

GSEX/01



# GILLINGHAM SOUTHERN EXTENSION, DORSET

## GEOPHYSICAL SURVEY

commissioned by WYG Group Ltd

May 2017



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project info

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project team

PROJECT MANAGER Sam Harrison  
AUTHOR Alistair Webb  
FIELDWORK Aaron Rawlinson, Ross Bishop  
GRAPHICS Caroline Norrman, David Harrison, Rafael Maya-Torcelly  
APPROVED BY Sam Harrison – Project Manager



 **HEADLAND  
ARCHAEOLOGY**  
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**NORTH**

Headland Archaeology  
Unit 16, Hillside, Beeston Road, Leeds, LS11 8ND

0113 387 6430

[north@headlandarchaeology.com](mailto:north@headlandarchaeology.com)

[www.headlandarchaeology.com](http://www.headlandarchaeology.com)



# PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey of a 115 hectare site, south of Gillingham, Dorset, as part of a baseline assessment of the heritage potential of the site. This information will help guide archaeological strategy in advance of the proposed development of the site. The majority of anomalies are indicative of post-medieval agricultural and modern activity with some natural variation within the soils due to the localised presence of alluvial deposits and the widespread distribution of other superficial deposits. One area of clear archaeological potential has, however, been located in the south-western corner of the site. Here linear anomalies forming one small square enclosure and one larger rectangular enclosure, together with other ditch type anomalies, have been identified. This area is assessed as of moderate to high archaeological potential. A curvilinear anomaly which may locate the continuation of a medieval deer park pale boundary (which is recorded beyond the site limits) has also been identified. However, this interpretation is extremely tentative and the anomaly could be indicative of much more recent agricultural activity. Consequently its potential is assessed as low to moderate. The archaeological potential of the remainder of the site is assessed as very low.

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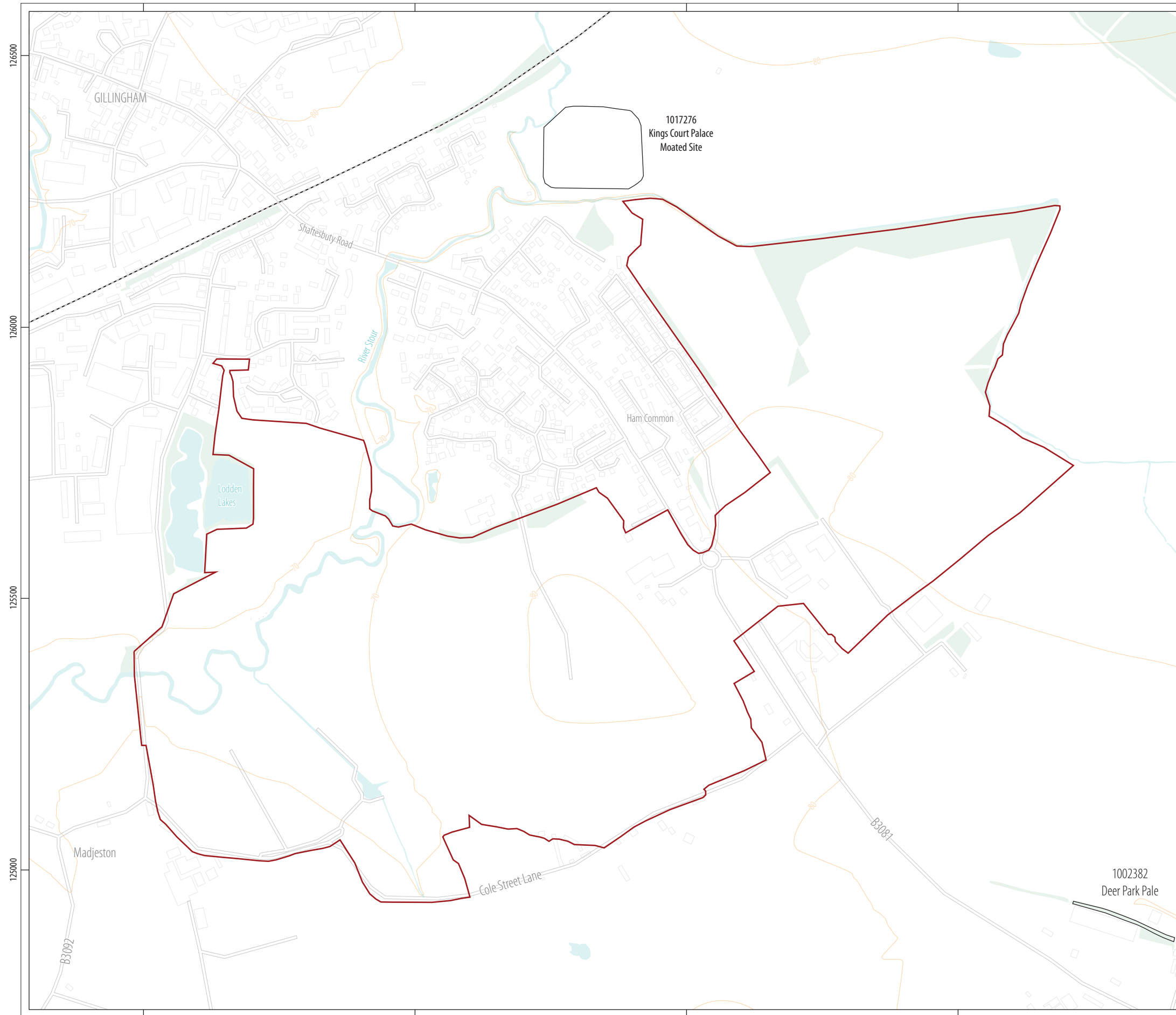
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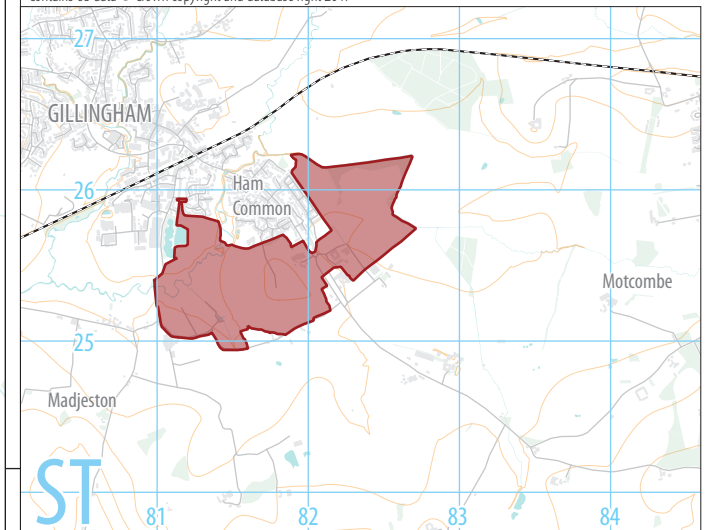


GSEX/01

Gillingham Southern Extension  
Gillingham  
Dorset

0 200km  
1:10,000,000 @ A3

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**HEADLAND**  
**ARCHAEOLOGY**

NORTH

Unit 16, Hillside, Beeston Road  
Leeds LS11 8ND  
0113 387 6430  
[www.headlandarchaeology.com](http://www.headlandarchaeology.com)

0 1Km  
1:7,500 @ A3

KEY

- proposed development area
- scheduled monument



# GILLINGHAM SOUTHERN EXTENSION, DORSET

## GEOPHYSICAL SURVEY

### 1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by WYG Group Ltd (The Client), to undertake a geophysical (magnetometer) survey of land to the immediate south-east of Gillingham where a large mixed use development is being proposed. The survey was carried out as part of a baseline study whose aim was to assess the heritage potential of the proposed development area, which covers approximately 115 hectares, and therefore the impact of the proposed development on the historic environment. The survey was carried out in advance of the submission of detailed planning applications.

The work was undertaken in accordance with a Written Scheme of Investigation (Headland Archaeology 2017), produced on behalf of the client and approved by Dorset County Council, and was undertaken in accordance with guidance contained within the National Planning Policy Framework (DCLG 2012). All work was also undertaken in line with current best practice (Chartered Institute for Archaeologists 2014, English Heritage 2008).

The survey was carried out between February 22nd and March 10th 2017 in order to provide information on the archaeological potential of the PDA.

#### 1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The PDA comprises 36 fields (F1–F36) within a contiguous but irregularly shaped block of land, centred at ST 8200 2550 (see Illus 1), on the southern edge of Gillingham. The fields are predominantly under improved pasture (see Illus 2). Several small parcels of land around a new industrial estate were unsuitable for survey (see Illus 3 and Illus 4), as was Field 36 to the north-west apex of the PDA (see Illus 5), thus reducing the maximum surveyable area to approximately 105 hectares.

New Road (B3092) forms part of the western boundary and Cole Street Lane marks the southern boundary to the west of Shaftesbury Road (B3081) which also bisects the PDA from north/south with some light industrial units either side of the road. Fern Brook defines the eastern boundary. The river Lodden meanders across the north-western corner of the PDA.

Topographically the PDA is gently undulating ranging from approximately 77m above Ordnance Datum (AOD) to the north and south but falling to approximately 72m AOD in the centre and to 66m AOD along the course of the River Lodden.

#### 1.2 GEOLOGY AND SOILS

The underlying bedrock geology comprises mudstone of the Kimmeridge Clay Formation. Much of the PDA is overlain by clay, silt, sand and gravel superficial deposits of alluvium or head although there are parts of the site where there are no recorded superficial deposits (see Illus 6; NERC 2017).

The soils are classified in the Soilscape 18 association, characterised as slowly permeable seasonally wet loams and clays (Cranfield University 2017).

### 2 ARCHAEOLOGICAL BACKGROUND

Research for the baseline assessment (WYG 2017) has demonstrated that the PDA lies within a landscape of considerable archaeological interest with evidence for activity dating from all periods, from the prehistoric to the present day, having been revealed through archaeological fieldwork carried out over the last 20 years as Gillingham has expanded. However, few known heritage assets are recorded in the PDA itself.



**ILLUS 2** General view of the south of Field 29, looking north-east

### 3 AIMS, METHODOLOGY AND PRESENTATION

The general aim of the geophysical survey was to provide sufficient information to establish the presence/absence, character and extent of any archaeological remains within the PDA. This will therefore enable an assessment to be made of the impact of the proposed development on any sub-surface archaeological remains, if present.

The specific archaeological objectives of the geophysical survey were:

- › to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- › to therefore model the presence/absence and extent of any buried archaeological features; and
- › to prepare a report summarising the results of the survey.

#### 3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. A feature such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Terrasurveyor V3.0.31.0 (DWConsulting) software was used to process and present the data.

#### 3.2 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:7,500. Illus 2–5 inclusive are site condition photographs. Illus 6 is a 1:7,500 scale survey location plan showing the GPS swath data. The superficial geology data (after NERC 2017) is presented at the same scale in Illus 7.

The processed greyscale data and an overall interpretation plot are also presented at 1:7,500 on Illus 8 and Illus 9. Detailed data plots of the fully processed data (greyscale), the minimally processed data (XY traceplot) and an accompanying interpretative plot, are presented at a scale of 1:2,500 in Illus 10–24 inclusive, with more detailed (1:1,000) plots of the area of archaeological potential in Illus 25, 26 and 27.





**ILLUS 3** Area unsuitable for survey in Field 8

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Headland Archaeology 2017) and guidelines outlined by Historic England (English Heritage 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations from Ordnance Survey mapping are reproduced with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

*The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.*

## 4 RESULTS AND DISCUSSION

The ground conditions across the PDA were good (with the exception of the omitted areas – see above) and the overall quality of the data collected was good throughout.

The magnetic background only varies slightly across the PDA with no obvious discernible differences between the data recorded over

the superficial head deposits and where there are no recorded superficial deposits.

Against this background numerous anomalies have been identified. Those anomalies with modern, agricultural or geological origins are discussed first followed by those anomalies with a possible or probable archaeological cause. All anomalies are discussed below and cross-referenced to specific anomalies on the interpretative drawings, where appropriate.

### 4.1 FERROUS AND MODERN ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris is common on most sites, often being present as a consequence of manuring or tipping/infilling.

There is a cluster of these ferrous anomalies to the east of the PDA in F3 (Illus 13–15). These responses are not considered to be archaeological and are probably due to the spreading or tipping of modern debris probably resulting from the groundworks/landscaping which has obviously been carried out in the adjoining land block (F8 – see Illus 3 and Illus 16–18). A larger, L-shaped, area of disturbance is also located in F5 (Illus 13–15), including several high magnitude discrete anomalies. These responses are also considered highly likely to be due to recent ground disturbance/activity.



**ILLUS 4** Area unsuitable for survey in Field 12

Four high magnitude linear dipolar anomalies (Illus10–12; **SP1–4**) are identified in the fields (F2, F3, F4 and F7) east of Shaftesbury Road. These anomalies are caused by sub-surface pipes. A fifth pipe anomaly (**SP5**) is recorded aligned north-west/south-east crossing F18 to the western side of the PDA (Illus16–18).

Several individual high magnitude dipolar anomalies (Illus 10–12; **MH1, MH2 and MH3**), in F1 east of Shaftesbury Road, locate man-holes and a modern sewer/drain system. **MH4–7**, in F2 (Illus 10–12), are also due to man-holes and a sewer which probably link to the pipes identified as **SP1** and **SP2**. **MH8–11** in F3–F5, are also caused by man-holes (Illus 10–15).

In F5 several high magnitude ‘spike’ anomalies are identified for which there are no obvious surface features. However there is a lot of magnetic contamination in this field and it is assumed that there has also been a lot of modern disturbance and/or tipping/infilling in this field.

A small cluster of magnetic disturbance in F21 (Illus 22–24; **FP1**) and a larger cluster in F4 (Illus 10–12; **FP2**) locate the sites of two former ponds/clay pits, shown on the (1886) first edition mapping, and which are now infilled.

Magnetic disturbance around the field edges is due to ferrous material within or close to the adjacent field boundaries and is of no archaeological interest.

## 4.2 AGRICULTURAL ANOMALIES

Numerous linear anomalies are identified across the PDA for which no definite interpretation can be given. However, analysis of historical mapping suggests that the division and layout of land within the PDA has remained virtually unchanged since the publication of the first edition Ordnance Survey map in 1886. Consequently only one of these linear anomalies, **FB1**, in F31 (Illus 19–21) is interpreted as a former field boundary. However, it is noted that some of these boundaries ‘may potentially originate in the later medieval period’ (WYG 2017).

However, with the exception of the anomalies described in Section 4.4 below, the remainder of the linear trend anomalies are all considered likely to have an agricultural origin with the majority interpreted as field drains, most obviously in F18 (Illus 16–18).

## 4.3 GEOLOGICAL ANOMALIES

Numerous low magnitude discrete anomalies are identified across the PDA. These anomalies are due to minor variations in composition of the soils. Much broader low magnitude anomalies in F23 and F31 (Illus 19–21), either side of the river Lodden, reflect the likely deposition and accumulation of alluvium from the flooding of the river.

## 4.4 ANOMALIES OF ARCHAEOLOGICAL POTENTIAL (ILLUS 22–27)

One area of definite archaeological potential has been identified in F30, to the south-west corner of the PDA. Here a single small square





ILLUS 5 Area unsuitable for survey in Field 36

enclosure, **E1**, and three sides of a much larger rectangular enclosure, **E2**, are clearly located on slightly higher ground just off the flood plain of the River Lodden. Several linear ditch type anomalies, **D1–5**, are also identified between, and immediately south of, these two enclosures. Another short linear anomaly, **D6**, is also identified, immediately to the east in F29 which may also be indicative of a ditch forming part of the enclosure system located immediately to the west. Parallel linear anomalies, **D7** and **D8**, further east in F28 are also tentatively ascribed a possible archaeological origin.

In F18 arcing anomaly, **FB2**, may also be of archaeological potential. Whilst this anomaly may be caused by a drain it could possibly locate the continuation of the deer park pale (HER 1002382) recorded approximately 0.5km from the southern boundary of the PDA.

## 5 CONCLUSION

The geophysical survey has successfully evaluated the site and has identified one clear area of archaeological potential, which comprises two enclosures and associated ditches, in the south-western corner of the PDA just off the flood plain of the river Lodden. This area is assessed as of moderate to high archaeological potential.

Further to the east a curvilinear ditch type anomaly may locate the line of a medieval deer park pale boundary. However, this interpretation is considered tentative and the potential is assessed as low to moderate.

Elsewhere across the PDA the anomalies identified are consistent with post-medieval and recent agricultural and modern activity. The majority of the PDA is therefore assessed as having a very low archaeological potential.

## 6 REFERENCES

Chartered Institute for Archaeologists (CIfA) 2014 *Standard and guidance for archaeological geophysical survey* [online document] available from [http://www.archaeologists.net/sites/default/files/CIfAS&GGeophysics\\_1.pdf](http://www.archaeologists.net/sites/default/files/CIfAS&GGeophysics_1.pdf)

Cranfield University 2017 *Cranfield Soil and Agrifood Institute Soilscales* [online] accessed 22 March 2017 from [www.landis.org.uk/soilscales/](http://www.landis.org.uk/soilscales/)

Department of Communities and Local Government (DCLG) 2012 *National Planning Policy Framework* [online document] available from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf)

English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines* (2nd edition) [online document] available from <http://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf>

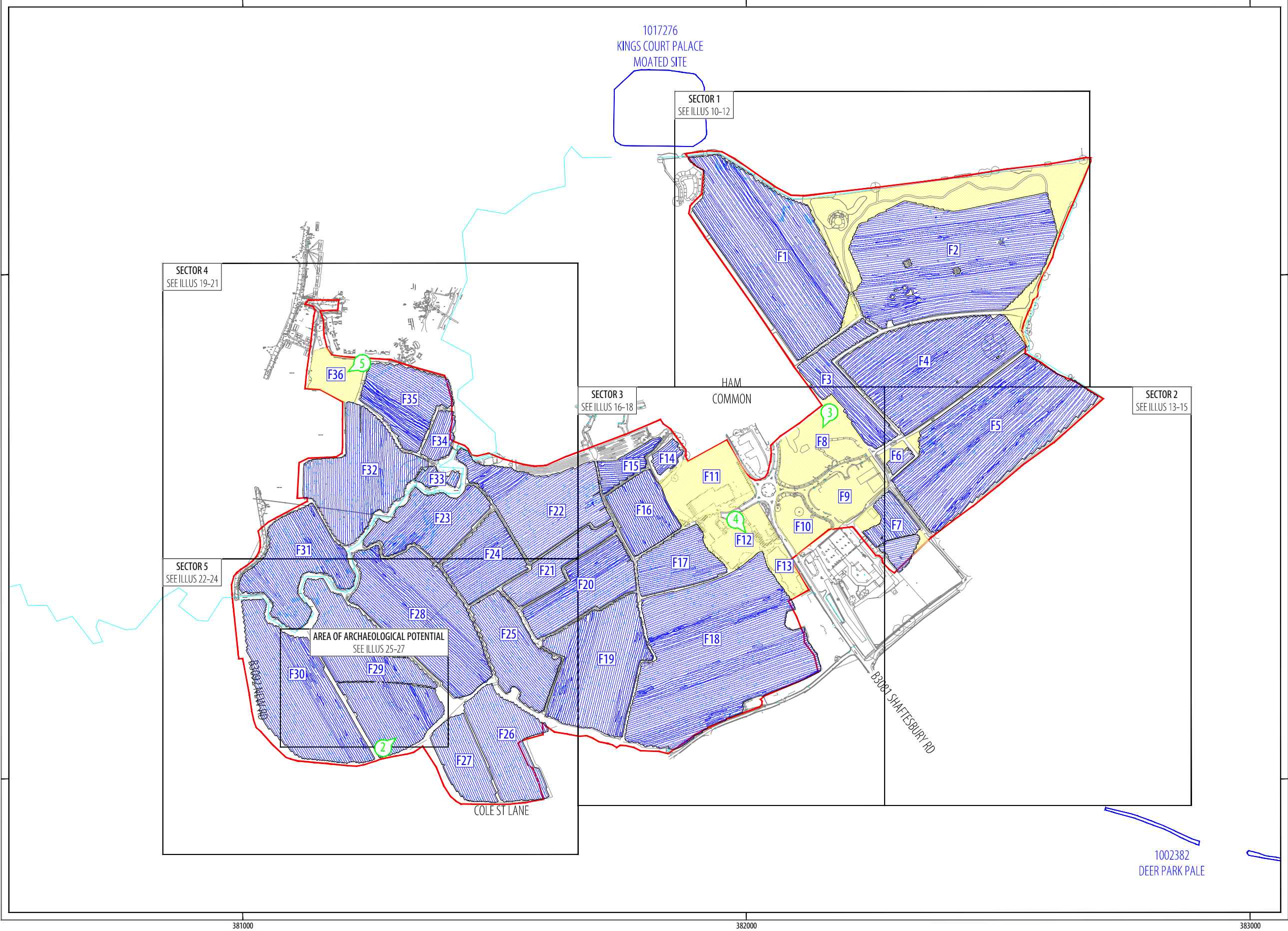
Gaffney, C & Gater, J 2003 *Revealing the Buried Past: Geophysics for Archaeologists* The History Press: Stroud

Headland Archaeology 2017 *Gillingham Southern Extension, Dorset: Written Scheme of Investigation for Geophysical Survey* [unpublished document] Headland Archaeology ref GSEX/01

Natural Environment Research Council (NERC) 2017 *British Geological Survey* [online] accessed 22 March 2017 from <http://www.bgs.ac.uk/>

WYG Group Ltd 2017 (in prep) *Gillingham Southern Extension, Dorset: Archaeological DBA, Setting Assessment and Geophysical Survey* [unpublished document] WYG





ILLUS 6 Survey location showing GPS swaths