Appendix B Written Scheme of Investigation for Archaeology

Explanatory Note

The Written Scheme of Investigation (WSI) was prepared in December 2009, and revised in January 2010 following discussions with the Archaeological Officer at Central Bedfordshire Council. That revised version (v1.1) is appended.

This WSI was based on a preliminary alignment of Woodside Connection. The geophysical survey area was extended in May 2012, to cover both the proposed residential and commercial development area and the emerging preferred route for Woodside Connection (appended).

Following completion of the geophysical survey and adoption of the preferred route for Woodside Connection, the Archaeological Officer has agreed a combined trial trench layout for both the proposed residential and commercial development area and Woodside Connection (appended).

WOODSIDE CONNECTION
HOUGHTON REGIS
BEDFORDSHIRE

WRITTEN SCHEME OF INVESTIGATION FOR A PROGRAMME OF ARCHAEOLOGICAL FIELD EVALUATION

Project: WC1583

Document: 2009/118
Version 1.1

7th January 2010

Produced by	Checked by	Approved by
Wesley Keir	Joe Abrams	Drew Shotliff

Produced for:
AMEY

On behalf of:
Bedfordshire Highways (Central Bedfordshire Council)

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Preface

Every effort has been made in the preparation and submission of this document and all statements are offered in good faith. Albion Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party, or for any loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in this document.

This document has been prepared by Wesley Keir (Project Officer), checked by Joe Abrams (Project Manager) and approved by Drew Shotliff (Operations Manager). The figures were produced by Joan Lightning (CAD Technician).

Albion Archaeology
St Mary s Church
St Mary s Street
Bedford, MK42 0AS
☎: 01234 294006
Fax: 01234 294008
E-mail: office@albion-arch.com
Website: www.albion-arch.com

Version History

Version	Issue date	Reason for re-issue
1.0	4th December 2009	n/a
1.1	7th January 2010	The CBC Archaeological Officer asked for minor changes to text in Sections 3.1, 3.2, 3.3, 7.2.7 and 7.3.13

Structure of the WSI

The first section of this document introduces the project. Section 2 reviews the archaeological and historical background of the Study Area. Section 3 outlines the methodologies to be employed in achieving the objectives of the investigation. Section 4 details the resources that will be deployed and outlines the project programme. Section 5 is a bibliography. Supplementary information on the HER and NMR data, and on the methodologies and personnel that will be deployed on the project is contained in the three appendices (Sections 6, 7 and 8).

Key Terms

Throughout this WSI, the following terms or abbreviations are used:

Albion	Albion Archaeology
CBCA	Central Bedfordshire Council Archaeologist
Client	AMEY
HER	Bedfordshire and Luton Historic Environment Record
IfA	Institute for Archaeologists
LPA	Local Planning Authority
NMR	National Monuments Record
Procedures Manual	*Procedures Manual Volume 1 Fieldwork*, 2nd edn, 2001 Albion Archaeology

Non-technical Summary

AMEY, acting on behalf of Bedfordshire Highways (Central Bedfordshire Council), is designing and managing a road scheme that will connect Junction 11A of the M1 with Poynters Road in Houghton Regis. This scheme is known as the Woodside Connection, the extent of which is henceforth referred to as the Development Area (DA).

The Central Bedfordshire Council Archaeologist (CBCA) has advised that the route is archaeologically sensitive. Archaeological evidence ranging from the Mesolithic to post-medieval periods has been identified within the DA and land within 200m of its edges (study area). Most of this data has been derived from fieldwalking, geophysical survey or cropmarks visible on aerial photographs. As a result, the CBCA has issued a brief (CBC 2009) outlining a programme of archaeological field evaluation which will assess the potential impact of the development and allow an appropriate mitigation strategy to be developed.

Albion Archaeology has been commissioned by AMEY to prepare a Written Scheme of Investigation (this document) for the evaluation and to carry out the work. The work will comprise fieldwalking and geophysical survey, followed by trial trenching which will be used to target areas of identified archaeological interest and to provide even coverage of the DA. The results will assist in determining the mitigation requirements for any remains impacted by the scheme and will accompany the planning application for the scheme.

On completion of the evaluation, the site archive will be kept in secure storage at the offices of Albion Archaeology in St Mary s Church, Bedford, prior to its deposition with Luton Museum. Albion Archaeology is a registered archaeological organisation with the Institute for Archaeologists. It employs over 30 full time, professional staff, who have provided specialist archaeological input for large numbers of projects of this type.

1. INTRODUCTION

1.1 Planning Background

AMEY, acting on behalf of Bedfordshire Highways (Central Bedfordshire Council), is designing and managing a road scheme that will connect Junction 11A of the M1 with Poynters Road in Houghton Regis (Fig. 1). This scheme is known as the Woodside Connection, the extent of which is henceforth referred to as the Development Area (DA).

The Central Bedfordshire Council Archaeologist (CBCA) has advised that the route is archaeologically sensitive. As a result the CBCA issued a brief (CBC 2009) outlining a programme of archaeological field evaluation which will assess the potential impact of the development and allow an appropriate mitigation strategy to be developed.

Albion Archaeology has been commissioned by AMEY to prepare a Written Scheme of Investigation (this document) for the evaluation and to carry out the work. The results will assist in determining the mitigation requirements for any remains impacted by the scheme and will accompany the planning application for the scheme.

1.2 Status of the Written Scheme of Investigation

This document represents a written scheme of investigation for the implementation of a programme of archaeological work, to be approved by the CBCA (Central Bedfordshire Council Archaeologist) before work on site begins. It outlines the circumstances of the project and gives an indication of the scope of the work required. It also includes a review of the known archaeological and historical background of the area affected by the scheme, in order to provide a preliminary assessment of the archaeological potential of the DA. A detailed schedule of the works, methodologies and resources is included so that the proposed work is quantifiable and can be monitored by the CBCA.

1.3 Site Location and Description

The DA consists of a 100m wide and *c*. 3km long corridor that extends from Poynters Road in Houghton Regis (TL 02945 23460) to Junction 11 of the M1 (TL 03835 25899) in the parish of Chalton (Fig. 1).

The topography of the DA is relatively flat at 125 130m OD; its lowest point is where it crosses a tributary of the River Lea towards the southern end of the DA. The underlying geology consists predominantly of chalk, with smaller areas of sand and gravel confined to the course of a tributary of the River Lea. At the southern end of the DA these deposits are overlain by brown calcareous soils, whilst lighter soils of Iknield Rendzina are present within the northern half of the Study Area (King 1969).

The vast majority of the DA is currently in arable use (Fig. 2), although smaller strips of scrubland and grassland exist on the outskirts of Houghton Regis and Luton (Area 2; Fig. 2).

2. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

This section reviews the available documentary, cartographic and archaeological evidence for the DA and land within 200m of its edges (henceforth referred to as the Study Area). Reference has been made to selected archaeological evidence from beyond the Study Area where it augments understanding of the landscape within which the DA is located. Analysis of the known historical and archaeological background of the study area has been used to characterise, as far as possible, the archaeological potential of the DA. All known archaeological data for the Study Area is listed in Appendix 1 and their locations are shown on Fig. 3.

The sources of information listed below were consulted:

The Bedfordshire and Luton Historic Environment Record (HER)
This is a database of archaeological information, which contains written and pictorial records of known archaeological monuments, previous archaeological investigations, find spots, and buildings of historical and archaeological significance. The HER contains information specific to the county of Bedfordshire.

The National Monuments Record (NMR)
This is a database similar in content to the HER. However, it is a national database rather than a county-specific one. For a comprehensive assessment of the known archaeology of an area, it is often helpful to search both the HER and the NMR. The NMR is maintained by English Heritage, Swindon.

Cartographic data
Early maps and other illustrations of an area can be a very productive form of research. Often, they indicate dramatic changes in land-use during the post-medieval and modern periods. This can be very helpful in appreciating how the archaeological resource may have been affected by the expansion of settlements and/or industrial sites during, in particular, the 19th and 20th centuries. The principal source consulted in this case was the Bedfordshire and Luton Archives and Records service, Bedford.

2.2 Archaeological Investigations Already Undertaken

Archaeological evidence ranging from the Mesolithic to the post-medieval period has been identified within the Study Area; most of it is derived from fieldwalking, geophysical survey or cropmarks visible on aerial photographs.

Land within the Study Area and around Houghton Regis has been extensively fieldwalked by the Manshead Society (Hudspith 1991, 1995, 1999). The sites of Roman farmsteads were identified at HER15501 and HER15812 (Fig. 3). The northern end of the Study Area was incorporated within an archaeological assessment and evaluation undertaken in advance of the proposed M1 widening (BCAS 1993, 1994, 1995; Northamptonshire Archaeology 2006). This included fieldwalking and geophysical survey of areas immediately adjacent to the M1. The only intrusive investigations undertaken to date within the Study Area consist of three small trial trenches excavated in the vicinity of the Roman site at HER15501

and three trial trenches excavated on an Iron Age and Roman settlement site (HER15839; BCAS 1995) prior to widening of the M1. The locations of all these investigations are shown on Fig. 4.

2.3 Mesolithic (10,000BC 3,500BC)

Evidence of the Mesolithic period within the Study Area consists of a small number of worked flints found through fieldwalking. Larger concentrations, perhaps indicative of a seasonal hunting camp, have been found further to the west (Hudspith 1991, 58).

2.3.1 Archaeological potential within the DA

Fieldwalking in recent years suggests there is little potential to find significant archaeology of this period within the DA.

2.4 Neolithic Bronze Age (3,500BC 700BC)

Evidence dating to this period comprises scatters of flintwork found during fieldwalking. A large range of artefacts and debitage were recovered either side of the M1, including land within the very northern end of the Study Area (HER16090; HER16091; HER16092; BCAS 1993). The main components were cores, scrapers, blades and waste flakes. Flint scatters have also been found in the vicinity of Chalton Farm (Hudspith 1991, 58).

The relatively high density of the finds suggests intensive use of the landscape, probably related to seasonal hunting or pastoral farming, rather than permanent settlement sites (BCAS 1993, 12).

2.4.1 Archaeological potential within the DA

A relatively large quantity of flintwork dating to this period has been found in the vicinity of the DA, particularly towards its northern end near the ridgeway at Chalton. The relatively high density of the flintwork suggests there is a high potential to find further remains of this period, although the paucity of pottery suggests any remains are unlikely to be associated with permanent settlement.

2.5 Iron Age (700BC AD43)

Fieldwalking, geophysical survey and trial trenching identified an early-middle Iron Age settlement at the northern end of the Study Area (HER15839). This comprised boundary and enclosure ditches and a pit. The pottery assemblage comprised basic utilitarian wares, which coupled with the faunal evidence for the presence of domestic animals, suggests a small, rural settlement, supported by an agricultural economy based partly, at least, on animal husbandry (BCAS 1995, 18). The area was later re-settled in the Roman period (see Section 2.6).

The only significant evidence for later Iron Age activity is a large number of pottery sherds found during housing development in Marlin Road (HER15280; Holgate 1998, 126) at the southern end of the Study Area.

A rectangular enclosure of uncertain date has been recorded from aerial photographs at the southern end of the Study Area (HER1792). Its form and relationship with other features in the vicinity suggests it could date to the Iron Age.

2.5.1 Archaeological potential within the DA

Fieldwalking to date has shown little evidence of Iron Age activity within the DA. However, the activity identified outside the DA, particularly near to its northern end at HER15839, suggests there is a moderate potential to find further remains of this period within the DA.

2.6 Roman (AD43 - AD410)

Several Roman farmsteads have been identified through fieldwalking on the chalkland around Houghton Regis. Three of these, HER15501, HER15812 and HER15839, are located within the Study Area. Each site was marked by substantial scatters of tile, building stone and pottery sherds, indicative of later Roman occupation (Hudspith 1991, 64; BCAS 1995). Iron smelting slag was also recovered at HER15501 and HER15812 (Hudspith 1991, 1999) suggesting some degree of industrial activity at both sites.

Two of these sites (HER15839; HER15501) were later trial trenched. The area of the Iron Age site (HER15839), mentioned above, was re-settled in the later Roman period. Geophysical survey and trial trenching revealed enclosure ditches and structural evidence in the form of postholes containing fragments of daub (BCAS 1995). A possible droveway was also revealed, the alignment of which suggests it may extend further west into the Study Area. Three small trial trenches were excavated on the fieldwalked site at HER15501 but revealed no archaeological features (Warren 1996, 11).

2.6.1 Archaeological potential within the DA

Substantial evidence of this period has been found through fieldwalking at HER15501 and HER15812 within the DA. The proximity of the remains at HER15839 also suggests the possibility that associated features may extend into the DA. Therefore, a high potential for remains of this period is predicted within the DA.

2.7 Saxon medieval (AD410 AD1500)

The Study Area falls within the parishes of Houghton Regis and Chalton (historically part of Toddington parish). Lying immediately to the west of the Study Area, the settlement at Houghton (as it was initially known) was already established by Domesday (Page 1912a). The suffix Regis was soon added to reflect the fact that it was owned by the Crown and to distinguish it from Houghton Conquest. It remained the property of the king until Henry I granted the manor of Houghton to Hugh de Gurney in the 12th century. The manor passed through various families, eventually passing to the Bray family in the later 15th century. The village of Chalton to the north of the Study Area was, up until the 20th century, a hamlet within the parish of Toddington. The manor of Toddington is recorded in Domesday as being held by William Spec (Page 1912b). It passed through various families, eventually passing to the Pever family in the 13th century, with whom it remained until the 15th century. John Pever also held land later referred to as Chalton Manor from the early 13th century onwards

During the medieval period, historical maps indicate that the landscape traversed by the Study Area would have consisted largely of unenclosed common fields that are likely to have belonged to the manors mentioned above. Little of this landscape is

evident today within the Study Area, although medieval ridge and furrow has been recorded further to the west (HER12262; HER12263). The only features of this period identified within the Study Area are trackways, either still surviving today or visible as cropmarks. A routeway first recorded in AD926 and known as the Theedway crosses the northern end of the Study Area (HER10843). Its course east to west is marked partly by Houghton Road and partly by a trackway heading westwards. It is thought to have been a major route for the transportation of salt inland from the East Anglian coast during the Saxon and medieval periods. Further south, trackways marked on late 18th-century estate maps, and which are likely to date back to the medieval period, are visible as cropmarks just extending into the Study Area at HER1792 and HER12407.

2.7.1 Archaeological potential within the DA

Little archaeological evidence of this period has been found within the DA. However, there is a moderate potential to find remains associated with the agricultural landscape known to have existed in the area.

2.8 Post-medieval (AD1500 - AD1800)

The medieval common fields within the Study Area, referred to above, were enclosed by the end of the 18th century. Some of these 18th-century boundaries still survive as hedgelines on the western margins of the Study Area. Chalton Cross Farm at the northern end of the Study Area dates to the 18th century (Page 1912b). To the south of the main farm buildings is a further compound and outbuildings, which appear to correspond with farm buildings marked on the First Edition OS map of 1882. The trackway on which Chalton Cross Farm is located follows the course of a footpath marked on the Toddington Inclosure map dating to 1797. Evidence of small-scale chalk and sand quarrying are visible as earthworks adjacent to Chalton Cross Farm (HER12121) (visible at least until the 1960s) and as cropmarks at HER12120 and HER1792.

The southern end of the Study Area includes part of what is now a business park, but was once part of the original extent of the landscaped grounds belonging to Houghton Hall, which dates back to the 17th century.

2.8.1 Archaeological potential within the DA

There is a moderate potential to reveal remains associated with the agrarian landscape of this period. The grounds of Houghton Hall do not extend into the DA.

3. METHOD STATEMENTS

3.1 Standards

The standards and requirements set out in the following documents will be adhered to throughout the project:

• IfA	*Code of Conduct* *Standard and Guidance for Archaeological Field Evaluation*
• Albion Archaeology	*Procedures Manual: Volume 1 Fieldwork* (2nd edn, 2001)
• English Heritage	*The Management of Archaeological Projects, 2nd edition*
• East Anglian Archaeology Occasional Paper 14	*Gurney, D. 2003, Standards for the Field Archaeology in the East of England*

3.2 Archaeological Evaluation

3.2.1 Introduction and objectives

In order to identify the specific archaeological impacts of the development and determine an appropriate mitigation strategy, the following evaluative techniques are proposed. These techniques are designed to provide information on the following:

- The location, extent, nature, and date of any archaeological features or deposits that may be present;
- The integrity and state of preservation of any archaeological features or deposits that may be present.

The desk based research (Section 2) demonstrates that the DA has the potential to provide significant archaeological data, particularly with regard to Neolithic/Bronze Age activity and Roman settlement/agricultural remains. These have been identified as valuable research themes for the county of Bedfordshire.

The paucity of Neolithic/Bronze Age settlement evidence means that the identification and investigation of activity sites of this period is a high priority (Oake 2007, 10). By using a suite of evaluative techniques, there is also an opportunity to address the success of different strategies in identifying these sites. In this regard, the understanding of flint scatters is of particular importance. Evidence of Roman rural settlement would address the identified research area regarding relationships between settlement and enclosure during this period (Oake 2007, 11).

Therefore, in addition to the generic objectives stated above, research aims for the project at this stage will comprise:

Research aim	Source/s
To gain data regarding sites of Bronze Age/Neolithic activity and the success of the different evaluation techniques in identifying these sites.	Oake 2007, 10
To gain data on Roman settlement/agricultural remains	Oake 2007, 11

Detailed method statements for non-intrusive evaluation (fieldwalking and geophysical survey) and intrusive evaluation (trial trenching) are presented in Appendix 2. A summary of the fieldwork strategy and post-excavation methodologies are presented below.

3.2.2 Fieldwalking

The DA has been fieldwalked in recent years as part of a wider survey (Hudspith, 1991, 1995, 1999). However, the CBCA considered that the results are not in a format which can easily be used to predict archaeological potential in the DA specifically (CBC 2009). Therefore, Area 1 of the DA will be fieldwalked in its entirety (Fig. 2) using the collection strategy described below. This does not include the small areas of landscaping and scrubland (Area 2) that are at the southern end of the DA adjacent to Houghton Regis.

The fieldwalking will be based on the establishment of 20m transects that are aligned with the course of the DA and the collection of artefacts within a 2m-wide corridor along the edge of each transect. Differential GPS (dGPS) will be used to plot each find-spot on the OS National Grid.

Fieldwalking works best on areas that have been ploughed, harrowed and weathered, although there is still benefit in walking those areas that have simply been ploughed or those where the crop is beginning to come through. Hey and Lacey (2001) also conclude that fieldwalking, as might be expected, is good at indicating presence and date, but poor on issues of condition and layout; the periods that fare less well are the Iron Age and Saxon.

Results of the fieldwalking will be used to provide information on the location and date of potential archaeological remains. This, together with the geophysical survey (Section 3.2.2), will help to inform the design of the trial trenching strategy (Section 3.2.3). Ground conditions and the date of any remains identified will be taken into account when assessing the value of the results. Detailed method statements are presented in Appendix 2.

3.2.3 Geophysical survey

Non-intrusive geophysical survey will comprise detailed magnetometer survey over the whole of the DA, with the exception of small areas of scrubland at its southern end adjacent to Houghton Regis (within Area 2; Fig. 2). The work will be done in accordance with English Heritage guidelines (David *et al*. 2008).

On suitable land, detailed magnetometry is generally done on a 30m x 30m grid. Readings are taken at 1m centres in traverses 0.25m apart. The data is captured in the machine s internal memory, and then downloaded onto a computer. Individual grids are then matched together to produce an overall plan of the surveyed area. Geophysical survey will provide information on the location and extent of archaeological remains.

The results of the survey will be analysed and a report produced giving details of any possible archaeological remains and their locations. The results of the geophysical survey will contribute to the design of the trial trenching strategy.

3.2.4 Trial trenching

A maximum of 5% of the DA will be trial trenched, with a provision for additional trenches equivalent to 1% of the DA to further investigate deposits and features as necessary. The locations of the trenches will be designed in order to:

(a) investigate areas of archaeological interest identified by the fieldwalking and geophysical surveys;
(b) investigate areas that appear to be lacking in archaeology, with the overall aim of providing even coverage of the DA.

The trench layout will be agreed with CBCA before trial trenching commences.

Trenches will be opened using a mechanical excavator, operated by an experienced driver under archaeological supervision. All excavation and recording will be carried out by experienced Albion staff, with external specialists consulted as necessary. An appropriate level of environmental and other sampling will be undertaken in accordance with standard guidelines (Appendix 2, Section 7.3).

3.2.5 Post-fieldwork analysis and reporting

Data gathered during all stages of the evaluation will be analysed and synthesised into a final report. The analysis will be carried out using Albion Archaeology s networked Access database system and GIS.

The report will be sufficiently detailed to allow the results of the evaluation to be interpreted without recourse to the site archive. It will place the results of the evaluation in their local, regional and national context, and will highlight any relevance to national and regional research frameworks.

An unbound draft copy will be submitted to the CBCA within four weeks of the completion of fieldwork. A copy of the subsequently approved document will be supplied in both hard copy and digital format to the CBCA and the HER.

3.3 Archiving

The archive of finds and records generated during the Project will be kept secure at all stages of the operation. All records and materials produced will be archived to the standards outlined in Appendix 3 of English Heritage s *Management of Archaeological Projects*. In liaison with the landowner, in principle, permission will be sought for transfer of title of all finds to Luton Museum (Accession Number 2010:2). We will adhere to the deposition guidelines of Luton Museum and will make provision for storage grant payment.

Details of the project and its findings will be submitted to the OASIS database in accordance with the guidelines issued by English Heritage and the Archaeology Data Service.

3.4 Monitoring

It is recognised that responsibility for monitoring the project and ensuring both adherence to the project design and the maintenance of professional standards lies with CBCA. So that arrangements for monitoring can be made, the CBCA will be

given advance warning of the intended start date. On-site meetings will be arranged, as appropriate, at each stage of the fieldwork.

Any variation to the project design will be agreed with the CBCA before a revised programme of work is implemented.

3.5 Health and Safety

A comprehensive risk assessment will be carried out before the start of fieldwork in accordance with Albion Archaeology s *Health & Safety Policy*.

As part of the project briefing, all staff will be made aware of their responsibilities and the specific site hazards (identified under the risk assessment). Site health and safety will be monitored and reviewed as the project progresses and the risk assessment revised, if necessary.

Albion Archaeology will comply fully with all operational requirements of the client/landowner.

3.6 Quality Assurance and Project Management

Albion Archaeology s three principal organisational goals are:

i. delivery of a first class service to clients;
ii. development of the highest professional standards;
iii. rapid dissemination of the results of archaeological projects.

To meet these goals, the following elements of Total Quality Management are under continuing development:

3.6.1 Service delivery

- A networked Projects Database and client contact *pro formae* which underpin our service delivery.
- A networked time and cost recording system which underpins project budget management.
- Use of Microsoft Project for scheduling both individual projects and the work of the organisation as a whole.
- Specific standards reviews at the completion of each project stage.

3.6.2 Professional standards

- Adherence to professional standards set out by the IfA.
- Commitment to the utilisation and development of regional and national research frameworks.
- Commitment to staff development to maintain professional expertise.
- Comprehensive Fieldwork Procedures Manual.
- Consistent approach to assessment, analysis and archiving by means of standardised database templates and procedures.
- Continual review of service standards provided by sub-contractors.
- Support for Albion Archaeology staff involved in national archaeological organisations.

3.6.3 Rapid dissemination

- Regular publication of the results of fieldwork projects, in both stand-alone format and as part of regional and period-based summaries.
- Safe and secure storage of project archives prior to deposition with relevant museum.
- Provision of an education service for local schools.
- Maintenance of a public display area at St Mary s Archaeology Centre.

3.7 Insurance

- ***Professional indemnity***

  Albion Archaeology maintains £2,000,000 cover with Saturn Professional Risks Ltd.

- ***Employers liability***

  Albion Archaeology maintains £20,000,000 cover for any one occurrence with St. Paul Travellers Insurance Company Limited (UC POP 3323443).

- ***Third party (persons or property)***

  Albion Archaeology maintains £10,000,000 cover for any one occurrence with St. Paul Travellers Insurance Company Limited (UC POP 3323443).

- ***Hired plant and equipment***

  Through the Royal Sun Alliance, Albion Archaeology maintains equipment hire insurance, covering temporary accommodation, tools and plant. The current level of cover is £320,000 with a £2,500 excess.

4. RESOURCES AND PROGRAMMING

4.1 Albion Archaeology Company Profile

Albion Archaeology, formerly called Bedfordshire County Archaeology Service, was established in 1974. In keeping with its commitment to the maintenance of the highest standards of professional practice, it has been a Registered Organisation with the Institute for Archaeologists since August 1997. Albion Archaeology is one of the region s leading archaeological organisations and for more than 25 years has undertaken major fieldwork and evaluation projects in Hertfordshire and surrounding counties. It offers a comprehensive service to local and national government, statutory bodies, and the private sector. Current clients include David Wilson Homes, CgMs, Bellway Homes, English Heritage and Persimmon Homes.

4.2 Albion Archaeology Staff Resources

Albion Archaeology employs over 30 full time, professional archaeological staff. Additional staff are recruited as required by the organisation s work load. The following individuals will be deployed on this project (details in Appendix 2).

Drew Shotliff MA MIFA, Operations Manager: *quality control and overall management*
Joe Abrams BA MIFA, Project Manager: *project management*
Wesley Keir BSc AIFA, Project Officer: *day-to-day operational management*
Supervisor (TBC): *on-site supervision*
Jackie Wells MA, Finds Officer: *finds processing and reporting*
Anna Slowikowski M Phil, Artefacts Manager (ceramics): *reporting*
Holly Duncan M Litt, Artefacts Manager (non-ceramics): *reporting*

Archaeological Technicians will be assigned to the project team as necessary. Technical support will be provided by in-house specialist staff in the areas of surveying, illustration and computing.

4.3 External Sub-contracted Specialists

All sub-contracted specialists employed by Albion Archaeology are established and well-respected in their fields of expertise. Each has a proven track record of providing quality services within set deadlines. *Pro forma* contracts are used to ensure work is correctly specified and delivered to time and budget. Albion Archaeology continually reviews the quality of work received from sub-contractors and continually seeks competitive quotes in order to avoid over-reliance on a single supplier.

The following external specialists will be used, as required, on this project:

Dr. Richard Macphail, University College London: *soil formation processes and micromorphology*
John Giorgi, Freelance: *plant remains*
Alan Pipe, Museum of London Archaeology Service: *faunal and molluscan remains*
Dr. Peter Guest, Cardiff University: *coinage*
Rob Scaife, Southampton University: *palynology*
Museum of Lincoln: *artefact conservation*

4.4 Programme

The anticipated timetable for the evaluation is set out below. The dates of the work are currently unknown but it is likely to take place in 2010 in advance of submission of the planning application.

Task		Time required
1	Agree methodology with CBCA	2 weeks
2	Geophysical survey	2 weeks
3	Fieldwalking survey	1 week
4	Trial trenching	4 weeks
5	Post-fieldwork analysis, reporting and archiving	3-4 weeks

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Warren, D., 1996, Trial excavations at Chalton Cross Farm, Toddington Parish in *Journal of the Manshead Archaeological Society of Dunstable* **36**, 11-13.

BCAS = Bedfordshire County Archaeology Service

Historical maps consulted within BLARS (Bedfordshire and Luton Archives and Records Service)

1762	Houghton Regis estate map (B553).Contains the manors of Houghton Regis and Seywell belonging to John Duke of Bedford.
1796	Houghton Regis inclosure map (MA84/1, 2).
1797	Toddington inclosure map (MA1/1, 2).
1841	Houghton Regis tithe map (MAT25/1, 2). (Doesn t include the DA).
1880	OS 25-inch 1st Edition (sheet XXIX.15)
1882	OS 25-inch 1st Edition (sheet XXIX.11)
1889	OS 6-inch 1st Edition (sheet XXIX.SE)
1891	OS 6-inch 1st Edition (sheet XXXII.NE)
1901	OS 25-inch 2nd Edition (sheets XXIX.15 and XXIX.11)
1901/2	OS 6-inch 2nd Edition (sheets XXIX.SE and XXXII.NE)
1913	Toddington tithe map (MAT58). (Doesn t include the DA).
1925	OS 25-inch 3rd Edition (sheets XXIX.15 and XXIX.11)
1927	OS 6-inch 3rd Edition (sheet XXIX.SE). (MCI/3/7 sheet 94)
1931	Land Utilisation map. Annotated OS 6-inch 3rd Edition (sheet XXIX.SE)
1938	OS 25-inch revised edition (sheets XXIX.15 and XXIX.11)

6. APPENDIX 1: ARCHAEOLOGICAL AND HISTORICAL FEATURES WITHIN THE STUDY AREA RECORDED BY THE HER AND NMR

HER Number	NMR Number	Description	Period
1792		A group of cropmarks recorded from aerial photographs. These represent a possible prehistoric rectangular enclosure and post-medieval fields and trackway.	Prehistoric/post-medieval
7024		18th-century landscaped grounds belonging to Houghton Hall, now much degraded.	Post-medieval
10843		Ancient routeway known as the Theedway, first recorded in AD926 but probably has prehistoric origins. It was a significant route in Saxon times, being incorporated into a number of parish boundaries in the area. It is thought to have been a major route for the transportation of salt inland from the East Anglian coast. It continued in use as a major route throughout the medieval period and did not go out of use until the 19th century.	Prehistoric post-medieval
12120		Site of former quarry pit visible on an aerial photograph.	Post-medieval
12121		Earthworks of a probable former quarry pit visible on an aerial photograph and on 1960 OS 6-inch map.	Post-medieval
12407		Site of former medieval/post-medieval trackway visible as a cropmark on aerial photographs. May correspond with a trackway named Mear Way shown on 1795 estate map. The alignment of this trackway followed that of the former parish boundary before the latter was altered and moved westwards.	Medieval post-medieval
15280		Late Iron Age pottery found in Marlin Rd, Lewsey.	Late Iron Age
15501	1096596	Site of Roman occupation at Chalton Cross. Identified from pottery, tile and other finds found during fieldwalking and trial trenching.	Roman
15812	1134512 / 1368840	Roman farmstead identified from roof tile and other building material found during field walking.	Roman
15839	359608 / 1065439	Iron Age and Roman settlement near Chalton Cross Farm, identified by trial trenching and geophysical survey. A Roman well was previously found nearby in the 19th century.	Iron Age Roman
16090	1368840	Scatter of Neolithic to Bronze Age flintwork identified during fieldwalking near Chalton Cross Lodge.	Neolithic Bronze Age
16091	1368840	Scatter of Neolithic to Bronze Age flintwork identified during fieldwalking near Chalton Cross Lodge.	Neolithic Bronze Age
16092	1368840	Scatter of Neolithic to Bronze Age flintwork identified between Luton Road and the M1 during fieldwalking. A possible rectangular enclosure was also identified by geophysical survey.	Prehistoric Roman

7. APPENDIX 2: ARCHAEOLOGICAL METHOD STATEMENTS

7.1 Geophysical Survey

1 **General principles of the geophysical method.**

Detailed magnetometry
Although the changes in the magnetic field resulting from differing features in the soil are usually weak, changes as small as 0.2 nanoTesla (nT) in an overall field strength of 48,000nT, can be accurately detected using an appropriate instrument. The mapping of the anomaly in a systematic manner will allow an estimate of the type of material present beneath the surface. Strong magnetic anomalies will be generated by buried iron-based objects or by kilns or hearths. More subtle anomalies such as pits and ditches can be seen if they contain more humic material which is normally rich in magnetic iron oxides when compared with the subsoil. To illustrate this point, the cutting and subsequent silting or backfilling of a ditch may result in a larger volume of weakly magnetic material being accumulated in the trench compared to the undisturbed subsoil. A weak magnetic anomaly should therefore appear in plan along the line of the ditch.

2 **Methodology for the collection of the data.**
The detailed magnetic survey will be carried out using a Bartington Grad 601-2. The instrument consists of two fluxgates mounted 1m vertically apart and very accurately aligned to nullify the effects of the earth's magnetic field. Readings relate to the difference in localised magnetic anomalies compared with the general magnetic background.

Readings will be taken at 0.25m centres along traverses 1m apart. This equates to 3200 sampling points in a full 30m x 30m grid. Data collection requires a temporary grid to be established across the survey area using wooden pegs at 30m intervals.

The Grad 601-2 has a typical depth of penetration of 0.5m to 1.0m. This would be increased if strongly magnetic objects have been buried in the site. The collection of data at 0.25m centres provides an appropriate methodology balancing cost and time with resolution.

3 **Processing, analysis, presentation and interpretation of the data.**
Processing of the data will be carried out using specialist software either Geoplot 3 or ArchaeoSurveyor. This can emphasise various aspects contained within the data but which are often not easily seen in the raw data. Basic processing of the magnetic data involves 'flattening' the background levels with respect to adjacent traverses and adjacent grids. 'Despiking' is also performed to remove the anomalies resulting from small iron objects often found on agricultural land. Once the basic processing has flattened the background it is then possible to carry out further processing which may include low pass filtering to reduce 'noise' in the data and hence emphasise the archaeological or man-made anomalies.

The presentation of the data for the survey will be a print-out of the raw data both as grey scale and trace plots together with a grey scale plot of the processed data. Magnetic anomalies will be identified and plotted onto the 'Abstraction and Interpretation of Anomalies' drawing for the site.

4 **Reporting.**
The report for the survey will comprise a written section describing the background to the survey, the methodologies used and a discussion of the results. The text will be illustrated using plots of the results using CAD to overlay the results and interpretations over the base mapping. The format for these drawings will either be A3 or A1 depending on the size and configuration of the survey areas.

7.2 Fieldwalking

1 The survey area will be divided into linear transects 20m wide.
2 Transect length will depend on that of the area being surveyed.
3 Transects will be marked out with dGPS or by hand where appropriate using high-visibility canes.
4 Each transect will be surveyed by the observation of a 2m wide strip along the edge of each transect.
5 Up to four transects will be walked simultaneously.
6 Finds will be collected in bags and deposited in the exact location in which they were identified.
7 Modern artefactual material (post-1900) will not be retained. However, the location of concentrations of 20th century material will be recorded as it can, on occasion, be useful in indicating recent land-use which may have impacted upon underlying archaeological remains.
8 Using dGPS, a surveyor will follow behind the fieldwalking team, numbering the finds, plotting their locations on the OS National Grid and collecting them.
9 Ground and weather conditions will be noted for their potential effect on results.
10 The data will be used to produce spatial distribution plots of the artefacts encountered.
11 Artefact processing will be undertaken concurrently with and immediately after the fieldwork.

7.3 Trial Excavation

1 The location of all trenches will be marked out on the ground in advance of machining. Access to the trenches will be along agreed routes only.
2 The lengths of the trenches will be decided once the fieldwalking and geophysical surveys have been completed, but their width will be a minimum of 2m. The depth cannot be specified at this stage, but for health and safety reasons no hand excavation will be undertaken below 1.2m. If the trenches exceed this depth, then recording will be undertaken from the present ground surface. This is to avoid exposing staff to unnecessary risk.
3 All machine excavation will be supervised by an archaeologist.
4 Topsoil and subsoil will be stockpiled separately on either side of the open trenches. This will be safely stored adjacent to the trench edges.
5 Topsoil and modern overburden will be removed by machine down to the top of archaeological deposits, or natural subsoil, whichever is encountered first.
6 All features will be investigated and recorded unless otherwise agreed with the CBCA. A sufficient sample will be excavated in order to achieve the project objectives; excavation slots through linear features will be at least 1m wide, and discrete features will be half-sectioned or excavated in quadrants. To ensure the integrity of archaeological remains or features, the maximum possible pre-excavation recording will be undertaken. Features such as hearths, burials and surfaces, and key relationships between features, will be investigated in such a way as to minimise unnecessary destruction.
7 All excavated features and deposits will be fully recorded in accordance with Albion Archaeology s Procedures Manual.
8 If human remains are encountered, and if excavation is required, Albion Archaeology will seek an exhumation licence from the Ministry of Justice under the Burial Act 1857. Only in exceptional circumstances will human remains be removed during the evaluation stage of a project.
9 Each trench will be issued a unique block of numbers for recording purposes.
10 Spoil will be scanned for artefacts.
11 Artefacts, including those recovered from spoil heaps and from the excavated overburden, will be assigned to the relevant context number for the trench.
12 Artefact processing will be undertaken concurrently with the investigation. Artefact information will be available during fieldwork and monitoring meetings.

13 All significant features will be photographed using black and white 35mm film. Supplementary photographs will be taken in a high quality digital format and 35mm colour slide film.

14 A programme of environmental sampling will be carried out in accordance with English Heritage (2002/01) Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation. Samples will be taken from deposits which visually appear to contain charred remains, snails or small bones. Background samples may be taken, as appropriate, from deposits which have key stratigraphic locations or dating material. Processing will be undertaken at St Mary s Church Archaeology Centre in accordance with the Procedures Manual. This will be done during fieldwork so that the results can help to inform on-site strategies. Specialist advice will be sought as necessary.

15 None of the trenches will be backfilled before the client and the CBCA have inspected them, or before agreement otherwise has been obtained.

16 Once archaeological recording is complete the trench will be backfilled in reverse order (subsoil first) and compacted using the machine bucket.

17 Pre- and post-entry photographs of the land will be taken. If required by the client, the area of disturbed ground will be quantified after backfilling.

7.4 Post-Fieldwork Analysis and Reporting

During or immediately after fieldwork, all records will be checked and cross-referenced to ensure they are internally consistent. Recording, cleaning and conservation of finds will follow the IFA *Guidelines for Finds Work*. All soil samples will be processed and assessed as appropriate.

The data acquired during all stages of fieldwork will be analysed sufficiently to provide the information required by the project s objectives. Site drawings will be digitised and geo-referenced. Contextual, artefactual and ecofactual data will be entered onto a networked Access database. This will be used to analyse and report on the results of the fieldwork.

The report will contain sufficient detail to enable the results of the evaluation to be interpreted without recourse to the site archive. This will include the tabulation of contextual and finds information. The report will consider the significance of any archaeological deposits in local, regional and national terms.

The report will be laid out as follows:

- Non-technical summary;
- Introduction (site location and description, planning background, archaeological background);
- Description of each individual stage of investigation (method statement, results, limitations);
- Summary of results and significance;
- Appendix: summary of contexts within each trench;
- Figures, including a location plan, appropriate all-features plans, sections, and photographs.

8. APPENDIX 3: PROJECT STAFF CVS

Drew Shotliff: Operations Manager
Technical qualifications
MA Archaeological Practice, University of Birmingham, 1985
BA (Hons) Modern History, Mansfield College, Oxford, 1980
Member of the Institute of Field Archaeologists
Core skills
Archaeological project management through design and fieldwork to publication. Post-excavation analysis of large urban and rural sites. Development of fieldwork and post-fieldwork analysis methodologies using database, AutoCAD and GIS applications. Research interests centre on Saxon and medieval rural settlement. Member of the Service Management Team, with specific responsibility for project programming and finance. Member of the Medieval Settlement Research Group. Member of the Society of Landscape Studies.
Employment History
1991 to present, Operations Manager, Albion Archaeology
1991, Consultant to ODA/British Council, Samanalawewa Project, Sri Lanka
1990 1991, Project Officer, Cambridgeshire County Council
1987 1990, Senior Archaeologist, Museum of London
1982 1987, various archaeological employment including English Heritage, University of Birmingham (Sutton Hoo), and Ecuador, Cyprus and France

Joe Abrams: Project Manager
Technical qualifications
BA (Hons) Archaeology, Institute of Archaeology, University College London, 1995
Member of the Institute of Field Archaeologists
Core skills
The management of multiple fieldwork projects from inception to publication and archive. Has experience of a wide variety of archaeological work, including excavation and post-excavation analysis.
Employment History
2004 to present, Project Manager with Albion Archaeology
2002 2004 Project Officer with *Archaeological Services and Consultancy Ltd*, Milton Keynes.
2000 2002 Archaeological Supervisor with the *Cambridgeshire Archaeological Field Unit*.
1998-2000 Archaeological technician for various companies across the UK including the *Museum of London Archaeology Service*, *Pre-Construct Archaeology*, *Southampton City Council*, *Carlisle City Council*, *English Heritage* and the *University of Cambridge Archaeological Unit.*

Wesley Keir: Project Officer
Technical Qualifications
BSc (Hons) Archaeology, Bournemouth University, Bournemouth, 2000
Associate of the Institute of Field Archaeologists

Core Skills
The management of fieldwork projects with experience of a wide variety of archaeological work, including excavation and post-excavation analysis. Experience ranges from open area excavation, evaluation, watching briefs, earthwork survey, and some building recording. Since 2000 he has worked on a variety of sites in Hertfordshire, Bedfordshire, Cambridgeshire, Suffolk and surrounding counties.

Other research interests include earthwork survey, including undertaking independently the survey of a medieval manorial grange.

Employment History

2005 to present, Project Officer with Albion Archaeology
2003-2005, Archaeological Supervisor with Albion Archaeology
2002-2003, Project Officer with Archaeological Solutions
2001-2002, Archaeological Supervisor with Archaeological Solutions
2000-2001, Archaeological Site Assistant with Archaeological Solutions

Jackie Wells: Finds Officer
Technical qualifications
MA Post-Excavation Studies, University of Leicester, 1990
BA (Hons) Archaeology and History, University of Nottingham, 1988
Core skills
Processing and analysis of ceramic and non-ceramic artefact types of all periods. Computer-based artefacts analysis. Preparation of interim, assessment, client and published reports. Establishment and maintenance of County Ceramic Type Series. Particular interest in Saxon and early medieval archaeology. Jackie has produced pottery and non-ceramic artefact sections of articles published in *Bedfordshire Archaeology* (Volumes 22, 23, 24 and 25)*, Bedfordshire Monograph Series* (Archaeology of the Bedford Region), *Records of Bucks*. (Volumes 45 and 46), and *Sussex Archaeological Collections* (Volume 138).
Employment History
Over 15 years postgraduate experience of both ceramic and non-ceramic artefacts, encompassing fieldwork, analysis, publication and archiving gained mainly through work in South Wales, Bedfordshire and the East and South Midlands. Material studied spans the later prehistoric to late medieval/post-medieval periods.

Anna Slowikowski: Artefacts Manager (ceramics)
Technical qualifications
M Phil, University of Leeds, 1991
PGCE, Sheffield City Polytechnic, 1977
BA (Hons) Prehistory/Archaeology and Ancient History, Univ. of Sheffield, 1976
Member of the Institute of Field Archaeologists
Member of the Association of Archaeological Illustrators and Surveyors
Core skills
Management and analysis of ceramic artefacts. Specialist knowledge of medieval pottery but with extensive experience of Iron Age and Roman ceramics. Responsible for the establishment and maintenance of a regional Ceramic Type Series. Ceramic illustration. Education and outreach. Member of the Service Management Team, with specific responsibility for personnel issues. Active member of both national and regional specialist ceramic study groups
Employment History
An artefact specialist since 1977, she has published extensively in specialist and county journals and monographs. She has worked abroad, in Poland, and in Nottingham and West Yorkshire, and is one of the ceramic specialists involved in the Wharram Percy Research Project. Past Chair of the Association of Archaeological Illustrators and Surveyors, former committee member of the local group of the Council for British Archaeology, and Council member of the Medieval Pottery Research Group, sitting on their Minimum Standards Working Party.

Holly Duncan: Artefacts Manager (non-ceramics)
Technical qualifications
M Litt, Department of Archaeology, University of Glasgow, 1982
BA (Hons) Anthropology, University of Pennsylvania, Philadelphia, 1976
Member of the Institute of Field Archaeologists
Core skills
Management and analysis of non-ceramic artefacts, with specialist knowledge of the post-Roman and medieval periods and substantial experience in the prehistoric and Roman periods. Responsible for the Bedfordshire Artefact Typology (BAT) in conjunction with the two registered museums in the county. Wide network of specialist researchers and conservation specialists.

Employment History
An artefact specialist since 1981, her work has been published in both Scottish and English archaeological journals, and she has conducted research in the United States. She is a member of both the Roman Finds Group and the Finds Research Group (AD700 - AD1700); former committee member of the IFA Finds Group, having sat on their Standards and Guidance for Finds Work Working Party, and a past member of the MDA Archaeological Objects Thesaurus Working Party.

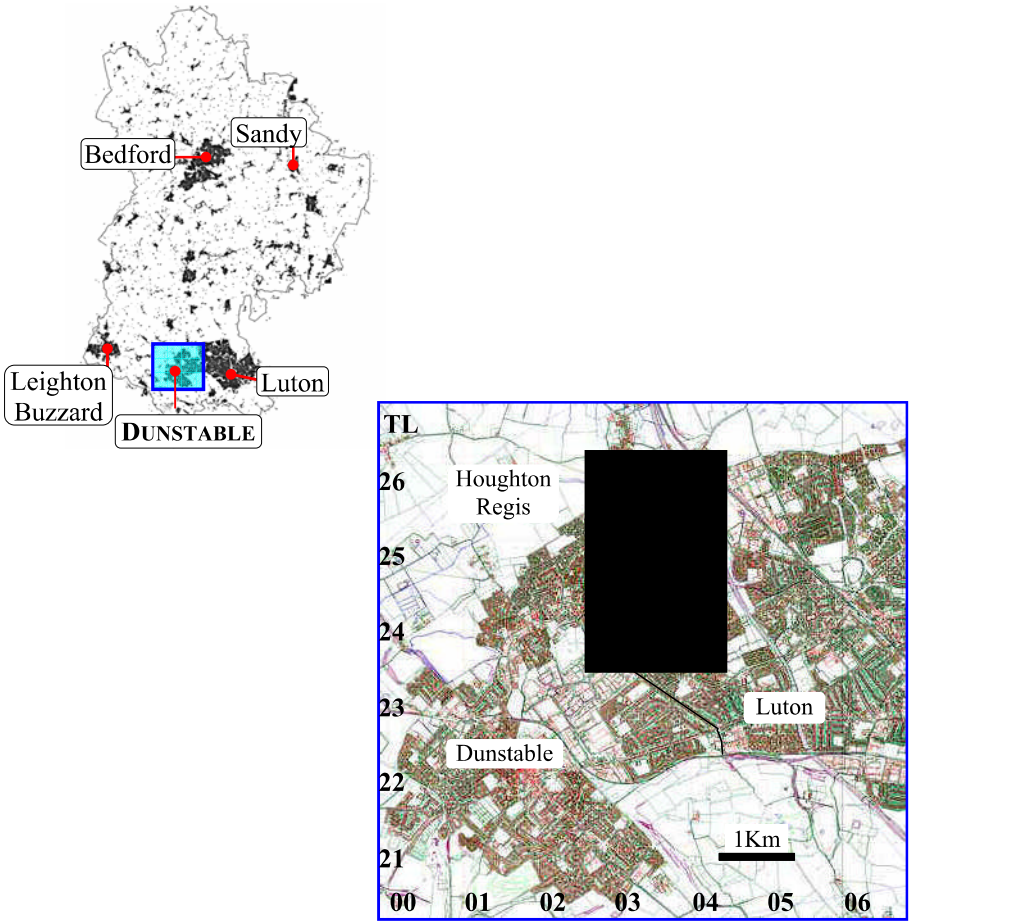

Figure 1: Location map

Base map reproduced from the Ordnance Survey Map with the permission of the Controller of Her Majesty s Stationery Office, by Albion Archaeology, Central Bedfordshire Council,. OS Licence No. 100017358(LA). © Crown Copyright.

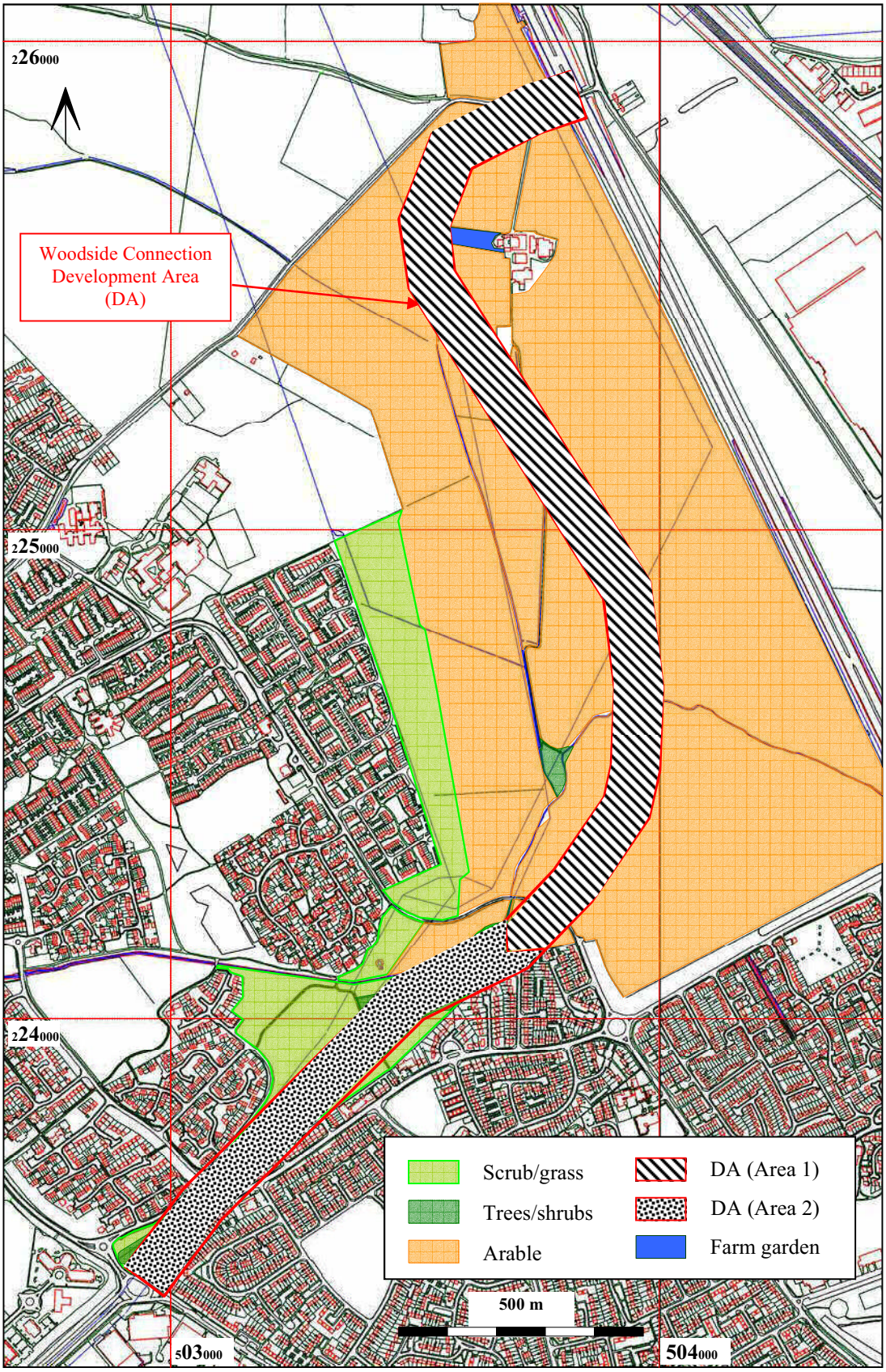

Figure 2: Current land use

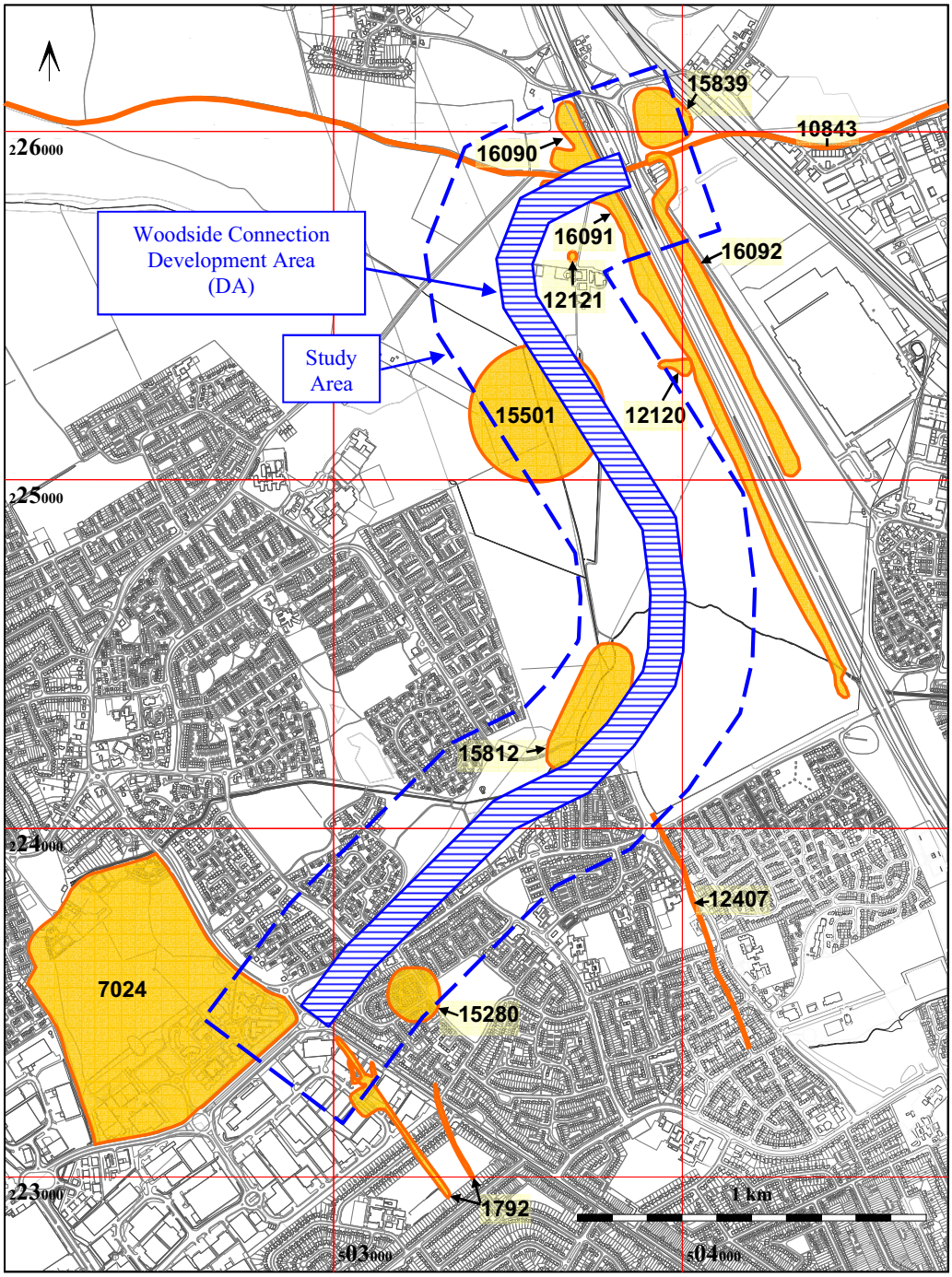

Figure 3: HER data

Base map reproduced from the Ordnance Survey Map with the permission of the Controller of Her Majesty s Stationery Office, by Albion Archaeology, Central Bedfordshire Council,. OS Licence No. 100017358(LA). © Crown Copyright.

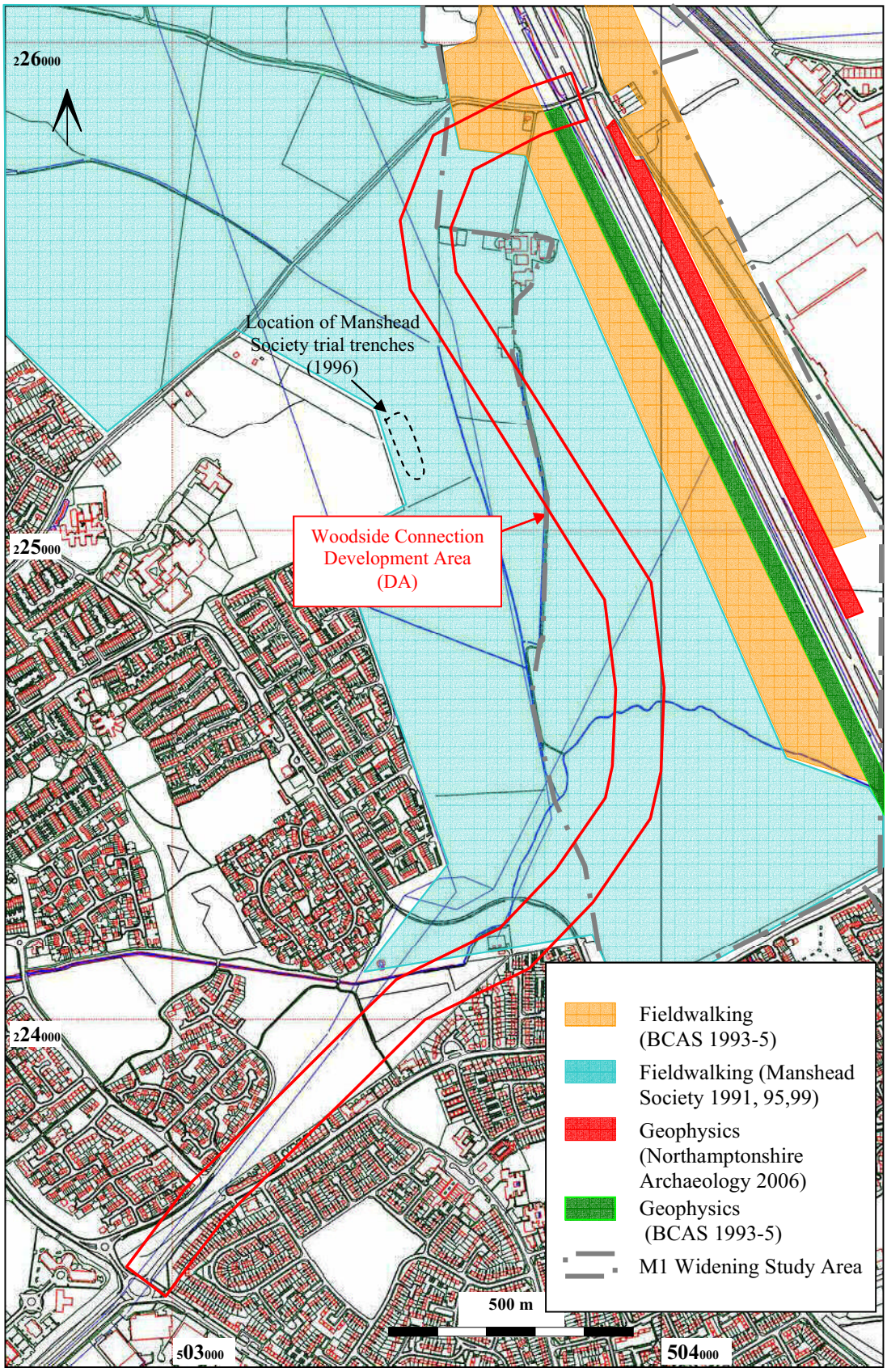

Figure 4: Previous archaeological investigations

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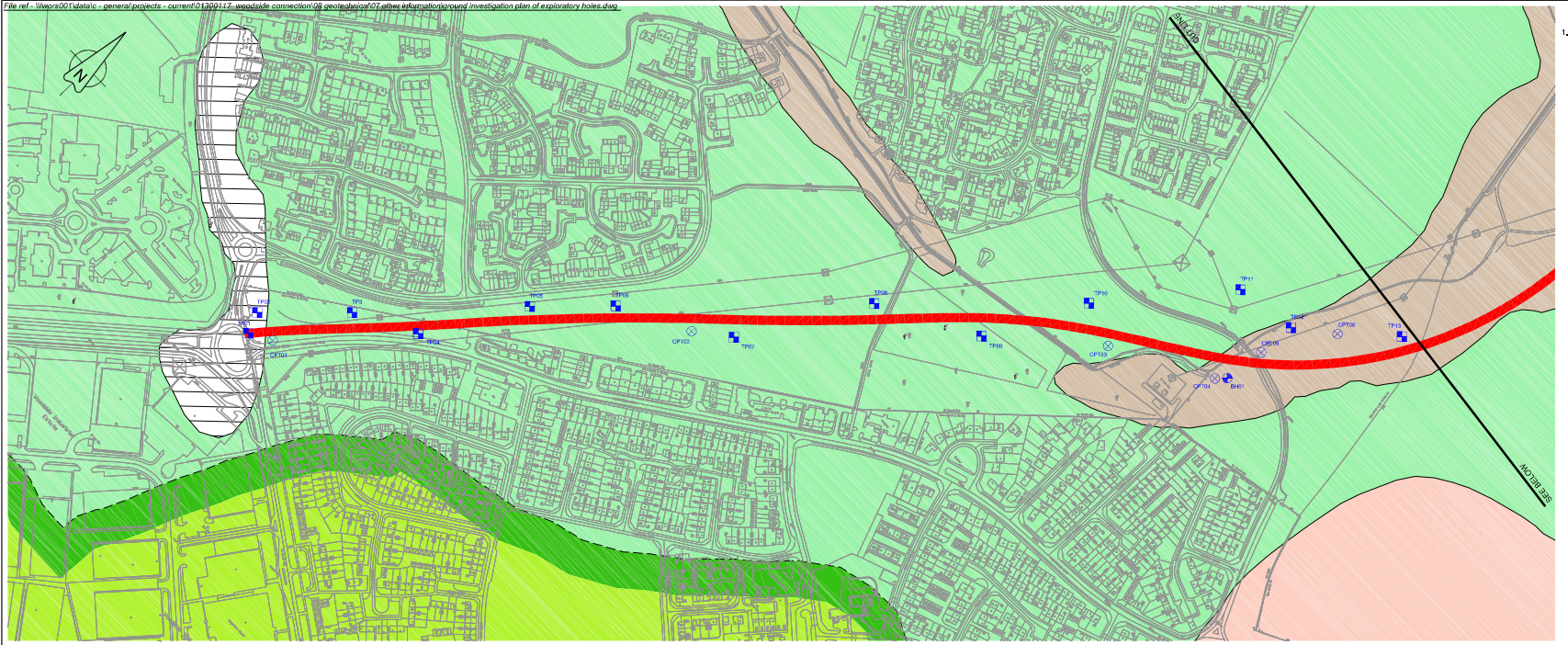
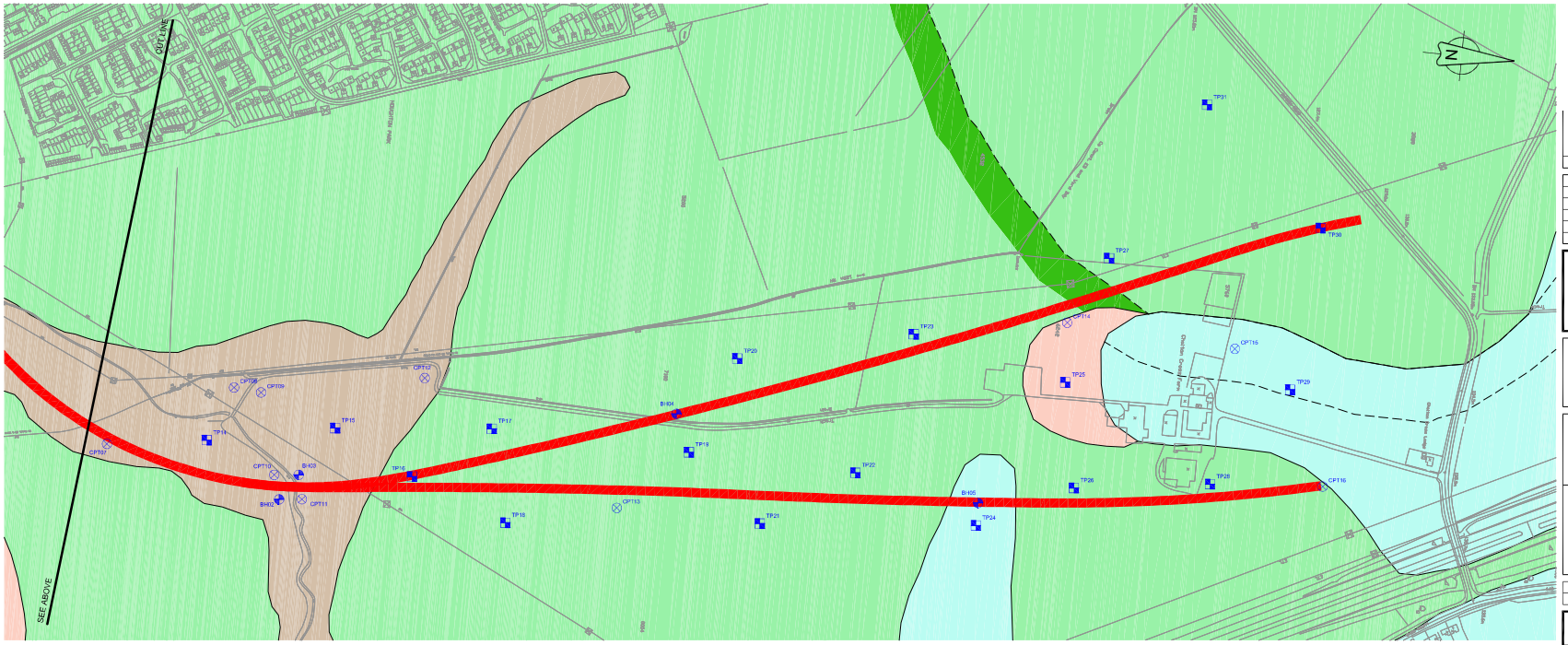




NOTES

1.

KEY

- Lower Chalk
- Middle Chalk
- Totternhoe Stone/Lime Stone
- Alluvium
- Sand & Gravel
- Head
- Till
- Made Ground
- Geological Boundary - Drift
- Geological Boundary - Solid
- Proposed Trial Pit
- Proposed Cable Percussion Borehole
- Proposed CPT
- Proposed Road

Rev	Revision details	Chkd	Appd	Date

Drawn:	.	Preliminary	✓
Design:	.	For comment	
Chkd:	.	For tender	
Appd:	.	For construction	
Date:	.	As constructed	
		Other	

DRAFT

amey

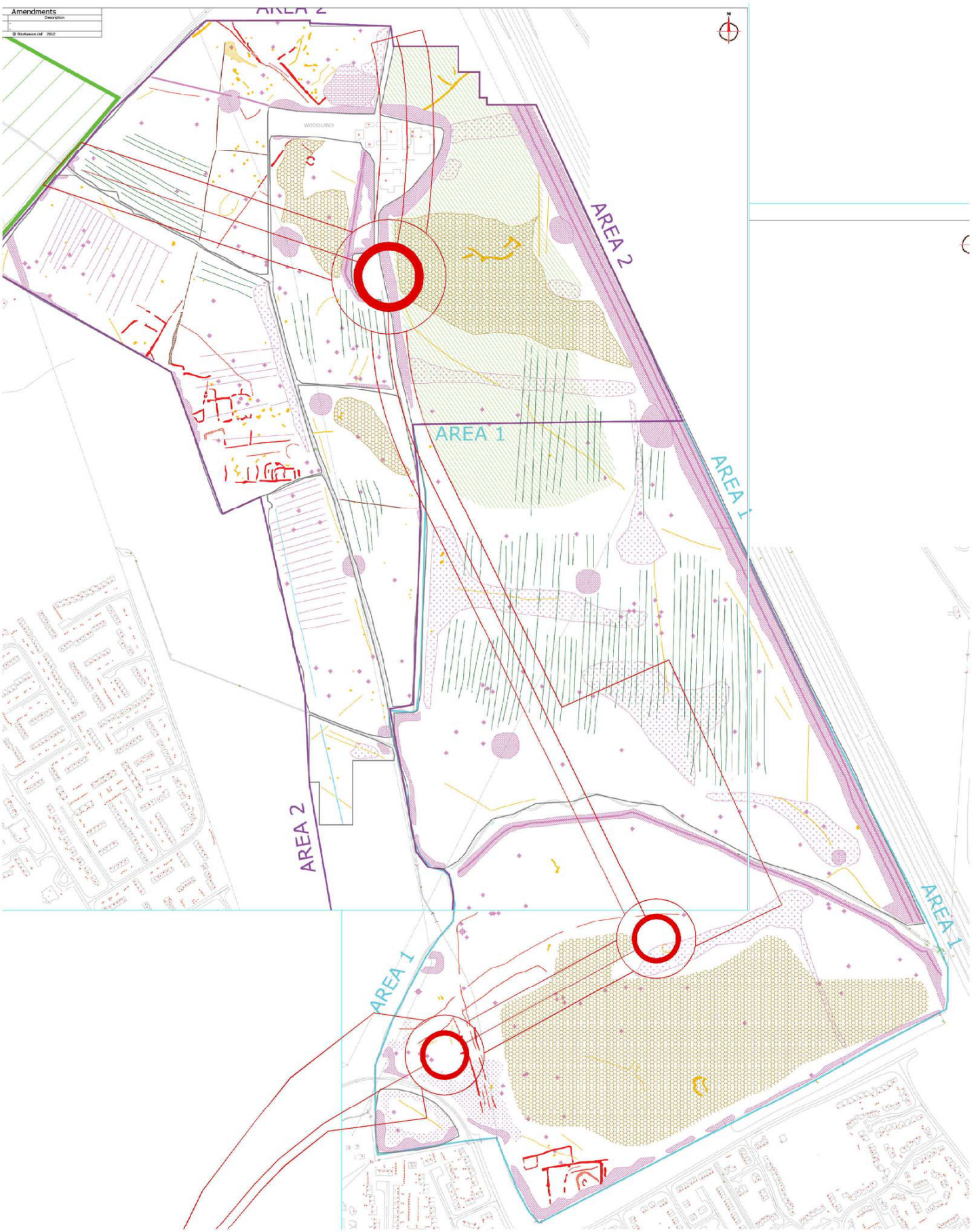
Client: Central Bedfordshire

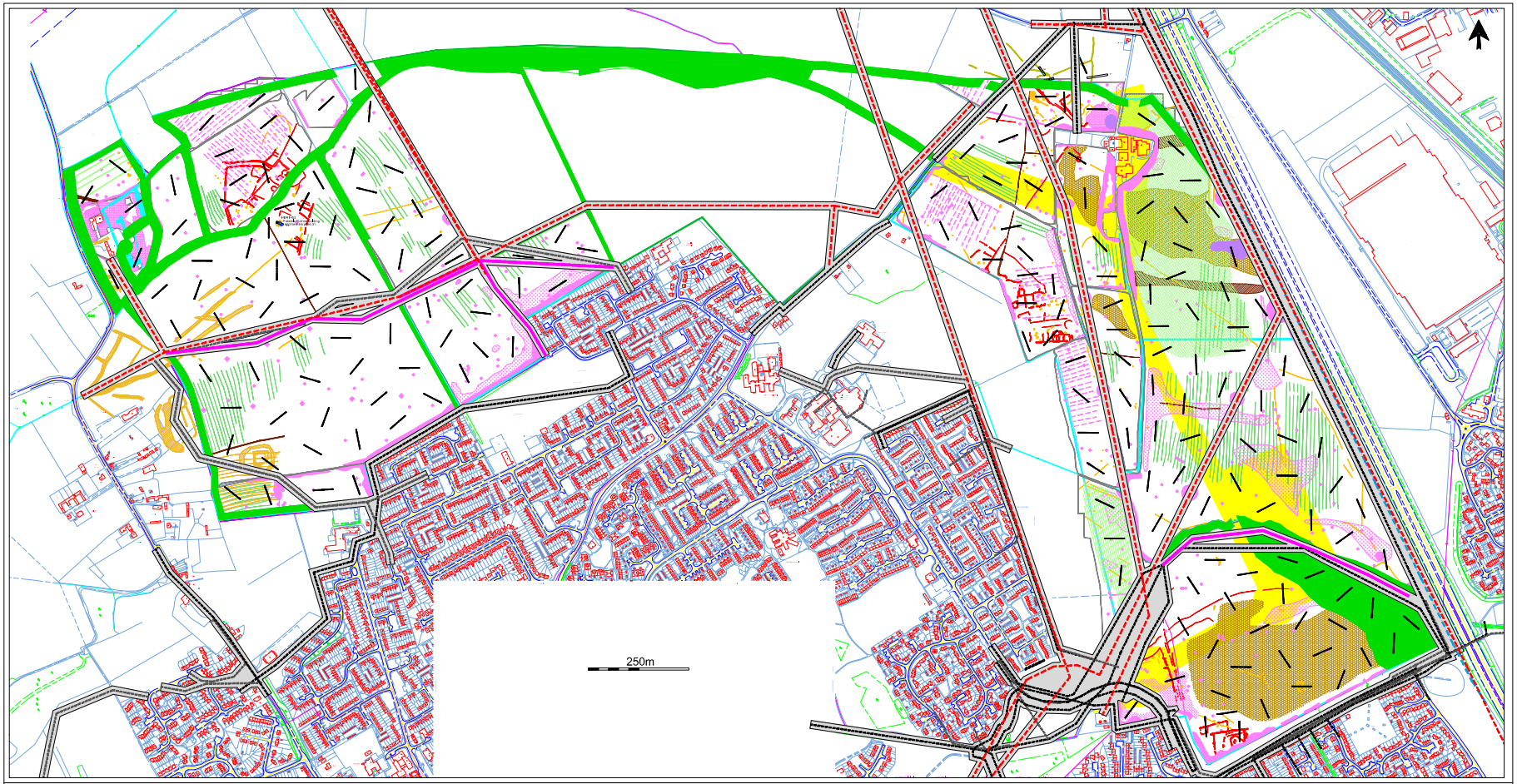
Project Name: WOODSIDE CONNECTION

Drawing Title: Geotechnical
Ground Investigation Plans of Exploratory Holes

Original Drawing Size :	A1
Scale : 1:2500 @ A1	Dimensions : -

Drawing No	Rev
3028-GEO2	00


Amendments
Description
AREA 2
WOODLAND
AREA 2
AREA 1
AREA 1
AREA 2
AREA 1
AREA 1



Investigation area limits
Woodside Connection
Green space within development
Trial trenches

For key to geophysics results interpretation, please see separate report

Overhead Utilities
Below ground Utilities from plan
Below ground utilities from geophysics
20m safety easement

HERs 12120 &12121 Possible post-med quarries
HER EBD666 previous archaeological trenches
HER EBD666 previous geophysical survey results
HERs 14735 & 12284 linear earthworks/cropmarks
HER 3395 Moated enclosure

250m
Scale 1:4000 @ A0
Version 1.2 17/08/2012

Houghton Regis North Development: Geophysical Survey Results Interpretation and Trial Trench Location Plan.

Albion Archaeology

P.E.