - 1:10,000

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)

SU90NE
1961
1:10,560
SU90SE
1962
1:10,560

Historical Map - Slice A



Order Details

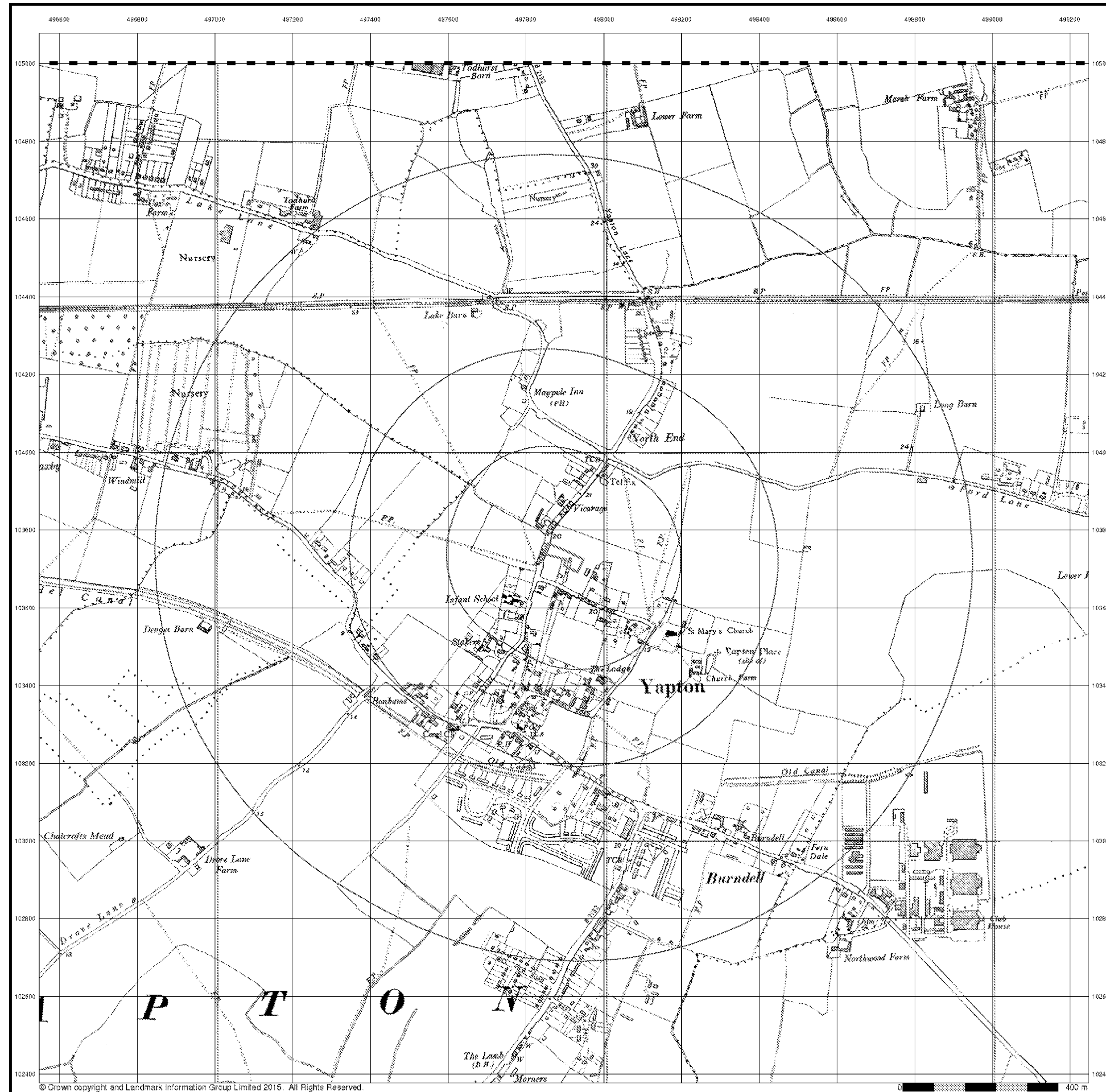
Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

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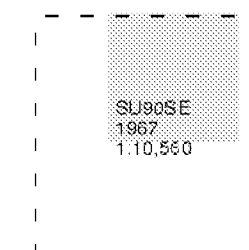
Ordnance Survey Plan

Published 1967

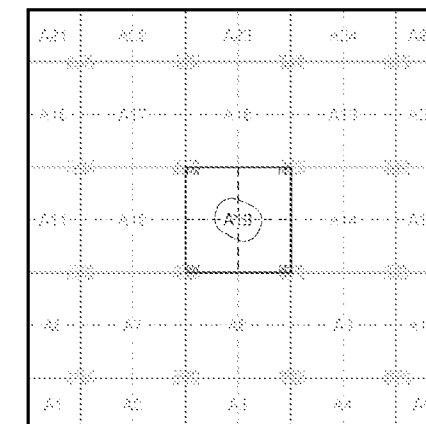
Source map scale - 1:10,000

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: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

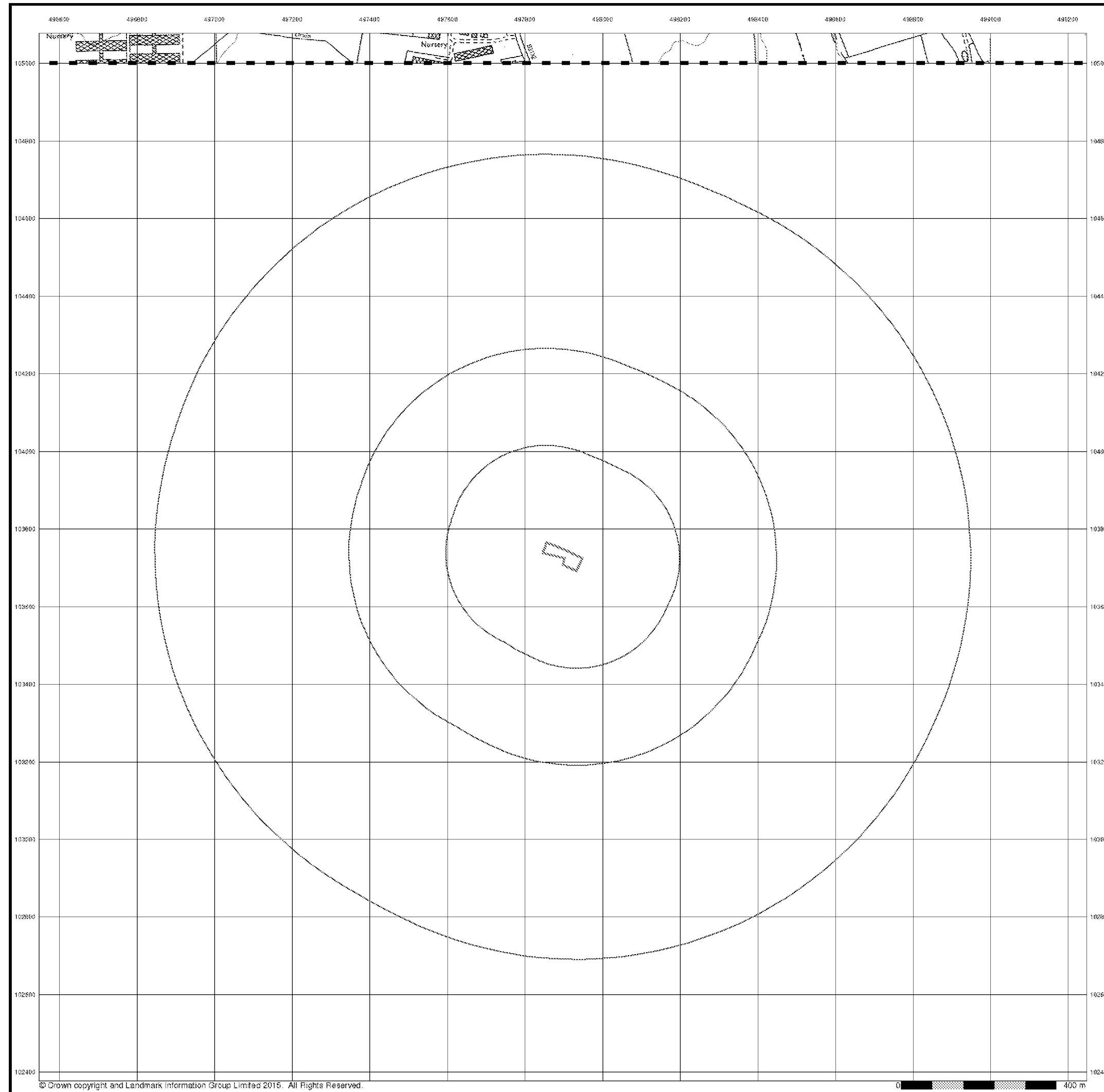
Site Details

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Ordnance Survey Plan

Published 1979

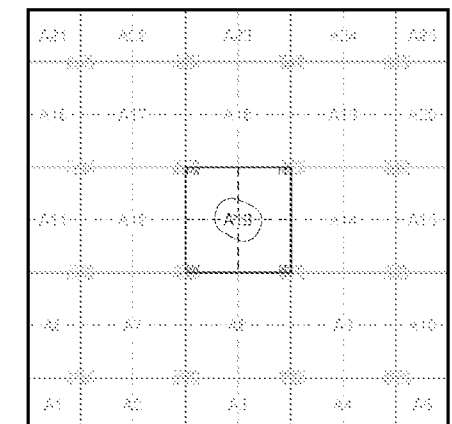
Source map scale - 1:10,000

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)

SU56NE
1979
1:10,000

Historical Map - Slice A



Order Details

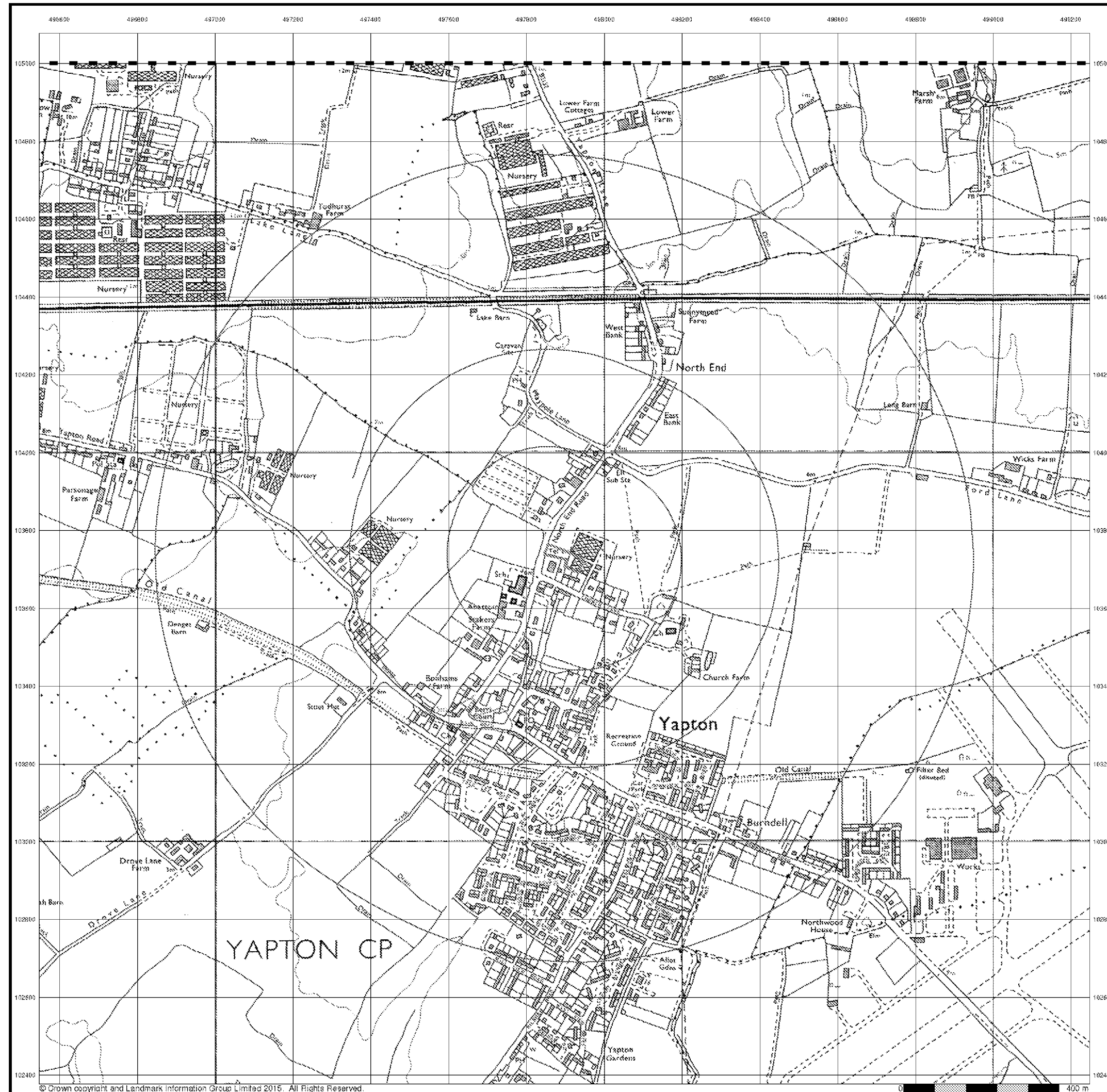
Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

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Web: www.environcheck.co.uk



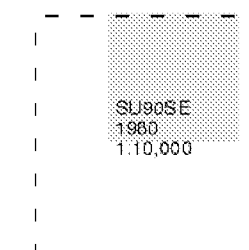
Ordnance Survey Plan

Published 1980

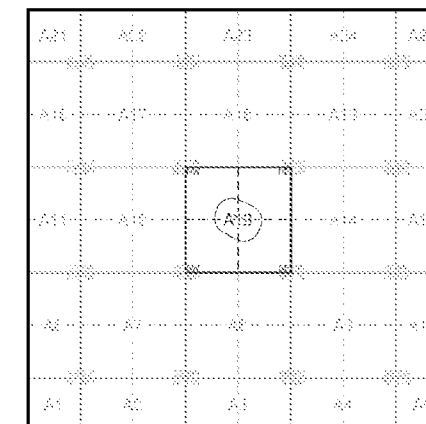
Source map scale - 1:10,000

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: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

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Ordnance Survey Plan

Published 1992

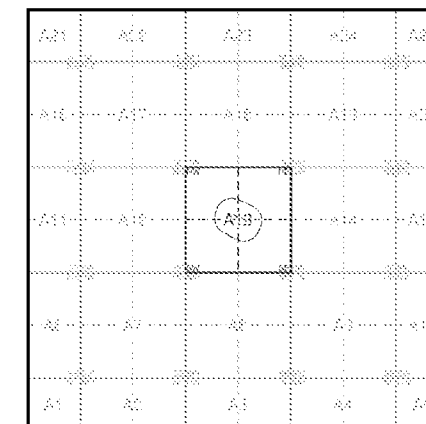
Source map scale - 1:10,000

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)

SU90NE	1992	1:10,000
SU90SE	1992	1:10,000

Historical Map - Slice A

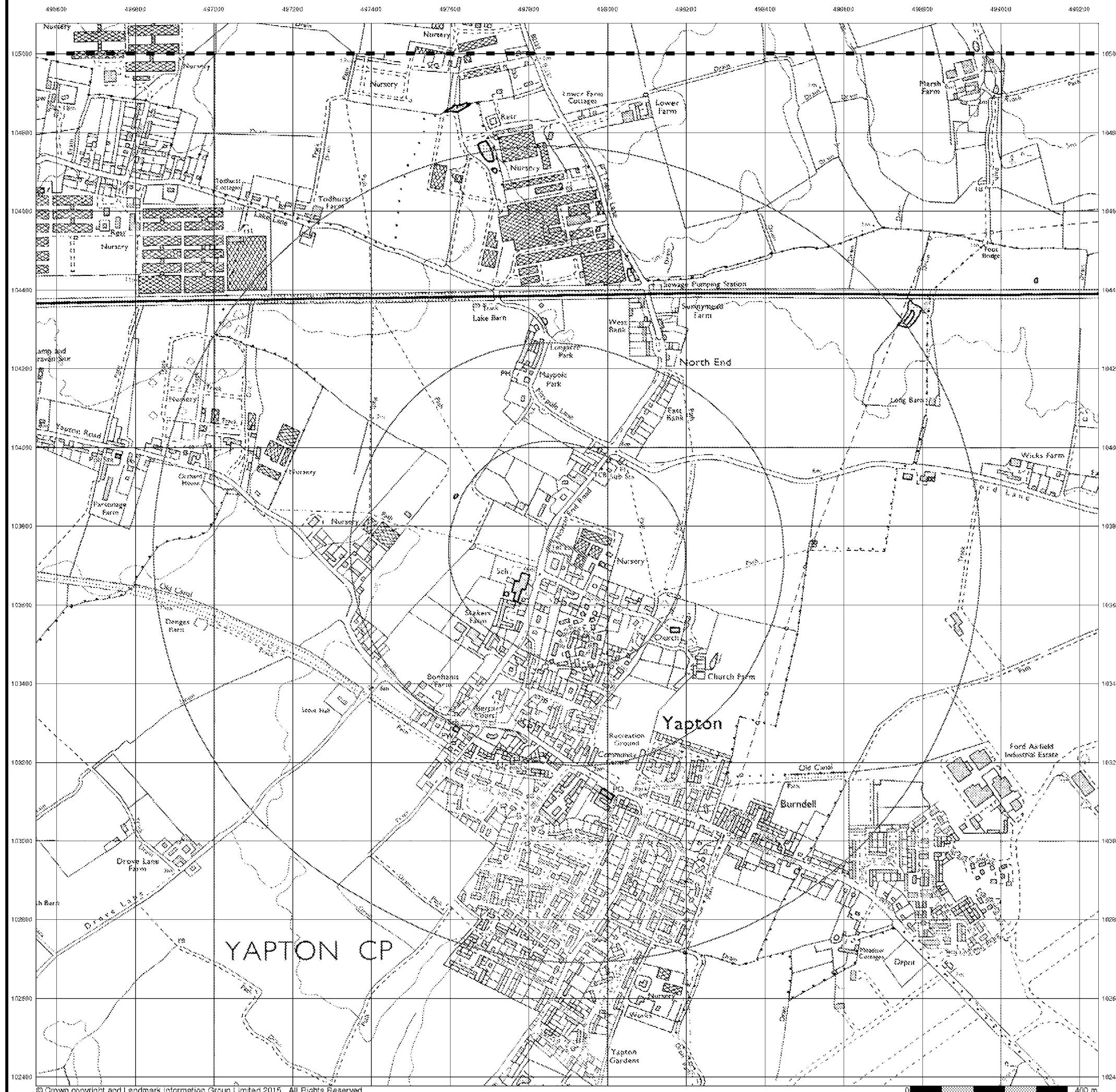


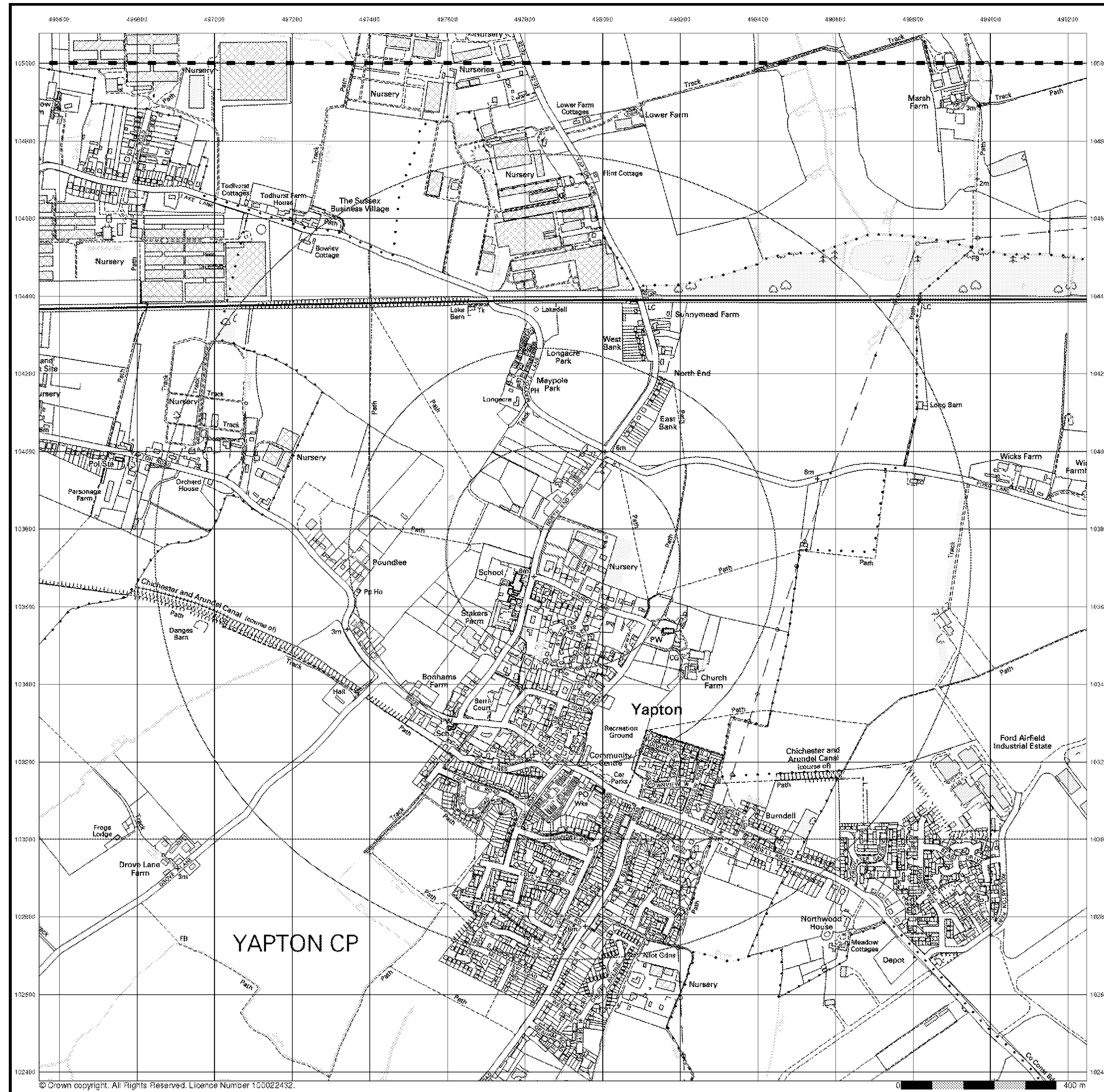
Order Details

Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA





10k Raster Mapping

Published 2000

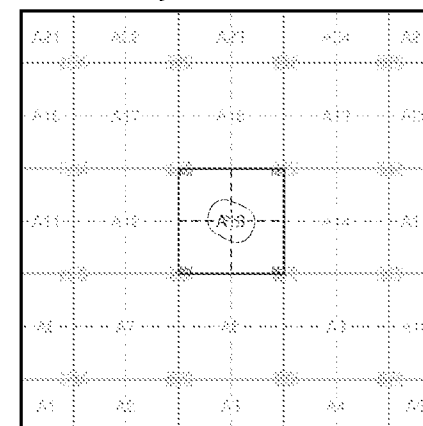
Source map scale - 1:10,000

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.

Map Name(s) and Date(s)

SU90NE	2000	1:10,000
SU90SE	2000	1:10,000

Historical Map - Slice A



Order Details

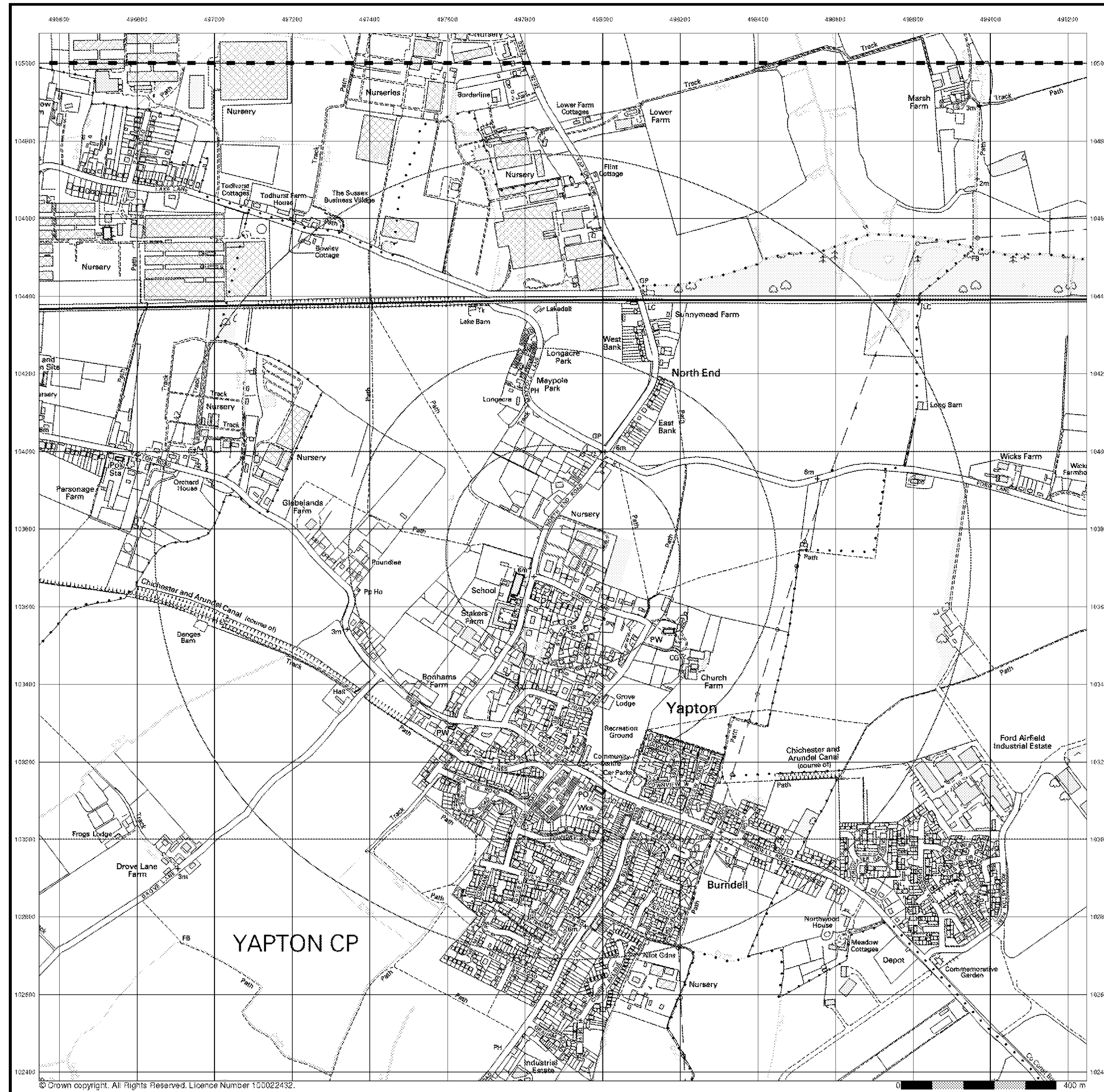
Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
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10k Raster Mapping

Published 2006

Source map scale - 1:10,000

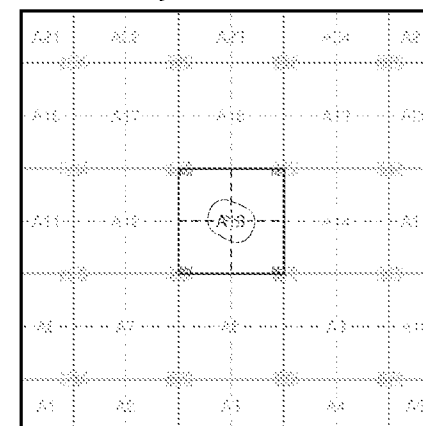
The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks 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.

Map Name(s) and Date(s)

SU90NE
2006
1:10,000

SU90SE
2006
1:10,000

Historical Map - Slice A



Order Details

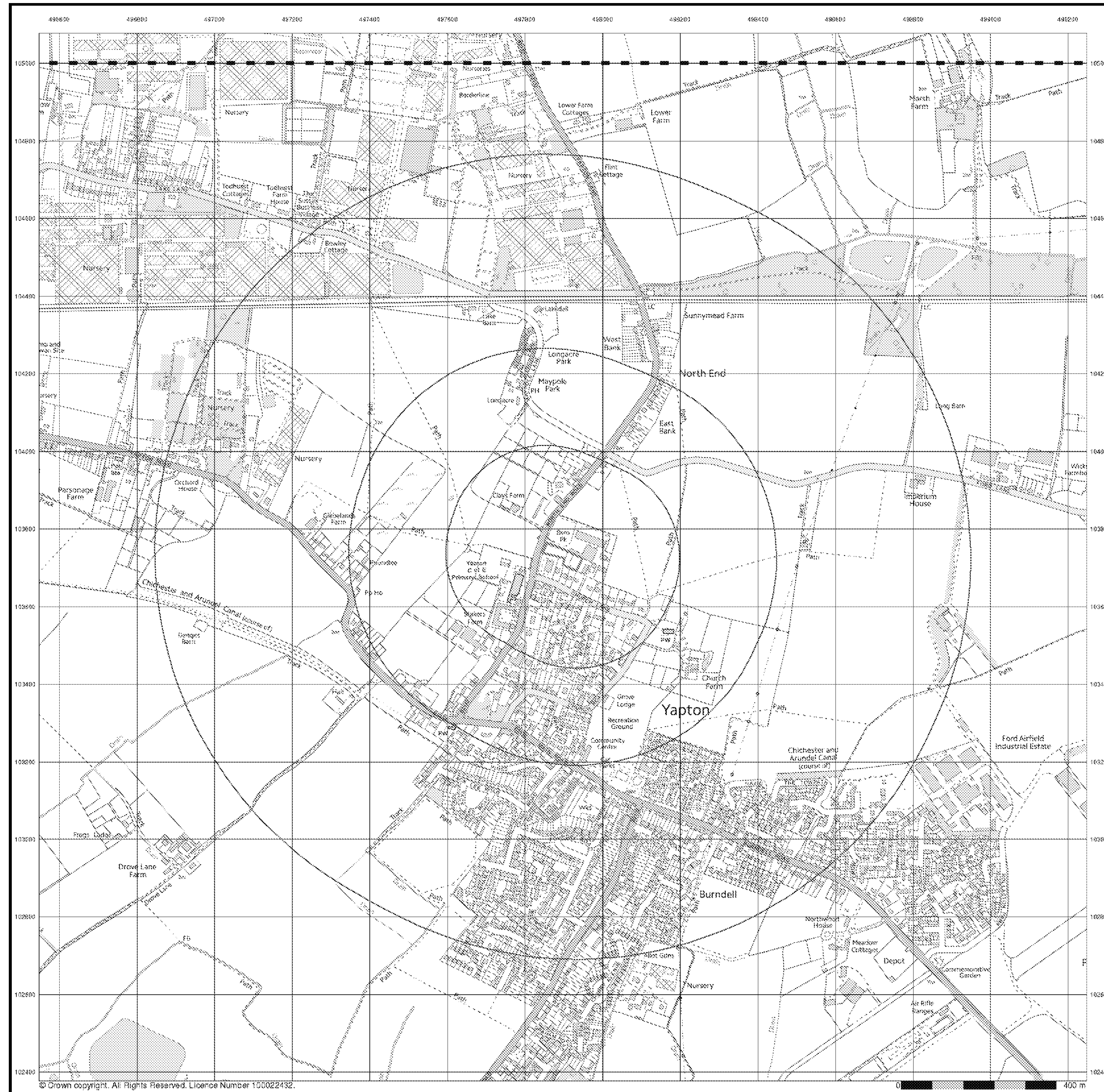
Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

Land adjacent to Orchard Business Park, North End Road,
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VectorMap Local

Published 2017

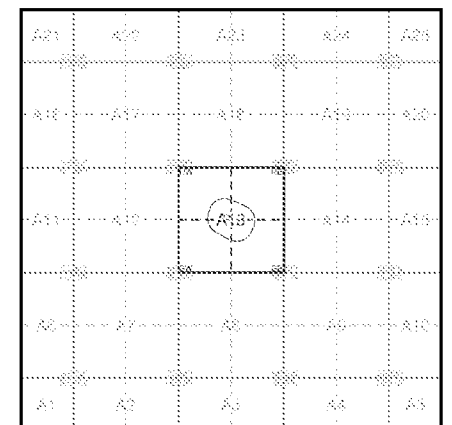
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

SU90NE
2017
Variable
SU90SE
2017
Variable

Historical Map - Slice A



Order Details

Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 1000

Site Details

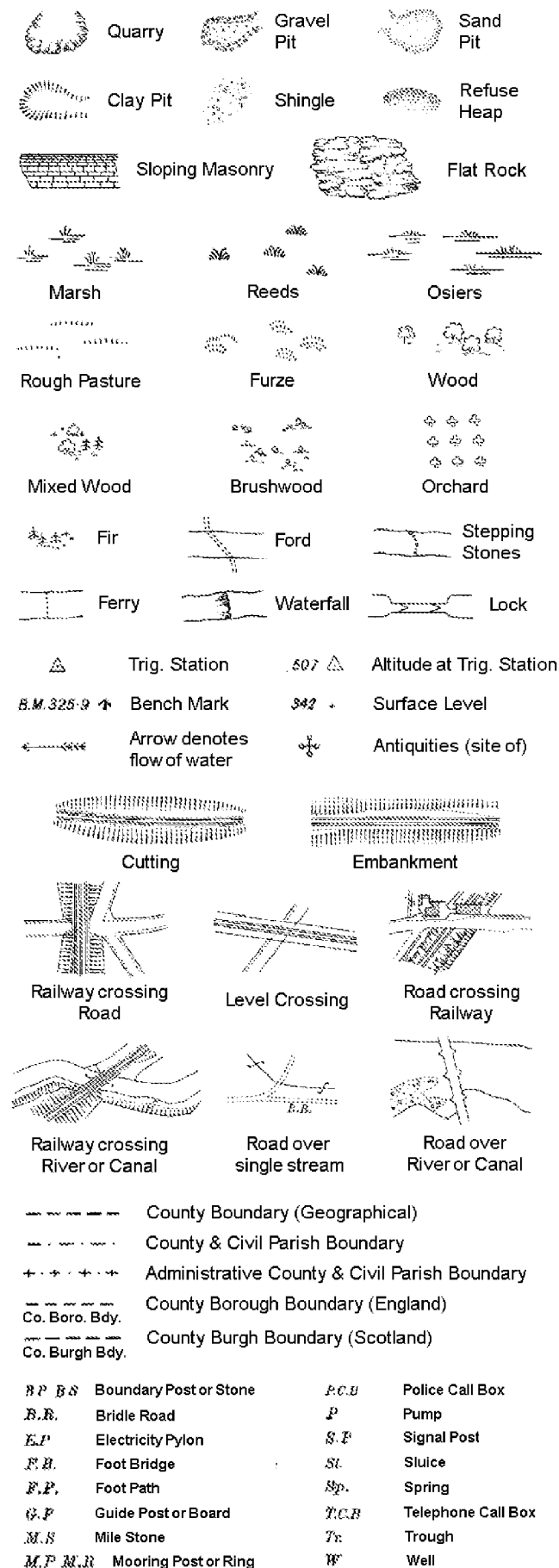
Land adjacent to Orchard Business Park, North End Road,
Yapton, ARUNDEL, BN18 0GA



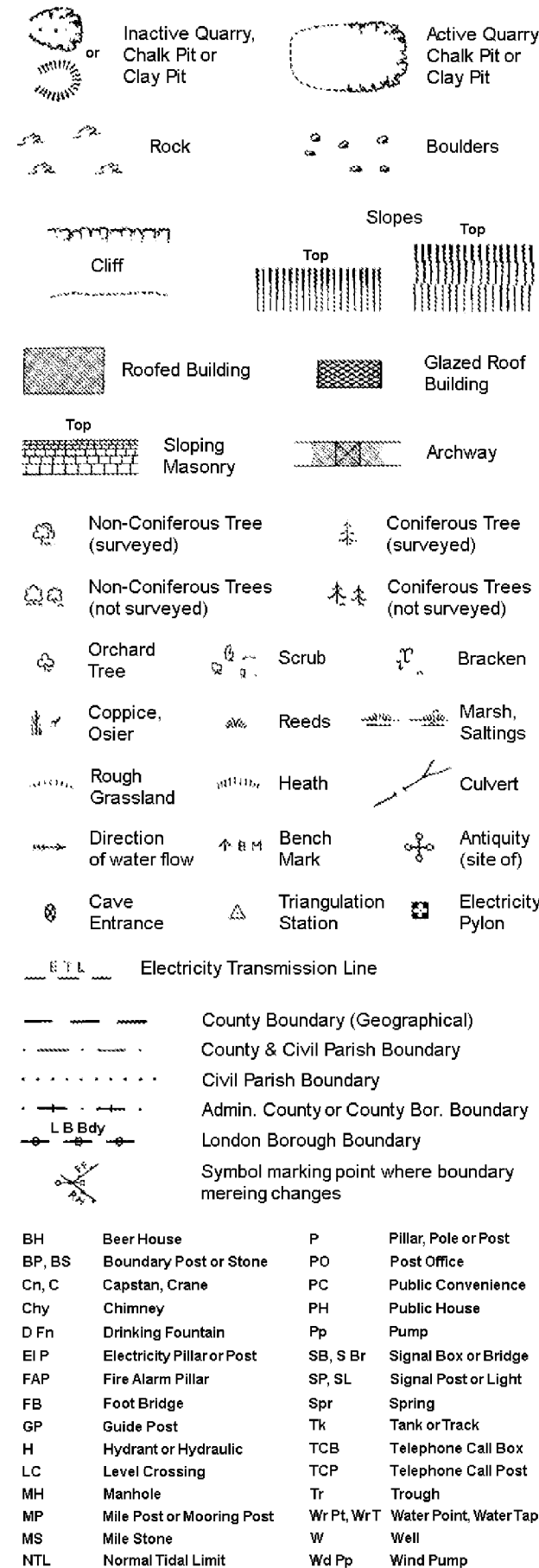
Tel: 0844 844 9852
Fax: 0844 844 9951
Web: www.smwirocheck.co.uk

Historical Mapping Legends

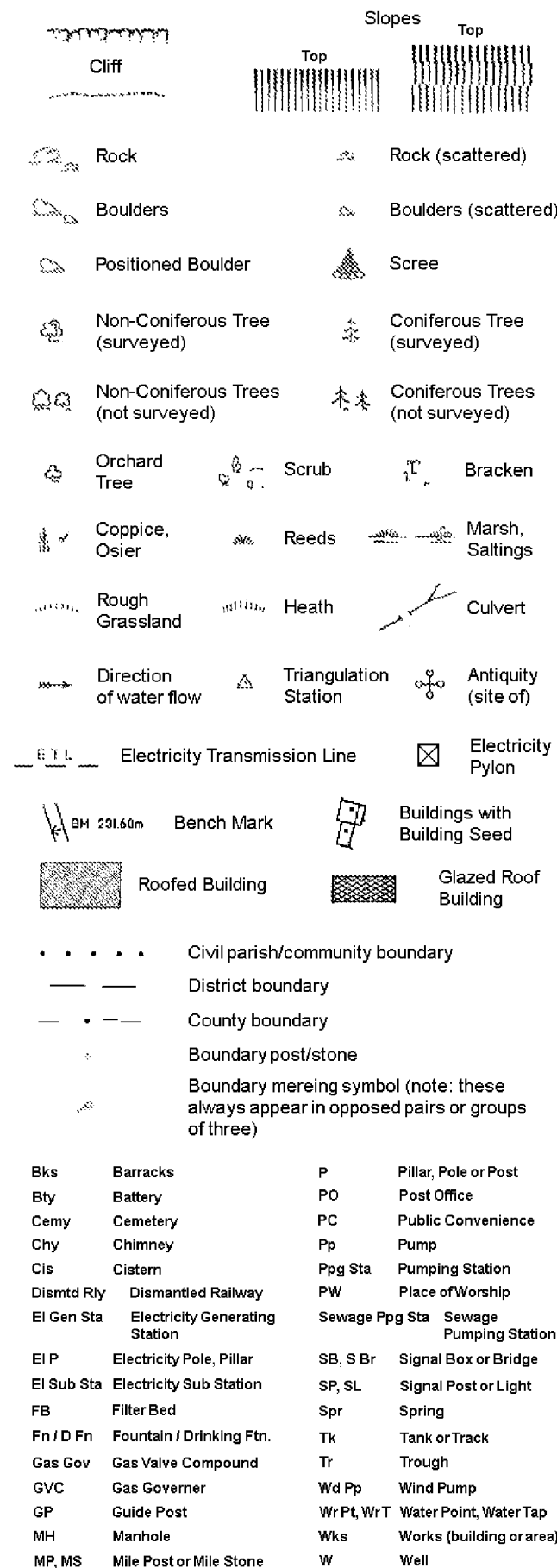
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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



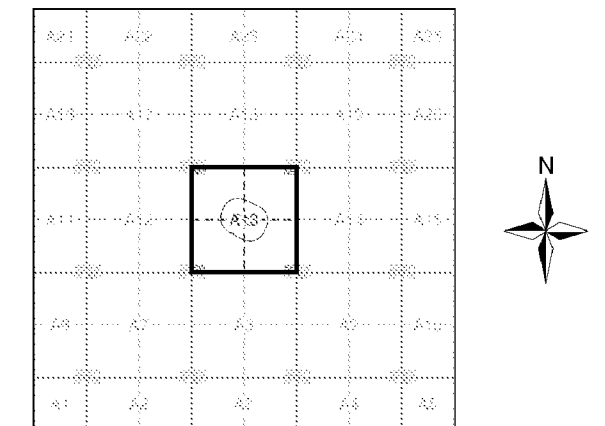
Large-Scale National Grid Data 1:2,500 and 1:1,250



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:2,500	1876 - 1877	2
Sussex	1:2,500	1897	3
Sussex	1:2,500	1912	4
Sussex	1:2,500	1938 - 1939	5
Ordnance Survey Plan	1:2,500	1974 - 1975	6
Additional SIMs	1:2,500	1978 - 1992	7
Additional SIMs	1:2,500	1982 - 1988	8
Additional SIMs	1:2,500	1987 - 1992	9
Ordnance Survey Plan	1:2,500	1989	10
Additional SIMs	1:2,500	1992	11
Large-Scale National Grid Data	1:2,500	1994	12
Large-Scale National Grid Data	1:2,500	1995	13
Historical Aerial Photography	1:2,500	1999	14

Historical Map - Segment A13



Order Details

Order Number: 144926118_1_1
Customer Ref: 16612
National Grid Reference: 497900, 103730
Slice: A
Site Area (Ha): 0.3
Search Buffer (m): 100

Site Details

Land adjacent to Orchard Business Park, North End Road, Yapton, ARUNDEL, BN18 0GA



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