

**Geophysical Resistivity Survey
Crowhurst Manor, Crowhurst
East Sussex**

**NGR 575715 112300
(TQ 75715 12300)**

English Heritage SAM No: 1233335

**Sitecode: CMH13
ASE Project No: 6110**

ASE Report No: 2013128



John Cook BSc (Hons) AlfA

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May 2013

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Abstract

Archaeology South East was commissioned by Mr Michael Bernard to undertake an earth resistance survey at Crowhurst Manor, Crowhurst. The Earth Resistance survey area consisted of approximately 0.5ha of land covered with short grass.

The survey aimed to identify anomalies potentially relating to the surviving medieval ruins.

The earth resistance survey successfully identified evidence for archaeological remains, although this evidence was limited to areas with associated surviving above ground structural remains. The survey also indicated disturbance across the site relating to the construction of buildings.

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1.0 INTRODUCTION

1.1 Site Background

1.1.1 Archaeology South-East (ASE) a division of the Centre for Applied Archaeology (CAA), Institute of Archaeology (IoA), University College London (UCL) was commissioned by Mr Michael Bernard to undertake a resistivity survey at Crowhurst Manor, Crowhurst, henceforth referred to as 'the site' (NGR TQ 01983 07080; Figure 1). The surveyed area consisted of lawn and garden of approximately 0.5ha (Figure 2).

1.1.2 The site lies partially over the Ruins of the Old Manor House, English Heritage SAM No: 1233335 which is classed as Grade II and has the following listing:

Remains of a small medieval manor house built by Walter de Scotney in 1250. Stone rubble overgrown with ivy. The main portion consists of a gable end with 2 trefoil-headed windows, a pointed doorway and large pointed window above this with the remains of cusping for tracery. There are also other smaller pieces of masonry.

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1233335>

1.1.3 A previous archaeological watching brief during the installation of a freestanding swimming pool at Court Lodge, Crowhurst was conducted in the north-western corner of the site during late 2004 (ASE 2004).

1.1.4 This revealed the beneath ground remains of a substantial wall footing to the west of the upstanding ruin of Crowhurst Manor, orientated north to south, with a possible east to west return extending to the west. Several investigative slots located elsewhere around the pool revealed a second possible wall footing orientated east to west from the remains of the Manor ruin. A possible construction cut or covered drain, associated with the north-south wall footing and demolition layers were also revealed in Slot 1.

1.1.5 See Appendix 2 of this report for the figures relating to the watching brief (*ibid.*).

1.2 Geology and Topography

1.2.1 According to the British Geological Survey (BGS 2013) the geology at the site consists of Wadhurst Clay Formation - Mudstone. No superficial deposits were recorded.

1.2.2 The site is bounded to the east by Forewood Lane, to the north by St George's Church and to the west by pasture. Several trees are located within the survey area as well as ruin walls and the existing house, Court Lodge.

1.2.3 A driveway from Forewood Lane also ran through the survey area.

1.3 Aims of Geophysical Investigation

- 1.3.1 The aim of the project was to carry a detailed geophysical survey of the site and to produce an interpretative report on the potential of the site for archaeological remains. No WSI was written for the work, but a Section 42 Licence application to EH (ASE ref: 6110 let3pr) set out the methods, aims and reporting requirements of the project:

The objective of the project is to discover if the Manor House ruins are more extensive than the Scheduled area suggests and, if so, to establish a plan of buried structures, robbed walls, collapsed masonry, etc. It is suggested that the Manor House may have been adapted from an earlier, possibly larger, ecclesiastical building and it is hoped that the survey results will enable such a hypothesis to be tested. The aim of the geophysical survey is therefore to produce a detailed archaeological geophysical survey of the site and produce an interpretative report on the findings. Intrusive investigations (e.g. test pits, trenching, etc) are not permitted within the Scheduled Monument under a Section 42 Licence.

1.4 Scope of Report

- 1.4.1 This report details the findings of the survey with a view to contributing to the overall and ongoing assessment of the archaeological potential of the site. The resistivity survey was conducted by John Cook with the assistance of volunteers. The geophysical survey was project managed by Neil Griffin (fieldwork) and by Jim Stevenson (post-excavation).

2.0 SURVEY METHODOLOGY

2.1 Summary of Methodology

2.1.1 Using a 30m x 30m grid, a RM15 resistance meter attached to a PA1 twin probe frame with 0.5m probe separation was used to record sample readings at every 1.0m along 1.0m traverses.

2.2 Geophysical Survey Methods Used

2.2.1 The area covered by the survey is shown Figure 2.

2.2.2 The survey grid consisted of a 30m x 30m grid. The grid was surveyed with 1.0m traverses and samples were taken every 1.0m. The survey was undertaken over the course of two days with sunshine and showers, following a prolonged period of wet weather.

2.3 Applied Geophysical Instrumentation

2.3.1 The resistance survey was carried out using a twin probe array fitted with a Geoscan RM15 data logger. The twin probe array is popular within archaeology and combines convenience with ease of use. The two probes of the array had 0.5m spacing and were connected to two remote probes placed at least thirty times this distance from the array (15m). This is done to lessen the effect on the results of probe separation and to improve depth penetration (Clark 1996: 44). The penetration of the survey is dependent on the probe spacing, usually reaching a depth relative to half the probe space, in this case 0.25m.

2.3.2 The resistance survey uses an electric current to measure the relative water content of buried features. Features such as pits and ditches contain looser material than the surrounding geology and have an enhanced water-bearing capacity, allowing the current to pass through them more freely. These are measured as low resistance anomalies on the results. Stone and brick wall foundations prove a barrier to the electrical current and are shown as higher resistance anomalies (Gaffney & Gater 2003: 26). Resistance survey relies on detecting differences in water content between archaeological features and the surrounding geology and is ineffective in waterlogged or highly arid conditions. The SI unit of measurement for resistance is ohms.

2.4 Instrumentation Used for Setting out the Survey Grid

2.4.1 It is vitally important for the survey grid to be accurately set out. The English Heritage guidelines (David 1995) state that no one corner of any given survey grid square should have more than a few centimetres of error. The survey grid for the site was set out using a Topcon Network rtk Global Positioning System (GPS) consisting of a FC-250 controller and GR3 receiver. This data is processed in survey specific software to provide a sub centimetre Ordnance Survey position. Each surveyed grid point has an Ordnance Survey position; therefore the geophysical survey can be directly referenced to the Ordnance Survey National Grid.

2.5 Data Processing

2.5.1 The resistance data was processed using Geoplot V3. The first step was to perform a DESPIKE to remove any spurious readings. The next step was to pass the results through a HIGH PASS FILTER which removed any low frequency spatial data and then a LOW PASS FILTER was applied, removing high frequency spatial data and enhancing larger weak features. The data was then INTERPOLATED in both the X and Y axes, improving the data presentation.

2.6 Survey Limitations

2.6.1 Several trees, paved areas, hedges, walls and a swimming pool all formed barriers to the geophysical survey. These were omitted from the survey and only areas where meaningful results could be obtained were surveyed.

2.6.2 Due to the spatial limitations of the survey area there were limited options for matching readings between remote probe moves. The data has been adjusted to account for variations in background resistance readings.

3.0 GEOPHYSICAL SURVEY RESULTS

(Figures 3-5)

3.1 Introduction to Results

3.1.1 The results should be read in conjunction with the figures at the end of this report. The types of features likely to be identified are discussed below.

3.1.2 High Resistance Anomalies

These are areas where the current from the array has passed less easily due to relative scarcity of water content. They may relate to stone or brick foundations or rubble in an archaeological context.

3.1.3 Low Resistance Anomalies

These are areas where the current from the array has passed more easily due to relatively high water content. Low resistance anomalies may equate to pits or ditches in an archaeological context.

3.2 Interpretation of Resistance Survey Results

3.2.1 High resistance anomalies were observed across the area surveyed. It is difficult to elucidate much from the data. However, a greater concentration of high resistance anomalies is noted to the south of the upstanding remains and the existing buildings of Court Lodge and outside the existing scheduled monument.

3.2.2 High Resistance Results

High resistance anomalies (HR1) are observed within the area of the existing upstanding remains indicating some below ground survival of wall remains. High resistance anomalies that may represent linear structural remains, such as walls, were observed in the east of the survey area (HR2). A linear high resistance anomaly (HR3) can be seen to the north of the existing structural remains. This anomaly may be due to below ground remains although the anomaly may also relate to patches of asphalt seen in this area (Figure 6, Photograph 1). The most significant area of high resistance anomalies (HR4) are observed in the south of the survey area. These anomalies may indicate a large area of ground disturbance or made ground which may relate to structural remains or buried surfaces such as floors. However, this may also relate to the construction and landscaping of Court Lodge and associated nearby services. An area of high resistance anomalies in the north of the existing up-standing remains (HR5) may relate to paving slabs observed on site (Figure 6, Photograph 4). However, attempts were made to limit survey over these features and a below ground cause cannot be discounted. A moderate high resistance anomaly (HR6) was identified over the location of wall footings uncovered in the previous archaeological watching brief (2004). A similar anomaly was identified to the south of the swimming pool and may indicate a continuation of the wall footings.

3.2.3 Low Resistance Results

No low resistance anomalies were observed within the survey.

4.0 CONCLUSIONS

- 4.0.1 The earth resistance survey at Crowhurst Manor, Crowhurst has successfully revealed anomalies of possible archaeological origin. Moderately high and high resistance anomalies within the survey may relate to structural footings, or robbed out features.
- 4.0.2 As carrying out a twin probe earth resistance survey with a probe separation of 0.5m will generally only provide a practical survey depth of 0.5m it is possible that features at greater depth would not be identified within the resistance survey.
- 4.0.3 The survey indicated a significant level of disturbance that has probably occurred due to the construction of several Victorian buildings and associated services. Therefore a considered excavation approach would be required in order to assess the survival of any remains and to make a more meaningful interpretation. Any such excavations with the boundaries of the Scheduled Monument would require the appropriate consent to be granted by English Heritage and the Department for Culture, Media and Sport.

4.1 Statement of Indemnity

- 4.1.1 Geophysical survey is the collection of data that relate to subtle variations in the form and nature of soil and which relies on there being a measurable difference between buried archaeological features and the natural geology. Geophysical techniques do not specifically target archaeological features and anomalies noted in the interpretation do not necessarily relate to buried archaeological features. As a result, magnetic and earth resistance detail survey may not always detect sub-surface archaeological features. This is particularly true when considering earlier periods of human activity, for example those periods that are not characterised by sedentary social activity.

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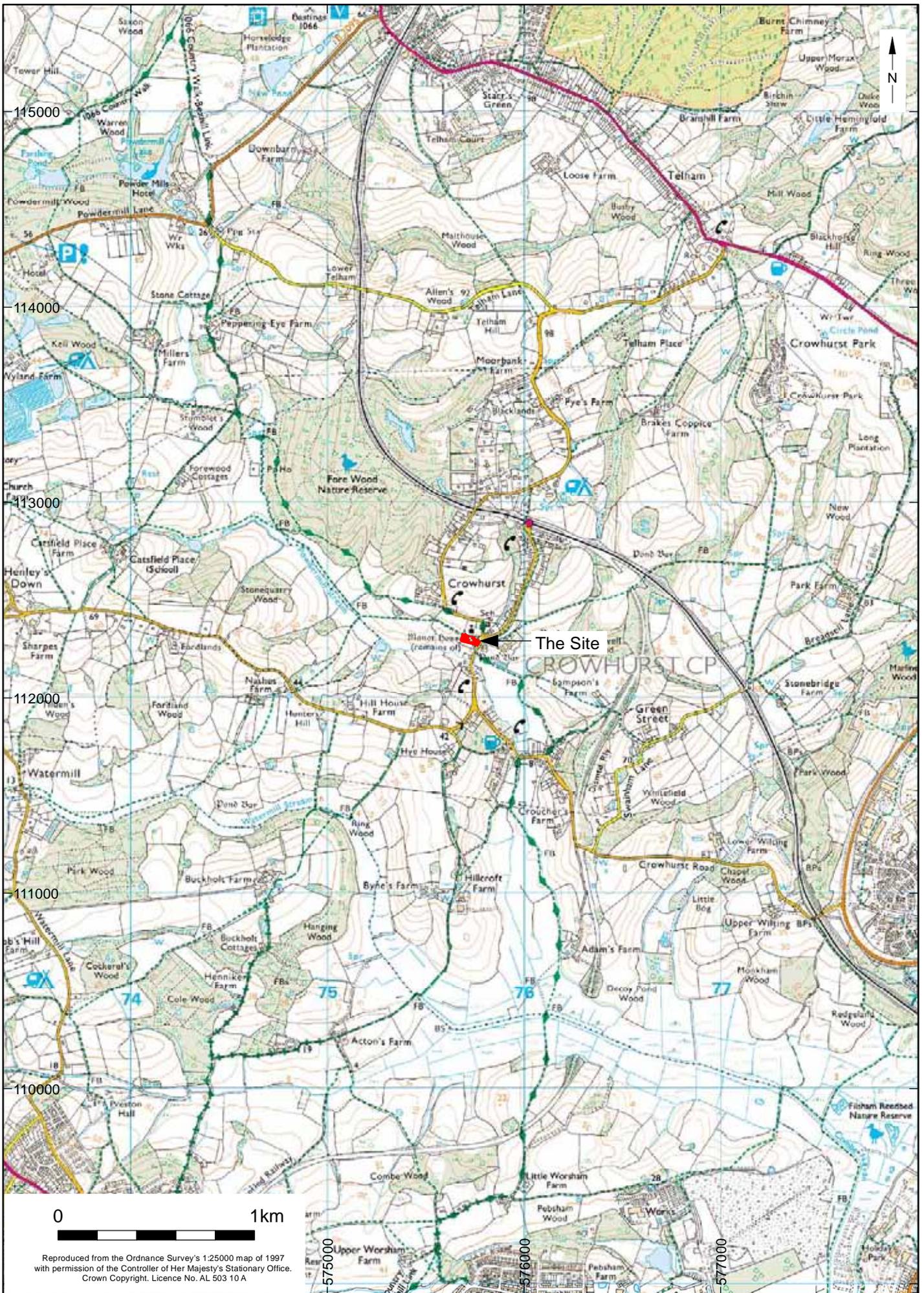
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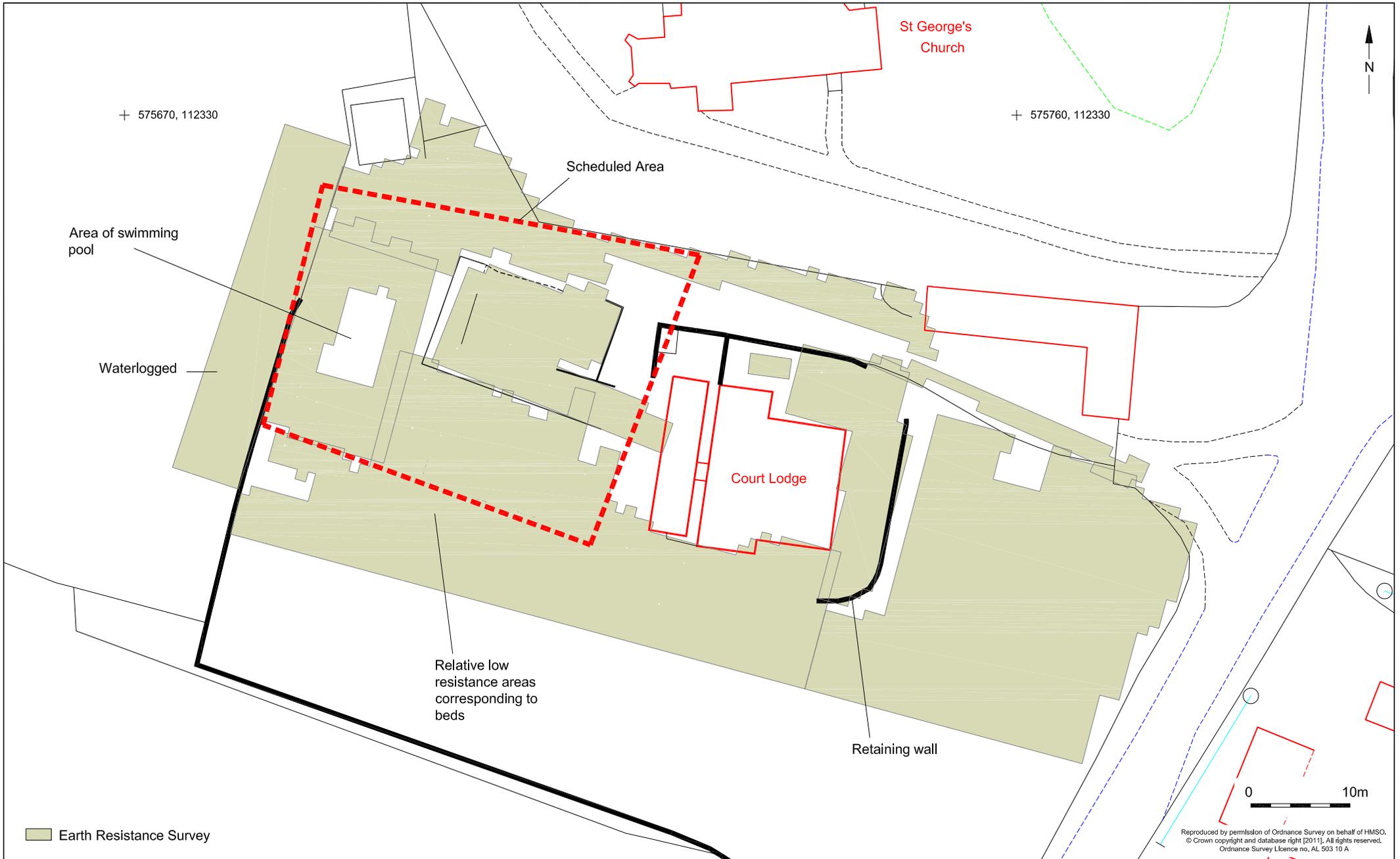
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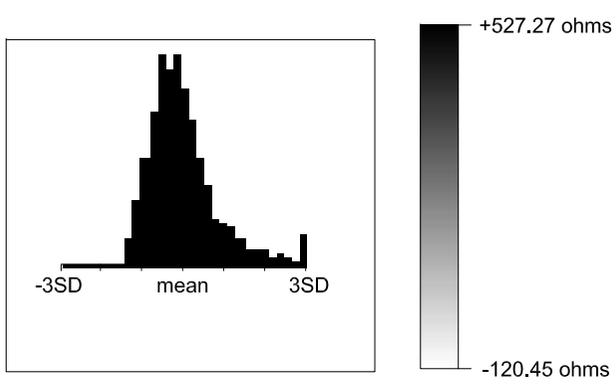
Archaeology South-East would like to thank Michael Bernard for commissioning this survey, the land owner Martin White for providing access and facilities, Nick Austin and all the volunteers.



© Archaeology South-East		Crowhurst Manor Earth Resistance Survey		Fig. 1
Project Ref: 6110	May 2013	Site location		
Report Ref: 2013128	Drawn by: JLR			

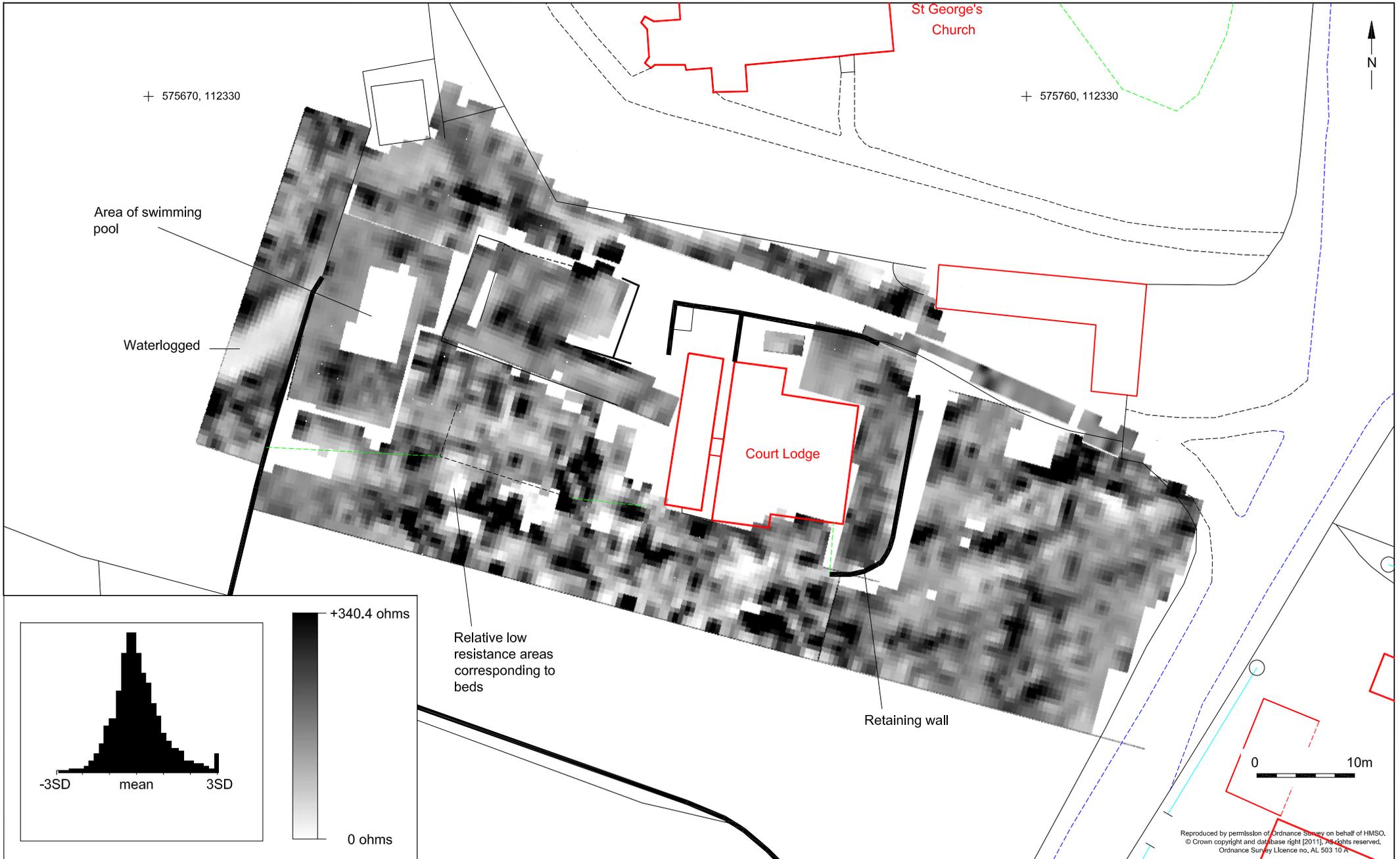


© Archaeology South-East		Crowhurst Manor Earth Resistance Survey	Fig. 2
Project Ref: 6110	July 2013	Location of Earth Resistance Survey	
Report Ref: 2013128	Drawn by: JC		



Relative low resistance areas corresponding to beds

© Archaeology South-East		Crowhurst Manor Earth Resistance Survey		Fig. 3
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Crowhurst Manor Earth Resistance Survey

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Processed Data

Fig. 4



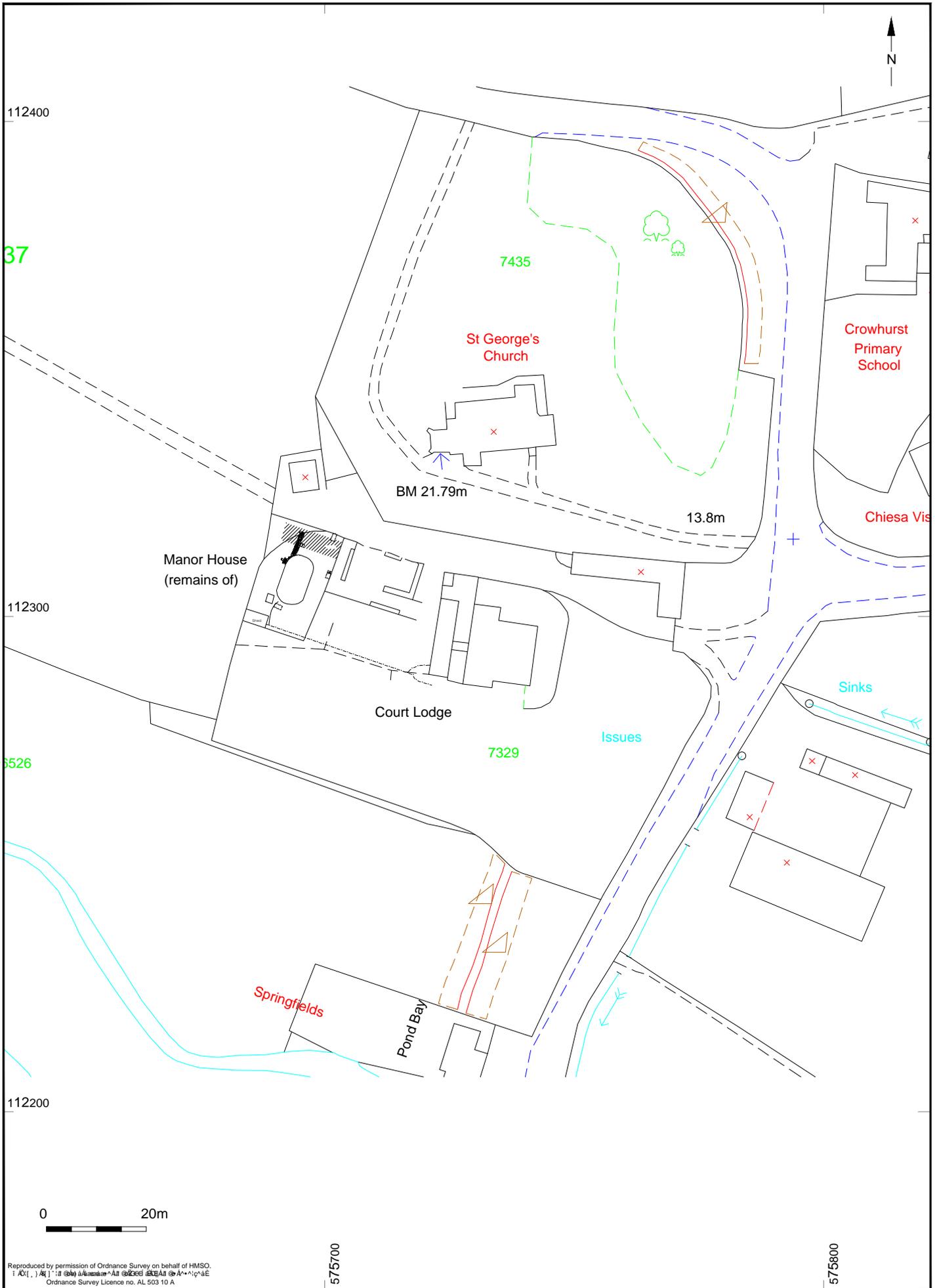
© Archaeology South-East		Crowhurst Manor Earth Resistance Survey		Fig. 5
Project Ref: 6110	July 2013	Interpretation		
Report Ref: 2013128	Drawn by: JC			



© Archaeology South-East		Crowhurst Manor Earth Resistance Survey		Fig. 6
Project Ref: 6110	July 2013	Location of photographs		
Report Ref: 2013128	Drawn by: JC			

Appendix 1

Figures from the 2004 ASE watching brief at the site



© ARCHAEOLOGY SOUTH EAST		Court Lodge, Crowhurst	Fig. 2
Ref: 1977	Jan 2005	Trench Location Plan	

Monitored Area



Wall 3

Slot 4

Slot 1

Pool

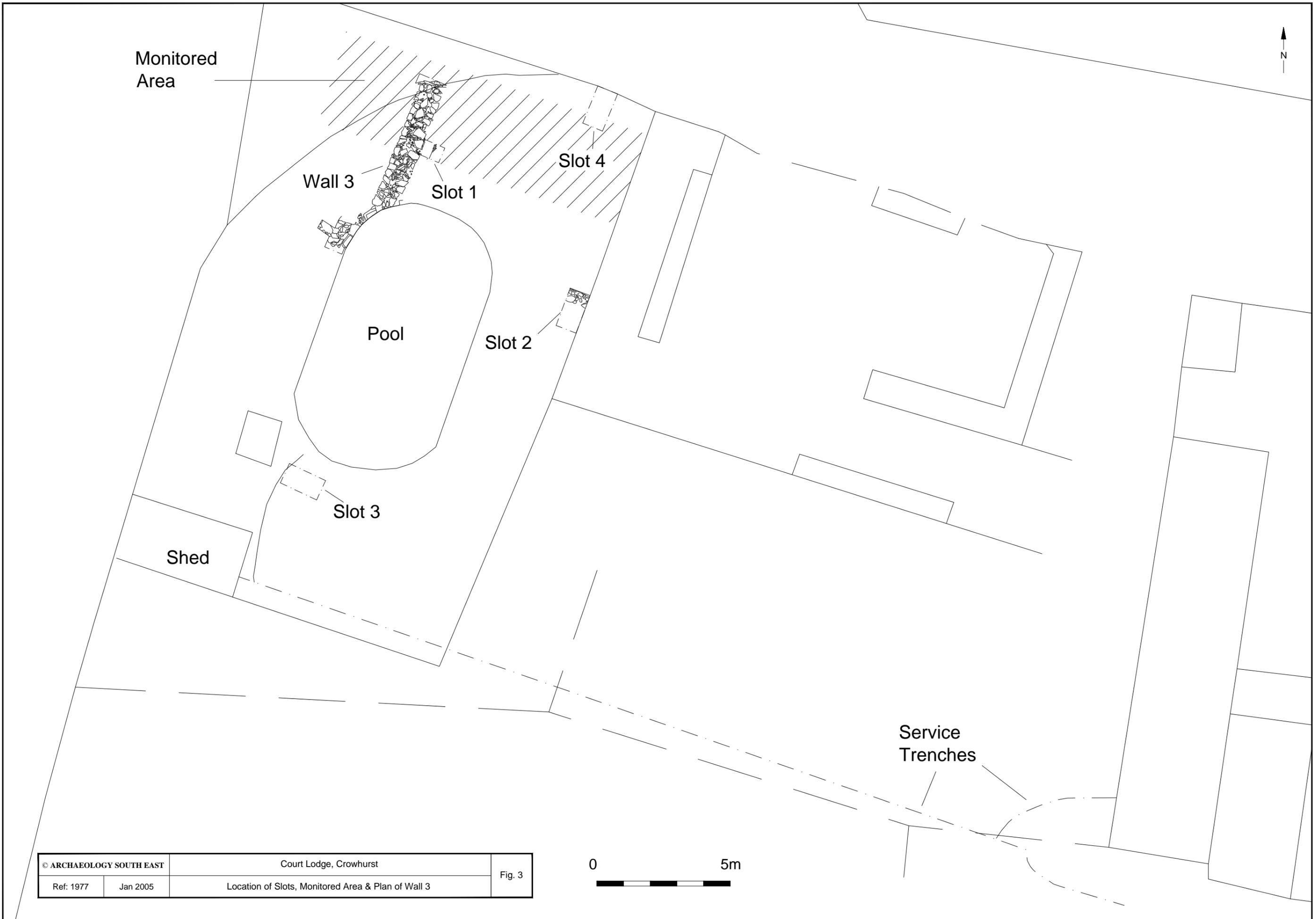
Slot 2

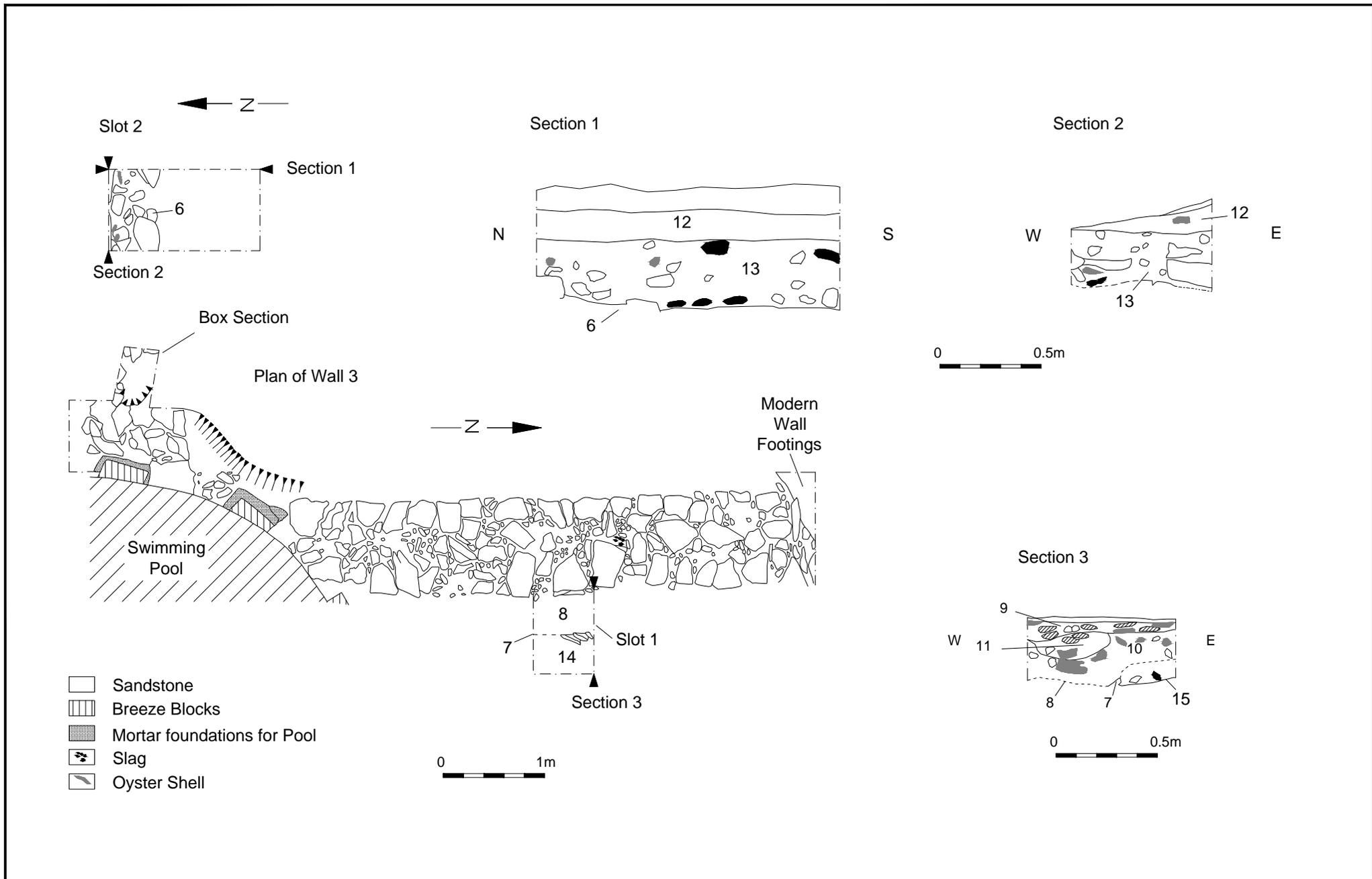
Slot 3

Shed

Service Trenches

© ARCHAEOLOGY SOUTH EAST		Court Lodge, Crowhurst		Fig. 3
Ref: 1977	Jan 2005	Location of Slots, Monitored Area & Plan of Wall 3		





© ARCHAEOLOGY SOUTH EAST		Court Lodge, Crowhurst	Fig. 4
Ref: 1977	Jan 2005	Plans & Sections of Slots 1 & 2	



Plate 1: View of Wall 3 with Manor ruin in background: looking east.

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