LK CONSULT LIMITED

LAND OFF
ST. MARY'S ROAD
HAYLING ISLAND

PHASE 1 PRELIMINARY
RISK ASSESSMENT



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NON TECHNICAL SUMMARY

LK Consult Ltd (LKC) has undertaken a Preliminary Risk Assessment for land off St. Mary's Road, Hayling Island. The assessment was required to identify any potential contamination risk should the study area be developed for housing.

The works were undertaken in accordance with UK guidance and included a review of the history of the area from historical mapping dating back to 1871 and a review of geological, hydrogeological, ecological, mining, radon and landfill data.

The majority of the study area has remained undeveloped from 1871 mapping with tracks, drains, ponds and a mound present from 1969 mapping. The majority of the study area comprises arable farmland. A farm building with an above ground fuel tank is present in the centre of the study area.

LKC undertook a visit to the study area and hand excavated 8 no. trial holes to identify shallow ground conditions. These identified limited made ground over natural slightly sandy gravelly clay strata across the study area.

Of the 8 no. trial holes undertaken rare plastic fragments were encountered in TH1, rare brick fragments in TH5, rare ash, brick and plastic in TH6 and rare ash and brick in TH7.

A conceptual model in accordance with UK guidance was derived which considers all potential sources, all potential receptors (such as future residents or groundwater) who may be affected by contamination and the possible pathways of how the potential source may affect the identified potential receptors.

Where a source, pathway and a receptor are all present then this comprises a potential pollutant linkage which could warrant further assessment such as by soil sampling and / or remediation.

LKC identified seven potential pollutant linkages, of which four were considered a localised moderate risk, one a site wide moderate risk and two a low to very low risk.

A localised **moderate risk** has been identified with regards to possible asbestos containing materials (ACMs), heavy metals and salts, PAHs and hydrocarbons posing a risk to human health by way of inhalation and direct contact. A **low risk** has been identified elsewhere across the site for these contaminants.

A localised **moderate risk** has also been identified with regards to volatile contaminants posing a risk to human health and mobile contaminants posing a risk to controlled waters. A **low risk** has been identified elsewhere across the site for these contaminants and for pesticides, herbicides and fertilisers.

A precautionary **moderate risk** from soluble sulphate affecting subsurface concrete has been determined across the study area.

A **low to very low risk** has been identified across the study area with regards to gas posing a risk to human health by way of inhalation and for contaminants posing a risk to flora.

An intrusive investigation with appropriate sampling and monitoring is recommended to address these pollutant linkages. This should target areas where a moderate risk has been identified and a low density confirmatory investigation undertaken across the remainder of the site.

A detailed Unexploded Ordnance UXO) desk study and risk assessment provided by Zetica Ltd has identified a moderate UXO hazard level in the northern and eastern parts of the study area. This hazard level has been determined by Zetica Ltd due to records of 13no. bombs falling in the vicinity of the study area. A low UXO hazard level has been identified elsewhere within the study area. Further details and risk mitigation recommendations are provided in the Zetica Ltd report in Appendix D.

LKC also recommend, as per good practice, that a watching brief for made ground and any visual / olfactory evidence of contamination be maintained during site clearance and development works.

1 INTRODUCTION

1.1 Background

LK Consult Ltd (LKC) has been commissioned by Gladman Developments Ltd to carry out a Phase 1 Preliminary Risk Assessment (PRA) for land off St. Mary's Road, Hayling Island. The report was undertaken in support of a future planning application to redevelop the study area for a residential end use.

According to guidance set out in CLR11[1], GPLC1-3[2] and the National Planning Policy Framework (NPPF)[3] a PRA with a study area reconnaissance is required as a minimum to ascertain if there is a potential contamination risk.

In accordance with current guidance, the PRA will include a study area reconnaissance, study area history, geology, hydrogeology, hydrology, mineral search and a landfill search. Information gathered from the desk study and reconnaissance will be used to develop a contamination conceptual model for the study area, which will support the identification and assessment of any pollutant linkages.

Based on the findings of this report, an appropriate intrusive investigation can be derived, if required.

1.2 Study Area Details

A summary of study area details are presented in Table 1-1. Figures 1 and 2 indicate the study area location and boundary.

Location	To the northwest of St. Mary's Road, Hayling Island. Centred at approximate National Grid Reference 471930E 099800N.
Area	11.81ha.
Topography	6 metres above ordnance datum (AOD). Study area is approximately level.
Current Land Use	<u>Study area</u> Study area comprises arable farmland over the majority of the study area with a drain running east to west across the centre of the study area. A farm building, pond and embankments are present in the centre of the study area. An area in the east comprises open grassland with a stockpile of compost, manure and farm machinery. <u>Surrounding Area</u> North: Open grassland, St. Mary's Church and grave yard. East: Residential dwellings and works. South: Residential dwellings. West: Open grassland and residential dwellings.
Proposed Development	Residential dwellings (including up to 30% affordable housing), structural planting and landscaping, informal public open space, children's play areas, sustainable drainage systems (SuDS), vehicular access from St. Mary's Drive and associated ancillary works.

Table 1-1: Summary of study area details.

[1] EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11.
[2] EA (2010). "Guiding Principles for Land Contamination." GPLC1-3.
[3] DCL (2012). "National Planning Policy Framework." Department of Communities and Local Government. March 2012.

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2 STUDY AREA HISTORY

In compiling the study area history, LKC consulted historical mapping provided by the Landmark Information Group Ltd. Copies of relevant historical plans are provided in Appendix A and are summarised Table 2-1. Notable features within 100m of the study area boundary have been presented (distances will be approximate). The exception to this will be features within a 250m buffer that could be infilled historically.

It should be noted that a number of features are no longer shown on the 2015 mapping. This may be due to this type or scale of mapping not showing as much detail as the previous mapping edition, rather than the feature not being present.

Study Area Features	Location	Map Dates Present	Comments
Fields and field boundaries	Whole Site	1871-present	
Footpath	N boundary	1871-2006	Footpath no longer shown on 2015 mapping.
Drain	Centre	1969-present	Running E-W across the study area.
Drain	SW	1969-2006	No longer shown on 2015 mapping. Observed to be present during the study area reconnaissance.
Drain	N boundary	1969-2006	No longer shown on 2015 mapping. Observed to be present during the study area reconnaissance.
Mound	Centre	1969-2006	No longer shown on 2015 mapping. Observed to be present during the study area reconnaissance.
Pond	Centre	1969-present	Directly to the south of the mound.
Track	N	1969-1987	Leading from the N to the centre of the study area. No longer shown on 1990 mapping.
Track	W	1969-2006	No longer shown on 2015 mapping.
Building	Centre	2015 only	Possibly associated with Rook Farm (adj. SE).
Surrounding Area Features	**Distance/ Location**	**Map Dates Present**	**Comments**
Grave Yard	Adj. NE	1871-present	Associated with St. Mary's Church. Extended adjacent to the study area by 1970 mapping.
Well	40m E	1871-1889	No longer present by 1909 mapping.
Smithy	50m E	1871-1909	No longer present by 1910 mapping.
Pond	95m S	1871-1962	No longer present by 1969 mapping.
Pump	50m E	1881-1898	No longer present by 1899 mapping.
Pump	60m E	1881-1898	No longer present by 1899 mapping.
Well	50m E	1881-1881	No longer present by 1898 mapping.
Well	60m E	1881-1898	No longer present by 1899 mapping.
Well	100m E	1881-1899	No longer present by 1909 mapping.
Well	130m S	1881-1913	No longer present by 1931 mapping.
Well	140m E	1881-1909	No longer present by 1910 mapping.
Pond	220m W	1881-1979	No longer present by 1987 mapping.
Pump	240m W	1881-1898	No longer present by 1899 mapping.

Table 2-1: Summary of historical features.

Surrounding Area Features	Distance/ Location	Map Dates Present	Comments
Rook Farm	Adj. SE	1871-present	
5 no. Wells	60m-70m E and 130m NE	1898-1899	No longer present by 1909 mapping.
Smithy	95m E	1898-1909	No longer annotated by 1910 mapping.
4 no. pumps	100m S, 100m NE, 110m NE, 120m NE	1898-1899	No longer present by 1899 mapping.
Pump	160m SW	1898-1913	Annotated as a well by 1909 mapping. No longer present by 1931 mapping.
Pumps	220m SE	1898 only	No longer present by 1899 mapping.
Pumps	230m SE	1898 only	No longer present by 1899 mapping.
Pump	240m W	1898 only	No longer present by 1899 mapping.
Orchard	60m S	1909-1962	No longer present by 1970 mapping.
Orchard	10m S	1932-1979	Glasshouses present and extended S by 1962 mapping. No longer present by 1987 mapping.
Orchard	10m SW, 10m S and 25m E.	1932-1962	No longer present by 1969 mapping.
Orchard	95m E	1932-1970	Orchard Trees no longer present, glasshouses are present and the area annotated as a Nursery by 1970 mapping. No longer present by 1979 mapping.
Orchard	90m E	1932-1962	
Southleigh Holiday Park	Adj. SW	1969-1987	Includes swimming pool, paddling pool, embankments and tennis courts. No longer present by 1990 mapping. Area redeveloped for housing.
Garage	60m E	1970-present	No longer annotated by 1989 mapping.
Electricity Substation	20m NE	1970-present	
Works	Adj. NE	1982-present	
Works	Adj. NE	1989-1993	No longer present by 1996 mapping.

Table 2-1: Summary of historical features.

3 ENVIRONMENTAL SETTING

In compiling this Section, LKC consulted environmental information provided by the Envirocheck Report (Appendix B), British Geological Survey (BGS) (Appendix C), the Coal Authority and Zetica Ltd (Appendix D). A summary is presented in Table 3-1.

Categories (data sources)			Details
Geology	Artificial[1]		None recorded.
	Superficial[1]		River Terrace Deposits (sand, silt and gravel).
	Bedrock[1,2]		London Clay Formation (clay, silt and sand).
	BGS logs[3]		BH Ref: SZ29NW15, NW of the study area: compact sandy gravel 3.65m, firm brown silty clay to 4.57m, compact brown sand to 5.18m, firm grey clayey silt to 6.7m. BH Ref: SZ29NW14, approximately 10m W of the study area: topsoil to 0.8m, soft brown sandy clay to 2.1m, brown sandy clayey gravel to 2.74m, brown sandy gravel to 3.96m, soft brown silty clay to 4.27m. BH Ref: SZ29NW13, approximately 80m W of the study area: firm brown sandy clay to 1.8m, grey / brown sandy clayey gravel to 2.43m, grey silty clay to 3.35m, brown compact sand to 3.81m, grey sandy clay with flints to 4.26m.
Hydro-geology	Aquifer Designation	Superficial[1]	Secondary A.
		Bedrock[1]	Unproductive strata.
	Source Protection Zone (SPZ)[1]		Study area does not lie within a SPZ.
	Groundwater Abstractions[1]		One in the centre of the study area, taken by A A Cleave & Sons at a daily rate of 218m^3 for spray irrigation. Nearest outside the study area: 306m N, also taken by A A Cleave & Sons for spray irrigation.
Hydrology	Nearest Surface Water[1]		Drain in the centre of the study area.
	Water Quality Data[1]		No water quality data available.
	Flooding[1]		No risk from rivers or sea.
	Surface Water Abstractions[1]		None within 500m. Nearest 814m E, taken by A G Philips & Son from an unnamed surface water for spray irrigation.
	Discharge Consent[1]		None within 250m. Nearest 453m W, unknown discharge into freshwater stream/river by Hermitage Housing Association. Revoked 31st March 1997.
	Pollution Incidents[1]		None within 250m. Nearest 445m NE, sewage and sewerage material into a seaside mill pond caused by deliberate action. Category 3 – minor incident. Dated 24th August 1999.
Minerals / Mining	Coal Mining Development High Risk Area[4]		Not identified within the study area.
	Surface Extractions[1]		None within 1km.
	Cheshire Brine Compensation District		Not identified within the study area.

Table 3-1: Summary of environmental setting.
Data Sources: **1** - Envirocheck Report (Appendix A and B); **2** - BGS Sheet 331 1:50,000; **3** - BGS GeoIndex http://mapapps2.bgs.ac.uk/geoindex/home.html (Appendix C); **4** - The Coal Authority Web Mapping Services (WMS) and Interactive Map Viewer http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx

Categories (data sources)		Details
Ground Stability[1] (on-site)	Collapsible Ground	Low hazard.
	Compressible Ground	No hazard.
	Landslide	Very low hazard.
	Running Sand	Low hazard.
	Shrinking / Swelling Clay	Low hazard.
	Ground Dissolution	No hazard.
Landfill sites	Known/Registered[1]	None within 500m. Nearest 667m E, north of Mengham House. Deposited waste included inert waste. Input dates not supplied.
	Potential[1]	28 within 250m: 11 pumps, 50-240m, potentially infilled from 1899 to 1931 mapping. 11 wells, 40-140m, potentially infilled from 1898 to 1931 mapping. 3 pools, 40-140m, potentially infilled from 1982 to 1990 mapping. 2 ponds, 95-220m, potentially infilled from 1969 to 1987 mapping.
Radon[1]		The property is in an intermediate probability radon area, as between 1 and 3% of homes are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions.
Designated Sites[1]		Area of Outstanding Natural Beauty, Chichester Harbour – 467m E.
Contemporary Trade Directory[1]		6 within 100m. Nearest 16m E: Smith & Austin Engineering Products Ltd (sheet metal work). Status is active.
Fuel Station Entries[1]		2 within 100m. Nearest 68m E, Hayling Motors. Status is obsolete.
Unexploded Ordnance (UXO)[5]		A detailed UXO desk study and risk assessment has identified a moderate UXO hazard level on the N and E parts of the study area and a low UXO hazard level on the remainder of the study area.

Table 3-1: Summary of environmental setting.
Data Sources: **1** - Envirocheck Report (Appendix A and B); **5** – Zetica Ltd UXO desk study and risk assessment (Appendix D).

4 STUDY AREA RECONNAISSANCE

A study area reconnaissance was carried out on the 12th April 2016. Hand dug trial holes were undertaken in accessible areas to confirm the shallow ground conditions.

An annotated plan with photographs, trial hole logs and pertinent features is provided in Appendix E.

Relevant features identified are summarised below:

- Study area comprises arable farmland over the majority of the study area with drains in the centre and southwest and along the northern boundary.
- A farm building, pond and a mound are present in the centre of the study area.
- The building appears to house farm vehicles.
- An above ground fuel tank was observed adjacent to the farm building, no hydrocarbon staining or evidence of spills / leakages was observed.
- An area in the east comprises open grassland with a stockpile of compost, stockpile of manure and farm machinery.
- Made ground was observed to a depth of 0.3m underlain by natural slightly sandy gravelly clay. Of the 8 no. trial holes undertaken rare plastic fragments were encountered in TH1, rare brick fragments in TH5, rare ash, brick and plastic in TH6 and rare ash and brick in TH7.
- Rare ash and brick fragments were observed on the mound.
- Access to the study area is via a gate off St. Mary's Road.
- Overhead wires from the adjacent substation pass over the north east corner of the site.

The surrounding area comprises:

- Open grassland, St. Mary's Church and Grave Yard to the north.
- Residential dwellings and works to the east.
- Residential dwellings to the south.
- Open grassland and residential dwellings to the west.

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5 PRELIMINARY CONCEPTUAL MODEL

5.1 Introduction

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the study area and whether further investigation work is required.

The Sections below are therefore divided into potential contaminant, potential pathway and potential receptor as described in CLR11[4]. The final Section provides an assessment of the potential pollutant linkages that may still be present on the study area if redevelopment were to occur.

5.2 Potential Contaminants

Arable Farmland

The majority of the study area is currently used as arable land. This land uses may involve the use of pesticides, herbicides and fertilisers which may contain heavy metals (lead, arsenic), organophosphates, organochlorides, chlorophenols, Chlorinated Aliphatic Hydrocarbons (CAHs). Specific contaminants such as aldrin, dieldrin, atrazine and DDT may also be present.

Above Ground Fuel Tank and Farm Building

An above ground fuel tank and farm building are present in the centre of the study area. Localised spillages of hydrocarbon fuels, anti-freeze and solvents may have occurred within this area of the site.

Made Ground

Made ground was encountered in trial holes across the study area during the reconnaissance with inclusions of rare ash, brick and plastic in trial holes along the southern and south eastern boundaries. Rare ash and brick was also noted in the central mound. Similar made ground may also be present below footpaths and tracks.

It is therefore possible that there could be some localised, low level contamination associated with this. Localised, contamination could include heavy metals (such as arsenic and lead), sulphates, and PAHs[5].

It is also possible that Asbestos Containing Materials (ACMs) could be present in the made ground within the embankments in the centre of the study area, depending on the source of the material.

Potentially infilled ground

Several areas of potentially infilled ground have been identified within 250m of the study area. These have the potential to generate hazardous gas (principally carbon dioxide and methane).

[4] Defra (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11.
[5] Defra (2002). "Potential Contaminants for the Assessment of Land." R&D Publication CLR 8.

The potential for migration of hazardous gas can depend upon the age of the feature, volume of material, type of infill material, size of feature distance from the study area and intervening geology.

Due to the size of the features, the distance from the study area and date of infilling these are not considered to be viable sources of hazardous gas.

Ordnance

A moderate UXO hazard level has been determined for the northern and eastern parts of the study area. Therefore, LKC consider that there is a low likelihood in this part of the study area of contamination from possible contaminants associated with UXO such as acids, organic contaminants and metal salts including lead azide and mercury fulminate.[6]

Industries in Surrounding Area

The immediate surrounding areas have been developed for both residential and industrial usage. Several potentially contaminative land-uses have been identified within 100m of the study area (including several orchards, electricity substation, works, garage and a smithy); however, contamination is unlikely to be more significant than the contamination sources already identified.

London Clay

The London Clay may be a source of sulphate.

5.3 Potential Pathways

The pathways are split into the migration of soil, water and gas.

Soil

This also includes soil-derived dust / fibres, vapours from the soil and the uptake of contaminants from the soil into flora / vegetables.

Principal potential pathways associated with human health from soil contamination are ingestion, dermal and inhalation. The current UK technical report document[7] recognises ten such pathways comprising four ingestion, two dermal and four inhalation. These are listed as follows:

- Ingestion of soil
- Ingestion of soil-derived indoor dust
- Ingestion of contaminated vegetables
- Ingestion of soil attached to vegetables
- Dermal contact with soil
- Dermal contact with soil-derived indoor dust
- Inhalation of soil-derived outdoor dust
- Inhalation of soil-derived indoor dust
- Inhalation of vapours outside
- Inhalation of vapours inside

The proposed end-use follows a standard conceptual model of residential. For this land use scenario all ten of the pathways will have to be considered.

Soils may be within direct contact with receptors (e.g. building foundations, services).

[6] DoE Industry Profile (1995). "Chemical Works, Explosives, Propellants and Pyrotechnics Manufacturing Works"
[7] EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

Soils can also generate dust / fibres which could migrate via windblow to adjacent receptors.

Water

Surface water and groundwater are principal mechanisms for the migration of contaminants. The following pathways are considered in the assessment:

- Surface run-off over impermeable surface.
- Infiltration into the ground, through potentially contaminated material (contamination possibly going into solution).
- Migration through potentially permeable strata and preferential pathways, such as drains, sewers and culverts.

The superficial geology comprises River Terrace Deposits (clay, silt, sand and gravel) and is likely to be variably permeable. This could therefore act as a pathway for the migration of potential contaminated waters.

Bedrock is anticipated to be London Clay Formation (clay, silt and sand) and is likely to be relatively impermeable and reduce the migration of potential contaminated waters.

A watercourse runs through the centre of the study area which could act as a preferential pathway.

Gas

Gas can migrate via the following potential pathways:

- Migration through potentially permeable strata and preferential pathways, such as drains, sewers and culverts.
- Migration into buildings (e.g. via services) and accumulation of gases in confined spaces (potentially causing explosion if methane is present).

As discussed above, the superficial geology and preferential pathways may act as pathways for gas migration. The clay bedrock may act as a barrier for migrating gas.

5.4 Potential Receptors

Potential receptors include:

- Human Health: future residents and receptors outside of the study area.
- Controlled Waters: Drains in the centre and southwest of the study area and underlying Secondary A Aquifer.
- Buildings and structures.
- Potable water pipes.
- Flora within future gardens/landscaping.

5.5 Preliminary Contamination Conceptual Model

The preliminary contamination conceptual model for land at St. Mary's Road, Hayling Island is illustrated in Table 5-1 below and has identified seven generic potential pollutant linkages.

Each linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552[8].

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix F.

Where LKC identified a low to very low risk, either limited intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the study area and the proposed development.
Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what category the pollutant linkage will fall into (i.e. moderate or low risk will be chosen).

Where LKC identifies a moderate or higher, risk intrusive work or precautionary remedial measures will be recommended.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors. Acute risks can be easily mitigated by good environmental management of the study area during works. Standard health and safety precautions (as per HSE guidance[9]) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

[8] CIRIA (2001). "Contaminated Land Risk Assessment: A Guide to Good Practice". C552.
[9] HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment
PL1	Dermal contact. Inhalation of soil, fibres and dust. Ingestion of soils, dust, vegetables, soil attached to vegetables. Windblown dust.	Future residents. Receptors outside the study area.	ACM (potentially within mound).	Low (localised)	Severe (ACM)	**Moderate**	Low probability as ACMs may be present in the mound in the centre of the study area. **Recommendation:** Targeted intrusive investigation required.
				Unlikely (remainder)	Severe	Moderate / **Low**	Unlikely probability across the remainder of the study area due to absence of development and demolition materials in the soil. Low risk assumed. **Recommendation:** No intrusive works required.
			Heavy metals and PAHs (ash in made ground).	Low (localised)	Medium	**Moderate /** Low	Low probability of localised heavy metals and PAHs in the site soils below paths/tracks, mound and where rare ash was noted during the study area reconnaissance. Moderate risk assumed due to the proposed residential development. **Recommendation:** Targeted intrusive investigation required.
				Unlikely (remainder)	Medium	**Low**	Unlikely probability of heavy metals and PAHs across the remainder of the study area as made ground was not observed. **Recommendation:** Low density confirmatory intrusive investigation required given made ground identified in trial holes.
			Heavy end hydrocarbons (spills / leakages from above ground fuel tank and farm building).	Likely (localised)	Medium	**Moderate**	Likely probability of localised hydrocarbons as spills / leakages considered possible from above ground fuel tank and building in the centre of the study area. **Recommendation:** Targeted intrusive investigation required.
				Unlikely (remainder)	Medium	**Low**	Unlikely probability across the remainder of the study area due to lack of a viable source. **Recommendation:** Intrusive investigation not required.
			Pesticides, herbicides and fertilisers (arable farmland).	Low	Medium	Moderate / **Low**	Low probability of pesticides, herbicides and fertilizers from arable land use. Low risk assumed at this stage. **Recommendation**: Low density confirmatory intrusive investigation required.
			Acids, organic contaminants metal salts including lead azide and mercury fulminate (ordnance)	Low (localised)	Medium	**Moderate /** Low	Low probability in the N and E of the study area where a moderate UXO hazard level has been identified. Moderate risk assumed due to the proposed residential development. **Recommendation:** Targeted intrusive investigation required.
				Unlikely (remainder)	Medium	**Low**	Unlikely probability across the remainder of the study area due to the low UXO hazard level. **Recommendation:** Intrusive investigation not required.
PL2	Inhalation of vapours. Migration through permeable strata and preferential pathways.	Future residents.	Volatile Contaminants: Fuels, anti-freeze and solvents (spills / leakages from above ground fuel tank and farm building).	Likely (localised)	Medium	**Moderate**	Likely probability as spills / leakages of volatile contamination considered likely from farm vehicles and above ground fuel tank. **Recommendation:** Targeted intrusive investigation required.
				Unlikely (remainder)	Medium	**Low**	Unlikely probability across the remainder of the study area as no significant source was identified. **Recommendation:** Intrusive investigation not required.
PL3	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future residents. Buildings. Receptors outside the study area.	Methane, carbon dioxide. (potentially infilled features 250m of the study area).	Unlikely	Severe	Moderate / **Low**	Unlikely probability due to size, distance from the study area and age of potential sources of gas identified. Low risk assumed as clay deposits will likely impede migration of hazardous gas. **Recommendation:** Intrusive investigation not required.

Table 5-1: Preliminary Contamination Conceptual Model.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment
PL4	Surface Run-off. Migration through permeable strata and preferential pathways Perched waters migration.	Groundwater (Secondary A Aquifer). Surface water (Drains within the study area).	Mobile Contaminants: Fuels, anti-freeze and solvents (spills / leakages from above ground fuel tank and farm building).	Likely (localised)	Medium	**Moderate**	Likely probability of localised spills / leakages of mobile contamination. **Recommendation:** Targeted intrusive investigation required.
				Unlikely (remainder)	Medium	**Low**	Unlikely probability across the remainder of the study area as no significant source was identified. **Recommendation:** Intrusive investigation not required unless evidence of mobile contamination identified in the ground.
PL5	Sulphate attack on concrete.	Building structure.	Sulphate (ash in made ground and in London Clay).	Likely	Mild	**Moderate** / Low	Likely probability and moderate risk assumed at this stage. **Recommendation:** Confirmatory intrusive investigation required.
PL6	Ingestion of tainted water supply.	Future residents.	Organic Contaminants (spills / leakages from above ground fuel tank and farm building).	Likely	Medium	**Moderate**	Likely probability of localised spills / leakages of mobile contamination. **Recommendation:** Targeted intrusive investigation required.
				Unlikely	Medium	**Low**	Unlikely probability across the remainder of the study area as no significant source was identified. **Recommendation:** Intrusive investigation not required.
PL7	Direct Contact (plant uptake).	Flora.	Phytotoxic Contaminants (made ground, herbicides).	Low	Minor	**Very low**	Low probability as no evidence of vegetation distress noted. **Recommendation:** Intrusive investigation not required.

Table 5-1 (continued): Preliminary Contamination Conceptual Model.

6 SUMMARY CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary Conclusions

The proposed development comprises residential dwellings (including up to 30% affordable housing), structural planning and landscaping, informal public open space, children's play areas, sustainable drainage systems (SuDS), vehicular access from St. Mary's Drive and associated ancillary works.

The majority of the study area has remained undeveloped from 1871 mapping with tracks, drains, ponds and a mound present from 1969 mapping. The majority of the study area comprises arable farmland. A farm building with an above ground fuel tank is present in the centre of the study area.

A moderate UXO hazard level has been identified for the northern and eastern parts of the study area, with a low UXO hazard level identified for the remainder.

Potential contamination sources affecting the study area were identified as heavy metals and salts, PAHs, sulphate, asbestos, hydrocarbons, herbicides, pesticides and gas (carbon dioxide and methane). These contaminants may pose a risk to future residents (via ingestion/dermal contact/inhalation pathways and explosion), controlled waters (via migration through permeable strata / preferential pathways), buildings and structures (direct contact and explosion), water pipes (direct contact) and flora (root uptake).

A contamination conceptual model has been produced by LKC. This has identified the following risks summarised in Table 6-1. Where a moderate / low risk was identified, the assumed risk at this stage has been shown.

Pollutant Linkage		Risk	Further Action Required
1	Contaminants posing a risk via dermal contact, ingestion and inhalation (of soil, dust, fibres and vegetables).	**Moderate** (localised)	Localised moderate risk for ACMs, heavy metals and salts, PAHs and hydrocarbons - targeted intrusive investigation required.
		Low (remainder)	Low density intrusive investigation required across the remainder of the study area to confirm ground conditions and for pesticides, herbicides and fertilisers.
2	Volatile contaminants posing a risk via the inhalation of vapours.	**Moderate** (localised)	Localised moderate risk around tank and farm building - targeted intrusive investigation required.
		Low (remainder)	No intrusive work required.
3	Gas posing a risk via the migration of gas into building causing explosion and asphyxiation.	**Low**	No intrusive work required.
4	Mobile contamination posing a risk via the migration through permeable strata.	**Moderate** (localised)	Localised moderate risk around tank and farm building - targeted intrusive investigation required.
		Low (remainder)	No intrusive work required unless evidence of mobile contaminants identified in the ground.
5	Sulphate posing a risk to building via direct contact (sulphate attack).	**Moderate**	Confirmatory Intrusive investigation required.
6	Organic contaminants posing a risk to water pipes.	**Moderate** (localised)	Localised moderate risk around tank and farm building - targeted intrusive investigation required.
		Low (remainder)	No intrusive work required.
7	Phytotoxic Metals posing a risk to flora via root uptake.	**Very Low**	Intrusive investigation not required.

Table 6-1: Risk table.

Based on the above LKC would recommend that further work is undertaken, which is briefly detailed in the following Sections.

6.2 Recommendations

6.2.1 General

In accordance with the NPPF, LKC consider that sufficient information on the potential contaminative status of the study area is available in this Preliminary Risk Assessment report to allow the validation of any future planning application by the Local Planning Authority and for conditional planning approval to be granted. Such conditional approval will likely include standard prescriptive conditions requiring a study area investigation, risk assessment and, if appropriate, a remedial strategy are completed to the satisfaction of the Local Planning Authority prior to the commencement of any development.

LKC would recommend that once conditional planning approval is granted, a Phase 2 intrusive survey should be carried out across the study area to investigate the identified potential pollutant linkages further. The scope of this Phase 2 survey should be prior agreed with the Local Authority and should include the following.

6.2.2 Phase 2 Site Investigation

The investigation should include targeted sampling in the centre, north and east of the study area involving sampling of the near surface soils beneath tracks, below the footprints of current buildings, the mound and around the above ground tank.

A low density investigation is recommended across the remainder of the site to confirm ground conditions and to assess the site wide risk from pesticides, herbicides and fertilisers. Investigation work is required to assess the risk to proposed buildings from naturally occurring sulphate given the underlying geology.

It should be noted that boreholes and / or trial pits may also be utilised to provide appropriate geotechnical information on sub-surface conditions.

The UXO hazard level should also be considered prior to the undertaking of, and during any intrusive site works. Further details and risk mitigation recommendations are provided in the Zetica Ltd report in Appendix D.

6.2.3 Watching Brief

Notwithstanding the above, a watching brief should be maintained by the site manager during the clearance of the study area and development works, for any likely contaminated made ground, such as ash and clinker; any unusual ground conditions and any visual and / or olfactory evidence of hydrocarbon contamination.

If evidence of made ground and / or visual and olfactory evidence of contaminants are identified, then near surface sampling will likely be required to characterise the material and recommendations for appropriate remediation undertaken, if required. Samples should be collected in sufficient quantity and analysed for a suitable suite of determinands to demonstrably characterise the study area. Should any significant thickness of made ground be encountered during works within the study area, LKC would recommend that this information is reported to the Local Authority and to LKC for further assessment.

FIGURES

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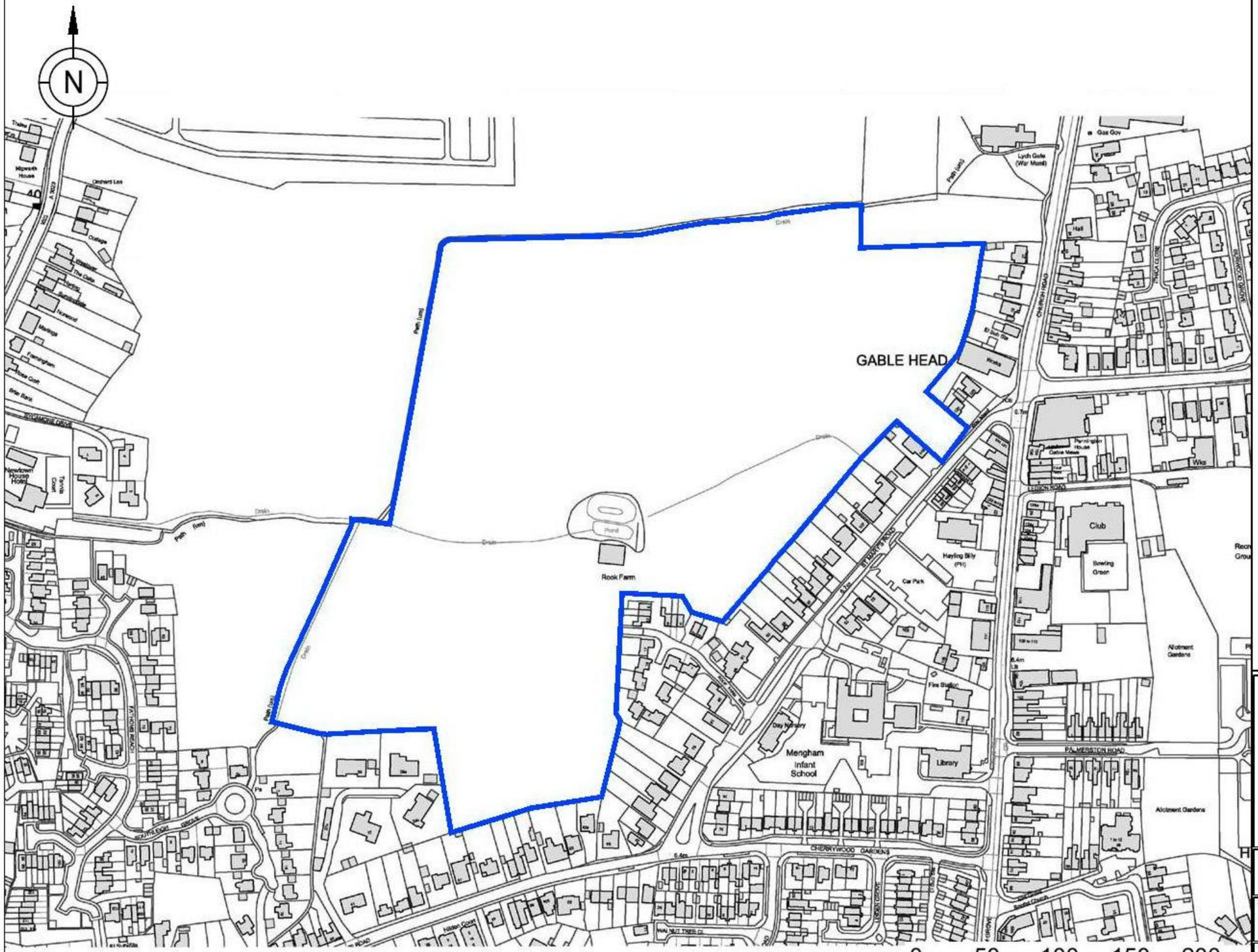
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Figure 1: Study Area Location Plan, Land at St Mary's Road, Hayling Island

Drawn: April 2016 Scale: 1:25,000 @ A4 (see scale bar)

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KEY

Study Area Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

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Client: Gladman Developments Ltd

Site: Land at St Mary's Road, Hayling Island

Title: Study Area Boundary Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 16 1109	1:4000 @ A4	2	

Drawn By:	Checked By:	Drawn:
AC	TB	Apr 2016

Extract from: Gladman
Drawing Ref: Location Plan, 2016-026-01 (16/03/2016)

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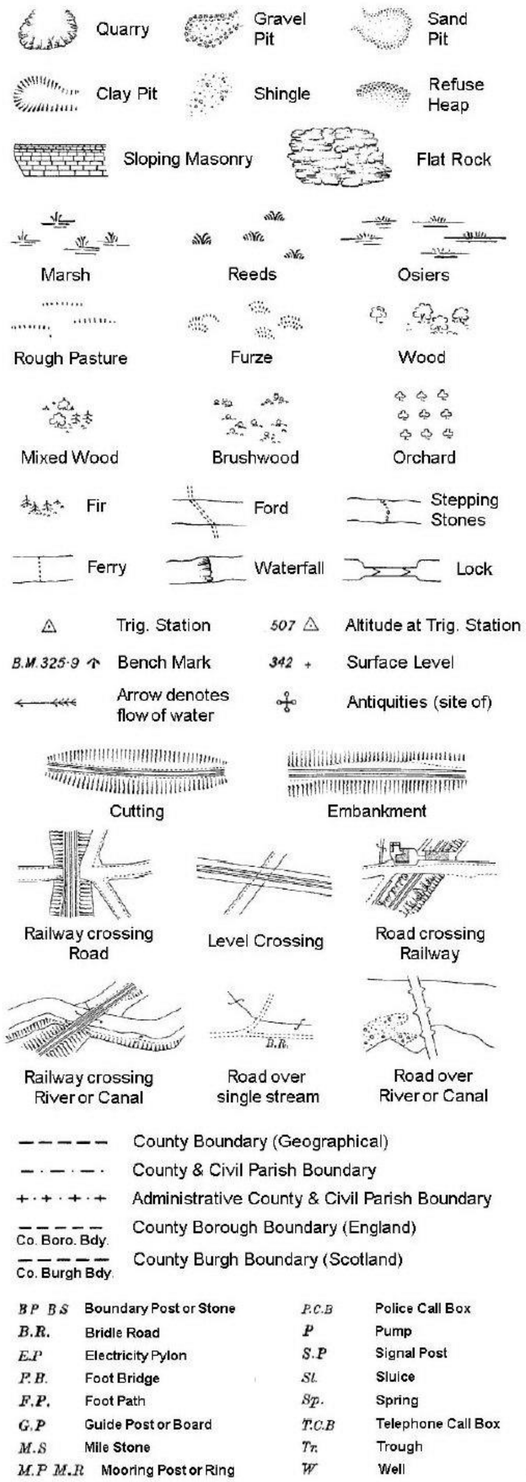
APPENDIX A

HISTORICAL MAPS

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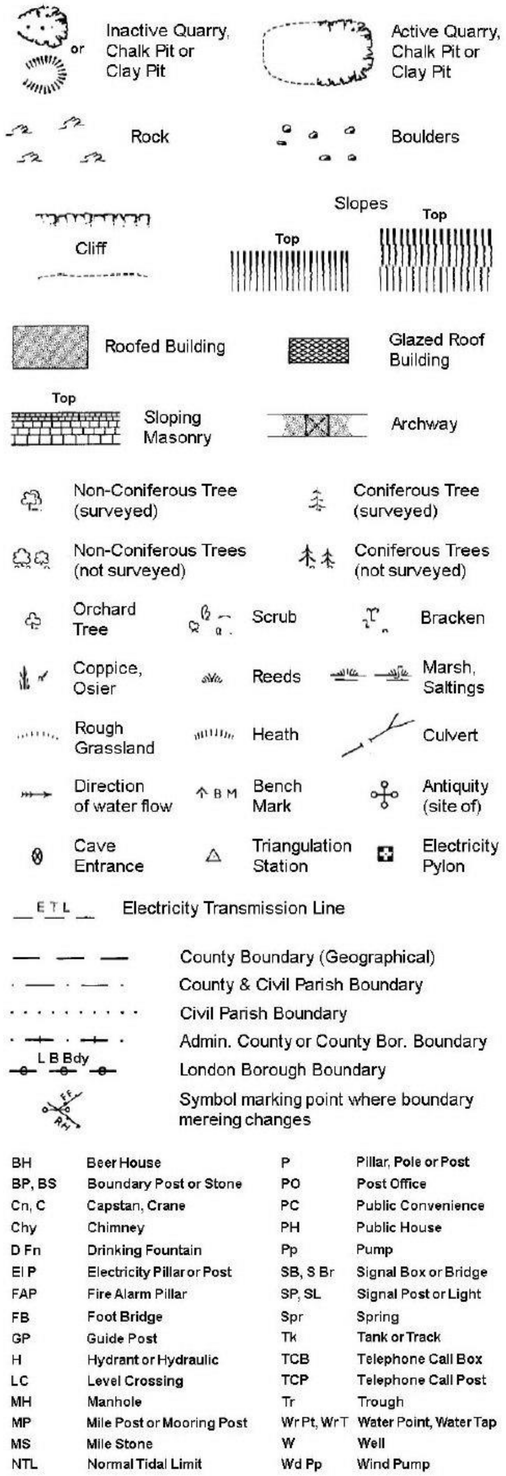
Historical Mapping Legends

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



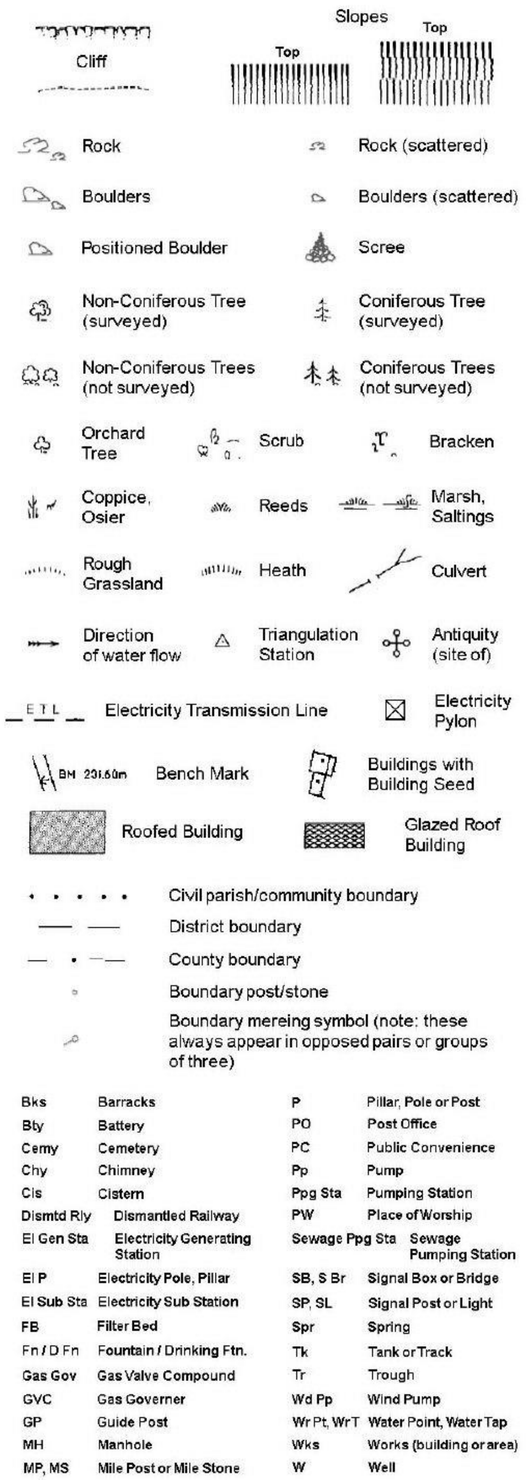
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



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

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



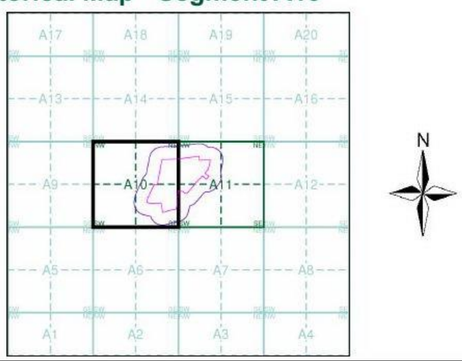
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity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

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hampshire & Isle Of Wight	1:2,500	1879 - 1881	2
Hampshire & Isle Of Wight	1:2,500	1898	3
Hampshire & Isle Of Wight	1:2,500	1909	4
Hampshire & Isle Of Wight	1:2,500	1932	5
Ordnance Survey Plan	1:2,500	1969	6
Additional SIMs	1:2,500	1979	7
Additional SIMs	1:2,500	1987 - 1988	8
Ordnance Survey Plan	1:2,500	1990	9
Additional SIMs	1:2,500	1990 - 1991	10
Large-Scale National Grid Data	1:2,500	1993	11
Large-Scale National Grid Data	1:2,500	1996	12

Historical Map - Segment A10

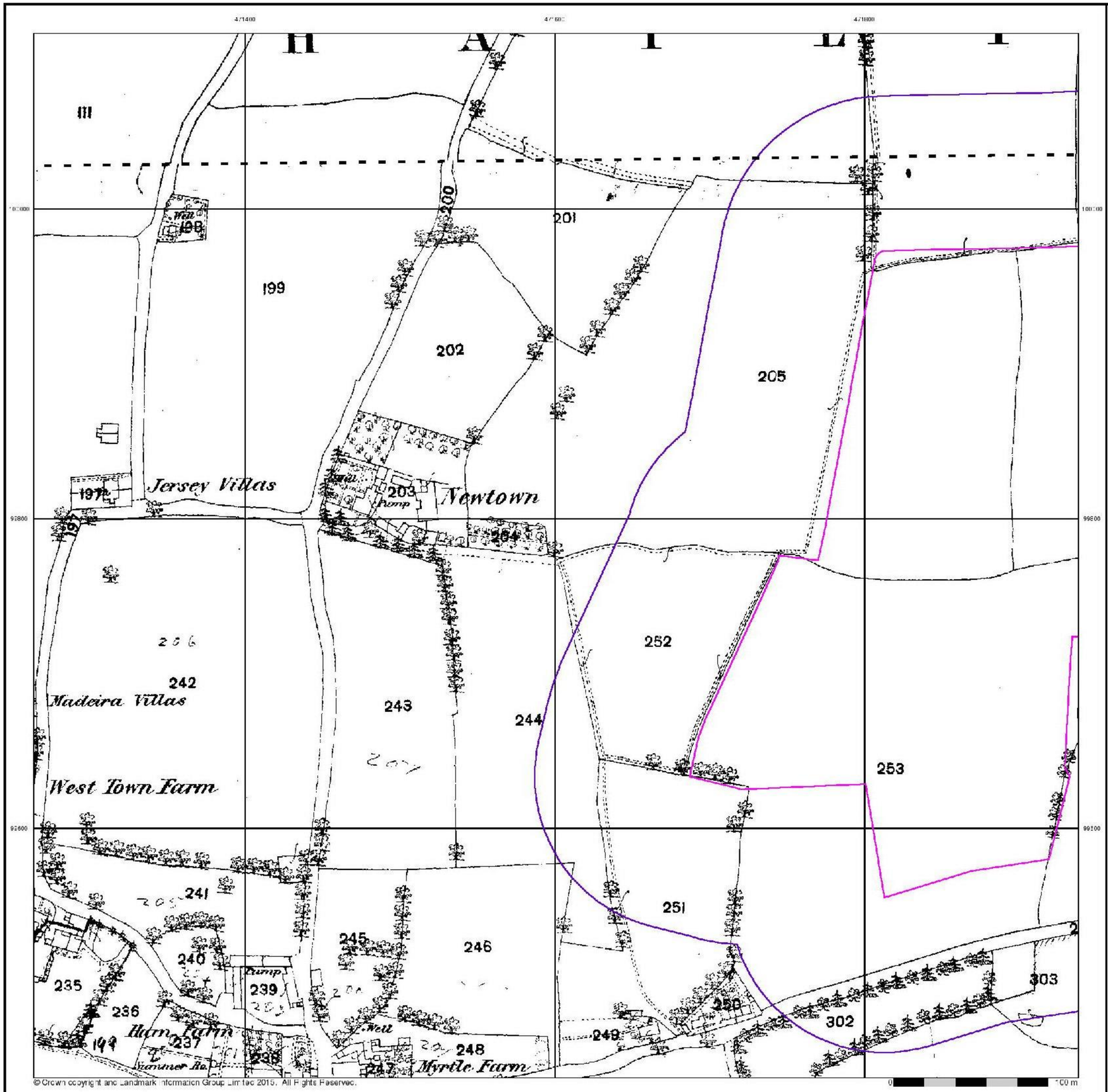


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Search Buffer (m):	100

Site Details

Site at 471930E, 099820N



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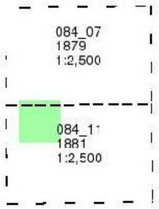
Hampshire & Isle Of Wight

Published 1879 - 1881

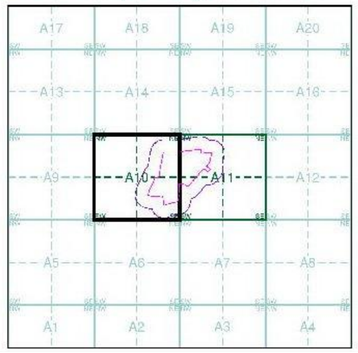
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A10



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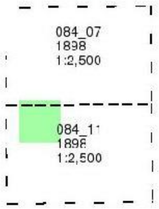
Hampshire & Isle Of Wight

Published 1898

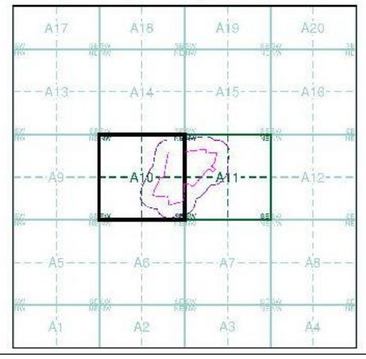
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Map Name(s) and Date(s)



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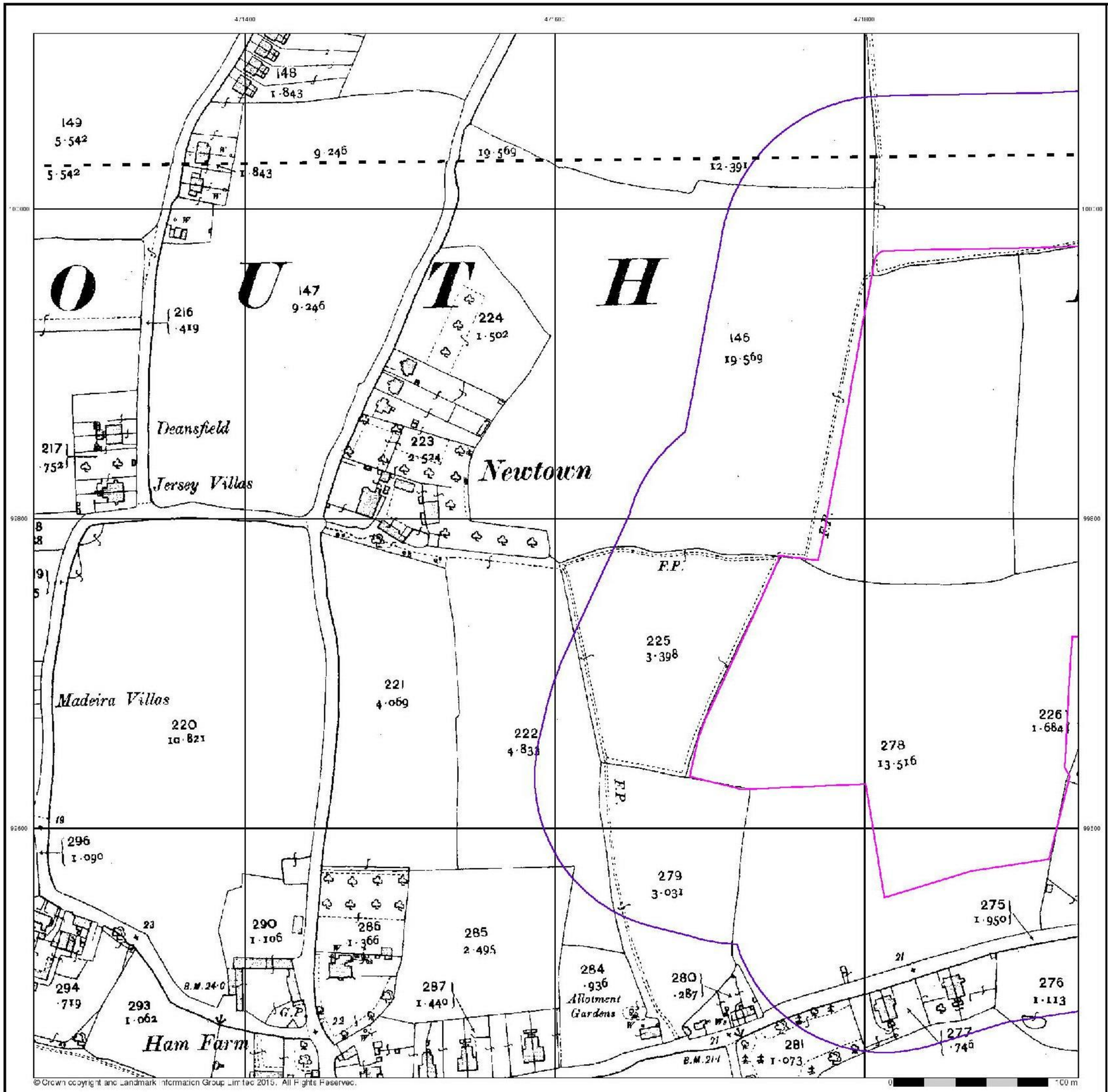
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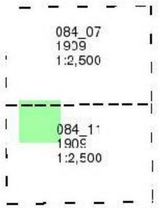
Hampshire & Isle Of Wight

Published 1909

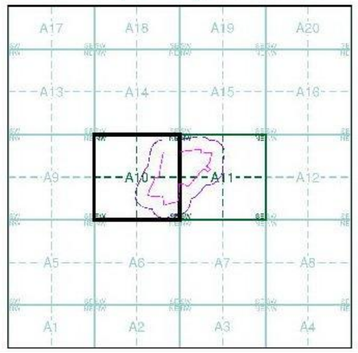
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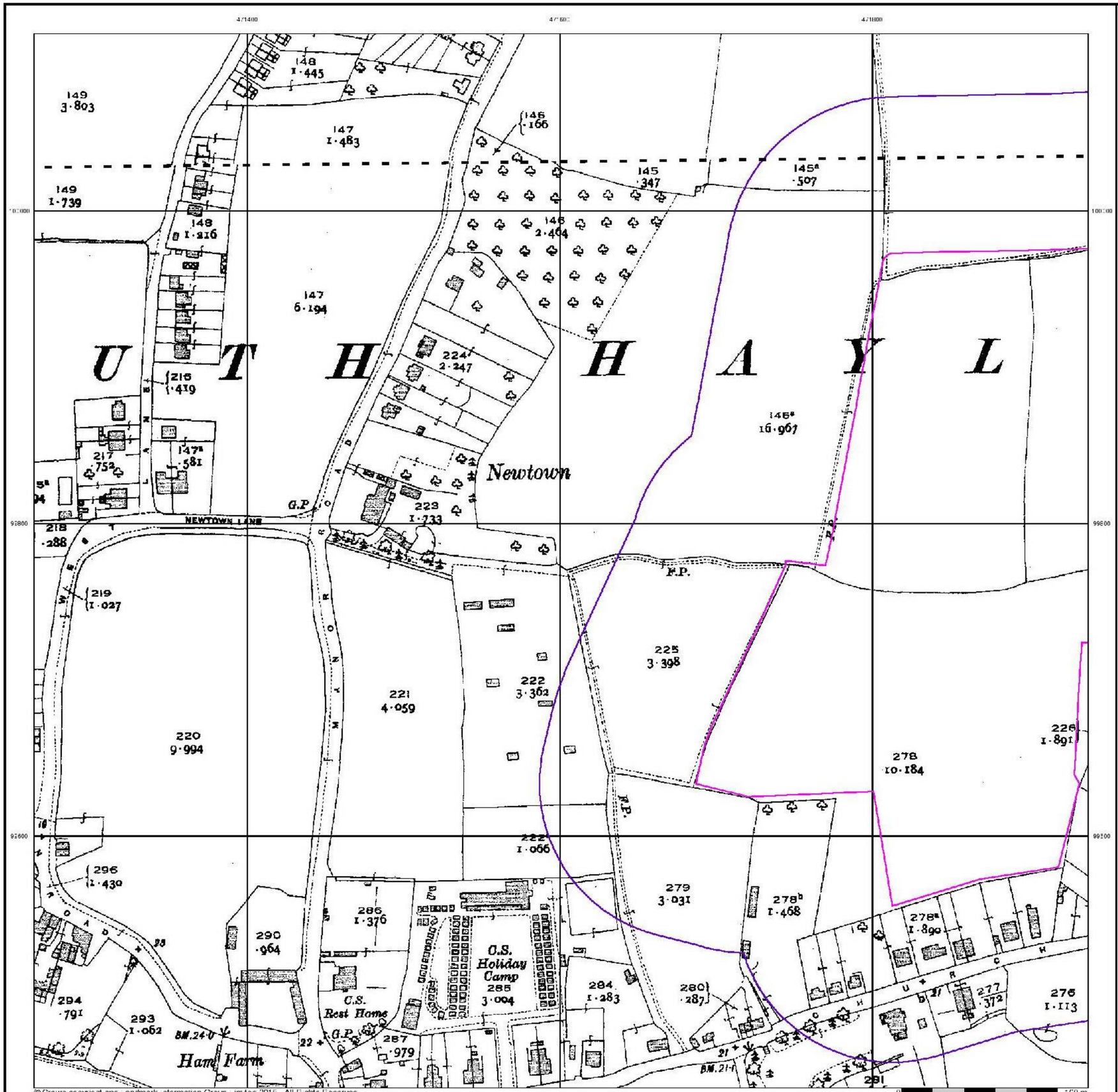
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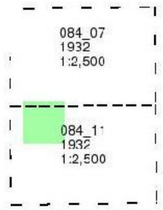
Hampshire & Isle Of Wight

Published 1932

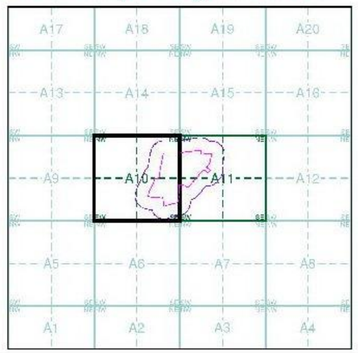
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Map Name(s) and Date(s)



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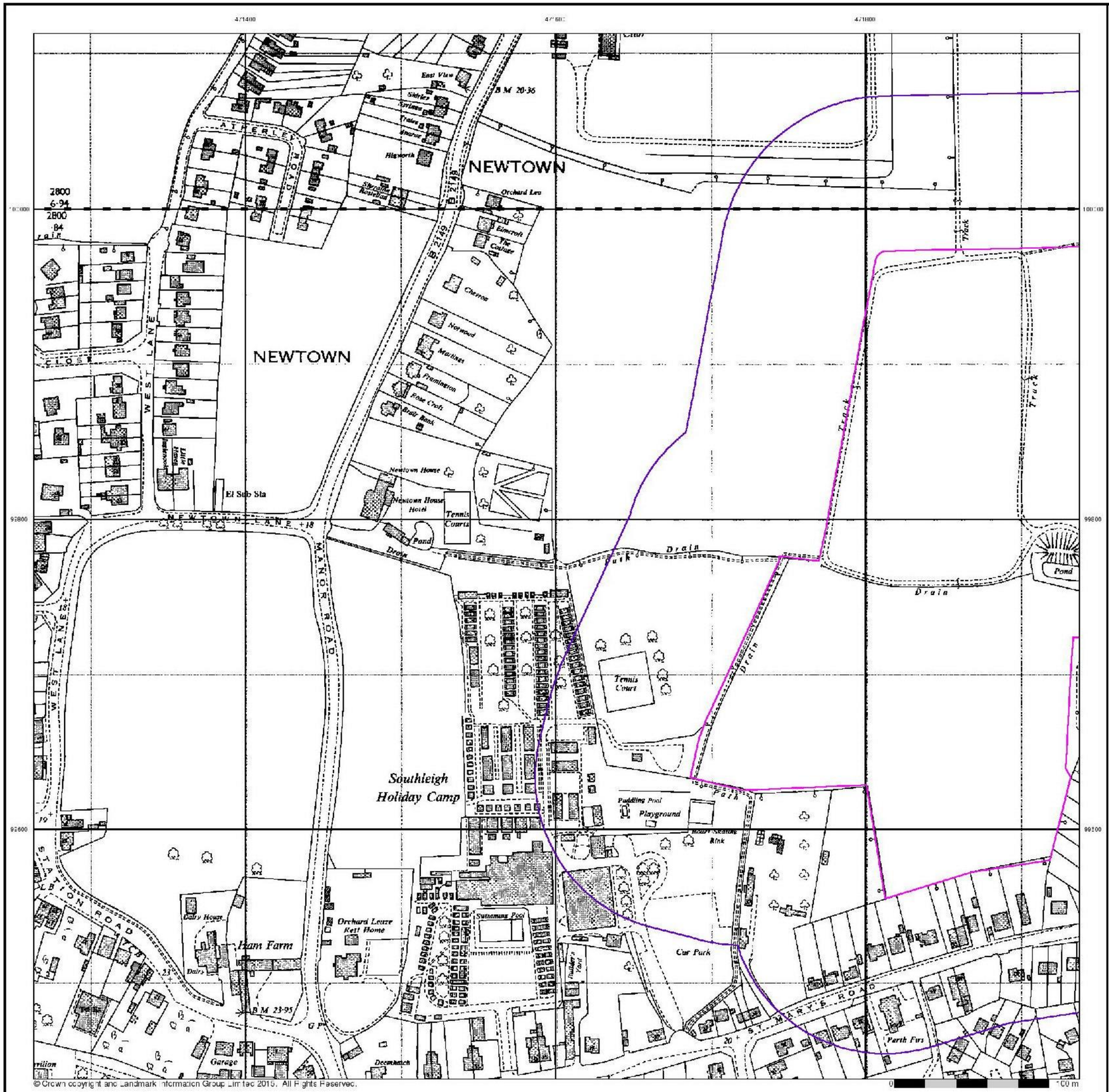


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Ordnance Survey Plan

Published 1969

Source map scale - 1:2,500

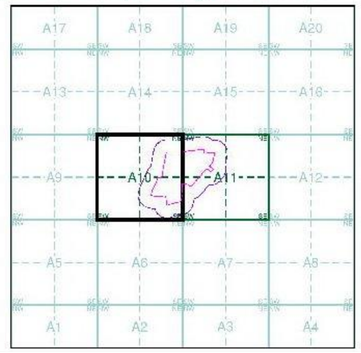
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Map Name(s) and Date(s)

SU7·00
1969
1:2,500

SZ7199
1969
1:2,500

Historical Map - Segment A10



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Additional SIMs

Published 1979

Source map scale - 1:2,500

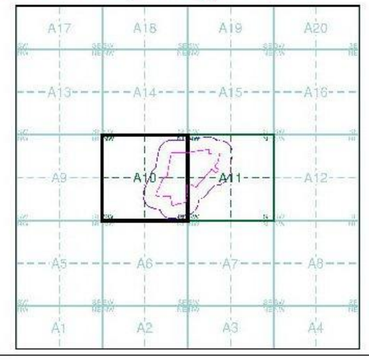
The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps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

Map Name(s) and Date(s)

SU7100
1979
1:2,500

SZ7199
1979
1:2,500

Historical Map - Segment A10



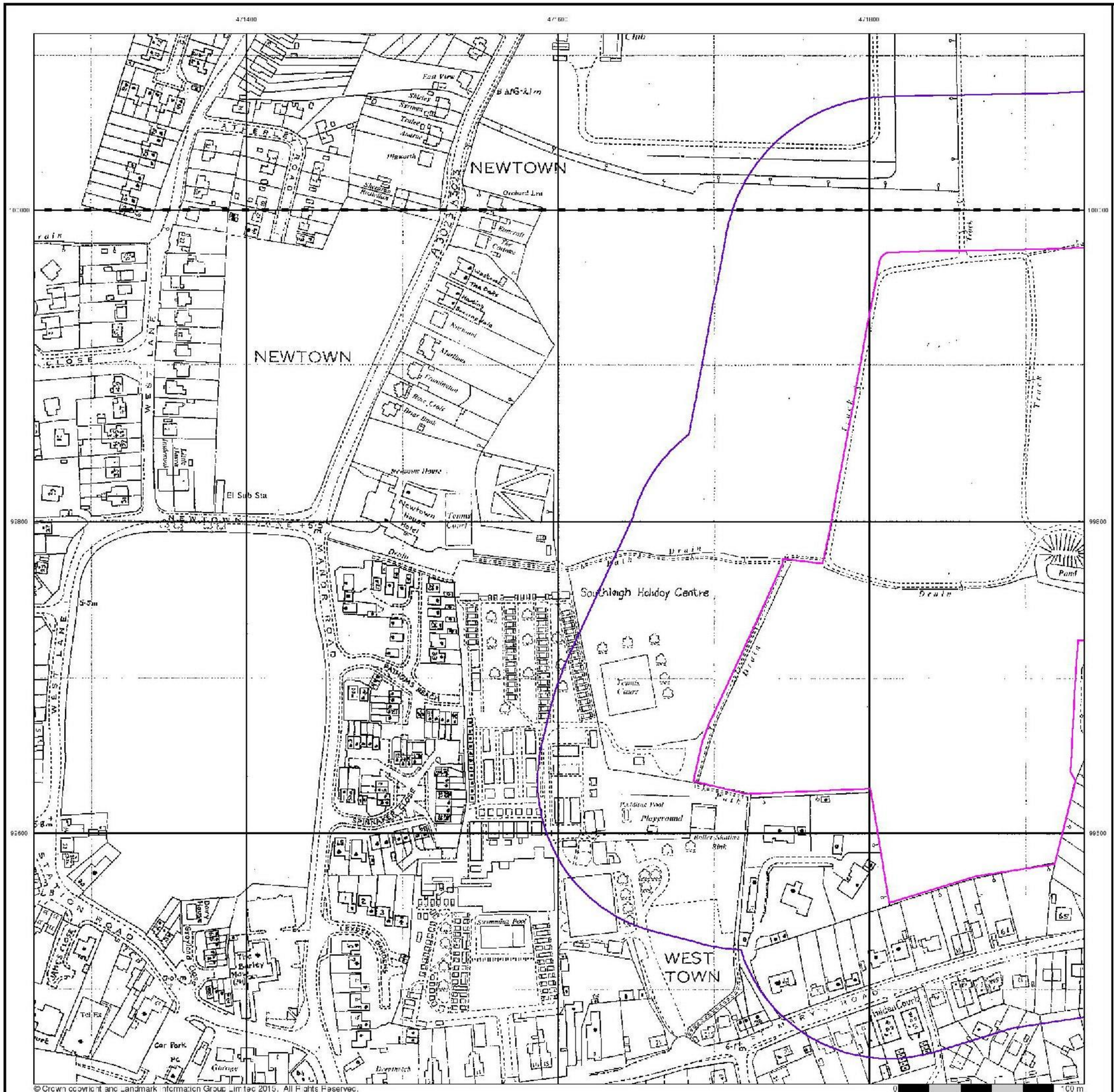
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Additional SIMs

Published 1987 - 1988

Source map scale - 1:2,500

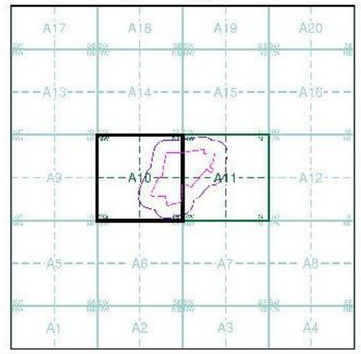
The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps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

Map Name(s) and Date(s)

SU7 00
1988
1:2,500

SZ7199
1987
1:2,500

Historical Map - Segment A10



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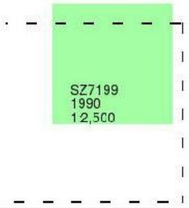
Ordnance Survey Plan

Published 1990

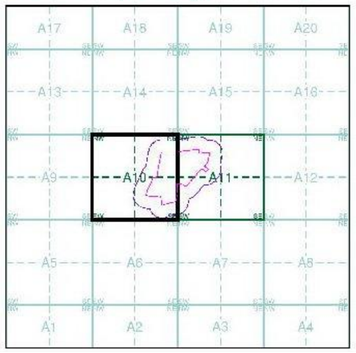
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A10



Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	100

Site Details

Site at 471930E, 099820N

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Additional SIMs

Published 1990 - 1991

Source map scale - 1:2,500

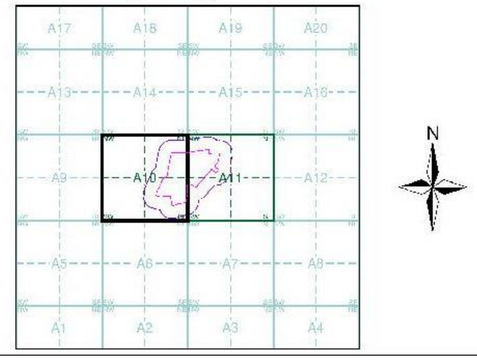
The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps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

Map Name(s) and Date(s)

SU7100
1991
1:2,500

SZ7199
1990
1:2,500

Historical Map - Segment A10



Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
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Large-Scale National Grid Data

Published 1993

Source map scale - 1:2,500

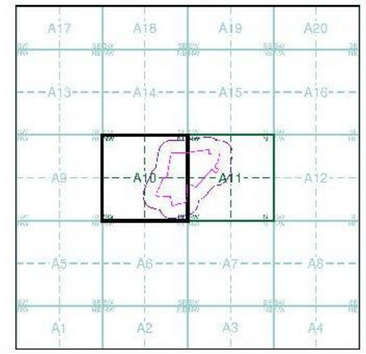
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic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

Map Name(s) and Date(s)

SU7100
1993
1:2,500

SZ7199
1993
1:2,500

Historical Map - Segment A10



Order Details

Order Number:	83759459_1_1
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Large-Scale National Grid Data

Published 1996

Source map scale - 1:2,500

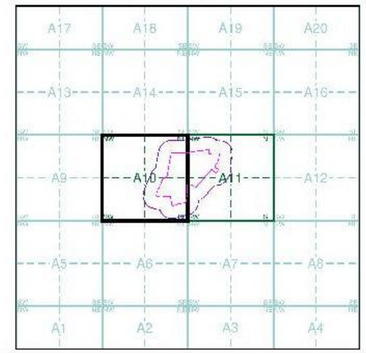
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic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

Map Name(s) and Date(s)

SU7100
1996
1:2,500

SZ7199
1996
1:2,500

Historical Map - Segment A10



Order Details

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Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
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Site Area (Ha):	11.92
Search Buffer (m):	100

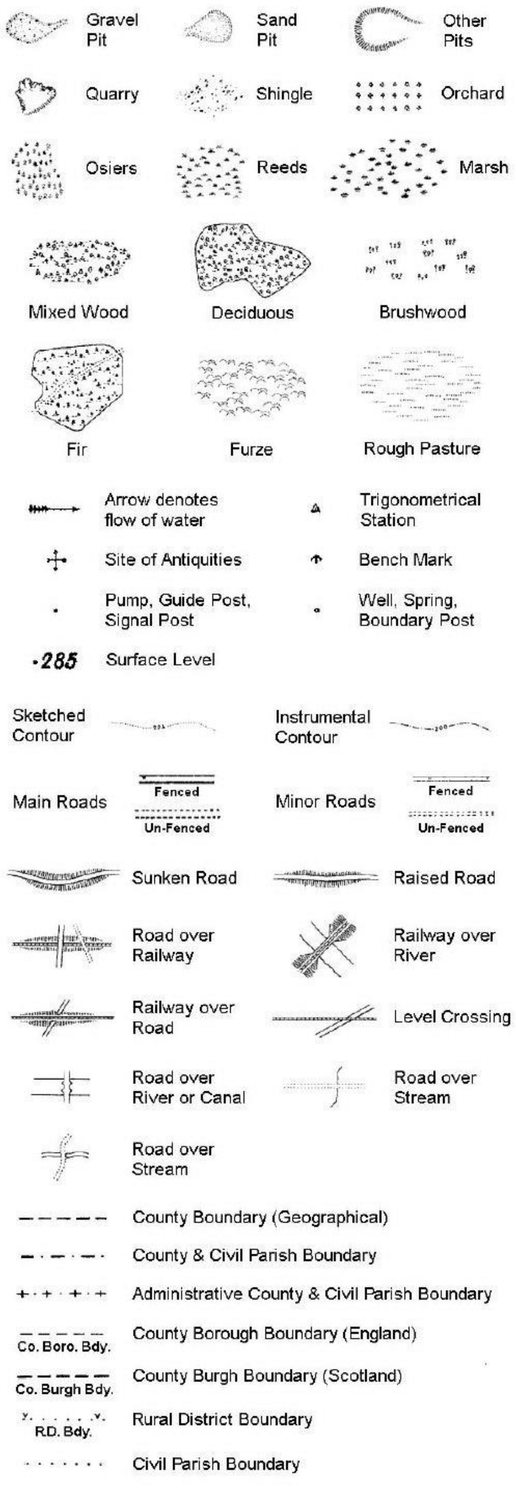
Site Details

Site at 471930E, 099820N

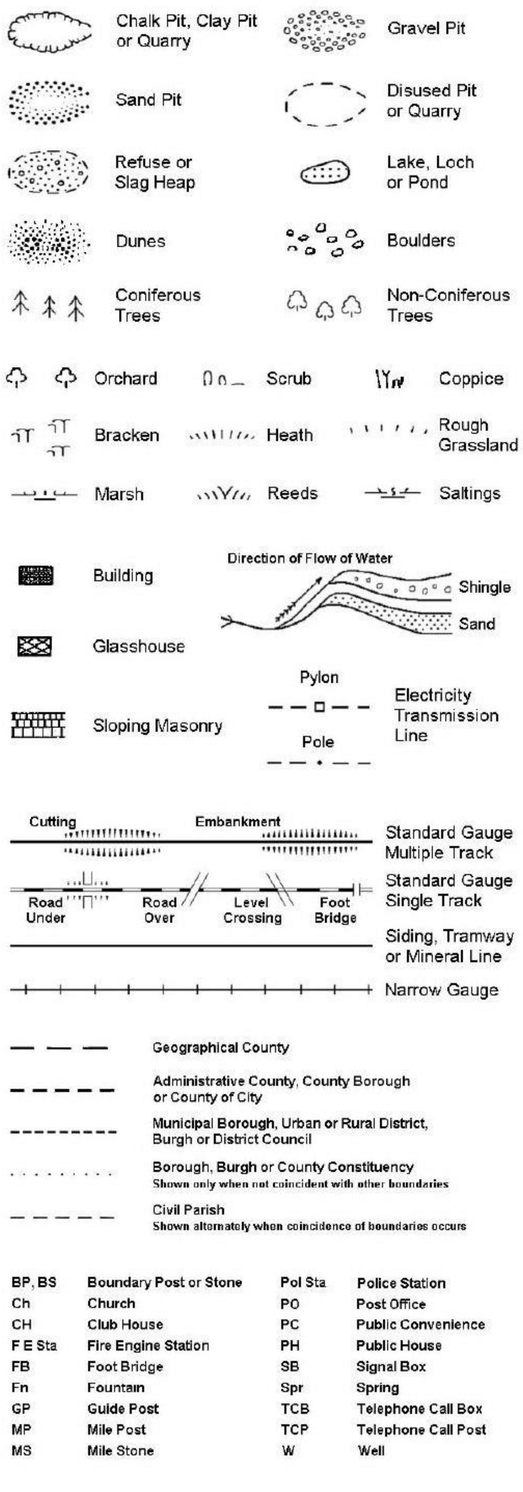
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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

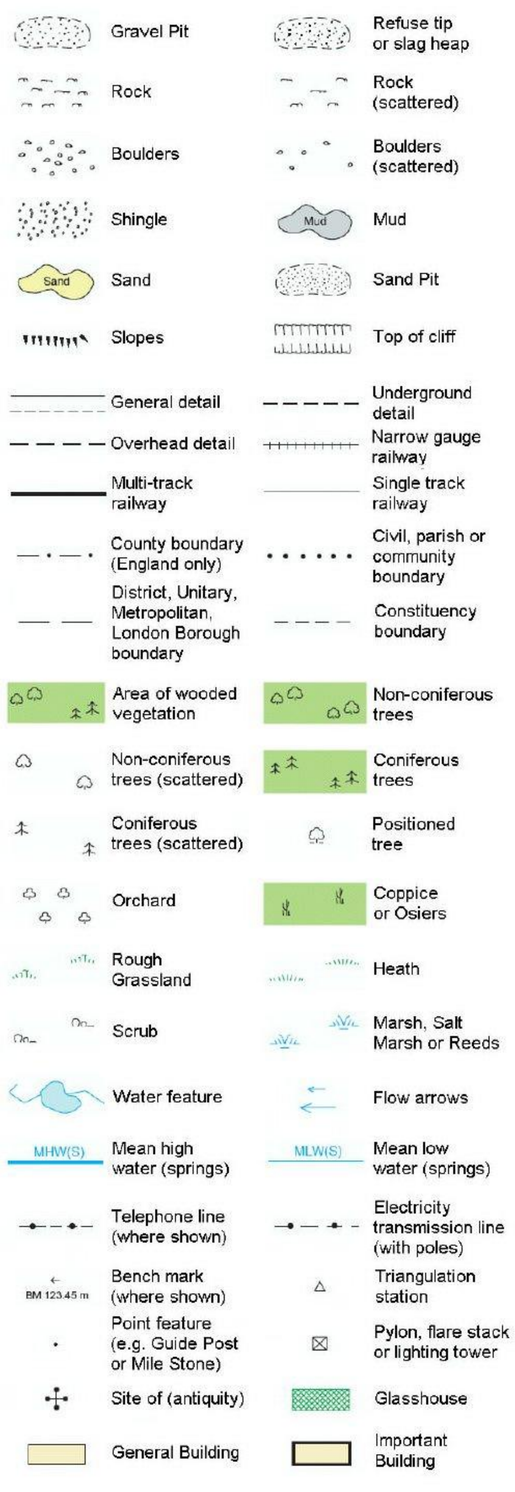


Ordnance Survey Plan 1:10,000



BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

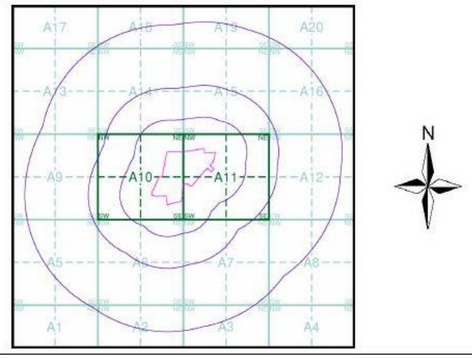


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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hampshire & Isle Of Wight	1:10,560	1871	2
Sussex	1:10,560	1879	3
Hampshire & Isle Of Wight	1:10,560	1898	4
Sussex	1:10,560	1899	5
Hampshire & Isle Of Wight	1:10,560	1910 - 1911	6
Sussex	1:10,560	1913	7
Sussex	1:10,560	1913	8
Hampshire & Isle Of Wight	1:10,560	1931 - 1932	9
Hampshire & Isle Of Wight	1:10,560	1932	10
Hampshire & Isle Of Wight	1:10,560	1938 - 1942	11
Sussex	1:10,560	1953	12
Ordnance Survey Plan	1:10,000	1962	13
Ordnance Survey Plan	1:10,000	1972	14
Ordnance Survey Plan	1:10,000	1991	15
10K Raster Mapping	1:10,000	2000	16
Street View	1:10,000	2015	17

Historical Map - Slice A



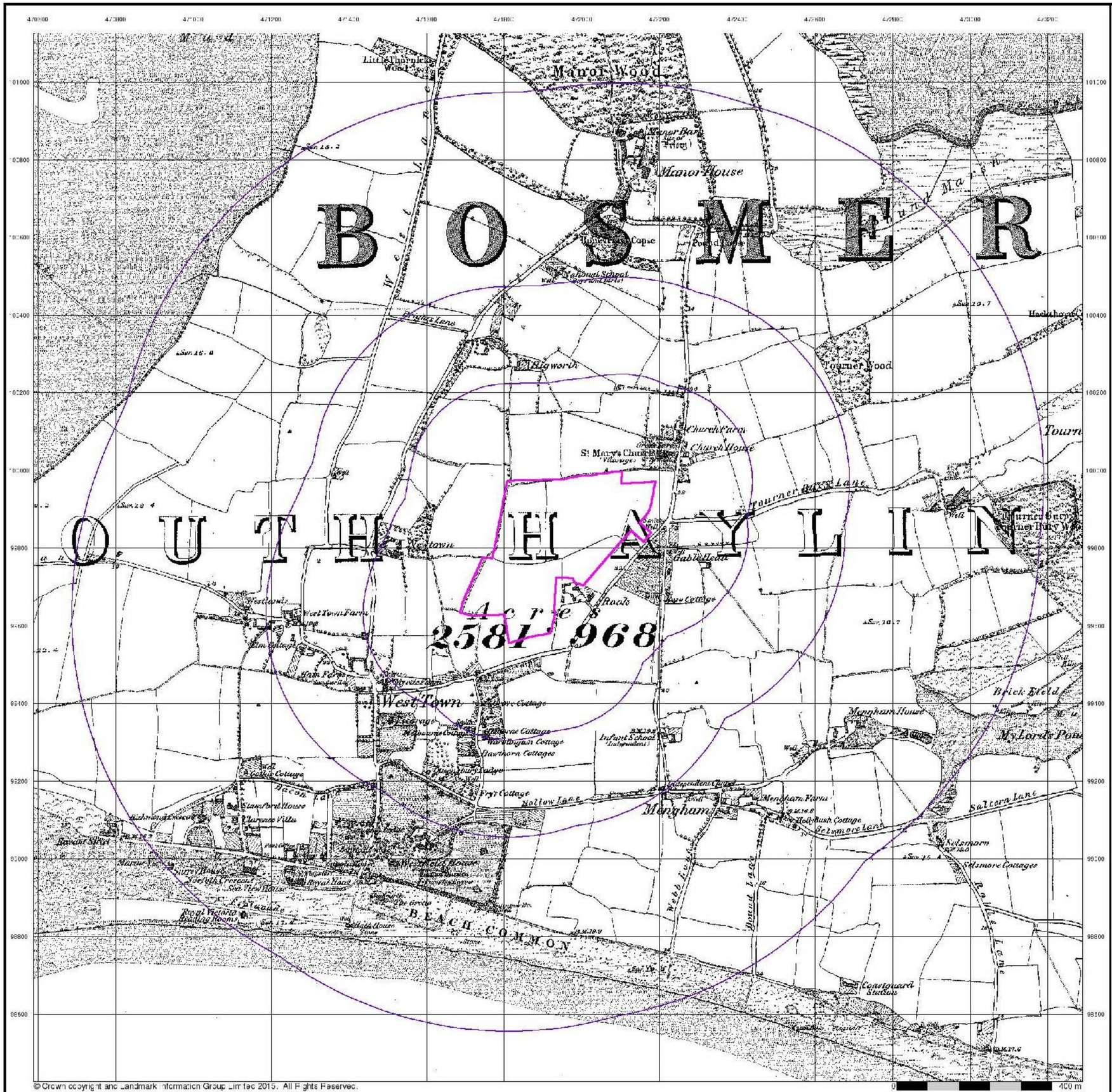
Order Details

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Customer Ref: LKC 16 1109
National Grid Reference: 471930, 99800
Slice: A
Site Area (Ha): 11.92
Search Buffer (m): 1000

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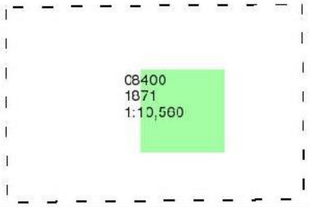
Hampshire & Isle Of Wight

Published 1871

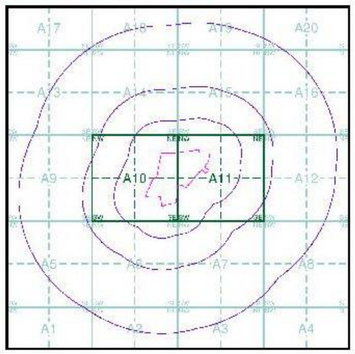
Source map scale - 1:10,560

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

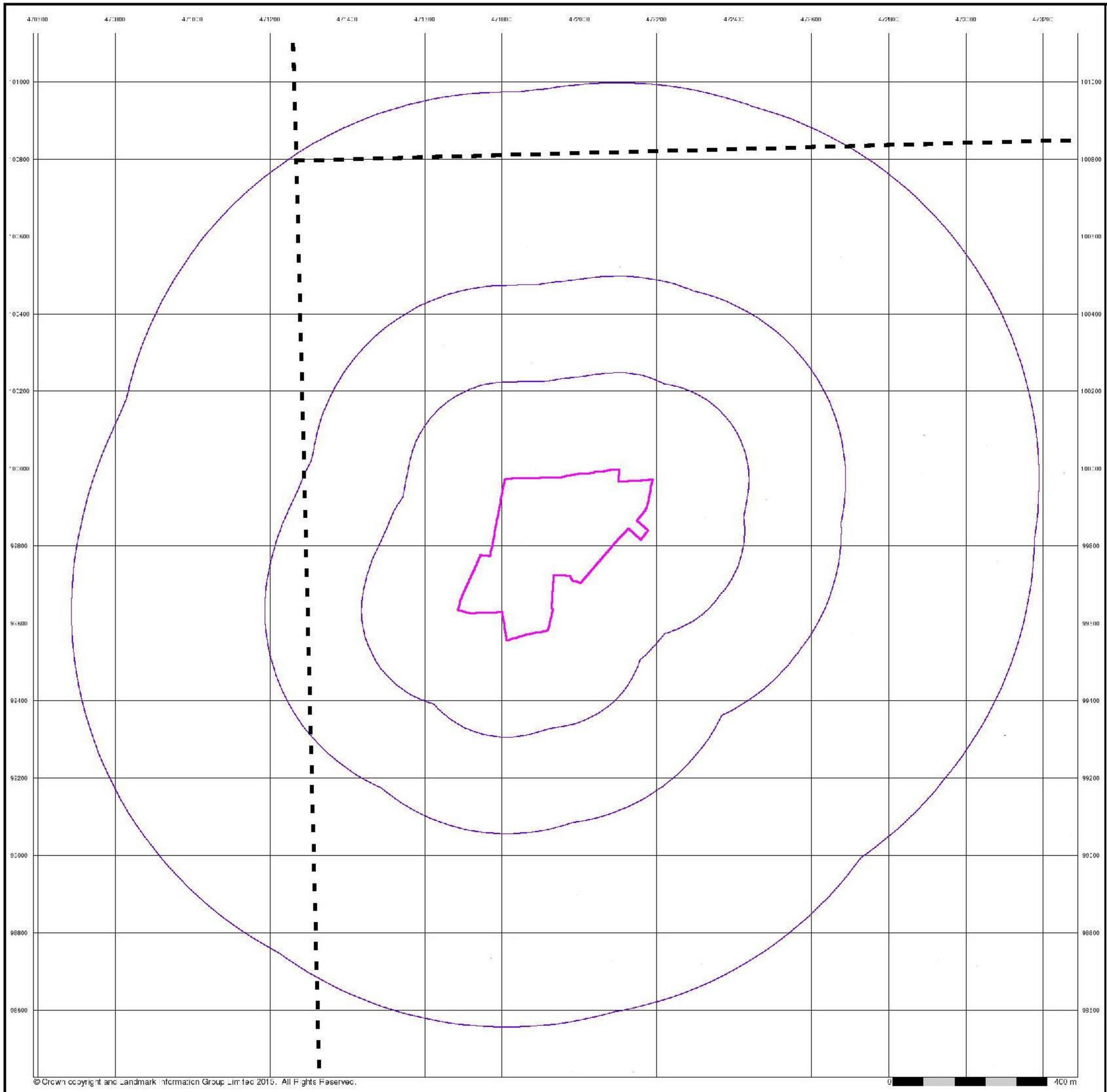


Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	1000

Site Details

Site at 471930E, 099820N



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Sussex

Published 1879

Source map scale - 1:10,560

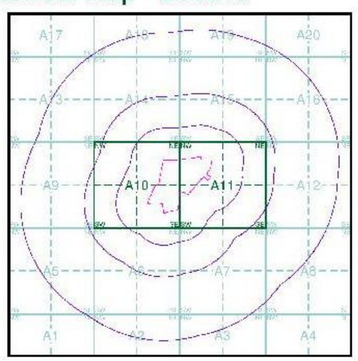
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some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

06000
1879
1:10,560

07200
1879
1:10,560

Historical Map - Slice A



Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
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Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	1000

Site Details

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Hampshire & Isle Of Wight

Published 1898

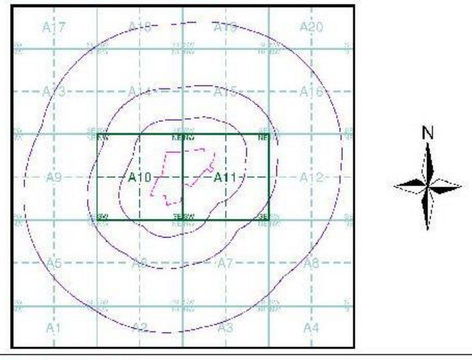
Source map scale - 1:10,560

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)

084NW 1898 1:10,560	084NE 1898 1:10,560
084SW 1898 1:10,560	084SE 1898 1:10,560

Historical Map - Slice A



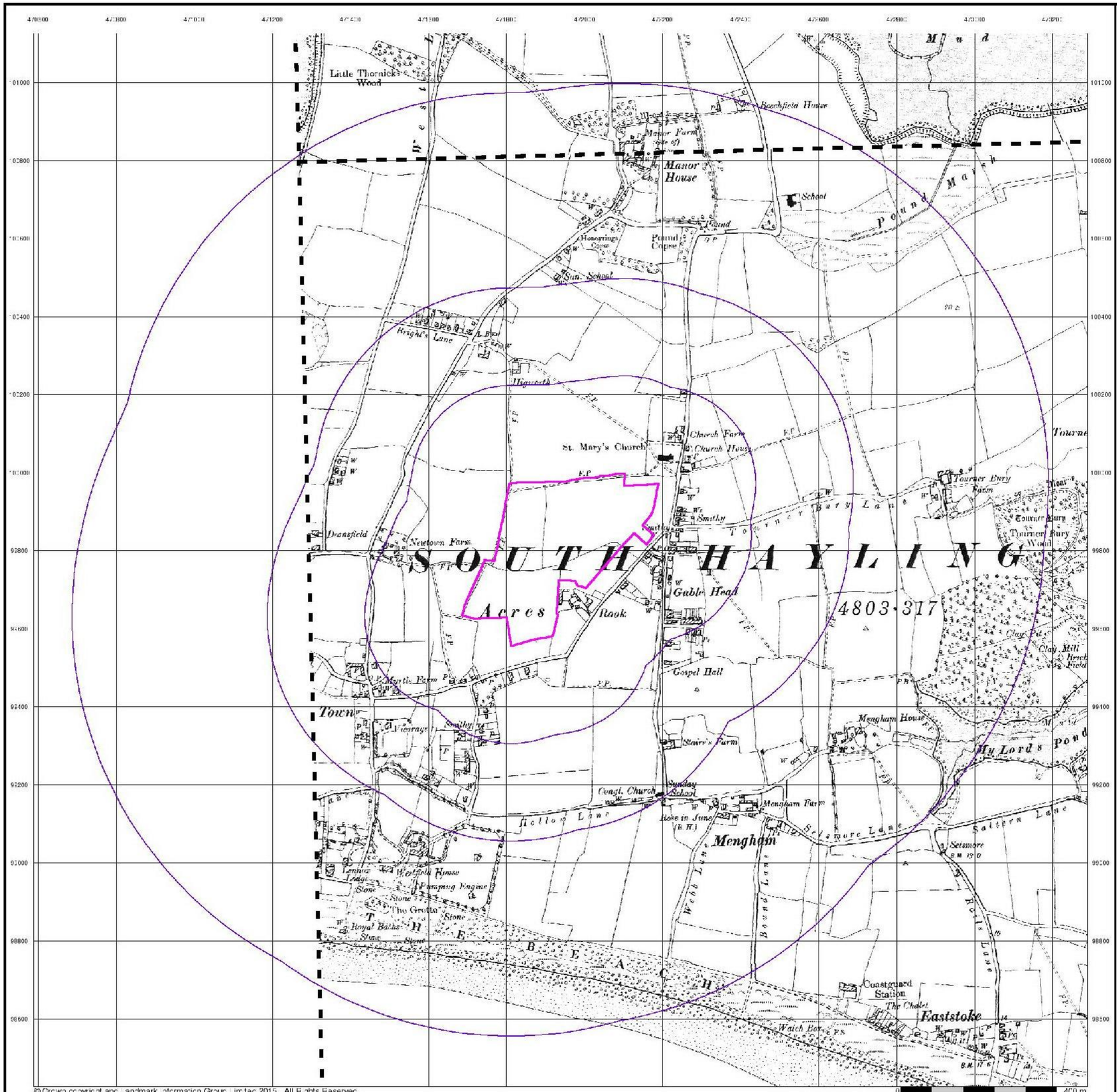
Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	1000

Site Details

Site at 471930E, 099820N

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Sussex

Published 1899

Source map scale - 1:10,560

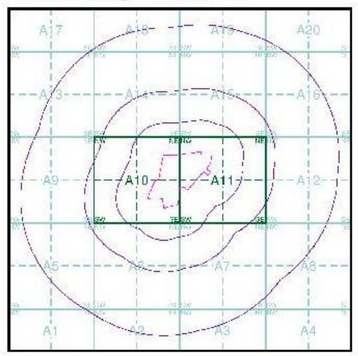
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some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

060SW
1899
1:10,560

072NW
1899
1:10,560

Historical Map - Slice A



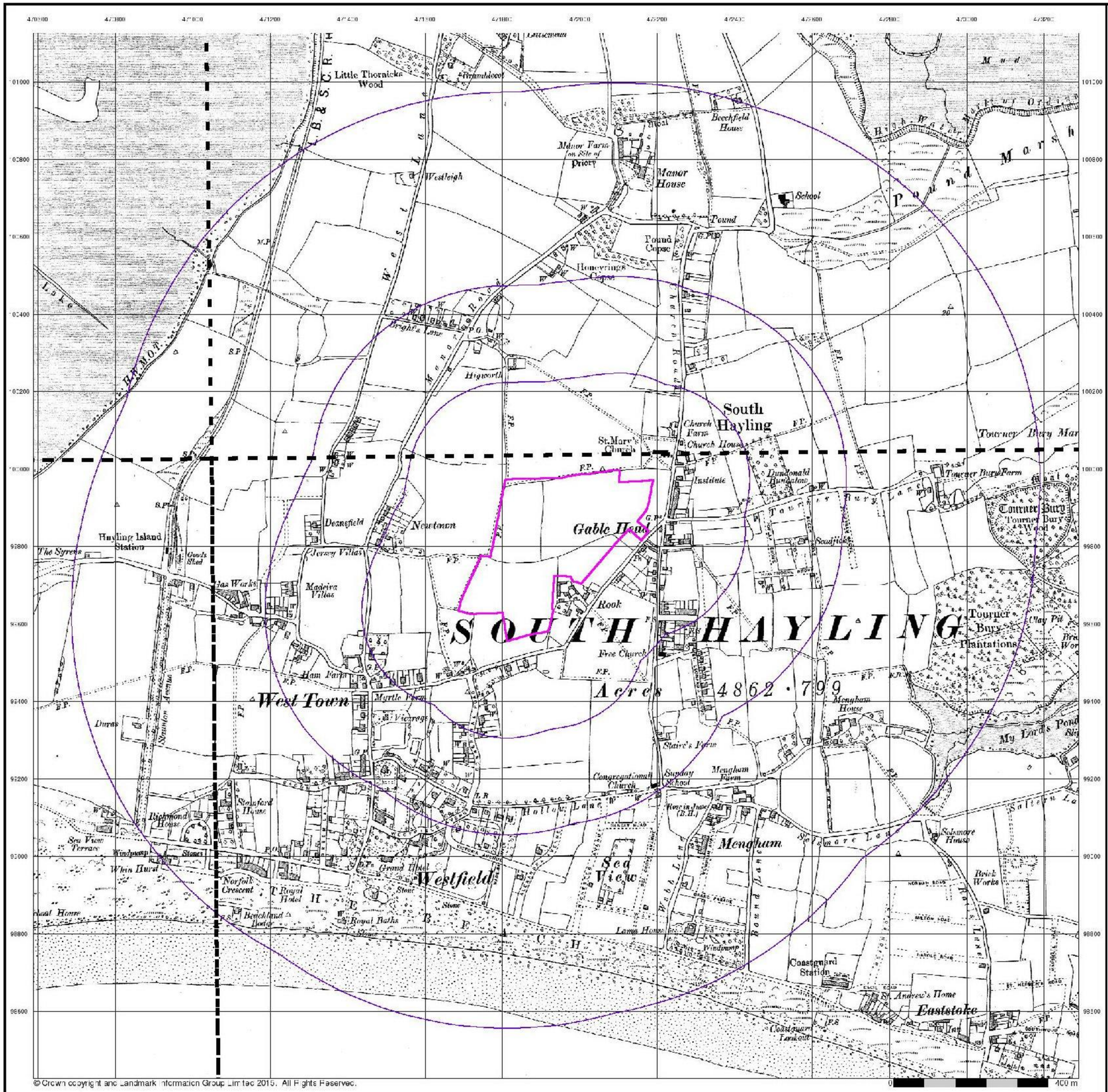
Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
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Site Details

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Hampshire & Isle Of Wight

Published 1910 - 1911

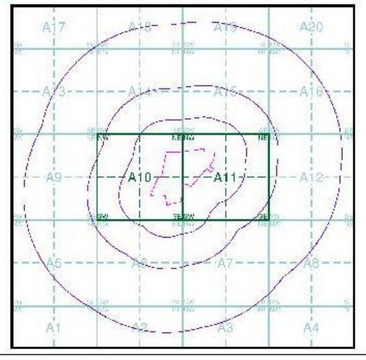
Source map scale - 1:10,560

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)

084NW 1910 1:10,560	084NE 1910 1:10,560
084SW 1911 1:10,560	084SE 1910 1:10,560

Historical Map - Slice A



Order Details

Order Number:	83759459_1_1
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Site Area (Ha):	11.92
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Site Details

Site at 471930E, 099820N



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Sussex

Published 1913

Source map scale - 1:10,560

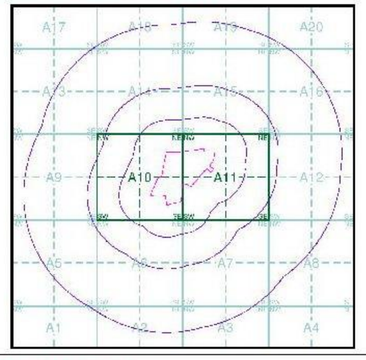
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some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

060SW
1913
1:10,560

072NW
1913
1:10,560

Historical Map - Slice A



Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	1000

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Sussex

Published 1913

Source map scale - 1:10,560

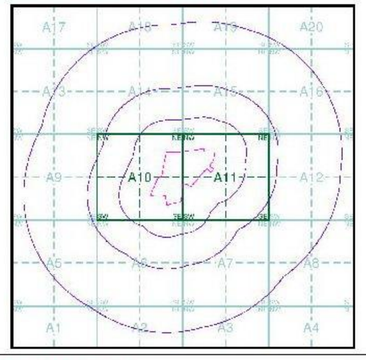
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Map Name(s) and Date(s)

060SW
1913
1:10,560

072NW
1913
1:10,560

Historical Map - Slice A

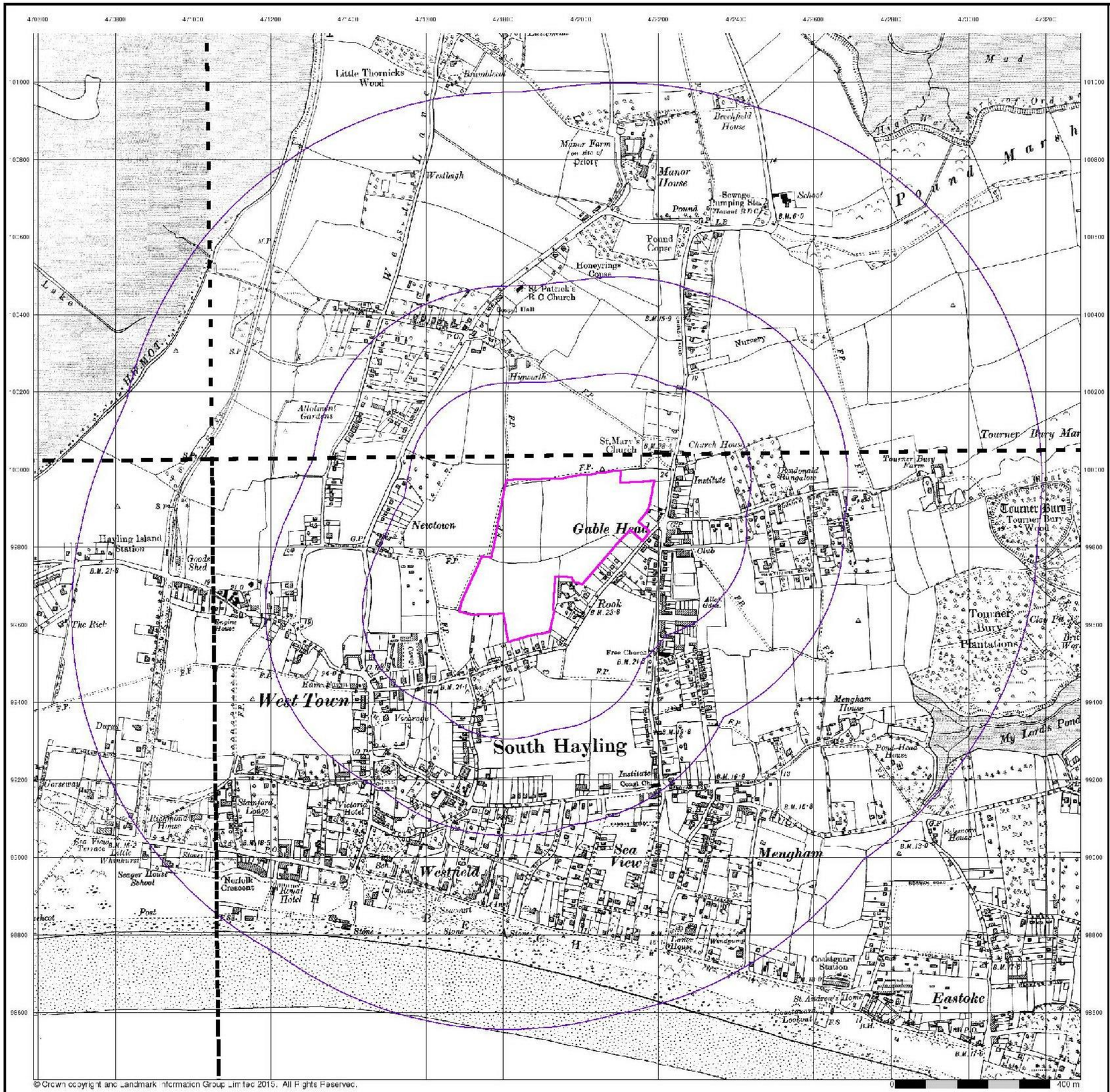


Order Details

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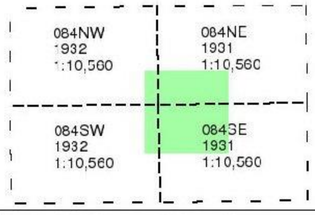
Hampshire & Isle Of Wight

Published 1931 - 1932

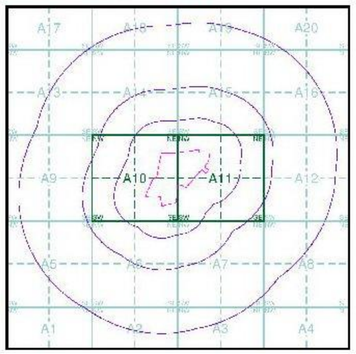
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A

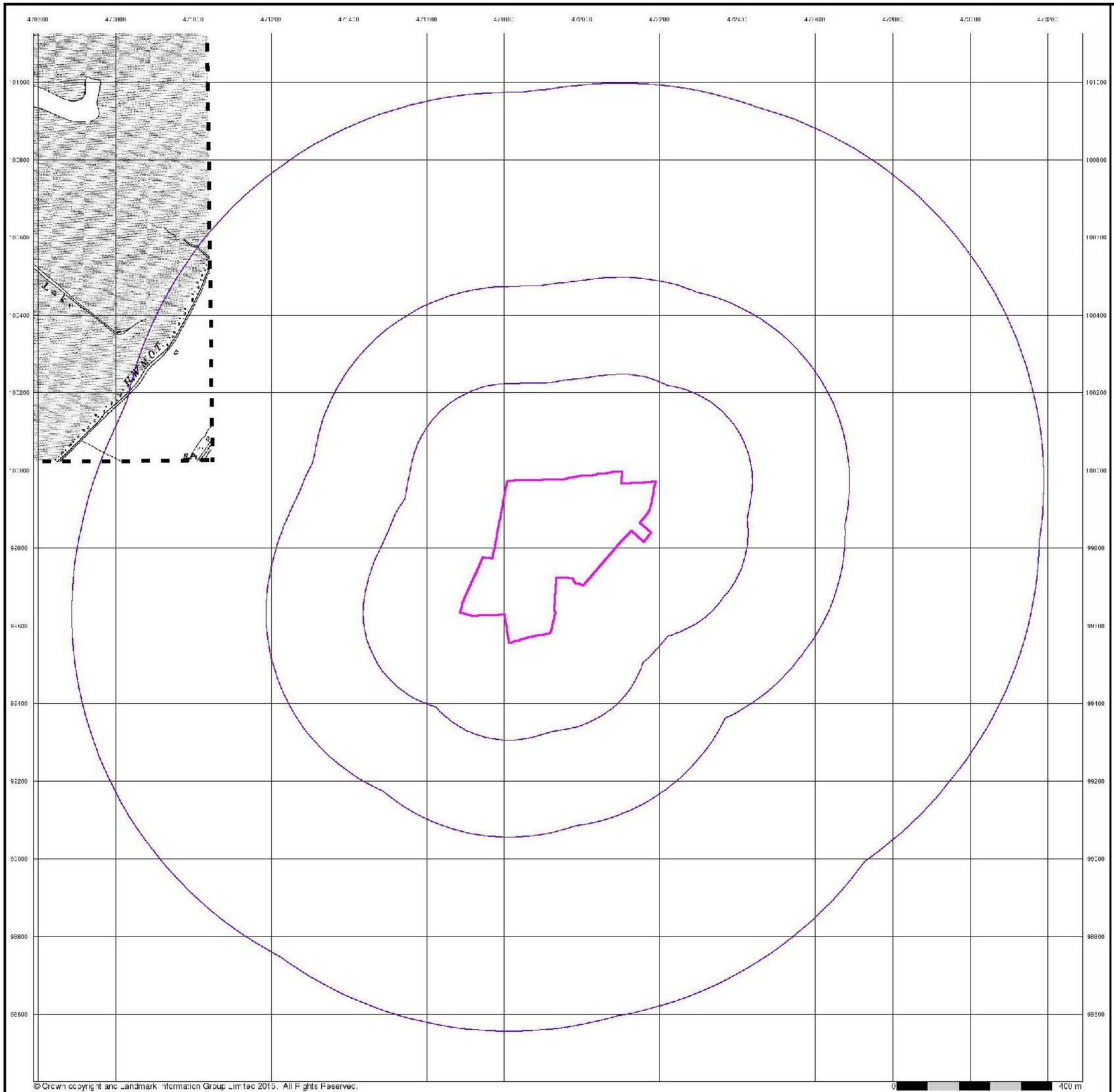


Order Details

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Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	1000

Site Details

Site at 471930E, 099820N



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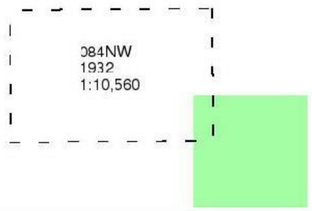
Hampshire & Isle Of Wight

Published 1932

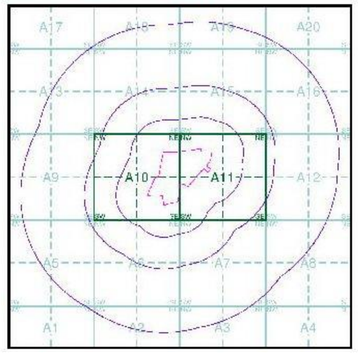
Source map scale - 1:10,560

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:	83759459_1_1
Customer Ref:	LKC 16 1109
National Grid Reference:	471930, 99800
Slice:	A
Site Area (Ha):	11.92
Search Buffer (m):	1000

Site Details

Site at 471930E, 099820N

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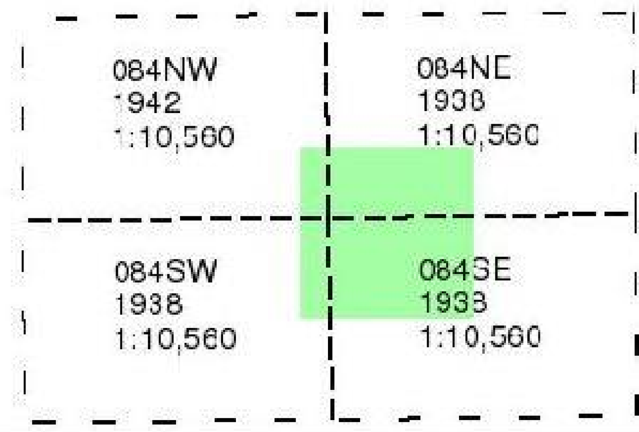
Hampshire & Isle Of Wight

Published 1938 - 1942

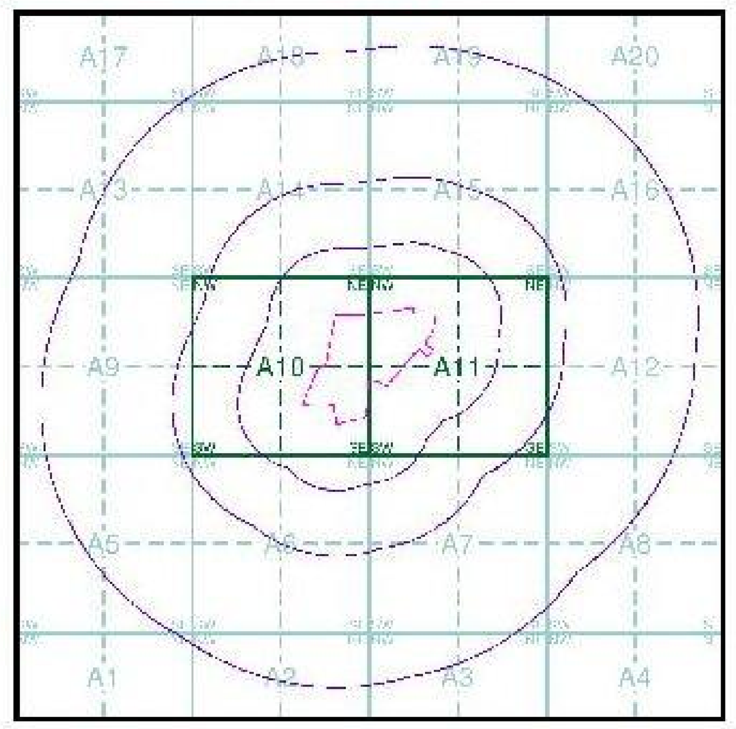
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

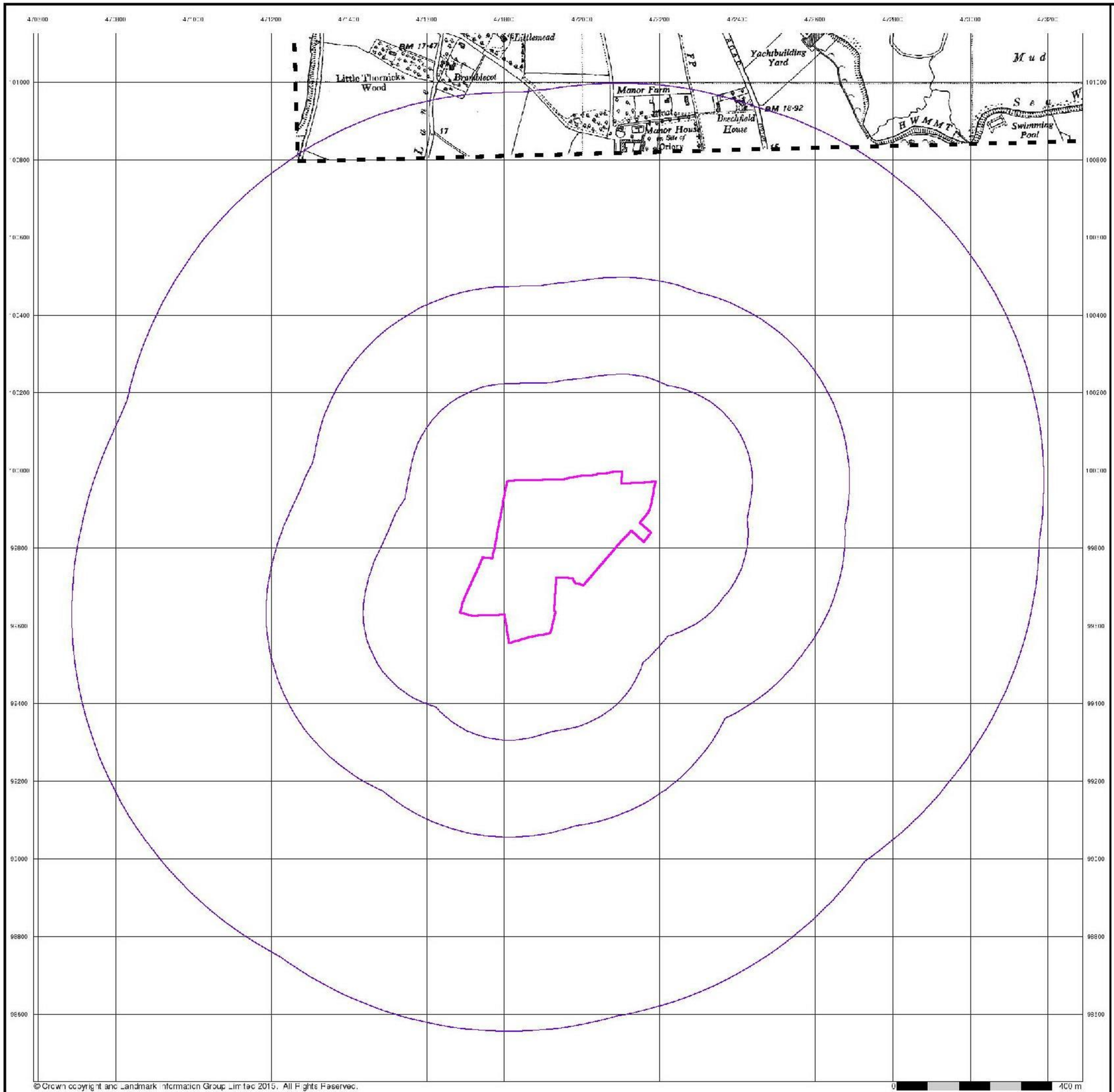
Order Number: 83759459_1_1
Customer Ref: LKC 16 1109
National Grid Reference: 471930, 99800
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0 400 m

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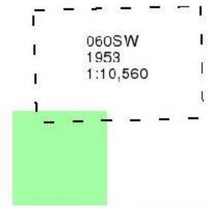
Sussex

Published 1953

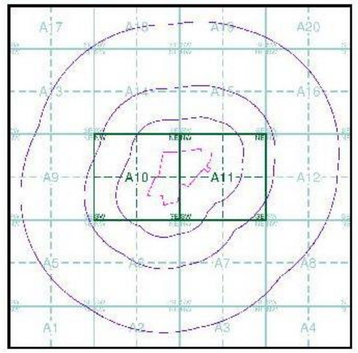
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



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Ordnance Survey Plan

Published 1962

Source map scale - 1:10,000

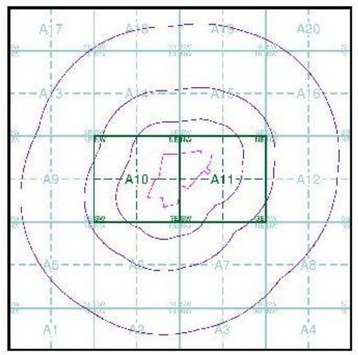
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some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

SU70SW
1962
1:10,560

SZ79NW
1962
1:10,560

Historical Map - Slice A



Order Details

Order Number:	83759459_1_1
Customer Ref:	LKC 16 1109
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Site Area (Ha):	11.92
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Ordnance Survey Plan

Published 1972

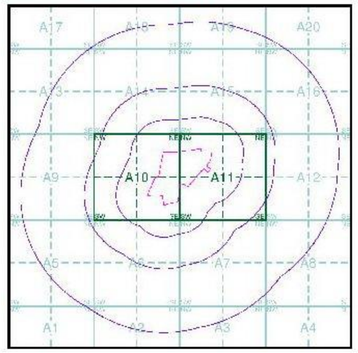
Source map scale - 1:10,000

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)

SJ70SW
1972
1:10,000

Historical Map - Slice A



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Ordnance Survey Plan

Published 1991

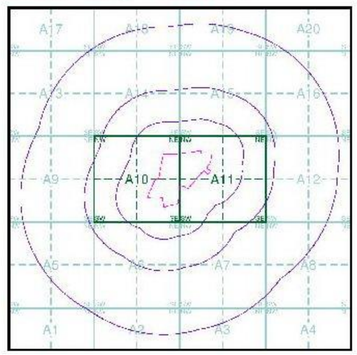
Source map scale - 1:10,000

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)

SZ79NW
1991
1:10 000

Historical Map - Slice A



Order Details

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10k Raster Mapping

Published 2000

Source map scale - 1:10,000

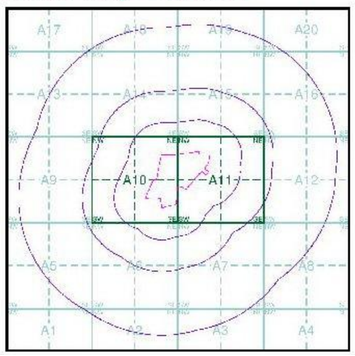
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks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

SU70SW
2000
1:10,000

SZ79NW
2000
1:10,000

Historical Map - Slice A



Order Details

Order Number:	83759459_1_1
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Street View

Published 2015

Source map scale - 1:10,000

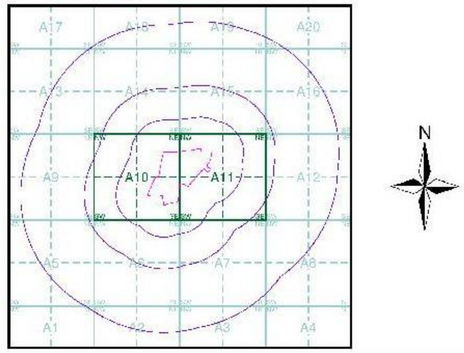
Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)

SU70SW
2015
1:10,000

SZ79NW
2015
1:10,000

Street View Map - Slice A



Order Details

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