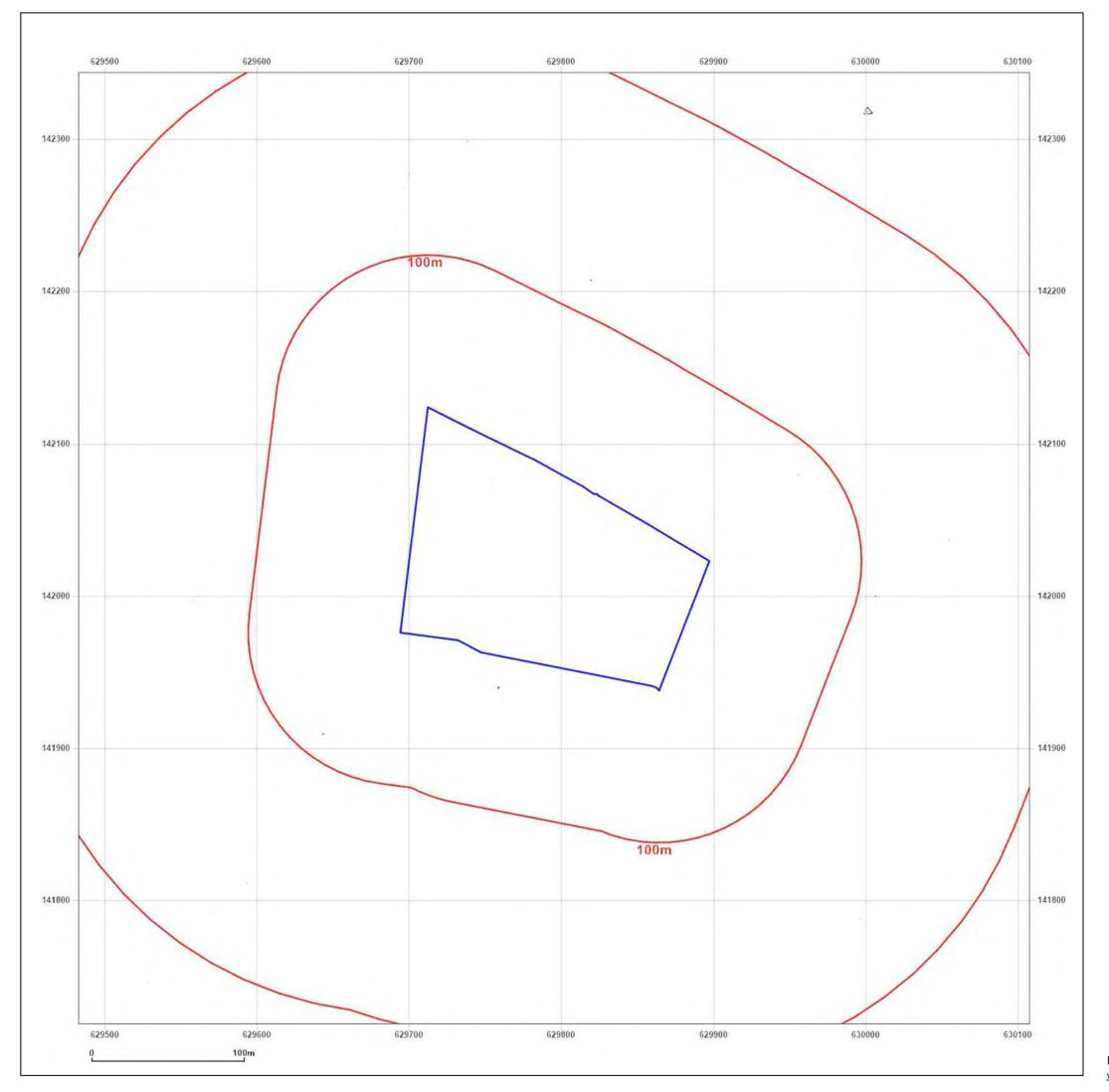
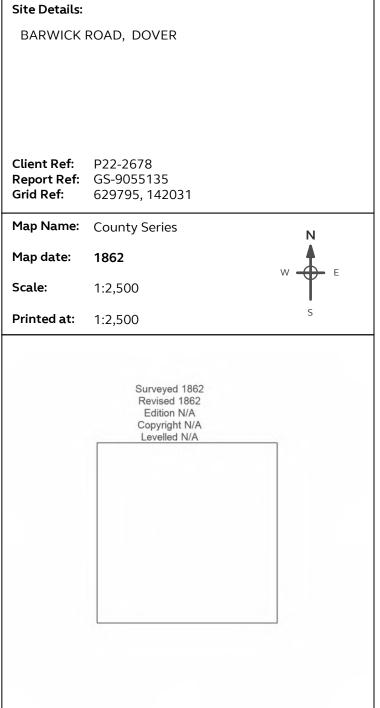


APPENDIX CHISTORICAL ORDNANCE SURVEY MAPPING





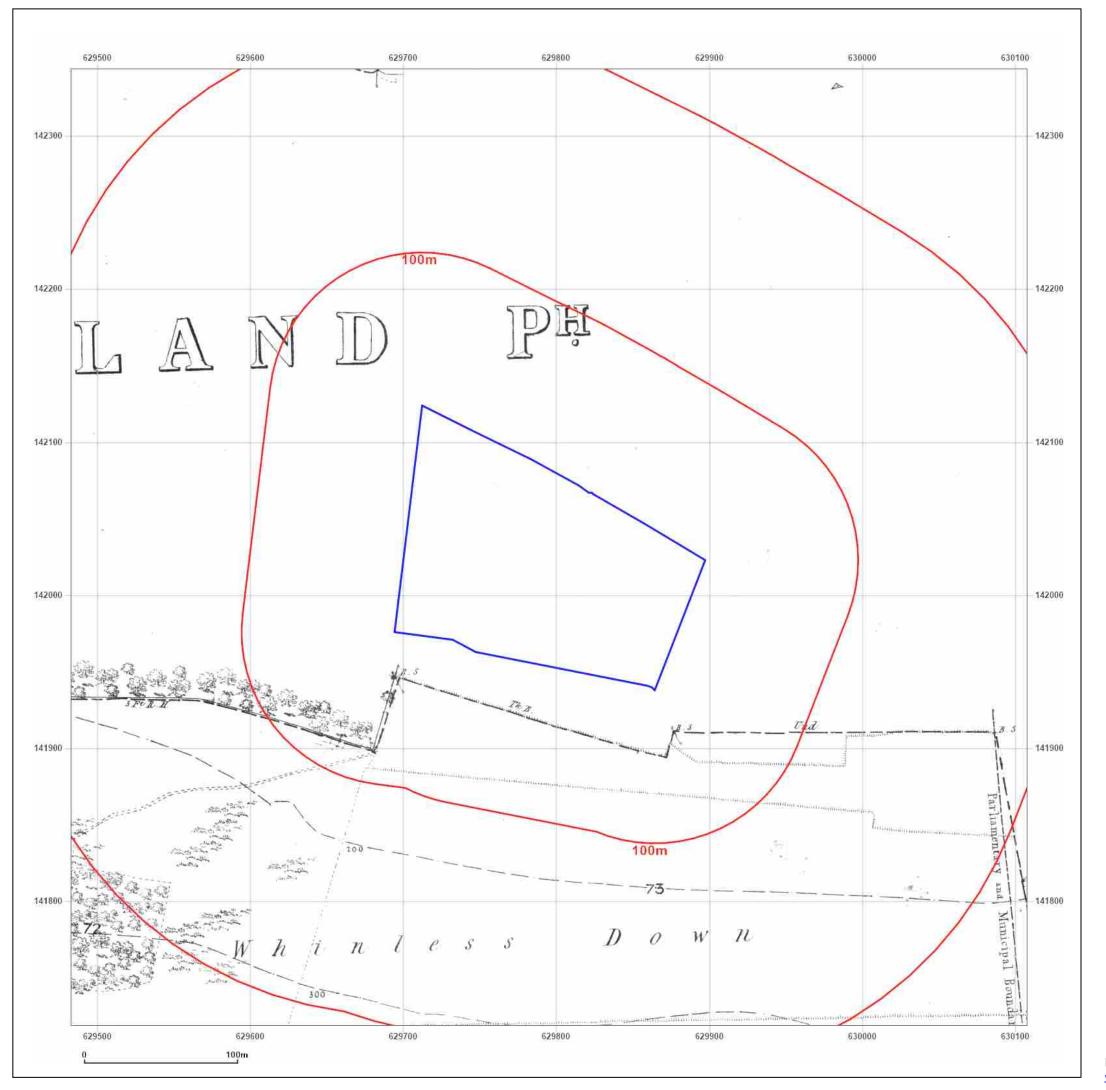




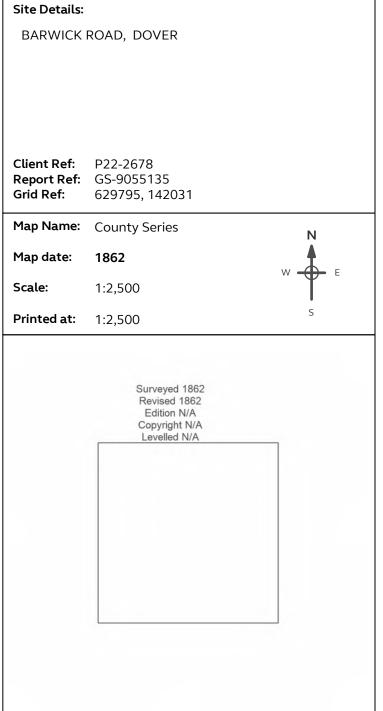
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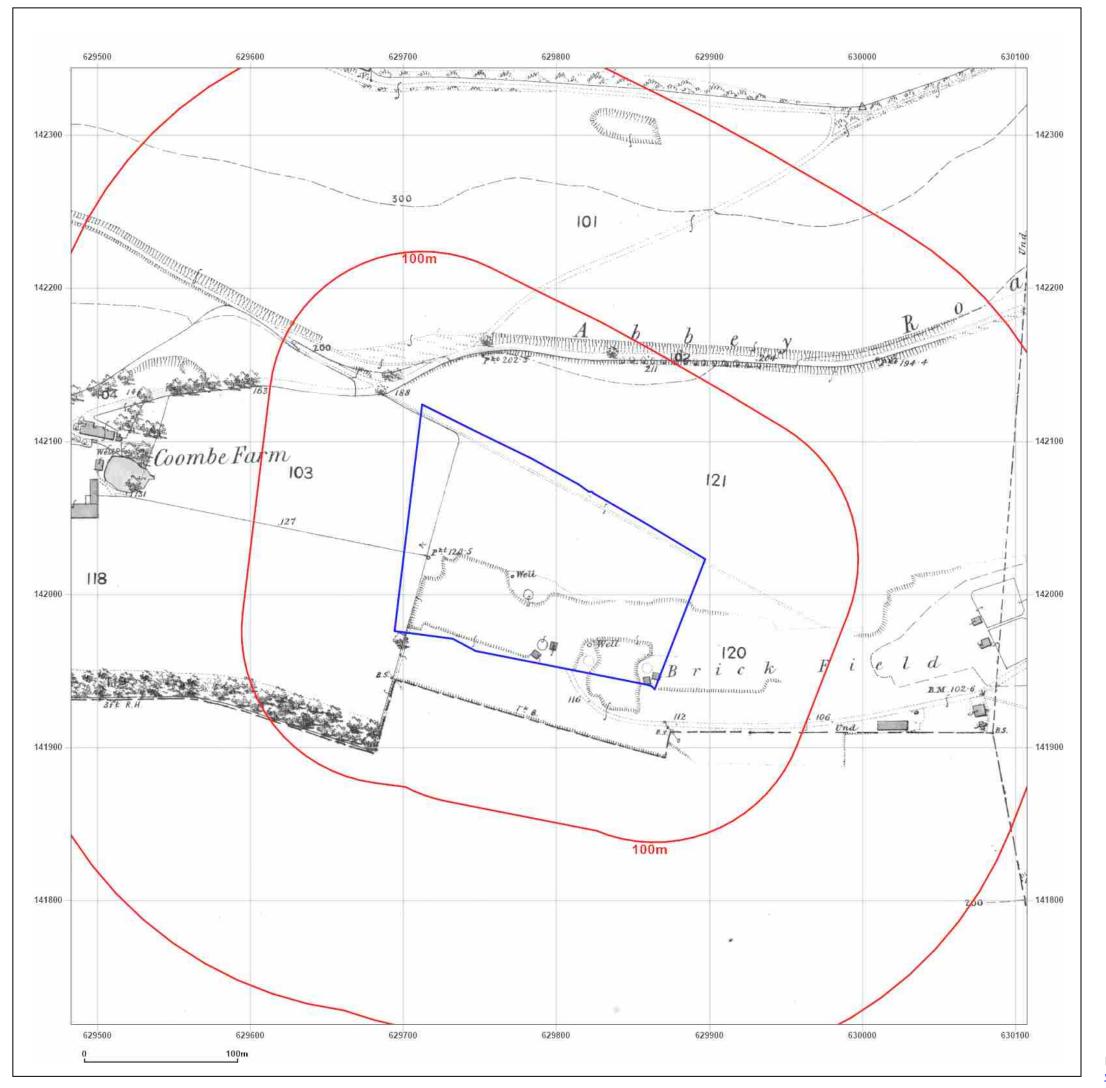




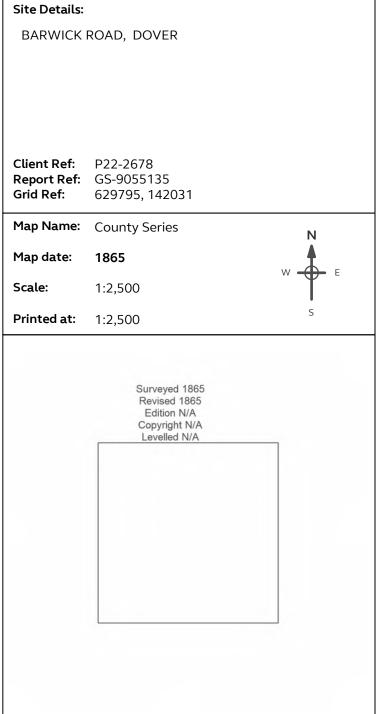
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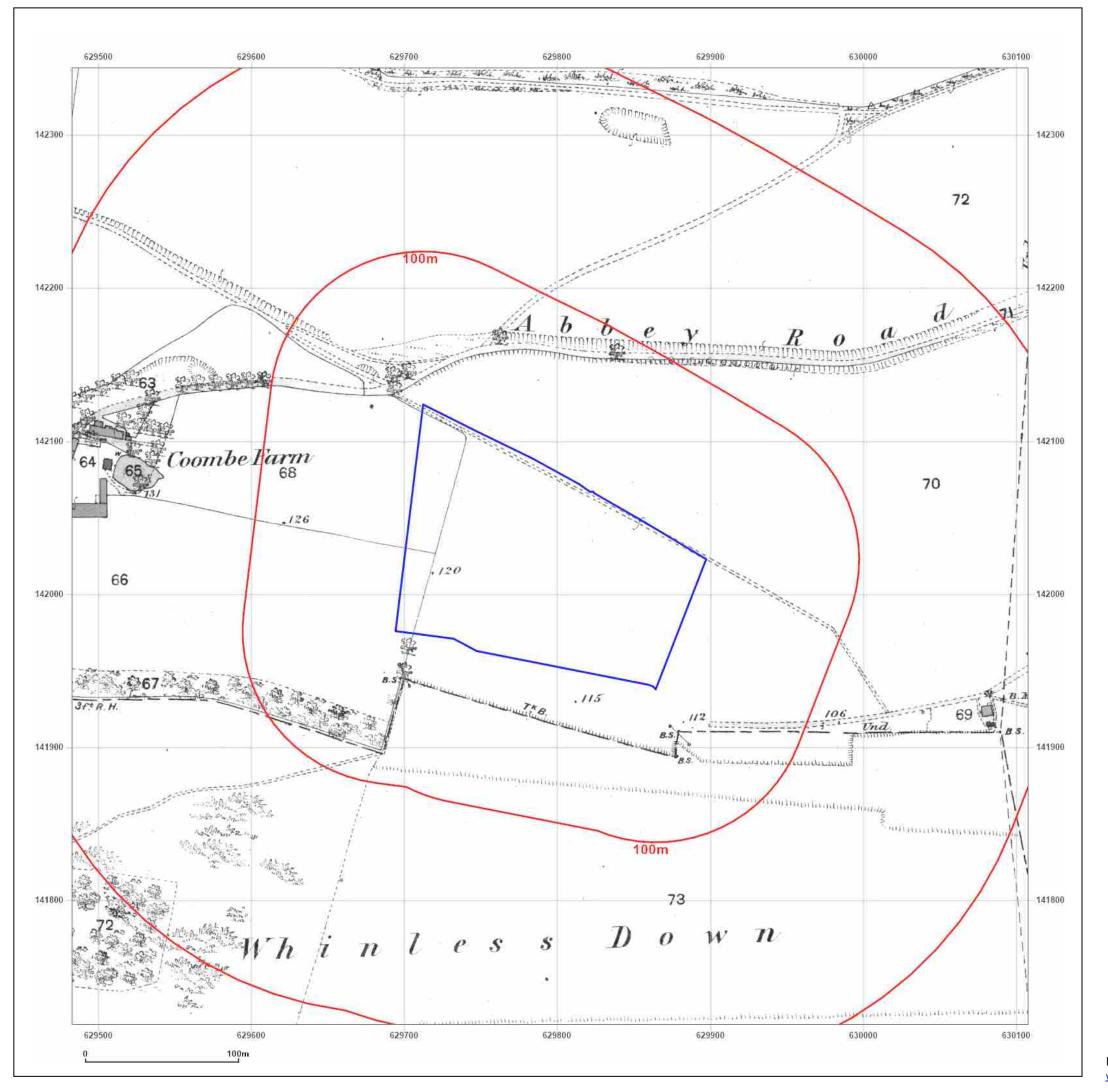




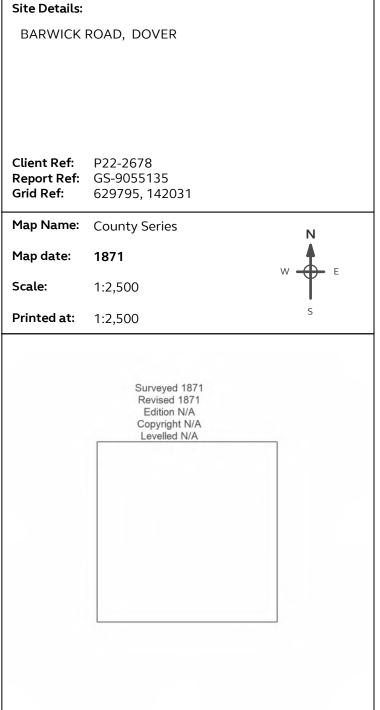
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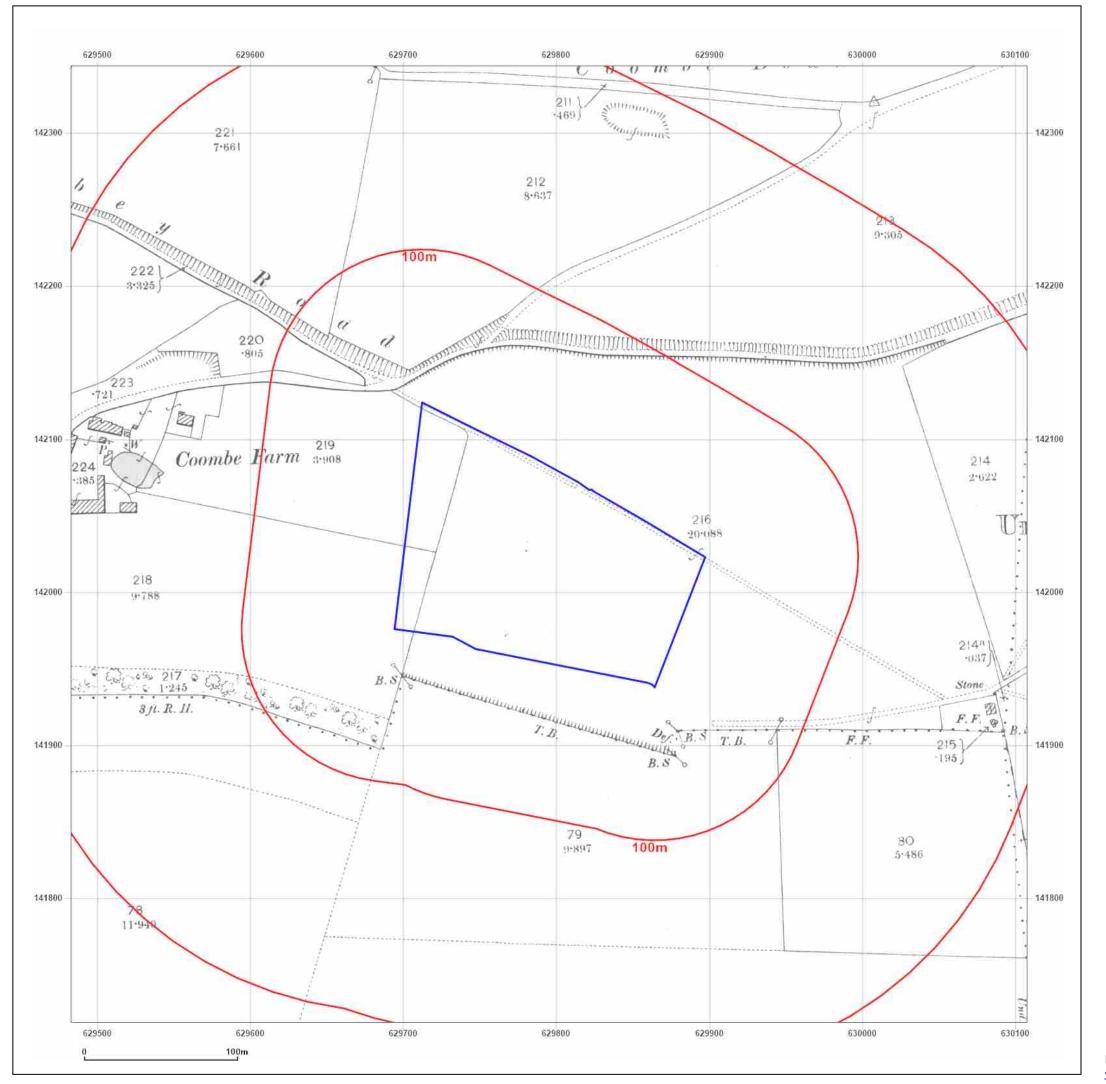




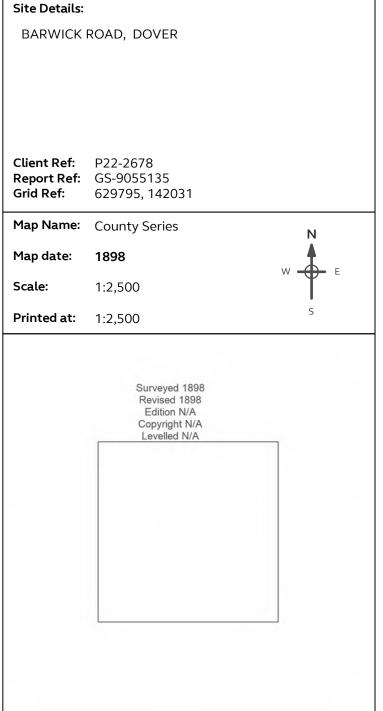
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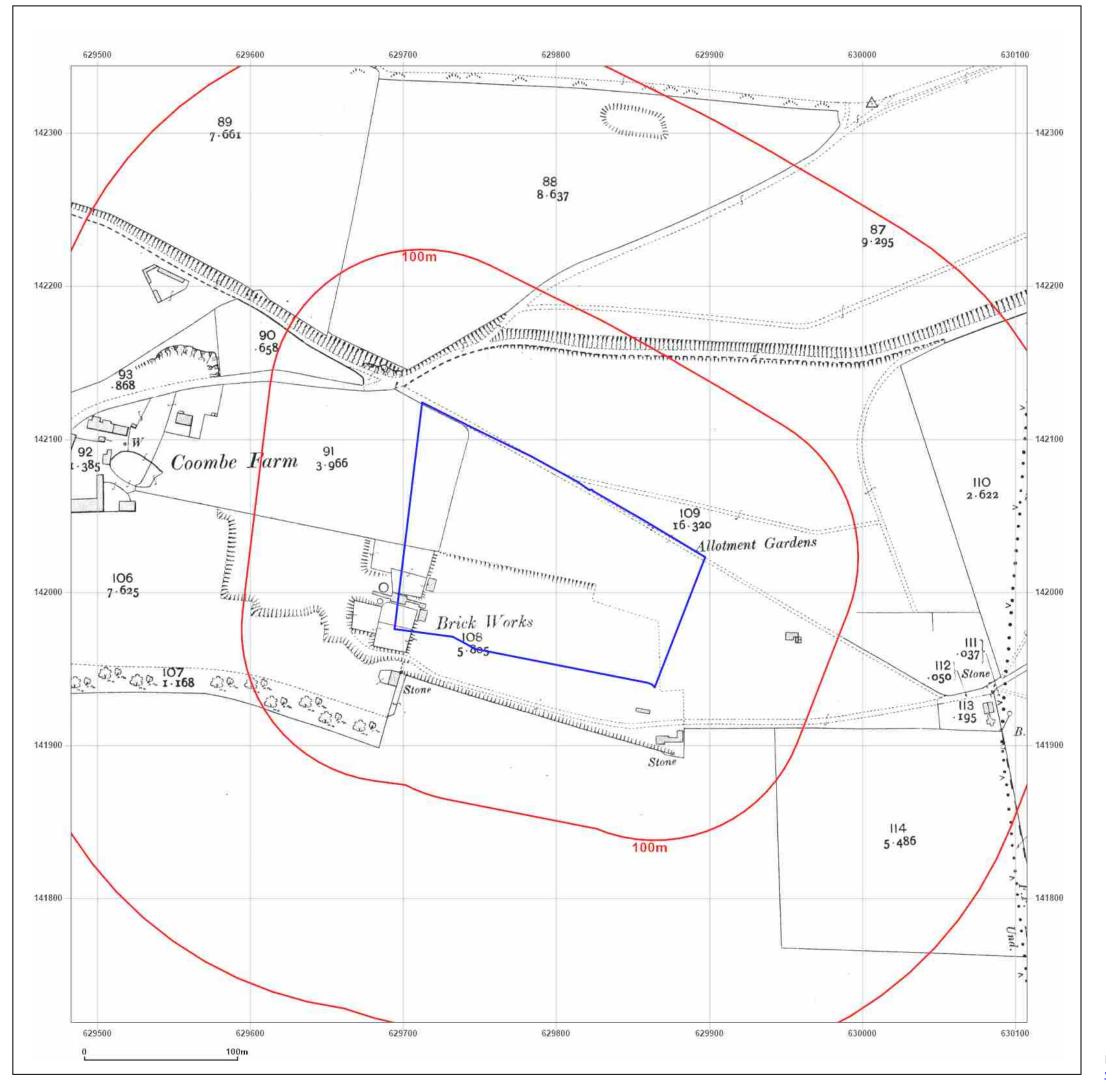




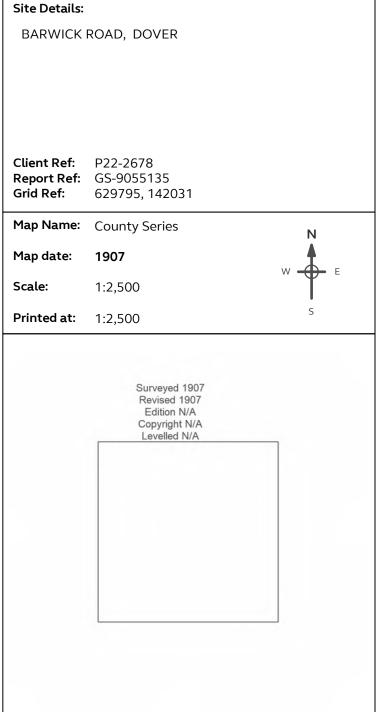
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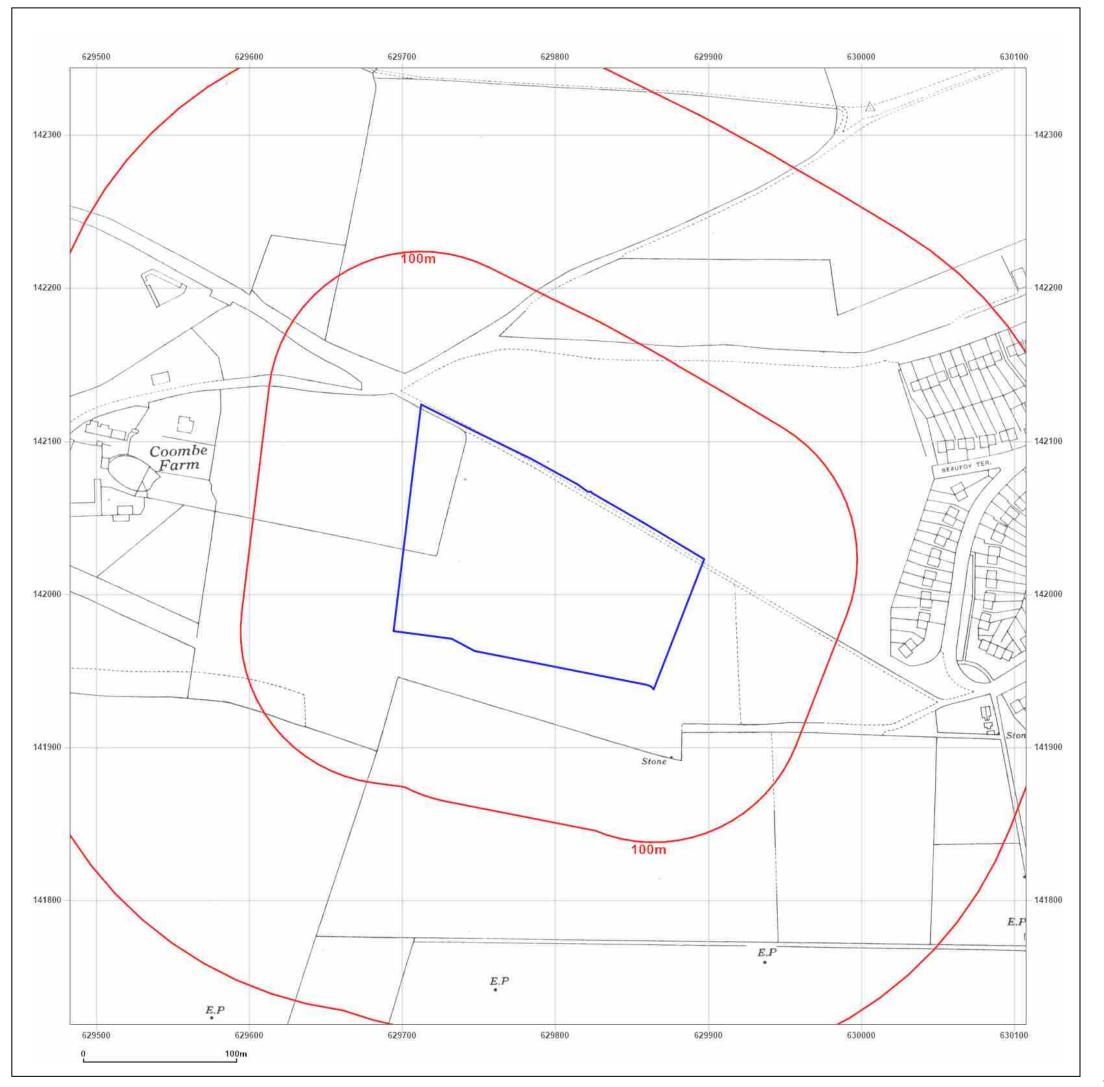




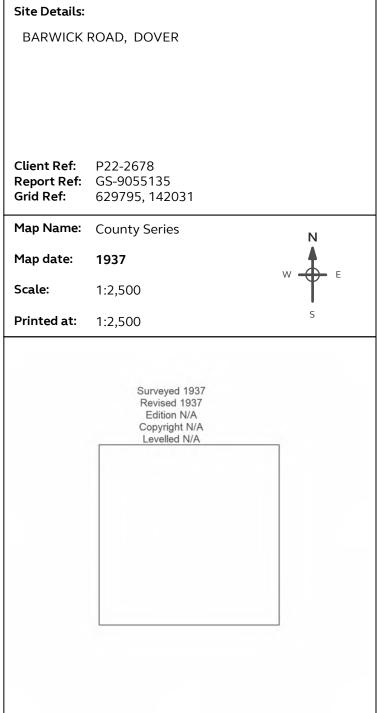
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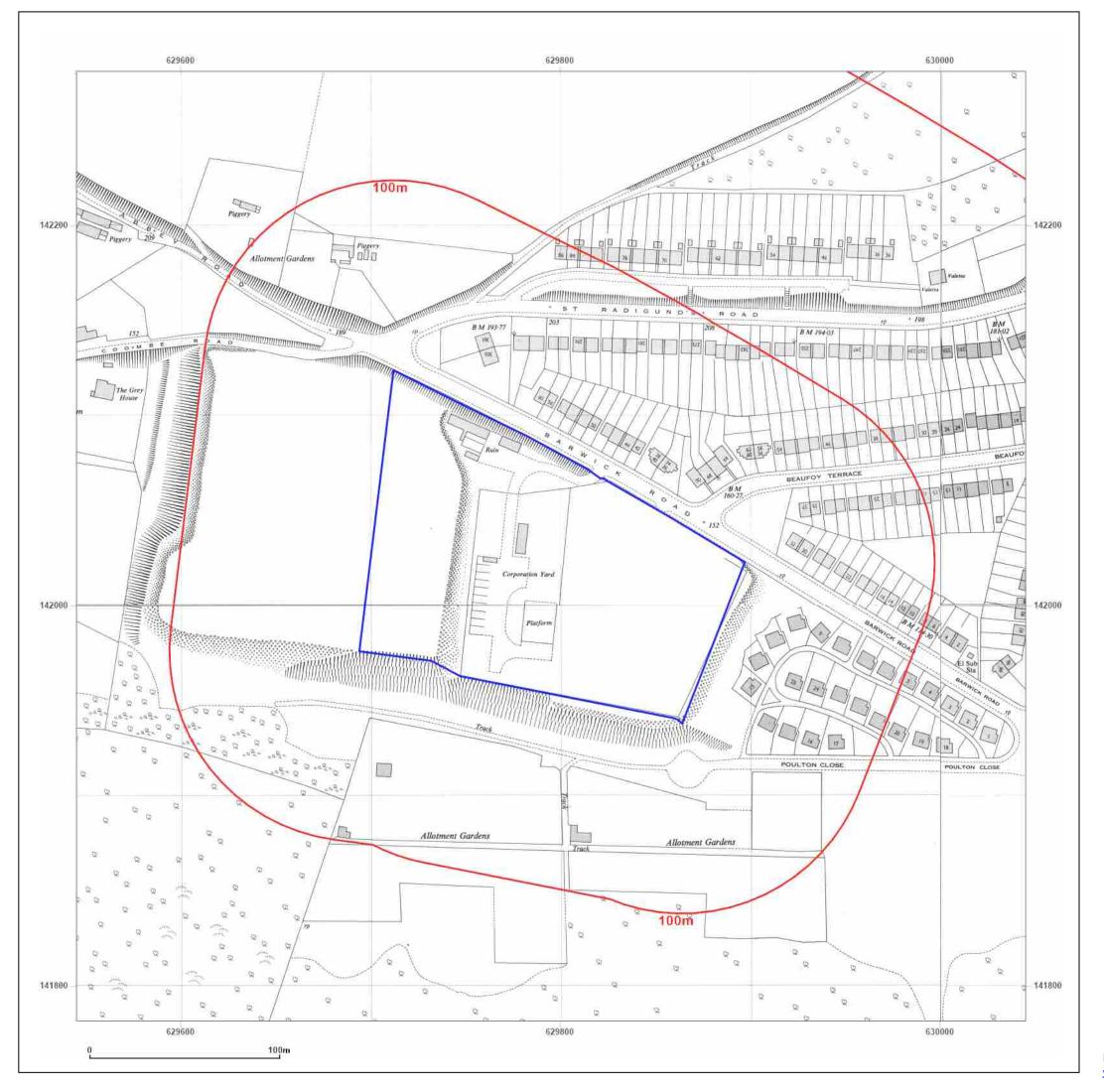




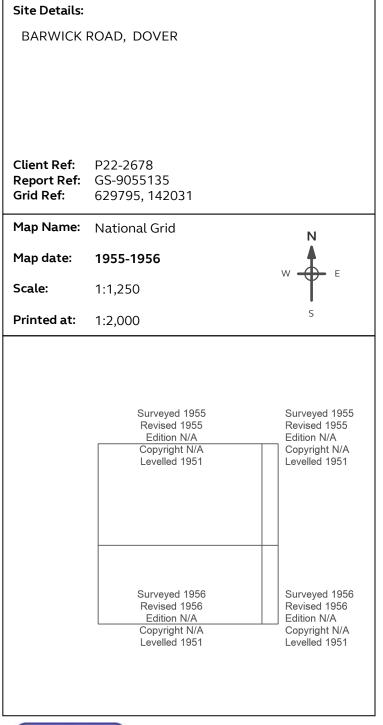
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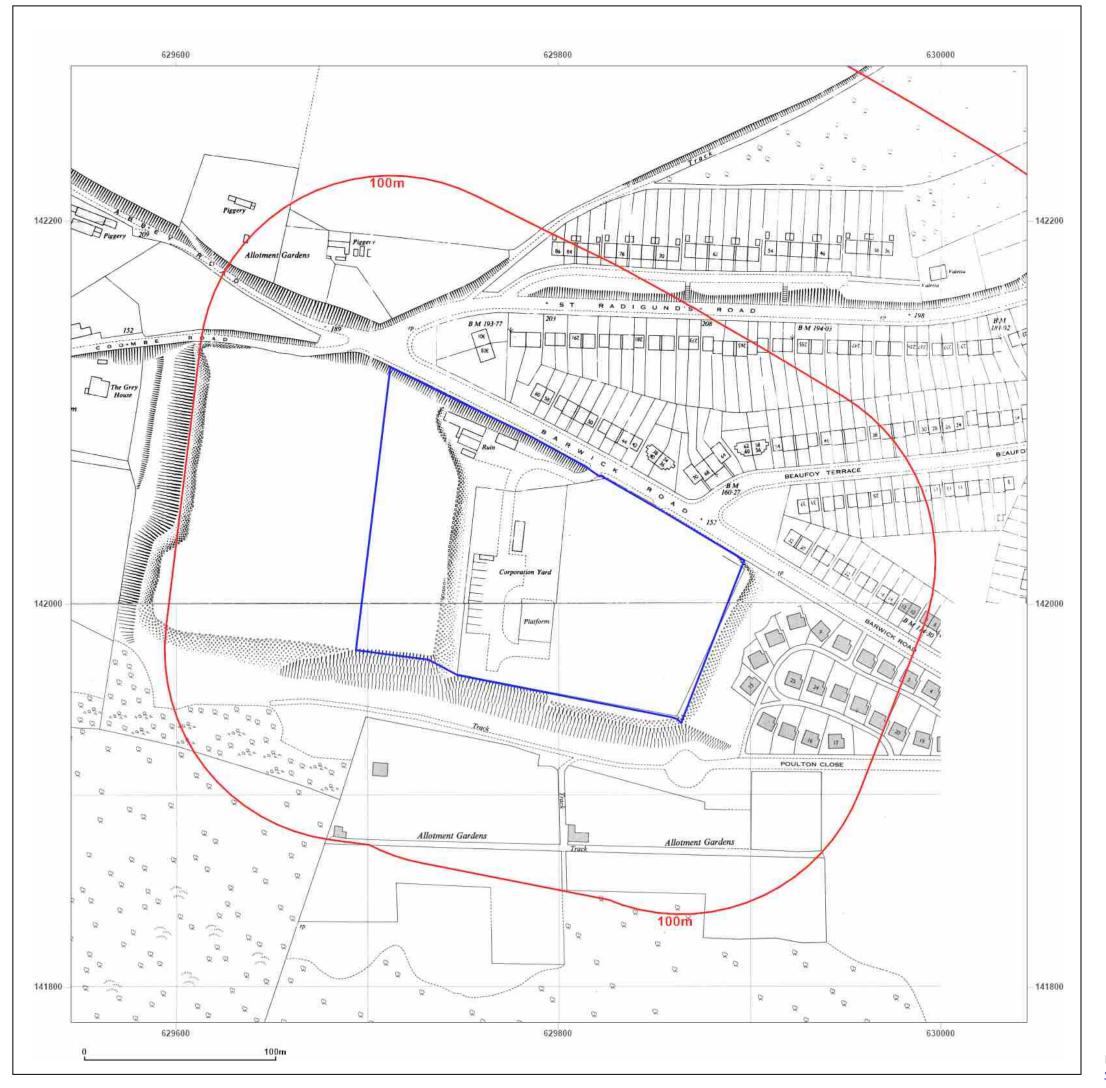




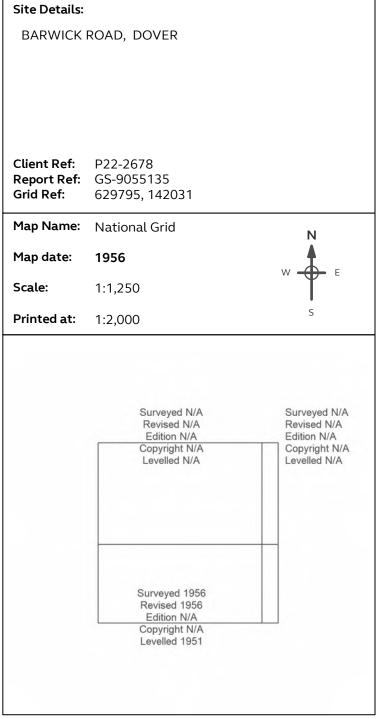
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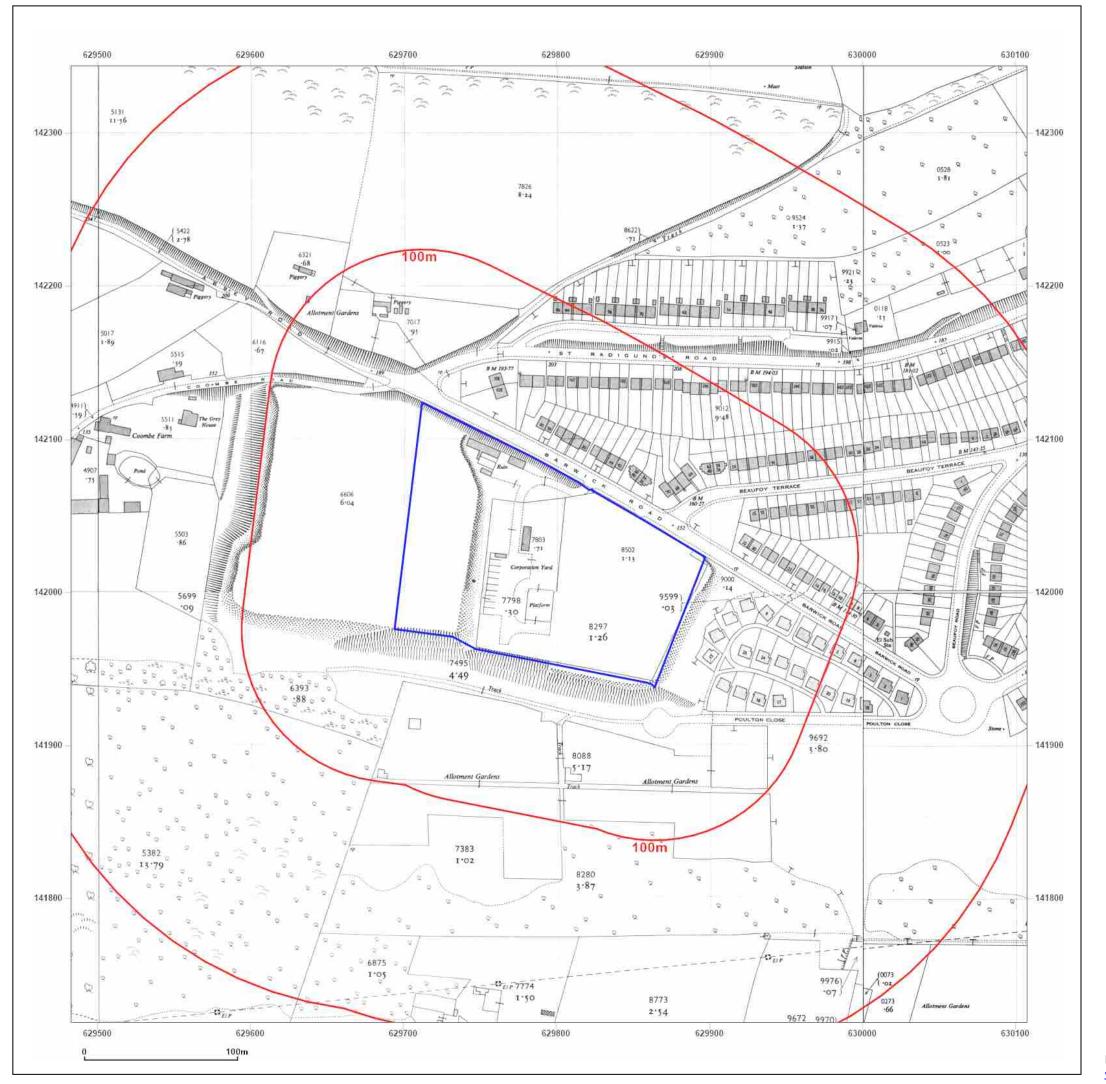




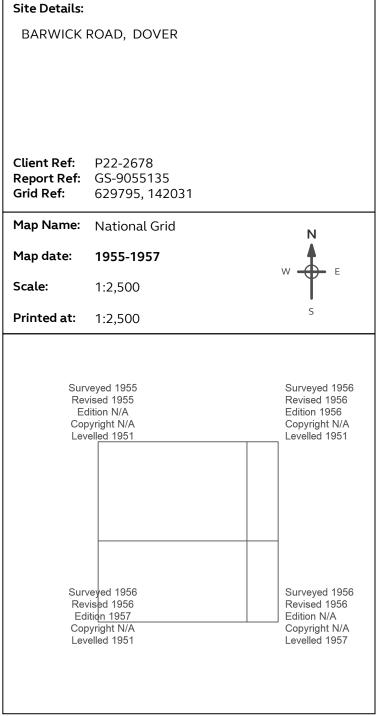
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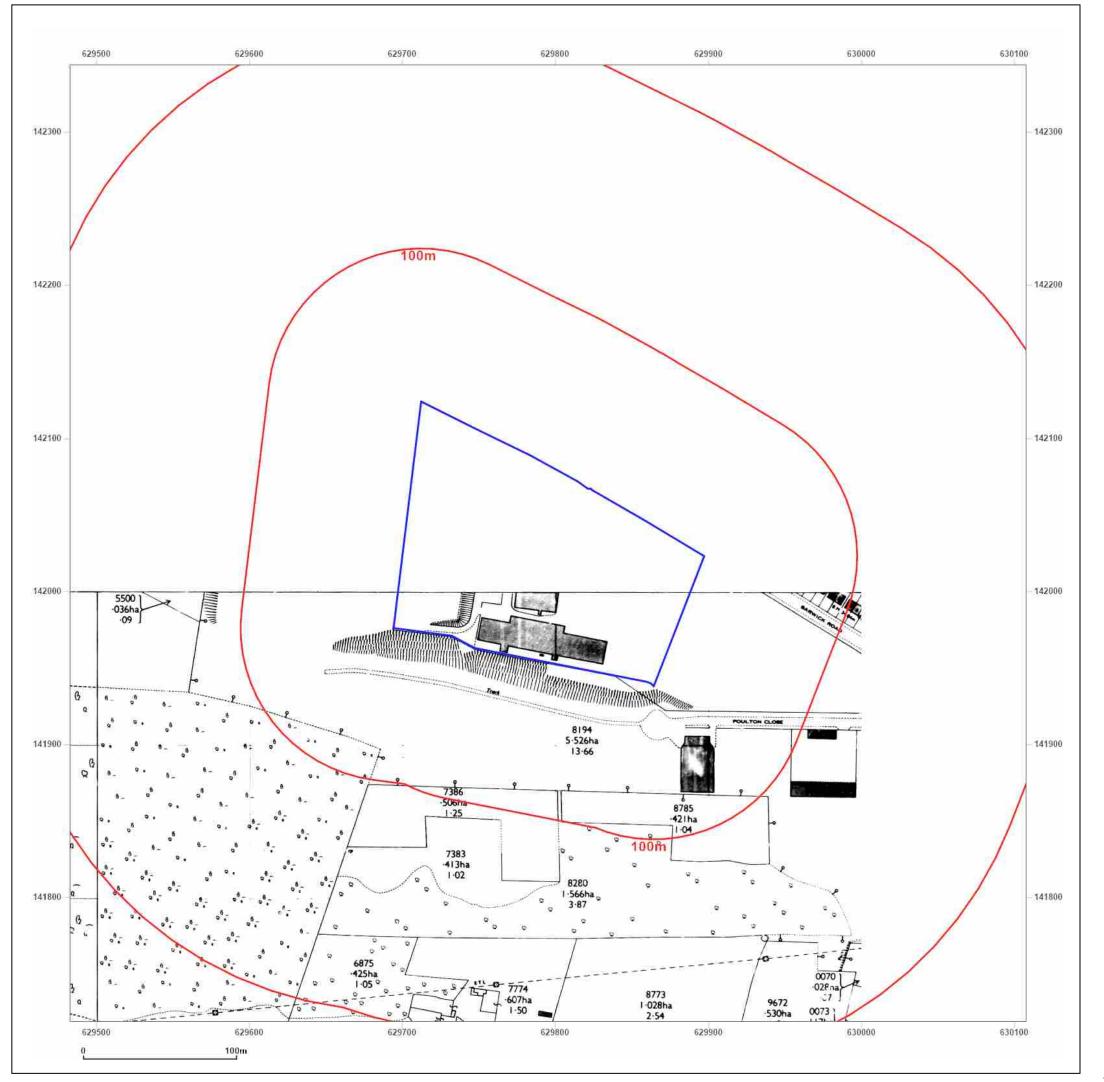




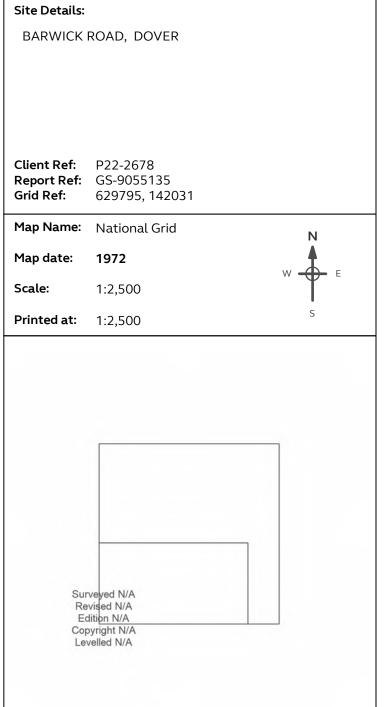
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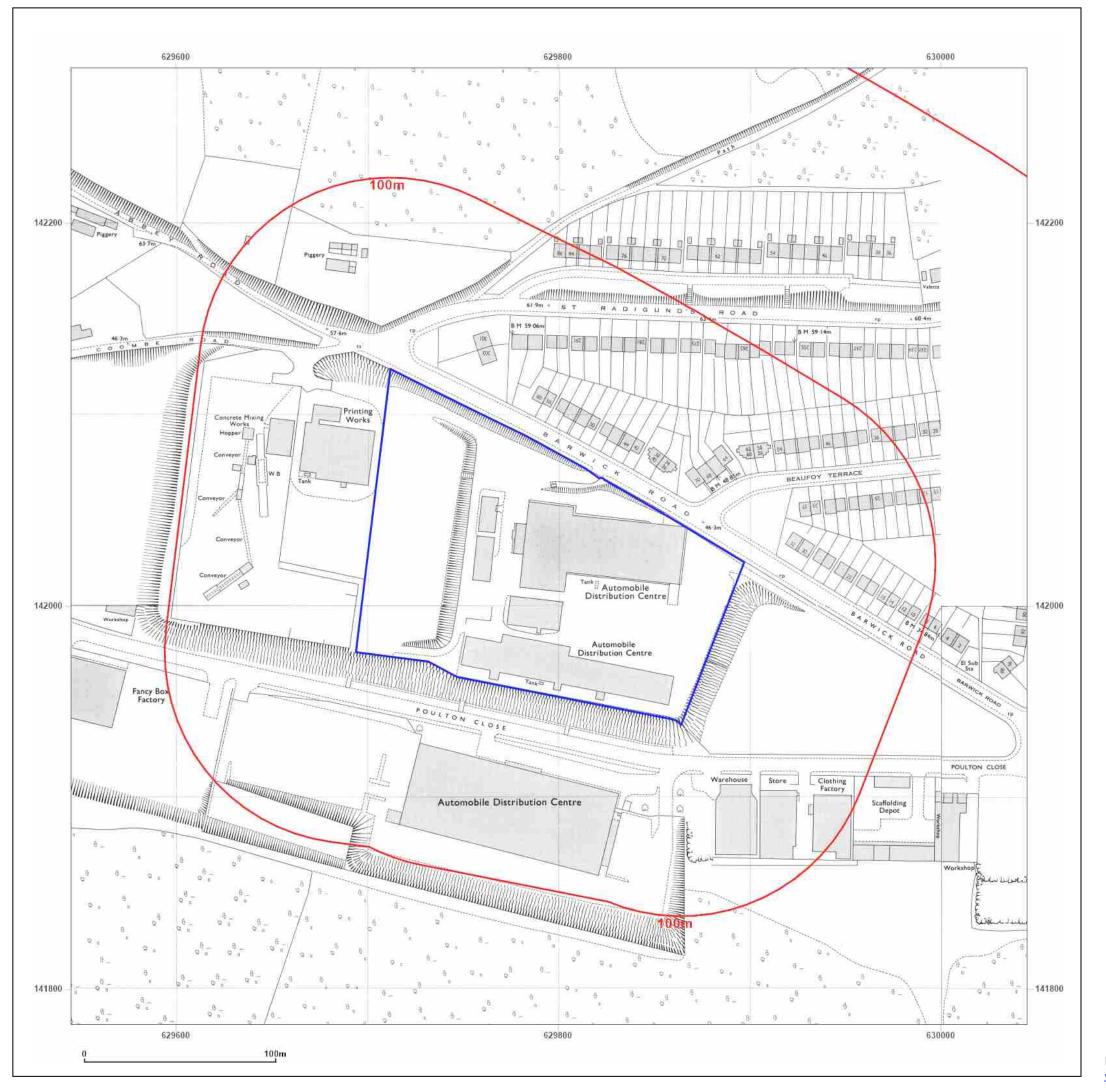




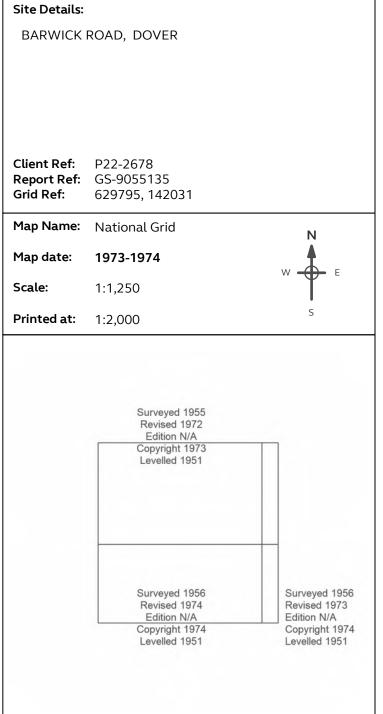
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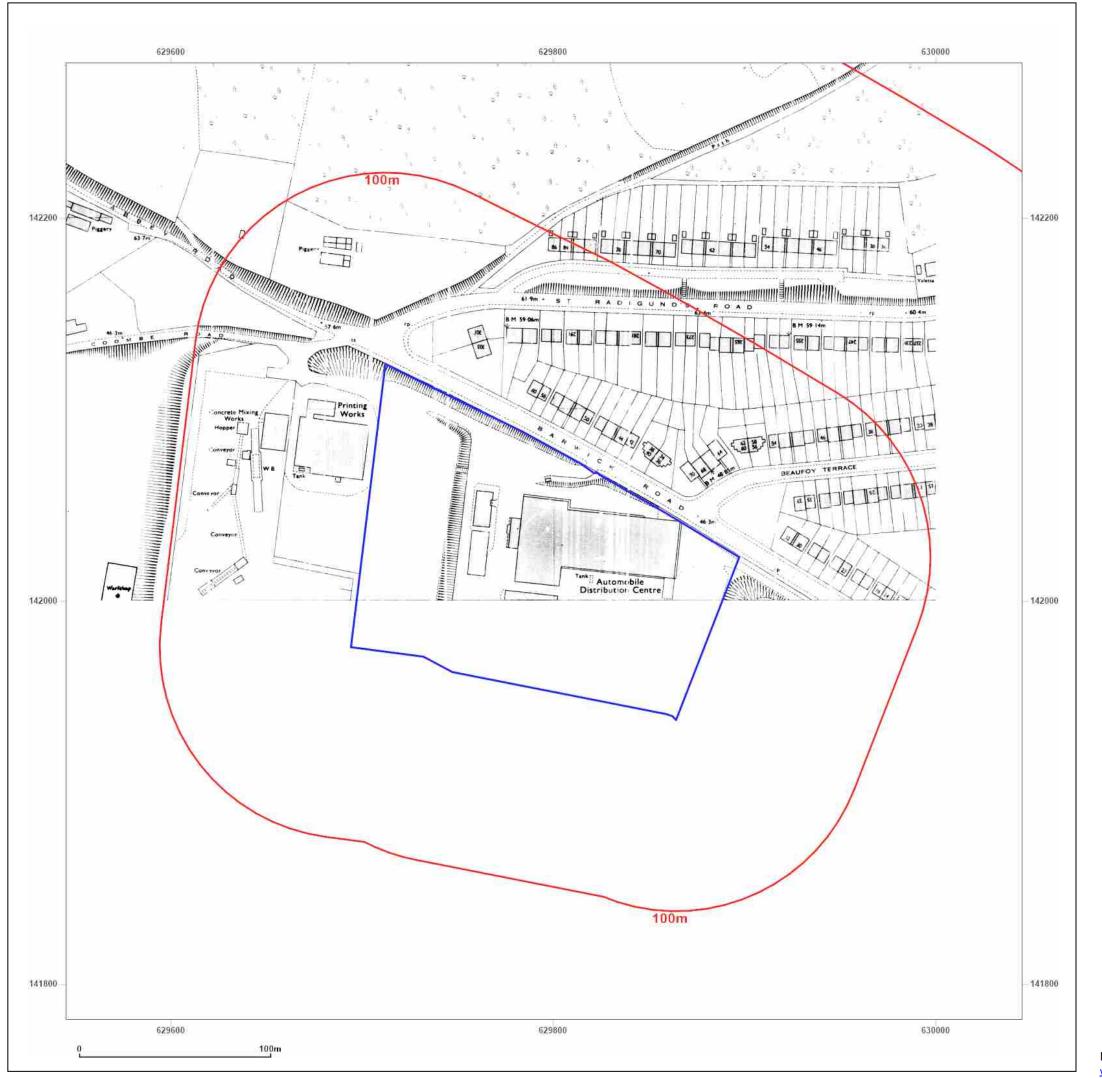




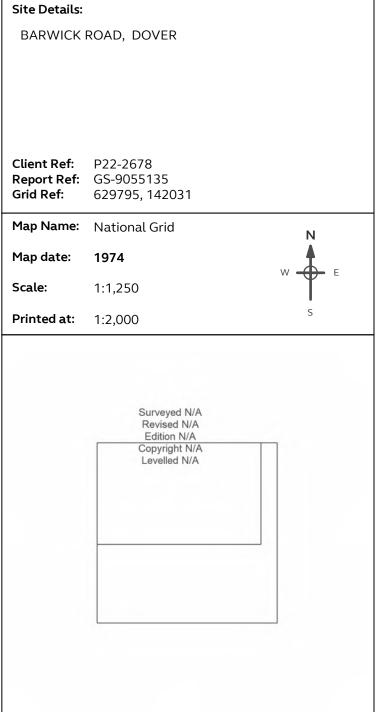
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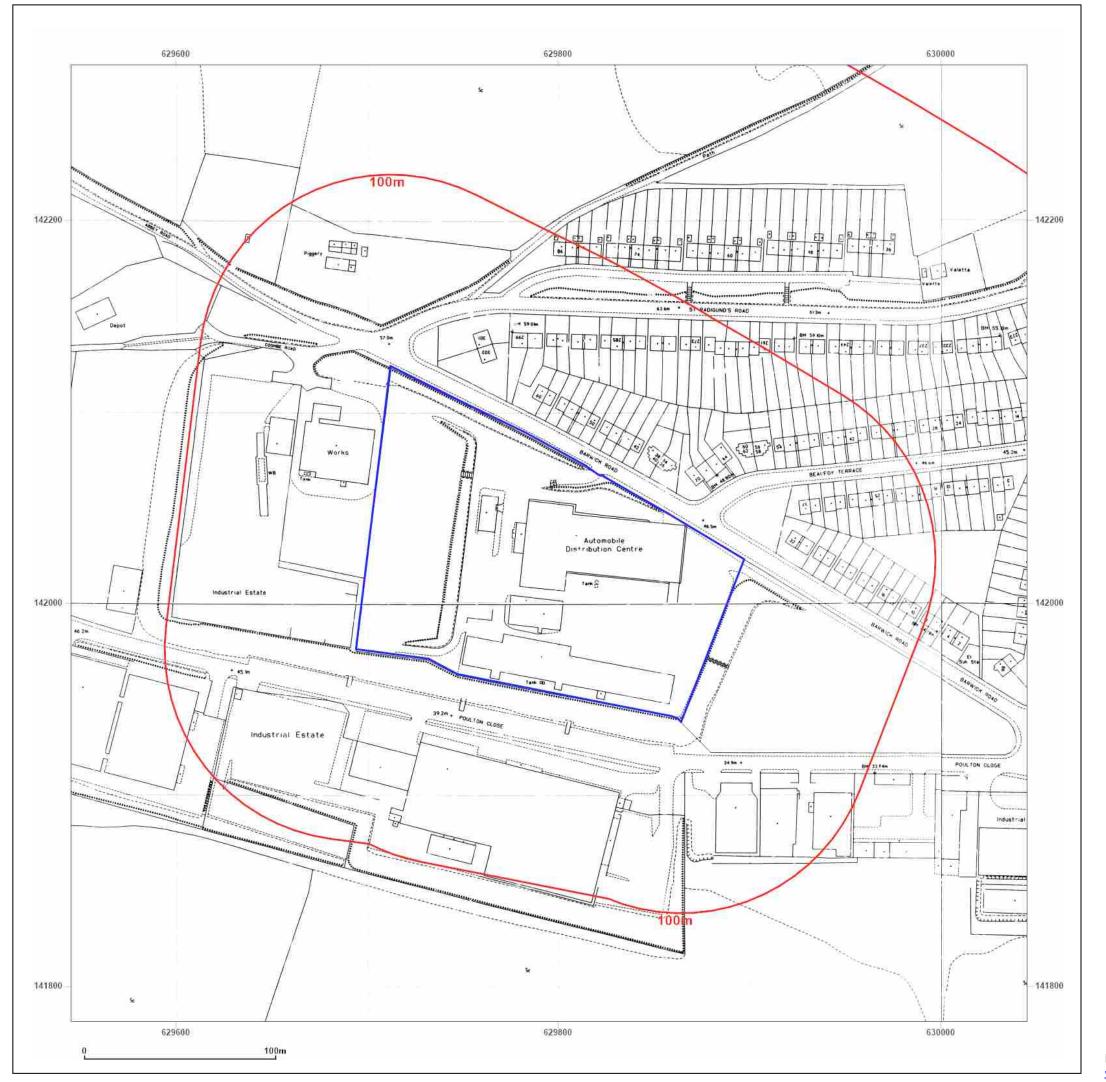




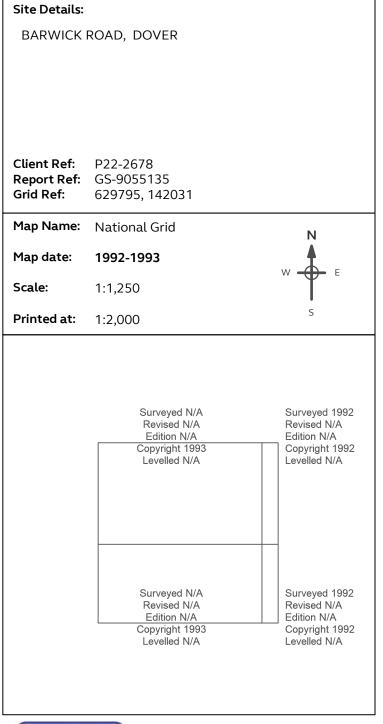
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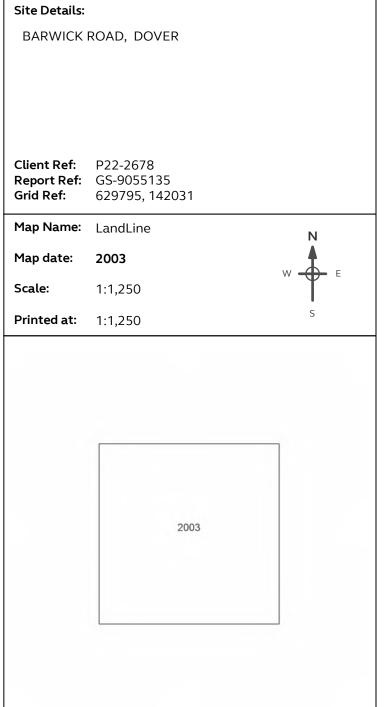
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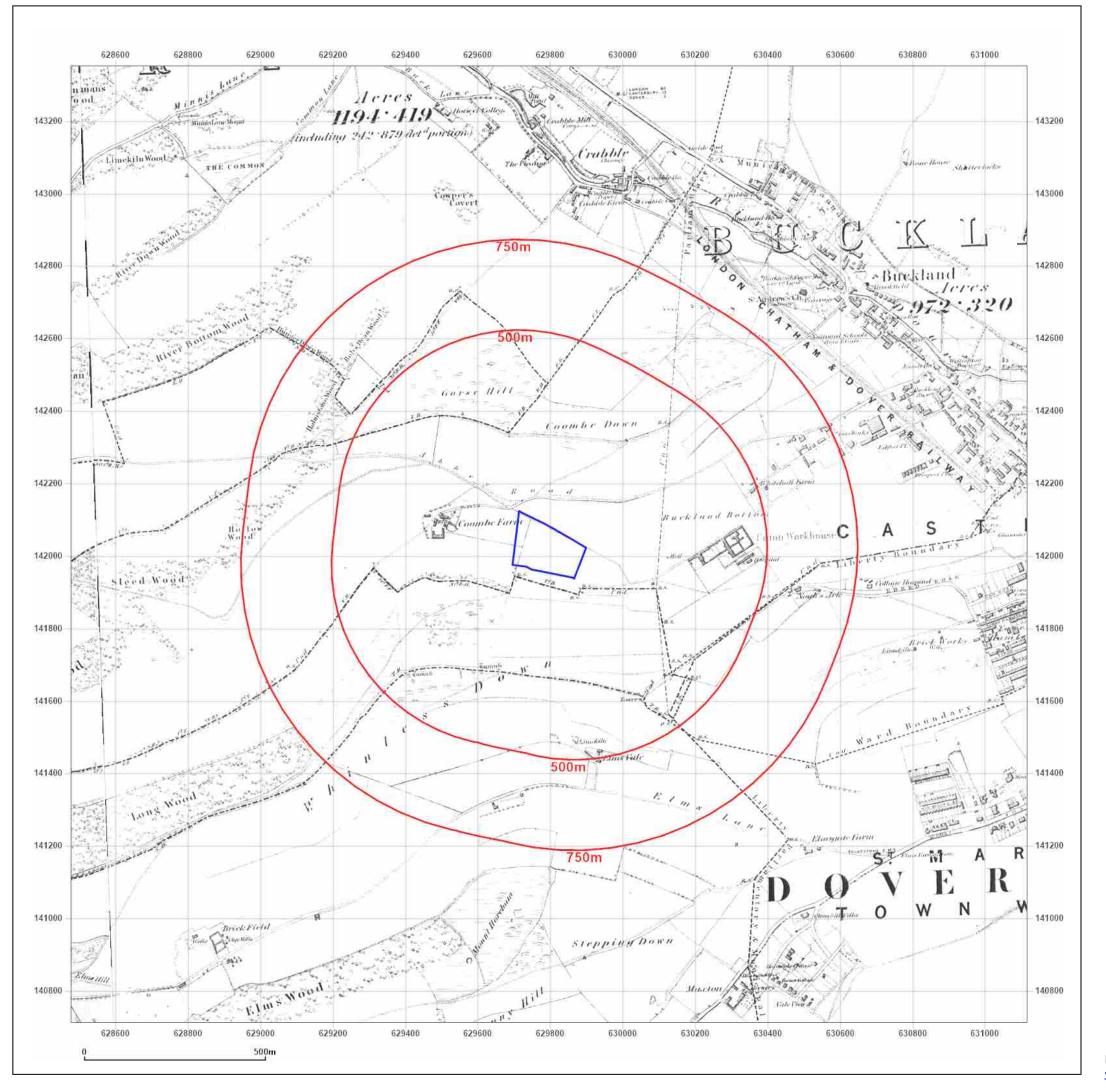




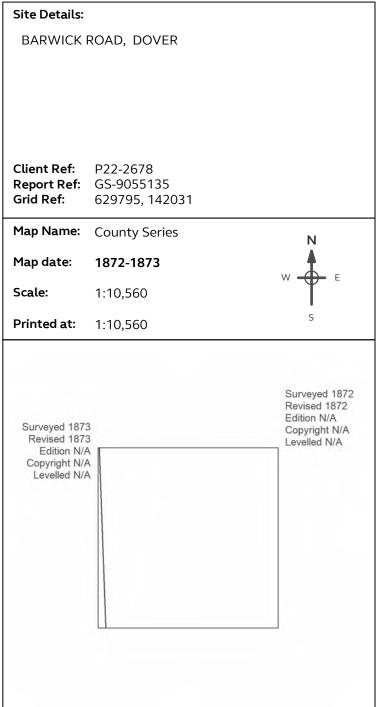
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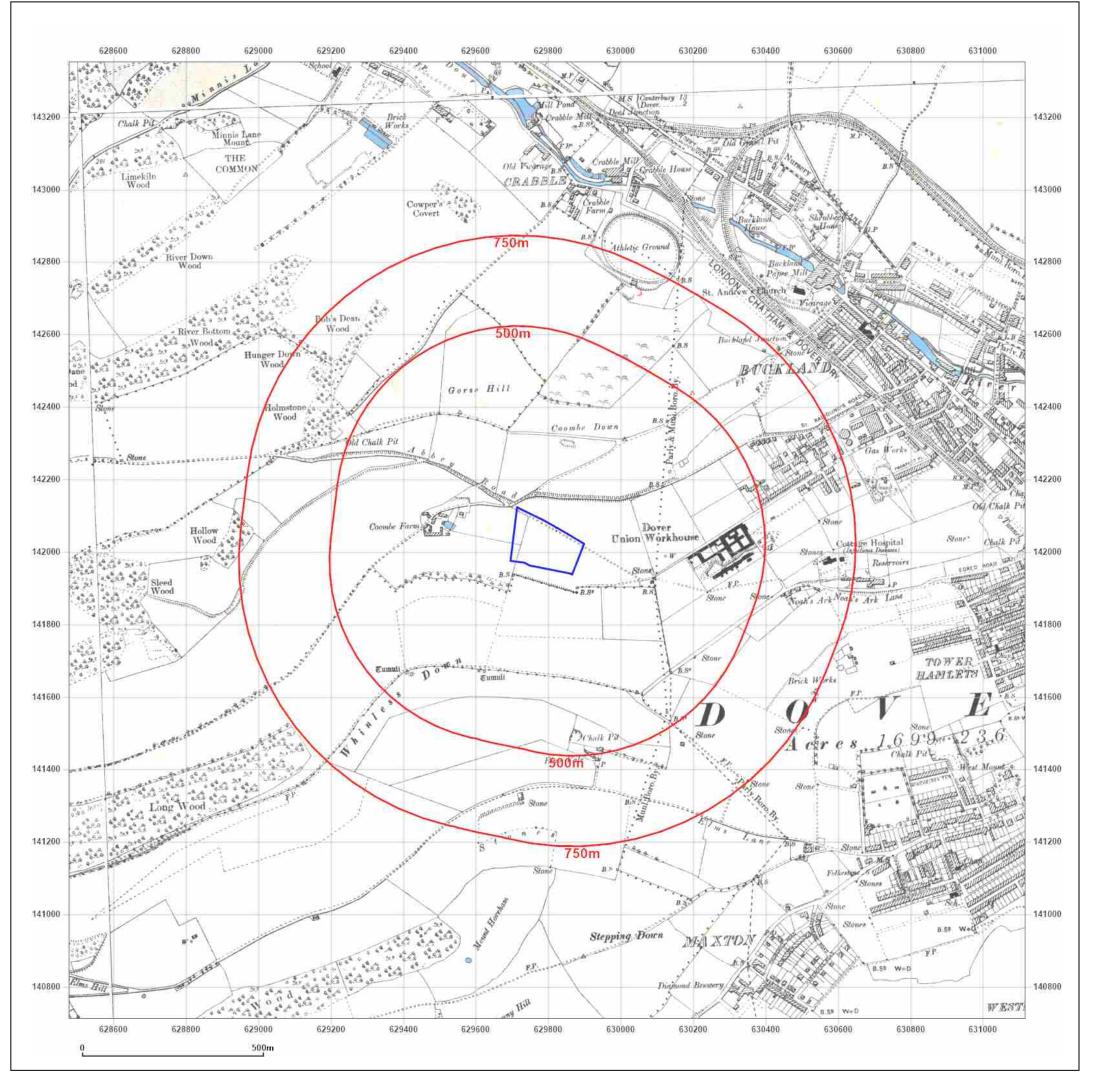




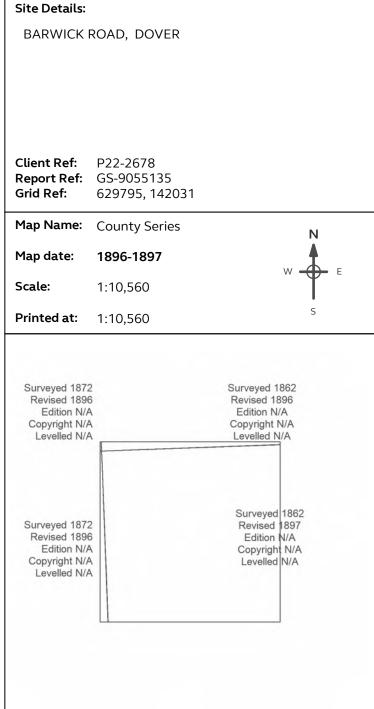
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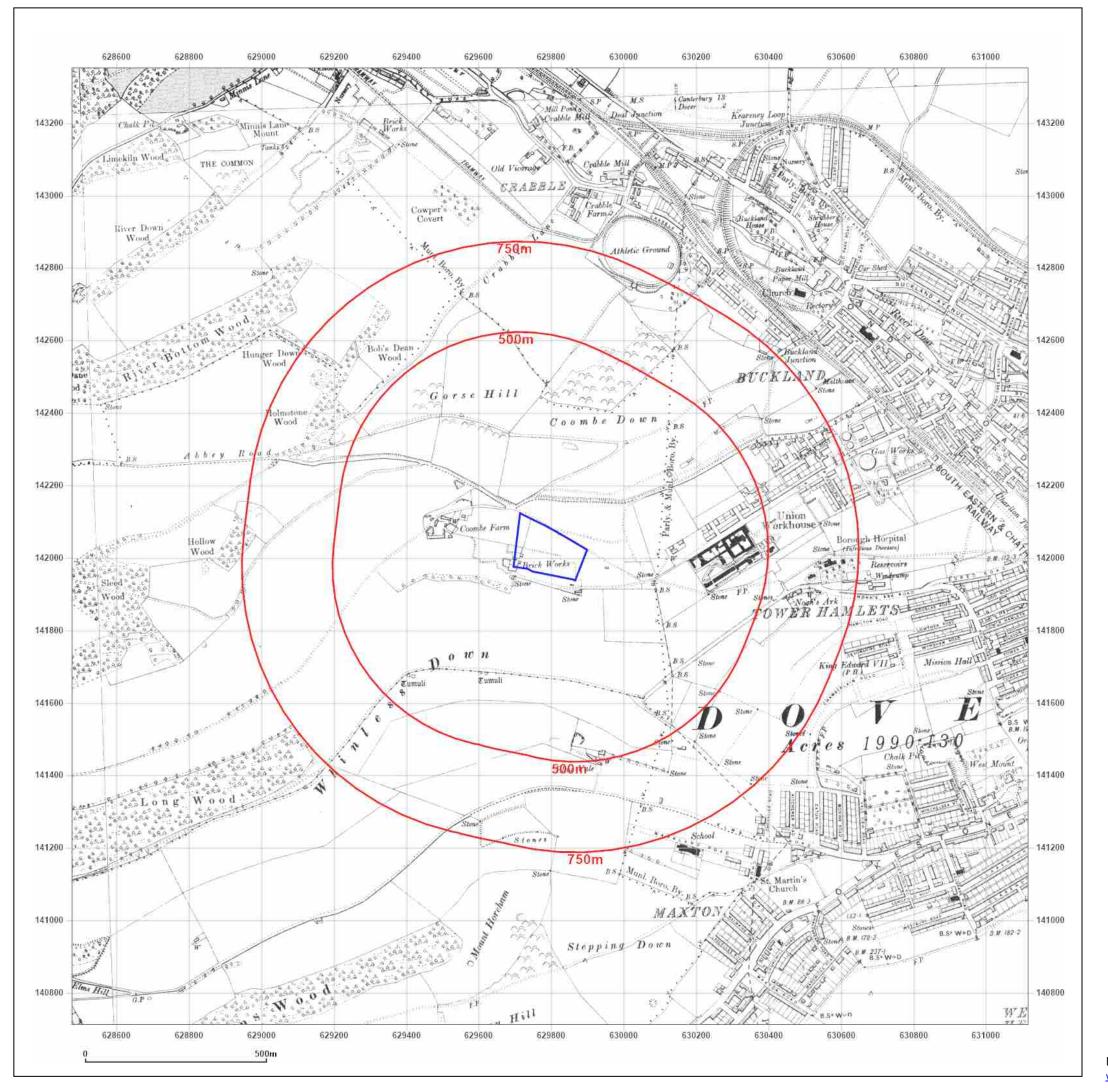




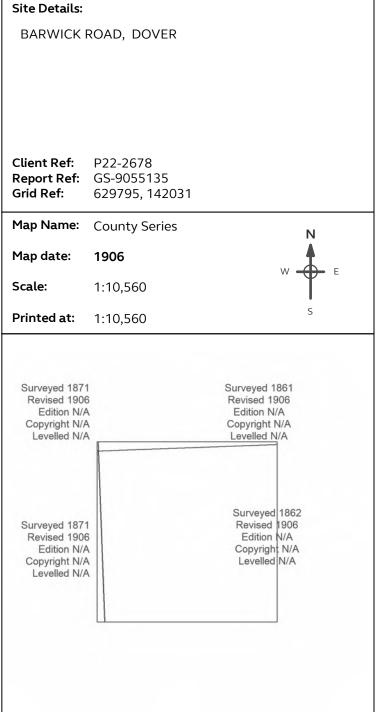
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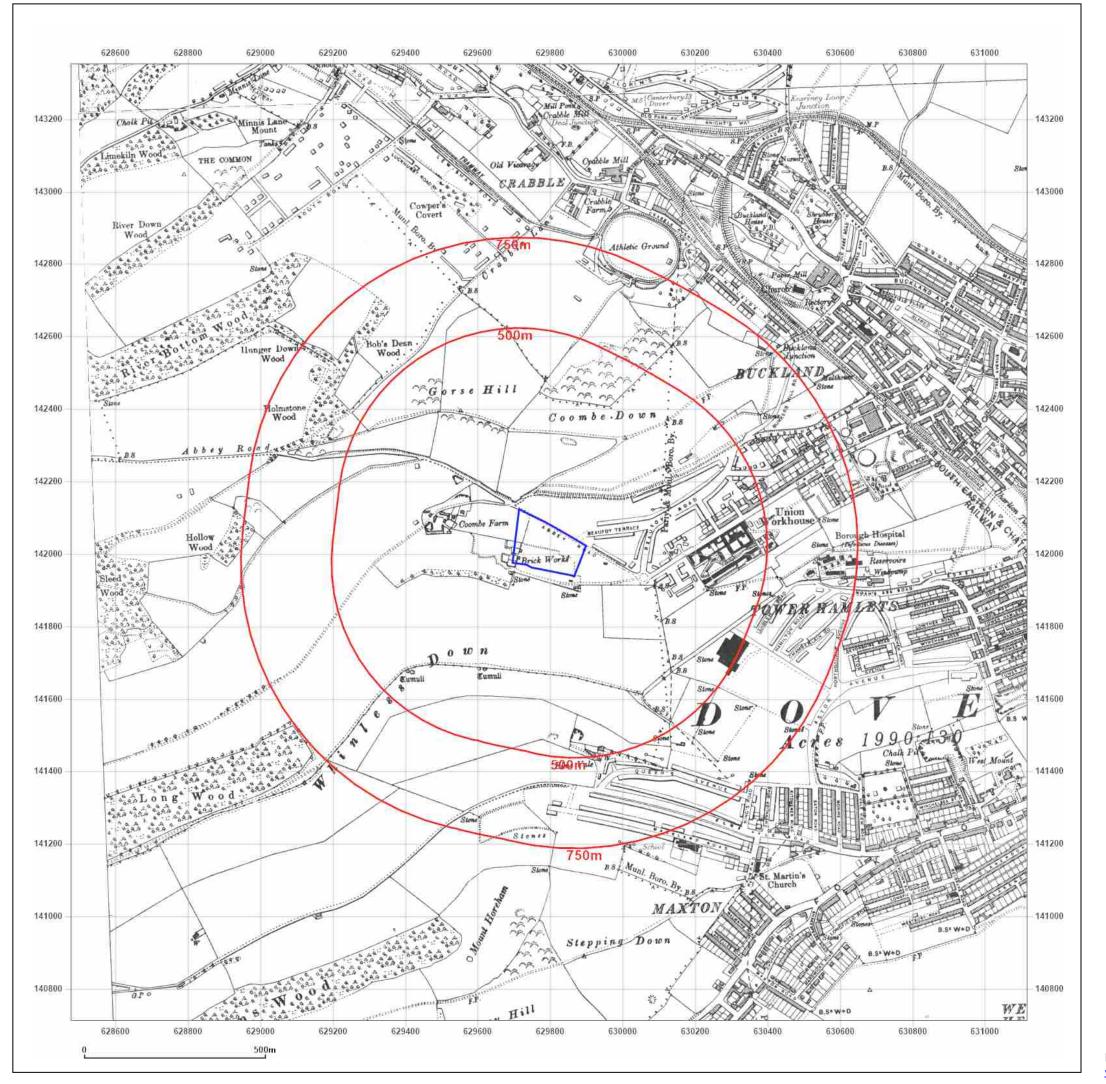




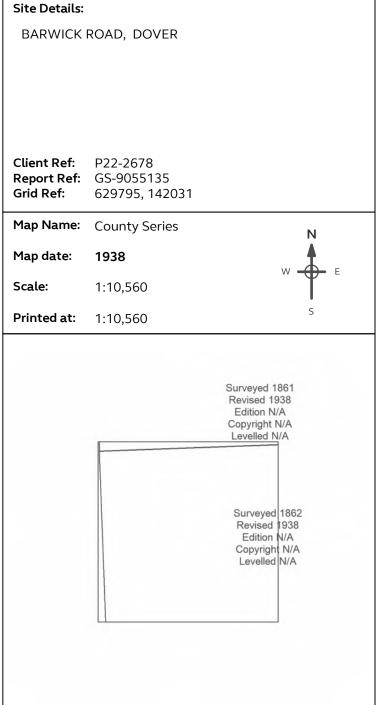
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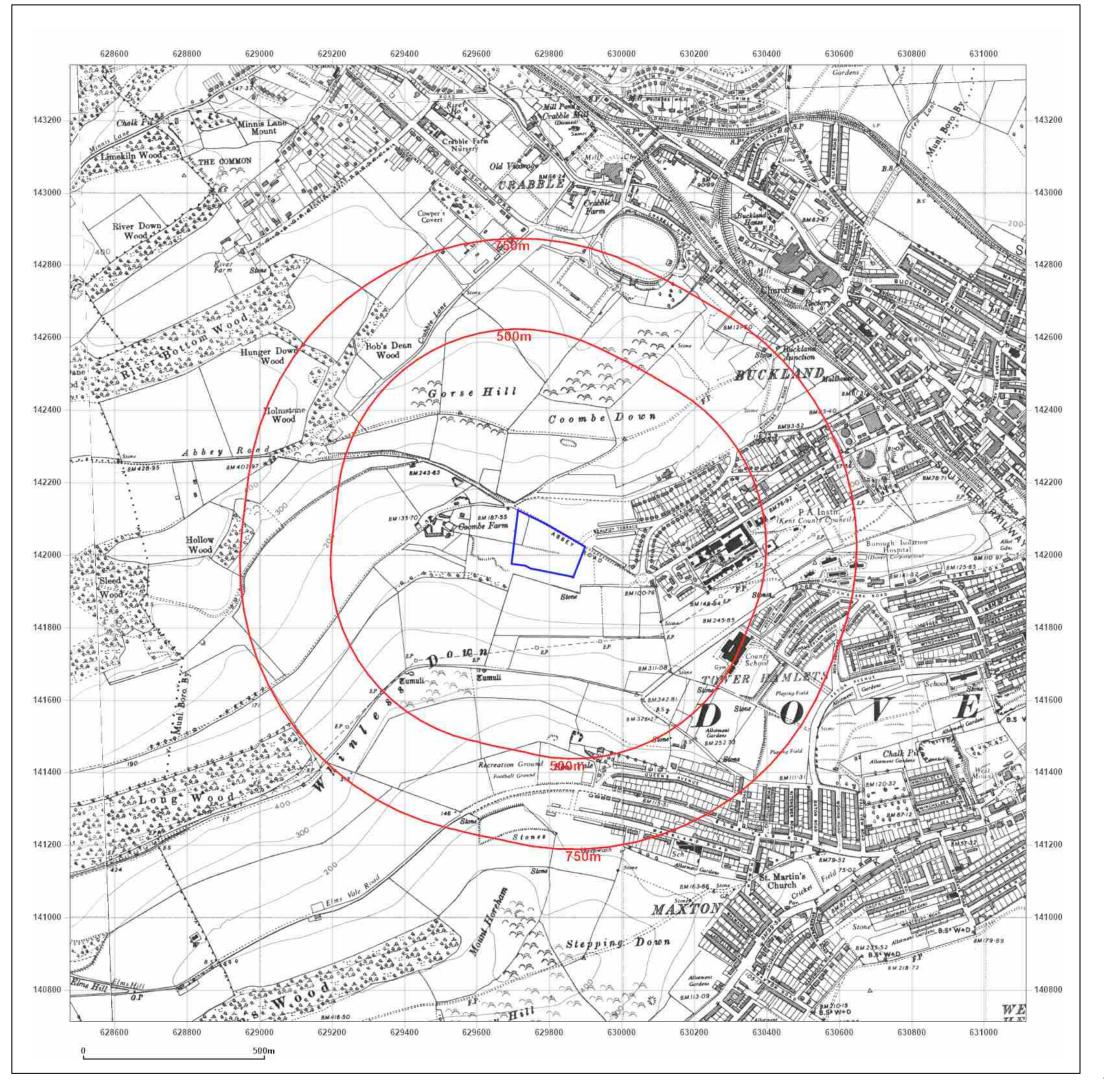




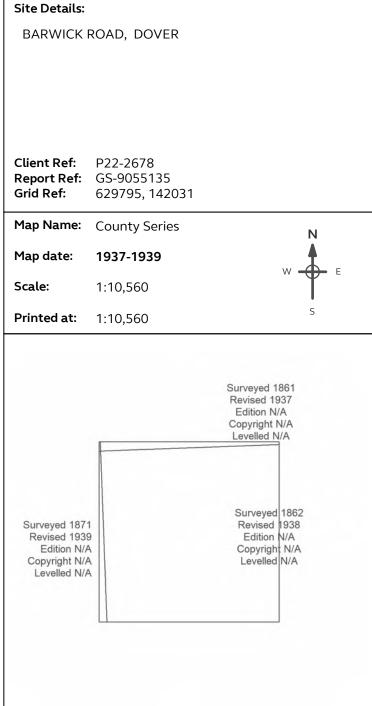
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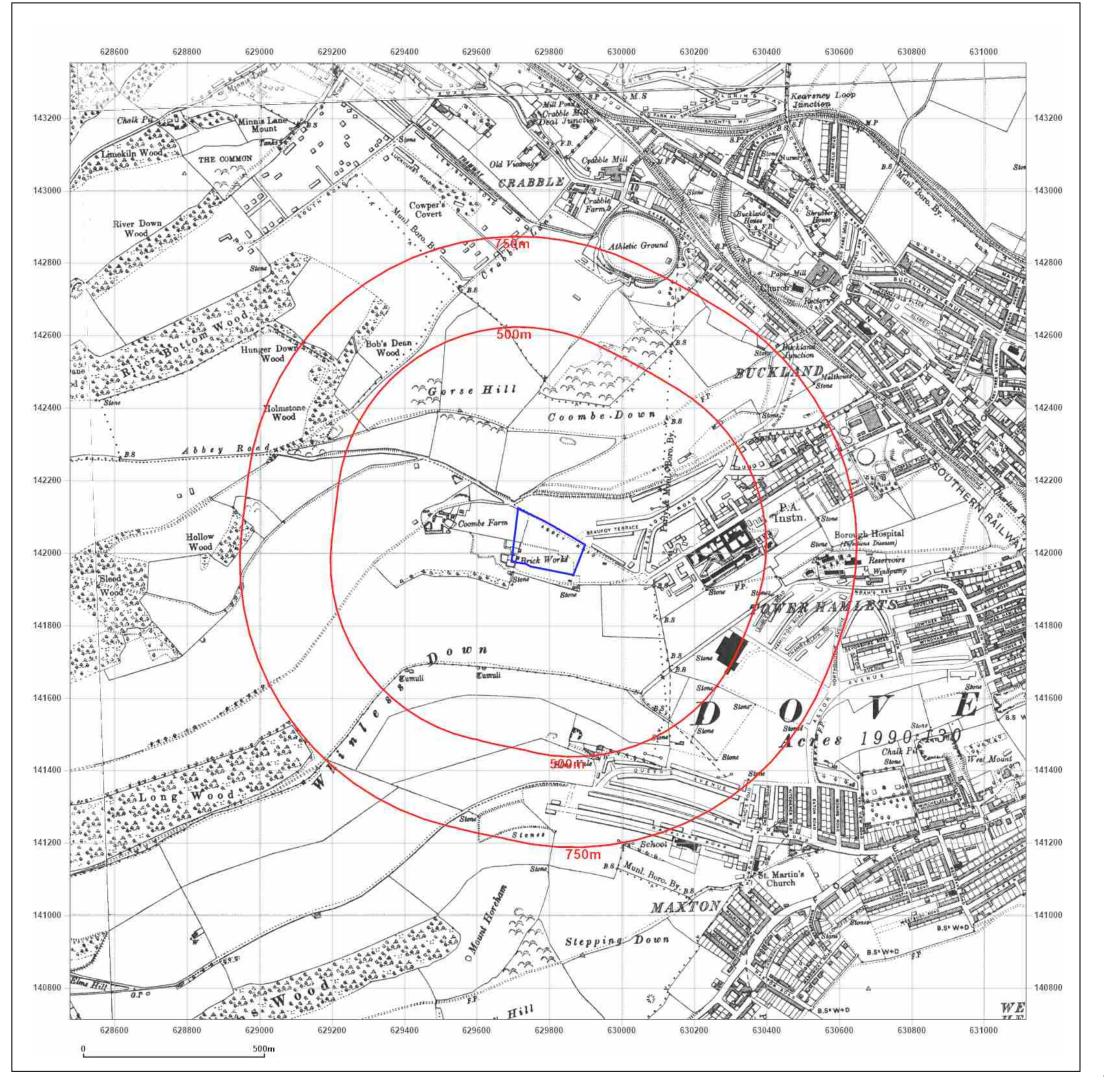




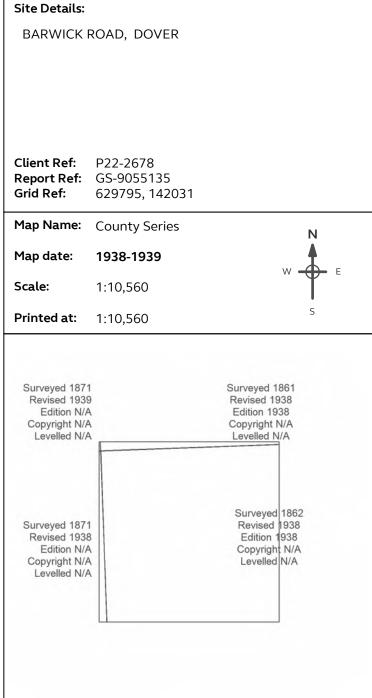
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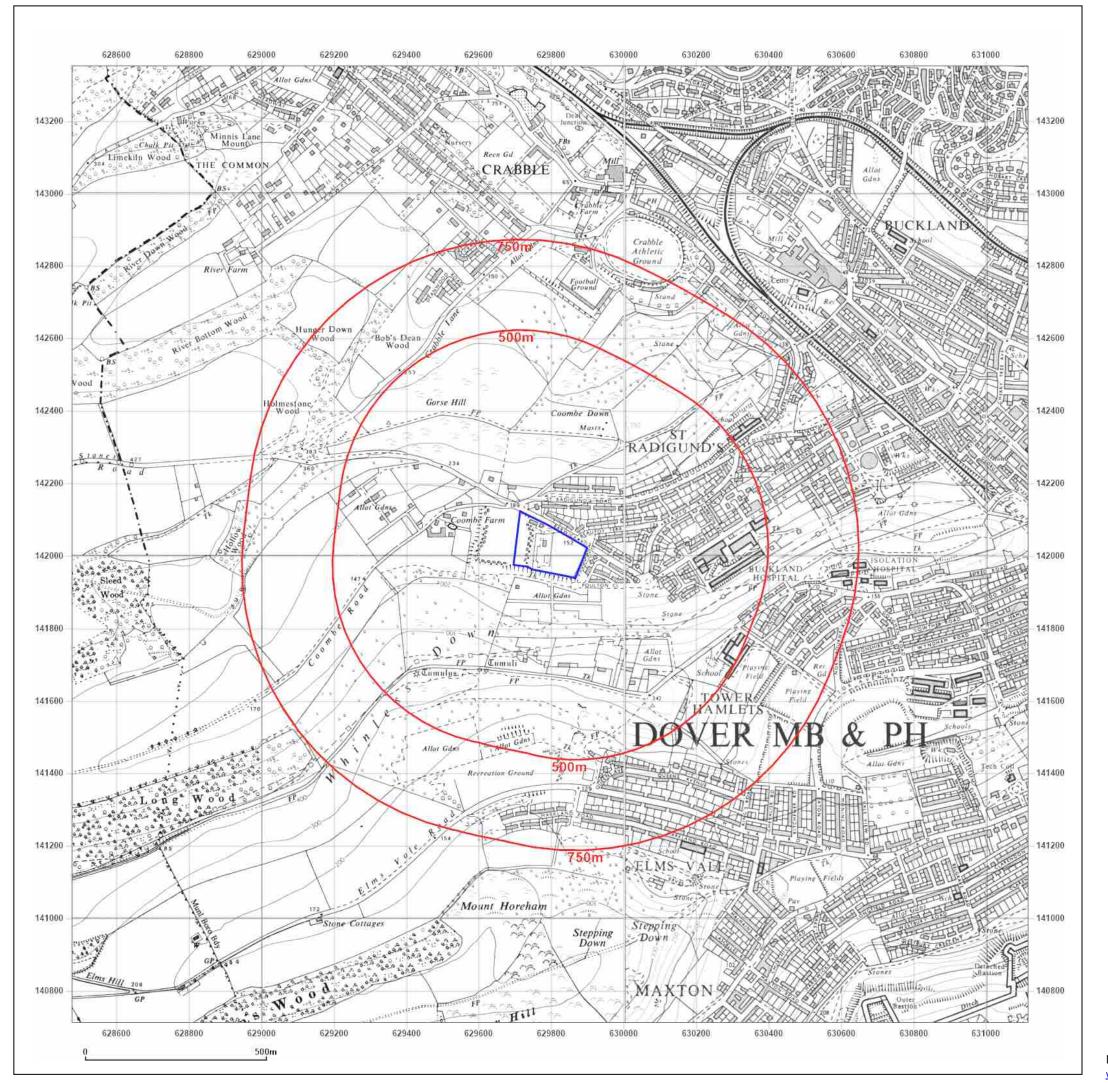




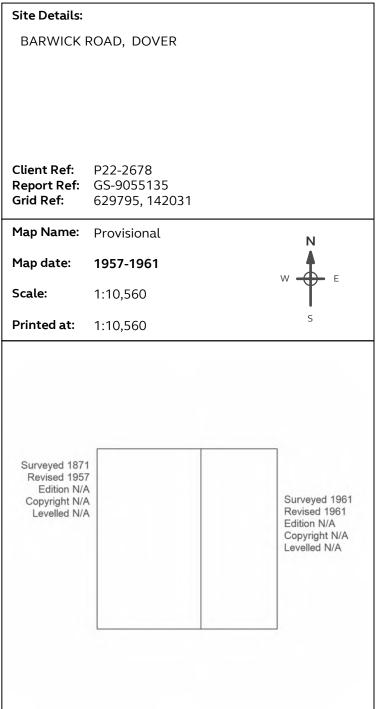
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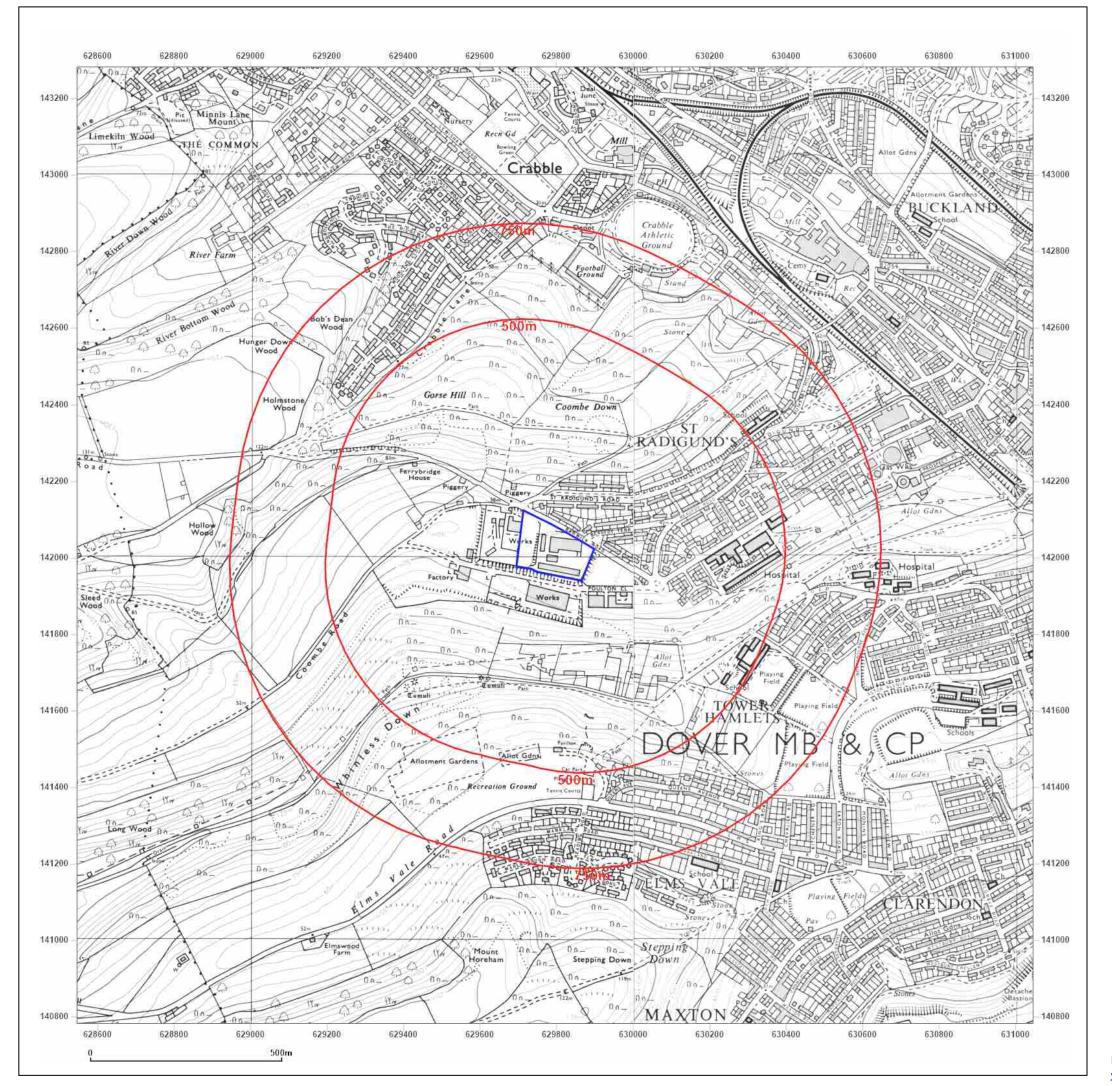




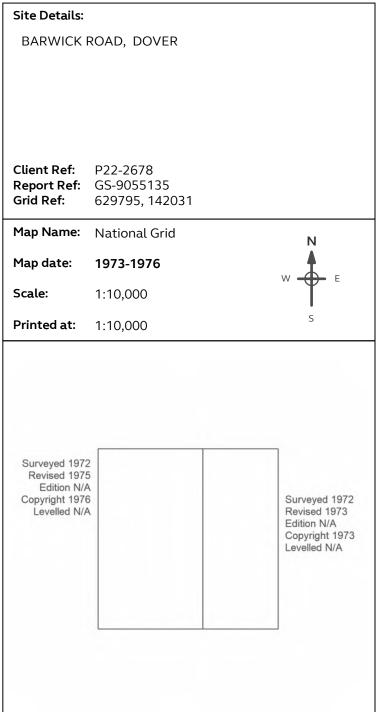
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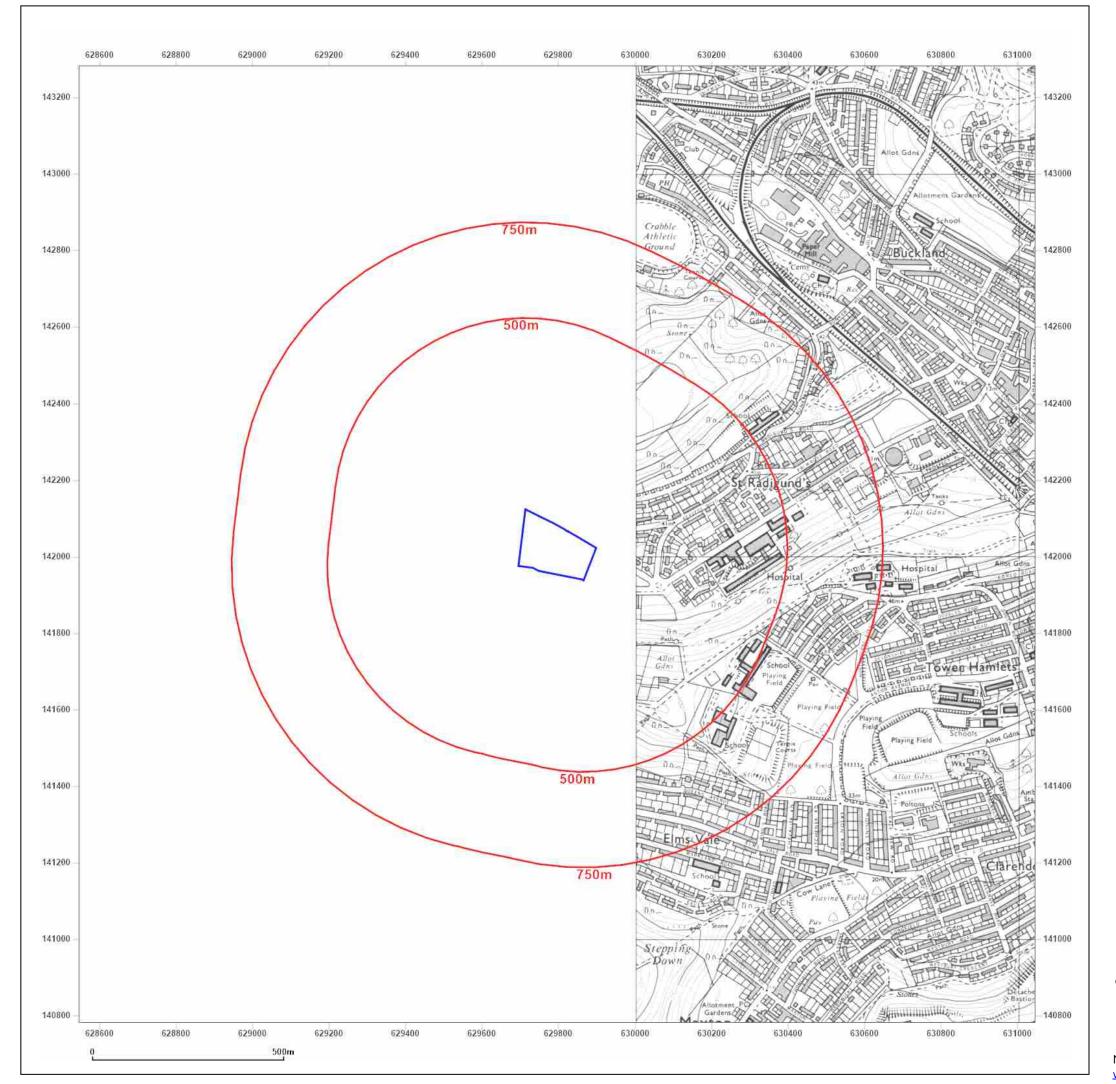




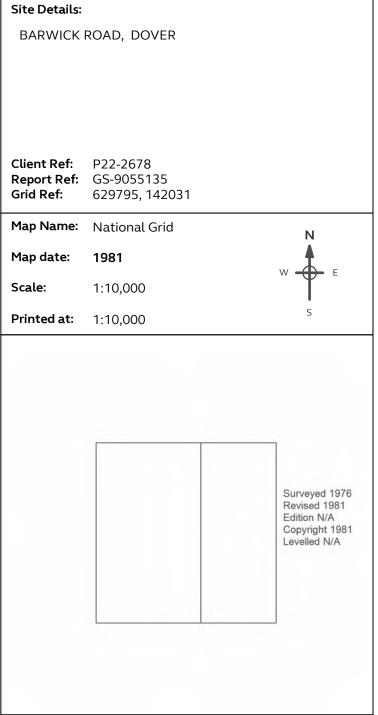
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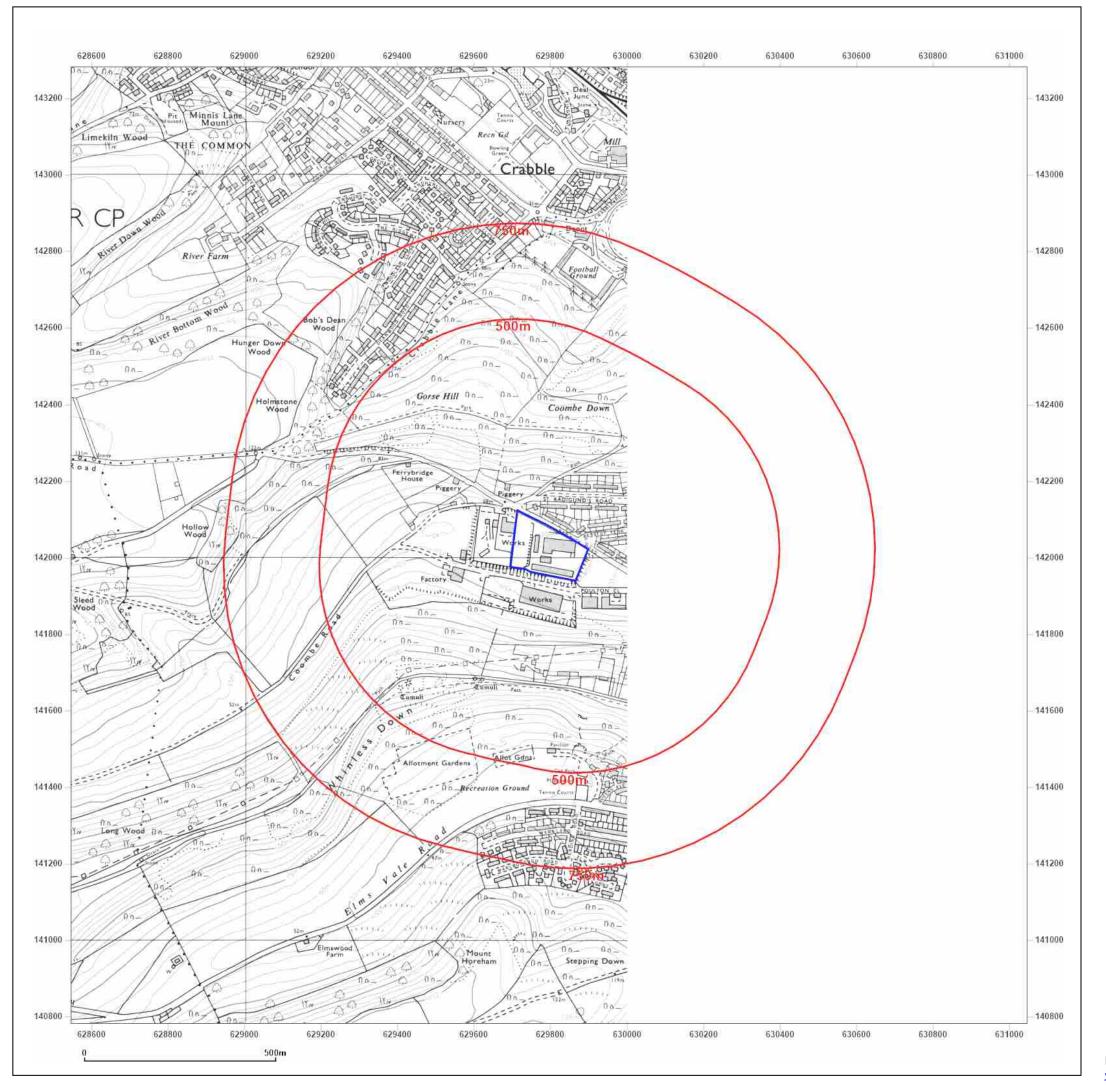




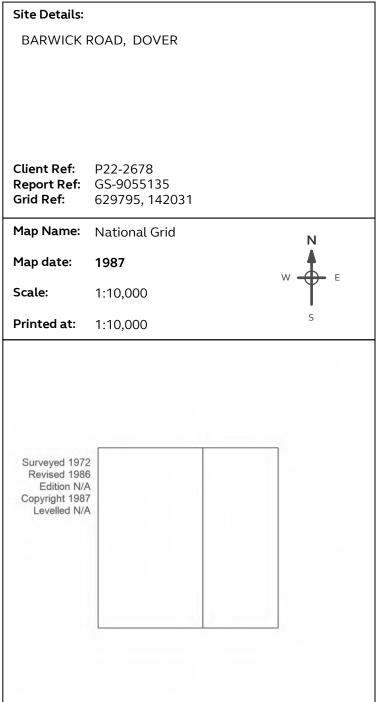
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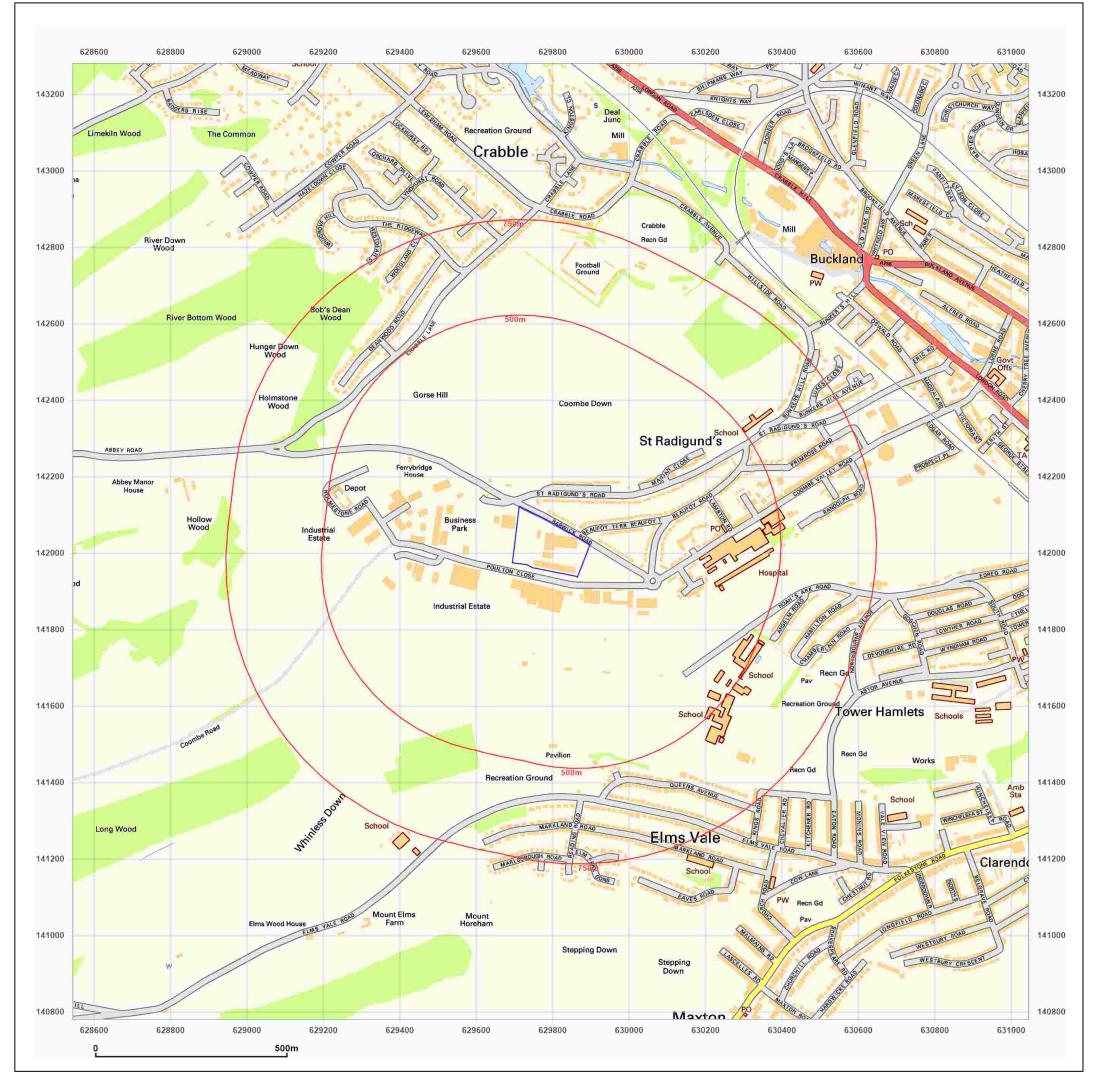




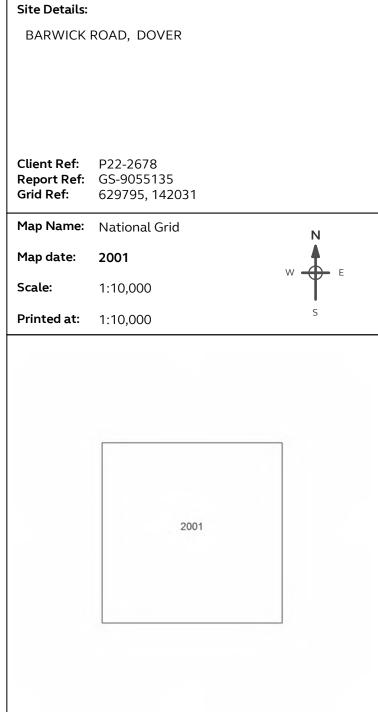
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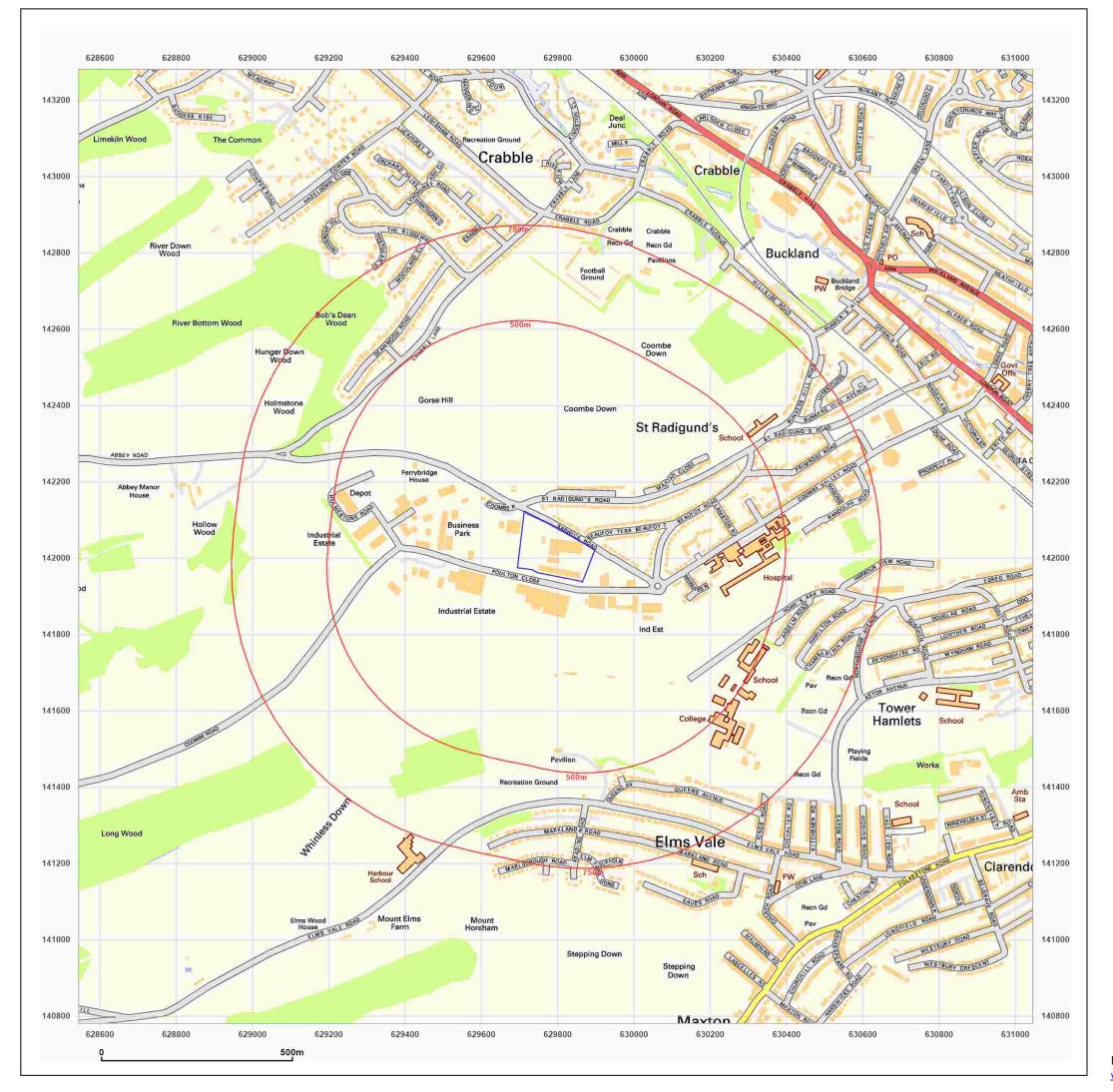




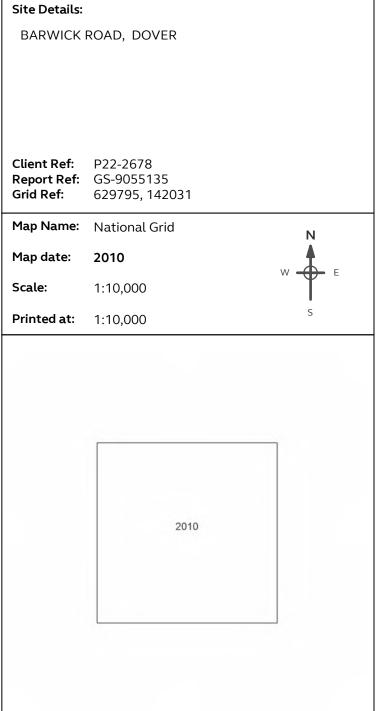
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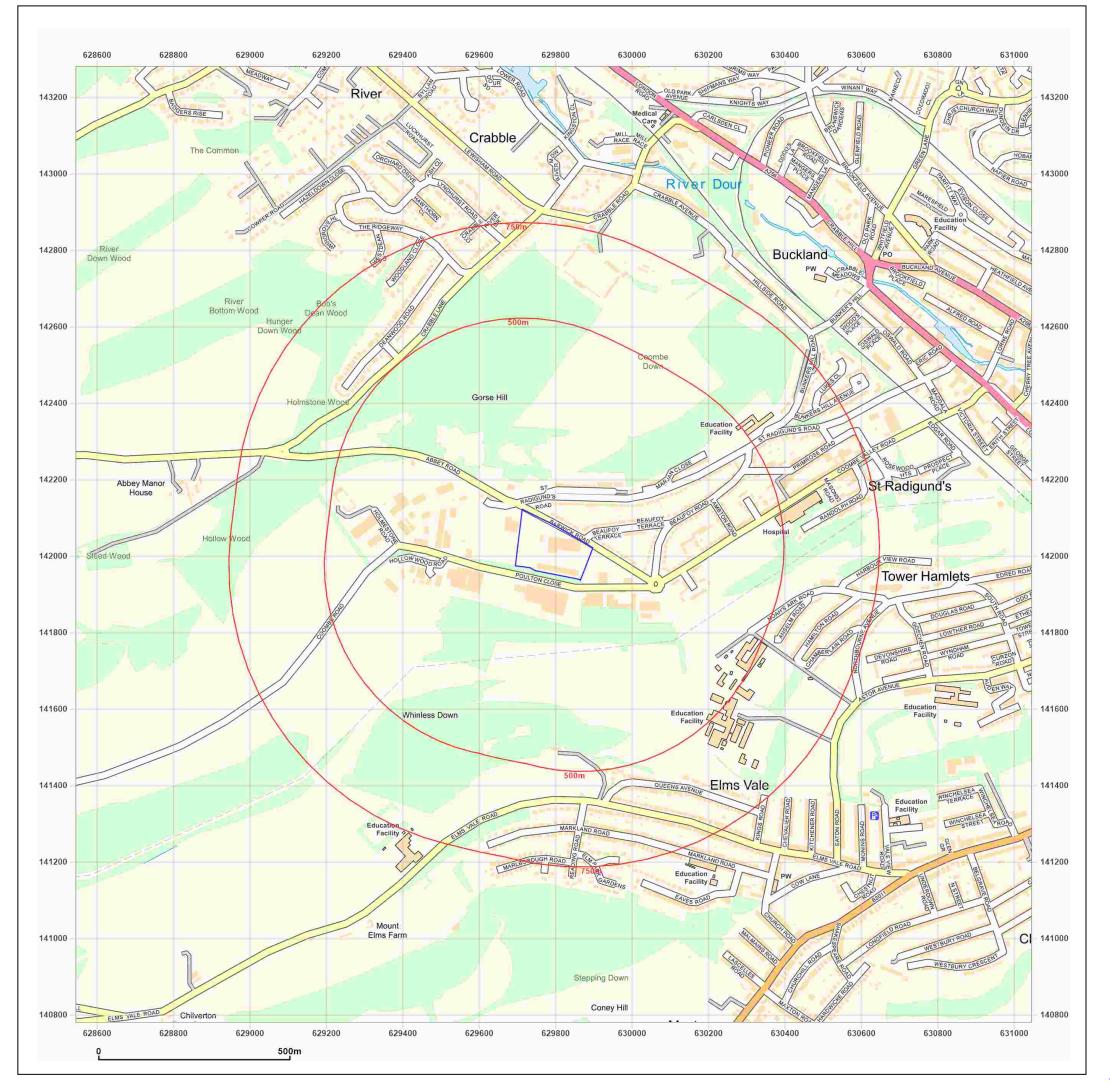




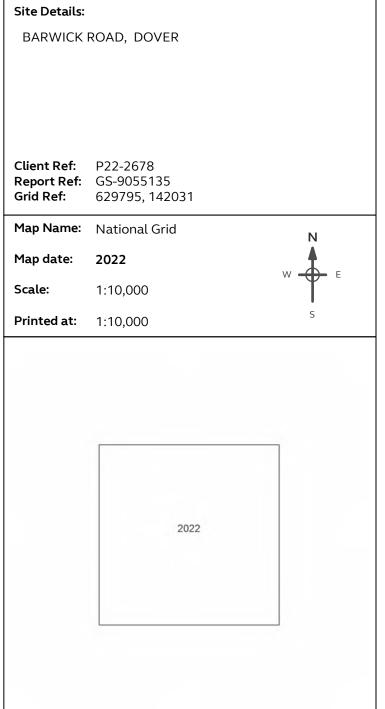
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APPENDIX D

PRELIMINARY UNEXPLODED ORDNANCE (UXO) RISK ASSESSMENT REF: PA10421C-00



Preliminary UXO Risk Assessment

1st Line Defence Limited

Unit 3, Maple Park, Essex Road, Hoddesdon,

Herts, EN11 0EX Tel: +44 (0)1992 245 020

E-mail: info@1stlinedefence.co.uk

Company No: 7717863 VAT No: 128 8833 79

www.1stlinedefence.co.uk

Client Create Consulting Engineers Limited

Project Barwick Road, Dover

Site Address Barwick Road, Dover, Kent CT17 OLL

Report Reference PA10421c-00

Date 20/09/22

Originator DB

Assessment Objective

This preliminary risk assessment is a qualitative screening exercise to assess the likely potential of encountering unexploded ordnance (UXO) at the Barwick Road, Dover site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

Background

This assessment uses the sources of information available in-house to 1st Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1st Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1st Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.













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Risk Assessment Considerations

Site location and description/current use

The site is located in the town of Dover, south Kent

Recent aerial imagery indicates that the site comprises hardstanding ground and two industrial structures. The northern site boundary is affixed to Barwick Road whilst scrubby ground borders the east and southern boundaries of the site. Scrubby ground and *Cactus Graphics* sits adjacent to the western boundary of the site.



The site is approximately centred on the OS grid reference: TR 29781 42026.

Are there any indicators of current/historical military activity on/close to the site?

In-house records do not indicate that the site footprint had any former military use. No features such as WWII defensive positions, encampments or firing ranges are recorded to have been located at the site. In addition, no information or ordnance being stored, produced, or disposed of within the proposed site boundary could be found.

It is understood that the Dover Home Guard were active in Dover during WWII, however no reference to them being located within the vicinity of the site has been found at this stage.

Although the closest Heavy Anti-Aircraft (HAA) battery was situated approximately 1.7km west of the site, the range of a fired projectile can be up to 15km. The conditions in which unexploded anti-aircraft ordnance may have fallen unrecorded within the proposed site are analogous to that of German aerial delivered ordnance – see below for further information.

What was the pre- and post-WWII history of the site? Pre-war OS mapping dated 1938 indicates that the site area was occupied mostly by undeveloped ground, with three buildings associated with a *Brick Works* encroaching into the south-west of the site. Undeveloped ground lay to the east, south and north-west of the site, *Brick Works* bind the south-west of the site, and *Abbey Road* borders the north of the site. *Coombes Farm* can be seen further west of the site.

Post-war OS mapping dated 1956 indicates that the site area underwent structural development since previous mapping editions, including a *Corporation Yard*, and a *Platform* in the centre of the site, and smaller structures in the north-west which are recorded as "ruin". The remainder of the site is occupied by undeveloped land. In the wider site area, houses have been constructed along *Barwick Road* (previously *Abbey Road*), adjacent to the northern boundary of the site, whilst this map also shows the development of prefabricated housing to the east of the site. To the south-west of the site, *Poulton Close* and *Allotment Gardens* have been developed, meanwhile the west of the site remains to be occupied by open ground.

Was the area subject to bombing during WWII?

During WWII the site was situated within the Municipal Borough of Dover. According to official Home Office bombing statistics, this borough sustained an overall high density of bombing, with an average of 108.8 items dropped per 1,000 acres. This included 365 high explosive (HE) bombs, one parachute mine, three oil bombs, two phosphorus bombs, one fire pots and three V-1 pilotless aircrafts, totalling 375 incidents.

Various bomb map editions, record HE bombs, incendiary bombs and shells within the wider vicinity of the site, however no incidents are recorded within the site boundary.

























Is there any evidence of bomb damage on/close to the site?	Post-war OS mapping records a "ruin" within the north-western area of the site, which is often indicative of bomb damage. As pre-war OS mapping indicates that this area of the site was occupied by open ground, further research is recommended to assess whether these buildings were on site during WWII, and whether any references to bombing can be found in written records.	
To what degree would the site have been subject to access?	The majority of site is not anticipated to have experienced regular access during the war due to its open nature. Where the site was occupied by structures associated with the Brick Works it is expected access would have been more frequent, however. Also, the nearby roadways, <i>Brick Works</i> and farm may have afforded the site a degree of monitor. Evidence of UXO is considered more likely to go unnoticed and unrecorded within infrequently accessed areas.	
To what degree has the site been developed post-WWII?	When comparing post-war mapping and recent aerial imagery it appears the site area has undergone development in the form of industrial warehouse units.	
What is the nature and extent of the intrusive works proposed?	The nature and extent of works proposed was not available at the time of writing.	

Summary and Conclusions

During WWII the site was situated within the Municipal Borough of Dover. According to Home Office bombing statistics, this borough sustained an overall high density of bombing, with an average of 108.8 items dropped per 1,000 acres. Various bomb plot maps have been consulted, and while these do not plot any bombing incidents on site, they do record bombing incidents within the wider area of the site. Post-war OS mapping records buildings in the north-west corner of the site as "ruin"; it is considered necessary to conduct further research in this regard, as "ruin" buildings are often indicative of bomb damage. As no bombing is recorded on site in available bomb maps, it would be prudent to address available written records to potentially explain these ruins, and to assess whether these structures occupied the site during the war.

Also, as the site was occupied mostly by open ground during WWII, it is anticipated access would have been largely infrequent, which could have made it less likely that a bomb would have been noted and reported. The presence of the *Brick Works* in the south-west of the site may have slightly increased access levels in that area of the site, however.

Recommendations

Given the findings of this preliminary report, **Further Research** is recommended in the form of a **Detailed UXO Risk Assessment**. This is recommended in order to better assess the wartime conditions within and around the proposed area of works. Further research would involve the acquisition of any available written local bombing records, WWII-era aerial photography and other archival material.

Prior to or in lieu of a Detailed Assessment, it is recommended that appropriate UXO Risk Mitigation Measures are provided for intrusive works proposed.

If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1st Line Defence.























APPENDIX E

RISK ASSESSMENT CLASSIFICATION

Classification	Definition			
High Likelihood	There is a pollution linkage and an event that either appears very likely in			
	the short-term and almost inevitable over the long-term, or there			
	evidence at the receptor of harm or pollution.			
Likely	There is a pollution linkage and all the elements are present and in the right			
	place, which means that it is probable 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.			
Low Likelihood	There is a pollution linkage and circumstances are possible under which an			
	event could occur.			
	However, it is by no means certain that even over a longer period such			
	event would take place, and is less likely in the short-term.			
Unlikely	There is a pollution linkage but circumstances are such that it is improbable			
	that an event would occur even in the very long-term.			

Table E1: Classification of Probability

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. (Note: Water Resources Act contains no scope for considering significance of pollution). Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organisation forming part of such ecosystem (note: the definitions of ecological systems within the draft circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from Site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to human health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources. (Note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem, (note: the definitions of ecological systems within draft circular on Contaminated Land, DETR, 2000).	Concentration of a contaminant from Site exceed the generic, or Site-specific assessment criteria. Leaching of contaminants from a Site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the draft circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.), easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during Site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

Table E2: Classification of Consequence

		Consequence				
		Severe	Medium	Mild	Minor	
Risk	High Likelihood	Very high risk	High risk	Moderate risk	Moderate/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	

Table E3: Combination of Consequence with Probability