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Written Scheme of Investigation

The Chiltern Railways
(Bicester to Oxford
Improvements)
Order 2012



Written Scheme of Investigation
for Archaeological Works

oxfordarchaeology



southsouthsouth

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The Chiltern Railways (Bicester to Oxford Improvements) Order 2012

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1 INTRODUCTION

1.1 Project details

- 1.1.1 In October 2012, the Secretary of State made the Chiltern Railways (Bicester to Oxford Improvements) Order 2012 (the Order). This Transport and Works Act (TWA) Order authorises the construction and operation of an improved railway between Bicester and Oxford. The Order is accompanied by a planning direction (or 'deemed planning permission') granted by the Secretary of State, which is subject to a number of conditions.
- 1.1.2 The Order is being implemented by the Chiltern Railway Company Ltd. (Chiltern Railways) assisted by Network Rail. Certain of the planning conditions require that detailed designs or other information are submitted to, and approved by, the relevant local planning authority, which may be either Cherwell District Council or Oxford City Council, or both.
- 1.1.3 Condition 9 of the deemed planning permission requires that the *'development shall not commence in respect of any Individual Section until a Written Scheme of Investigation (WSI) of archaeological potential within that Section has been submitted to and approved in writing by the local planning authority and such elements of that WSI as the local planning authority considers necessary before commencement of development have been implemented.'*
- 1.1.4 Condition 9 further requires that *'construction of the replacement road from Wendlebury Road to Langford Lane and the bridge over the railway (being Work No 11) shall not commence until details of the measures to avoid ... protect ... and record archaeological remains have been submitted to and approved in writing by the local planning authority ... and the approved field evaluation has been completed.'*

1.2 This Written Scheme of Investigation

- 1.2.1 This Written Scheme of Investigation (WSI) has been prepared by Oxford Archaeology (OA) on behalf of Chiltern Railways assisted by Network Rail. This document is specific to how OA will undertake mitigation measures to fulfil the archaeological requirements of the planning conditions as outlined above.
- 1.2.2 The archaeological work will be undertaken ahead of, and alongside, the rail improvements works construction programme. Permanent and temporary impacts associated with these works upon potential archaeological remains along the route have been discussed with the area Planning Archaeologist for the Cherwell District at Oxfordshire County Council (Richard Oram). Following this a proposed scheme of investigation has been devised and discussed by OA with Richard Oram. This has identified locations and a variety of methods that will be employed to evaluate, investigate and record any archaeological remains that may be present or encountered. This has also identified parameters for the preservation in situ of remains where possible. Currently, detailed information with regard to the impact areas is not available although the main construction elements of the design are known. To accommodate the variety of construction related scenarios and locations along the route, this documents outlines the principles for all archaeological works and how these will be undertaken by OA. Potential works at one location (Pear Tree) fall within the Oxford City boundary and will be discussed and agreed with the Oxford City Archaeologist (David Radford) prior to implementation. All work will be undertaken in accordance with local and national planning policies.



- 1.2.3 Table 1 outlines the locations for archaeological works along the route and the methods to be employed to investigate these. It is recognised that this list may not reflect the final number or location of sites that will be investigated and that some of those listed may be withdrawn from the scheme and not require investigation. However, this document and the methods outlined will be applicable to all new sites through agreement and discussions with the relevant Planning Archaeologist.

1.3 Location, geology and topography

- 1.3.1 The improvements to the rail line will be undertaken between the Oxford Station terminal at platform 3 and the connection to the London line to the east of Bicester North Station and Launton Road (Fig, 1). Associated temporary and permanent works (compounds and crossings) will be located adjacent to either side of the existing rail line.
- 1.3.2 From north to south, the railway line crosses three topographic zones, A, B and C. These comprise:
- Zone A - the western slopes of the River Ray valley and its tributaries, which lie between c 60 and 70m aOD.
 - Zone B - the low ridge of Oxford Clays between the valleys of the River Thames and the River Cherwell, rising up to c 100m aOD.
 - Zone C - the floodplain of the Thames Valley in the Oxford area, generally below c 80m aOD.
- 1.3.3 The geology along the railway line broadly reflects the topography:
- Zone A crosses a sequence of alluvium, gravel terraces, Lower Oxford Clay, with Kellaways Sands and Clays at the northern, Bicester, end of the Study Area (BGS 1982, 1994 and 2002).
 - Zone B over Oxford Clay and Wolvercote (3rd) terrace gravels (ibid).
 - Zone C lies over alluvium (BGS 1982).
- 1.3.4 Perhaps unsurprisingly, there is no significant change in elevation along the route of the railway. The greater part of the route crosses existing arable and pasture farm land only entering suburban built-up zones as the line approaches Oxford from the north.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND AND POTENTIAL

2.1 Archaeological and historical background

- 2.1.1 A detailed study of the known cultural and archaeological heritage resource within a 1km boundary to either side of the route has been completed by OA as part of the Environmental Impact Assessment (EIA) and Environmental Statement (ES) undertaken in 2009 (ERM 2009a and 2009b). Reference should be made to the ES for background information and the findings from previous desk studies (ERM 2009b).
- 2.1.2 Subsequently, the only archaeological evaluation fieldwork to be undertaken in predetermination of the Order was at Langford Lane. At this location a new crossing impacts upon remains associated, although not within, the Alchester Roman Town Scheduled Monument (SM OX18). A combined evaluation comprising both geophysical



survey and intrusive trial trenching was undertaken in 2010. Specific background information to this site and the results of the evaluation have been presented as a separate report to which reference should be made for further information (OA 2011).

2.2 Potential

- 2.2.1 Existing heritage resources and areas of potential are identified by OA site association in Table 1.

3 PROJECT AIMS

3.1 General project aims

- 3.1.1 Due to the range of periods and types of site potentially covered by this document it is not intended nor practical to outline a series of detailed site specific aims for this scheme. However, the following aims and objectives will serve as a guideline for all archaeological works. These are specific to the fieldwork methods where identified.

Walkover survey

- 3.1.2 It is the aim of the walkover surveys to:

- (i) identify any archaeological or historical potential at the identified locations, and
- (ii) relate these to any surrounding historical structures and/or landscape features and earthworks.

Building recording

- 3.1.3 It is the aim of the structural recording to:

- (iii) investigate and record the identified historic structures buildings in terms of their age, construction and development, and
- (iv) make that record accessible through a report and a project archive deposited with a public institution.

Earthwork survey

- 3.1.4 It is the aim of the earthwork surveys is to:

- (v) preserve by record the detailed profile and extent of any earthworks that will be affected by the construction,
- (vi) relate these to any surrounding historical structures and/or landscape features and earthworks, and
- (vii) inform the following phase of intrusive fieldwork recording during the enabling and construction works.

Trial trench evaluation

- 3.1.5 It is the aim of the trial trench evaluations to:

- (viii) establish the presence/absence of archaeological remains,
- (ix) determine and confirm the character of any remains present, without compromising any deposits that may merit detailed investigation under more detailed open area excavation or Strip, Map and Sample recording,
- (x) determine or estimate the date range of any remains from artefacts or otherwise,

- (xi) characterise any underlying archaeological strata down to undisturbed geology without significantly impacting upon significant younger (overlying) deposits where possible,
- (xii) determine the geo-archaeological and palaeo-environmental potential of any archaeological deposits encountered,
- (xiii) establish what archaeological remains/deposits maybe affected by any proposed development,
- (xiv) make available the results of the investigation to inform subsequent mitigation strategies,
- (xv) produce reports and full archive or summary reports where these will facilitate a rolling programme of investigation, and
- (xvi) disseminate the results of the investigation at a level appropriate to their importance.

Watching brief

3.1.6 It is the aim of the Watching Brief (WB) investigations to:

- (xvii) establish the presence/absence, extent, date, nature, function, and phasing of the archaeological remains present within the identified locations within and limited by the scope of the construction impact.

Strip, map and sample recording

3.1.7 It is the aim of the Strip, Map and Sample (SMS) investigations to:

- (xviii) establish the presence/absence, extent, date, nature, function, and phasing of the archaeological remains present within the identified locations and to preserve these by detailed archaeological records,
- (xix) characterise the overall nature of any archaeological remains encountered and to understand the process of their formation,
- (xx) identify priorities within any areas of exposed archaeological remains that may warrant more detailed investigation,
- (xxi) establish the relative archaeological value of any remains encountered and implementing an appropriate archaeological recording response to these through agreement with the relevant Planning Archaeologist,
- (xxii) recover evidence for the ecofactual and environmental potential of any archaeological deposits and features where this is considered appropriate to investigate,
- (xxiii) make available the results of the investigation through appropriate publication, and
- (xxiv) contribute information to key research objectives identified within the Regional Research Agenda for the Solent Thames region relevant to the remains encountered.

Excavation

3.1.8 Specific aims for detailed excavation will largely follow those outlined above for SMS. However, where significant remains are identified within an evaluation phase and subsequent excavation is required, it may be appropriate to identify site specific aims and objectives. In such scenarios these will be provided to the Planning Archaeologist



accompanied by detailed limits of excavation and the scope for further works. Detailed site specific aims and objectives will be referenced to the Regional Research Agenda where relevant.

4 PROJECT SPECIFIC EXCAVATION AND RECORDING METHODOLOGY

4.1 Scope of works and range of development impacts

- 4.1.1 Table 1 below outlines the nature of the archaeological works that are likely to be undertaken at each location. These are listed north to south from Bicester to Oxford and are identified by unique OA site numbers. The planning permission has been divided into geographical Sections, to assist implementation. The Section applicable to each is shown in Table 1. Figures identifying site locations within the TWA boundary of the planning permission are included at the rear of this document (Figs 2-22).
- 4.1.2 Some locations identified in Table 1 refer to retained structures, such as the bridges near Oxford, which will not suffer any negative impacts during the construction. These are still included in the list as they form part of the site reference sequence from previous discussions with Richard Oram prior to the production of this WSI and are also referenced within the figures at the rear of this document.
- 4.1.3 Although works are not expected to deviate greatly from this table, it should be noted that this is not a fixed list and that additional works, such as detailed excavation, may arise from either SMS recording and/or the evaluation process at individual locations. These possibilities are not included within the table. Entirely new sites may also arise following revision or modification of the design for both permanent and temporary works. The methods outlined below describe when and how such scenarios may arise and how they will advance from one stage to the next.
- 4.1.4 Any newly identified impact locations not currently included here will be assessed for archaeological potential against the existing data reported within the Cultural Heritage and Archaeology chapter of the ES. The methods outlined below will be applied accordingly to reflect the potential of any additional location and through agreement with the relevant Planning Archaeologist. The guiding principle for all archaeological intrusive investigation will be to limit this to the footprints of the permanent and temporary below ground impacts that may significantly affect or remove any archaeological deposits. Where possible archaeological remains will be preserved *in situ*. Entry to all sites will be arranged with the landowners through the client's agents prior to any OA staff access.

Table 1 Proposed Archaeological Works

LPA	Site name/location	Section	OA site number	Associated archaeological potential	Construction works and associated impacts	Proposed archaeological works
Cherwell District Council	New Chord Line, Gavray Drive, Bicester	A	Site 37	Evaluation of adjacent area produced evidence of Iron Age activity	New chord line	Evaluation
	Tubbs Crossing, Bicester	B	Site 36	Evaluation to north revealed evidence of archaeological activity but suggested that the site lay outside the medieval and later focus of Bicester	Construction of new footbridge	No works currently proposed within the limited impact of the permanent works Inclusion of temporary works within the acquired land and associated impacts may be subject to change and should be reviewed at any such stage
	Bicester Town Station	B	Site 35	Medieval and post-medieval potential	Construction of new station	Walkover Survey
	Bicester Town Station	B	Site 35	Medieval and post-medieval potential	Construction of new station	Evaluation (where accessible)
	North of Langford Park Farm	B	Site 34	Find spot of Neolithic axe and known Roman settlement	Embankment widening and limited temporary access works	SMS Recording currently limited to the embankment widening and haul road adjacent to the rail line Inclusion of temporary works within the acquired land and associated impacts may be subject to change and should be reviewed at any such stage
	North of Langford Lane	C	Site 33	Bridge crossing	Limited impact on existing bridge	Building Recording
	Langford Lane level crossing	C	Site 32	Roman Road	Stopping of existing crossing, creation of turning heads	Watching Brief These construction works are subject to Scheduled Monument Consent that specifies a watching brief to monitor

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LPA	Site name/location	Section	OA site number	Associated archaeological potential	Construction works and associated impacts	Proposed archaeological works
Cherwell District Council	Langford Lane bridge	C	Site 31	Complex of rectilinear cropmarks, drainage ditches and settlement to south of the Roman town of Alchester.	New road and bridge crossing. Temporary works impacts.	the limited below ground impact Excavation and preservation in situ To be the subject of a separate WSI
	Wendlebury	C	Site 30	Roman settlement south of Alchester	Access and working area for embankment works and temporary compounds New badger setts	SMS Recording and Evaluation No plans currently to create the new badger setts at these locations, thus excluded from the fieldwork limits of investigation
	Wendlebury/Merton	C	Site 29	No known sites but area of potential	New footbridge crossing	Evaluation
	North of M40	C	Site 28	No known sites but area of potential	Identified location for potential replacement agricultural building and access track. Access track to join at Merton Crossing close to the line of the Roman road from Alchester to Oxford	Evaluation Subject to confirmation of inclusion of these works within the construction
	North of Holts Farm	C	Site 27	No known sites but area of potential	Identified location for potential replacement agricultural building and access track	Evaluation Subject to confirmation of inclusion of these works within the construction
	Holts Farm	D	Site 26	Line of bridge works will destroy the southern extent of ridge and furrow earthworks.	Access and working area for embankment works. Landtake for bridge abutments and new access road. TWA Order boundary encloses a large area – to include temporary works compound and haul roads	Walkover Survey
	Holts Farm	D	Site 26	As above	As above	Earthwork Survey
	Holts Farm	D	Site 26	As above	As above	Evaluation

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LPA	Site name/location	Section	OA site number	Associated archaeological potential	Construction works and associated impacts	Proposed archaeological works
Cherwell District Council	Oddington	D	Site 25	Possible prehistoric enclosure to the south of railway.	Access and working area for embankment works and culvert	SMS Recording
	Oddington Crossing	D	Site 24	No known sites but area of potential	Landtake for bridge abutments, embankments and new access road. Temporary impacts (storage, compound etc)	Evaluation
	South of Oddington Crossing	D	Site 23	Cropmarks of circular enclosures	Access and working area for embankment works and culvert redevelopment. Construction impact and design to be confirmed. Possibly access alongside embankment	SMS Recording
	East of Brookfurlong Farm	D	Site 22		New footbridge crossing with associated temporary works (storage, crane, compound, access etc)	Evaluation
	East of Brookfurlong Farm	D	Site 21	No known sites but area of potential	Replacement badger sett and access. Location and requirement subject to confirmation	Evaluation
	North of Gallos Brook	D	Site 20	Cropmarks of possible prehistoric enclosures	Access and working area for embankment works. Construction impact and design to be confirmed. Possibly access alongside embankment	SMS Recording
	North of Islip	D	Site 19	No known sites but area of potential north of earthworks	Replacement badger sett and access	Evaluation

LPA	Site name/location	Section	OA site number	Associated archaeological potential	Construction works and associated impacts	Proposed archaeological works
Cherwell District Council	Islip Station	E	Site 18	No known sites but area of potential	Station redevelopment	Walkover Survey
	Islip	F	Site 17	Listed Building	New footbridge crossing with associated temporary works (storage, crane, compound etc)	Evaluation
	Existing pond	F	Site 16	Existing ponds	Newt habitat recreation. Redevelopment of existing ponds. Temporary works in adjacent area	None associated with the pond Possible Evaluation for the temporary works area NE of pond
	Islip Millstream Viaduct	F	Site 15	Islip Millstream Viaduct	Viaduct superstructure may be modified (subject to design confirmation)	Building Recording
	Islip Viaduct	F	Site 14	Islip Viaduct	As above	Building Recording
	Islip No 2 Viaduct	F	Site 13	Islip No 2 Viaduct	As above	Building Recording
	Northfield Farm Bridge	F	Site 12	Northfield Farm Bridge	Existing bridge structure (including abutments) will be demolished	Building Recording
	Water Eaton Bridge and access roads	F	Site 11	No known sites but area of potential	New bridge and access road. Access, works compound and working space for bridge reconstruction works	Evaluation
	North of Water Eaton Station	F	Site 10	Prehistoric/Roman settlement and field system Cropmarks	New aggregates depot and newt pond habitat creation	Walkover Survey
	North of Water Eaton Station	F	Site 10	Prehistoric/Roman settlement and field system Cropmarks	New aggregates depot and newt pond habitat creation	Evaluation (to include Site 9 where deemed appropriate)
	Water Eaton Station	F	Site 9	Roman ditches	New station including associated car parking and relocated aggregates depot	Walkover Survey
	Water Eaton Station	F	Site 8	Gosford Grain Silo	Demolition of silo building	None

LPA	Site name/location	Section	OA site number	Associated archaeological potential	Construction works and associated impacts	Proposed archaeological works
	Footbridge crossing at North Oxford Golf club	G	Site 7	No known features within development footprint area but area contains evidence of prehistoric funerary monuments	New footbridge construction and access for construction	Evaluation
Oxford City Council	Pear Tree	H	Site 6	Pear Tree ridge and furrow	Temporary works compound	Walkover Survey
	Pear Tree	H	Site 6	Pear Tree ridge and furrow	As above	Earthwork Survey
	Pear Tree	H	Site 6	Pear Tree ridge and furrow	As above	Evaluation if preservation in situ is not a viable option
	Wolvercote Tunnel	H	Site 5	Wolvercote Tunnel	Retained structure.	none
		H	Site 4	First Turn Overbridge	Retained structure (no impacts)	none
	Oxford Canal Bridge	H	Site 3	Oxford Canal overbridge	Retained structure (no impacts)	none
	Castle Mill Stream	I	Site 2	Castle Mill Stream Bridge	Retained structure (no impacts)	none
	Sheepwash Channel Bridge Rewley Abbey Stream	J	Site 1	Sheepwash Channel Bridge	Retained structure (no impacts)	none



- 4.1.5 This document outlines the method for undertaking archaeological works according to the type of construction and impacts that may occur at each location and according to the access availability at each site.

4.2 Methods

- 4.2.1 A summary of OA's general approach to excavation and recording can be found in Appendix A. Standard methodologies for Geomatics and Survey, Environmental evidence, Artefactual evidence and Burials can also be found below (Appendices B, C, D and E respectively).

Building recording

- 4.2.2 Building recording will broadly follow Levels 1 and 2 defined by English Heritage (Understanding Historic Buildings: A Guide to Good Recording Practice, EH, 2006). This will comprise a basic photographic and written record of the structures and an analysis of historic maps, plans and images where available. The photographic and written details will record any construction details and changes to the structures.

Walkover survey

- 4.2.3 Each specified site will be visited and viewed ahead of construction works to identify the ground conditions and the archaeological and historical potential offered at each location. Basic photographic and written records will be made to inform the requirements for subsequent investigations or measures that may be employed to avoid construction impacts at the temporary land take locations.

Earthwork survey

- 4.2.4 Earthwork surveys will be undertaken where specified to record the historic ridge and furrow remains that will be destroyed by the construction work. These will be conducted following OA's standard practices outlined in Appendix B. The results will be plotted against the available historic maps to inform the interpretation of these remains.

Preservation in situ at Pear Tree

- 4.2.5 It is noted that the Oxford City Planning Archaeologist's preference for Pear Tree (Site 6) is to limit the works to an earthwork survey and to undertake measures to ensure the preservation of the ridge and furrow. This has been discussed and noted with the design team and the intention is to limit potential impacts at this site to the minimum. However, currently there are no details available to confirm the potential construction impacts although, if used during the construction phase, this is likely to take the form of a compound or storage area. Currently, it is proposed to preserve the topography by laying a geotextile matt directly over the existing turf and building a level platform / compound above this in graded material. Measures would also be agreed with the contractors to limit vehicle movement to ensure that the earthworks are not damaged by wheel ruts. Reinstatement would similarly be specified to ensure that the imported materials were removed in a careful manner that would not impact upon the ridge and furrow topography. Finally, a suitable grass seed mix would be sown upon the exposed former turf level.
- 4.2.6 Should impacts be unavoidable, any subsequent intrusive investigation will only be undertaken with the agreement of the Oxford City Planning Archaeologist and subject to any stipulated requirements.



Watching brief

- 4.2.7 Watching briefs will generally be avoided in favour of evaluation and SMS recording or excavation at all locations. However, where relatively limited construction impact is expected coupled with little identified archaeological potential it may be required to undertake a Watching Brief. Such scenarios are not planned currently with the exception of monitoring of the ground works at the current Langford Lane crossing which will be subject to Scheduled Monument Consent. Archaeological attendance and recording will be undertaken alongside the construction works. Construction works will allow suitable safe time and access to record any remains should they be encountered. The archaeologist will not directly control the levels or extent of machine excavation.

Strip, map and sample

- 4.2.8 Site specific Watching Brief and SMS recording methodologies are not defined in detail due to the absence of evaluation phase data for each location. However, the following method will apply as a guideline.
- 4.2.9 Sites with specific potential have been identified through crop mark or existing evaluation data and selected for SMS recording due to the relatively localised construction impacts at these locations (Sites 34, 30, 25, 23 and 20). The impacts at each of these locations are embankment widening and associated temporary works such as haul road access. Each site will be investigated prior to the commencement of the construction works. Currently, each location shows a well defined limit to the archaeological investigation (see figs 3, 5, 11, 12 and 13). The extent and impact of the temporary haul roads is not currently known and it may be required to increase the area at some of these locations where well preserved archaeological remains are encountered. The requirement for this will be reviewed on a site by site basis through agreement with the Planning Archaeologist.
- 4.2.10 All stripping will be completed under close archaeological supervision using a mechanical excavator(s) fitted with a toothless bucket (or similar) for the removal of the topsoil. Each machine stripping topsoil and underlying deposits will be supervised by an individual archaeologist where appropriate (i.e. where archaeological features are at such a density, or that the individual machines are operating at too great a distance from each other, or that the skill level of the machine operators and the site conditions are not conducive to acceptable clean surface results). Machine excavation will cease upon exposing archaeologically significant deposits or the surface level of undisturbed geology (drift or solid) depending upon which is encountered first.
- 4.2.11 Plant movement during the stripping phase will be arranged through on site agreement to avoid potential disturbance to archaeological deposits (i.e. deep wheel ruts or tracking over stripped areas). Where areas are demonstrated to be devoid of archaeological remains or where all archaeological remains have been excavated to fulfil the aims above, these will be defined on a plan that will be supplied to the Planning Archaeologist to facilitate a sign off for these areas to allow unrestricted plant access when required for construction. OA site staff may also authorise limited access across areas which are devoid of archaeology, if required by the contractors and if these are operating on site at the same time as the archaeological works.
- 4.2.12 If, during the removal of the topsoil, it is identified that the stripping method employed is not conducive to exposing archaeological features or deposits, stripping will cease subject to a site review with the Planning Archaeologist and OA's project manager and/or senior site staff to agree an alternative approach.



- 4.2.13 The machine stripping will aim to achieve a clean surface that does not require substantial hand cleaning to fulfil the aims outlined above. However, where archaeological deposits are encountered these will be hand cleaned as necessary to define the extent of the feature/deposit and allow initial sample investigation.
- 4.2.14 Where appropriate within the SMS works, the recording methodology will follow a two-stage approach with the initial sample investigation being limited to characterisation of features and deposits and a plan of the archaeology exposed. This information will inform a second phase of more detailed excavation. The second phase may require definition and agreement of more detailed research aims based upon the primary characterisation results. However, this will be appropriate and proportionate to the potential significance of the exposed archaeology and will be developed by OA in agreement with the Planning Archaeologist. The detailed requirements will be confirmed in writing which may take the form of a summary update to be appended to this document or as a full revision to include appropriate references to regional and national research objectives. The scale of any update will reflect the importance and quantity of remains encountered.
- 4.2.15 If no, or relatively sparse remains, or those of limited research value are encountered, then characterisation of the archaeology may be deemed an appropriate form of mitigation. All such approaches will be reviewed on a continuing basis and agreed with the Planning Archaeologist before proceeding.
- 4.2.16 If significant or dense archaeological remains are identified, the relevant area will be defined by a physical high visibility barrier and no plant will track across it. Any vehicle routes or equipment storage will be kept at an appropriate distance to ensure safe working conditions for the archaeological team. For such clear areas of interest the two-stage excavation approach as described above may be implemented. Application of this will be targeted towards those aspects of the archaeological data that have the potential to contribute significantly to interpretations of the history of inhabitation at each site or to wider research aims at a local, regional or national scale. In such examples, reference will be made to the appropriate Regional Research Agenda.
- 4.2.17 The sample level of archaeological deposits and features will be established in detail according to the nature of the remains and confirmed informally either within a specific method statement or an outline of the requirements to the Planning Archaeologist. However, at this stage and prior to the availability of site data, and for sparse or localised remains that may be dealt with by the attending archaeologists during the course of the strip phase, the following provides a guideline:
- The complete (100%) excavation of any grave or cremation.
 - Any structures will be excavated to the extent that they are sufficiently characterised and understood, this shall involve excavating a representative range of structural elements such as post-holes, construction trenches, etc. Some sufficiently important structures e.g. hearths, kilns, midden deposits etc may require 100% samples.
 - Any positive feature, archaeological feature or deposit likely to obscure earlier features will be completely removed in the most appropriate fashion, after being recorded.



- Linear features shall be excavated to the extent that they are characterised and understood. This shall include ditch terminals and intersections and sufficient interventions to provide evidence of dating and formation.
- An appropriate range of discrete/isolated features (pits, postholes etc) and non-linear negative features shall be investigated. In most cases such features will be half-sectioned, but where either no dating/functional evidence has been obtained, or where artefacts have been recovered of such a nature that the recovery of additional material of a similar nature is thought to be worthwhile, and then further sampling shall be undertaken. Where clusters of like features occur, it may prove sufficient to investigate a representative sample.

4.2.18 During the course of the SMS recording it may also be possible to define areas that may be preserved in situ. This may apply where the full depth impacts of the temporary and permanent constructions are known and these can clearly be defined in relation to the deposits encountered on site. The basic principle for preservation in situ to be applied at any location is that no temporary or permanent impacts must affect buried archaeological remains either proved or potential. For example, it may be possible that the construction of the haul roads will only require the removal of the uppermost existing topsoil and turf if an underlying stable soil horizon is present. Such a scenario could arise if a buried ploughsoil is present that offers no archaeological potential but provides a firm base for the construction of the haul road. If the haul road is then constructed above this level utilising a geotextile barrier and no other excavations are subsequently undertaken to depth, then the buried soil horizon will afford suitable preservation of any potential deposits. The possibilities for the application of this approach will be reviewed on a continual basis at each location. It should also be noted that this is intended to be applied to 'reasonable' areas rather than localised and small areas where preservation in situ is likely to offer little benefit to the archaeological remains. All such scenarios will be discussed and agreed with the Planning Archaeologist.

4.2.19 The SMS recording may also be applied as full mitigation following evaluation if deemed appropriate and where the remains do not warrant detailed excavation.

Evaluation

4.2.20 Site specific trial trench evaluation methodologies are not defined in detail within this WSI due to the absence of detailed impact information at each location. The general principle applied at each relevant location will be that areas of either permanent or temporary impact caused by the construction or related activities within the Order boundary will be subject to a 4% trial trench evaluation sample by area. Areas already within the Order boundary that offer no archaeological potential (i.e. the current rail line) have not been included in the area and percentage calculations.

4.2.21 The requirement for this approach may also be supplemented by data provided by SMS recording in immediately adjacent areas where this is available, or limited by confirmation of areas that are within the Order boundary but not subject to intrusive works within this design. All areas that will be subject to a trial trench evaluation as currently understood, with the exception of the Pear Tree Compound (Site 6) have been defined on plan, with a clearly indicated limit of investigation boundary and the locations of the trenches (see figures at the rear of this document). These are provisional and subject to approval by the relevant Planning Archaeologist prior to the fieldwork. It is also recognised that the boundaries of the evaluations are limited by the current



understanding of the likely permanent and temporary construction work impacts. Should the design for these change at any evaluation location to include land not currently within the archaeological investigation boundaries, further evaluation or SMS recording may be required. Each case will be reviewed against the available evidence and agreed with the relevant Planning Archaeologist using evaluation data and/or SMS recording data.

- 4.2.22 Evaluation trenches will each be mechanically excavated to the first archaeological horizon, or the surface of the underlying geology, depending upon which is encountered first. Plans showing the proposed trench locations at each evaluation location are presented within the figures at the rear of this WSI.
- 4.2.23 It is recognised that archaeological deposits may be stratified within alluvial sequences where these may be encountered above gravel and particular care will be taken to ensure such deposits may be identified during the machine excavation. Where archaeological horizons are identified above the level of the underlying geology, machine excavation will expose this horizon along the length of that trench. Hand excavation will continue at this stage to fulfil the aims outlined above. Once this archaeological horizon has been sufficiently evaluated the trench will be machine excavated to the next horizon below this level or the surface of the geology. The decision to follow this method exactly will depend upon the quality and importance of any remains discovered at the higher stratigraphic level and will only be undertaken through discussion and agreement with the Planning Archaeologist. Where significant and/or dense groupings of features and deposits are encountered that require further mitigation, excavation will cease at that level to allow a suitable investigation during any subsequent mitigation stage. This recognises the fact that earlier sequences could exist that may not be investigated until a subsequent mitigation phase. Where machine excavation exposes the surface of the geology, this horizon will be sufficiently cleaned to establish the presence/absence of archaeological remains.
- 4.2.24 Where appropriate and limited by the construction timetable, the evaluation phase may lead directly into SMS recording or an excavation phase omitting detailed data reporting. This will only be undertaken through agreement with the Planning Archaeologist and subject to the issue of summary data results to inform a decision for further works. Summary data will comprise as a minimum, a plan showing the archaeological features and trench locations, a summary table that identifies the features with spot dating of artefactual material and an assessment of the quality of preservation and the importance of the remains. This will ensure that suitable time is available for the archaeological investigations within a tight construction timetable.

Excavation

- 4.2.25 In the absence of evaluation data for all sites at this stage, with the exception of the crossing at Langford Lane, detailed excavation methodologies cannot be specified at this stage. Due to the importance of the Langford Lane site and the associated remains, this location will be subject to an individual WSI. This will cover details for preservation in situ through design and excavation where impacts cannot be avoided to the known remains.
- 4.2.26 Similar combinations of preservation in situ, SMS recording and detailed excavation may be devised at the other locations subject to the results of the trial trench evaluations. The full scope of any such investigations will be agreed with the relevant Planning Archaeologist. Where appropriate, a detailed site specific WSI will be



produced for these locations and will include reference to the relevant regional and national research objectives.

4.3 Programme

4.3.1 Enabling works for the construction and habitat creation programmes will commence in 2013. The detailed timetable is subject to ongoing revision although the intention of Chiltern Railways is to complete, where practicable, all archaeological fieldwork in 2013 ahead of construction related ground works.

4.3.2 The relevant Planning Archaeologist will be informed of fieldwork at each location ahead of any site attendances. In the first instance Walkover and Earthwork Surveys will be completed at the specified locations. Following these, evaluation works and SMS recording will be timetabled to commence ahead of the intrusive ground works and allowing for additional time should more detailed excavation be required. Where targeted location attendances are required for small scale works such as the construction of footbridge crossings, these will be undertaken alongside the initial ground work if it is not practicable to complete the archaeological mitigation prior to this.

4.4 Fieldwork management structure

4.4.1 All fieldwork will be completed by a team of archaeologists working under a Supervisor or Project Officer. These works will be completed under the management of Steve Lawrence BA MIFA, Senior Project Manager. All fieldwork undertaken by OA South (Oxford Office) is overseen by the Head of Fieldwork, Dan Poore MIFA.

5 PROJECT SPECIFIC REPORTING AND ARCHIVE METHODOLOGY

5.1 Content

5.1.1 The content of reports will be as defined in Appendix F.

5.1.2 The Walkover and Earthwork Survey reports will be produced immediately after the fieldwork has been undertaken and issued in the form of grey literature client reports. The Walkover Surveys are for information only to inform the scope and requirements for further works at the specified locations.

5.1.3 Reporting of the evaluations will remain flexible and it may be expedient to agree interim results and the scope for further works based upon the provision of summary data and assessment of the results in the field. In such circumstances an outline of the evaluation results and the scope of further works will be clarified in writing between OA and the relevant Planning Archaeologist in a summary statement. This method will only be applied where it is deemed beneficial to progress an evaluation into an open area excavation or SMS recording without a break in attendance due to the relatively short space of time available prior to construction at particular locations.

5.2 Specialist input

5.2.1 OA has a large pool of internal specialists, as well as a network of external specialists with whom OA has well established working relationships. A list of these specialists is presented in Appendix G. In the event that additional specialist input is required, an updated list of specialists will be supplied if requested.



5.3 Programme

- 5.3.1 Detailed final reporting requirements have not been defined at this stage due to the unknown quality and extent of remains that may be encountered. The range of final reports may take the form of a client report in the instance of low quality or negative results through to published monographs in the instance of high quality and important remains. As a minimum these will take the form of a client report with a suitable note published in South Midland Archaeology. However, it is likely that elements of the fieldwork that produce archaeological remains of note will be published within the Oxoniensia Journal.
- 5.3.2 The full scope and a timetable for reporting will be agreed with the Planning Archaeologists on completion of the fieldwork.

5.4 Archive

- 5.4.1 The site archive will be deposited with the Oxfordshire County Museum following completion of the project.
- 5.4.2 A summary of OA's general approach to documentary archiving can be found in Appendix H.

6 HEALTH AND SAFETY

6.1 Roles and responsibilities

- 6.1.1 For each fieldwork attendance and site location within this project, the Senior Project Manager has responsibility for ensuring that safe systems of work are adhered to. He will delegate elements of this responsibility to the senior member of the site team at each location who will implement these on a day to day basis.
- 6.1.2 The Director with responsibility for Health and Safety at OA is Robert Williams (Chief Operations Officer). He is advised by the OA Group Health and Safety Coordinator, Dan Poore (NEBOSH Level 3).

6.2 Method statement and risk assessment

- 6.2.1 A summary of OA's general approach to health and safety can be found in Appendix I. A location specific risk assessment will be undertaken by the Senior Project Manager and approved by the Group Health and Safety Coordinator prior to attendance at each identified site. All risk assessments will be kept on site, along with OA's standard health and safety file, which will contain all relevant health and safety documentation.
- 6.2.2 The Health and Safety file will be available to view at any time by all staff.

7 MONITORING OF WORKS

- 7.1.1 The programme for the archaeological works is summarised at Section 4.3 of this WSI. Where possible, details of the timing of work at each location (apart from Walkover Surveys) will be provided to the relevant Planning Archaeologist at least 10 working days in advance of the work commencing.
- 7.1.2 The relevant Planning Archaeologist will be kept up to date and informed of progress and archaeological discoveries at regular intervals during the project by email, phone and through site visits where required/requested.



- 7.1.3 The relevant Planning Archaeologist will have free access to the sites during fieldwork (subject to Health and Safety considerations) and all records to ensure the works are being carried out in accordance with this WSI and all other relevant standards.

8 REFERENCES

ERM, 2009a Evergreen 3 Project: The Chiltern Railways (Oxford to Bicester) Improvements: EIA *Scoping Report*. Client report issued April 2009.

ERM, 2009b Evergreen 3 Project: The Chiltern Railways (Oxford to Bicester Improvements) Order Environmental Statement: *Volumes 1-4*. Client report issued December 2009.

OA, 2011 Langford Lane, Alchester, Oxfordshire. Archaeological Geophysical Survey and Trial Trench Report. Unpublished client report. May 2011



OA STANDARD FIELDWORK METHODOLOGY APPENDICES

The following methods and terms will apply, where appropriate, to all OA fieldwork unless varied by the accompanying detailed Written Scheme of Investigation.

Copies of all OA internal standards and guidelines referred to below are available on request.

APPENDIX A. GENERAL EXCAVATION AND RECORDING METHODOLOGY

A.1 Standard methodology – summary

Mechanical excavation

- A.1.1 An appropriate mechanical excavator will be used for machine excavation. This will normally be a JCB or 360° tracked excavator with a 1.5 m to 2 m wide toothless ditching bucket. For work with restricted access or working room a mini excavator will be used.
- A.1.2 All mechanical excavation will be undertaken under direct archaeological supervision.
- A.1.3 All undifferentiated topsoil or overburden of recent origin will be removed down to the first significant archaeological horizon, in successive, level spits.
- A.1.4 Following mechanical excavation, all areas that require examination or recording will be cleaned using appropriate hand tools.
- A.1.5 Spoil heaps will be monitored in order to recover artefacts to assist in the analysis of the spatial distribution of artefacts. Modern artefacts will be noted but not retained.
- A.1.6 After recording, evaluation trenches and test pits will usually be backfilled with excavated material in reverse order of excavation, and compacted as far as is practicable with the mechanical excavator. Area excavations will not normally be backfilled.

Hand excavation

- A.1.7 All investigation of archaeological levels will usually be by hand, with cleaning, examination and recording both in plan and section.
- A.1.8 Within significant archaeological levels the minimum number and proportion of features required to meet the aims of the excavation will be hand excavated. Pits and postholes will usually be subject to a 50% sample by volume. Linear features will be sectioned as appropriate. More complex features such as those associated with funerary activity will usually be subject to 100% hand excavation.
- A.1.9 In the case of evaluations, it is not necessarily the intention that all trial trenches will be fully excavated to natural stratigraphy, but the depth of archaeological deposits across the site will be assessed. The stratigraphy of a representative sample of the evaluation trenches will be recorded even where no archaeological deposits have been identified. Any excavation, both by machine and by hand, will be undertaken with a view to avoiding damage to any archaeological features or deposits, which appear to be worthy of preservation in situ.



Recording

- A.1.10 Written descriptions will be recorded on proforma sheets comprising factual data and interpretative elements.
- A.1.11 Where stratified deposits are encountered a Harris matrix will be compiled during the course of the excavation.
- A.1.12 Plans will normally drawn at 1:100, but on urban or deeply stratified sites a scale of 1:50 or 1:20 will be used. Detailed plans will be at an appropriate scale. Burials will be drawn at scale 1:10 or recorded using geo-referenced digital photography.
- A.1.13 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.
- A.1.14 A register of plans will be kept.
- A.1.15 Long sections of showing layers will be drawn at 1:50. Sections of features or short lengths of trenches will be drawn at 1:20.
- A.1.16 A register of sections will be kept.
- A.1.17 Generally all sections will be tied in to Ordnance Datum.
- A.1.18 A full black and white photographic record, illustrating in both detail and general context the principal features and finds discovered will be maintained. The photographic record will also include colour (digital) working shots to illustrate more generally the nature of the archaeological work.
- A.1.19 Photographs will be recorded on OA Photographic Record Sheets.

A.2 Relevant industry standards and guidelines

- A.2.1 The Institute for Archaeologists' Standard and Guidance notes relevant to fieldwork are:
 - Standard and Guidance for Field Evaluation
 - Standard and Guidance for Excavation
 - Standard and Guidance for an Archaeological Watching Brief.
- A.2.2 These will be adhered to at all times.

A.3 Relevant OA manual and other supporting documentation

- A.3.1 All fieldwork will be undertaken in accordance with the requirements of the OA Field Manual (ed. D Wilkinson 1992), and the revised OA fieldwork manual (publication forthcoming).
- A.3.2 Further guidance is provided to all excavators in the form of the OA 'Fieldwork Crib Sheets - a companion guide to the Fieldwork Manual'. These have been issued ahead of formal publication of the revised Fieldwork Manual.



APPENDIX B. GEOMATICS AND SURVEY

B.1 Standard methodology – summary

- B.1.1 The aim of OA methodology is to provide comprehensive survey cover of all investigation areas. Additionally, it is designed to provide coverage for any areas, beyond the original scope of the project, which arise as a result of further work. It provides digital plans of all required elements of the project and locates them within an overall grid.
- B.1.2 It also maintains all necessary survey data and ensures that the relevant information is copied into the primary record, in order to ensure the integrity of the project archive. Furthermore, it ensures that all core data is securely stored and backed up. It establishes accurate project reference systems utilising a series of control stations and permanent base lines.
- B.1.3 The survey will be conducted using a combination of Total Station Theodolite (TST) survey utilising Reflectorless Electronic Distance Measurement (REDM) where appropriate, hand-measured elements and GPS (Global Positioning System).
- B.1.4 Before the main work commences, a network of control stations will be laid out encompassing the area. Control stations will be tied in to known points or existing features using rigorous metric observation. The control network will be set in using a TST to complete a traverse or using techniques as appropriate to ensure sufficient accuracy. A GPS, or other appropriate method, will be used to orientate the control network to National Grid or other recognised coordinate system.
- B.1.5 All control stations will be checked by closed traverse and/or GPS, as appropriate. The accuracy of these control stations will be accessed on a regular basis and re-established accordingly. All stations will be recorded on Survey Control Station sheets.
- B.1.6 Each control station will be marked with a PGM (Permanent Ground Marker). Witness diagrams will include the full 3-D co-ordinates generated, a sketch diagram and measurements to at least three fixed details, written description of the mark and a photograph of the control point in its environs.
- B.1.7 Prior to entry into the field all equipment will be checked, and all pre-survey information will be logged onto the field computer and uploaded onto survey equipment as appropriate. The software in the field computer will be verified and all cabling between the GPS and/or TST and computer will be checked. Prior to conducting the survey the site will be reconnoitred for locations for a viable control network and check the line of sight and any possible hindrance to survey. Daily record sheets will be kept to record daily tasks and conditions.
- B.1.8 All spatial data will be periodically downloaded onto a field computer, and backed up onto CD, or DVD. It will be cleaned, validated and inspected.
- B.1.9 All survey data will be documented on daily survey record sheets. Information entered on these sheets includes key set up information (Instrument height etc.) as well as daily variables and errors/comments. All survey data will be digitally recorded in a raw format and translated during the download process this shall allow for any errors to be cross referenced with the daily survey record and corrected accordingly.
- B.1.10 A weekly summary of survey work will be produced to access development and highlight problems. This information also will be recorded on the weekly survey journal. Technical support for the survey equipment and download software shall be available at



all times. In those instances where sites are remotely operated, all digital data will be backed up regularly and a copy returned to Oxford on a weekly basis.

- B.1.11 A site plan will initially be created by a rapid survey of relevant archaeological features by mapping their extent using a combination of TST and GPS. This will form the basis for deciding excavation strategy and will be updated as the excavation clarifies the extent of, and relationships between, archaeological features.
- B.1.12 Excavated archaeological interventions and areas of complex stratigraphy will be hand drawn. At least two Drawing Points (DPs) will be set in as a baseline and measurements taken off this by tape and offset. The hand drawn plans will be referenced to the digitally captured pre-site plan by measuring in the DPs with a TST or GPS. These hand drawn elements will then be scanned in, geo-referenced using the DPs as reference points and digitised following OA's digitising protocols. For further details on hand planning procedure please refer to the fieldwork guidelines.
- B.1.13 Where appropriate rectified photography may be used to record standing structures or burials. This will be carried out in line with Standard OA procedures for rectified photography.
- B.1.14 Survey data recorded in the field will be downloaded using appropriate downloading software, and saved as an AutoCAD Map DWG file, or an ESRI Shapefile. These files will be regularly updated and backed up with originals being stored on an OA server in Oxford.
- B.1.15 All drawings will be composed of closed polygons, polylines or points in accordance with the requirements of GIS construction and OA Geomatics protocols. Once created, additional GIS/CAD work will normally be carried out at the local OA central office or at on-site remote locations when appropriate. Support for all GIS/CAD work will be available from OA's Oxford Office during normal office hours. The aim of the GIS/CAD work is to produce workable draft plans, which can be produced as stand-alone products, or can be readily converted to GIS format. Any hand-drawn plans will be scanned and digitised on site in the first instance. Subsequent plans will be added to the main drawing as it develops.
- B.1.16 All plan scans will be numbered according to their plan site number. Digital plans will be given a standard new plan number taken out from the site plan index.
- B.1.17 All digital data will be backed up incrementally on CD or DVD. On each Friday the entire data directory will be backed up and returned to Oxford where it will be copied onto the OA projects server. Each CAD drawing will contain an information layout which will include all the relevant details appertaining to that drawing. Information (metadata) on all other digital files will be created and stored as appropriate. At the end of the survey all raw measurements will be made available as hard copy for archiving purposes.

B.2 Relevant industry standards and guidelines

- B.2.1 English Heritage (2009), Metric Survey Specifications for Cultural Heritage
- B.2.2 English Heritage (2006), Understanding Historic Buildings A Guide to Good Practise
- B.2.3 English Heritage, (2007) Understanding the Archaeology of Landscapes A Guide to Good Recording practise

B.3 Relevant OA manual and other supporting documentation

- B.3.1 OA South Metric Survey, Data Capture and Download Procedures



B.3.2 OA South Digitising Protocols

B.3.3 OA South GIS Protocols

B.3.4 These will be superseded by the OA South Geomatics Manual (in progress).



APPENDIX C. ENVIRONMENTAL EVIDENCE

C.1 Summary of standard methodology

- C.1.1 Different environmental and geoarchaeological sampling strategies may be employed according to established research targets and the perceived importance of the strata under investigation. Where possible an environmental specialist(s) will visit the site to advise on sampling strategies. Sampling methods will follow guidelines produced by English Heritage and Oxford Archaeology. A register of samples will be kept. Specialists will be consulted where non-standard sampling is required (eg. TL, OSL or archaeomagnetic dating) and if appropriate will be invited to visit the site and take the samples.
- C.1.2 Geoarchaeological sampling methods are site specific, and methodologies will be designed in consultation with the geoarchaeological manager on a site by site basis.
- C.1.3 Bulk soil samples, where possible of 40 litres or 100% of a deposit if less is available, will be taken from potentially datable features and layers for flotation for charred plant remains and for the recovery of small bones and artefacts. Larger soil samples (up to 100L) may be taken for the complete recovery of animal bones, marine shell and small artefacts from appropriate contexts. Smaller bulk samples (general biological samples) of 10-20 litres will be taken from any waterlogged deposits present for the recovery of macroscopic plant remains and insects. Series of incremental 2L samples may be taken through buried soils and deep feature fills for the recovery of snails and/or waterlogged plant remains, depending on the nature of the stratigraphy and of the soils and sediments. Columns will be taken from buried soils, peats and waterlogged feature fills for pollen and/or phytoliths, diatoms, ostracods and foraminifera if appropriate. Soil samples will be taken for soil investigations (particle size, organic matter, bulk chemistry, soil micromorphology etc.) and possibly for metallurgical analysis in consultation with the appropriate specialists.
- C.1.4 Bulk samples from dry deposits will be processed by standard water flotation using a modified Siraf-style machine and meshes of 0.25mm (flot) and 0.5 or 1mm depending (residue). Heavy residues will be wet sieved, air dried and sorted. Samples taken exclusively for the recovery of bones, marine shell or artefacts will be wet sieved to 2mm. Waterlogged samples (1L sub-sample) and snail samples (2L) will be processed by hand flotation with flots and residues collected to 0.25mm (waterlogged plants) and 0.5mm (snails) respectively; these flots and residues will be sorted by the specialist. Samples specifically taken for insects, pollen, other microflora and microfauna, metallurgy and soil analysis will be submitted as whole earth to the appropriate specialists or processed following their instructions.

C.2 Relevant industry standards and guidelines

- C.2.1 English Heritage 2010. Waterlogged Wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood.
- C.2.2 English Heritage 2001. Archaeometallurgy. Centre for Archaeology Guidelines 2001.01.
- C.2.3 English Heritage 2011. Environmental Archaeology. A guide to the theory and practice of methods, from sampling and recovery to post excavation, (2nd ed)
- C.2.4 English Heritage 2004. Dendrochronology: Guidelines on Producing and Interpreting Dendrochronological Dates.



- C.2.5 English Heritage 2006. Archaeomagnetic Dating. Guidelines for Producing and Interpreting Archaeomagnetic Dates.
- C.2.6 English Heritage 2007. Geoarchaeology. Using Earth Sciences to Understand the Archaeological Record.
- C.2.7 English Heritage 2008. Luminescence Dating. Guidelines on Using Luminescence Dating in Archaeology.
- C.2.8 English Heritage 2008. Guidelines for the Curation of Waterlogged Macroscopic Plant and Invertebrate Remains.

C.3 Relevant OA manual and other supporting documentation

- C.3.1 Oxford Archaeology 2005. Environmental Sampling Guidelines, 2nd ed.



APPENDIX D. ARTEFACTUAL EVIDENCE

D.1 Summary of standard methodology

- D.1.1 Before a site begins arrangements concerning the finds will be discussed with the Head of Finds. Information will be provided by the project manager about the nature of the site, the expected size and make-up of the finds assemblage and any site specific finds retrieval strategies. On-site requirements will be discussed and a conservator appointed who can be called on to make site visits if required. Special requirements regarding particular categories of material will be raised at this early stage for instance the likelihood of recovering assemblages of waterlogged material, large timbers, quantities of structural stone or ceramic building material. Specialists may be required to visit sites to discuss retrieval strategies.
- D.1.2 The project manager will supply the Head of Finds with contact details of the landowner of the site so that consent to deposit any finds resulting from the investigation can be sought.
- D.1.3 The on-site retrieval, lifting and short term packaging of bulk and small finds will follow the detailed guidelines set out in the OA Finds Manual (sections 2 and 3), First Aid for Finds and the UKIC conservation guidelines No.2.
- D.1.4 All finds recovered from site will be transported to an OA regional office for processing; local sites will return finds at the end of each day, away based sites at the end of each week. Special arrangements can be discussed for certain sites with the department manager before the start of a project. Larger long running sites may in some instances set up on-site processing units to deal with the material from a particular site.
- D.1.5 All finds qualifying as Treasure will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act (1996), and the Treasure (Designation) Order 2002. Where removal can not be effected on the same working day as the discovery, suitable security measures will be taken to protect the finds from theft.
- D.1.6 Each box of finds will be accompanied by a finds context checklist itemising the finds within each box. The number of bags of finds from each context and individual small find from each context will be recorded. A member of the processing team will check the list when it arrives in the department. There are separate forms for finds recovered from fieldwalking.
- D.1.7 The processing programme is reviewed on a weekly basis and priorities are worked out after discussions with the Head of Fieldwork and the Head of Post-excavation. Project managers will keep the Head of Finds informed of any pressing deadlines that they are aware of. All finds from evaluations are dealt with as a matter of priority.
- D.1.8 All bulk finds are washed (where appropriate), marked, bagged and boxed by the processing team according to the guidelines set out in section 4 and 5 of the OA Finds Manual, First-aid for finds and the UKIC guidelines No.2. They must also take into account the requirements of the receiving museum. Primary data recording count and weight of fragments by material from each context is recorded on the site database.
- D.1.9 Unstable and sensitive objects are recorded onto the database and then packaged and stored in controlled environments according to their individual requirements. The advice of a conservator will be sought for sensitive objects in need of urgent conservation. All



metalwork will be x-rayed prior to assessment (and to meet the requirements of most receiving museums).

- D.1.10 Finds recovered from the environmental sample processing will be incorporated into the main assemblage and added to the database.
- D.1.11 On completion of the processing and data entry a finds file for each archaeological investigation will be produced, a summary of which is available for the project manager. The assemblage is allocated an OA number for storage purposes. Bulk finds are stored on a roller racking system, metals in a secure controlled storage and organic finds are refrigerated where possible.
- D.1.12 The movement of finds in and out of the department storage areas is strictly monitored and recorded. Carbon copy transit forms exist to record this information. Finds will not be removed from storage without the prior knowledge of the Head of Finds.
- D.1.13 Finds information summarised in the finds compendium is used to assess the finds requirements for the post excavation stages of the project. The Finds department holds a list of all specialists used by OA (see below) both internal and external.
- D.1.14 On completion of the post excavation stage of the project the department prepares the finds assemblage for deposition with the receiving museum. Discussions will be held with the museum, the excavator and the head of finds to finalise any selection, retention or discard policy. Most museums issue strict guidelines for the preparation of archives for deposition with their individual labelling, packaging and recording requirements.

D.2 Relevant industry standards and guidelines

- D.2.1 UKIC, 1983, Packaging and Storage of Freshly-Excavated Artefacts from Archaeological Sites. Conservation Guidelines No.2. Archaeology Section, United Kingdom Institute for Conservation.
- D.2.2 UKIC, 1988, Excavated Artefacts and Conservation: UK sites Revised Edition. Conservation Guidelines No.1. Archaeology Section, United Kingdom Institute for Conservation.
- D.2.3 Society of Museum Archaeologists, 1993, Selection, retention and dispersal of Archaeological Collections. Download available via <http://www.socmusarch.org.uk/publica.htm>
- D.2.4 Watkinson, D E & Neal, V, 1998, First Aid for Finds (3rd edition). RESCUE & UKIC

D.3 Relevant OA manual and other supporting documentation

- D.3.1 Allen, L, and Cropper, C (internal publication only) Oxford Archaeology Finds Manual.



APPENDIX E. BURIALS

E.1 Summary of standard methodology

- E.1.1 Human remains will not be excavated without a relevant licence/faculty and, where applicable (for example, a post medieval cemetery), a risk assessment from the local environmental officer.
- E.1.2 All human remains will be treated with due care and regard to the sensitivities involved, and will be screened from the public throughout the course of the works.
- E.1.3 Excavation will be undertaken in accordance with IFA (Roberts and McKinley 1993) and English Heritage and The Church of England guidelines (Mays 2005). For crypts and post-medieval burials the recommendations set out by the IFA (Cox 2001) in *Crypt Archaeology: an approach*, are also relevant.
- E.1.4 In accordance with recommendations set out in the English Heritage and Church of England (2005) document *Guidance for best practice for treatment of human remains excavated from Christian burial grounds in England*, skeletons will not be excavated beyond the limits of the trench, unless they are deemed osteologically or archaeologically important.
- E.1.5 Where any soft tissue survives and/or materials (for example, inner coffins, mattresses and other paddings) soaked in body liquor, no excavation or handling of the remains will take place until an appropriate risk assessment has been undertaken. Relevant protocols (i.e. Cox 2001) for their excavation, recording and removal will be adhered to.
- E.1.6 OA does not excavate or remove modern burials (post-1907) and does not remove or open sealed lead coffins. Appropriate PPE (e.g. chemical suit, latex gloves) will be worn by all staff when working with lead coffins.
- E.1.7 Graves and their contents will be hand excavated in plan. Each component (for example, skeleton, grave cut, coffin (or remains of), grave fill) will be assigned a unique context number from a running sequence. A group number will also be assigned to all of these, and small finds numbers to features such as coffin nails, hobnails and other grave goods (as appropriate).
- E.1.8 Soil samples will be taken during the excavation of inhumations, usually from the region of the skull, chest, right hand, left hand, abdomen and pelvis, right foot and left foot. Infants (circa. less than 5 years) will normally be recovered as bulk samples. Soil samples will also be taken from graves that appear to contain no human bone.
- E.1.9 Burials (including the skeleton, cremation, coffin fittings, coffin, urn, grave goods / other) will be recorded by photographic and written record using specialised pro forma context sheets, although these records may only include schematic representations of the location and position of the skeletons, depending on the nature and circumstances of the burial.
- E.1.10 Where necessary, hand drawn plans (usually at 1:10, sometimes 1:5) will be made, especially of contexts where required details cannot be adequately seen using digital rectified photography (for example, urned cremations; undisturbed hob nails).
- E.1.11 Levels will be taken. For inhumations this will be on the skull, pelvis and feet as a minimum.
- E.1.12 Human remains that are exhumed will be bagged and labelled according to skeletal region and carefully packed into suitable containers (for example, acid free cardboard



- boxes) and transported to a suitable storage location. Any associated coffins and coffin fittings will be contained with the human remains wherever possible.
- E.1.13 Unurned cremations will not usually be half sectioned or excavated in spits, but recovered as a bulk sample.
- E.1.14 Wherever possible, urned cremations will be carefully bandaged, recovered whole and will be excavated in spits in the laboratory, as per the recommendations of McKinley (2004).
- E.1.15 Unless deemed osteologically or archaeologically important disarticulated bone / charnel will be collected and reserved for re-burial if immediate re-internment as close to its original position is not practicable. In some instances, a rapid scan of this material may be undertaken by a qualified osteologist, if deemed relevant.
- E.1.16 If undisturbed, pyre sites will normally be excavated in quadrants, at the very least in 0.5 m blocks of 0.5 m spits.
- E.1.17 Pyre debris dumps will be half sectioned or quadrant and will be subject to 100% sampling.
- E.1.18 Wooden and lead coffins and any associated fittings, including fixing nails will be recorded on a pro forma coffin recording sheet. All surviving coffin fittings will be recorded by reference to Reeve and Adams (1993) and the unpublished master catalogue that is being compiled by OA. Where individual types cannot be paralleled, they will be drawn and/ or photographed and assigned a style number. Biographical details obtained from legible departum plate inscriptions will be recorded and further documentary research will be made.
- E.1.19 Funerary structures, such as brick shaft graves and/or vaults will be hand-drawn at a scale of 1:10 or 1:20, as appropriate. Location, dimensions and method of construction will be noted, and the structure added to the overall trench plan.
- E.1.20 Memorials, including headstones, revealed within the areas of development will be recorded irrespective of whether they are believed to be in situ.
- E.1.21 Where required, memorials will be accorded an individual context number and will also be included as part of the grave group, if the association with a burial is clear.
- E.1.22 Memorials will be recorded on pro-forma context sheets, based on and following the guidelines set out by Mytum (2002), and will include details of:
- Shape
 - Dimensions
 - Type of stone used
 - Iconography (an illustration may best describe these features)
 - Inscription (verbatim record of inscription; font of the lettering)
 - Stylistic type

E.2 Relevant industry standards and guidelines

- E.2.1 Cox, M, 2001 Crypt archaeology. An approach. IFA Paper No. 3
- E.2.2 Mays, S, 2005 Guidance for Best Practice for Treatment of Human Remains Excavated from Christian Burial Grounds in England. Church of England and English Heritage.



- E.2.3 McKinley, J, and Roberts, C, 1993 Excavation and post-excavation treatment of cremated and inhumed human remains, IFA Technical Paper No. 13
- E.2.4 McKinley, J, 2004 Compiling a skeletal inventory: cremated human bone. In Brickley, M, and McKinley, J (eds) Guidelines to the Standards for Recording Human Remains, IFA Technical Paper No. 7. 9-13.
- E.2.5 Mytum, H, 2000 Recording and Analysing Graveyards. CBA Handbook No. 15.
- E.2.6 Reeve, J, and Adams, M, 1993 The Spitalfields Project. Volume I – The Archaeology Across the Styx. CBA Research Report No. 85
- E.2.7 The Human Tissue Act 2004

E.3 Relevant OA manual and other supporting documentation

- E.3.1 Loe, L, 2008 The Treatment of Human Remains in the Care of Oxford Archaeology. Oxford Archaeology internal policy document.
- E.3.2 Excavating and recording human remains. Oxford Archaeology internal guidelines document.



APPENDIX F. REPORTING

F.1 Summary of standard methodology

F.1.1 For Watching Briefs and Evaluations, the style and format of the report will be determined by OA, but will include as a minimum the following:

- A location plan of trenches and/or other fieldwork in relation to the proposed development.
- Plans and sections of features located at an appropriate scale.
- A section drawing showing depth of deposits including present ground level with Ordnance Datum, vertical and horizontal scale.
- A summary statement of the results.
- A table summarising the features, classes and numbers of artefacts contained within, spot dating of significant finds and an interpretation.
- A reconsideration of the methodology used, and a confidence rating for the results.
- An interpretation of the archaeological findings both within the site and within their wider landscape/townscape setting.

F.1.2 For Excavations, a Post-Excavation Assessment and Project Design will generally be prepared, as prescribed by English Heritage Management of Research Projects in the Historic Environment (MoRPHE) 2006, Section 2.3. This will include a Project Description containing:

- A summary description and background of the project.
- A summary of the quantities and assessment of potential for analysis of the information recovered for each category of site, finds, dating and environmental data. Detailed assessment reports will be contained within appendices.
- An explicit statement of the scope of the project design and how the project relates to any other projects or work preceding, concurrent with or following on from it.
- A statement of the research aims of the fieldwork and an illustrated summary of results to date indicating to what extent the aims were fulfilled.
- A list of the project aims as revised in the light of the results of fieldwork and the current post-excavation assessment process.

F.1.3 A section on Resources and Programming will also be produced, containing:

- A list of the personnel involved indicating their qualifications for the tasks undertaken, along with an explanation of how the project team will communicate, both internally and externally.
- A list of the methods which will be used to achieve the revised research aims.
- A list of all the tasks involved in using the stated methods to achieve the aims and produce a report and research archive in the stated format, indicating the personnel and time in days involved in each task. Allowance should be made for general project-related tasks such as monitoring, management and project meetings, editorial and revision time.



- A cascade or Gantt chart indicating tasks in the sequence and relationships required to complete the project. Due allowance will be made for leave and public holidays. Time will also be allowed for the report to be read by a named academic referee as agreed with the County Archaeological Officer, and by the County Archaeological Officer.
 - A report synopsis indicating publisher and report format, broken down into chapters, section headings and subheadings, with approximate word lengths and numbers and titles of illustrations per chapter. The structure of the report synopsis should explicitly reflect the research aims of the project.
- F.1.4 The Project Design will be submitted to the County Archaeological Officer or equivalent for agreement.
- F.1.5 Under certain circumstances (eg with very small mitigations), and as agreed with the County Archaeological Officer or equivalent, a formal Assessment and Project Design may not be required and either the project will continue straight to full analysis, or a simple Project Proposal (MoRPHE 2006 Section 2.1) will be produced prior to full analysis. This proposal may include:
- A summary of the background to the project
 - Research aims and objectives
 - Methods statement outlining how the aims and objectives will be achieved
 - An outline of the stages, products and tasks
 - Proposed project team
 - Estimated overall timetable and budget if appropriate.
- F.1.6 Once the post-excavation Project Design or Project Proposal has been accepted, the County Archaeological Officer or his appointed deputy will monitor the progress of the post-excavation project at agreed points. Any significant variation in the project design will be agreed with the County Archaeological Officer.
- F.1.7 The results of the project will be published in an appropriate archaeological journal or monograph. The appropriate level of publication will be dependent on the significance of the fieldwork results and will be agreed with the County Archaeological Officer. An OASIS (Online Access to the Index of Archaeological Investigations) form will be completed for each project as per English Heritage guidelines.

F.2 Relevant industry standards and guidelines

- F.2.1 Oxford Archaeology (OA) adheres to the national standards in post-excavation procedure as outlined in English Heritage's Management of Research Projects in the Historic Environment (MoRPHE; EH 2006). Furthermore, all post-excavation projects take into account the appropriate regional research frameworks as well as national research agendas such as the Framework for Historic Environment Activities & Programmes in English Heritage (SHAPE; EH 2008).



APPENDIX G. LIST OF SPECIALISTS REGULARLY USED BY OA

G.1.1 Below are two tables, one containing 'in-house' OA specialists, and the other containing a list of specialists who are regularly used by OA.

Internal archaeological specialists used by OA

Specialist	Specialism	Qualifications
Lisa Brown	Early Prehistoric pottery	BA, PGDip, MIitt, MIfA
Paul Booth	Iron Age and Roman pottery	BA, FSA, MIfA
John Cotter	Medieval and Post Medieval pottery, Clay Pipe and CBM	BA (Hon.), MIfA
Cynthia Poole	CBM and Fired Clay	BA (Hon.), MSc
Edward Biddulph	Roman Pottery	BA (Hon.), MA, MIfA
Ian Scott	Metalwork and Glass	BA (Hon.)
Leigh Allen	Metalwork and worked bone	BA (Hon.), PGDip
Dr Ruth Shaffrey	Worked stone artefacts	BA, PhD
Julian Munby	Architectural Stone	BA, FSA
Dr Rebecca Nicholson	Fish and Bird Bone	BA (Hon.), MA, D.Phil, MIfA, FSA Scot
Elizabeth Huckerby	Pollen and waterlogged plant remains	BA, MSc, MIfA
Lena Strid	Animal bone	MA
Andrew Bates	Animal Bone	BA, MA
Dr Denise Druce Pollen	Charred plant remains and charcoal	BA, PhD, MIfA
Liz Stafford	Geoarchaeology and land snails	BA, Msc
Nicola Scott	Archaeological archive deposition	BA
Mike Donnelly	Flint	Bsc, MIfA

External archaeological specialists regularly used by OA

Specialist	Specialism	Qualifications
Lynne Keys	Slag	BA (Hon.)
Quita Mould	Leather	BA, MA
Penelope Walton Rogers	Identification of Medieval Textiles	FSA, Dip.Acc
Dana Goodburn Brown	Conservation	BSc (Hon.), BA, MSc
Steve Allen	Conservation	BA, MA, MAAIS



Chiltern Railways (Bicester to Oxford Improvements)

Specialist	Specialism	Qualifications
Dr Richard McPhail	Soils, especially Micromorphology	BA (Hon.), MSc, PhD
Dana Challinor	Charcoal	MA (Hon.), MSc
Dr Nigel Cameron	Diatoms	BSc, MSc, PhD
Dr David Smith	Insects	BA (Hon.), MA, PhD
Professor Adrian Parker	Phytoliths and pollen	Bsc (Hons.), D.Phil
Dr David Starley	Slag	BSc, PhD
Wendy Carruthers	Charred and waterlogged plant remains	
Dr Sylvia Peglar	Pollen	PhD
Dr John Whittaker	Ostracods and Foraminifera	BA (Hons), PhD
Dr John Crowther	Soil Chemistry	MA, PhD
Dr Martin Bates	Geoarchaeology	Bsc, PhD
Professor Mark Robinson	Insects, molluscs, waterlogged plant remains	MA, PhD
Dr Dan Miles	Dendrochronology	D.Phil, FSA
Dr Jean-luc Schwenninger	Optically Stimulated Luminescence Dating	PhD
Dr David Higgins	Clay Pipe	BA, PhD, MifA
Dr Hugo Lamdin Wymark	Flint	BSc, PhD, FSA Scot, MifA



APPENDIX H. DOCUMENTARY ARCHIVING

H.1 Standard methodology

- H.1.1 The documentary archive constitutes all the written, drawn, photographic and digital records relating to the set up, fieldwork and post-excavation phases of the project. This documentary archive, together with the artefactual and environmental ecofact archive collectively forms the record of the site. The report is part of the documentary archive, and the archive must provide the evidence that supports the conclusions of the report, but the archive may also include data which exceeds the limitations of research parameters set down for the report and which could be of significant value to future researchers.
- H.1.2 At the outset of the project OA Archive department will contact the relevant local receiving museum or archive repository to notify them of the imminent start of a new fieldwork project in their collecting area. Relevant local archiving guidelines will be observed and site codes, which integrate with the receiving repository, will be agreed for labelling of archives and finds.
- H.1.3 During the course of the project the Archive department will assist the Project Manager in the management of the archive including the cataloguing and development technique suitable for photographic archive requirements.
- H.1.4 The site archive will be security copied either by microfilming and the master sent to English Heritage as part of the National Archaeological Record or it will be digitally scanned and stored in a dedicated archive section of the OA computer network. A copy of the work as microfiche diazo or .pdf/a on disk will be sent to the receiving museums with the hard copy. This will act as a safeguard against the accidental loss and the long-term degeneration of paper records and photographs.
- H.1.5 Born digital data where suitable will be printed to hard copy for the receiving museum but if the format is such that it needs maintaining in digital form a copy will be sent to the receiving museum by CD. Back-up copies will be stored on the OA digital network and or posted to the ADS in accordance with AAF & ADS guidelines. In most cases a digital copy of the report will be included in the OASIS project library hosted by ADS.
- H.1.6 Prior to deposition the Archive department will contact the museum regarding the size and content of the archive and discuss any retention and dispersal policies which may be applicable in line with local and SMA Guidelines ' Selection, Retention & Dispersal of Archaeological Collections' 1993
- H.1.7 The site archive will then be deposited with the relevant receiving museum or repository at the earliest opportunity unless further archaeological work on the site is expected. The documentary archive will include correspondence detailing landowner consent to deposit the artefacts and any copyright licences in accordance with the receiving museum guidelines.
- H.1.8 Oxford Archaeology will retain full copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it will provide a licence to the client in all matters directly relating to the project as described in the Written Scheme of Investigation.
- H.1.9 OA will advise the client of any such materials supplied in the course of projects which are not OA's copyright.



H.1.10 OA undertakes to respect all requirements for confidentiality about the client's proposals provided that these are clearly stated. It is expected that such conditions shall not unreasonably impede the satisfactory performance of the services required. OA further undertake to keep confidential any conclusions about the likely implications of such proposals for the historic environment. It is expected that clients respect OA's general ethical obligations not to suppress significant archaeological data for an unreasonable period.

H.2 Relevant industry standards and guidelines

H.2.1 At the end of the project the site archive will be ordered, catalogued, labelled and conserved and stored according to the following national guidelines:

H.2.2 The 2007 AAF guide Archaeological Archives A Guide to best practice in creation, compilation, transfer and curation. Brown D.

H.2.3 The IFA Standard & Guidance for the creation, compilation, transfer and deposition of archaeological archives

H.2.4 The UKIC's Guidelines for the preparation of excavation archives for long-term storage

H.2.5 The MGC's Standards in the museum care of archaeological collections

H.2.6 Local museum guidelines such as Museum of London Guidelines: (<http://www.museumoflondonarchaeology.org.uk/English/ArchiveResearch/DeposResource>) will be adopted where appropriate to the archive collecting area.

H.2.7 The site archive will be prepared to at least the minimum acceptable standard defined in Management of Archaeological Projects 2, English Heritage 1991.

H.3 Relevant OA manual and other supporting documentation

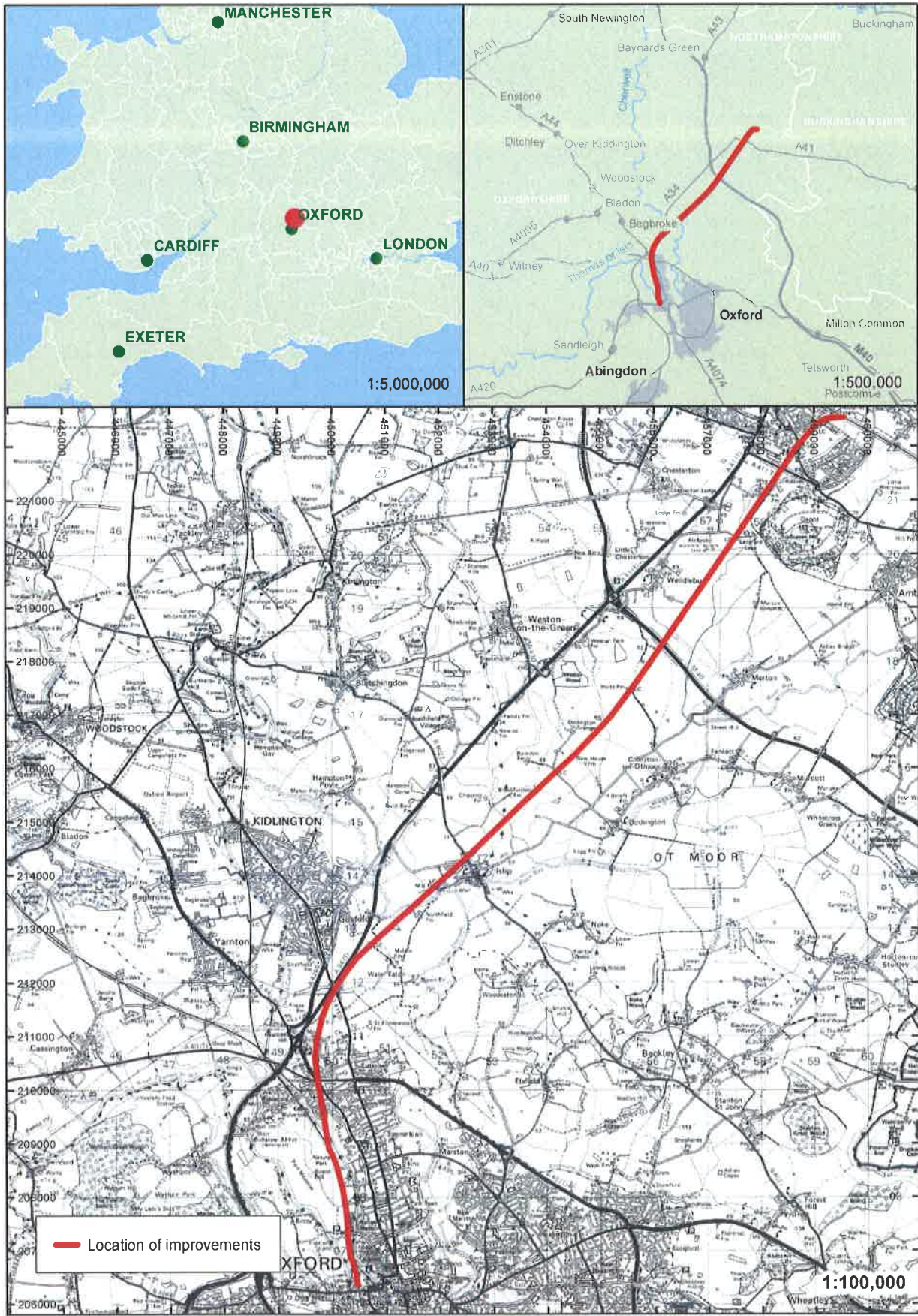
H.3.1 The OA Archives Policy.



APPENDIX I. HEALTH AND SAFETY

I.1 Summary of standard methodology

- I.1.1 All work will be undertaken in accordance with the OA Health and Safety Policy (Revision 13, August 2009), the OA Site Safety Procedures Manual, a site-specific Risk Assessment and, if required, Safety Plan or Method Statement. Copies of the site-specific documents will be submitted to the client or their representative for approvals prior to mobilisation, and all relevant H and S documentation will be available on site at all times. The Health and Safety documentation will be read in conjunction with the project WSI.
- I.1.2 Where a site is covered by the The Construction (Design and Management) Regulations (2007), all work will be carried out in accordance with the Principal Contractor's Construction Phase Plan.
- I.1.3 All work will be carried out according to the requirements of all relevant legislation and guidance, including, but not exclusively.
- The Health and Safety at Work Act (1974),
 - Management of Health and Safety at Work Regulations (1999),
 - Manual Handling Operations Regulations 1992 (as amended in 2002),
 - The Construction (Design and Management) Regulations (2007), and
 - The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995).



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Figure 1: Site location

