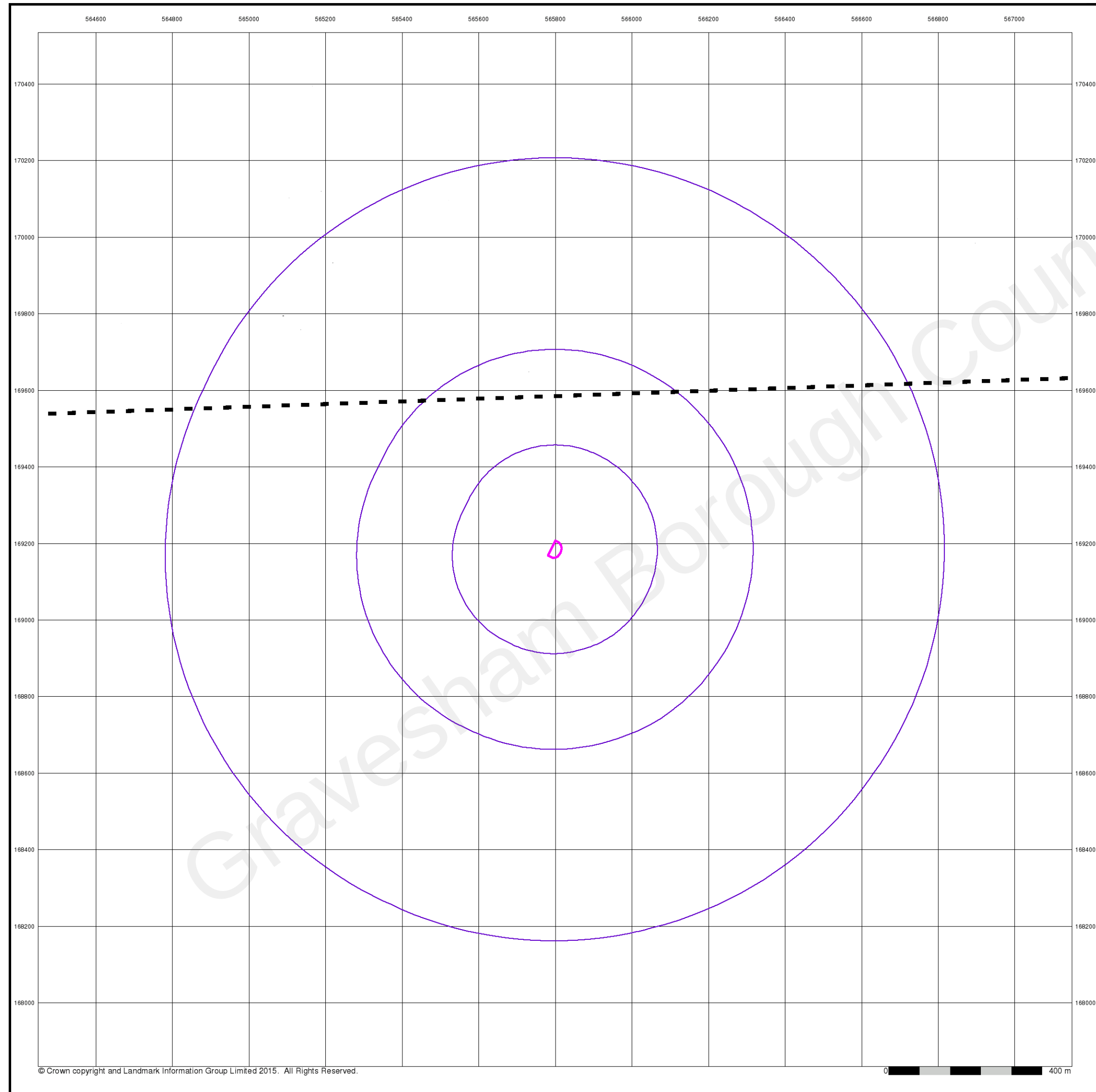




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Essex

Published 1872

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)

08900
1872
1:10,560

Historical Map - Slice A

N

Order Details

Order Number:	134231146_1_1
Customer Ref:	LP1436
National Grid Reference:	565800, 169180
Slice:	A
Site Area (Ha):	0.1
Search Buffer (m):	1000

Site Details

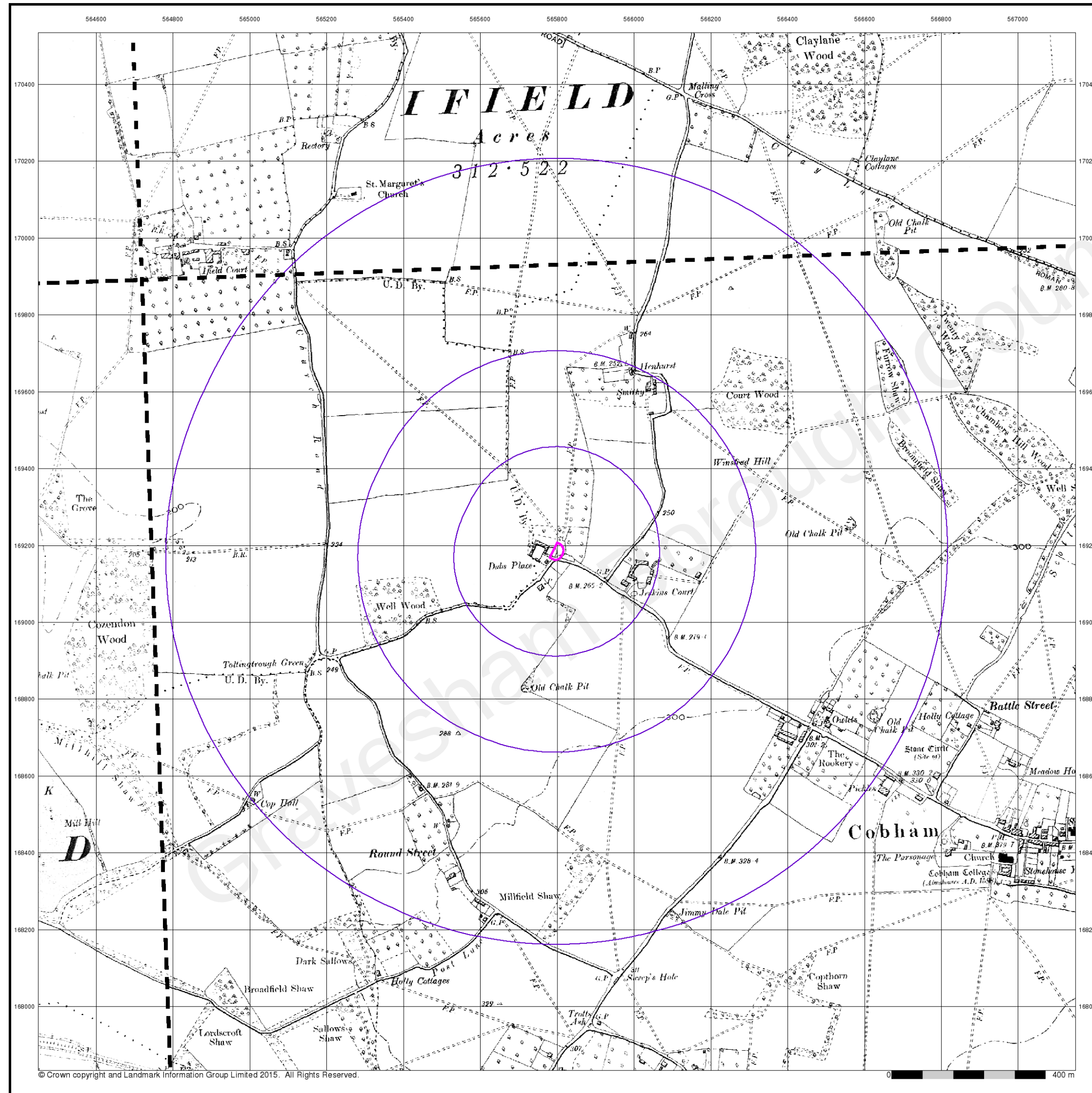
The Barn, Dabbs Place Cottage, Jeskyns Road, Cobham, GRAVESEND, DA13 9BL

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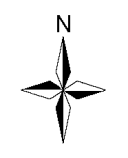
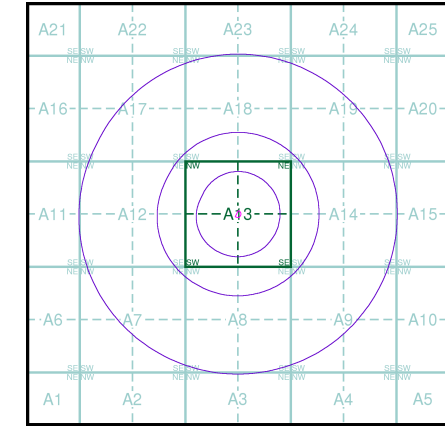
Kent
Published 1897 - 1898
Source map scale - 1:10,560

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)

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018NW 1897 1:10,560	018NE 1898 1:10,560

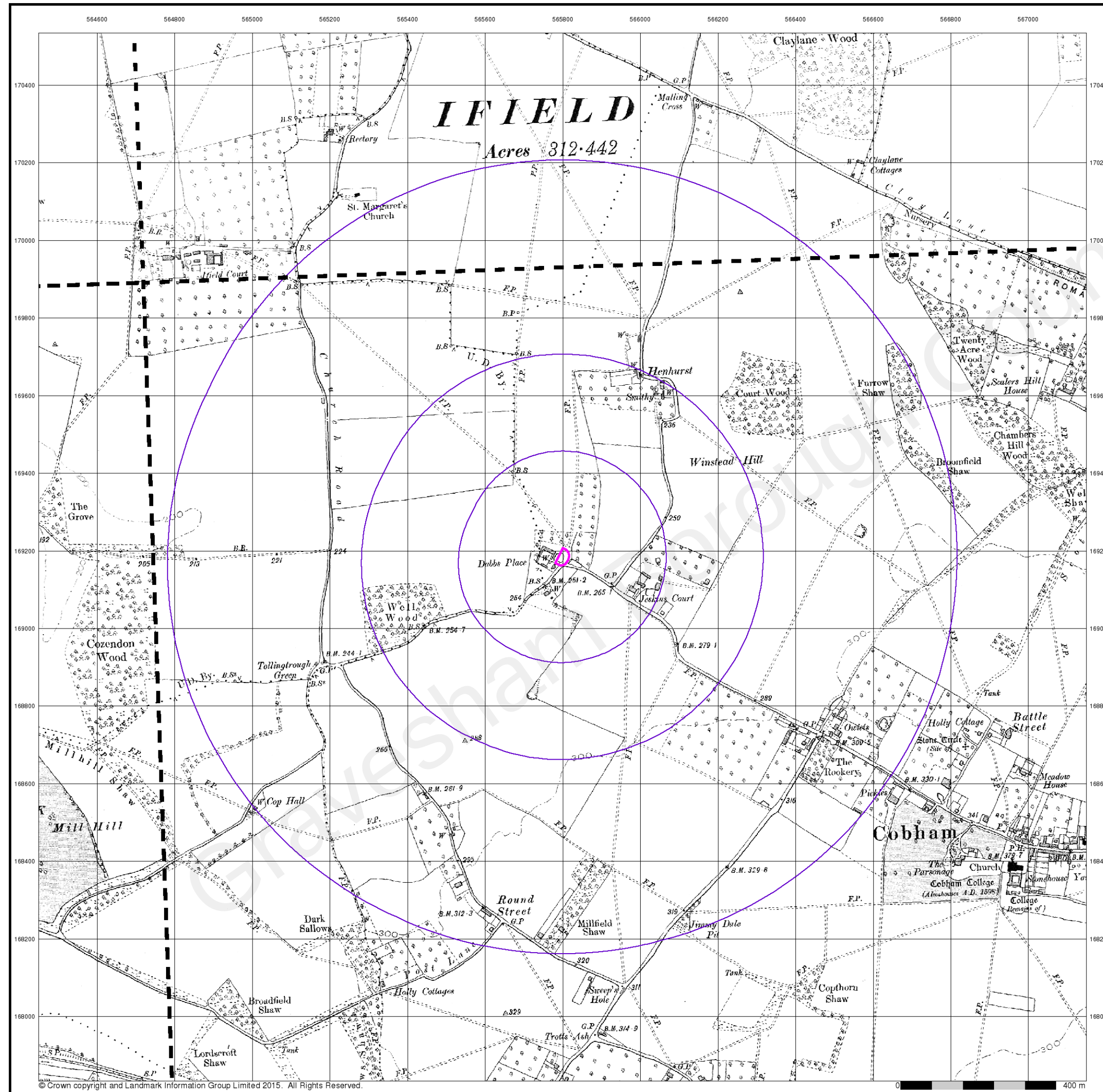
Historical Map - Slice A



Order Details
Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details
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Kent

Published 1909

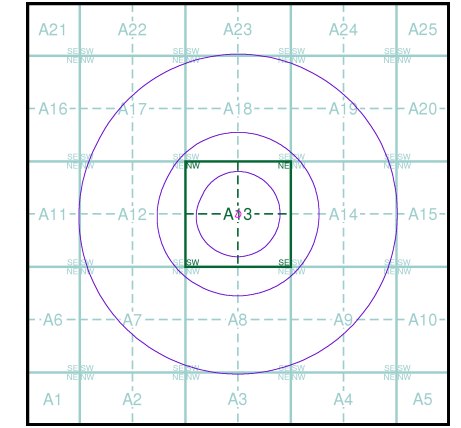
Source map scale - 1:10,560

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

Map Name(s) and Date(s)

010SW 1909 1:10,560	010SE 1909 1:10,560
018NW 1909 1:10,560	018NE 1909 1:10,560

Historical Map - Slice A



Order Details

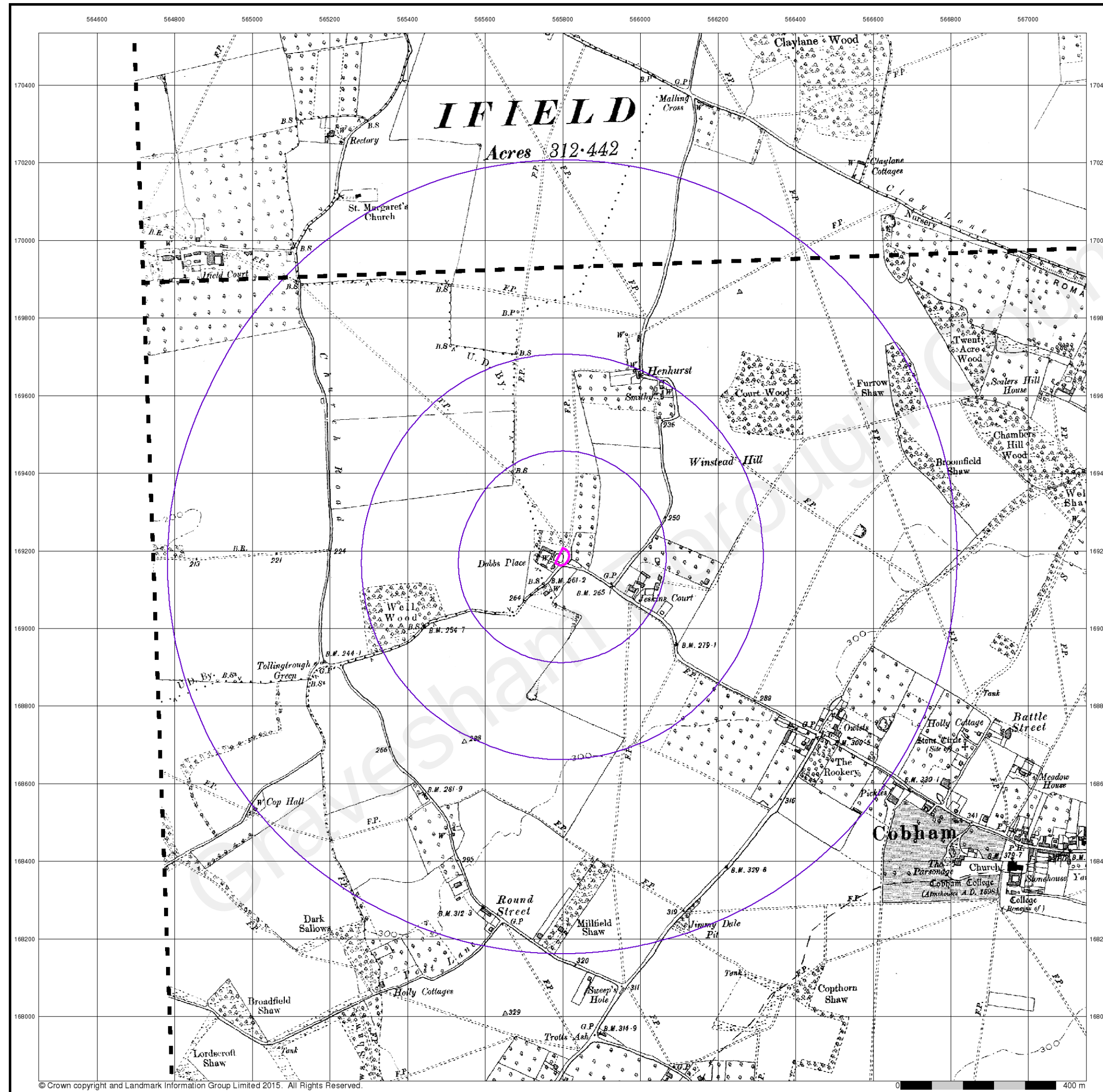
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Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

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Kent

Published 1909

Source map scale - 1:10,560

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

Map Name(s) and Date(s)

010SE
1909
1:10,560

018NE
1909
1:10,560

Historical Map - Slice A

Order Details

Order Number:	134231146_1_1
Customer Ref:	LP1436
National Grid Reference:	565800, 169180
Slice:	A
Site Area (Ha):	0.1
Search Buffer (m):	1000

Site Details

The Barn, Dabbs Place Cottage, Jeskyns Road, Cobham, GRAVESEND, DA13 9BL

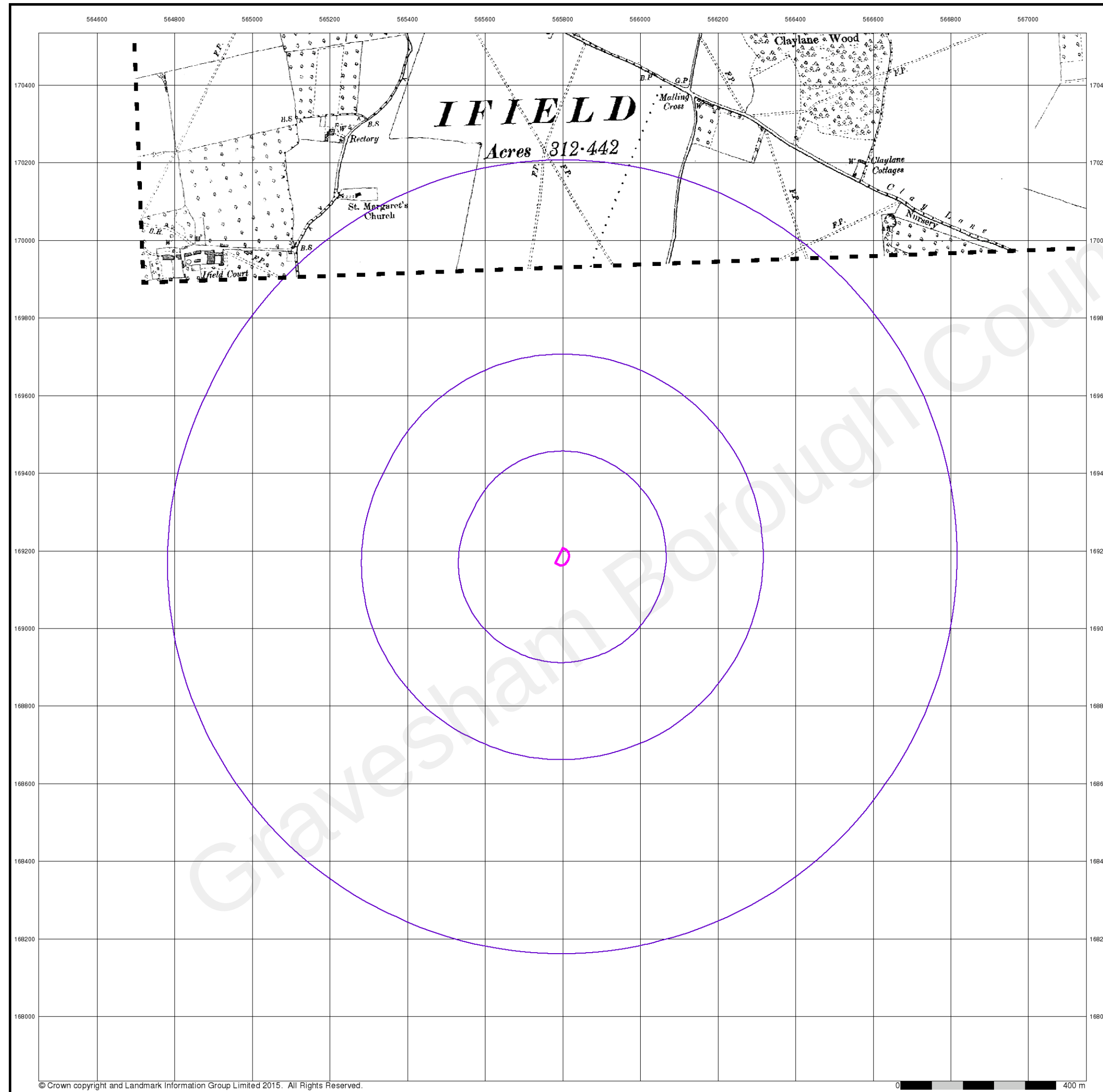
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0 400 m

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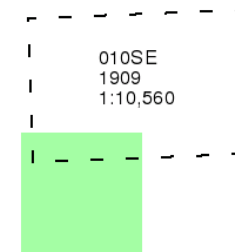
Kent

Published 1909

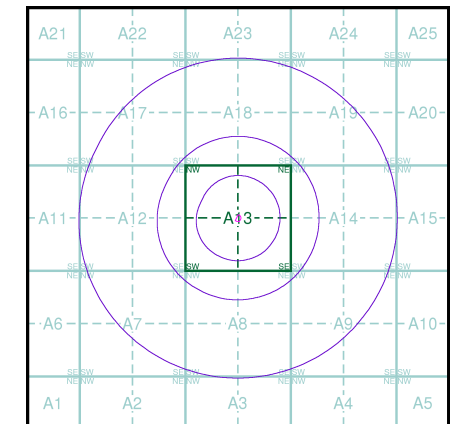
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

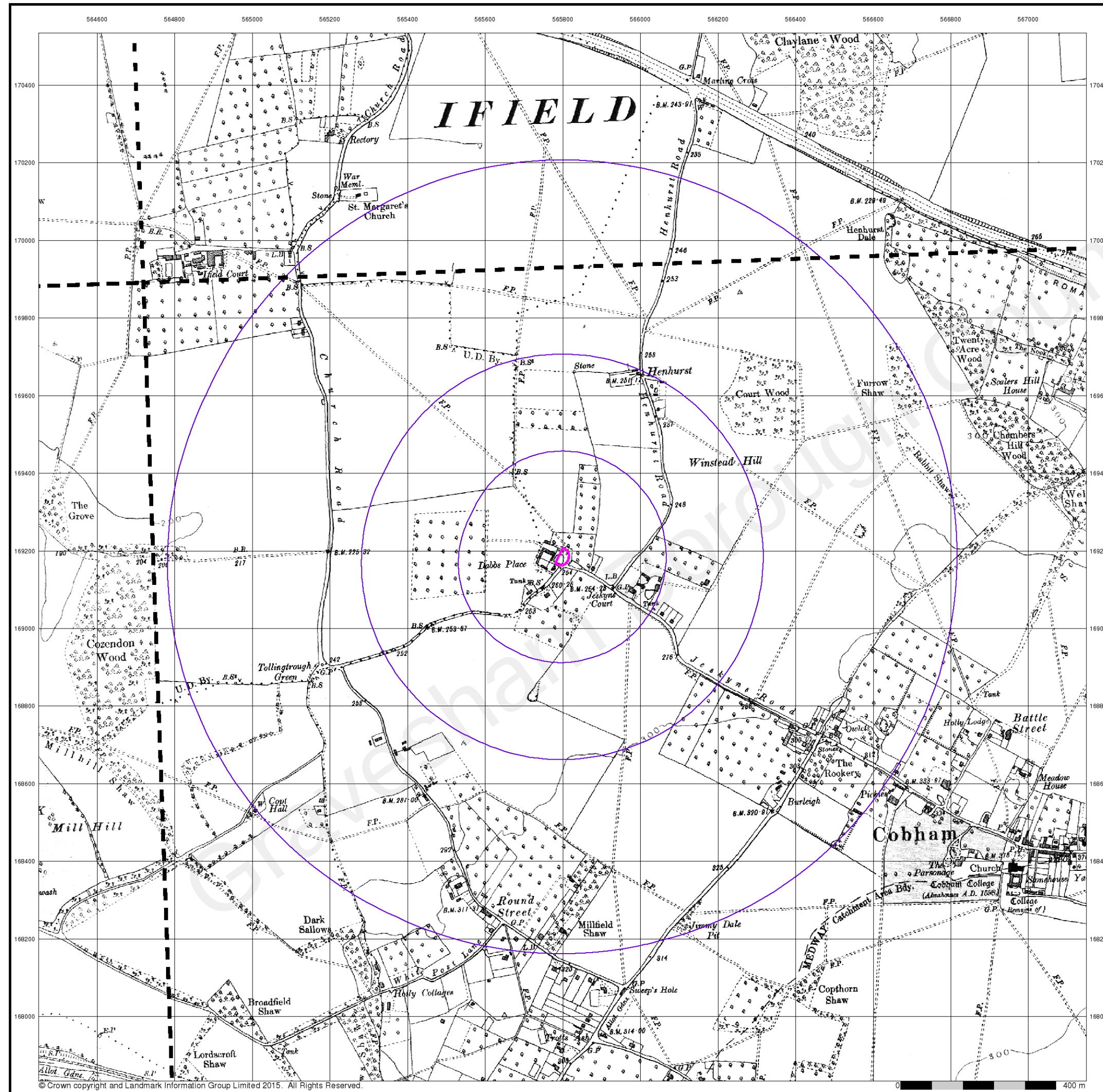
Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

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Kent

Published 1931 - 1932

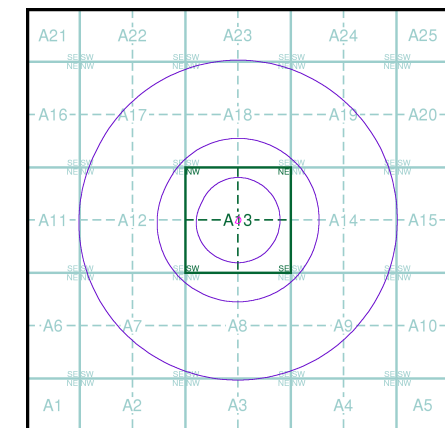
Source map scale - 1:10,560

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)

010SW 1931 1:10,560	010SE 1932 1:10,560
018NW 1931 1:10,560	018NE 1931 1:10,560

Historical Map - Slice A



Order Details

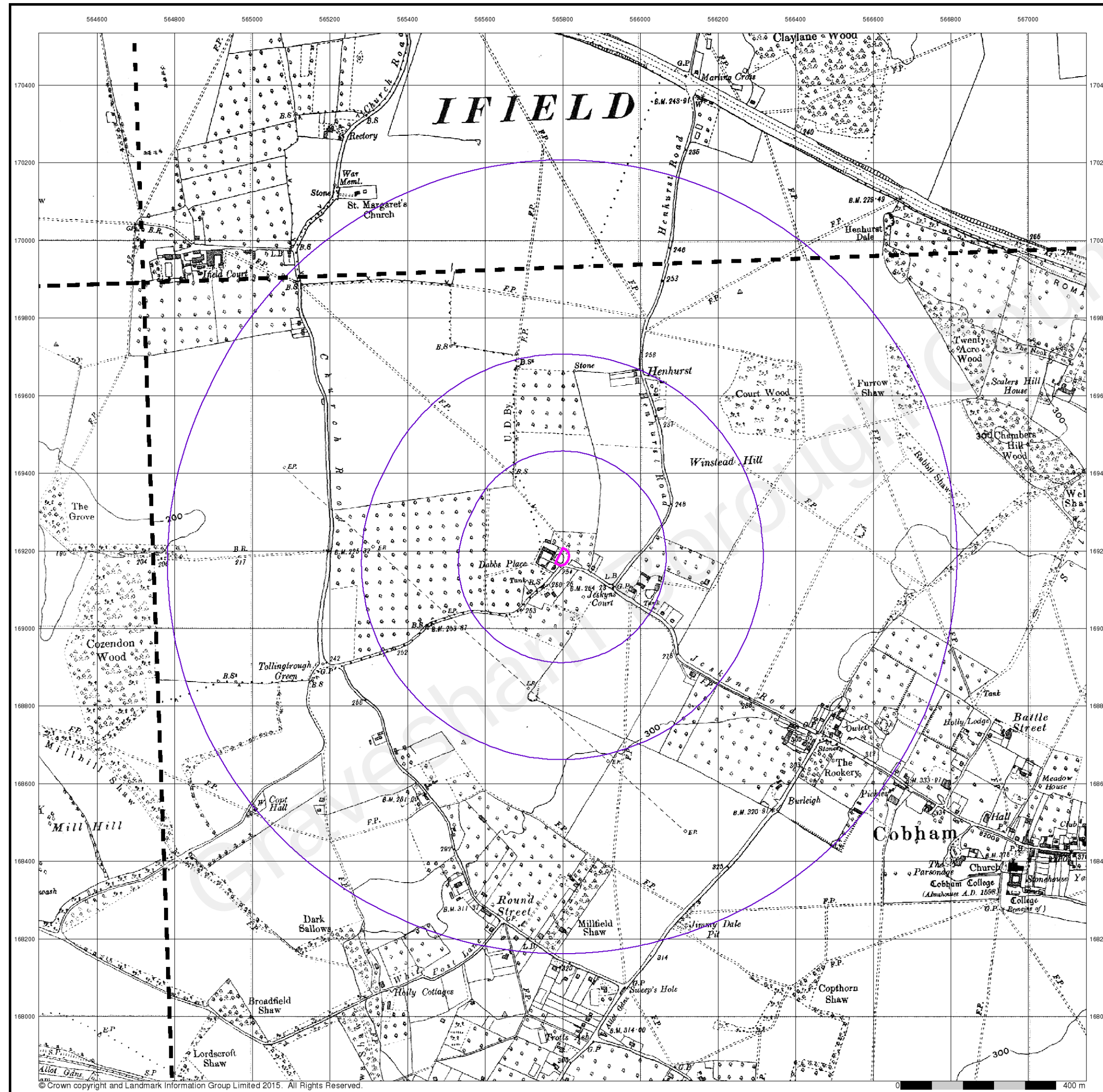
Order Number: 134231146_1_1
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National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

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Kent

Published 1938 - 1939

Source map scale - 1:10,560

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Map Name(s) and Date(s)

010SW 1938 1:10,560	010SE 1938 1:10,560
018NW 1938 1:10,560	018NE 1939 1:10,560

Historical Map - Slice A

Order Details

Order Number:	134231146_1_1
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National Grid Reference:	565800, 169180
Slice:	A
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Site Details

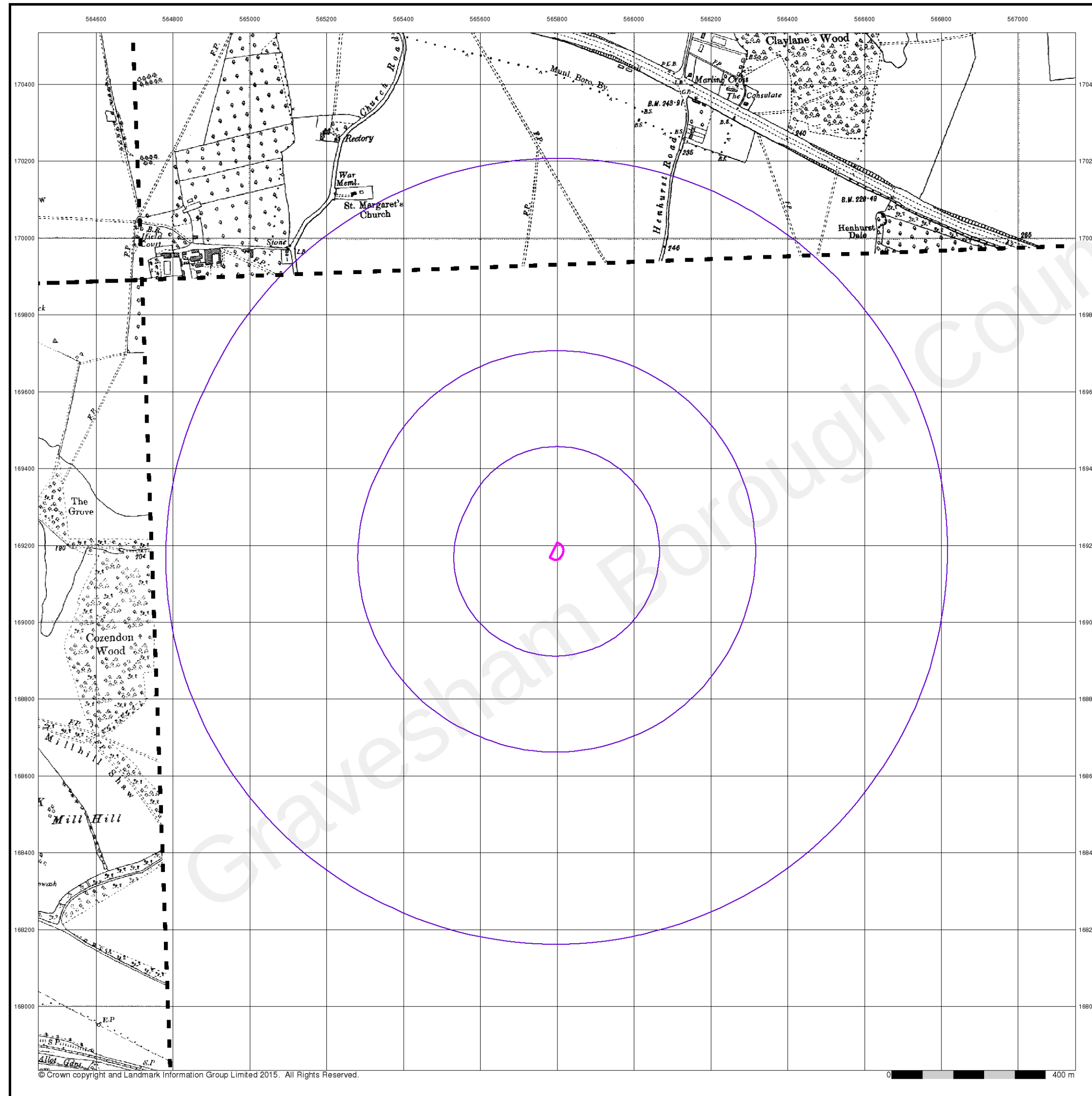
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Kent

Published 1938 - 1946

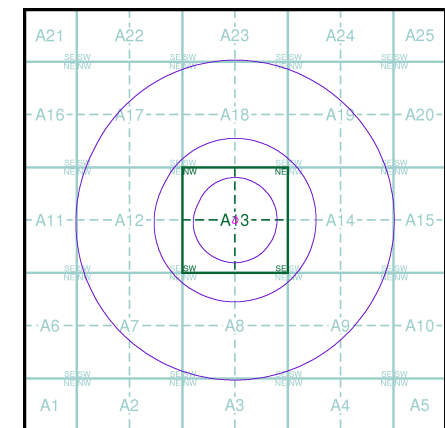
Source map scale - 1:10,560

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)

010SW 1938 1:10,560	010SE 1946 1:10,560
018NW 1939 1:10,560	

Historical Map - Slice A

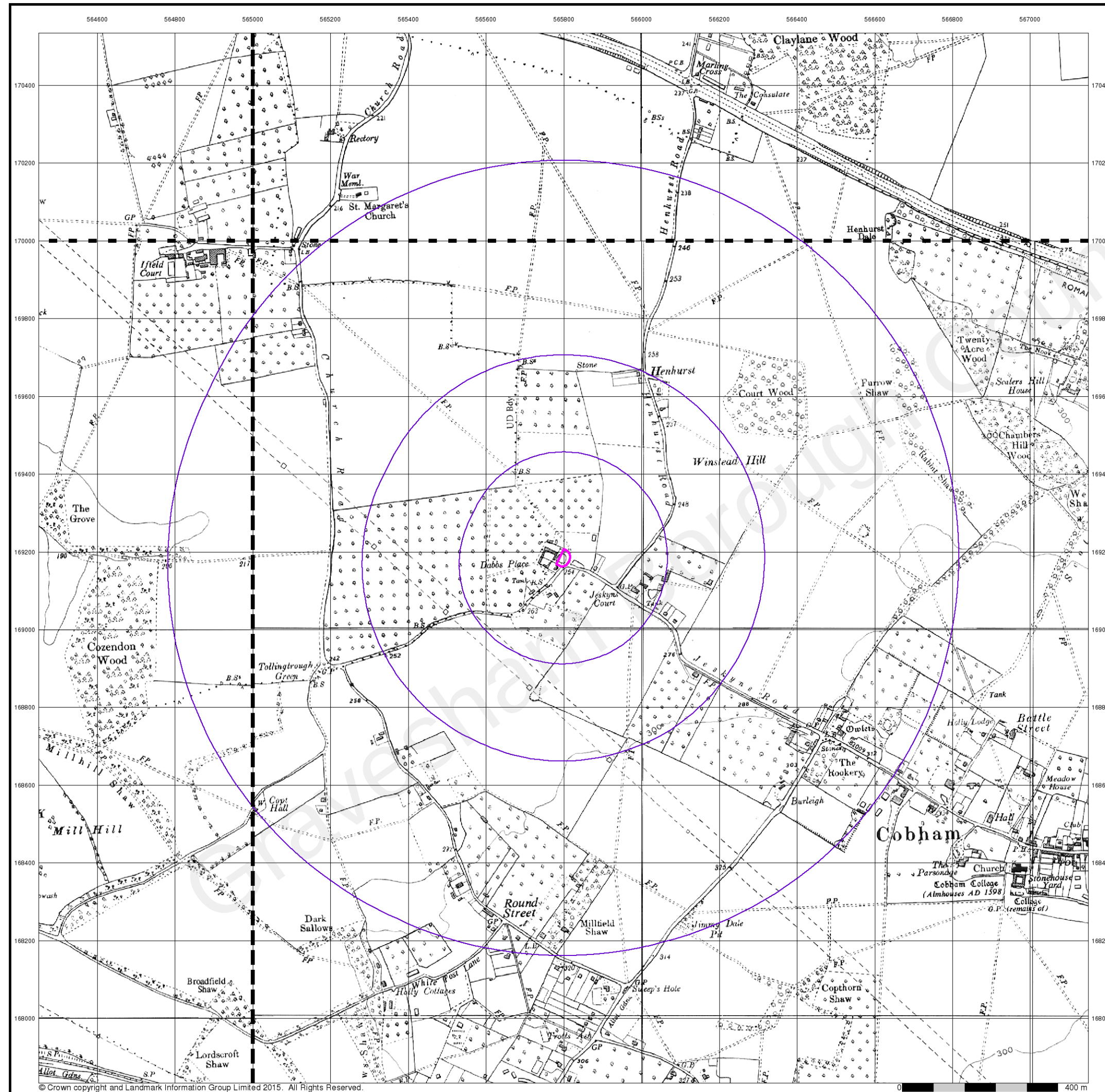


Order Details

Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

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Ordnance Survey Plan

Published 1961 - 1962

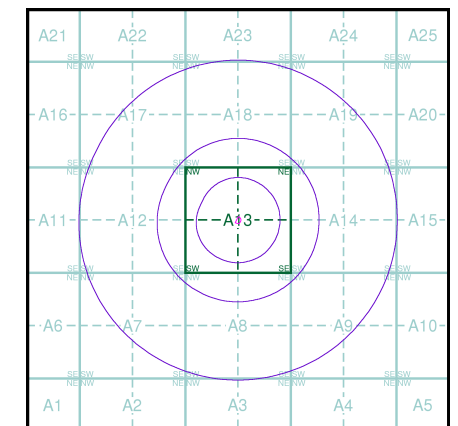
Source map scale - 1:10,000

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

Map Name(s) and Date(s)

TQ67SW	TQ67SE
1962	1961
1:10,560	1:10,560
TQ66NW	TQ66NE
1961	1961
1:10,560	1:10,560

Historical Map - Slice A



Order Details

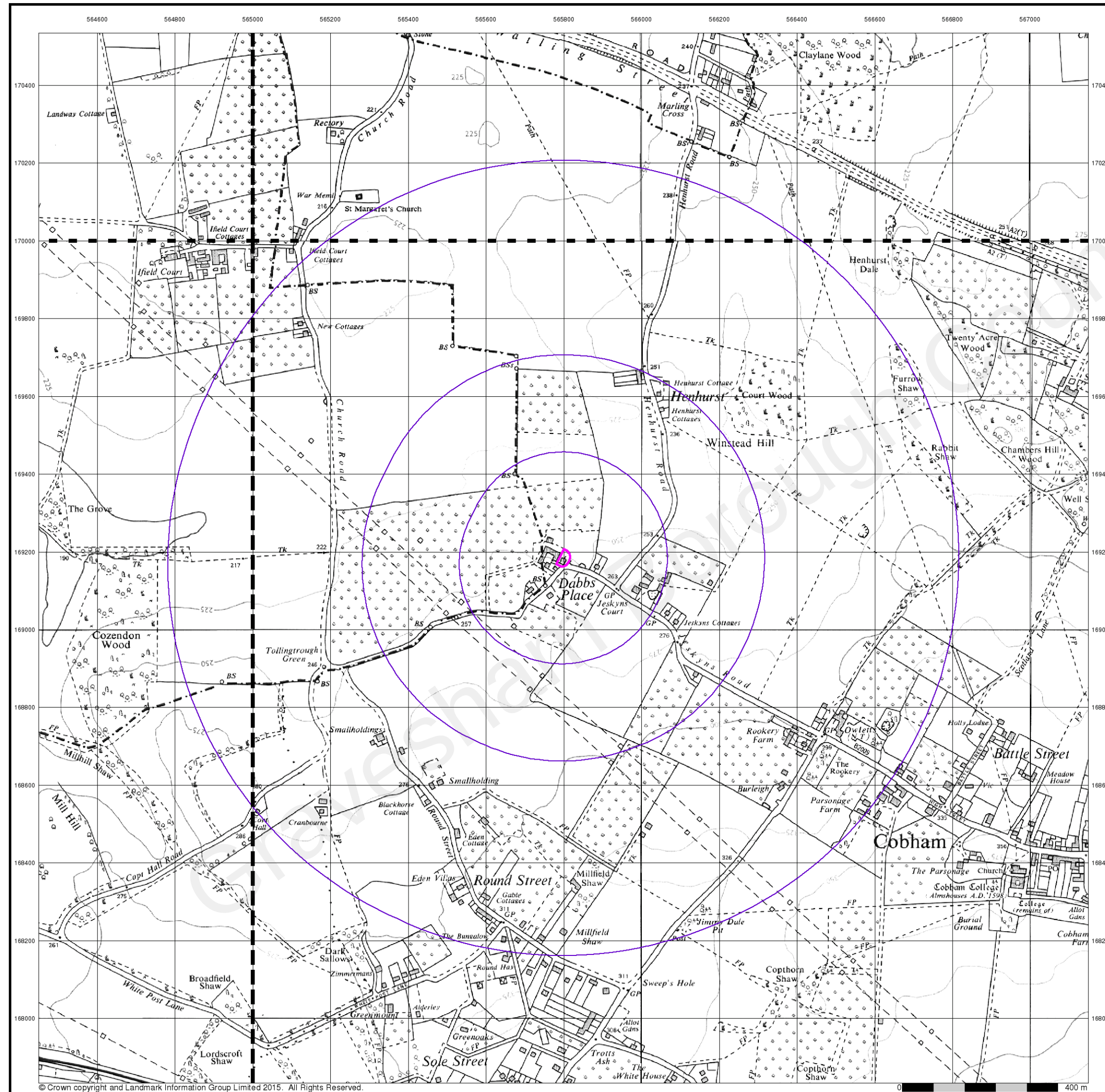
Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

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Ordnance Survey Plan

Published 1965 - 1966

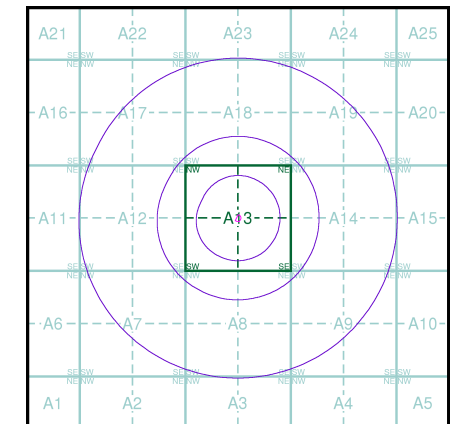
Source map scale - 1:10,000

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)

TQ67SW	TQ67SE
1966	1966
1:10,560	1:10,560
TQ66NW	TQ66NE
1965	1966
1:10,560	1:10,560

Historical Map - Slice A

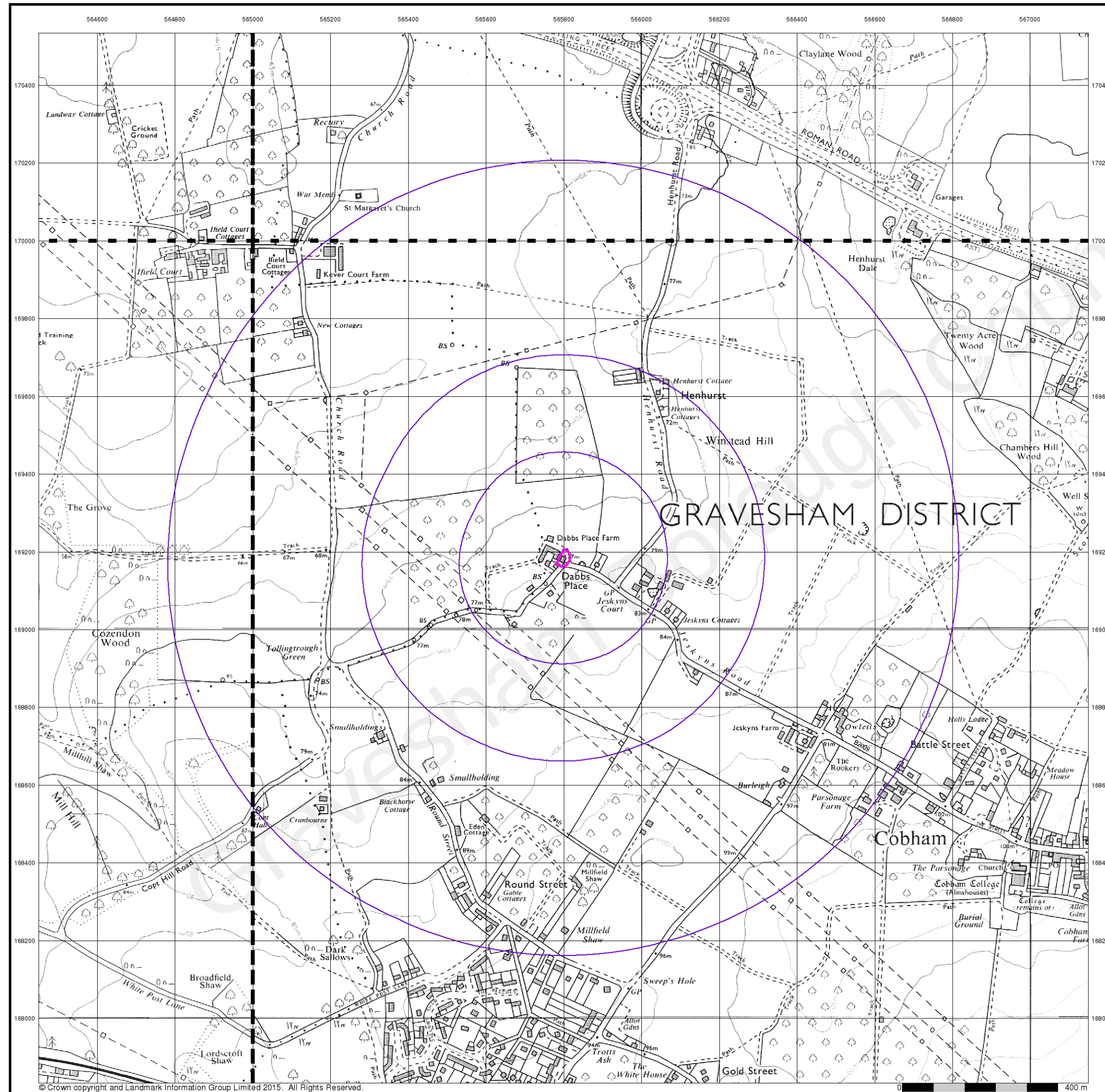


Order Details

Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

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Ordnance Survey Plan

Published 1973 - 1978

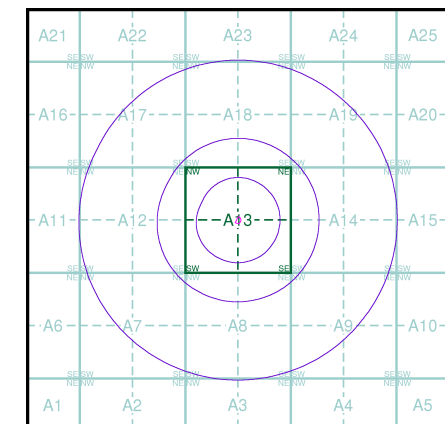
Source map scale - 1:10,000

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

Map Name(s) and Date(s)

TQ67SW	TQ67SE
1973	1975
1:10,000	1:10,000
TQ66NW	TQ66NE
1975	1978
1:10,000	1:10,000

Historical Map - Slice A



Order Details

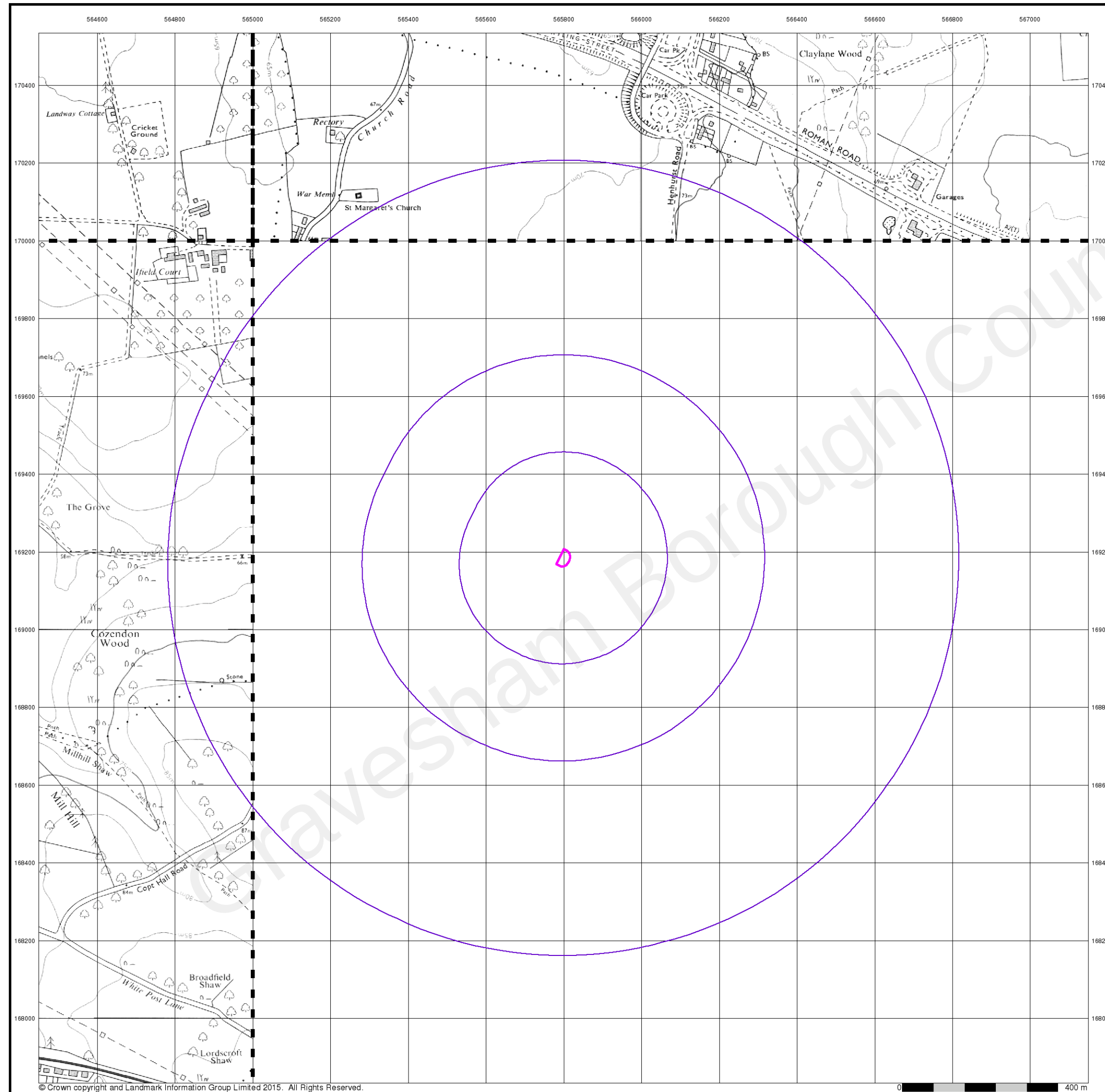
Order Number: 134231146_1_1
Customer Ref: LP1436
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Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

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Ordnance Survey Plan

Published 1980 - 1982

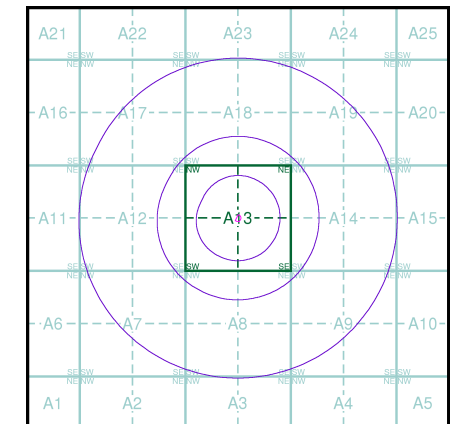
Source map scale - 1:10,000

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)

TQ67SW	TQ67SE
1980	1982
1:10,000	1:10,000
TQ66NW	
1981	
1:10,000	

Historical Map - Slice A



Order Details

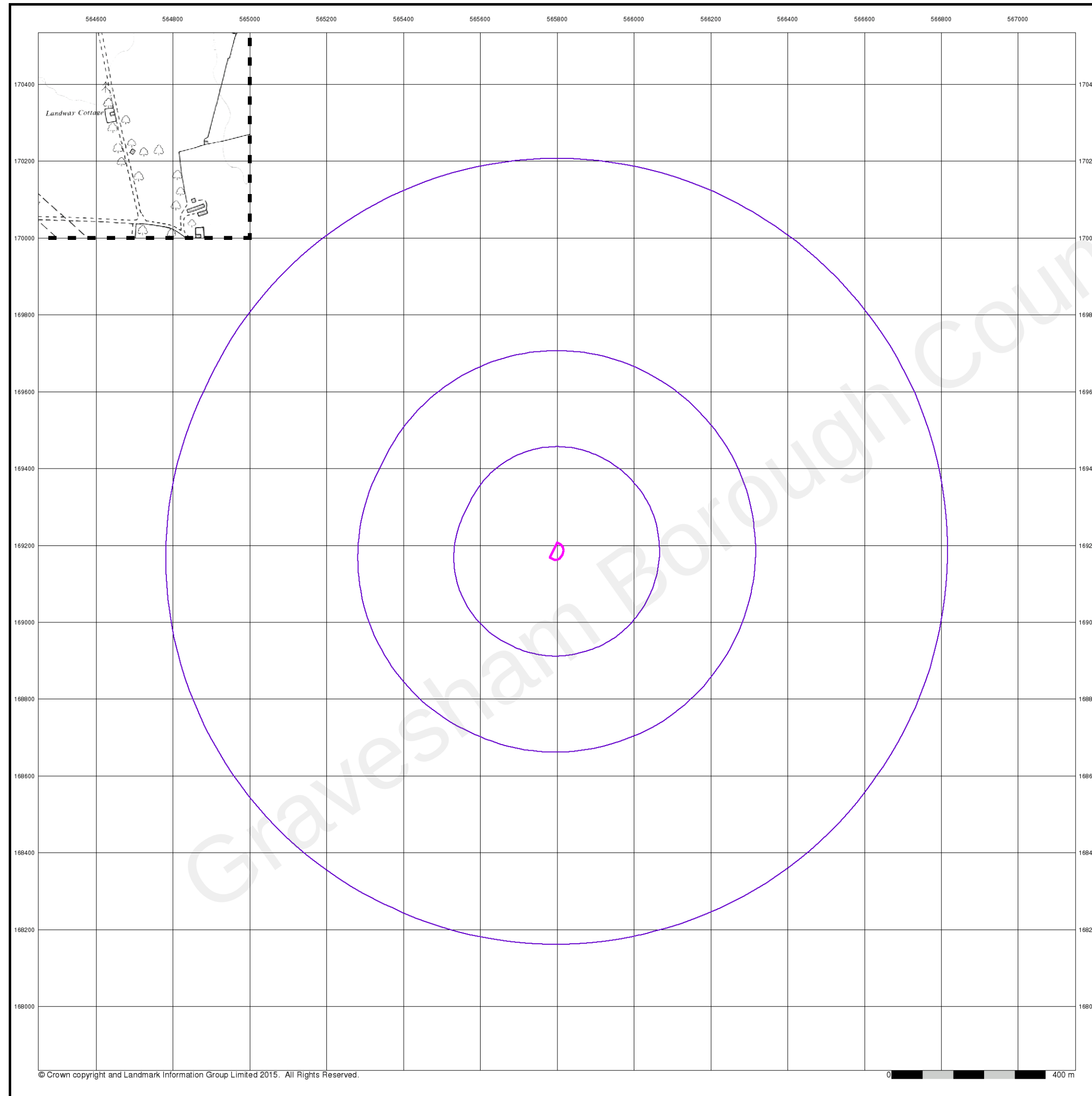
Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

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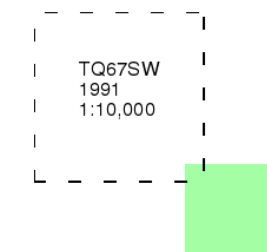
Ordnance Survey Plan

Published 1991

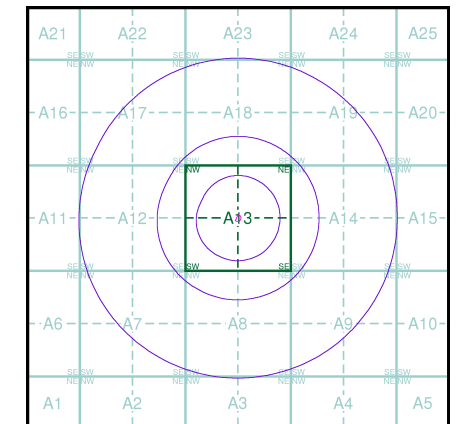
Source map scale - 1:10,000

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)



Historical Map - Slice A

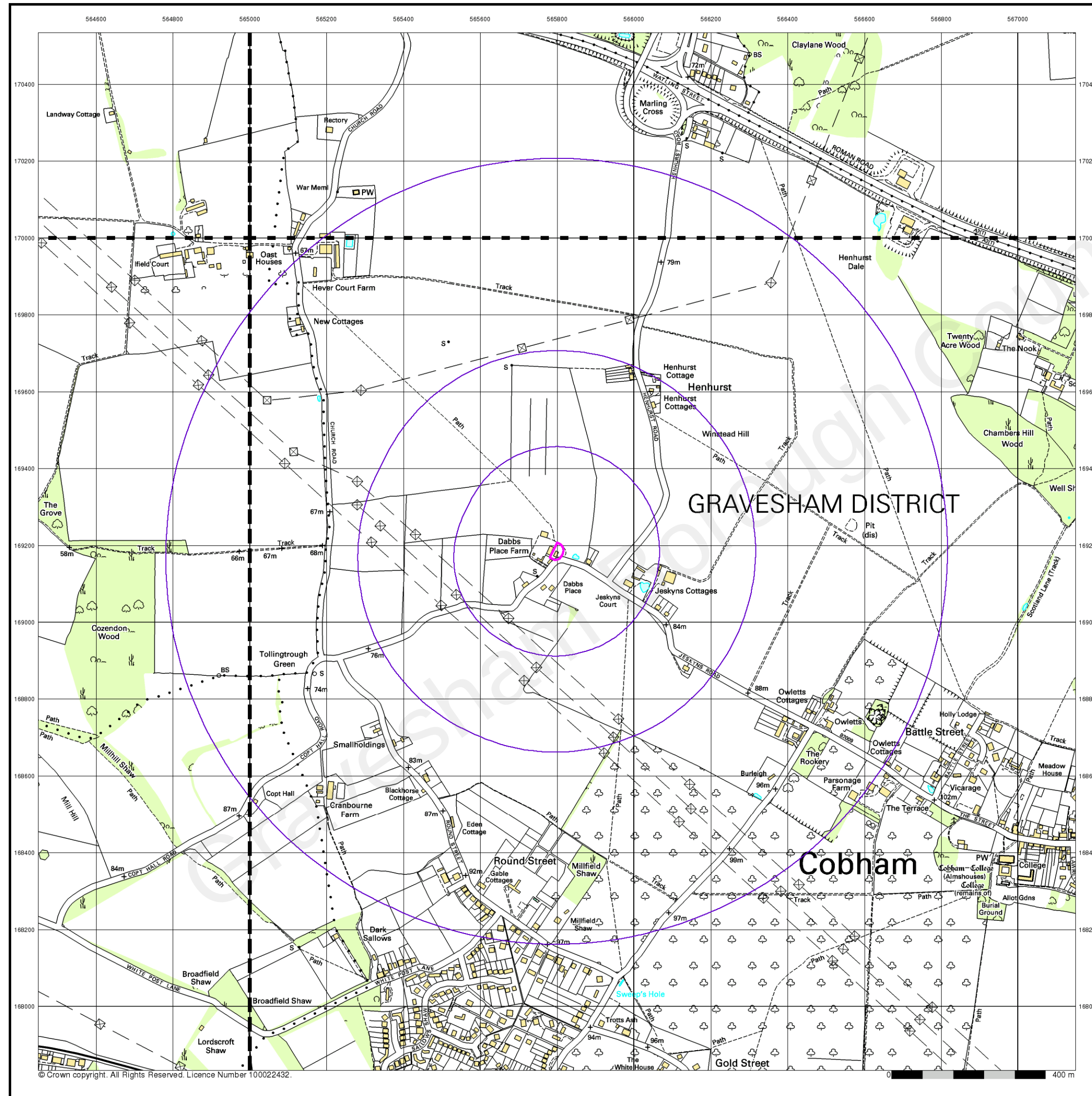


Order Details

Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

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10k Raster Mapping

Published 1999

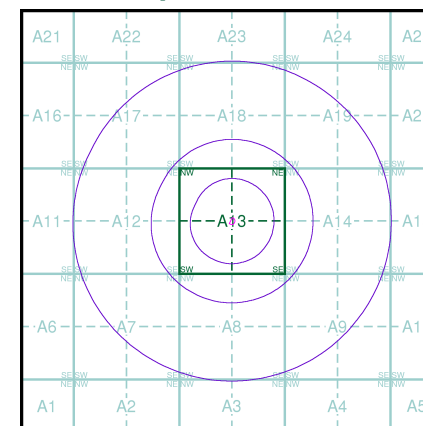
Source map scale - 1:10,000

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

Map Name(s) and Date(s)

TQ67SW	TQ67SE
1999	1999
1:10,000	1:10,000
TQ66NW	TQ66NE
1999	1999
1:10,000	1:10,000

Historical Map - Slice A



Order Details

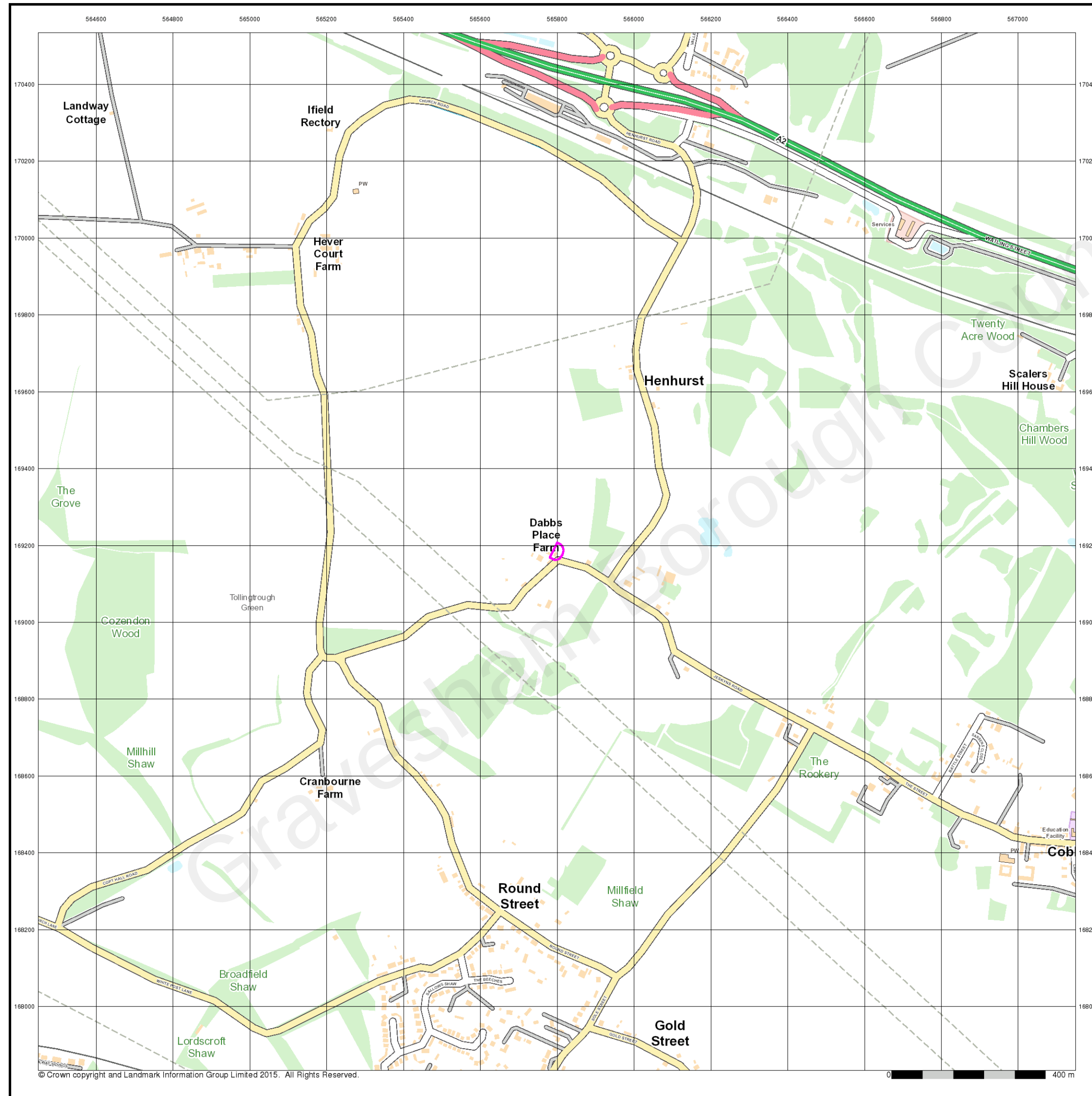
Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Slice: A
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

The Barn, Dabbs Place Cottage, Jeskyns Road, Cobham, GRAVESEND, DA13 9BL

Landmark®
INFORMATION GROUP

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



Street View

Published 2017

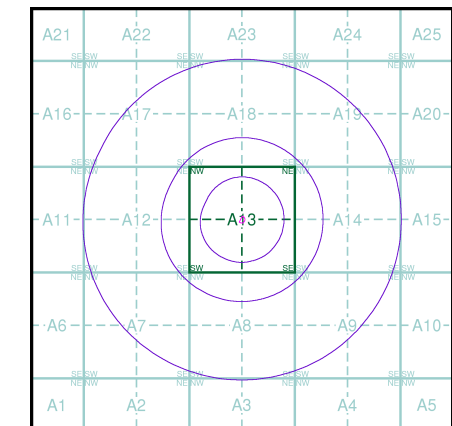
Source map scale - 1:10,000

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)



Street View Map - Slice A

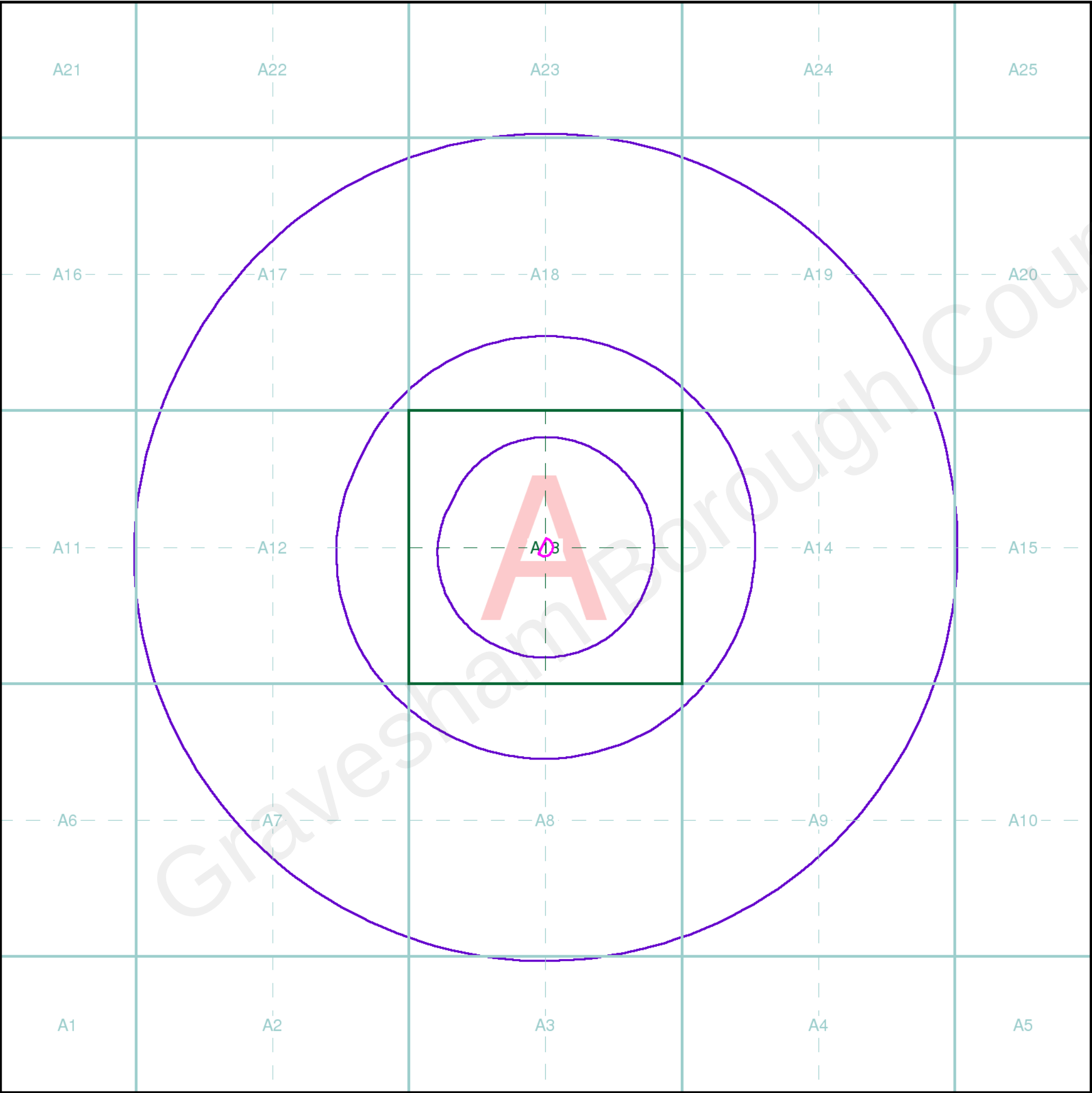


Order Details

Order Number: 134231146_1_1
Customer Ref: LP1436
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Slice: A
Site Area (Ha): 0.1
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Site Details

The Barn, Dabbs Place Cottage, Jeskyns Road, Cobham, GRAVESEND, DA13 9BL



Index Map

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

Slice

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

Segment

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

Quadrant

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

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr D Beesley, Leap Environmental Ltd, The Atrium
Business Centre, Curtis Road, Dorking, Surrey, RH4 1XA

Order Details

Order Number: 134231146_1_1
Customer Ref: LP1436
National Grid Reference: 565800, 169180
Site Area (Ha): 0.1
Search Buffer (m): 1000

Site Details

The Barn, Dabbs Place Cottage, Jeskyns Road, Cobham,
GRAVESEND, DA13 9BL

Full Terms and Conditions can be found on the following link:
<http://www.landmarkinfo.co.uk/Terms/Show/515>

APPENDIX D – QUALITATIVE RISK ASSESSMENT MODEL

Qualitative Risk
Assessment Model

Contaminant	Receptor	Route ¹	Pathway ¹	Likelihood of Occurrence ²	Severity of Consequence ²	Risk Classification ³	Notes
Polyaromatic Hydrocarbons and Petroleum Hydrocarbons	Future Residents	1	Ingestion of soil	Low likelihood	Mild	Low risk	There is the potential for localised PAH and petroleum hydrocarbon contamination on site associated with the made ground (from the infilled pond and stockpiles on site) and the former above ground fuel tank in the northern area of the site. The previous investigation on site recorded elevated PAH concentrations within topsoil on site. The likelihood of occurrence is considered to be low given the proposed hardstanding for the private garden area (with only limited areas of hedgerow proposed for the perimeter of the site).
		2	Ingestion of household dust	Low likelihood	Mild	Low risk	
		3	Ingestion of contaminated vegetables	Low likelihood	Mild	Low risk	
		4	Ingestion of soil attached to vegetables	Low likelihood	Mild	Low risk	
		5	Dermal contact with soil	Low likelihood	Mild	Low risk	
		6	Dermal contact with household dust	Low likelihood	Mild	Low risk	
		7	Inhalation of fugitive soil dust	Low likelihood	Mild	Low risk	
		8	Inhalation of fugitive household dust	Low likelihood	Mild	Low risk	
		9	Inhalation of vapours outside	Low likelihood	Mild	Low risk	
		10	Inhalation of vapours inside	Low likelihood	Mild	Low risk	
	Construction workers	1	Ingestion of soil	Low likelihood	Mild	Low risk	There is considered to be a low likelihood that construction workers will come into contact with contaminants of concern with the correct use of PPE.
		5	Dermal contact with soil	Low likelihood	Mild	Low risk	
		7	Inhalation of fugitive soil dust	Low likelihood	Mild	Low risk	
		9	Inhalation of vapours outside	Low likelihood	Mild	Low risk	
	Groundwater		Intergranular flow of free product	Unlikely	Medium	Low risk	The underlying groundwater is considered to be some distance beneath the ground (historical boreholes in the vicinity of the site recorded groundwater 62m below ground level).
			Rainwater infiltration and leaching of contaminated soils	Unlikely	Medium	Low risk	
	Surface water		Rainwater infiltration and leaching, intergranular flow via groundwater to controlled waters	Low likelihood	Mild	Low risk	No surface water features are mapped on site. The closest surface water feature is some 40m east of the site.
			Surface water run-off	Low likelihood	Mild	Low risk	

Contaminant	Receptor	Route ¹	Pathway ¹	Likelihood of Occurrence ²	Severity of Consequence ²	Risk Classification ³	Notes
	Material construction of buildings and infrastructure		Contact of building materials, including water supply pipes with contaminated soils and/or contaminated groundwater	Low likelihood	Mild	Low risk	
Heavy Metals	Future Residents	1	Ingestion of soil	Low likelihood	Mild	Low risk	There is the potential for localised heavy metal contamination on site associated with the made ground (from the infilled pond and stockpiles on site). The likelihood of occurrence is considered to be low given the proposed hardstanding for the private garden area (with only limited areas of hedgerow proposed for the perimeter of the site).
		2	Ingestion of household dust	Low likelihood	Mild	Low risk	
		3	Ingestion of contaminated vegetables	Low likelihood	Mild	Low risk	
		4	Ingestion of soil attached to vegetables	Low likelihood	Mild	Low risk	
		5	Dermal contact with soil	Low likelihood	Mild	Low risk	
		6	Dermal contact with household dust	Low likelihood	Mild	Low risk	
		7	Inhalation of fugative soil dust	Low likelihood	Mild	Low risk	
		8	Inhalation of fugative household dust	Low likelihood	Mild	Low risk	
	Construction workers	1	Ingestion of soil	Low likelihood	Mild	Low risk	There is considered to be a low likelihood that construction workers will come into contact with contaminants of concern with the correct use of PPE.
		5	Dermal contact with soil	Low likelihood	Mild	Low risk	
		7	Inhalation of fugative soil dust	Low likelihood	Mild	Low risk	
	Groundwater		Intergranular flow of free product	Unlikely	Medium	Low risk	The underlying groundwater is considered to be some distance beneath the ground (historical boreholes in the vicinity of the site recorded groundwater 62m below ground level).
			Rainwater infiltration and leaching of contaminated soils	Unlikely	Medium	Low risk	
	Surface water		Rainwater infiltration and leaching, intergranular flow via groundwater to controlled waters	Low likelihood	Mild	Low risk	No surface water features are mapped on site. The closest surface water feature is some 40m east of the site.
			Surface water run-off	Low likelihood	Mild	Low risk	
Asbestos	Future Residents	7	Inhalation of fugative soil dust	Low likelihood	Severe	Moderate risk	There is the potential for asbestos contamination associated with the ACM cladding and roofing of the

Contaminant	Receptor	Route ¹	Pathway ¹	Likelihood of Occurrence ²	Severity of Consequence ²	Risk Classification ³	Notes
		8	Inhalation of fugative household dust	Low likelihood	Severe	Moderate risk	barn. The likelihood of occurrence is considered to be low given the proposed hardstanding for the private garden area (with only limited areas of hedgerow proposed for the perimeter of the site).
	Construction workers	7	Inhalation of fugative soil dust	Unlikely	Medium	Low risk	There is considered to be a low likelihood that construction workers will come into contact with contaminants of concern with the correct use of PPE.

Notes to table:

1. Classification of human exposure pathways (routes) from *The CLEA model, Research and Development Publication CLR10*.
2. Classification of Probability and Consequence from *CIRIA C552 Contaminated land risk assessment, a guide to good practice 2001*
3. Risk Classification from *DETR Guidelines for Environmental Risk Assessment and Management, 2000*

QUALITATIVE RISK ASSESSMENT MODEL

The Qualitative Risk Assessment Model used is based upon that developed by the NHBC¹ (2008) which is itself developed from (DOE, 1995) A Guide to Risk Assessment and Risk Management for Environmental Protection; and the Statutory Guidance on Contaminated Land (Defra, September 2006). The methodology is based on that presented in CIRIA² C552 2001; but differs in terms of the definitions of classification of consequence, which include a consideration of immediacy of hazards.

The key to the classification is that the designation of risk is based upon the consideration of both:

- A) the magnitude of the potential consequence (i.e. severity) [takes into account both the potential severity of the hazard and the sensitivity of the receptor]
- B) the magnitude of probability (i.e. likelihood) [takes into account both the presence of the hazard and receptor and the integrity of the pathway]

These are defined in the tables on the following pages:

Table 1 Classification of Consequence

Classification	Definition	Examples
Severe	Highly elevated concentrations likely to result in “significant harm” to human health as defined by the EPA 1990 Part 2a, if exposure occurs. Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long term maintenance of the population. Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in “significant harm” to human health as defined by the EPA 1990 Part 2A if exposure occurs. Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long term maintenance of the population. Significant damage to crops, buildings or property.	Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes/

¹Guidance for the Safe Development of Housing on Land Affected by Contamination R&S66: 2008 Annex 4

²C552 Contaminated Land Risk Assessment, A Guide to Good Practice

Mild	Exposure to human health unlikely to lead to “significant harm”. Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change on its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population. Minor damage to crops, buildings or property.	Exposure could lead to slight short-term effects (e.g. mild skin rash). Surface spalling of concrete.
Minor	No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects or damage to buildings, structures and services.	The loss of plants in a landscaping scheme. Discolouration of concrete.

*For these purposes disease is to be taken to mean an unhealthy condition of the body or a part off it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only in so far as it is attributable to the effects on the body of the person concerned.

Table 2 Classification of probability

Category	Definition	Examples
High Likelihood	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	A) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden. B) Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years.
Likely	There is a pollutant linkage and all the elements are present and in the right place which means that it is probably that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long-term.	A) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5 – 1m in a residential garden, or the top 0.5m in public open space. B) Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.
Low Likelihood	There is pollutant linkage and circumstances are possible under which an event could occur. However it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	A) Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5 – 1m in public open space. B) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage
Unlikely	There is a pollutant linkage but circumstances are such that it is improbably that an event would occur even in the very long-term.	A) Elevated concentrations of toxic contamination are present below hardstanding. B) Light industrial unit <10 yrs old containing a double skinned UST with annual integrity testing results available.

Risk is then classified as a product of the magnitude of the potential consequence and the likelihood of it coming about as follows:

Table 3. The classification of risk

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

Description of the classified risks

Very high risk

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence there severe harm to a designated receptor is already occurring. Realisation of the risk is likely o present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short term.

High risk

Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short term and are likely over the longer term.

Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Low risk

It is possible that harm could arise to a designated receptor from identified hazard, but it is unlikely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier

would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

Very low risk

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

No potential risk

There is no potential risk if no pollution linkage has been established.

Definitions	
Hazard	A property or situation which in certain circumstances could lead to harm. [The properties of different hazards must be assessed in relation to their potential to affect the various different receptors].
Risk	A combination of the probability or frequency of the occurrences of a defined hazard AND the magnitude of the consequence of that occurrence.
Probability	The mathematical expression of the chance of a particular event in a given period of time [e.g. probability of 0.2 is equivalent to 20% or a 1 in 5 chance].
Likelihood	Probability; the state or fact of being likely.
Consequences	The adverse effects (or harm) arising from a defined hazard which impairs the quality of the environment or human health in the short or longer term.
Pollution Linkage	An identified pathway is capable of exposing a receptor to a contaminant and that contaminant is capable of harming the receptor.

Geotechnical risk is the risk to building and construction work created by the site ground conditions. The Preliminary Geotechnical Risk Register has been compiled to provide an assessment of the likely risks that may impact on the proposed development based on the results of the desk study, and should be used to specify the type and extent of the intrusive investigation and testing undertaken, and to identify potential mitigation measures to control the risk to an acceptable level.

The inclusion of a risk in the register does not indicate that the risk is present, rather the likelihood of mitigation measures being required due to that risk, based on the available data. Equally, a risk classified as low indicates that mitigation measures are unlikely to be required for the hazard identified based on the available data.

The risk register should be developed and refined throughout the design process such that it will enable the management of geotechnical risk.

The Geotechnical Risk Register has been developed in accordance with the guidance presented in ICE/DETR Document "Managing Geotechnical Risk" (2002). The degree of risk (R) is determined by assessing the likelihood of a hazard (L) occurring and the effect of the hazard (E) on the project ($R=L \times E$). The effect may be measured in one or more aspect e.g. increased cost, delays in the program, health and safety etc. The scale of the likelihood, effect and risk are determined as follows:-

Likelihood of Occurrence			X	Effect of Hazard			=	Degree of Risk		
Scale	Likelihood	Chance		Scale	Effect	Increase in cost or time		Degree of Risk	Risk Level	Action required
4	Probable	>1 in 2		4	Very High	>10%		1-4	Trivial	None
3	Likely	1 in 10 to 1 in 2		3	High	4-10%		5-8	Significant	Consider cost effective solutions or improvements at no extra cost
2	Unlikely	1 in 100 to 1 in 10		2	Low	1-4%		9-12	Substantial	Work must not start until risk has been reduced. Additional resource required
1	Negligible	<1 in 100		1	Very Low	<1%		13-16	Intolerable	Work must not start until risk has been reduced. If risk can not be reduced, project should not proceed.

Hazard	Effect	Likelihood of Occurrence	Effect of Hazard	Risk Classification	Notes
Made Ground	Deepened foundations	Unlikely	Low	Trivial	Deep made ground is considered unlikely on site.
	Unstable excavations	Unlikely	Low	Trivial	
Compressible Ground	Bearing capacity failure	Negligible	High	Trivial	Strata on-site is not deemed excessively compressible
	Excessive settlement	Negligible	High	Trivial	
High Groundwater Table	Unstable excavations/ running sands	Unlikely	Low	Trivial	Unlikely, given that groundwater is considered to be some distance below ground level.
	Dewatering	Negligible	Low	Trivial	
	Contamination	Negligible	Low	Trivial	
Deep Excavations	Deepened foundations	Negligible	High	Trivial	Absence of deep excavations on-site.
Working in highway	Traffic Management	Negligible	Very low	Trivial	N/A
Shrinkable soils	Deepened foundations	Unlikely	Low	Trivial	Unlikely in underlying geology.
	Heave	Unlikely	Low	Trivial	
Frost Susceptible soils	Road Design	Unlikely	Low	Trivial	Soils on-site are not deemed frost susceptible.
Aggressive ground conditions for Concrete	Concrete design	Negligible	High	Trivial	Not anticipated within underlying geology.
Slope Stability/Retaining Structure	Local stability	Negligible	Low	Trivial	There are no steep slopes on site.
	Global stability	Negligible	Low	Trivial	
Mining	Suitability for development	Negligible	High	Trivial	N/A
Ground dissolution/ Natural cavities	Remedial measures				
		Likely	High	Substantial	Chalk is mapped along the northern site boundary, as such there is a chance chalk is beneath the site which could promote solution feature initiation.
Landfill	Land gas	Negligible	High	Trivial	No landfills have been identified within 1km of the site.
Contaminated land	Remedial measures				
		Unlikely	High	Significant	Significant contamination is not anticipated on site, given the results of testing from the previous site investigation.
Archaeological remains	Remedial measures	Negligible	High	Trivial	N/A.
UXO	UXO supervision	Unlikely	Very high	Significant	UXO risk has been deemed MODERATE/LOW.

APPENDIX E – SITE PHOTOGRAPHS

Site Photographs



Plate 1- Stockpile of made ground.



Plate 2- North-east corner of the site.



Plate 3- Covered topsoil stockpile.



Plate 4- Inside the barn.



Plate 5- Asbestos cladding found on the surface around the site.



Plate 6- Made ground around the northern boundary of the barn.



Plate 7- Open green space east of the barn.



Plate 8- Dabbs Place Lane running along the southern boundary.



Plate 9- The barn in the southern area of the site.



Plate 10- Damaged asbestos cladding along the walls of the barn.

APPENDIX F – CHEMICAL LABORATORY TEST RESULTS

Chemical Laboratory
Test Results