



Phase I Desk Study

at

**Land North of Mayflower Way, Angmering, Littlehampton,
West Sussex, BN16 4AY**

for

Peter Taylor & Crayfern Homes

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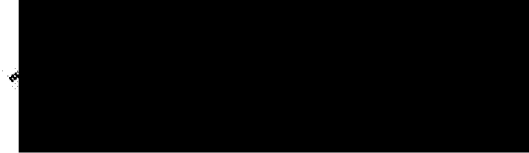
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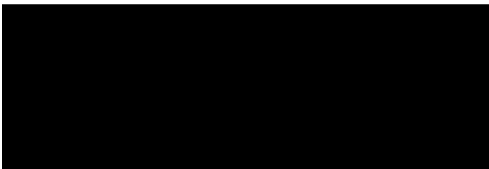
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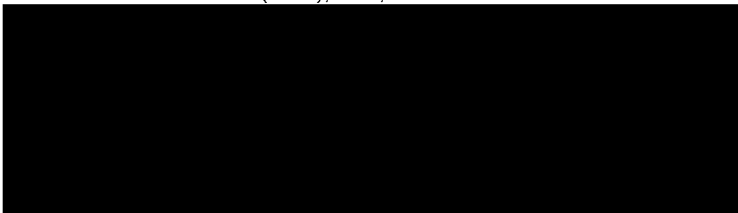
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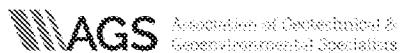
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Commission

Soils Limited was commissioned by Peter Taylor & Crayfern Homes to undertake a Phase I Desk Study on Land North of Mayflower Way, Angmering, Littlehampton, West Sussex, BN16 4AY. The scope of the investigation was outlined in the Soils Limited quotation reference Q17034 dated 9th November 2016.

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.

Contents

Section 1	Introduction.....	I
1.1	Objective.....	1
1.2	Location.....	1
1.3	Proposed Development.....	1
1.4	Legislation and Liability.....	1
1.5	Limitations and Disclaimers.....	2
Section 2	Site Conditions.....	4
2.1	Site Walkover.....	4
2.2	Site Drainage.....	4
2.3	Site Photographs.....	4
Section 3	Geology, Hydrogeology, Hydrology and Radon.....	5
3.1	Anticipated Geology.....	5
3.1.1	River Terrace Deposits.....	5
3.1.2	Lewes Nodular Chalk Fm.....	5
3.2	Hydrogeology.....	5
3.3	Hydrology.....	6
3.4	Radon Gas.....	6
Section 4	Site History.....	7
4.1	Historic Map Study.....	7
Section 5	Environmental Records and Consultation.....	8
5.1	Dataset Information.....	8
5.2	Site Sensitivity Maps.....	9
5.3	Regulatory Enquires.....	9
5.4	Soil Geochemistry.....	9
Section 6	Discussion and Conclusions.....	11
6.1	General.....	11
Section 7	Preliminary Conceptual Site Model.....	13
7.1	General.....	13
7.2	Sources of Contamination.....	13
7.2.1	Onsite Potential Contamination Sources.....	13
7.2.2	Offsite Potential Contamination Sources.....	13

7.3	Potential Pathways	15
7.4	Potential Receptors.....	17
7.5	Preliminary Risk Assessment.....	17
7.6	Potential Contamination.....	19
7.7	Preliminary Conceptual Site Model	19
Section 8	Recommendations	21
8.1	General.....	21
8.2	Proposed Further Site Works.....	21
8.3	Discovery Strategy.....	21

List of Figures

Figure 1 - Site Location Plan.....	23
Figure 2 - Proposed Development	24

List of Tables

Table 2.1 Site Walkover Record (On-site).....	4
Table 2.2 Site Walkover Record (Off-Site)	4
Table 3.1 Hydrogeological Assessment	5
Table 3.2 Hydrogeological Assessment	6
Table 4.1 Potential Sources of Pollution Indicated from Historic Maps.....	7
Table 4.2 Historic Development of the Site	7
Table 5.1 Environmental Significance of Data.....	8
Table 5.2 Contemporary Trade Directory	8
Table 5.3 Geological Hazards	9
Table 5.4 Soil Geochemistry	10
Table 6.1 Summary of Potential Contamination Sources	12
Table 7.1 Onsite Potential Contamination Sources	13
Table 7.2 Offsite Potential Contamination Sources	13
Table 7.3 Potential Soil Migration Pathways	15
Table 7.4 Site Specific Sources and Pathways	16
Table 7.5 Off-site Potential Pathways	17
Table 7.6 Potential Receptors	17
Table 7.7 Risk Assessment.....	18
Table 7.8 Potential Contaminants or Properties	19
Table 7.9 Preliminary Conceptual Site Model and Risk Assessment Methodology	20

Table 8.1 Required Further Environmental Investigation	21
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List of Appendices

Appendix A Country Series and Ordnance Survey Maps

Appendix B Landmark Envirocheck Report

Appendix C Site Sensitivity Maps

Appendix D Site Photographs

Appendix E Risk Assessment Criteria

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 North of Mayflower Way, Angmering, Littlehampton, West Sussex, BN16 4AY and had an O.S Land Ranger Grid Reference of TQ 072 033. The site location map is presented in Figure 1 and the full Site Walkover discussed in Section 2.1 of this report.

I.3 Proposed Development

The proposed development comprised erection of 24No. residential units including two, three and four-bedroom detached, semi-detached and terraced houses. The development was to include areas of hard landscaping such as access roads, pavements and driveways, and areas of soft landscaping including communal open space and private gardens.

In compiling this report reliance was placed on drawing number 1701/2.10/P8, 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 North of Mayflower Way, Angmering, Littlehampton, West Sussex, BN16 4AY and was prepared for the benefit of Peter Taylor & 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 Contact 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 2016, 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	Builders Yard
	Structures	None
	Site topography	Slight undulating. Very gently dipping SW
	Site covering	Waste Ground
	Vegetation	Mature trees on south and west border.
	Potential	Stockpiled soil debris and concrete debris
	Contamination Sources	
	Odour	None noted
	Drainage	None observed – assumed self-draining

Table 2.2 Site Walkover Record (Off-Site)

Off-Site	Use of Land	Nursery and Industrial to north, Industrial/commercial to east, Agricultural and residential to south, Recreational to west.
	Area topography	Flat – slight dip down to south
	Vegetation	Some mature trees at borders. Potential Japanese Knotweed off east boundary.
	Potential	Tank noted to have been located circa 10m from east site boundary – now removed.
	Contamination Sources	Yellow Penfold 2000ltr diesel tank located off east site boundary.

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 of the Lewes Nodular Chalk Formation with the superficial deposits of 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 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 **Lewes Nodular Chalk Fm.**

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.

This formation can exhibit occasional erosional features such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits. The features sometimes manifest themselves at the surface as shallow circular depressions and solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. This 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 Aquifers	Superficial	Secondary A Aquifer ¹	✓
	Bedrock	Principal Aquifer ²	✓

Hydrogeological Data		Comment	Risk
Groundwater Vulnerability		Major Aquifer (HU) ³	✓
Source Protection Zones (SPZ)		None	
Abstraction	Potable	Potable water supply – 1797m/SW	
	Non-potable	Agriculture: Horticultural Watering – 270m/NE	
Surface Water Features		Offline drainage feature 33m/W	
Flood Risk from Rivers or Seas		None	
Flood Risk from Surface Water		None	

Note: ✓ = Likely. ¹ Secondary A Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base water flow to rivers. These are generally aquifers formerly classified as minor aquifers.

² Principle 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 high leaching potential – soils which can possibly transmit a wide range of pollutants

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 ~11.0 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	S	In-line with local topography
Groundwater	S	In-line with local topography

3.4 Radon Gas

The site was located in an **Intermediate probability radon area**, where 1 to 3% of homes are estimated to be at or above the action level.

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
Nursery	Onsite	0	1968	1990
Nursery	W	14	1943	1989
Pond	SE	24	1950	1999
Nursery	N	44	1968	2016
Tank	W	52	1943	1999
Tank	NW	66	1968	1974
Nursery	NW	69	1968	1999
Sub Station	E	131	1959	1990
Nursery	S	196	1943	1962
Nursery	NE	220	1943	2016

Table 4.2 Historic Development of the Site

Site Development	Date Range	
	From	To
Open land	1876	1968
Nursery	1968	1990
Derelict site/Builders yard	1990	2016

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	1000
Discharge Consents	E	33,175,196,220	250
Integrated Pollution Prevention and Control	None	None	1000
Local Authority Pollution Prevention and Controls	N	54	250
Local Authority Pollution Prevention and Control Enforcements	None	None	1000
Nearest Surface Water Feature	W	33	250
Pollution Incidents to Controlled Waters (Significant Incidents only)	None	None	250
Prosecutions Relating to Authorized Processes	"	"	1000
Registered Radioactive Substances	"	"	1000
Substantiated Pollution Incident Register	"	"	1000
Nearest potable abstraction point	"	"	1000
Nearest non-potable abstraction point	"	"	250
Water Industry Act Referrals	"	"	1000
Source Protection Zones	"	"	1000
Extreme Flooding from Rivers or Sea without defences	"	"	1000
Flooding from rivers or sea without defences	"	"	1000
Areas benefiting from flood defences	"	"	1000
Flood Water Storage Areas	"	"	1000
Flood defences	"	"	1000
BGS Recorded Landfill Sites	"	"	1000
Historical Landfill Sites	"	"	1000
Licensed Waste Management Facilities	"	"	500
Local Authority Recorded Landfill Sites	"	"	1000
Registered Landfill Sites	"	"	1000
Registered Waste Transfer Sites	"	"	500
Registered Waste Treatment or Disposal Sites	"	"	1000
Control of Major Accident Hazards Sites (COMAH)	"	"	1000
Notification of Installations Handling Hazardous Substances	"	"	250
Planning Hazardous Substance Consents	"	"	1000

Table 5.2 Contemporary Trade Directory

Contemporary Trade Directory within 250m ¹	Direction	Distance (m)	Status
Town & Country Paving Ltd – Concrete Products	NE	50	Inactive
Roundstone Van Centre – Commercial Vehicle Dealers	E	69	Inactive
Kayjay Motors – Garage Services	E	88	Inactive

<i>Contemporary Trade Directory within 250m¹</i>	<i>Direction</i>	<i>Distance (m)</i>	<i>Status</i>
Highdown Coach Works – Garage Services	NE	82	Inactive
N S Marine – Marine Engineering Equipment Manufacturers	NE	82	Inactive
Valley Motors – Garage Services	N	147	Inactive
Knights Motor Services Ltd – Garage Services	N	147	Inactive

Note: ¹ Those likely to impact the underlying soil and/or groundwater, date not supplied. Most of these activities either (i) operate according to environmental guidance (i.e. environmental permitting or IPPC) therefore may not be considered as source of contamination, (ii) are remote from the site or (iii) are not located up gradient of the site therefore have not direct impact on identified receptors.

Table 5.3 Geological Hazards

<i>Source</i>	<i>Nearest Distance from Site/Type</i>
Non Coal Mining Affected Areas	Rare
Mining Instability	None
Natural and Mining Cavities	None
Potential For Collapsible Ground Stability Hazards	Onsite/Low
Potential For Compressible Ground Stability Hazards	None
Potential For Ground Dissolution Stability Hazards	Onsite/Very Low
Potential For Landslide Ground Stability Hazards	Onsite/Very Low
Potential For Running Sand Ground Stability Hazards	Onsite/Low
Potential For Shrinking or Swelling Ground Stability Hazards	Onsite/Low
Shallow Mining Hazards	None

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 the Local Planning Authority (LPA) had been contacted and asked to provide any information on potential risks pertaining the site. The LPA held no records suggesting petroleum was stored at or in the vicinity of the site.

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	15-25	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 change, 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 map showed the site to be situated on the Lewes Nodular Chalk Formation with the superficial deposits of the River Terrace Deposits overlying.
2. The Environment Agency Hydrogeological Maps showed that the bedrock Hythe Formation had a Principal Aquifer Designation and the superficial River Terrace Deposits had a Secondary A Aquifer Designation. The overall groundwater vulnerability was soils of high leaching potential (HU), soils which can possibly transmit a wide range of pollutants.
3. Surface water flow was expected to flow to the south in line with the local topography. Groundwater was anticipated to flow down to the south in line with the wider topography.
4. Environment Agency records showed that the site was not at risk of flooding from rivers or seas.
5. The Local Planning Authority held no records showing petroleum was stored at or in the near vicinity of the site.
6. The potential presence of Japanese knotweed or presence of other invasive species was noted off the east site boundary, at the time of site reconnaissance. If present, this may have significant impact on the construction of new dwellings and specialist advice should be sought.
7. Any suspicious ground conditions encountered during groundworks must be reported to a competent person for further inspection.
8. Site was not situated within an area where risk assessment against the ingress of radon was required. Therefore, Radon protection measures **will not be required** within the proposed new development.
9. 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	Historical Nursery	Onsite	0	1968	1990	HM
	Builders Yard			1990	2016	HM, SW
	Stockpiled Soil Debris			-	2016	SW
	Discarded Tank (removed)	E	10	-	2016	SW
	2000Ltr Diesel Storage Tank	E	10	-	2016	SW
	Historical Nursery	W	14	1943	1989	HM
	Pond	E	24	1950	1999	HM
	Nursery	N	44	1968	2016	HM
	Town & Country Paving Ltd – Concrete Products	NE	50	-	-	DS
	Tank	W	52	1943	1999	HM
	Tank	NW	66	1968	1974	HM
	Historical Nursery	NW	69	1968	1999	HM
	Roundstone Van Centre – Commercial Vehicle Dealers	E	69	-	-	DS
	Kayjay Motors – Garage Services	E	88	-	-	DS
	Highdown Coach Works – Garage Services	NE	82	-	-	DS
Off-Site	N S Marine – Marine Engineering Equipment Manufacturers	NE	82	-	-	DS
	Sub Station	E	131	1959	1990	HM
	Valley Motors – Garage Services	N	147	-	-	DS
	Knights Motor Services Ltd – Garage Services	N	147	-	-	DS
	Historical Nursery	S	196	1943	1962	HM
	Nursery	NE	220	1943	2016	HM

Notes: SW – Site walkover, HM – Historic Maps, DS – Datasheet, GC – Geochemistry, LA – Local Authority

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	Likelihood ¹
Historical Nursery	✓
Builders Yard	✓
Stockpiled Soil Debris	✓

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 Table 7.2.

Table 7.2 Offsite Potential Contamination Sources

Sources	Direction	Distance (m)	Likely ¹
Discarded Tank (removed)	E	5	✓
2000ltr Diesel Storage Tank	E	5	✓
Historical Nursery	W	14	
Pond – Infilled	E	24	✓
Nursery	N	44	
Town & Country Paving Ltd – Concrete Products	NE	50	
Tank	W	52	

Tank	NW	66
Historical Nursery	NW	69
Roundstone Van Centre – Commercial Vehicle Dealers	E	69
Kayjay Motors – Garage Services	E	88
Highdown Coach Works – Garage Services	NE	82
N S Marine – Marine Engineering Equipment Manufacturers	NE	82
Sub Station	E	131
Valley Motors – Garage Services	N	147
Knights Motor Services Ltd – Garage Services	N	147
Historical Nursery	S	196
Nursery	NE	220

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	Non- Pathway
Superficial Deposits	Yes	
Bedrock	No	

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	✓	Historical nursery onsite
	Consumption of home-grown produce	Contaminants in gardens areas	✓	Historical nursery onsite
Dermal	Dermal contact	Contaminants in soft landscaping areas	✓	Historical nursery onsite
Inhalation	Inhalation of dust (indoor and outdoor)	Contaminants in soft landscaping areas		No source identified
	Inhalation of vapours (indoor and outdoor)	Volatile compounds & Soft landscaping areas	✓	Discarded storage tank onsite
	Inhalation of soil gases	Soil gases (e.g. CH ₄ and CO ₂ , VOC) within 0-250m	✓	Infilled pond adjacent to site
Physical	Fire and explosion ¹	UXO (e.g. Bombs or projectile sites) (0-250m) ²		No bomb strikes identified
		Combustible material in soil	✓	Historical nursery onsite/ discarded storage tank onsite
		Soil gases (VOC) within 0-250m	✓	Infilled pond adjacent to site
	Via anthropogenic pathways (services trenches)	Contaminants & Trenches or drainage onsite		No drainage onsite
	Others physical pathways ³	Degradation of fills, blast... etc...		No source identified
Chemical	Location of service supply pipes in contaminated soils	Hydrocarbons & Pipes	✓	No source identified
	Direct contact of concrete with concrete aggressive soils	Sulphate, Acids & Concrete	✓	Potential natural sources
Others	Irradiation ⁴	Radon		No source identified
		Radioactive materials		No source identified
		UXO within 0-250m		No bomb strikes identified
	Via surface water runoff	Contaminants & Gradient (Area)		Permeable drift deposit
	Migration downwards via granular soils	Contaminants & Drift: Principal/secondary	✓	Secondary Aquifer
	Migration downwards via permeable soils and bedrock	Contaminants & Bedrock: Principal/secondary	✓	Principal Aquifer
	Plant uptake and phytotoxicity ⁵	Contaminants & Groundwater vulnerability: Principal/secondary	✓	Major Aquifer
		Metallic contaminants		No source identified
		Soil gases within 0-250m	✓	Infilled pond adjacent to site
	Plant uptake and ecotoxicological effects ⁶	Contaminants	✓	Historical nursery onsite/ discarded storage tank onsite

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	✓✓
Groundwater Human Health Building Materials	Migration via groundwater flows	✓✓
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	✓✓
	Visitors to the site	✓✓
	Construction workers on site	✓✓
	Service and maintenance workers	✓✓
	Site neighbours and wider public	✓✓
Groundwater/Controlled Waters	Groundwater/Future Potable Water Supply	✓✓
	Surface Water	
Buildings & Materials	Construction materials	✓✓
	Buildings and confined spaces	✓✓
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
Historical Nursery	Onsite	0	✓	✓	✓	Onsite source
Builders Yard	Onsite	0	✓	✓	✓	Previous onsite contaminative activity
Stockpiled Soil Debris	Onsite	0	✓	✓	✓	Onsite source
Discarded Tank (now removed)	E	5	✓	✓	✓	Adjacent to site.
2000ltr Diesel Storage Tank	E	5	✓	✓	✓	Adjacent to site.
Infilled pond	E	24	✓	✓	✓	Adjacent to site. Soil gas risk from infill material

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 Department of Environment (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	Ammonia	
P2	Asbestos	✓✓✓ Stockpiled material
P3	De-icing agents, fire-fighting chemical	
P4	Pesticides	✓✓✓ Historical Nursery onsite
P5	Metals and semi-metals (e.g. arsenic, chromium)	✓✓✓ Former builders yard
P6	Non-chlorinated solvents	
P7	Organic compounds (e.g. PAHs and TPHs)	✓✓✓ Historical nursery onsite, former builders yard, discarded tank and diesel storage 5m east of site.
P8	Organic solvents (e.g. chlorinated solvents)	
P9	Polychlorinated Biphenyl (PCBs)	
P10	Sulphate	
P11	Pathogens	
P12	Radioactive	
P13	Soil gas	✓✓✓ Infilled pond adjacent to site
Note: P=Properties		

7.7 Preliminary Conceptual Site Model

The preliminary conceptual site model, including linkages that require further action, is 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
P4, P5	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.	Nitrate vulnerable zone within 250m	Very low	Phase II Intrusive Investigation
P4, P7	Chemical attack	Building structures/services	BRE SDI 2005 for risk assessment. Water UK (2014) for pipes. Use Anglian Water trigger for services risk assessment	Residential development	Low risk	Phase II Intrusive Investigation
P2, P4, P5, P7, P13	Inhalation, ingestion and dermal contact	Human health Site residents	Use CLEA for human risk assessment	Residential development.	Moderate risk	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)	Moderate risk	Follow HSE Procedures
P4, P5, P7	Leaching (direct precipitation, overland flow and through flow)	Shallow groundwater/ Surface Water	Assess distance from watercourse and direction of flow – Consider use of R&D 20 publication and EA remediation target for risk assessment	Secondary A Aquifer	Moderate risk	Phase II Intrusive Investigation
P4, P5, P7	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.	Principal Aquifer	Moderate risk	Phase II Intrusive Investigation
P13	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	Infilled pond adjacent to site	Moderate risk	Phase II Intrusive Investigation

Note: P1: Ammonia, P2: Asbestos, P3: De-icing agents/firefighting chemicals, P4: Pesticides, P5: Metals and semi metals, P6: Non-chlorinated solvents, P7: Organic compounds, P8: Organic Solvents, P9: Polychlorinated Biphenyl, P10: Sulphate, P11: Pathogens, P12: Radioactive, P13: Soil 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 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	✓
Laboratory Testing	Quantify the risks identified in the Conceptual Site Model	✓
Risk Assessment	Assess pollutant linkages based on current contaminated land guidance and screening criteria's	✓
Borehole well installation	To allow for continued groundwater and/or gas monitoring	✓
Remediation	If the site-specific risk assessment reveals that the site was contaminated	✓
Validation & Verification	To validated and verify the remedial objectives based on the site-specific risk assessment	✓

8.3 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.

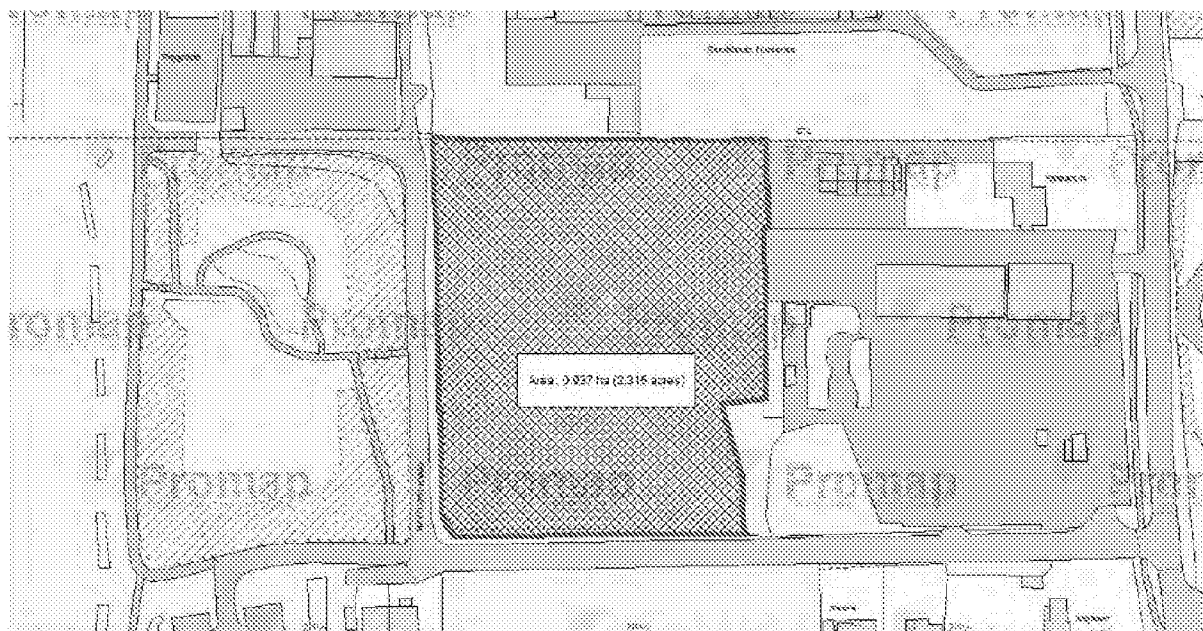


Figure 1 - Site Location Plan

Project

Land North of Mayflower Way, Angmering,
Littlehampton, West Sussex, BN16 4AY

Date

November 2016

Client

Peter Taylor & Crayfern Homes

Reference

I7028

Figure 2 - Proposed Development

Land North of Mayflower Way,
Angmering, Littlehampton, West
Sussex, BN16 4AY

Peter Taylor & Crayfern Homes

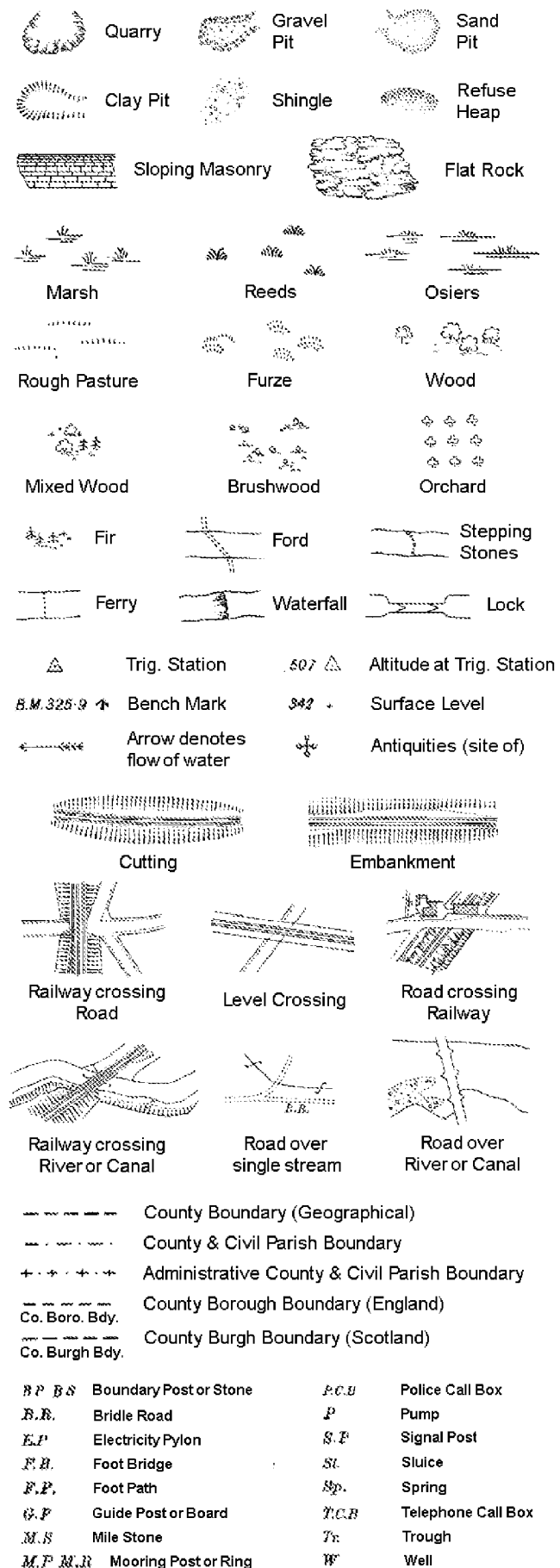
November 2016

17028

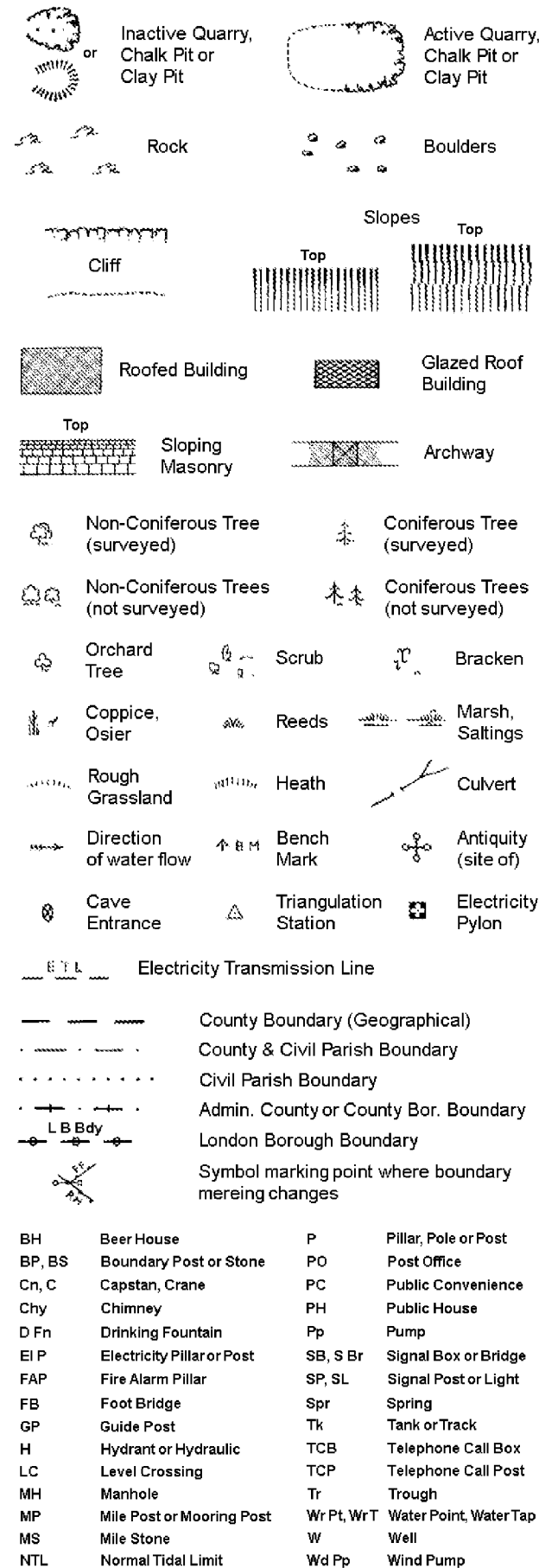
Appendix A Country Series and Ordnance Survey Maps

Historical Mapping Legends

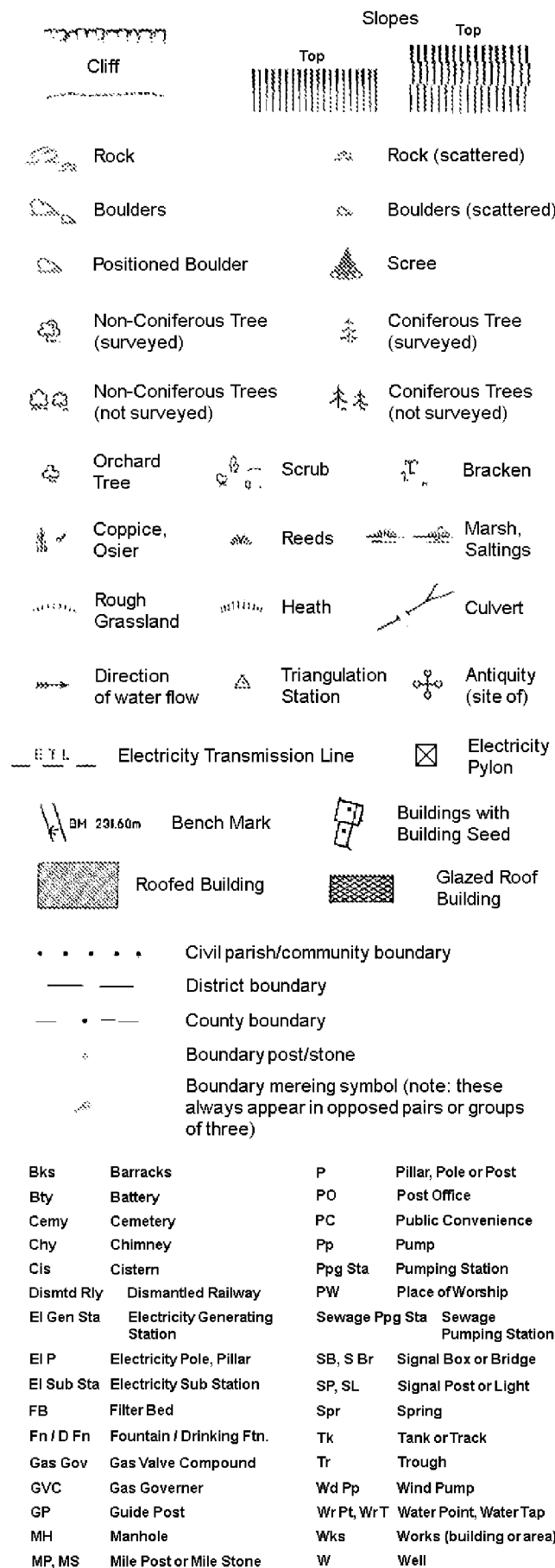
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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



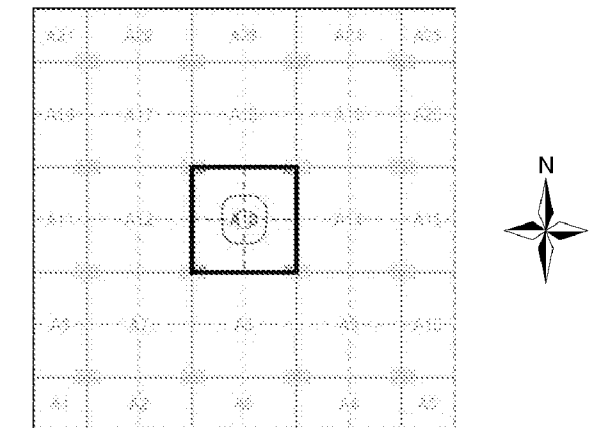
Large-Scale National Grid Data 1:2,500 and 1:1,250



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:2,500	1876	2
Sussex	1:2,500	1897 - 1898	3
Sussex	1:2,500	1911	4
Sussex	1:2,500	1932	5
Ordnance Survey Plan	1:1,250	1970 - 1989	6
Ordnance Survey Plan	1:2,500	1972	7
Supply of Unpublished Survey Information	1:1,250	1974	8
Supply of Unpublished Survey Information	1:2,500	1974	9
Supply of Unpublished Survey Information	1:2,500	1974	10
Additional SIMs	1:1,250	1977 - 1990	11
Ordnance Survey Plan	1:1,250	1979	12
Additional SIMs	1:2,500	1985	13
Additional SIMs	1:1,250	1985	14
Additional SIMs	1:2,500	1990	15
Additional SIMs	1:1,250	1990	16
Large-Scale National Grid Data	1:1,250	1994	17
Historical Aerial Photography	1:2,500	1999	18

Historical Map - Segment A13



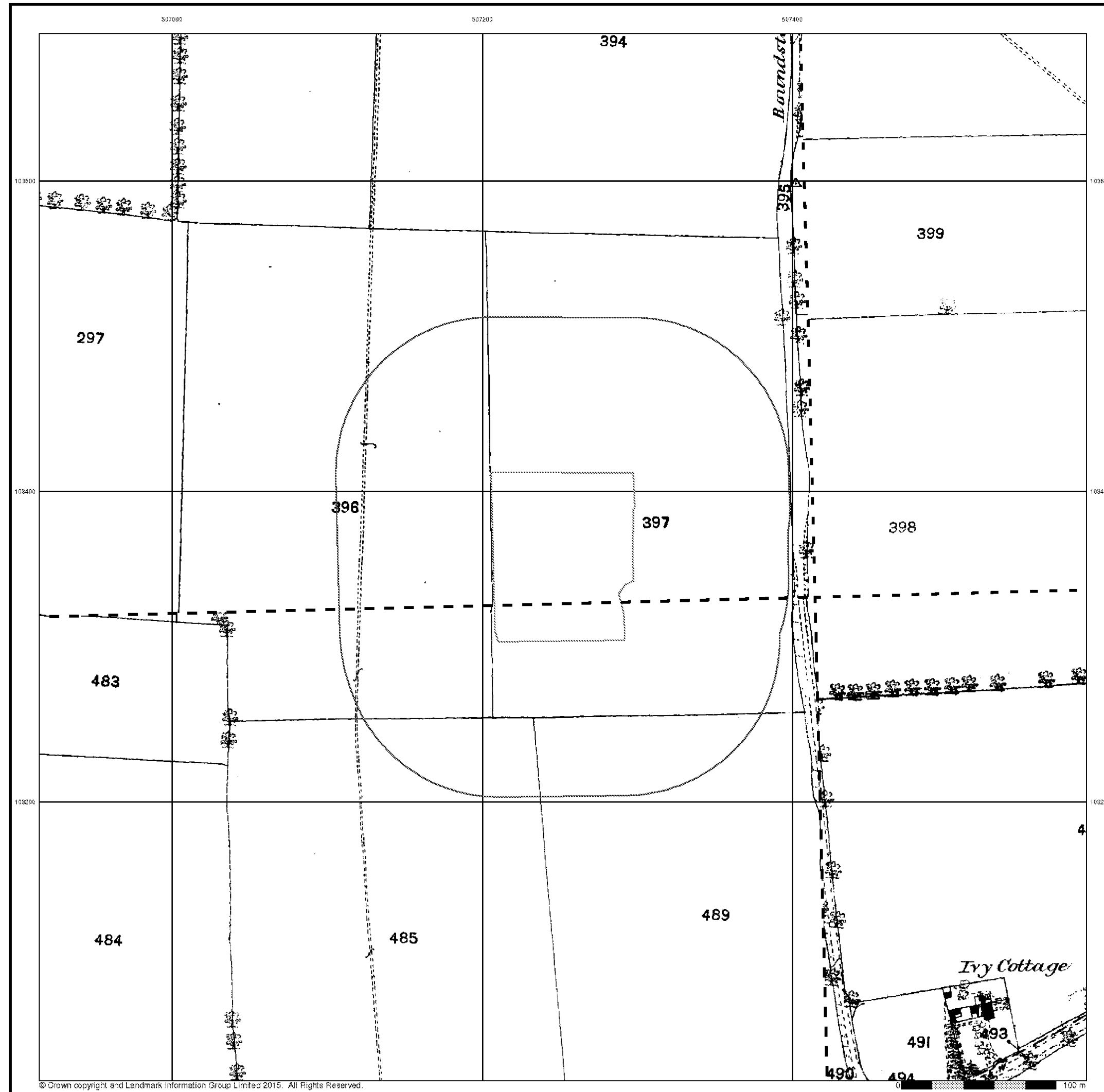
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Search Buffer (m): 100

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT





Sussex

Published 1876

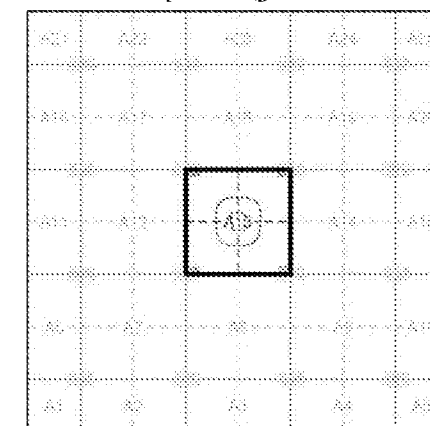
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Map Name(s) and Date(s)

063_11 1876 1:2,500	063_12 1876 1:2,500
063_15 1876 1:2,500	063_16 1876 1:2,500

Historical Map - Segment A13



Order Details

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Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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Sussex

Published 1897 - 1898

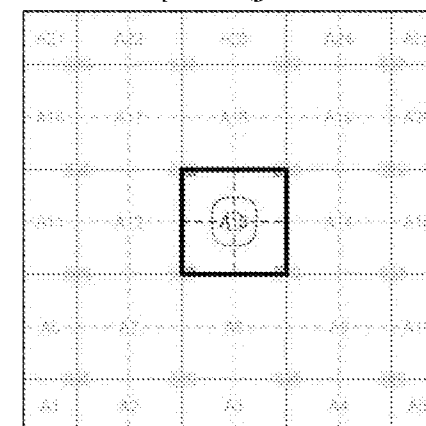
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Map Name(s) and Date(s)

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063_15 1898 1:2,500	063_16 1898 1:2,500

Historical Map - Segment A13



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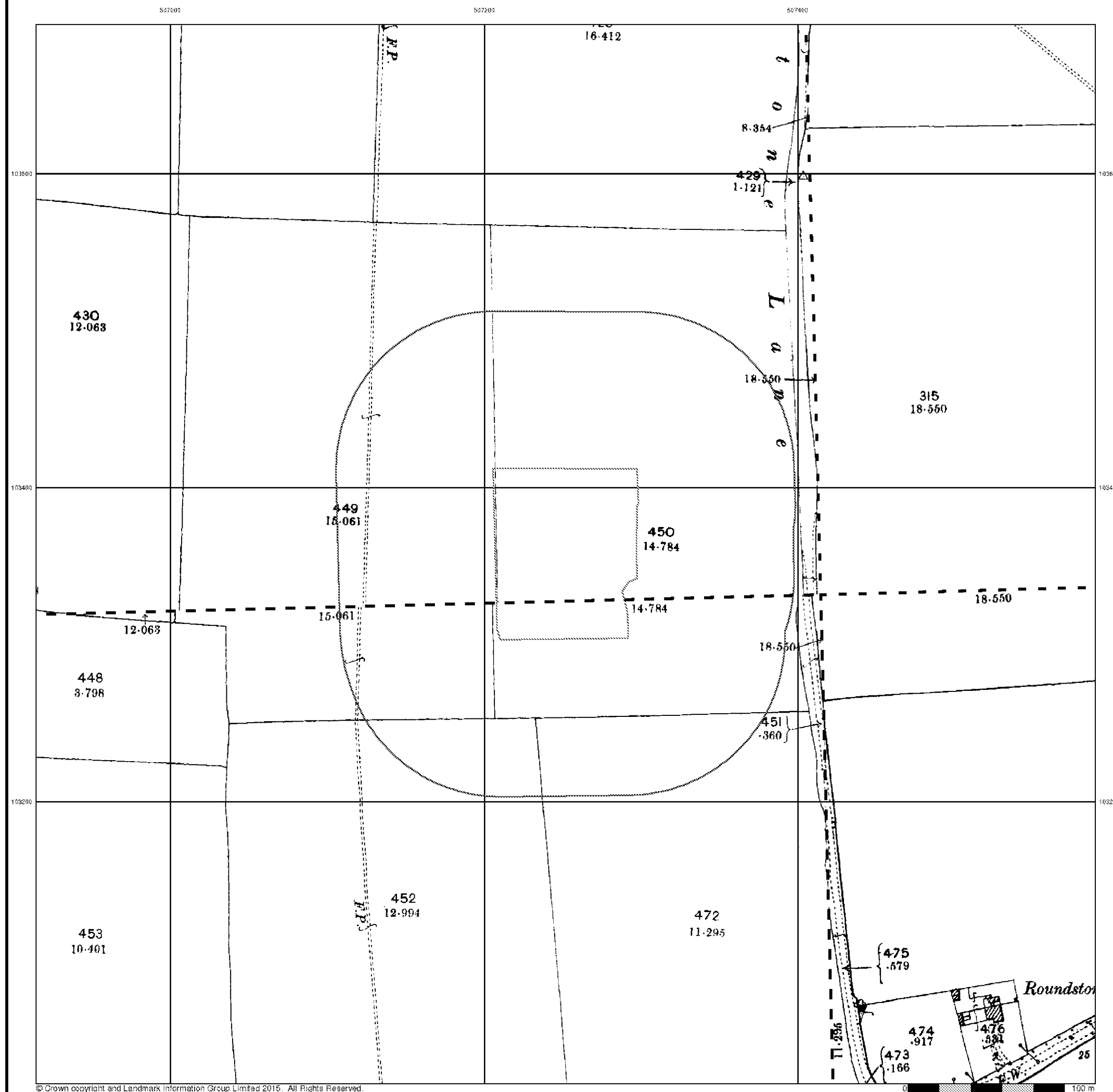
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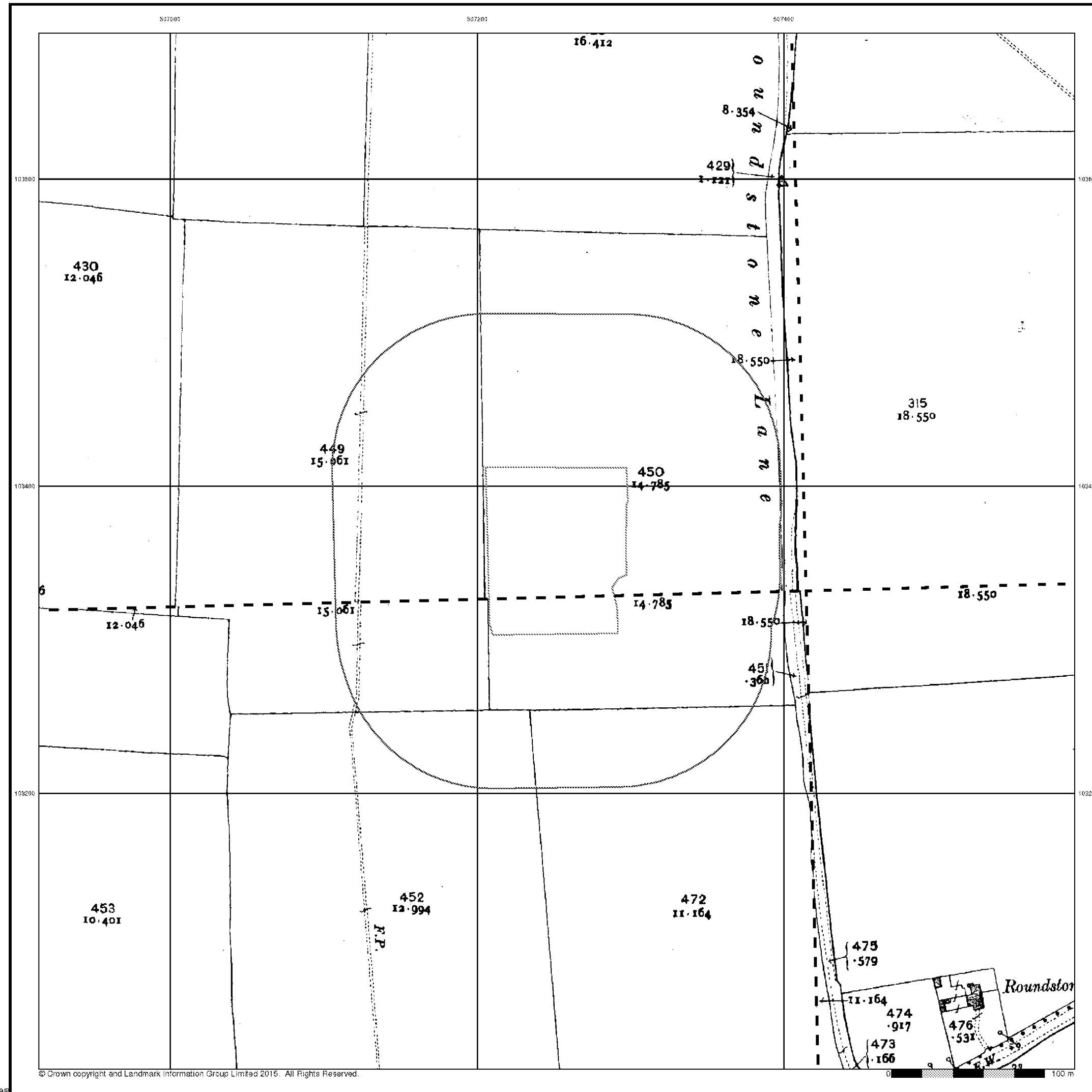
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Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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Sussex

Published 1911

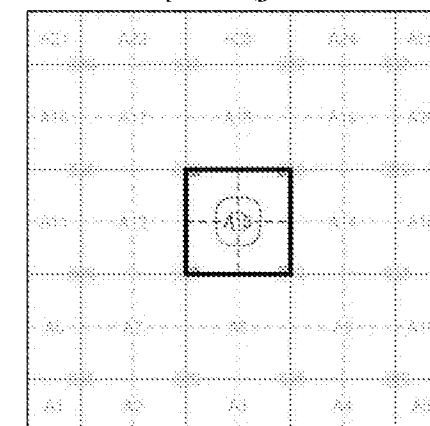
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Map Name(s) and Date(s)

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063_15 1911 1:2,500	063_16 1911 1:2,500

Historical Map - Segment A13



Order Details

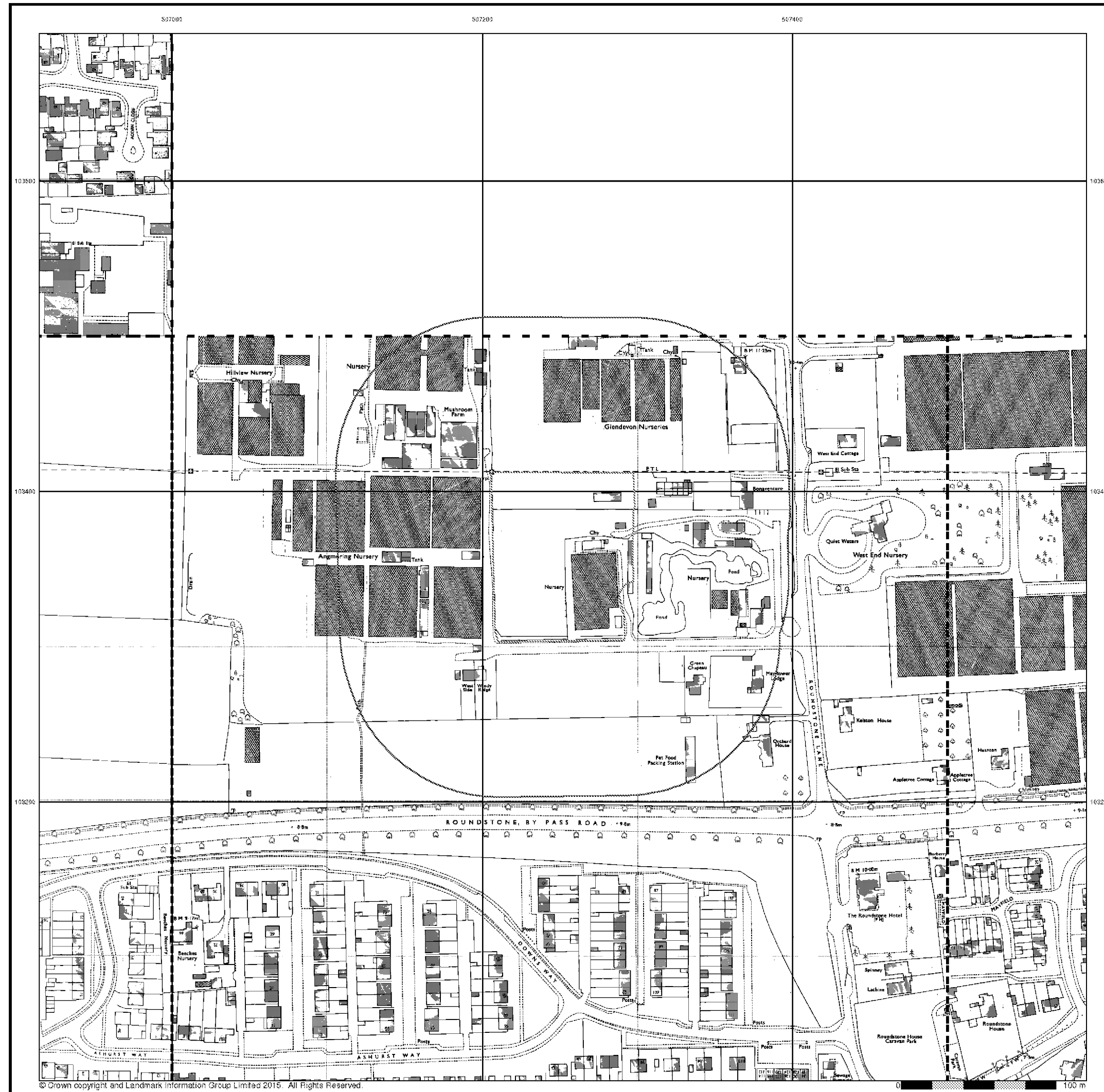
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Search Buffer (m): 100

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



A Landmark Information Group Service



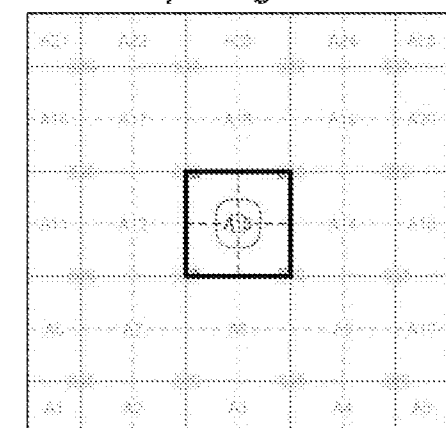
Ordnance Survey Plan Published 1970 - 1989 Source map scale - 1:1,250

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Map Name(s) and Date(s)

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TQ0603SE 1970 1:1,250	TQ0703SW 1970 1:1,250	TQ0703SE 1970 1:1,250

Historical Map - Segment A13



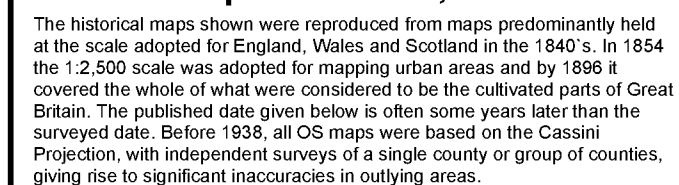
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Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT





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1:2,500

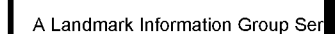
TO6700
1972
1:2,500

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Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT

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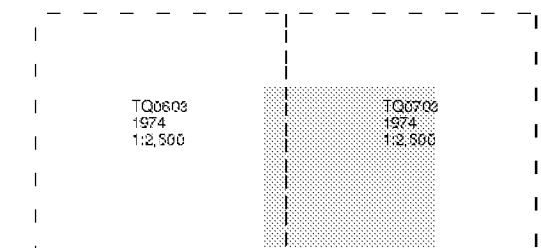
Supply of Unpublished Survey Information

Published 1974

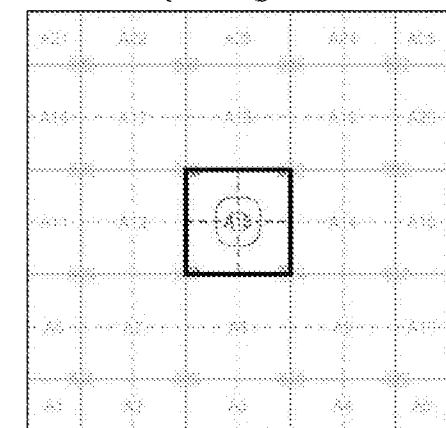
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SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a 'work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

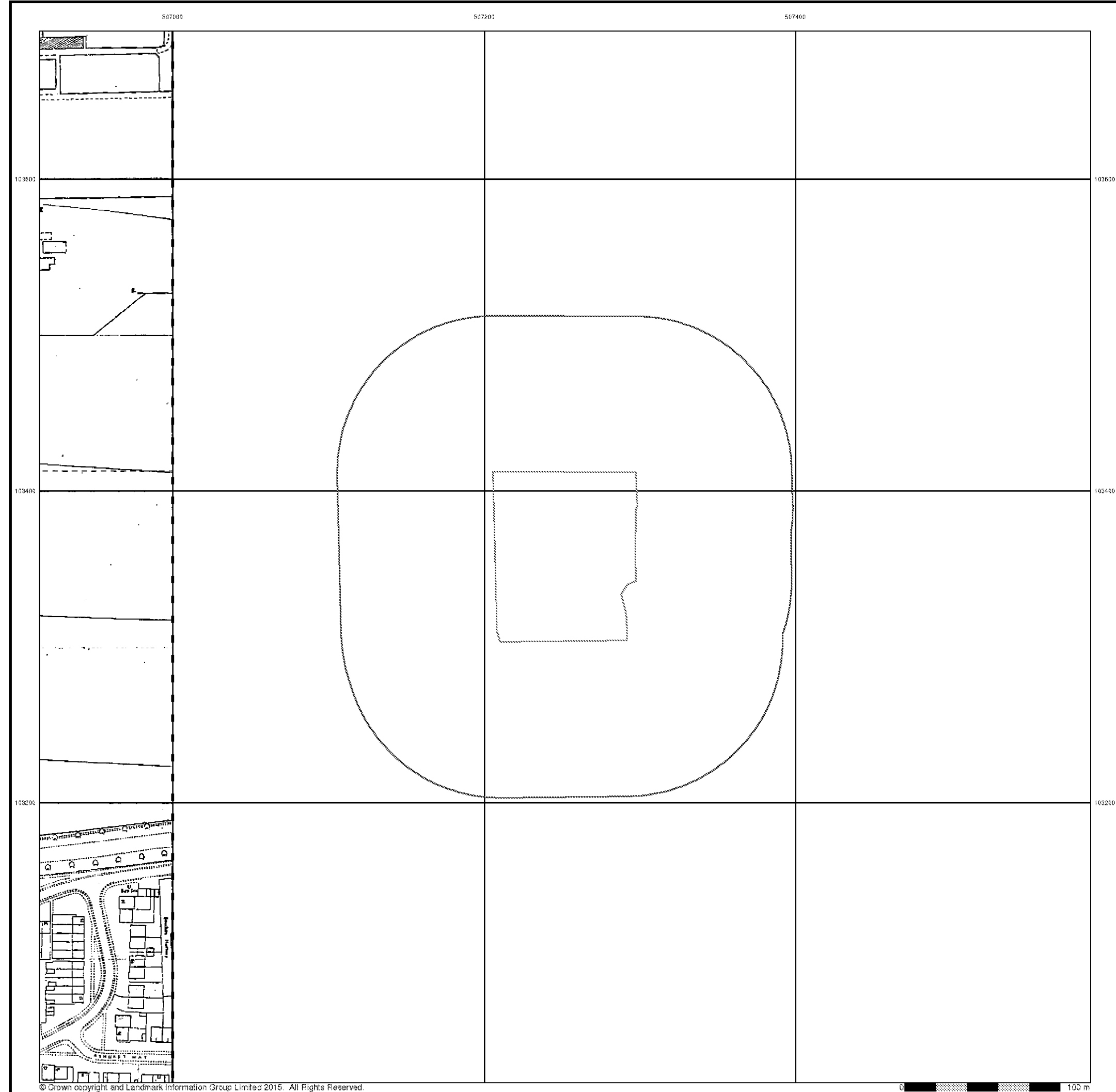
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Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



A Landmark Information Group Service



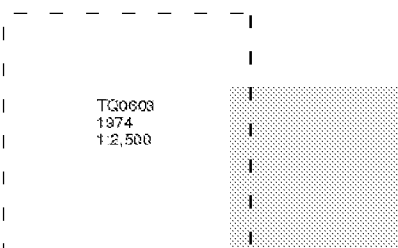
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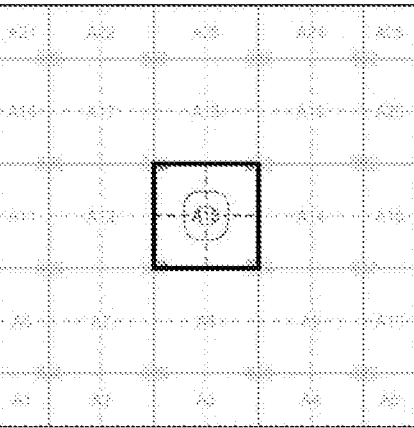
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

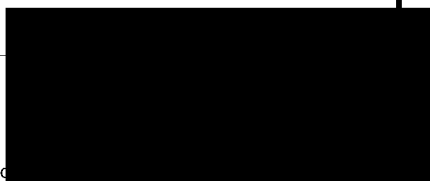
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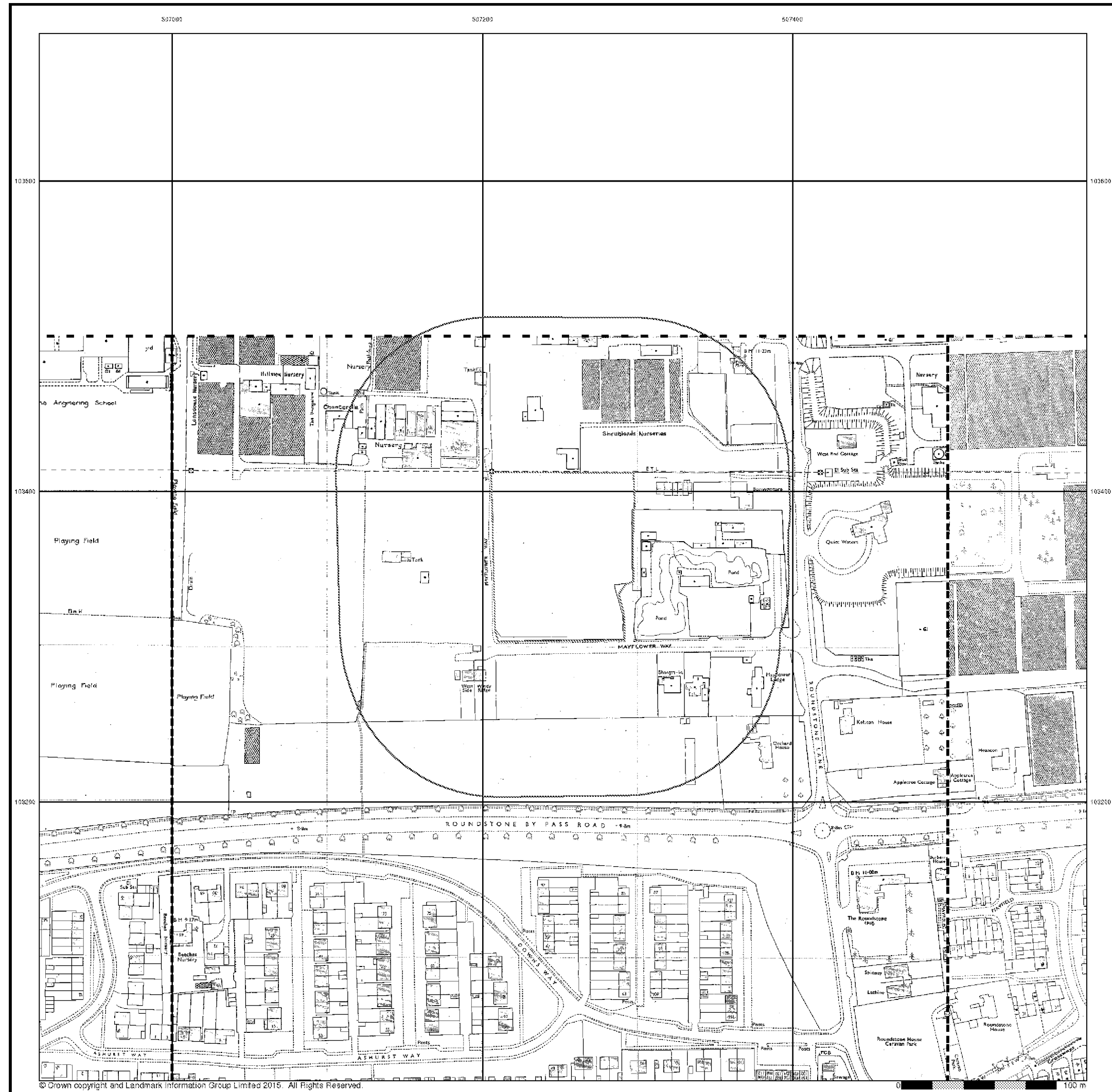
Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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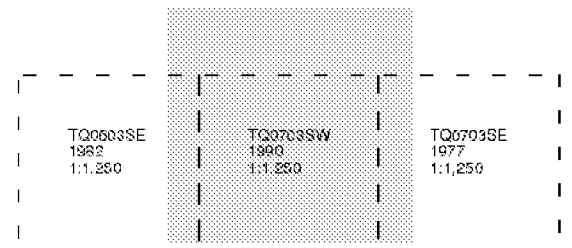




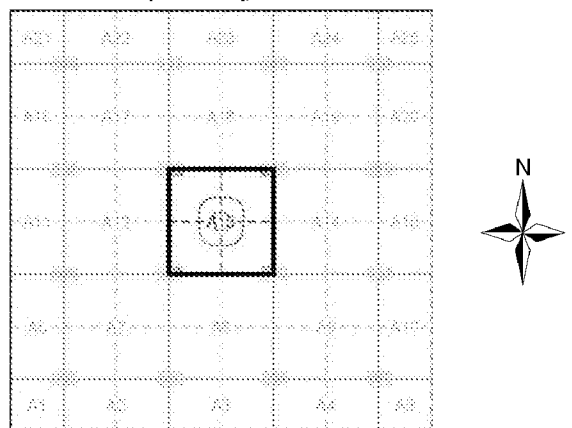
Additional SIMs
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Source map scale - 1:1,250

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



Historical Map - Segment A13

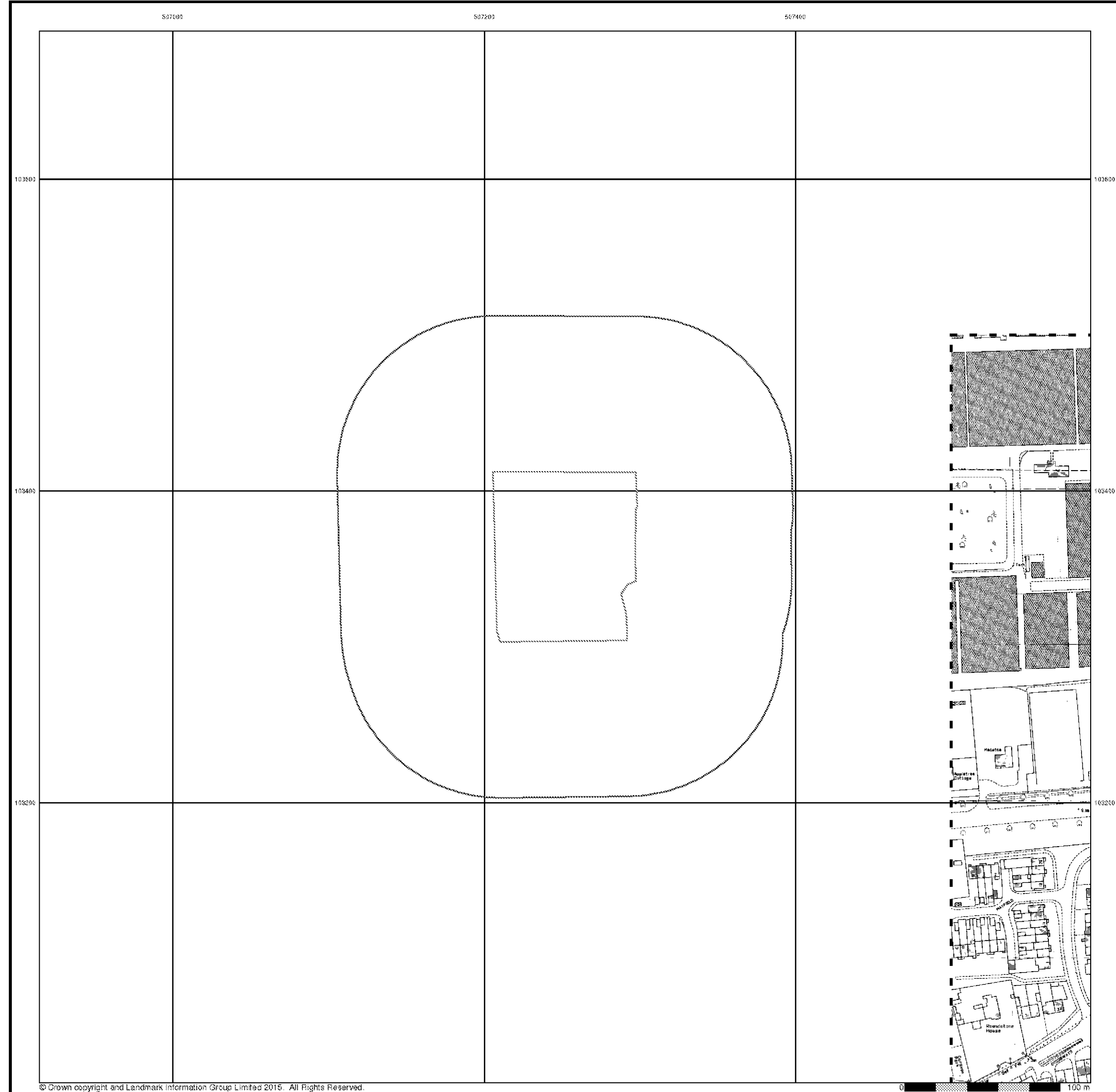


Order Details
Order Number: 104726713_1_1
Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details
Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



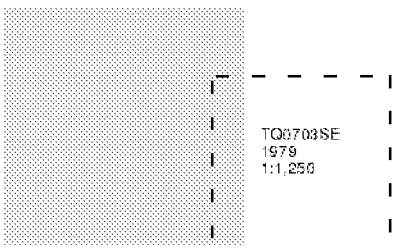
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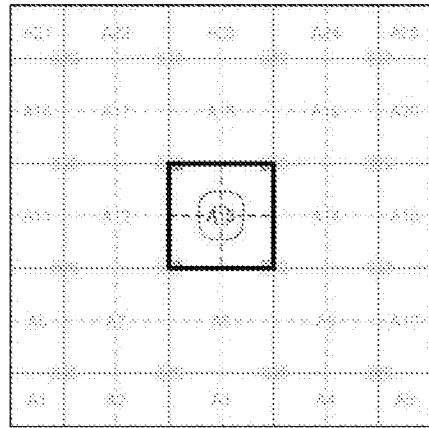
Ordnance Survey Plan
Published 1979
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



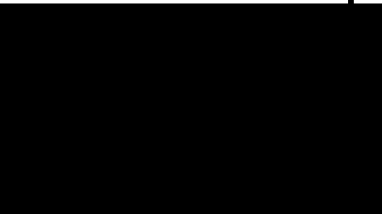
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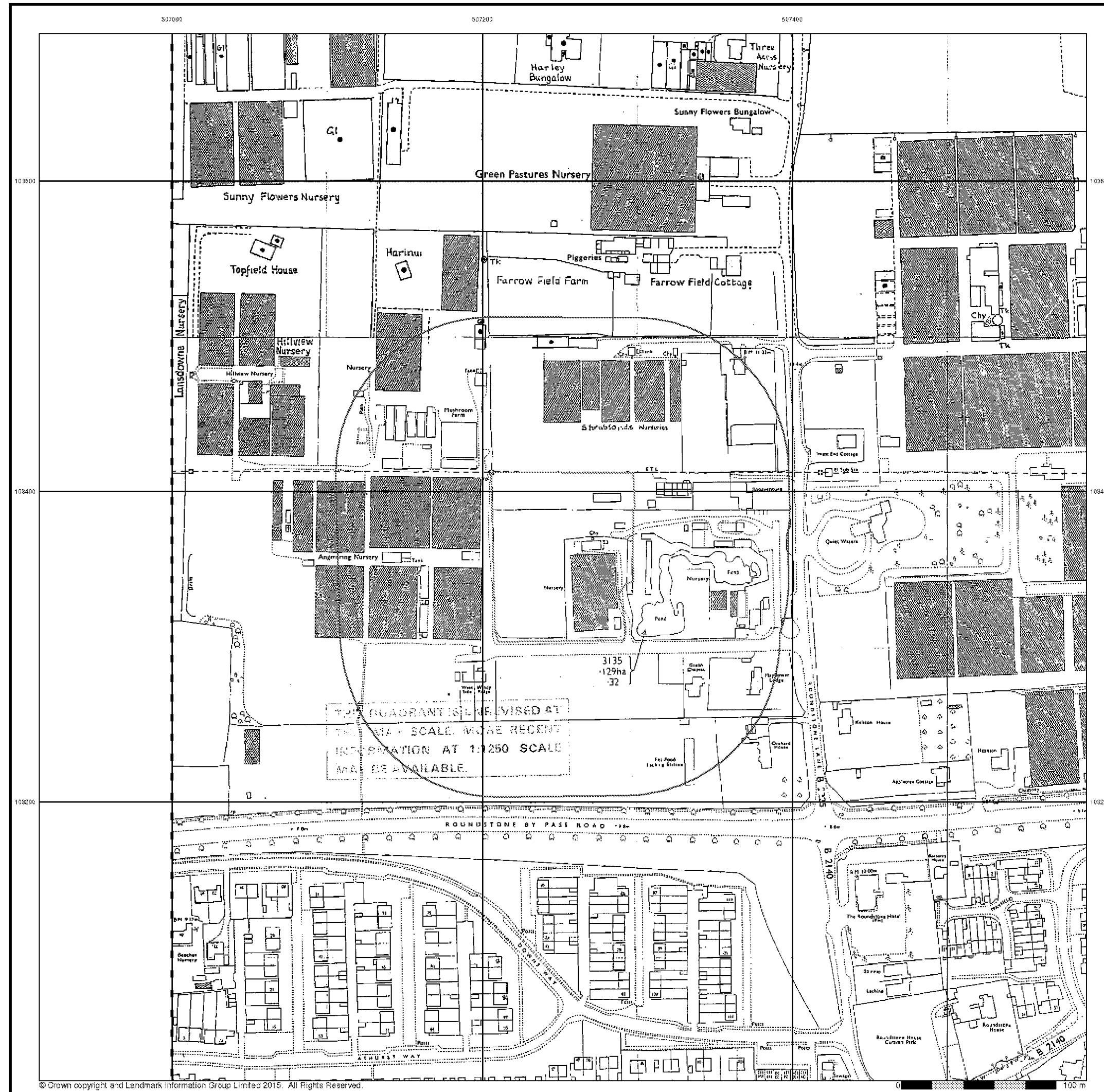
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Site Details
Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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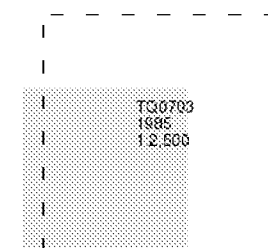
Additional SIMs

Published 1985

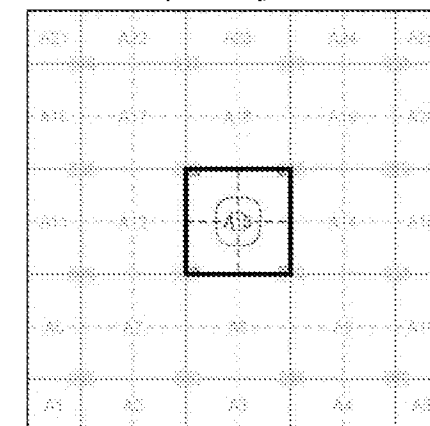
Source map scale - 1:2,500

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)



Historical Map - Segment A13



Order Details

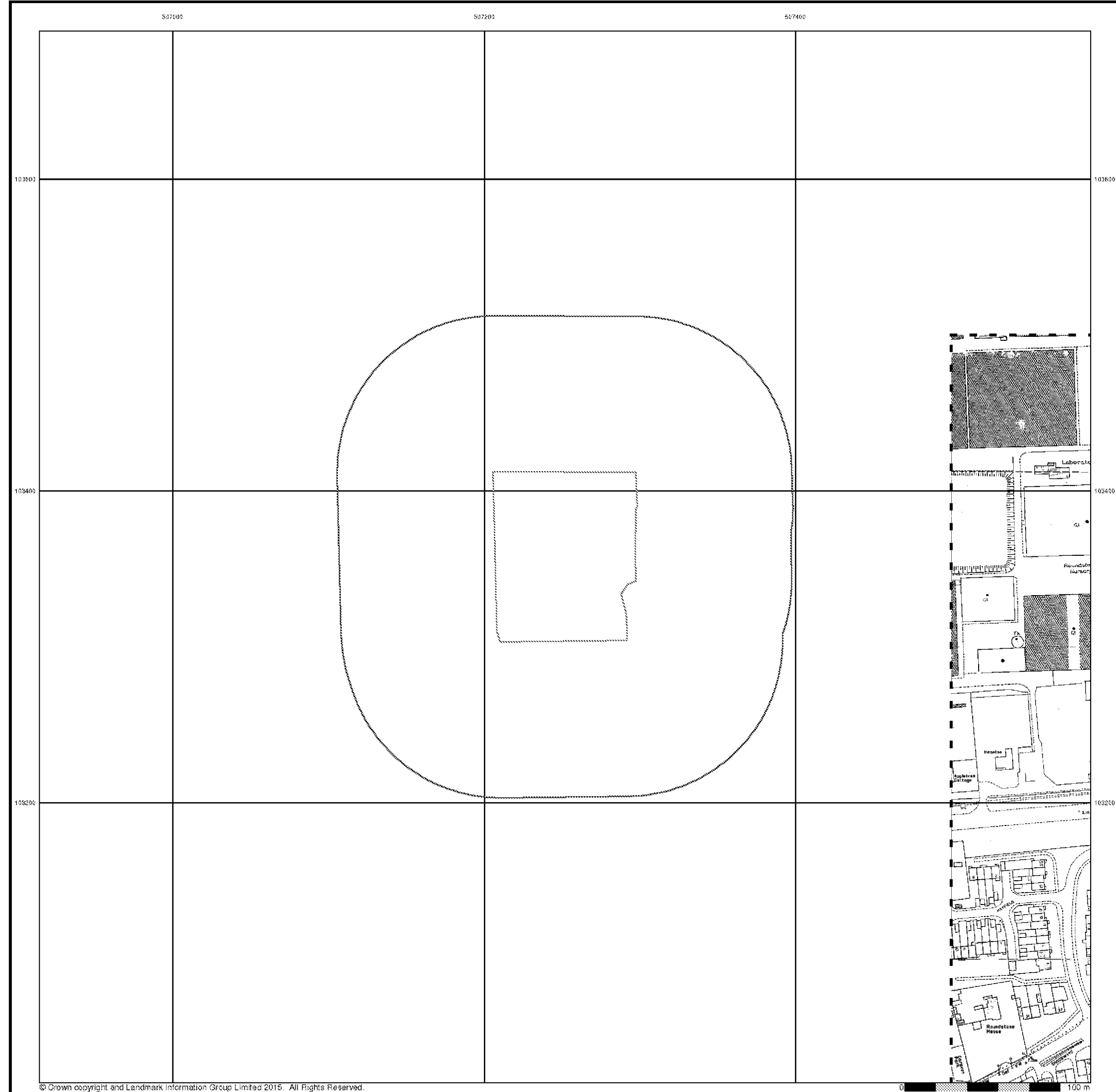
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Customer Ref: 15306
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Slice: A
Site Area (Ha): 0.96
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Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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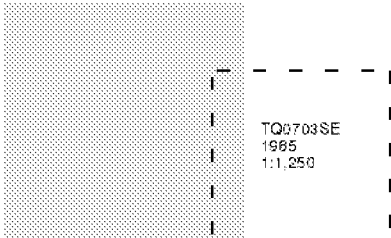
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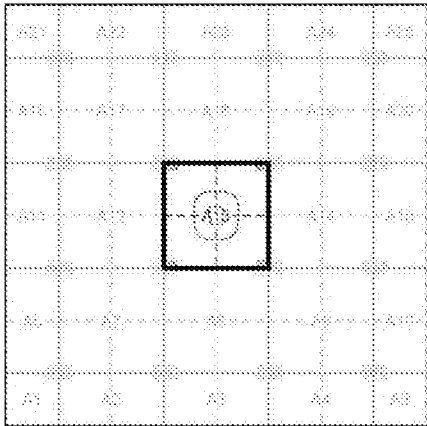
Source map scale - 1:1,250

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



Historical Map - Segment A13



Order Details

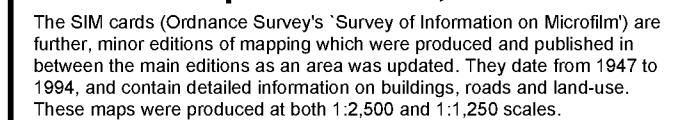
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National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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TC0703
1990
12,500

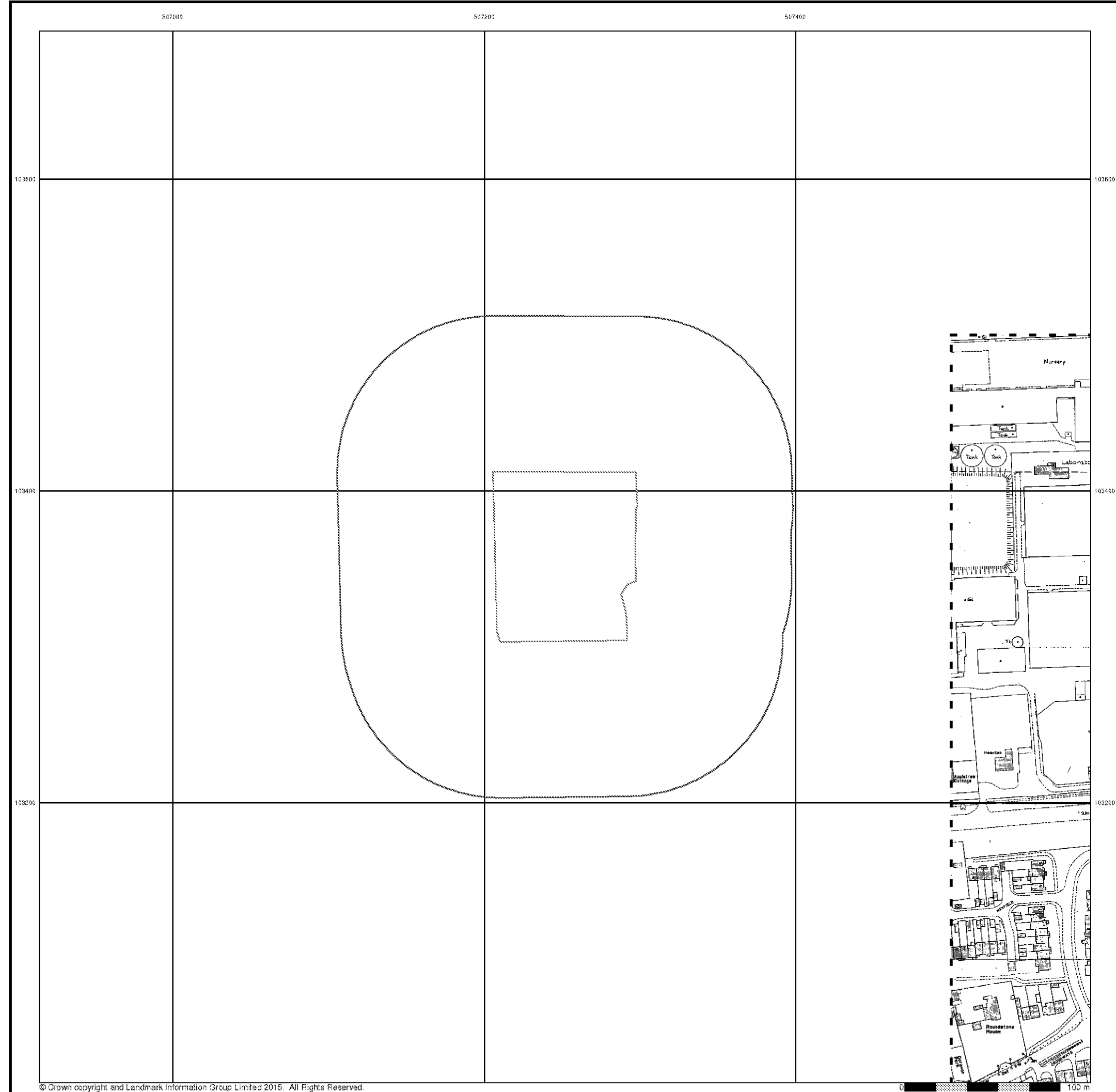
A 6x6 grid of points labeled A01 to A36. The points are arranged in a regular grid. A 3x3 square is highlighted in the center, with its center point A18 circled.



Order Number: 104726713_1_1
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National Grid Reference: 507250, 103360
Slice: A
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Search Buffer (m): 100

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT

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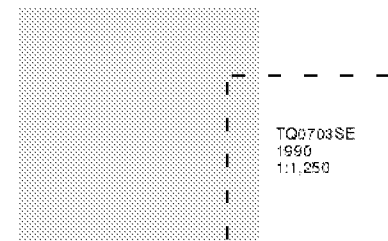
Additional SIMs

Published 1990

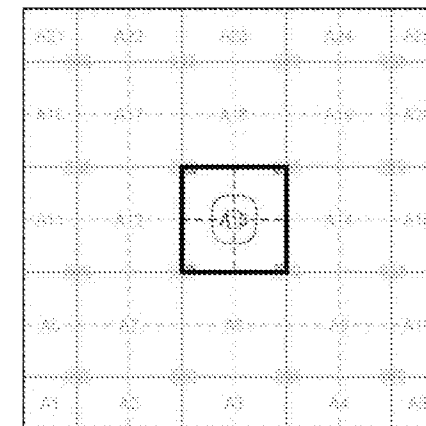
Source map scale - 1:1,250

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



Historical Map - Segment A13



Order Details

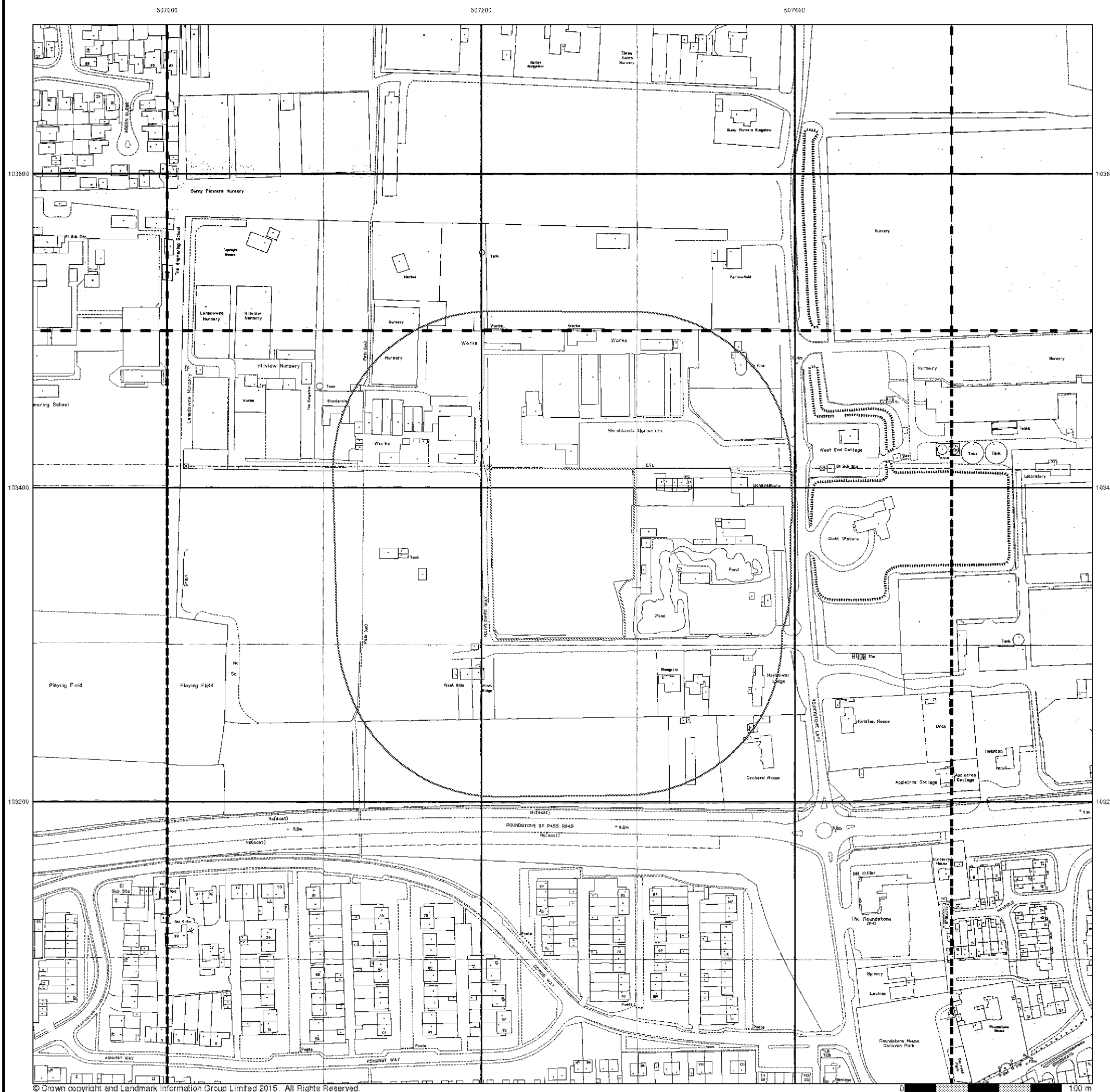
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Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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Large-Scale National Grid Data

Published 1994

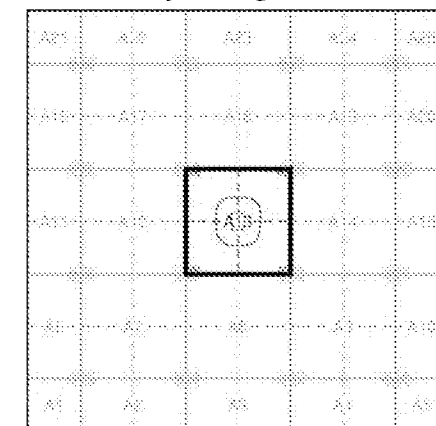
Source map scale - 1:1,250

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

Map Name(s) and Date(s)

TQ0603NE 1994 1:1,250	TQ0703NW 1994 1:1,250	TQ0703NE 1994 1:1,250
TQ0603SE 1994 1:1,250	TQ0703SW 1994 1:1,250	TQ0703SE 1994 1:1,250

Historical Map - Segment A13



Order Details

Order Number: 104726713_1_1
Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 100

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT

Landmark
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5072500

5072600

5072700

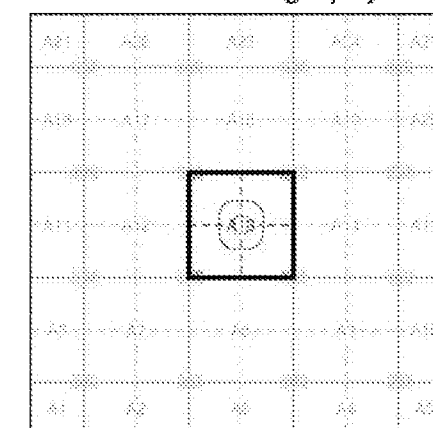


Historical Aerial Photography

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: 104726713_1_1
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 National Grid Reference: 507250, 103360
 Slice: A
 Site Area (Ha): 0.96
 Search Buffer (m): 100

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

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

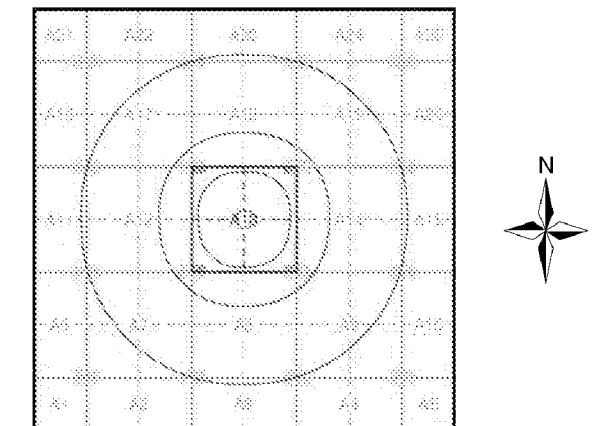
	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, 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	1879	2
Sussex	1:10,560	1899	3
Sussex	1:10,560	1913	4
Sussex	1:10,560	1913	5
Sussex	1:10,560	1932	6
Sussex	1:10,560	1943	7
Historical Aerial Photography	1:10,560	1947	8
Ordnance Survey Plan	1:10,000	1962	9
Ordnance Survey Plan	1:10,000	1976	10
10K Raster Mapping	1:10,000	2000	11
10K Raster Mapping	1:10,000	2006	12
VectorMap Local	1:10,000	2016	13

Historical Map - Slice A



Order Details

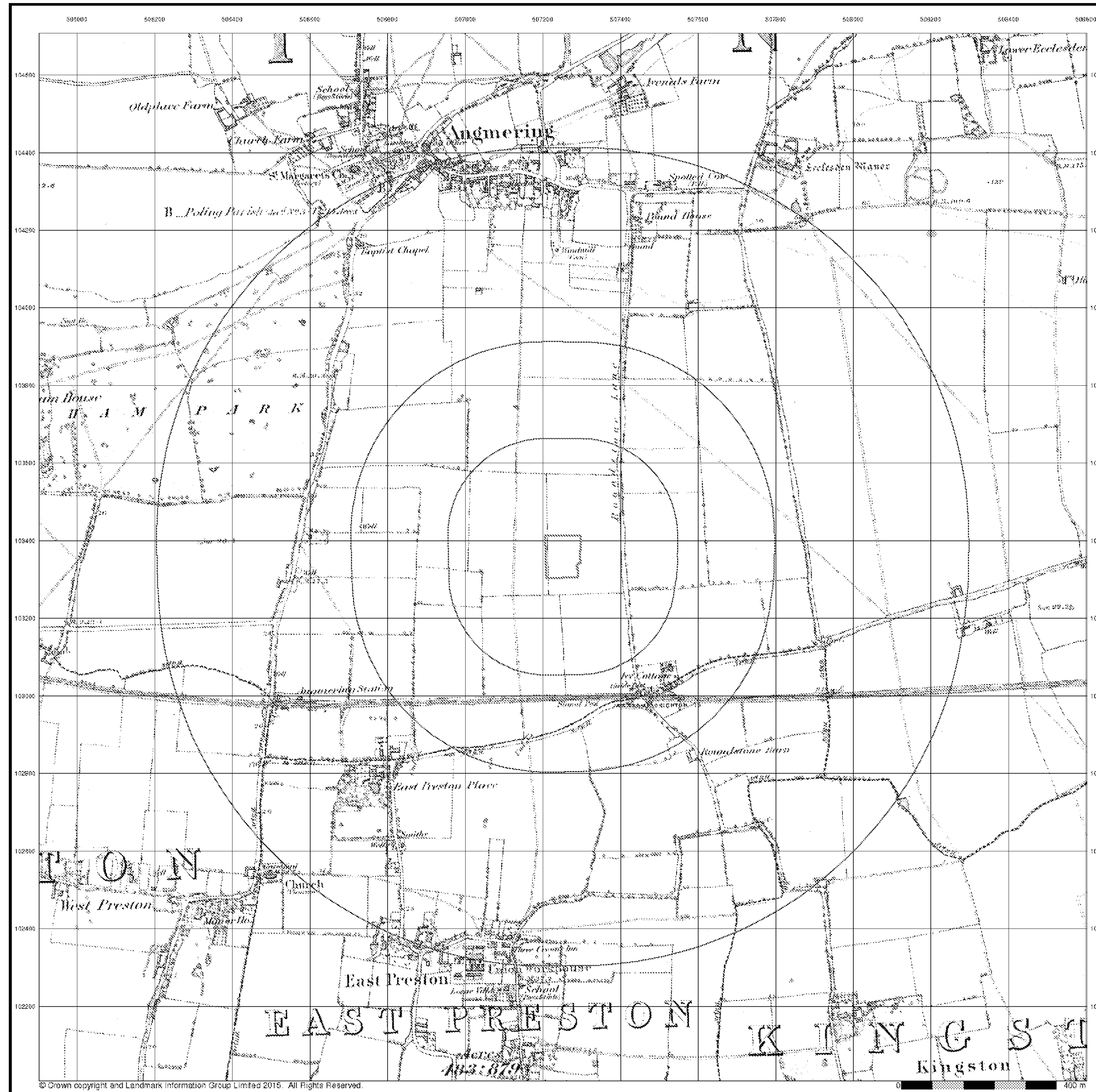
Order Number: 104726713_1_1
 Customer Ref: 15306
 National Grid Reference: 507250, 103360
 Slice: A
 Site Area (Ha): 0.96
 Search Buffer (m): 1000

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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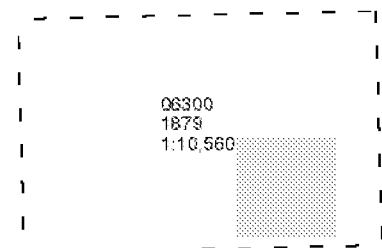
Sussex

Published 1879

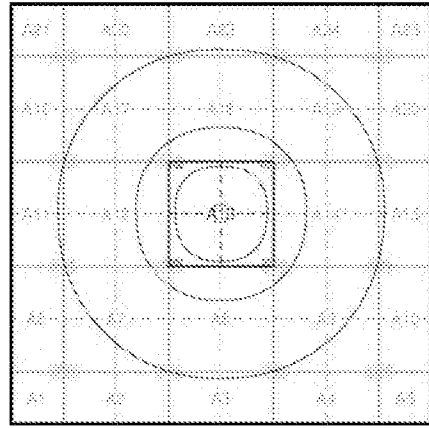
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

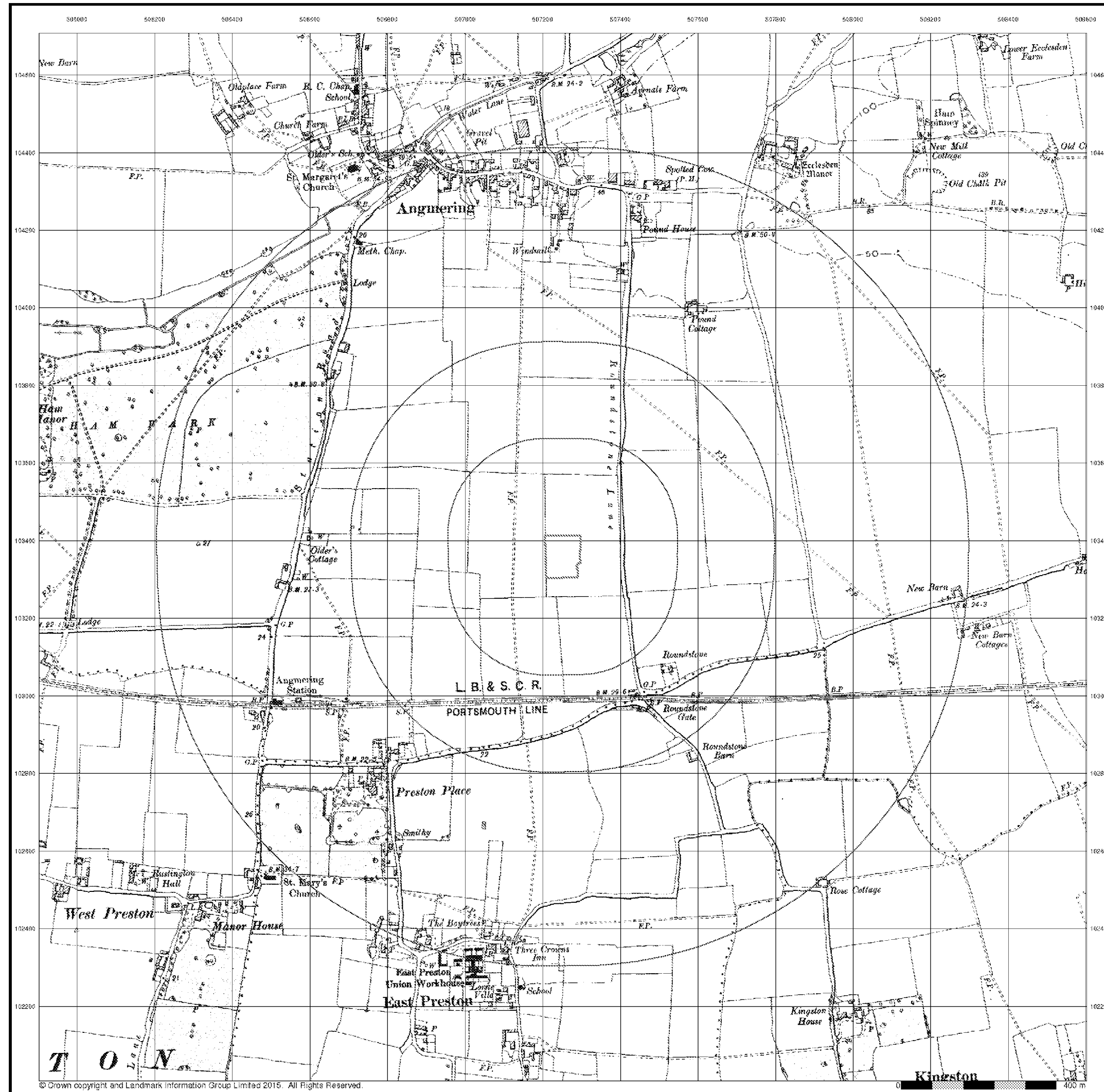
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Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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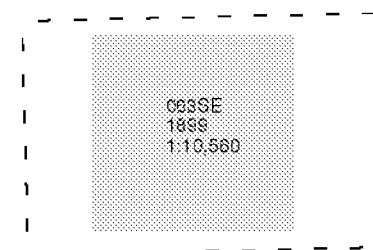
Sussex

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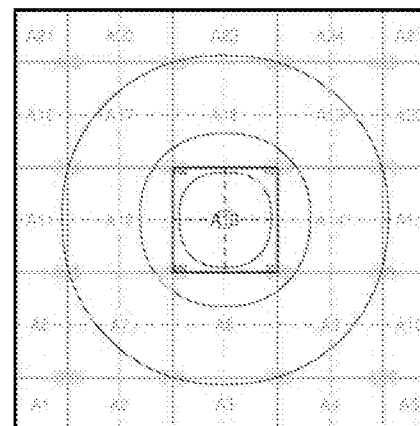
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

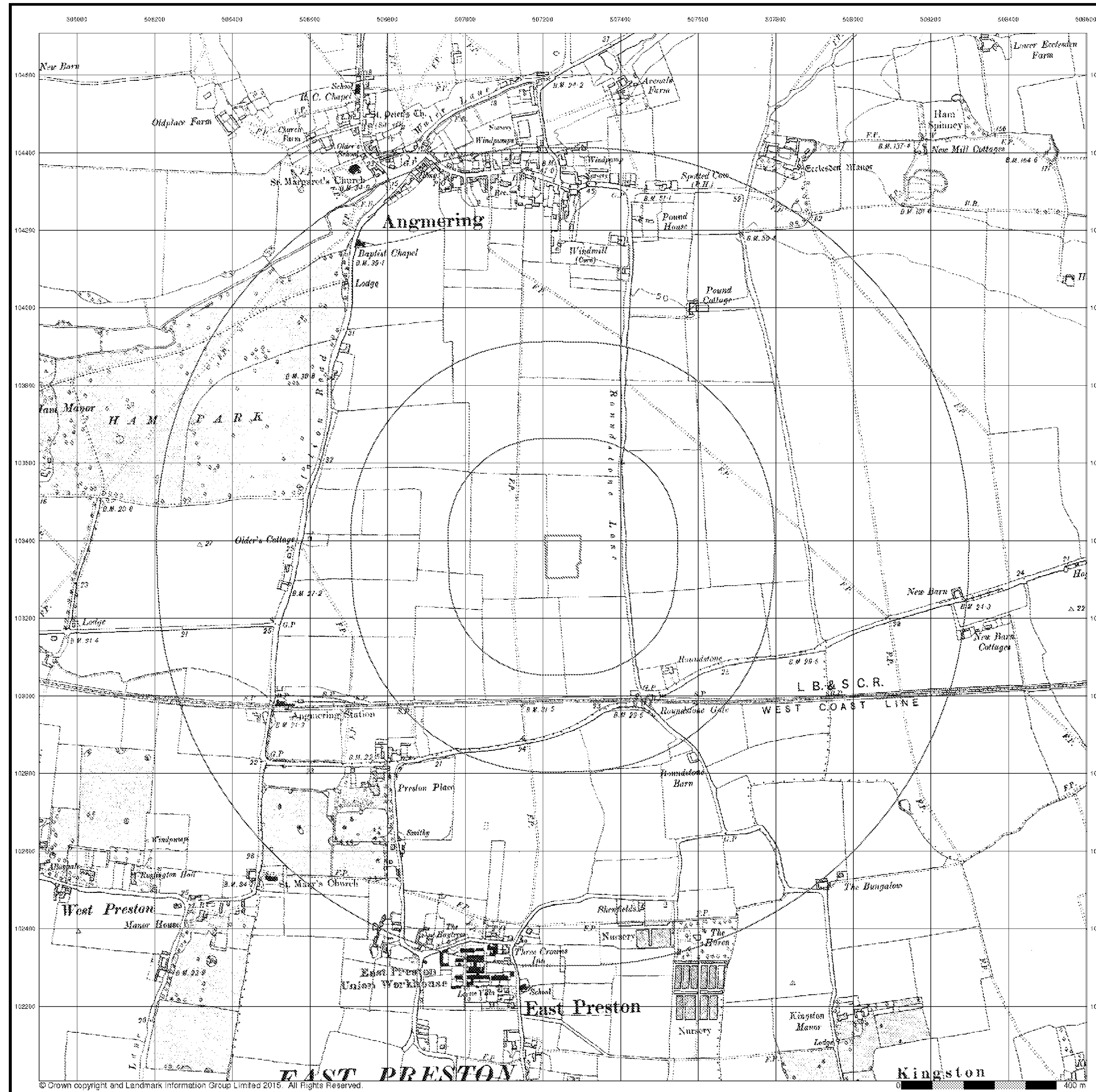
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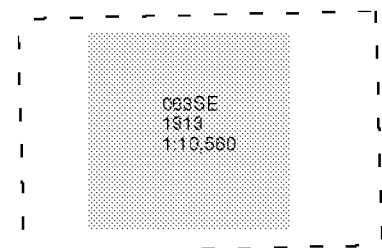
Sussex

Published 1913

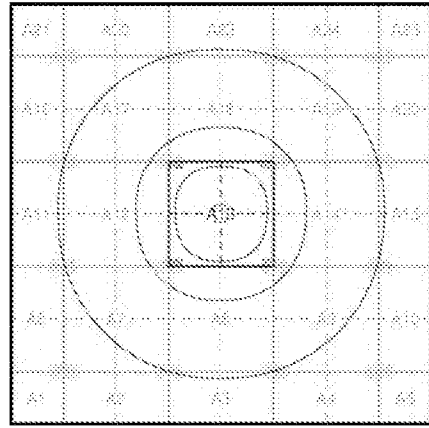
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

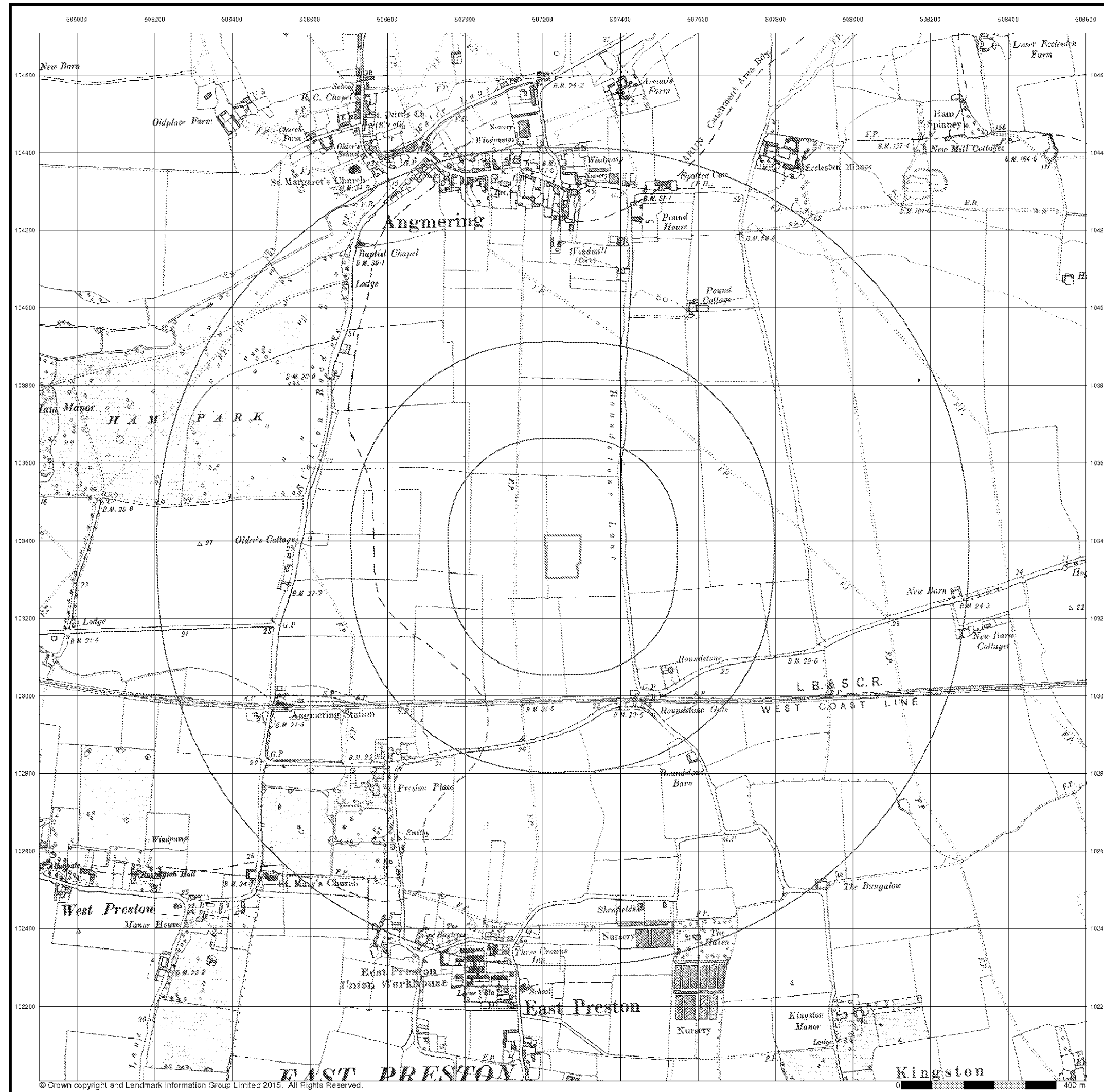
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Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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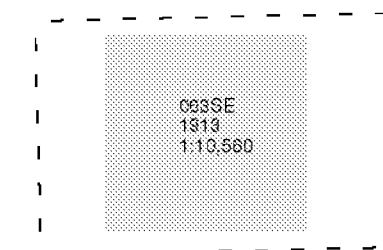
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Published 1913

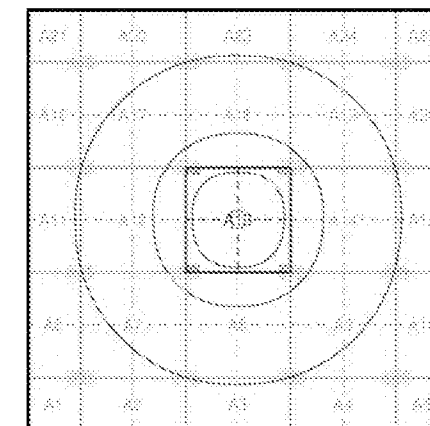
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps.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



Order Details

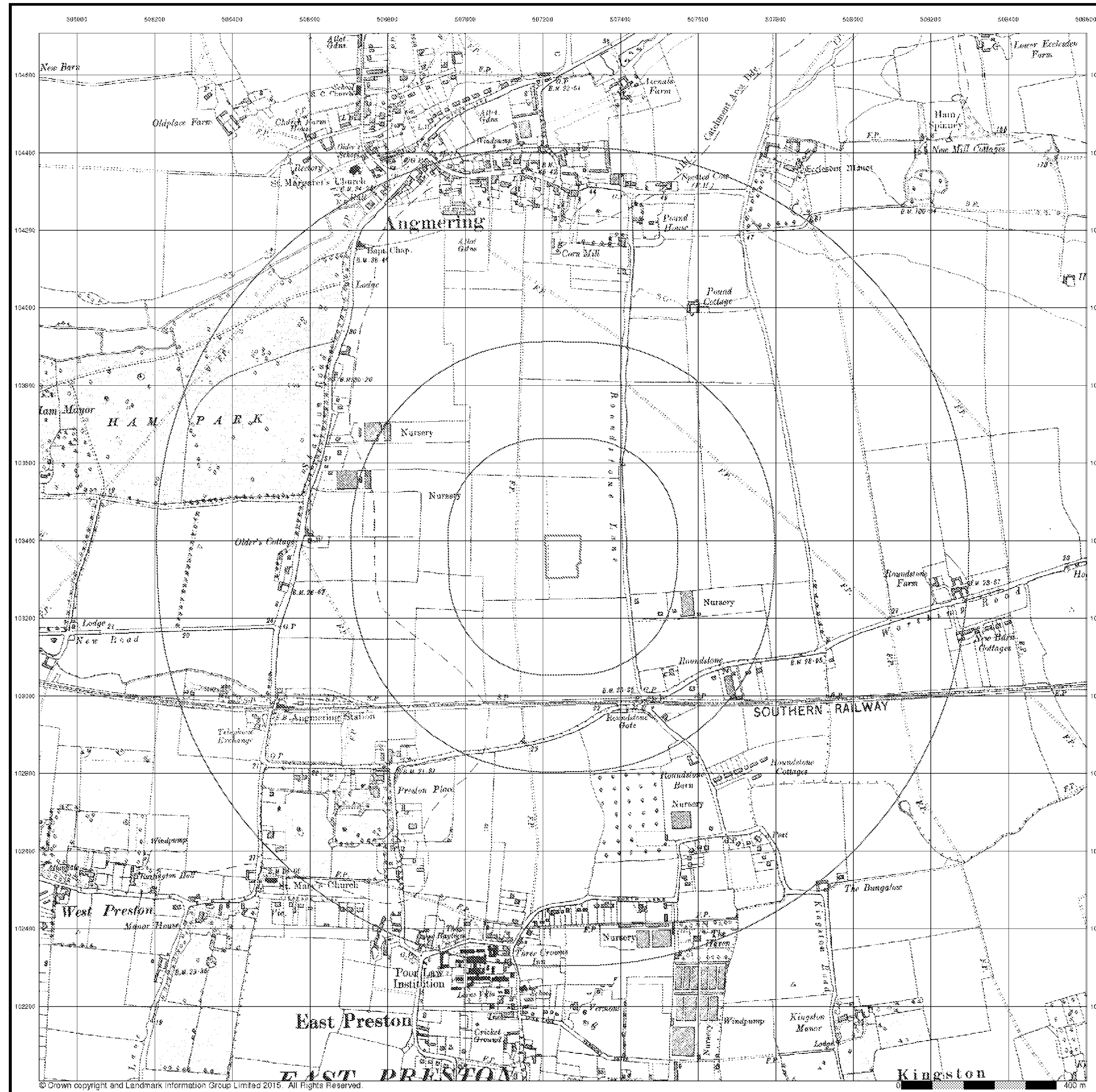
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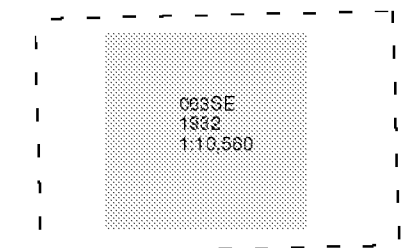
Sussex

Published 1932

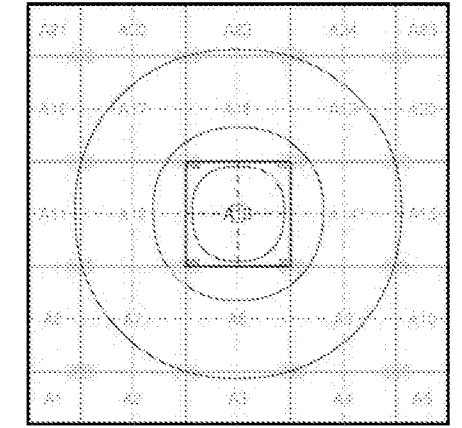
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

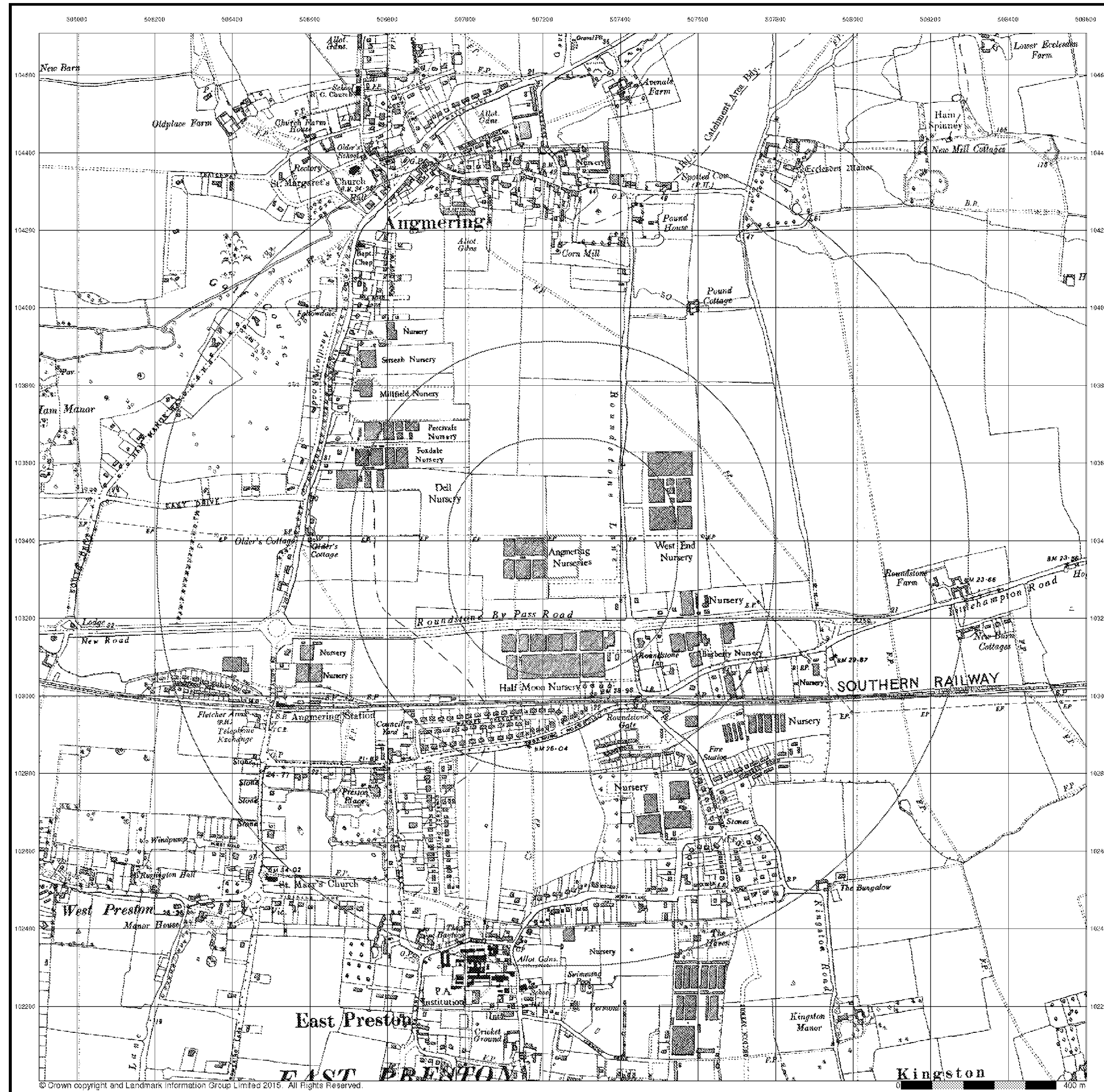
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Consultants

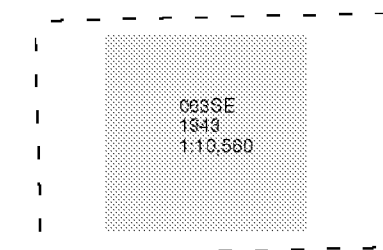
Sussex

Published 1943

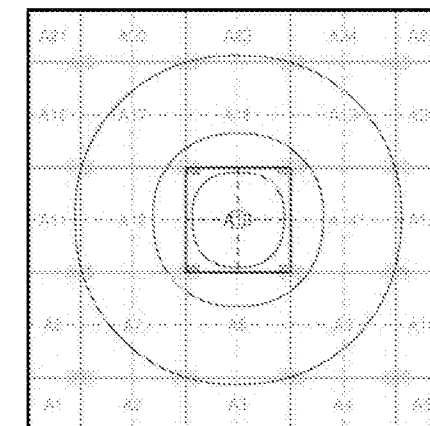
Source map scale - 1:10,560

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.

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Historical Map - Slice A



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Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT

Landmark
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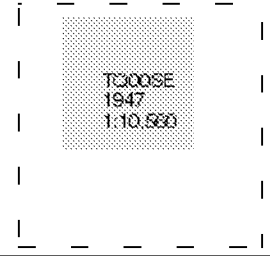


Historical Aerial Photography
Published 1947
Source map scale - 1:10,560

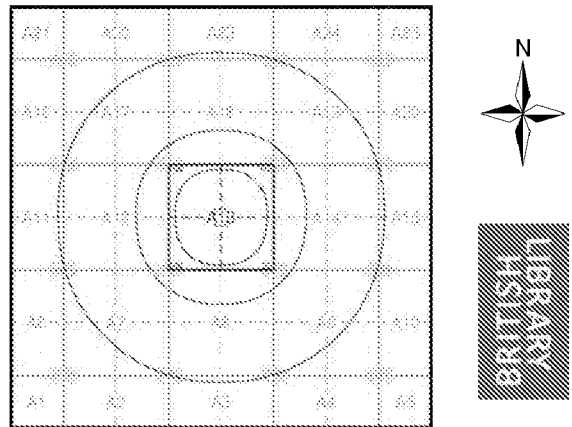
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 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.

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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



Order Details

Order Number: 104726713_1_1
Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 1000

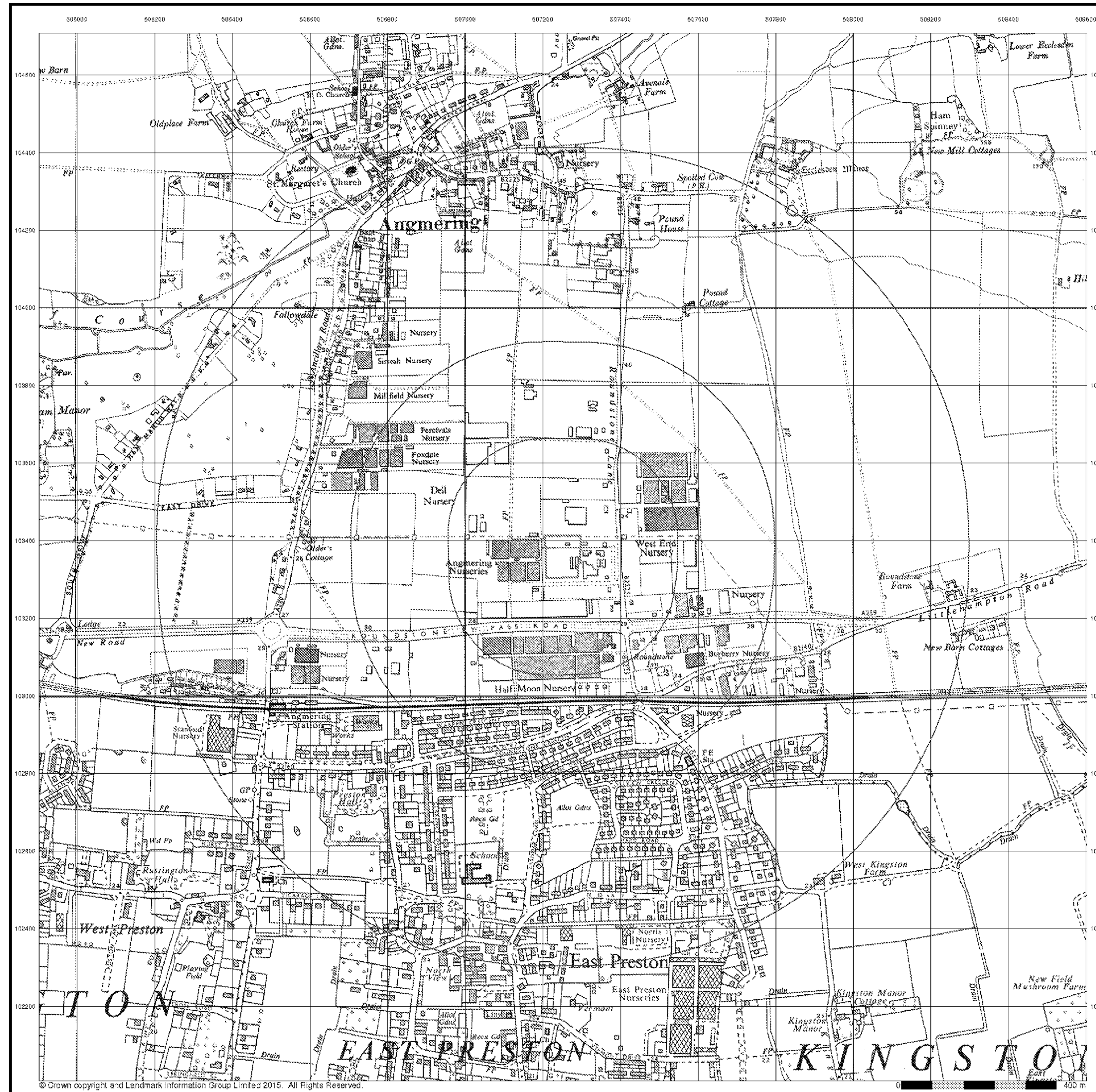
Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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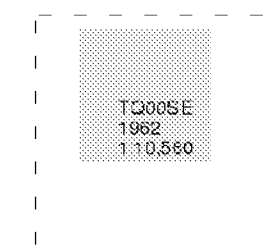
Ordnance Survey Plan

Published 1962

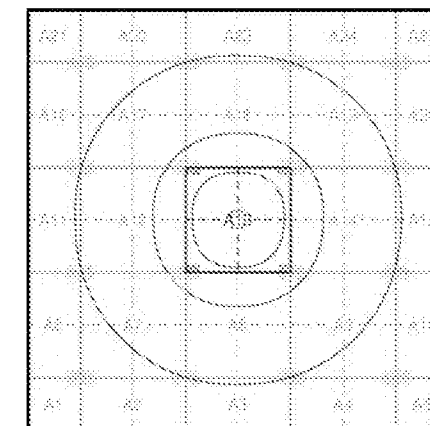
Source map scale - 1:10,000

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)



Historical Map - Slice A



Order Details

Order Number: 104726713_1_1
Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 1000

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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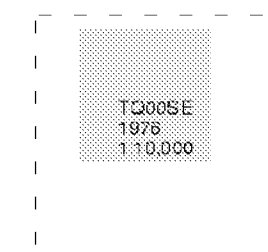
Ordnance Survey Plan

Published 1976

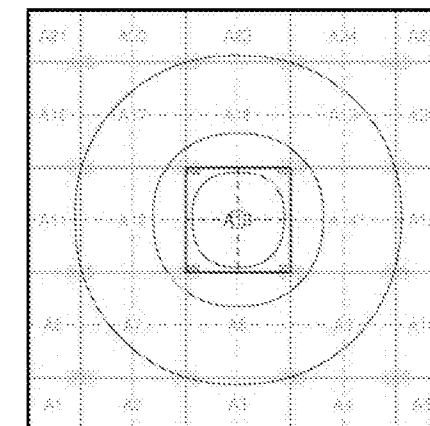
Source map scale - 1:10,000

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: 104726713_1_1
Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 1000

Site Details

Land at Mayflower Way, Angmering, Littlehampton, BN16 4AT



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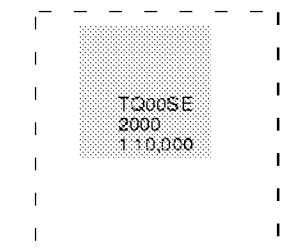
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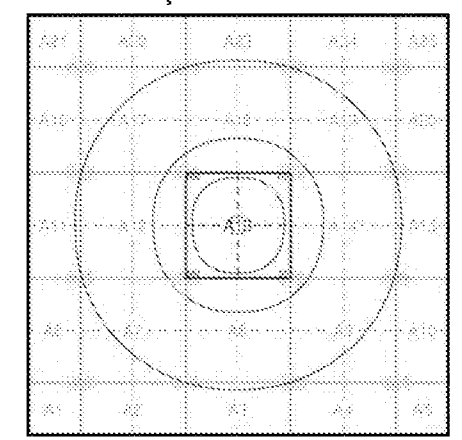
10k Raster Mapping
Published 2000
Source map scale - 1:10,000

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)



Historical Map - Slice A



Order Details

Order Number: 104726713_1_1
Customer Ref: 15306
National Grid Reference: 507250, 103360
Slice: A
Site Area (Ha): 0.96
Search Buffer (m): 1000

Site Details

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