RAIL LINK ENGINEERING

CHANNEL TUNNEL RAIL LINK TECHNICAL REPORT

TECHNICAL REPORT No.

000-RMA-RLEVC-00050-AA

CTRL SECTION 1 UPDATED PROJECT DESIGN FOR ARCHAEOLOGICAL ANALYSIS AND PUBLICATION

Volume 2 – Contractors' Method Statements

RAIL LINK ENGINEERING

CHANNEL TUNNEL RAIL LINK TECHNICAL REPORT

APPROVAL / REVISION RECORD SHEET

REPORT TITLE	CTRL SECTION 1 UPDATED PROJECT DESIGN FOR ARCHAEOLOGICAL ANALYSIS AND PUBLICATION VOLUME 2 – CONTRACTORS' METHOD STATEMENTS
REPORT NUMBER	000-RMA-RLEVC-00050-AA

REVISION	DETAILS	DATE
AA	1st issue to Consultees	July 2003

PREPARED BY: JAY CARVER, MARK TURNER and OWAJV	CHECKED BY: HELEN J GLASS
APPROVED BY MANAGER OF ENVIRONMENT (RLE): PAUL JOHNSON	APPROVED BY TECHNICAL DIRECTOR SECTION 1 (RLE): MIKE GLOVER

The following Up-dated Project Design document is presented in two volumes.

Volume 1: the primary background and project design specification

Volume 2: the Contractor's detailed Method Statements produced during the project design phase and accepted by RLE for implementation

CONTENTS

List of Tables

1 INTRODUCTION

1.1.1 This document comprises a set of Method Statements produced by the OWA Joint Venture in response to the CTRL Section 1 Up-dated Project Design Volume 1. Methods have been produced for each of the six Specialist Packages (Ceramics, Environmental, Lithics, Animal Bone, Small Finds and Human Remains). Separate Methods are also included for Integrated Site Reports, Digital Data Archive preparation, Document and Archive Control and Specialist Package Reports. Research Aims relevant to each package have been identified from Volume 1 Part 2 of the UPD and repeated in the relevant Method Statements for ease of cross-reference.

1.1.2 It is important that the pre-defined research questions are specifically addressed by the analysis programme. Additional lines of research that are not currently included, or which become apparent as the analysis progresses, will normally be noted as an area of future research potential, but will not be undertaken as part of the CTRL works, except with the written permission of the Project Manager.

1.1.3 Specialist packages will be carried out in the following general task sequence:

1.1.4 **Recording** - Identification, cataloguing and data entry of assemblages recommended for further analysis. The assessment level data and phasing has been used to inform the selection of material for analysis. The recording phase will include preliminary division of assemblages in accordance with the route-wide phase scheme, where this has not been adequately addressed at the assessment stage.

1.1.5 **Project Review** meetings - *Principal Site review meetings* will serve as a forum for discussion of aspects of site interpretation. They will be held on completion of recording tasks for each Principal Site, before any analysis or reporting tasks are started, and will be led by the relevant Period Team Leader, assisted by the Project Officer responsible for the report. *Period review meetings* will be held on completion of the main recording tasks across the project and will be led by the relevant Period Team Leader and Academic Chapter Author. They will serve as a forum for discussion of period-specific, route-wide research questions. If necessary, revised report synopses will be produced following period review meetings, to reflect changes in interpretation.

1.1.6 **Analysis** - Integrated analysis of assemblages and stratigraphy by Project Officers assigned to Principal Sites, focussed primarily on establishing a definitive site chronology. Specialists/ POs, in discussion, will divide and quantify assemblages in accordance with finalised Principal Site phases.

1.1.7 **Specialist Reports** - Data that is relevant to questions of site interpretation will be considered in the appropriate Principal Site Report. Route-wide or regional research questions will be addressed by the Lead Specialist and discussed at a synthetic level in the Route-wide Specialist Package Report. The Principal Site datasets will be combined and analysed in order to produce an integrated, route-wide synthesis by the relevant Lead Specialist. At the

same time, in discussion with the Lead Specialist, specialists will generate synthetic summaries for individual site assemblages, which will be integrated into Principal Site Reports by the relevant Project Officer. It is important that the analysis is undertaken before any report writing takes place, to ensure that the site reports and route-wide report offer consistent, internally consistent interpretations. Detailed supporting data will be made available in database form.

1.1.8 **Route-wide specialist package synthesis** - Lead Specialists will analyse data from across the project to address relevant route-wide research questions. They will then prepare synthetic overviews for each of the six specialist packages, in the Route-wide Specialist Package Reports.

1.1.9 **Route-wide general synthesis** - Concurrently with the above period team leaders and academic co-authors will work together to address route-wide research questions and prepare synthetic period-based chapters for the Project Monograph.

.

2 CERAMICS RECORDING AND ANALYSIS: RESEARCH AIMS, GENERAL METHODOLOGY AND TASK LISTS

2.1 Introduction

2.1.1 The research aims listed below are a compilation of aims to which ceramics studies can directly contribute, extracted from Part 2 of the UPD. Research questions concerned with patterns at a regional level will be addressed by a programme of ceramics research, comprising baseline quantification of Principal Site ceramics assemblages and targeted detailed analysis of key groups. Data that is relevant to questions of site interpretation will be included as a baseline record in the site digital archive and considered at a synthetic level in the appropriate Site Report. Integration of the various strands of evidence, and consideration of route-wide research questions, will be undertaken by the lead specialist and presented in the relevant route-wide specialist package report.

2.1.2 The CTRL Section 1 works have produced significant pottery assemblages for most periods from the Neolithic onwards. Some of these assemblages are of national importance and almost all are of major regional importance because of the relative dearth of significant published pottery assemblages of any period for the area crossed by CTRL. Many individual period assemblages are not only important in their own right but contribute to the group value of the assemblage as a whole, so that even small groups can significantly enhance understanding of the development of ceramic traditions across the region traversed by CTRL. Group value will be enhanced still further by the application of consistent (period based) recording strategies and standards across the length of Section 1, providing an unparalleled dataset for ceramic material of almost every period in this area.

2.1.3 For the reasons cited the majority of pottery assemblages merit full recording and analysis. For some of the small period collections, however, the assessment records provide adequate characterisation and quantification of the material. Wherever possible established standards and reference systems (i.e. CAT fabric series) will be used as the basis of recording methodologies. In addition, recording of material in each major period category will be carried out as far as possible by the smallest number of specialists compatible with meeting programme targets, in order to maximise internal consistency of the records.

2.1.4 The basic attributes to be recorded for ceramic material of all periods are predetermined (see UPD part 4.36). These are fabric and form, surface treatment and decoration, with quantification per context group by sherd count, weight and EVEs. The recording proposed for all the major period groups will be based on these attributes, with additional data recorded for specifc ceramic types or contexts (in line with current best practise standards) where appropriate (see below).

2.1.5 One other major attribute is date. The approach proposed for the recording of this attribute will be applied consistently across material of all periods and is detailed at the end of the period specific sections below.

2.1.6 The broad period scheme adopted in relation to ceramic material follows the framework established in the UPD part 4 for post-excavation analysis with the exception that it is proposed that the Middle Bronze Age ceramic assemblage should be examined alongside those for 'later prehistory'. This is partly because there is a general dearth of Early Bronze Age material from Section 1, making it easier to define a break in sequences and ceramic traditions after this point, and also because there are several assemblages with both Middle and Later Bronze Age components, offering the opportunity to examine the ceramic aspects of this important and relatively poorly-understood transition. Such an approach does not invalidate the broad period scheme proposed in the UPD but rather should enhance it by shedding light on a key aspect of chronological development.

2.2 Research Aims

Early Agriculturalists – The Neolithic and Early Bronze Age Landscape

2.2.1 Updated research framework – Neolithic Landscape:

2.2.2 Structured deposition in pits is noted across the route and chronologically appears to be the first indication of a change in the material assemblage and level of activity. What does this evidence contribute to our understanding of the spatial patterning of practices in the Neolithic landscape, and the kinds of cultural concerns or classificatory schemes represented in such deposits.

2.2.3 Do the Neolithic buildings at White Horse Stone represent residential settlement occupation or did they have some other purpose? Does the evidence from dry valley sequences along the CTRL route suggest that the rarity of Neolithic settlement sites is due to preservation conditions?

2.2.4 What other evidence is there for 'residence'? What does the range of secondary evidence and subsequent landuse pattern suggest about the location of possible 'lost' settlements?

2.2.5 What chronological and subsistence indictors are contained within the ceramic assemblage? A C14 AMS precision date strategy will be developed and a ceramic seriation report prepared. How does the subsequent series match patterns proposed regionally? What is the evidence for longevity during the Neolithic period? Does the evidence represent small fragments of an intensive range of activities over long periods, or local short-lived episodes?

2.2.6 The Neolithic structures at White horse Stone are unique to Kent at this time. Detailed research objectives require finalising with reference to the White Horse Stone assessment report. It will be necessary to refer to these in detail in preparing the archive research report for this site.

2.2.7 Discuss the evidence for long term continuity of place in the landscape from earlier Neolithic through to the later Neolithic ceramic deposits (Grooved ware pits). It will be aimed to present the later Neolithic evidence in detail due to its relatively unknown status in Kent.

2.2.8 Updated research framework – Early Bronze Age Landscape:

2.2.9 How does the CTRL evidence from grave contexts relate to wider interpretations of Late Neolithic and Early Bronze Age funerary traditions at regional and national scales? (Garwood n.d.)

2.2.10 Can a distinction between 'private/domestic' and 'corporate/ritual' activity be identified spatially? An analysis of the distribution of 'ritual' and domestic' activity should carried out with regard to a range of attribute variables to demonstrate the interrelation or interdependence(?) of the two classes of evidence.

2.2.11 The beaker groups: The assemblage analysis should include full recording of fabric, form and decoration. What is the provenance of the assemblage? Petrological analysis may determine local or regional sources. Residue analysis could be conducted where possible to identify vessel function.

2.2.12 In general although there are many EBA ceramic studies a finely tuned ceramic chronology for this assemblage will provide significant benefit regionally. Key research question is what level of regionality the assemblage demonstrates from the LNE through to the MBA. Is there an imported component?

2.2.13 How do sequences of burial events and material deposits relate to monument histories?

2.2.14 How do ring monuments appear to relate to settlement evidence and secondary flint scatters? What patterns do the finds assemblage at these sites present? Do they represent distinct and recurrent combinations, or variable finds groups? What does this indicate about social relations between different site types?

Updated research framework – Early Bronze Age / Middle Bronze Age Transition

2.2.15 The onset of the MBA at around 1500BC is characterised by the following broad trends. *Increased regionalism*, as demonstrated by Urn styles and regionally discreet Deveral Rimbury styles. *Increased residential evidence*, as indicated by the development of enclosures, settlements and land division. *A change in burial rite*, small cremation groups now dominate with no grave goods.

2.2.16 What is the CTRL evidence for MBA (Deveral Rimbury associated) settlement and continued structural deposition practices (e.g. artefact deposition as Thurnham)?

2.2.17 It is suggested that the adoption of enclosed settlement and organised residential structures can be associated with an increased interest in inheritance and legitimising of land rites. However it is apparent that often continuity of settlement at MBA sites has been difficult to establish beyond a single 'generation'. What chronological indicators can the CTRL data in the MBA contribute to this question?

2.2.18 Does the distribution and chronology of cremation burial reflect social change_Hlt30326231?

Farming Communities – The Later Bronze Age and Iron Age Landscape

2.2.19 Updated research framework – The Later Bronze Age Landscape:

2.2.20 Significant Deverel Rimbury and plainware assemblages have been recovered. A detailed seriation analysis coupled with absolute dating and residue analysis will be used to present a ceramic chronology (correlated to existing series) for the CTRL sites. The context (settlement/burial), source of raw material, distribution of vessel types, of the ceramic assemblages will enable questions of regionality, production and trade, role of structured deposition and 'feasting' economy, and visibility of the burial rite to be integrated with the above framework.

2.2.21 Updated research framework – The Early and Middle Iron Age Landscape (c.800 to 300 BC):

2.2.22 In terms of the analysis and publication of the assemblages more attention needs to be paid to contextualising material culture as opposed to strict division of specialist work. Minimum levels (as stated in works specification for assemblage recording, UPD part 4) of quantitative and contextual data must be recorded to allow others to consider issues of structured deposition and spatial organisation. Finds catalogues need to be cross-referenced to phase and context data.

2.2.23 Major themes are associated with population expansion as perceived by expansion onto previously un-exploited soils, and the progress of more nucleated social groups evidenced by the return of enclosure settlement in the middle and later Iron Age. The question of continental contact should be evaluated through artefact studies. Early and Middle Iron Age sites in east Kent appear to be utilising a distinctive 'continental' style pottery. Are these imports? Do the CTRL sites fall within this distinctive zone, or do the new finds expand this zone?

2.2.24 Is the 'expansion' of settlement related to increased production specialisation, as inferred by the large scale exploitation of the weald iron ore for example, or increased standardisation or centralisation of pottery production. Can the evidence for agricultural regimes be integrated also to demonstrate region-wide socio-economic change?

2.2.25 Ceramic chronologies supported by detailed series of AMS C14 dates (only AMS technique from primary contexts [or single entity contexts] have the potential to overcome the calibration curve plateau problems [c.800-400BC] for the period) have the potential to provide a regional type series chronology through application of Beysian statistics. Does the production and distribution of series types (especially finewares) demonstrate a trend towards social centralisation within the region? This could be investigated through thin section analysis of key vessel groups.

2.2.26 Continental contact maybe demonstrated through occurrence of imported fine wares from the MIA onwards. Can fluctuations in this trend be identified that may indicate periods of political independence, with the development of locally produced fine and decorated wares?

2.2.27 What potential exists in the ceramic archive to demonstrate variation between different site types in terms of use and consumption of resources? Could residue analysis provide a basis for cross comparison of vessel function and context?

2.2.28 Ceramic report for the period should concentrate on the basic attributes of technology (characterisation of fabric types), typology, distribution (can distribution plots demonstrate local production regions and exchange networks?) and dating. The key objective of the study shall be to provide a pattern comparison across the sample demonstrating variation in function and context of different vessel types. An illustrated, dated vessel type series catalogue shall be produced together with vessel type distribution plots across the route.

2.2.29 Knowledge of the early use of iron is rare in the region and priority should be given to close dating of such evidence and technological analysis of any production evidence. Slags, moulds, crucible and hearth linings should be targeted for precision dating if suitable samples are available (White Horse Stone). Ore sources may be determined through geological analysis.

2.2.30 Metal working. Can ore sources be related to specific ore types (such as high carbon or high phosphorous) that may indicate different tool type preferences? Within sites does the distribution of smelting and smithing evidence reflect a pattern of smelting outside/smithing within settlement boundaries?

2.2.31 The middle to later IA transition is characterised by a marked increase in material culture and the types of context in which it is found. Analyse the available data to illustrate this. How much is this a question of preservation or location investigation bias (destruction of earlier evidence by the increased agricultural intensification of the period and subsequent periods?). What maybe the reasons behind this perceived 'abundance'?

Towns and their Rural Landscapes I – The Later pre-Roman Iron Age and Romano-British landscapes (c.300Bc to c.AD500)

2.2.32 Updated research framework – The Later Iron Age and Romano-British Transition:

2.2.33 The recent literature on research agendas for the later Iron Age (Haselgrove et al. 1999; English Heritage 1997) calls for effort to made to understand indigenous transformations in the later 1st millennium distinct from the influence of Roman rule and continental contacts. Important for Kent is to understand the cultural and more precise chronological origins of the 'new' material culture as defined by the introduction of coinage and wheel made pottery, as well as new settlement types (fortified enclosures, numerous smaller enclosures), and ritual practise (increased symbolic deposition and hoarding, cremation cemeteries).

2.2.34 It will be imperative to attempt to develop and refine the chronology using the ceramic assemblages in conjunction with other artefactual evidence (and supported by absolute dating where appropriate). This will provide a framework for understanding and examining the changes and themes identified in this section.

2.2.35 In terms of indigenous development, identifying continuity of settlement is also important. Were the Roman style 'villas' developed by local Iron Age descendants for example or by 'immigrants' from the Romanised Gallic homelands? Does the proto-villa at Thurnham demonstrate any parallels with the Gallic Hall Villas in layout? Does the integration of the finds studies support a widespread immigration or local adaptation as the prime reason for visible cultural change?

2.2.36 Settlement: The final centuries of the 1st millennium BC sees an intensification in the landscape, that most believe is almost certainly connected to population rise that may be attributable to a combination of factors (see Haselgrove et al 1999). This model shall be tested through mapping the available sites and quantification of material culture associated with find spots.

2.2.37 A simple model sees changes in SE England from 150BC onwards as a peripheral product of European developments. From what point does imported material culture appear in the CTRL data, and what types? Does the archive represent Gallo-belgic 'imports' or locally produced stylistic influences? Does the evidence suggest direct political contact, immigration or other types of cultural affiliation? What 'kingdom' hinterland do the CTRL sites fall within, an indigenous and largely independent local hierarchy or one with increasing manipulation from Rome? Can any variation in political allegiance be identified from east to west across the sample? The ceramic and other artefact assemblages should help us to investigate the emergence of local and regional identities and evaluate broader networks of contacts.

2.2.38 How does the evidence for Iron Age burial (inhumation/disarticulated bone or cremation, grouped or isolated) help to inform our understanding of changing burial rite in the later 1st millennium? Do cremation cemeteries appear to be linked to increasing continental influence in the LIA? Is inhumation an equal but alternative rite dictated by local socio-political conditions?

2.2.39 The date and quantification of Roman finds should be analysed spatially and through time and comparable databases of imported and 'local/regional' types produced. This to be compared to a similar model for agricultural production products and discussions written up.

2.2.40 Updated research framework – Romano-British Landscape:

2.2.41 As for the preceding section the key objective shall be to report on a refined chronology across the CTRL site sample which will facilitate the synthesis of arguments formed under the research theme areas listed below (Millet n.d.)

2.2.42 The key transitional theme is the relative expression of 'Romanisation'. The synthesis should attempt to 'identify and assess the changes in landscape organisation resulting from the Roman conquest'. Can we observe settlement shift, the creation of new field systems and shifts in plot boundaries? A contextual synthesis is proposed through quantification of the data and its statistical manipulation and graphical display through use of a GIS. Such a presentation that centres on social and economic structures and change through time will underpin the explanatory framework, avoiding purely empirical presentation and at the same time opening up the dataset for researchers to interrogate within more sophisticated theoretical frameworks.

2.2.43 Looking at patterns of consumption (seeds, bones and artefact assemblages) within the tighter chronology proposed. Can we see changes in the way that surplus was used and in the ways that it was consumed ("foodways" = butchery practice, cooking and eating habits etc.)?

2.2.44 Is there any variation in these patterns that can be related to the different forms of settlement site identified (villa, non-villa etc.)? For instance is there evidence for feasting at villas ?

2.2.45 Investigation of Roman villas in Kent has concentrated on the structural and functional elements of the buildings. The priority now is to investigate the role of these centres within the wider landscape, comparing the range of economic activities from the Villas and lower order agricultural settlements. Utilising the economic and environmental data, the socio-economic reasons behind the development and decline of the villa can be investigated through the study of the chronology and fortunes of nearby non-villa rural sites.

2.2.46 Can phases be identified during which the pattern of production and consumption (= whole finds assemblage) at Thurnham distinguish it from the other excavated sites. If so, do they correlate with changes in the structural forms present?

2.2.47 In terms of the decline of the villa sites do we witness a flourish of nucleated non-villa settlement at the time that the major villa settlements are going out of use? What changes can be observed in the artefactual record that may be associated with the changes in the distribution of activity in the landscape?

2.2.48 Does Bower Road represent a villa settlement? Is the aisled building actually the principal building of a small villa type settlement or a subsidiary building within a larger estate?

2.2.49 Non-villa settlements are often thought to belong to the ‘poor and lowly’ and those who failed to become ‘Romanised’. They tend to be defined by absence. No stone and ceramic building material. Lack of imported pottery and other items of material wealth such as decorative metal work, fewer coins etc. Do the non-CTRL sites support this model? What do quantification analyses of material culture indicate about the connection between villa and non-villa settlements and their economic and social relationships? For example numerous coins have been noted on ‘rural’ sites. This may suggest that their role in the economy may not be adequately reflected by their lack of structural evidence. Map the relative wealth between different site types through assemblage summary distribution plots.

2.2.50 Good bone preservation is important to address of age sex distribution, subsistence, and pathology injury and ethnic origins. The cemetery at Pepper Hill however fails to meet this basic criterion. Therefore the Pepper Hill cemetery data are largely limited to study of the grave assemblages themselves, the dating, interment sequence and type, orientation, type of container and generalised review of grave goods to inform status, belief and ethnic origin. Clearly the most important potential for research lies in the relationship of the cemetery evidence to Springhead itself. Because the CTRL work will be undertaken at a later date on this site it is recommended that these questions be revisited during any subsequent post excavation analysis in CTRL Section 2.

2.2.51 At Pepper Hill the detailed chronology is vital and AMS dates should be used to assess the dating of the latest phases. Nationally, it is still not clear how many "Late Roman" cemeteries continue beyond the fourth century.

2.2.52 Post excavation work for Pepper Hill will be aimed at maximising the presentation of factual data for future research by others. This will be accompanied by a detailed archive report on the sequence, structures and grave assemblages. Consideration of the cemetery, its sequence and range of burial rites will be synthesised with same period burial evidence from throughout the route in support of a high level statement on the distribution and type of RB burial practice from differing contexts (see above 17).

2.2.53 Updated research framework - The late Roman-medieval transition:

2.2.54 The key objective will be to identify and report on 5th and 6th century data presenting the context, setting, taphonomy and site formation processes in some detail. Is the wealth of negative evidence a result of, site taphonomy, post depositional processes and field visibility biases?

2.2.55 Perhaps the key question should be “do we know what we’re looking for?” Has a reliance on relative dating obscured a slow rather than abrupt ‘departure’ of the Romano-British cultural horizon? Selected late contexts should be subject to AMS dating of ceramic residues to attempt to see whether the fall off in Romanised material culture is as dramatic as we are led to believe (suitable contexts at Thurnham and Pepper Hill should be utilised if appropriate deposits are present). The relative fall off of Romano British material culture will then be mapped and integrated with the limited environmental evidence to attempt to understand 5th and 6th century landuse patterns.

2.2.56 The study of difference and differentiation will be central to understanding the period. Does the earliest clearly Anglo-Saxon material occur in clear stratigraphic and spatial relationships to the ultimate Romano-British contexts? NW European parallels may be an important source of comparanda for this discussion. What does the 5th and 6th century evidence from CTRL illustrate about the relative socio-economic or political contacts that were developing towards the end of the RB period with the NW European Germanic ‘homelands’ and Gallo-Roman provinces.

Towns and their Rural Landscapes II – The Post Roman and Anglo-Saxon Landscape (500 AD to 1000AD)

2.2.57 Updated research framework – Anglo-Saxon period:

2.2.58 In general the relationship of Britons and Saxons is difficult to interpret from the archaeological record due to the lack of settlement evidence. Can the dating of the earliest Saxon contexts be correlated temporarily to the latest Romano-British contexts? Mapping well dated activity across the sample may illustrate hiatus or contemporaneous activity zones in the landscape. Can changes in the existing settlement patterns be correlated with differing occurrence of artefact groups and perhaps immigration patterns?

2.2.59 The presence of two population groups at Saltwood and Cuxton and the siting of the cemeteries within established prehistoric landscapes will provide a framework for discussing issues of migration, integration, and socio-political or

ideological meaning behind the material cultures represented and the relationship with past landscapes and peoples.

2.2.60 Distinctive grave goods at Kentish cemeteries suggest that Frankish influence was also prevalent in the Eastern Kent region. Can separated Jutish and Frankish traditions be illustrated at Saltwood or is the presence of diverse material culture merely a reflection of close integration between diverse immigrant groups mixing lineage's during the establishment of the kingdom?

2.2.61 What do the cemeteries indicate about the social organisation of the populations? What similarity and differences can be ascertained? Is a range of social groups represented? Utilise the grave groups to propose a model or models for the source populations. How do different burial rites inhumation architecture and spatial distribution reflect cultural origins (for example the row graves at Saltwood could be assimilated to Frankish traditions, does the accompanying material culture?).

2.2.62 Key objectives for the cemetery analyses will be to:

2.2.63 Accurately phase the development of the cemeteries through adoption of an absolute dating programme of C14 dates integrated with stratigraphic data.

2.2.64 Provide a grave good seriation correlated to the absolute dating programme to demonstrate the use and deposition of funerary objects.

2.2.65 Can analysis of the burial ritual help in assessing cultural affiliations.

The Medieval and Recent Landscape – 1000 AD to the modern day

2.2.66 Updated research framework – Medieval period and recent landscape:

2.2.67 Trade and exchange. Do distributions of ceramics (and other classes of artefactual and environment/economic material) fall into meaningful patterns? Can economic/political/social affiliations be identified in such patterns? Eg. Church/secular lordships. Influence of urban centres, Canterbury/London. Pottery supply, Ashford/Canterbury etc.

2.3 Ceramic assemblages summaries and methodologies

Earlier Prehistory (Neolithic to early Bronze Age inclusive)

2.3.1 Approximate totals: 1344 sherds (?5342 g) from 13 site assemblages

2.3.2 Lead specialist: Alistair Barclay (OA)

2.3.3 Three of these assemblages are very small (less than 20 sherds) and require limited further recording work in line with the adopted standard. Larger assemblages are from White Horse Stone, Beechbrook Wood and Tutt Hill, of which the first, at least, is of national importance because of its associations with a Neolithic long house.

2.3.4 Recording Methodology

2.3.5 Recording of this material will follow the nationally-accepted standards set out by the Prehistoric Ceramics Research Group (hereafter PCRG; PCRG 1997). These cover approaches to recording the basic ceramic attributes defined in the UPD specification. In addition, any evidence for characteristics (such as soot, limescale, abrasion etc) which shed light on vessel use will be noted and sherd thickness will also be recorded. This last aspect has been shown to be of considerable value in characterising prehistoric assemblages, to the extent that in combination with other attributes it can assist in assessment of the date of groups which may contain few other diagnostic characteristics. With regard to the recording of fabric there is no likelihood that fabrics defined in relation to Canterbury based work will be routinely encountered in CTRL Section 1 sites. It is therefore proposed that site or site-group specific fabric series be established. These will reflect the generally (but not universally) local nature of prehistoric pottery production. These fabric series will be cross referenced to each other and to any relevant Canterbury fabrics where appropriate. The proposed measures are: sherd count and weight by fabric/record per context, and EVEs (strictly rim equivalents - REs) for rim sherds.

Later Prehistory (Middle Bronze Age to middle Iron Age inclusive)

2.3.6 Approximate totals: 24907 sherds (181638 g) from 33 site assemblages

2.3.7 Lead specialist: Elaine Morris (University of Southampton)

2.3.8 Thirteen of these assemblages are small (less than 20 sherds). White Horse Stone provides the largest (c 7900 sherds) and probably the most significant assemblage, with a nationally important group of early Iron Age material. A number of other assemblages are numerically significant, with four groups of over 2000 sherds and two more well over 1000 sherds. Both Beechbrook Wood and Tutt Hill have assemblages which are important for understanding the Middle to Late Bronze Age transition and the Cobham Golf Course material may also be relevant to this question. The Beechbrook Wood assemblage also includes a particularly important group of early Later Bronze Age plain ware.

2.3.9 Recording Methodology

2.3.10 The approach to recording this material will be very similar to that for the earlier prehistoric assemblages. PCRG standards will again be applied to inform the approach to recording the characteristics defined in the PX specification. Again, recording of use-related characteristics and of sherd thickness is considered essential to provide adequate characterisation of these assemblages. The approach to fabric definition and recording will be similar to that suggested for the earlier prehistoric material, i.e. one or more stand-alone fabric series will be generated based on coherent groupings of sites which are likely to have drawn on the same or similar range(s) of sources of supply. These series will be correlated with each other and will be cross-referenced to Canterbury fabrics where appropriate.

Late Iron Age and Roman

2.3.11 Approximate totals: 62096 sherds (562003 g) from 46 site assemblages

2.3.12 Lead specialist: Paul Booth (OA)

2.3.13 This period assemblage includes 14 small groups (less than 50 sherds) and larger assemblages from the Pepper Hill/Waterloo Connection cemetery and from the villa at Thurnham. The former is of national importance and the latter of major regional importance. At least 14 assemblages have significant evidence for ceramic continuity from the late Iron Age into the Roman period. Together these assemblages have great potential for illuminating the transition between these periods in terms of the extent, nature and chronology of the adoption of 'Romanised' wares and vessel types. Routewide comparison of these assemblages may allow refinement of the absolute chronology of the 'late Iron Age'.

2.3.14 Recording methodology

2.3.15 The Study Group for Roman Pottery (SGRP) does not have a general standard for detailed recording of Roman pottery since its 1994 Guidelines relate only to basic archive records (Darling 1994). The principal attributes set out in the PX specification form the basis of an acceptable record, but as for the prehistoric periods should be supplemented with coded data relating to vessel use and reuse. The current OA Roman pottery recording system, for example, provides a simple approach to this. Fabric codes will be defined in terms of the Canterbury fabric type series, though it is unlikely that the latter will provide comprehensive coverage of the range of Roman material to be examined. Some preliminary checking and generation of at least one duplicate copy of the relevant part of the Canterbury series, along with associated updated documentation, will be an essential preliminary task before recording using this system can commence. Provision will also need to be made for addition of new fabrics to the series. This will ensure that known gaps in the series are filled before, rather than after, the start of recording and analysis. Fabrics will also be cross-referred to the National Roman Pottery Fabric Reference Collection (Tomber and Dore 1998) where relevant. Vessel form coding (not present in the CAT system) will follow the expanded version of the Southwark type series (Marsh and Tyers 1978) currently employed by MoLSS specialists. Reference may also be made to the type series of Monaghan (1987) where this is helpful for individual forms. A correlation between these two coding systems will be produced and included in the pottery database.

2.3.16 Two additions to the basic attributes list are proposed in the specific context of the cemetery assemblage from Pepper Hill. The first is a field for a measure of vessel completeness, intended both to assist consideration of the integrity of grave groups and as a way to record the state of vessels at the time they entered grave assemblages - recent work shows that such assemblages can contain a significant proportion of deliberately damaged vessels, for example. The second is a field for interpretative type, an assessment of the potential function of the vessel within the grave assemblage, as an aid to comparative analysis of these assemblages. For Pepper Hill, in particular, it is important that Monaghan's series be used as the primary record of vessel type.

2.3.17 For Pepper Hill, unusually, it may be possible to calculate the vessel population on the basis of vessel count. This is the most meaningful measure for this assemblage but is not appropriate to other groups from Section 1. The

other measures will allow comparison between Pepper Hill and the other assemblages.

Post-Roman (Early Anglo-Saxon to post-medieval inclusive)

2.3.18 Approximate totals: 9661 sherds (115535 g) from 33 site assemblages

2.3.19 Lead specialist: Lorraine Mepham (WA)

2.3.20 The period assemblage includes 13 small groups (less than 20 medieval or earlier sherds). There is an important early Anglo-Saxon cemetery assemblage from Saltwood Tunnel and a very small group of similar date from Tutt Hill. Middle and later Saxon pottery comes from Mersham and Westenhanger Castle with further small groups from Boarley Farm West and Holm Hill. The principal medieval assemblage is that from Parsonage Farm (*c* 3800 sherds) and a further substantial group came from ARC Area 420 near White Horse Stone. The remaining assemblages are rather smaller, but despite this a number have produced material of interest both in ceramic and wider terms. The Parsonage Farm assemblage is of particular importance both for its site associations (a moated site) and also as a type site for products of the relatively poorly-known Ashford kiln recorded in 1952.

2.3.21 All the post-medieval pottery assemblages from CTRL Section 1 are very small and no further detailed analysis is proposed for them.

2.3.22 Recording methodology

2.3.23 The characteristics to be defined and quantification methodologies specified are consistent with standards set out by the Medieval Pottery Research Group (MPRG; Slowikowski et al 2001). Canterbury (CAT) fabric codes will be used to classify the material where possible and new codes will be added to the series where appropriate. Characterisation of vessel form will follow MPRG standards.

Date

2.3.24 Determining the date of individual sherds and context groups is of crucial importance for the success of the post-excavation programme. The existing corpus of spot dates derived from assessments provides a guide to chronology of varying reliability. It is only to be expected that further, more detailed work will at least refine some of this dating and in other cases may change it more radically.

2.3.25 In the pottery database date will be recorded for individual sherds, and for whole assemblages deriving from context sub-groups and groups, as appropriate. Individual sherd/record date will be expressed as earliest and latest dates (one data field each). Some of these dates can be generated automatically on the basis of preceding assessment data in the relevant record, such as fabric, type, or fabric and type, which will tend to offer the most closely datable combination of attributes. Aspects of decoration may also provide distinct chronological indicators.

2.3.26 Assemblage group date, which will be expressed as beginning and end dates of a range, will contain an element of interpretation. These dates will generally define the range within which the group should fall. Such a date range may

only constitute a *terminus post quem* and that the actual date of context deposition of the group could be later than the range. The range given may well be narrower than that indicated by the earliest and latest dates found in the individual component records of the context group - such dates can be used to give outer limits for the date range of the group, if preferred, but normally the context group date would be expected to be more closely defined than the dates of some of its individual components. The given assemblage group date range will relate solely to the material recorded within the relevant major period group. It is not equivalent to the stratigraphic date of deposition and takes no account of the presence of any other material (see further below).

2.3.27 All these dates will be expressed in numerical terms in line with RCHME requirements (RCHME 1993).

2.3.28 A final date field will serve as a quick cross-reference to ceramic material of other periods. This indicates to the period based specialist (by the use of a simple letter code, E for earlier material, L for later material, or EL if both are present) that other material also derives from this context. The detailed assessment of the relevance of material from two or more major periods lies (initially at least) outside the scope of work of the individual period based specialist, but it is sensible for awareness of the presence of this material to be raised within the specialist database.

References

Darling, M, 1994 (ed) G*uidelines for the archiving of Roman pottery*, Study Group for Roman Pottery Guidelines Advisory Document 1, London

Marsh, G, and Tyers, P, 1978 The Roman pottery from Southwark, in *Southwark excavations 1972-1974*, Joint Pub No 1 London and Middlesex Archaeol Soc, Surrey Archaeol Soc, 533-582

Monaghan, J, 1987 *Upchurch and Thameside Roman pottery*, Brit Archaeol Rep British Ser 173

PCRG, 1997 The Study of Later Prehistoric Pottery: General Policies and Guidelines for Analysis and Publication, Prehistoric Ceramics Research Group

RCHME, 1993 *Recording England's Past: A data standard for the Extended National Archaeological Record*, Royal Commission on the Historical Monuments of England/Association of County Archaeological Officers

Slowikowski, A, Nenk, B, and Pearce, J, 2001 *Minimum standards for the processing, recording, analysis and publication of post-Roman ceramics*, Medieval Pottery Research Group Occ Paper No 2

Tomber, R, and Dore, J, 1998 *The national Roman fabric reference collection: a handbook*, Museum of London Archaeol Services Mono No 2

3 ENVIRONMENTAL REMAINS RECORDING AND ANALYSIS: RESEARCH AIMS, GENERAL METHODOLOGY AND TASK LISTS

3.1 Introduction

3.1.1 The research aims listed below are a compilation of palaeoenvironmental and palaeoeconomic aims extracted from Part 2.37 of the UPD. Research questions concerned with patterns at a regional level will be addressed by a programme of palaeoenvironmental and palaeoeconomic research, comprising identification, quantification and analysis of charred plant remains (including wood charcoal) waterlogged plant remains, pollen, molluscs and geoarchaeology. These aims have been compiled by the RLE archaeology team in consultation with the UCL academic team.

3.2 Research Aims

3.2.1 The following research aims, extracted from the Revised Research Framework, are to be addressed at the route-wide level.

Hunter-gatherers – The Mesolithic and Early Neolithic Transition

3.2.2 Key sites: Northumberland Bottom, White Horse Stone, Sandway Road (East of Station Road?)

3.2.3 Original research aims:

3.2.4 Define the nature of contemporary geomorphology and environment and its natural changes through time.

3.2.5 Define the range of human activity and where it took place, particularly through the study of palaeo-economy.

3.2.6 What was the effect of climatic and environmental changes on human lifeways and adaptive strategies?

3.2.7 Revised palaeo-environmental research aims, drawn from the Revised Research Strategy, include the following:

3.2.8 All lines of palaeo-environmental data shall be used to produce a landscape reconstruction of the contemporary environment.

3.2.9 Does the data inform a variability pattern in site type or location that may be attributed to geomorphological (including soil type), raw material source, or environmental factors (hydrography, altitude, orientation, vegetation)?

3.2.10 What plant foods are found in association with the in-situ assemblages? Can the presence of cereal remains at Sandway Road be resolved? What is the cereal taxa – is there evidence for domestication? How does the context of the find relate to other similar claims for early cereal use in the UK?

Neolithic Landscape

3.2.11 Key Sites: Northumberland Bottom, White Horse Stone, Sandway Road, Tutt Hill, Saltwood Tunnel.

3.2.12 Original research aims:

3.2.13 Define the nature of the contemporary environment.

3.2.14 Determine the nature and effect of clearance for agricultural activity.

3.2.15 Revised research aims:

3.2.16 All lines of palaeo-environmental data will be used to produce a landscape reconstruction of the contemporary environment.

3.2.17 Is there evidence for an ever-intensifying clearance of woodland? Can this be related to increased agricultural land-use?

3.2.18 Is the evidence for clearance distributed across the route or only where associated with particular activity or settlement evidence? Are cleared areas in the Mesolithic 'reoccupied' in the Early Neolithic? Can sites such as Sandway Road and Beechbrook Wood demonstrate this?

3.2.19 Do the Neolithic buildings at White Horse Stone represent residential settlement occupation or did they have some other purpose? Does the evidence from dry valley sequences along the CTRL route suggest that the rarity of Neolithic settlement sites is due to preservation conditions.

3.2.20 What is the range and distribution of animal and plant remains in the Earlier and Later Neolithic? Do they represent 'economic' data or are they limited to contexts demonstrating a 'ritual' or 'socio-structured' role?

3.2.21 The Neolithic structures at White Horse Stone are unique to Kent at this time. Detailed research objectives require finalising with reference to the White Horse Stone assessment report. It will be necessary to refer to these in detail in preparing the White Horse Stone Site Report.

Early Bronze Age Landscape

3.2.22 Key sites: Whitehill Road Barrow, Zone 2 WB. West of Northumberland Bottom, White Horse Stone, Tutt Hill, Saltwood Tunnel.

3.2.23 Revised research aims:

3.2.24 Is there evidence for an expansion of clearance and agricultural pastoralism or crop production in the EBA? Quantify and plot crop and animal bone evidence. What is the context of this evidence (ritual or domestic deposition)?

Early Bronze Age / Middle Bronze Age Transition

3.2.25 Key sites: Whitehill Road Barrow, West of Northumberland Bottom, White Horse Stone, Tutt Hill, Saltwood Tunnel

3.2.26 Revised research aims:

3.2.27 The appearance of farms and field systems has been taken to indicate agricultural intensification. What evidence is there in the CTRL dataset to support this? What can we identify about agricultural technology and farming regimes to contribute to this question? Are new soil types exploited in this period or earlier in the Bronze Age?

3.2.28 What is the pattern of colluvial deposition? Can a chronological and spatial model be developed to query the assumption that more widespread colluvial events are indicative of increased intensity in agriculture? Can soil erosion be related to plough agriculture or forest clearance?

The Later Bronze Age Landscape

3.2.29 Key sites: Tollgate, Cobham Golf Course, White Horse Stone

3.2.30 Original research aims:

3.2.31 Consider environmental change resulting from landscape organisation and re-organisation.

3.2.32 Revised research aims:

3.2.33 Changing environmental conditions have been associated with the development of an organised agricultural landscape. Colluvial deposition is often cited as an effect of woodland clearance and soil erosion resulting from agricultural activity. It is possible that a climatic deterioration also occurred during the period towards the end of the 2nd millennium BC. Can interrelationship of climatic change, landscape re-organisation and agricultural activity (and soil types) be demonstrated by the CTRL data to determine a historical reconstruction of changing environmental conditions?

3.2.34 What do the plant and animal assemblage data indicate about the relative role of pastoral or mixed farming? How is the evidence related to the expansion of field systems and land division? What evidence is there for increasing use of plant and animal resources for non-subsistence uses such as textile production?

3.2.35 What is the relative occurrence of different crop regimes? Is there an increasing use of spelt as opposed to emmer wheat chronologically? What new crops are introduced? Can the pattern of crop use be related to soil type and altitude? What other socio-economic or technological factors are relevant to crop selection?

3.2.36 Is there evidence for processing and storage of agricultural products in this period? Can we talk of an agricultural surplus, and if so can this be related with other lines of enquiry to demonstrate the socio-political drivers of the expanse of formally exploited agricultural landscapes?

3.2.37 Can patterns of soil type exploitation be demonstrated? What is the relation of field systems to the natural hydrography and altitude? Can a route-wide model be proposed for this range of attributes?

The Early and Middle Iron Age Landscape (c.800 to 300 BC)

3.2.38 Key sites: Tollgate, Northumberland Bottom, Cuxton, White Horse Stone, Beechbrook Wood, Parsonage Farm, Little Stock Farm, Saltwood Tunnel.

3.2.39 Revised research aims:

3.2.40 Major themes include population growth, reflected in expansion onto previously un-exploited soils, and the development of more nucleated social groups, evidenced by the return of enclosed settlements in the middle and later Iron Age.

3.2.41 Is the 'expansion' of settlement related to increased production specialisation, as inferred by the large scale exploitation of the weald iron ore for example, or increased standardisation or centralisation of pottery production. Can the evidence for agricultural regimes be integrated to demonstrate region-wide socio-economic change?

3.2.42 Detailed knowledge of agricultural practise in this period is poor. Effort will be made to maximise reporting of animal and plant remains to help inform 1st Millennium practises.

3.2.43 Can patterns of variable crop and animal husbandry (arable versus pastoralism) be related to different altitude and soil types? Is the introduction of bread wheat grain (spelt wheat replacing traditional emmer varieties) related to the expansion onto heavier soils?

3.2.44 Does the evidence of environmental change in the period (pollen sequences) show any regional variation in the impact of human behaviour on the landscape? Does the evidence indicate a worsening of climatic conditions up to 400BC and thereafter some improvement?

3.2.45 Can climatic variation be related to a visible (and related?) expansion into heavier soils and increased woodland clearance? Does the crop regime reflect either climatic changes or selection of different soils?

3.2.46 Environmental analysis will be based on a routewide environmental reconstruction of change, overlaid with studies of crop and animal distributions through time. Major patterns will be identified and discussed in terms of environmental and social change.

3.2.47 Is a large scale landscape re-organisation visible that can be correlated with any of the above possible causative factors? Is increasing production and or increased population in evidence? Are field systems laid out as an indication or effect of the politicisation and formalism of society related to environmental factors related to improving climate after 400BC?

3.2.48 Knowledge of the early use of iron is rare in the region and priority should be given to close dating of such evidence and technological analysis of any production evidence. Slags, moulds, crucible and hearth linings should be targeted for precision dating if suitable samples are available (White Horse Stone). Ore sources may be determined through geological analysis. Charcoal analysis can be used to compare and contrast EIA fuel use with later periods.

The Later pre-Roman Iron Age and Romano-British landscapes (c.300Bc to c.AD500)

3.2.49 Key sites: Pepper Hill Cemetery, Northumberland Bottom, Tollgate, Thurnham Roman Villa, East of Station Road, Bower Road, Saltwood Tunnel, 330 Z2 WB

3.2.50 Original Research aims:

3.2.51 Did population increase and concentration effect natural resource exploitation and accelerate environmental change?

3.2.52 Updated research framework:

3.2.53 The Romano-British landscape is recognised through the mapping of trackways, roads, boundaries and other field-system elements set against vegetation history, topography and hydrology. Mapping patterns of continuity and change can help us to understand the movement through and interaction between communities (ibid.). Can we demonstrate social and economic relations between various site types through mapping the form, extent and chronology and interaction of these landscape features and their interaction with environmental variables?

3.2.54 What soil types and altitudes govern the presence or absence of agricultural practises and settlement? For instance Champion (1994) recognises that non-villa rural settlement appears to be relatively absent in the lower greensand and weald regions. To what extent is this pattern the product of research opportunity rather than a true reflection of settlement in this period? Mapping of the CTRL activity will add significant data to this question. Can new patterns be identified and models proposed for future site prediction studies?

3.2.55 How is Romanisation indicated through the study of agricultural regimes and crop husbandry practise? What evidence is there for diversification or intensification in agricultural production through time?

3.2.56 Looking at patterns of consumption (seeds, bones and artefact assemblages) within the tighter chronology proposed. Can we see changes in the way that surplus was used and in the ways that it was consumed ("foodways" = butchery practice, cooking and eating habits etc.)?

3.2.57 Is there any variation in these patterns that can be related to the different forms of settlement site identified (villa, non-villa etc.)? For instance is there evidence for feasting at villas?

3.2.58 Updated research framework - The late Roman-medieval transition:

3.2.59 It has been stated that environmental sequences through the 5th century indicate that by and large the countryside remains open and exploited. Does the CTRL data support this view?

Towns and their Rural Landscapes II – The Post-Roman and Anglo-Saxon Landscape (500 AD to 1000AD)

3.2.60 Key sites: Cuxton A-S cemetery, White Horse Stone?, Saltwood Tunnel A-S cemetery

3.2.61 Updated research framework – Anglo-Saxon period:

3.2.62 Is there a relationship between the selection of a Bronze Age barrow cemetery at Saltwood versus a river vista site at Cuxton in terms of different social groups? An understanding of the survival level of the prehistoric landscapes will be attempted through an integration of stratigraphic, soil-micromorphological study and pollen analyses.

The Medieval and Recent Landscape - 1000 AD to the modern day

3.2.63 Key sites: Mersham, Parsonage Farm, Talbot House, Bridge House, Yonsea Farm, Brockton Farm

3.2.64 Original research objectives:

3.2.65 In what ways was the local rural economy affected by Enclosure and agricultural intensification?

3.2.66 Consider the environmental effects of industrialisation.

3.2.67 Consider changes in land use and organisation following construction of the railways.

3.2.68 Updated research framework – Medieval period and recent landscape:

3.2.69 What is the reason for the abandonment or shift in settlement seen at Parsonage Farm and Westenhanger?

3.2.70 What function do the structures at West of Sittingbourne Road, Bowers Lane and Saltwood have, and how does this relate to changes in landscape and resource utilisation?

3.2.71 Are such changes economical, social and/or political in origin? Are they related to changes in population densities, and intensification (or otherwise) of agricultural use?

3.2.72 Can changes through time in resource use/industrialisation (eg. changes in Mersham iron working) be identified in the CTRL sample? Is there evidence for inter-site specialisation?

3.2.73 Trade and exchange. Do distributions of ceramics (and other classes of artefactual and environment/economic material) fall into meaningful patterns? Can economic/political/social affiliations be identified in such patterns? Eg. Church/secular lordships. Influence of urban centres, Canterbury/London. Pottery supply, Ashford/Canterbury etc.

3.2.74 To what extent can the archaeological evidence be related to documentary evidence for particular sites and localities along the CTRL route? Can the combination of such sources inform issues such as changes in landscape use, resource utilisation, changes in land ownership? Are any such identified changes political, economical or environmentally determined (see also 3 above)?

Macroscopic Plant Remains Method Statement

3.2.75 Identification and reference:

3.2.76 A binocular microscope with a magnification of up to x40 will be used for the sorting and the identification of the plant remains.

3.2.77 The identification of the plant material will be carried out with the aid of a botanical reference collection held by the Museum of London Specialist Services, Wessex Archaeology or the Oxford University Museum.

3.2.78 Reference manuals will also be consulted for identification purposes, eg. Berggren (1969, 1981), Anderberg (1994), Beijerinck (1947).

3.2.79 *New flora of the British Isles* (Stace1991) will be used to obtain the up-to-date taxonomy for the different plants.

3.3 Charred plant remains

3.3.1 All identifiable charred plant remains in primary context will be sorted and extracted from the dried flots and full identifications made of all items.

3.3.2 For exceptionally large flots, which contain large amounts of charred plant remains, a riffle box, which divides the flot into random sub-samples, may be used to obtain a sub-sample of 400-500 items. If time permits, the remaining unsorted fractions will be scanned for additional species.

3.3.3 Full counts will be made of all identifiable items.

3.3.4 Full tables of all identifications will be prepared.

3.3.5 Smaller tables and graphs may be used to illustrate specific points.

3.3.6 Consideration and comments will be made on:

- Raw counts.
- Proportions: the ratios of different types of charred material, i.e. grain to chaff to weed seeds, within a sample assemblage will be examined because these may be directly related to particular products and by-products associated with crop-processing activities.
- Density: the number of items per litre of soil will be recorded.

3.4 Wood Charcoal Analysis

3.4.1 The tasks listed below have been selected to best fulfil the principal aims of this investigation which can be summarised as follows:

3.4.2 Identify any patterns or changes in modes of wood-use both spatially and over time; especially the use of wood in association with:

- funerary activities
- metal-working/industrial activities.
-

3.4.3 Assess the evidence for the selection and avoidance of woods associated with diverse domestic and non-domestic activities; including the social role of woody plants e.g. possible ritual use in association with funerary activities.

3.4.4 Assess the contribution tree & shrub communities made to the natural and cultural landscape (local and regional scale) and changes in the composition and availability of woodland resources; in particular through the effects of human exploitation, e.g. woodland management, clearance.

Methodology: sample selection, quantification, and analysis:

3.4.5 The following criteria were employed to identify samples suitable for detailed analysis

Context

3.4.6 Only samples from primary contexts are considered for further analysis. Some contexts have been excluded because it was thought the information gained would add little to our understanding of the palaeoenvironment or the nature of woody plant exploitation. For this reason samples from most of the smaller sites have not been selected for further study. Where appropriate, recommendations suggested in the assessment reports were followed.

3.4.7 Hearth, pit, and ditch context samples have been included for analysis where it is believed a). that the information gained could help clarify the possible function of such features and the activities associated with them, and/or, b). may provide greater information on the range of taxa available in the site environs, and possibly exploited for less specific daily tasks, than that available from samples associated with specialised activities.

3.4.8 Samples from post-holes, post-pits, and other probable structural features, are included where it is thought they will provide evidence of wood used in a structural capacity.

Quantity & fragment size

3.4.9 Following Keepax's (1988) recommendation that to recover the full range of taxa present in a given sample a minimum of 100 fragments (optimally 300 fragments) per sample should be examined - priority is given to individual samples listed as containing a minimum of 100 fragments. Samples of this size were not always present and so samples containing 51-100 fragments have been chosen where necessary. In some instances, e.g. samples from White Horse Stone, individual samples were small but judged to be worth examining because of the specific information they may provide.

3.4.10 Selection of samples for the following tasks was based on the quantities of charcoal at least >2mm in size, the minimum necessary for positive identification, listed in the assessment reports.

3.4.11 Only charcoal >5.6mm has been recorded in assessments of Saltwood Tunnel, thus reducing the potential quantity of charcoal per sample/context that can be considered as available and suitable for detailed analysis. It is proposed that the substantial multi-period assemblage from Saltwood Tunnel is analysed, as no identifications were made at the assessment stage.

Condition

3.4.12 Charcoal in poor physical condition can be difficult, if not impossible, to positively identify and is a time consuming process. Only samples listed in the assessment reports as 'well preserved', 'clean' or, 'in good condition', will be subject to recording and analysis.

Quantification

3.4.13 No attempt will be made to quantify the results statistically in terms of fragment counts or weight. Only the presence of a taxon in a sample will be accorded any real significance. However, fragment counts will be recorded for each taxon in each sample for all samples examined and may be used as an indication of relative abundance during interpretation of the results.

3.4.14 Data from the larger sites and assemblages will be analysed in terms of taxon 'Ubiquity' (Popper 1988) where possible. This form of presence analysis should allow meaningful comparisons to be made within and between samples and contexts and thus help identify any trends in sample/context composition.

Analysis

3.4.15 Fragments will be examined using an epi-illuminating microscope at magnifications up to X400. Identifications will be confirmed with reference to Schweingruber's (1991) Anatomy of European Woods and, if necessary, modern specimens in the wood and charcoal reference collection held at the Institute of Archaeology, UCL.

3.4.16 In addition to determining taxon identity, evidence of thermal and/or biological degradation, ring growth patterns, and number of rings, will be recorded if and where appropriate.

References

3.4.17 Keepax, C. (1988), Charcoal analysis with particular reference to archaeological sites in Britain. Unpublished PhD Thesis submitted to the University of London (UCL).

3.4.18 Popper, V. S. (1988) Selecting qualitative measurements in palaeoethnobotany. In: C. A. Hastorf and V. S. Popper, Current Palaeoethnobotany. Chicago: University of Chicago Press pp53-71.

3.4.19 Schweingruber, F. H. (1991), Anatomy of European woods. Swiss Federal Institute for Forest, Snow & Landscape Research.

3.5 Waterlogged plant remains

3.5.1 Process soil in the laboratory and sub-sample the sample incrementally to obtain the full range of taxa in the sample starting with 100-150ml of soil.

3.5.2 In the case of highly organic samples, which may include very fragile plant material, such as leaf and stem fragments, the soil matrix will first be carefully dissected using a scalpel blade. Only when it has been determined that any

fragile material has been extracted, e.g. leaf fragments, will the sample be carefully wet-sieved for the recovery of the smaller less visible plant items.

3.5.3 The samples will be scanned wet. Records will be made of the identifications without extracting the remains; the exceptions being unidentifiable items and any unusual or exotic plant items.

3.5.4 Quantify the material by using a 5 points scale: 1. = 1-5 items, 2. = 6-25, 3. + 25 – 100, 4. = 100- 500, 5. = 500+, exceptionally abundant.

3.5.5 The exception is the well at Thurnham Roman villa, where all the identifiable material will be extracted and quantified.

3.5.6 Presentation: full tables of identifications in taxonomic order will be prepared.

3.5.7 Sub-tables showing plants ecological preferences will be prepared.

3.5.8 Non-seed material. e.g. moss: will be identified by appropriate specialist.

References:

3.5.9 Anderberg A-I. 1994 *Atlas of Seeds* volume 4

3.5.10 Beijerinck, W, 1947 Zadenatlas der Nederlandsche Flora

3.5.11 Berggren G. 1969 *Atlas of Seeds*, volume 2

3.5.12 Berggren G. 1981 *Atlas of Seeds*, volume 3

3.5.13 Stace C, 1991 New flora of the British Isles. Cambridge

3.6 Geoarchaeology

General methodologies

3.6.1 The aim of the geoarchaeological analysis is to examine how the deposits recorded in each location accumulated, and were subsequently transformed ('site formation processes') and thus to determine what environment (man-made, natural or both) they represent. This information will contribute to:

3.6.2 The interpretation of various features, which the deposits fill or form.

3.6.3 A better understanding of the taphonomy of pollen and other environmental inclusions recovered from the deposits (ie: the processes by which living communities formed death assemblages). Stratigraphic integrity and bioturbation issues will also influence the strategy employed for pollen sampling (or whether it is carried out at all) and ^{14}C sample choices.

3.6.4 The reconstruction of the changing environment.

3.6.5 The geoarchaeology contribution to the UPD includes the **pollen, diatoms** and **soil micromorphology** components, as these techniques are closely related to the geoarchaeology. They are either based on sub-samples taken

from the geoarchaeological monoliths or are directly concerned with the interpretation of site formation processes. All these techniques play a large part in the reconstruction of past environments, which is in this project a part of the 'environmental assemblage' package, which includes the analysis of plant remains, molluscs and insect remains.

Monoliths

3.6.6 Where monolith description has not already been undertaken, the monoliths will be described loosely according to Jones et al. 1999, to include information about:

- Depth
- Texture
- Composition
- Colour
- Clast orientation
- Structure (bedding, ped characteristics etc)
- Contacts between deposits

3.6.7 A full description of any profile targeted for further analysis and those previously assessed and referred to in the text, though not taken to analysis, will be summarised for the site archive.

3.6.8 Sub-samples for pollen, additional sedimentary techniques and in some cases thin section analysis have been (or will be) taken from the monoliths. Illustrations (in schematic section/profile form) will be prepared relating the location of sub-samples (eg: for pollen and further sedimentological techniques) to the monolith samples and showing the relationship of the monolith units to the site stratigraphy and to OD heights. The monolith samples will also be located on a plan of the site.

3.6.9 The geoarchaeologist responsible for the description and sub-sampling of the monoliths will integrate the results of any sub-samples taken from and in association with the monoliths (pollen, radiocarbon dating, soil micromorphology etc) as appropriate.

Sample selection and preparation

3.6.10 Samples will be selected following recommendations in the assessment. Sub samples for pollen, magnetic susceptibility and loss-on-ignition will be collected as 1cm splits generally from every other centimetre. Sub samples for soil micromorphology, where not taken as separate kubiena samples, will be cut from the monoliths using small tins, specially made for MoLAS for this purpose. The depth measurements shall be recorded on the monolith description sheets and onto an EXCEL spreadsheet.

X-radiography

3.6.11 The plastic lined samples will be x-rayed using an x-ray machine and KODAK Pb contact film. Tests will be undertaken to determine the best exposure rates. Methods and interpretation will follow those outlined in Barham 1995.

Magnetic susceptibility

3.6.12 Magnetic susceptibility will be obtained using a dual frequency Bartington MS 2B meter. Subsamples will be air dried and sieved to <2mm, then weighed to exactly 5g. Measurements for each sample will be taken at both low (0.43kHz) and high (4.3kHz) frequencies. Low frequency magnetic susceptibility (χlf) measures the ease with which a sample can be magnetised and is proportional to the concentration of ferrimagnetic minerals (e.g. magnetite, maghaematite) in a sample. All measurements will be given on a mass specific basis (m3 kg-1). The high frequency (χhf) measurements will be taken in order to assess frequency dependant susceptibility (χfd), calculated as (χlf -χhf / χlf) x 100. χfd measures the extent to which susceptibility varies with the frequency of the applied magnetic field and is related to the percentage of fine magnetic grains at the stable single domain/superparamagnetic boundary (c.0.05µm). Such grains are commonly produced by pedogenesis (Gale and Hoare 1991). All measurements are given on percentage basis. Data will be logged onto an EXCEL spreadsheet and interpreted according to the principles outlined in Walden *et al* 1999.

Loss-on-ignition

3.6.13 Methodologies will follow those outlined in Gale and Hoare 1991. The sub-samples will be placed in a drying cabinet at 40°C to remove all moisture, ground using a pestle and mortar, sieved through a 2mm mesh to remove larger particles, placed in numbered crucibles and weighed using an electronic balance (to 2 decimal places). The crucibles plus sample will be fired to 550 °C in a muffle furnace for four hours. The samples will be cooled in the sealed furnace and then re-weighed. It is assumed the weight loss reflects the organic carbon content. The pre- and post-firing weights will be added to the EXCEL database. Carbonate measurement may be done if considered appropriate. This would involve re-firing to 1100 degrees and then reweighing each sample.

Particle Size

3.6.14 The samples will be dried, weighed and disaggregated in water. The suspension will be poured through a nest of sieves from 4mm down to 63microns, the residues air-dried, weighed and the silt+clay fraction (ie < 63 microns) calculated by subtraction. The data will be expressed as percentages and displayed in histogram form. The texture of the silt+clay fraction will be refined by additional 'finger-texturing' as appropriate (Canti 1991).

Pollen

3.6.15 Pollen analysis will be undertaken by Rob Scaife (Southampton), who will sub-sample any monoliths he presently holds, before passing them on to Jane Corcoran for description. Any monoliths at present held by OAU/MoLAS/Wessex will be sampled by Jane Corcoran. Wherever possible sub-sampling will be at standard 4 or 8cm intervals.

Preparation

3.6.16 Standard pollen procedures will be used for the extraction of the preserved pollen and spores. These procedures are detailed in Moore and Webb (1978) and Moore *et al.* (1991).

- Samples of 3-4 ml size.
- Deflocculation with 10% NaOh.
- Sieving at 150u for removal of the coarse fraction.
- Sieving at 10u (residue kept) for removal of clay.
- Hydrofluoric acid (boiling) digestion of silica.
- Erdtman's acetolysis (Sulphuric acid/Acetic Anhydride 1:9).
- Washing/centrifuging.
- Staining with aqueous safranin and mounting in glycerol jelly.

Examination and Identification

3.6.17 Pollen will be examined, identified and counted using an Olympus biological research microscope at magnifications of x400 and x1000 with normal transmitted and phase contrast lighting. An extensive pollen reference/comparative collection will be available for identification of difficult/critical taxa. Plant taxonomy will follow that of Stace (1991) and for pollen (in general) Moore and Webb (1978). A pollen sum of at least 400 grains per level excluding marsh/aquatic types and spores will be used.

Data Presentation

3.6.18 The data will be presented in standard pollen diagram form with the pollen of dry-land taxa calculated as a percentage of their sum. Marsh types and spores are as a percentage of the dry land sum + the sub-group. Diagrams will be plotted using Tilia and Tilia Graph.

Diatoms

3.6.19 Diatom analysis will be undertaken by Nigel Cameron, UCL.

3.6.20 Preparation and Identification

3.6.21 Diatom preparation will follow standard techniques (Battarbee 1986). Slides will be examined using a Leitz research microscope at a magnification of x1250 or x1000 under phase contrast illumination. Initial scanes will be undertaken to estrablish the potential of the site. A brief paper will be prepared and discussed with the AMLab before proceeding to an agreed analytical stage. Where possible a total of approximately 260-300+ diatom valves will be counted for each slide.

3.6.22 Where necessary diatom identifications will be confirmed using diatom floras and taxonomic publications held in the collection of the Environmental Change Research Centre (ECRC), UCL. The floras most commonly consulted are: Cleve-Euler (1951-1955), Hendey (1964), Hustedt (1930-1966), Werff & Huls (1957-1974). The principle source of data on species ecology used is Denys (1992).

3.6.23 Analysis and graphical representation.

3.6.24 The program TRAN (Juggins 1993) may be used for data manipulation and diagrams shall be plotted using TILIA and TILIAGRAPH

Ecological Attribution

3.6.25 Diatom species' salinity preferences will be classified using the halobian groups of Hustedt (1953, 1957: 199) summarised below:

- Polyhalobian: >30 g l-1
- Mesohalobian: 0.2-30 g l-1
- Oligohalobian - Halophilous: optimum in slightly brackish water
- Oligohalobian - Indifferent: optimum in freshwater but tolerant of slightly brackish water
- Halophobous: exclusively freshwater
- Unknown: taxa of unknown salinity preference.

3.6.26 (However, as the nutrient range of the diatoms will be more meaningful for the work undertaken during CTRL1, the taxonomy will be grouped according to nutrient range for this project, if possible. In addition the taxonomy will be harmonised with the nutrient training set, nutrient reconstruction will be undertaken (transfer function), a diagram produced and the data analysed).

Soil Micromorphology

3.6.27 Soil micromorphology analysis will be undertaken by (specialist to be appointed).

3.6.28 The microstratigraphic analysis will include soil micromorphology, microprobe and chemical analyses (as appropriate). Where thin sections have not already been manufactured, samples will be air- then oven-dried at 40oC, consolidated with crystic resin, cured and slabbed into thin-section sized blocks, which will be made into thin sections (Stirling, RHUL, Cambridge or Oregon). The thin sections will be cleaned and polished using 1,000 grade carborundum paper. The slides will be left uncovered in case they need to be studied by microprobe etc.

3.6.29 The thin sections will be examined at magnification from x1 to x400, under plane polarised light, crossed polarised light, oblique incident light, and fluorescence microscopy. The latter in order to search for autoflourescent materials, such as recent root material and calcium phosphate (‘apatite’), in the form of bone, mineralised coprolites and secondary mineral accumulations such as hydroxyapatite. Observations will be made regarding the biological and anthropogenic inclusions, fabric types and features indicative of depositional and post-depositional processes. Interpretations will be based upon Bullock et al 1985, Kemp 1995, Courty et al 1989 and previous experienced gained from the study of similar deposits.

Numerical soil micromorphological analysis:

3.6.30 Thin sections can be studied at two levels. Often soil micromorphological description provides sufficient data to allow an interpretation of a past soil’s history. On the other hand, description can be followed by numerical analysis of the described features and components, in order to more accurately resolve questions of site formation processes.

Chemical analysis

3.6.31 Prior to impregnation bulk samples will be taken from the samples in case it proves necessary to carry out some additional tests. This might include bulk chemical analysis: loss on ignition (organic content), magnetic susceptibility (burning, weathering), concentration and types of phosphate (reflecting inputs of bone, dung etc), pH and carbonate (inputs of ash and secondary carbonate).

Presentation of results

3.6.32 Reports will contain diagrams of all geoarchaeological analysis schemes, showing sampling positions superimposed onto section drawings or maps, along with descriptions clarifying how the chosen technique answers the questions posed by the stratigraphy. Analytical results will be presented visually as well as verbally, e,g,

- Particle size diagrams (curves, histograms or ternary plots)
- Plots of variables such as magnetic susceptibility, where possible shown alongside each other in relation to the lithostratigraphy to allow comparison.
- Micrographs to show evidence from micromorphology

Summary of individual site methodologies

3.6.33 Site identifiers used follow *RLE UPD Part 4: integrated archive report specification*. The organisation follows that in the *RLE UPD Part 4: the environmental assemblages* as closely as possible, given the nature of the geoarchaeological samples.

Hunter Gatherers: Palaeolithic

3.6.34 The geoarchaeological samples spanning the Late glacial and Pleistocene/Holocene transition periods form part of 'pedo-sedimentary' sequences, extending into the Holocene period and will be treated at analysis as continuous profiles. In most cases, where the geoarchaeological sequences include material from later periods, the methodologies for those periods will be referred back to this section.

3.6.35 The late glacial environment as such is not mentioned in the *RLE UPD Part 2: revised research framework.* The 'hunter gatherers' section begins at the Mesolithic and Early Neolithic transition. It is assumed here that this includes the climatic fluctuations following the Last Glacial Maximum (LGM) that shaped the landscape and began the processes of climatic amelioration, plant and animal (including human) recolonisation that continued into the Holocene.

3.6.36 In addition to the site methodologies listed below, a route-wide summary of the geoarchaeology evidence of relevance to reconstructing the Late glacial environment will be prepared. Together with other lines of environmental evidence (principally snails from White Horse Stone) this will contribute to the reconstruction of the environment that preceded the earliest evidence for Mesolithic human activity found on the route, providing a background to the evidence for the post-glacial environment.

Nashenden Valley

3.6.37 Summary data

3.6.38 Undisturbed sediment samples: 1 kubiena tin

3.6.39 Three profiles, each recording a sequence of Pleistocene and Holocene valley side deposits, which included two possible buried soils (Late glacial and Holocene) were recorded by a geoarchaeologist on site and reported on at assessment.

3.6.40 Description of recording/analytical tasks required

3.6.41 As better sequences were sampled at White Horse Stone (CTRL 1) and in the Ebbsfleet Valley (CTRL 2), no further analysis will be undertaken. However, the geoarchaeology assessment will be summarised for the Site Archive Report and the soil block impregnated in resin (but no thin section made) to form part of the site archive, which would be available for future analysis.

White Horse Stone

3.6.42 Summary data

3.6.43 Undisturbed sediment samples: 10 monoliths & 11+? unprocessed kubiena samples. Also 12+ thin sections manufactured during assessment (RMcP's) kubiena tins

3.6.44 The valley bottom deposits sampled form a pedo-sedimentary sequence spanning the Late glacial (a tripartite sequence of solifluction - soil formation - solifluction) to later prehistoric periods (soil formation – colluvium - soil formation – colluvium. A comprehensive sampling strategy and good preservation of environmental indicators, together with *in situ* archaeology (see Neolithic section) makes this the key site for geaoracheology/palaeoenvironmental analysis of landscape change across the Pleistocene/Holocene transition and through the early and mid Holocene.

3.6.45 The strategy for the geoarchaeological analysis of the Pleistocene/Holocene pedo-sedimentary sequence is discussed here. The strategy for the Neolithic and later occupation deposits is discussed in the *Early Agriculturalists* and *Farming Communities* sections.

3.6.46 Description of recording/analytical tasks required

3.6.47 (Pleistocene and Holocene sequence combined)

3.6.48 All monolith and kubiena samples available from the site will be examined initially. The geoarchaeological analysis will target a representative profile (or profile 'complex'), which preserves the site sequence best. It should also be as close as possible to columns C, F (and/or that from Pilgrims Way) which have been chosen for mollusc analysis. Profile selection will follow discussion with the stratigraphic specialist, lead environmentalist and environmental co-ordinator Undisturbed soil samples were taken through the Late glacial soil and underlying soliflucted sediment on Pilgrim's way (ARC PIL98, ARC WHS97, although it appears that a monolith covering this part of the Pleistocene sequence was taken on).

3.6.49 The monoliths from the selected profile (*depending on sample locations, which are not yet clear,* but probably about 5 monoliths, max) will be described and

sub-sampled for loss on ignition (LOI), magnetic susceptibility (MS) and thin section analysis (in the case of sample 978 from ARC PIL98). The sequence description will draw on information from the assessment report (especially where/if samples are lacking). A composite profile will be prepared, which summarises the lithostratigraphy and correlates the sequence with the site stratigraphy and associated sub-samples, bulk and kubiena samples. The samples/ sections sampled will also be located on a site plan.

3.6.50 *Depending on sample availability, location and size* about 5-10 kubiena samples will be set in resin, thin sections manufactured and examined. These will include a vertical sequence adjacent to the monolith sequence (probably a maximum of 8 samples) and also a lateral series of samples through the later prehistoric soil to examine catena relationships (2 samples). Loss on ignition, magnetic susceptibility and particle size tests (the latter depending on bulk sample availability) will be carried out on the sub-samples taken from the monoliths and the results also made available to the micromorphologist.

3.6.51 The geoarchaeological results (including soil micromorphology and the OSL dating carried out at assessment) will be integrated by the geoarchaeologist, paying heed to any stratigraphic/dating revisions made as a result analysis, into the Site Archive Report. The geoarchaeological results will in turn be integrated with the other strands of environmental evidence for Pleistocene/Holocene environment change by the lead palaeoenvironmentalist.

3.6.52 The soil micromorphology thin sections will form a stable long-term archive record of the pedo-sedimentary sequence found at the site. All remaining kubiena/monolith samples should be discarded after analysis.

Tollgate

3.6.53 Summary data

3.6.54 Undisturbed sediment samples: 4 monoliths

3.6.55 The monoliths represent a valley-side sequence of Pleistocene and Holocene slope deposits. The Pleistocene soliflucted deposits include a possible late glacial arctic soil and the Holocene deposits are similar to those recorded on ARC TGW97, which was located closer to the floor of the same dry valley.

3.6.56 Unlike at White Horse Stone, no detailed sampling for palaeoenvironmental remains was undertaken adjacent to the monoliths and the sequence has not been dated (and there is no potential for dating at analysis). However, the characteristics of the late glacial soil sampled at Tollgate contrasts with those recorded elsewhere in the region and may contribute to a better understanding of late glacial landscape change and the Pleistocene/Holocene transition in this area.

3.6.57 Description of recording/analytical tasks required

3.6.58 The relevant monoliths from ARC TLG97 will be subsampled to produce 5 soil blocks for micromorphology, which will be set in resin, thin sections manufactured and examined. Although better multidisciplinary (and at least broadly dated) evidence has been recovered elsewhere, the characteristics of

the Late glacial soil sampled at Tollgate are likely to provide useful comparable data. It will be compared in the present project (CTRL1) to the evidence recovered from White Horse Stone (on the eastern side of the River Medway and on the southern slopes of the North Downs).

3.6.59 It may also provide useful comparative material in CTRL2 for the better represented Late glacial deposits of the Ebbsfleet Valley itself (a short distance west of Tollgate and also on the northern slopes of the North Downs).

330 Zone 2 WB

3.6.60 Summary data

3.6.61 Undisturbed sediment samples: 3 monolith profiles (comprising 13 monoliths).

3.6.62 The monoliths at ARC STP99 sampled Late glacial and Holocene slope and valley floor deposits. Unlike other profiles sampled as part of CTRL1, the Late glacial deposits are derived from Thanet Sands and loess and as such provide a contrast to the coarser soliflucted chalky sediments sampled at White Horse stone, the Nashenden Valley and Tollgate. However, no dating or supporting palaeoenvironmental evidence exists for these deposits, which have been considered in some detail during assessment (making further analysis unnecessary).

3.6.63 Description of recording/analytical tasks required

3.6.64 No further analysis will be undertaken on the Pleistocene deposits. However, the Pleistocene part of the geoarchaeology assessment will be summarised for the Site Archive Report and a series of 5 soil blocks subsampled from the main Late glacial units (monolith profile 26) impregnated in resin. Although no thin sections will be made from these blocks, they will form part of the site archive and will be available for future thin section manufacture and analysis if required.

Cuxton Anglo Saxon Cemetery

3.6.65 Summary data

3.6.66 Undisturbed sediment samples: 2 monoliths

3.6.67 The monoliths sampled Late glacial and Holocene slope deposits. The monoliths had not survived well following excavation and were dried out and crumbly when assessed. No further sedimentary work is proposed. However, dating is required to correlate the sequence of landscape processes/change recorded at assessment with the archaeological activity recorded upslope and across the Medway (eg: White Horse Stone).

3.6.68 Description of recording/analytical tasks required

3.6.69 AMS dating on the snail shells preserved in context [45] (possibly an early Holocene soil horizon) if suitable. Summary of the geoarchaeology assessment for the Site Archive Report.

Mesolithic

3.6.70 Very little good geoarchaeological / palaeoenvironmental evidence specifically covering the Mesolithic period exists along the route, although the pedo-sedimentary profile at White Horse Stone is likely to span the Mesolithic. Although Mesolithic dates have been obtained from 2 sites, the relationship of the dated material to the contexts they appear to date needs further examination.

White Horse Stone

3.6.71 The Mesolithic period is likely to be covered by the Late glacial to Iron Age pedo-sedimentary profile through valley floor deposits at this site.

Sandway Road

3.6.72 Summary data

3.6.73 Undisturbed sediment samples: 2 monoliths and 5 kubiena tins

3.6.74 A truncated soil horizon, thought to be of Mesolithic date, with several cut features also considered to be Mesolithic (dated by ^{14}C on a hazlenut fragment in pit 72) which included charred grain in their fills were sampled. The key questions are:

3.6.75 Is the charred grain of Mesolithic date?

3.6.76 Are the deposits too bioturbated for reliable environmental reconstruction?

3.6.77 Can evidence for the Mesolithic environment (and thus resources available) be reconstructed from pollen and possibly soil micromorphology and compared to the charred assemblages (resources used)?

3.6.78 It is unclear when the bioturbation recorded in the deposits took place. Did it occur prior to the Mesolithic deposits being sealed by colluvium and, even if this was the case, when did colluvium seal the deposits from the intrusion of later material – if it did.

3.6.79 Description of recording/analytical tasks required

3.6.80 Most importantly, to determine the date of the charred grain found in the Mesolithic context and what plant(s) it represents, identified charred grain from pit 72 must be sent for AMS dating.

3.6.81 The undisturbed soil samples need to be examined in conjunction with section drawings/stratigraphic information to assess the level and nature of bioturbation present. This could involve x-ray if visual inspection is insufficient and if the samples have plastic containers.

3.6.82 As time is short and it may not be possible to wait for the AMS date prior to proceeding, 4 kubiena tins should be impregnated, rendering them available for micromorphology if required and part of the site archive if not. 2 samples from the monolith taken through pit 72 should also be scanned for pollen preservation (however, the sandy nature of the deposits suggests preservation may be poor).

3.6.83 Depending on the date of the charred grain, the results of examining the soil samples and site stratigraphy and pollen preservation, provision should be made for thin sections to be made and examined from the 4 impregnated soil blocks and 8 sub-samples for pollen analysis to be taken through the pit 72 profile.

East of Station Road

3.6.84 Summary data

3.6.85 Undisturbed sediment samples: 3 monoliths

3.6.86 Sequence spans Mesolithic and Iron Age/Roman periods. The Mesolithic tasks are included in section 0 (Late Iron Age) as the main potential of the sequence lies in its Late Iron Age/Roman significance.

3.6.87 Although the upper organic and fine-grained fills of a palaeochannel are likely to be contemporary with the adjacent Late Iron Age/Roman field system, a log at the base of the sequence gave a Mesolithic date, suggesting the lowermost fills may be earlier. A coarse-grained bed appears to separate the lower and upper fine-grained palaeochannel fills, suggesting re-activation of the stream and truncation of the earlier prehistoric deposits. Thus there is a need to examine the monolith sequence (not yet done geoarchaeologically) to establish the formation processes involved. There may be potential for pollen preservation in the lowest silty fills, which could provide some information on the local Mesolithic environment however these fills have not yet been assessed and may not be dateable as their relationship to the dated log needs re-examining.

3.6.88 Description of recording/analytical tasks required for the Mesolithic deposits

3.6.89 Further assessment is required on the lowermost part of the sequence before its potential for Mesolithic landscape reconstruction can be assessed. This would involve:

3.6.90 Examining the monolith sequence in conjunction with the site stratigraphy.

3.6.91 Assessing the basal silty fill for pollen preservation.

3.6.92 Finding out if any material suitable for dating is present in the monolith or in any samples taken from the primary silty fill (context 1731), which might preserve plant remains that could be dated. Assessment results don't mention these contexts so possibly not sampled?

White Horse Stone

3.6.93 Summary data

3.6.94 Blocks of undisturbed sediment: 7 thin sections manufactured during assessment from 4 soil blocks.

3.6.95 Monolith and kubiena samples through the early Holocene soil.

3.6.96 The strategy for the geoarchaeological analysis of the Pleistocene/Holocene pedo-sedimentary sequence is discussed in the *Hunter Gatherers* section for

landscape/environment reconstruction). The strategy for the Neolithic occupation deposits is discussed here.

3.6.97 Description of recording/analytical tasks required

3.6.98 Assuming that post hole fills can be taken as representing the character and extent of Neolithic activity within the longhouse, a combination of bulk analysis (LOI, phosphates, magnetic susceptibility, pH) and soil micromorphology (description, counting, recording of microfabrics and components and microprobe analysis as appropriate) will be undertaken. The precise selection of samples and strategy will follow discussion between the soil micromorphologist and project officer.

3.6.99 The soil micromorphology thin sections will form a stable long-term archive record of the deposits associated with the Neolithic longhouse found at the site, available for future research. All remaining non-impregnated kubiena/monolith samples should be discarded after analysis.

Later Neolithic

West of Northumberland Bottom

3.6.100 Summary data

3.6.101 Undisturbed sediment samples: 4 monoliths (TGW97)

3.6.102 The monolith sequence sampled the colluvial fills of the Wrotham Road dry valley and was taken adjacent to a column of bulk samples for snails. The Beaker period double inhumation overlooks this valley as does a Late Bronze Age /Early Iron Age ditched enclosure and the area was extensively occupied during the Iron Age, Roman and Medieval periods. The TLG97 (Tollgate) Late glacial sequence was sampled slightly further up this valley and the upper deposits sampled in that sequence are similar to those from TGW97, except on this site, being closer to the valley floor, the Holocene slope deposits are thicker.

3.6.103 No dating evidence was obtained from the colluvial deposits and snails were, in general, sparse, which will limit the scope of any past environmental reconstruction. However, evidence for periods of colluviation interspersed with landscape stability were recorded in the monoliths, which needs to be correlated with the archaeological evidence nearby (given the significance of this area for Neolithic funerary monuments – including the mortuary enclosure on the hill to the east, overlooking the dry valley).

3.6.104 AMS dating on snails, though not ideal, would allow the pulses of landscape erosion and stability to be correlated with the archaeological evidence for activity above the valley. Additional sediment characterisation of the sequence, involving a programme of magnetic susceptibility (MS) and loss on ignition (LOI) would add support to the profile description already undertaken. Thin section analysis is not likely to provide significantly more information than that already obtained from the monolith descriptions. However, a series of 6 soil blocks should be cut from the sequence and impregnated with resin (but no thin sections made) to form part of the site archive, which would be available for future analysis.

3.6.105 Early Bronze Age

Whitehill Road Barrow

3.6.106 Summary data

3.6.107 Undisturbed sediment samples: 3 monoliths

3.6.108 The monoliths sampled three separate locations of the inner and outer ditches. No datable remains were recovered, snail samples were not taken from adjacent to the monoliths and the majority of the sediments sampled are unlikely to preserve pollen. The lack of dating evidence (no suitable material for radiocarbon dating was obtained) suggests there is little scope in pursuing preliminary pollen assessment of the deposits.

3.6.109 The formation processes represented by the sediments sampled have been discussed adequately in the assessment and it is unlikely that further sediment analysis will add significantly to the interpretations presented in the assessment.

3.6.110 Description of recording/analytical tasks required

3.6.111 The geoarchaeology assessment will be summarised for the Site Archive Report. To provide a permanent record of the ditch fills, 5 soil blocks will be cut from the monoliths, impregnated with resin (but no thin section made) to form part of the site archive, which would be available for future analysis.

330 Zone 2 WB

3.6.112 Summary data

3.6.113 Undisturbed sediment samples: 3 monolith profiles (13 monoliths - all periods).

3.6.114 The monoliths at ARC STP99 sampled Late glacial and Holocene slope and valley floor deposits. The Pleistocene deposits are discussed in section 0. The Holocene deposits accumulated on the valley floor (context [84]) are fine-grained and appear to have experienced wet conditions in the past, probably associated with the seasonal seepage of springs. Although no adjacent column of bulk samples is available for analysis, there is a chance that pollen may be preserved in these valley floor deposits, which are thought to be of Bronze Age date, especially as they may have been decalcified prior to their accumulation on the damp valley floor. Such evidence could contribute to reconstructing the Bronze Age environment of the site, which is archaeologically important, lying in one of the dry valleys feeding the upper Ebbsfleet (above what later became the Springhead Roman settlement). Soil micromorphology may also be able to provide additional information to that discussed in the assessment report for the environment represented by the valley floor deposits. This will have significance for understanding the pattern of prehistoric occupation of the area.

3.6.115 Description of recording/analytical tasks required

3.6.116 The monoliths from the valley floor deposits will be sampled for pollen (3 samples) and soil micromorphology (3 samples). If pollen is adequately

preserved a series of sub-samples will be taken through [84] (about 1m thick) for analysis.

West of Northumberland Bottom

3.6.117 See Bronze Age section as monolith sequence spans Bronze and Iron Age.

North of Saltwood Tunnel

3.6.118 Summary data

3.6.119 Undisturbed soil samples: 2 (83 & 84)

3.6.120 Soil blocks from the old land surface below denuded Bronze Age barrow mounds, through which the Saxon graves were cut. May have potential to provide information about the landscape comtemporary with/pre-dating the barrow from pollen and soil micromorphology. Comparing the Bronze Age, Roman and Saxon undisturbed soil samples from the site may provide information about the changing soil characteristics through time on this site.

3.6.121 Description of recording/analytical tasks required

3.6.122 The samples/section drawings/site stratigraphy will need to be examined and if appropriate the blocks to be sub-sampled for pollen, set in resin, thin sections made and examined by soil micromorphology. Examine bulk samples for any material suitable for dating? The thin sections will provide a stable record of the pre-barrow soil for archive.

Late Bronze Age

Cobham Golf Course

3.6.123 Summary data

3.6.124 Unprocessed soil samples: 2 monoliths

3.6.125 The monoliths sample the fills of a Bronze Age ring ditch. No snails were preserved in the column taken adjacent to the monolith sequence and the majority of the sediments sampled are unlikely to preserve pollen. Thus, although further sedimentary analysis could be undertaken to gain a better understanding of the formation processes of the ditch deposits, there would be no environmental information to relate this to. It is unlikely that further work will be able to contribute substantially more to our understanding of the landscape existing during the period the ditch infilled than that already discussed in the assessment.

3.6.126 Description of recording/analytical tasks required

3.6.127 The geoarchaeology assessment will be summarised for the Site Archive Report. To provide a permanent record of the ditch fills, 3 soil blocks will be cut from the monoliths, impregnated with resin (but no thin section made) to form part of the site archive, which would be available for future analysis.

Early Iron Age

North of Saltwood Tunnel

3.6.128 Summary data

3.6.129 Undisturbed soil samples: 1 (E1)

3.6.130 A soil blocks from the basal layer of a storage pit may provide information about localised activity on site.

3.6.131 Description of recording/analytical tasks required

3.6.132 The samples/section drawings/site stratigraphy will need to be examined and if appropriate the block to be set in resin, a thin section made and examined by soil micromorphology. The thin section will provide a stable record of the primary pit fill for archive.

White Horse Stone

3.6.133 Summary data

3.6.134 Blocks of undisturbed sediment: 5 thin sections manufactured during assessment from 4 soil blocks and see section 0

3.6.135 The Iron Age soil forms part of the Pleistocene/Holocene pedo-sedimentary sequence: representing episodes of landscape stability (when soils developed) and erosion/deposition (when colluvial sediments accumulated). The strategy for the geoarchaeological analysis of the later prehistoric soil is discussed in the *Hunter Gatherers* section (see section 0 for landscape/environment reconstruction).

3.6.136 In addition samples are available for interpreting the function and activities associated with certain Iron Age features on the site. A strategy for the examination of these samples is discussed here.

3.6.137 Description of recording/analytical tasks required

3.6.138 A combination of bulk analysis (LOI, phosphates, magnetic susceptibility, pH) and soil micromorphology (description, counting, recording of microfabrics and components and microprobe analysis as appropriate) will be undertaken on samples taken and already made into 5 thin sections, as suggested in the assessment report. However, the precise selection of samples, in terms of the information they could provide regarding the character and extent of the Iron Age occupation within the settlement and the activities represented, will be reassessed following discussion between the soil micromorphologist and project officer.

3.6.139 The soil micromorphology thin sections will form a stable long-term archive record of the deposits associated with the Iron Age features found at the site. All remaining non-impregnated kubiena/monolith samples should be discarded after analysis.

Late Iron Age

West of Northumberland Bottom

3.6.140 Summary data

3.6.141 Undisturbed sediment samples: 1 monolith (ARC 330 98, Downs Road)

3.6.142 Description of recording/analytical tasks required

3.6.143 This monolith sampled rake-out deposits that had accumulated downslope of a kiln. It is unlikely that further work will add significantly to the interpretation of the site or to the route-wide research objectives. No further work will be undertaken.

East of Station Road

3.6.144 Summary data

3.6.145 Undisturbed sediment samples: 3 monoliths

3.6.146 The upper mainly organic fills of a palaeochannel are likely to be contemporary to the adjacent Late Iron Age/Roman field system – but this has not yet been confirmed by radiocarbon dating. Good plant macro, snail, insect and pollen preservation, so may be able to provide information about the use and subsequent abandonment of the field system. This may provide evidence for the effect such abandonment might have on the landscape, which might be compared to the environmental evidence from the Thurnham well fills.

3.6.147 There may be problems with radiocarbon dating the organic fills with adequate precision to correlate with the use/abandonment of the fields, owing to a plateau in the calibration curve for this period. Thus it has been suggested that multiple dates of known stratigraphic relationship are taken (from the monoliths, presumably?) which will refine the wide date ranges obtained from each individual date.

3.6.148 A log at the base of the palaeochannel sequence gave a Mesolithic date, suggesting the lowermost fills may be earlier. A coarse-grained bed appears to separate the lower and upper fine-grained palaeochannel fills, suggesting re-activation of the stream and truncation of the earlier prehistoric deposits. Thus there is a need to examine the monolith sequence (not yet done geoarchaeologically) to establish the formation processes involved.

3.6.149 Description of recording/analytical tasks required (later prehistoric/Roman part of sequence)

3.6.150 Re-examine monoliths, describe (geoarchaeologically) and sub-sample for pollen *(c 24* samples in all) and radiocarbon (4-5 dates? see dating assessment) in consultation with the relevant specialists.

West of Station Road: Parsonage Farm

3.6.151 Summary data

3.6.152 Undisturbed sediment samples: 2 monoliths ({1}&{2})

3.6.153 The monoliths represent a sequence of fluvial, organic and colluvial deposits that accumulated in/adjacent to one of the streams, which were later utilised to form the moat of the medieval manor. The fluvial and organic deposits appear to be of prehistoric date and are associated with a timber platform (only partly excavated). But the date needs to be confirmed with radiocarbon dating. A longer and more interesting sequence (in so far as it charted the use and disuse of a nearby field system) was found East of Station Road, which is also also on the Greensand. Thus no further work beyond radiocarbon dating will be carried out on the Parsonage Farm palaeochannel fills.

3.6.154 Description of recording/analytical tasks required

3.6.155 Two samples for radiocarbon dating (top and bottom of the organic deposits) will be obtained from the monoliths and the results integrated with a summary of the monolith assessment for the site archive.

Roman

Thurnham

3.6.156 Summary data

3.6.157 Undisturbed sediment samples: 3 monolith profiles

3.6.158 Pollen from the monolith samples taken through the disuse fills of a well, together with plant macros, snail and insect remains from adjacent bulk samples have good potential to reconstruct environment developments following the abandonment of the well (and the villa complex). Radiocarbon dating of the organic sediment at the top and base of the profile may be possible (but the plateau in the calibration curve for this period could cause some problem: see East of Station Road).

3.6.159 To tackle these monolith samples in the same way as other undisturbed sediment samples from the route, they need to be described geoarchaeologically in addition to the environmental analysis.

3.6.160 Description of recording/analytical tasks required

3.6.161 Describe the monolith profiles and sub-sample monolith 10305 for radiocarbon (top and base of organic sediment) and further pollen analysis *(c* 12 samples).

East of Station Road

3.6.162 See section (Late Iron Age)

North of Saltwood Tunnel

3.6.163 Summary data

3.6.164 Undisturbed soil samples: 4 (X1-4)

3.6.165 Soil blocks from the soil beneath road metalling may have potential for reconstructing the pre-road landscape from soil micromorphology, if not truncated. Comparing the Bronze Age, Roman and Saxon undisturbed soil samples from the site may provide information about the changing soil characteristics through time on this site.

3.6.166 Description of recording/analytical tasks required

3.6.167 The samples/section drawings/site stratigraphy will need to be examined and if appropriate the blocks to be set in resin, thin sections made and examined by soil micromorphology. The thin section will provide a stable record of the pre-road soil for archive.

Anglo-Saxon

North of Saltwood Tunnel

3.6.168 Summary data

3.6.169 Undisturbed soil samples: 14 (Q, M1-11, G1+2)

3.6.170 Soil blocks from the former landsurface through which the Saxon graves were cut, turf from the graves and the floor of a sunken building may have potential for reconstructing the Saxon environment and activities associated with the building. Comparing the Bronze Age, Roman and Saxon undisturbed soil samples from the site may provide information about the changing soil characteristics through time on this site.

3.6.171 Description of recording/analytical tasks required

3.6.172 The samples/section drawings/site stratigraphy will need to be examined and if appropriate blocks selected to be sub-sampled for pollen, set in resin, thin sections made and examined by soil micromorphology. The thin sections will provide a stable record of the Saxon soil and landscape for archive.

Medieval

West of Station Road: Parsonage Farm

3.6.173 Summary data

3.6.174 Undisturbed soil samples: 7 monoliths ({38}{39}{42}{43}{53}{54})

3.6.175 The monoliths sampled the fills of the moat and channel fills pre-dating and post-dating the medieval manor house. They are likely to preserve microfossil remains, which have potential to reconstruct the changing environment of the manor, prior to, during and following its use. Good waterlogged plant assemblages (and insects?) have been recovered from the moat fills, which will be integrated with the pollen evidence. No other medieval samples for environmental reconstruction have been obtained from the route and this evidence will provide useful information for the Greensand and Weald areas, where many medieval manor complexes are known but few have been studied alongside their contemporary landscape setting.

3.6.176 Description of recording/analytical tasks required

3.6.177 Further correlation with the site stratigraphy and (finds) dating is required to target a series of samples for pollen and diatom analysis.

3.7 Geoarchaeology References

3.7.1 Barham, AJ, 1995 'Methodological approaches to archaeological context recording:x-radiography as an example of a supportive recording, assessment and interpretative technique'. In *Archaeological sediments and soils: analysis, interpretation and management* (eds AJ Barham & RI Macphail) Institute of Archaeology, UCL, 145-82.

3.7.2 Battarbee, RW, 1986 'Diatom analysis' in *Handbook of Holocene palaeoecology and palaeohydrology* (ed. BE Berglund) 527-570

3.7.3 Canti M 1991 *Particle size analysis….* AML Report (English Heritage)

3.7.4 Denys, L. 1992. A check list of the diatoms in the Holocene deposits of the Western Belgian Coastal Plain with a survey of their apparent ecological requirements: I. Introduction, ecological code and complete list. Service Geologique de Belgique. Professional Paper No. 246. pp. 41.

3.7.5 Dearing, J, 1999 'Magnetic susceptibility' Chapter 4 in Walden, J, Oldfield, F and Smith, J (eds)

3.7.6 Gale, AJ and Hoare PG, 1991 Quaternary sediments: petrographic methods for the study of unlithified rocks

3.7.7 Hendey, N.I. 1964. An Introductory Account of the Smaller Algae of British Coastal Waters. Part V. Bacillariophyceae (Diatoms). Ministry of Agriculture Fisheries and Food, Series IV.

3.7.8 Hustedt, F. 1930-1966. Die Kieselalgen Deutschlands, Oesterreichs und der Schweiz unter Berucksichtigung der ubrigen Lander Europas sowie der angrenzenden Meeresgebeite. In Dr. L. Rabenhorsts Kryptogamen-Flora von Deutschland, Oesterrech und der Schweiz 7, Parts 1-3.

3.7.9 Kemp, R, 1985 Soil Micromorphology and the Quaternary QRA Technical Guide 2

3.7.10 Moore, P.D. and Webb, J.A. 1978: *An illustrated guide to pollen analysis*. London: Hodder and Stoughton.

3.7.11 Moore, P.D., Webb, J.A. and Collinson, M.E. 1991 *Pollen analysis* Second edition. Oxford: Blackwell Scientific.

3.7.12 Stace C, 1991 New flora of the British Isles. Cambridge

3.7.13 Walden, J, Oldfield, F and Smith, J (eds) 1999 *Environmental magnetism: a practical guide* QRA Technical Guide, 6

3.7.14 Werff, A. Van Der & H. Huls. 1957-1974 Diatomeenflora van Nederland, 10 volumes

4 LITHICS RECORDING AND ANALYSIS: RESEARCH AIMS, GENERAL METHODOLOGY AND TASK LISTS

4.1 Introduction

4.1.1 The research aims listed below are a compilation of aims to which lithic studies can directly contribute, extracted from Part 2.38 of the UPD. Research questions concerned with patterns at a regional level will be addressed by a programme of lithics research, comprising baseline quantification and dating of Principal Site assemblages and targeted detailed analysis of key groups. The CTRL lithics assemblages recommended for further analysis comprise prehistoric worked flint (other worked stone objects are considered under the Small Finds Specialist Package). Data that is relevant to questions of site interpretation will be included as a baseline record in the site digital archive and considered at a summary, synthetic level in the appropriate Principal site report. Consideration of route-wide research questions will be undertaken by the lead specialist and presented in the relevant route-wide specialist package report.

4.1.2 It is important that research questions are specifically addressed by the analysis programme. Additional lines of research that are not currently included, or which become apparent as the analysis progresses, will normally be noted as an area of future research potential, but will not be undertaken as part of the CTRL works, except with the written instruction of the Project Manager.

4.1.3 The fieldwork events which were undertaken for the CTRL project have produced an extremely extensive flint assemblage dating from the Late Glacial to the late Bronze Age. Good stratified assemblages from the Mesolithic to the late Bronze Age were recovered which will enable the changes in lithic technology to be examined over time across the landscape. The secure stratification of many of these assemblages and their artefactual and contextual associations enhances the data further. In addition to this body of nationally important material, there is a large collection of fieldwalked flint and flint from evaluations and excavations which will not be subjected to further detailed analysis but will be included in the synthetic analysis. The strength of this material lies in its spatial distribution across the landscape, which will complement the securely stratified assemblages in helping us to understand the use of the landscape across time. The flint assemblages as a whole have the potential to address many of the research questions outlined in the Part 2 of the Updated Project Design.

4.1.4 This document is divided into a compilation of directly relevant research aims, a general methodology for the baseline recording of the primary assemblages and the secondary analyses which will be undertaken to include fieldwalked collections, evaluation material and material from excavations that will not be subject to further detailed recording.

4.2 Research Aims

Hunter-gatherers – The Mesolithic and Early Neolithic Transition

4.2.1 Original research objectives:

4.2.2 Define range of human activity and where it took place, particularly through the study of palaeo-economy.

4.2.3 Updated research framework:

4.2.4 Does the data inform a variability pattern in site type or location that may be attributed to geomorphological (including soil type), raw material source, or environmental factors (hydrography, altitude, orientation, vegetation)?

4.2.5 Can the types of activities that were being prepared for be discerned through quantification of the relative frequency of artefact types discarded? What patterns emerge between differing topographic and environmental settings?

4.2.6 Do the assemblages indicate differing sources for raw material? What do the sources of material indicate about mobility patterns and ranges?

4.2.7 Does the evidence for human activity represent single or repeated use over time at Sandway Road and Beechbrook Wood? What has been the effect of bioturbation on the assemblage? Can a limited refitting exercise demonstrate that significant bioturbation has occurred, as demonstrated at Hengistbury Head, for example.

4.2.8 If repeated or habitual use is demonstrated, is there evidence to suggest seasonality and indication that the locations held special physical or ritual characteristics governing re-use?

4.2.9 What does the site distribution evidence contribute to establishing a predictive model for lowland SE England in the Mesolithic?

4.2.10 What is the landscape relationship between the Mesolithic activity pattern and subsequent Early Neolithic activity patterns?

Early Agriculturalists – The Neolithic and Early Bronze Age Landscape

4.2.11 Updated research framework – Neolithic Landscape:

4.2.12 Is the evidence for clearance distributed across the route or only where associated with particular activity or settlement evidence? Are cleared areas in the Mesolithic 'reoccupied' in the Early Neolithic? Can sites such as Sandway Road and Beechbrook Wood demonstrate this?

4.2.13 What is the evidence for continuity from the late Mesolithic in terms of relative mobility and the broad spectrum subsistence patterns? What patterns in comparing the Mesolithic and Neolithic flint scatters can be determined? Do they share attributes such as topographical location?

4.2.14 Does the primary and secondary worked flint data inform a variability pattern in site type or location that may be attributed to geomorphological (including soil type), raw material source, or environmental factors (hydrography, altitude, orientation, vegetation)? What is the relationship of recorded flint scatters to known activity sites?

4.2.15 Structured deposition in pits is noted across the route and chronologically appears to be the first indication of a change in the material assemblage and level of activity. What evidence does this dataset lend to our further understanding of the adoption and distribution of the traditional themes of sedentism, plant and animal domestication, mixed farming, and interment of human remains?

4.2.16 Does the discovery of preserved settlement evidence within dry valley sequences at White Horse Stone suggest that lack of evidence for 'residence' elsewhere maybe a characteristic of preservation conditions? What other evidence is there for 'residence'? What does the range of secondary evidence and subsequent landuse pattern suggest about the location of possible 'lost ' settlements?

4.2.17 The Neolithic structures at White horse Stone are unique to Kent at this time. Detailed research objectives require finalising with reference to the White Horse Stone assessment report. It will be necessary to refer to these in detail in preparing the archive research report for this site.

4.2.18 Updated research framework – Early Bronze Age Landscape:

4.2.19 EBA secondary flint assemblages are not readily discernible from Neolithic examples, however there are certain diagnostic items such as thumbnail scrapers, barbed and tanged arrowheads and flaked knives and daggers. If EBA components of the secondary assemblages can be isolated, compare the evidence distribution to above.

4.2.20 Can a distinction between 'private/domestic' and 'corporate/ritual' activity be identified spatially? An analysis of the distribution of 'ritual' and domestic' activity should carried out with regard to a range of attribute variables to demonstrate the interrelation or interdependence(?) of the two classes of evidence.

4.2.21 Discuss the distribution, development across the sample, chronology, topographical location, orientation, altitude and associated activities (with/without burial; accompanied structured deposition?) of the ring ditch monuments. What evidence is there for re-use of earlier ritual sites? Can a pattern for location be identified? What are the governing environmental (soils, altitude, aspect) or social attributes for chosen sites? How do they relate to settlement evidence and secondary flint scatters? What do later activities demonstrate about the longevity of the monuments and what has been the effect of later agricultural land-use? What patterns do the finds assemblage at these sites present? Do they represent distinct and recurrent combinations, or variable finds groups (Bruck 2000)? What does this indicate about social relations between different site types?

4.2.22 Can we identify seasonal use at these monuments and any suggestion that the sites may have been used by several groups converging at the site for specific activities of a communal or ritual nature?

4.2.23 Updated research framework – Early Bronze Age / Middle Bronze Age Transition:

4.2.24 The appearance of farms and field systems has been taken to indicate agricultural intensification. What evidence is there is there in the CTRL dataset to support this? What can we identify about agricultural technology and farming regimes to contribute to this question? Are new soil types exploited in this period or earlier in the Bronze Age?

4.2.25 It is suggested that the adoption of enclosed settlement and organised residential structures can be associated with an increased interest in inheritance and legitimising of land rites. However it is apparent that often continuity of settlement at MBA sites has been difficult to establish beyond a single 'generation' (Bruck 2000, 288). What chronological indicators can the CTRL data in the MBA contribute to this question?

4.3 General methods for baseline data

4.3.1 Although there are no nationally accepted guidelines for the recording and analysis of worked flint, the methodologies proposed below follow current best practice. It is important that a certain level of data is recorded in order to provide a platform for the flint specialists to work from. This is particularly important given the project aim of making the data widely available for future researchers to interrogate. All of the excavated flint will be recorded to a baseline level. The fields for this recording are as follows:

4.3.2 Numbers of flint types by context. Where small find numbers have been used these will be recorded individually.

4.3.3 The flint categories used will follow the OA's recording system (see Appendix 1). Where necessary additional types will be added. This will be necessary for the large Mesolithic assemblage from Sandway Road.

4.3.4 Numbers of burnt and broken pieces and the weight of cores will also be recorded (Table 1). This will allow the general condition of the material to be compared across the route. Recording core weights provides the best measure, together with typological attribution, for this artefact class. These fields will enable the assemblages to be examined on a route-wide basis.

4.3.5 Some of the assemblages, for example White Horse Stone and Sandway Road will require further sorting and basic recording as only samples of these assemblages were looked at during the assessment.

4.3.6 A context comments field enables a general impression of a complete context to be recorded. A context date field allows a date to be assigned to a context where possible.

TABLE 1: BASELINE FLINT FIELDS

Site code	Context	SF number	Flint Category	Total Number in bag	Number burnt in bag	Number broken in bag	Weight (g)	Context date	Context comments

4.3.7 *Burnt unworked flint* - the majority of this has been recorded during the assessment phase and does not require further work unless there is a particular need to do so. This will be detailed in the individual site summaries. Some spatial analysis of the burnt unworked flint has been recommended for some sites, again this is detailed in the site summaries. Data from the assessment records will be imported into the final datasets. Where the burnt unworked flint does require further recording its number, weight and general appearance will be recorded using the baseline recording form.

4.4 Second stage analysis

4.4.1 Selected primary assemblages or parts of assemblages will undergo a more detailed analysis in order to clarify the nature of the material, gain more information about the reduction sequences and the activities occurring on the sites. Each of the sites is dealt with below and, although the same attribute recording methodology will be applied throughout, not all of the assemblages will have the same level of recording undertaken. The analyses will be broken down into four distinct areas:

Attribute/ metrical analysis

4.4.2 Assemblages deemed suitable for attribute/metrical analysis will be examined in detail. The fields that will normally be recorded are presented in Table 2. Any divergence from these will be outlined in the detailed site methodology (see section 4 below).

TABLE 2: ATTRIBUTE ANALYSIS FIELDS

Number	Fields for recording	Comments/references
1	Metrical data (Length/breadth/thickness)	record in mm, follow Saville 1980
2	Hammer mode (hard/soft/indeterminate/not assessable)	
3	Completeness(Complete/broken/snapped/proximal/medial/distal section)	
4	Termination type (Feather/hinge/step/plunging/other)	
5	Butt type (cortical/plain/>1 removal/facetted/linear/punctiform/other/not assessable)	
6	Butt abrasion (Yes/No/Not assessable)	
7	Cortex cover (0-25%, 26-50%, 51-75%, 76-99%, 100%)	
8	Raw material type (gravel/chalk/other/indeterminate)	This section may need modification depending on raw material types
9	Condition (light cortication/medium cortication/heavy cortication/ironstained/sandglossed/calcium carbonate cover/ plough damage/other/not assessable	Can we have a lightly corticated, sand glossed piece with cal. carbonate or do these have to be separate fields
10	Previous Removals (Blade/flake/other)	Only to be recorded if felt useful for particular assemblages
11	Blank types (preparation flake/side trimming	Modified after Harding (1990)

	flake/distal trimming flake/miscellaneous trimming flake/blanks/rejuvenations/thinning flake/not assessable	
12	Scraping angles	After Movius *et al* 1968
13	Chips to be looked at to identify activities (samples only)	After Newcommer and Karlin 1987

Refitting analysis

4.4.3 Assemblages deemed suitable for refitting analysis will be laid out and refits, conjoins and related groups of raw materials sought. Each will be recorded using a standard form (Table 3).

TABLE 3: REFITTING FIELDS

Flint ID	Refit ID	Group Number	Above	Same as	Refit comments
Unique number	Unique number	Assigns a group number	Records relationship of refits	Records relationship of refits	Text field for comments

Usewear analysis

4.4.4 The potential for usewear analysis has been highlighted at a number of sites (eg White Horse Stone, Beechbrook Wood). This will be investigated further and recommendations for future researchers will be presented. In certain exceptional cases some usewear analysis will be undertaken (eg to help clarify the function of the Neolithic structures at White Horse Stone). Methodology for the usewear analysis will follow the standard references and use the recording system devised by OA.

TABLE 4: USEWEAR FIELDS

Location	Location damage	Fracture wear	Retouched	Straight edge	Snap	Location comments
Left proximal/ left distal/ right proximal/ right distal/ left/right/distal/ proximal	One face only/two faces/on or behind a point	>10 % step fractures/<10% step fractures/rounding/half moon fractures	Tick box	Tick box	Tick box	Text field for comments

Spatial analysis

4.4.5 Assemblages requiring spatial analysis will be plotted using the appropriate software packages. Patterns within the material and across the sites will be sought. Spatial analysis will carried out in conjunction with the relevant project officers. A wider level of spatial analysis will be carried out for the route-wide analysis (see 3 below).

Route-wide analysis

4.4.6 The following fieldwork event types have produced flint assemblages that will not be subject to further detailed recording as part of the post-excavation programme:

- Fieldwalked data
- Evaluation data
- Assessed excavated assemblages that will not been analysed further

4.4.7 However, summary archive reports will be made available for each site, which will generally be the assessment report, revised where necessary. This group of flint does however provide a great deal of information about the use of the landscape through time. This will be particularly important for the earlier prehistoric use of the landscape. It is unlikely that this material will need to be examined again although a contingency should be provided. It is proposed that the lithics specialists examine the distribution of this material in conjunction with the relevant project officer(s). If significant assemblages are isolated provision will be made for the relevant lithics specialist to briefly re-examine this material.

5 ANIMAL BONE RECORDING AND ANALYSIS: RESEARCH AIMS, GENERAL METHODOLOGY AND TASK LISTS

5.1 Introduction

5.1.1 The research aims listed below are a compilation of aims to which animal bone studies can directly contribute, extracted from Part 2.39 of the UPD. Research questions concerned with patterns at a regional level will be addressed by a programme of animal bone research, comprising baseline quantification and dating of principal site bone assemblages and targeted detailed analysis of key groups. Data that is relevant to questions of site interpretation will be included as a baseline record in the site digital archive and considered at a synthetic level in the appropriate Principl site report. Consideration of route-wide research questions will be undertaken by the lead specialist and presented in the relevant route-wide specialist package report.

5.1.2 It is important that research questions are specifically addressed by the analysis programme. Additional lines of research that are not currently included, or which become apparent as the analysis progresses, will normally be noted as an area of future research potential, but will not be undertaken as part of the CTRL works, except with the written permission of the Project Manager.

5.2 Research objectives

Hunter-gatherers – The Mesolithic and Early Neolithic Transition

5.2.1 No evidence

Early Agriculturalists – The Neolithic and Early Bronze Age Landscape

5.2.2 Original research objectives:

- Define nature of contemporary environment.
- Determine nature and effect of clearance for agricultural activity.
- Define ritual and economic landscapes and their relationships.
- Determine nature of and changes in economic lifeways, e.g. relative importance of hunting-foraging and agriculture, studied especially through recovery of faunal and charred plant remains.
-

5.2.3 Updated research framework – Neolithic Landscape:

5.2.4 All lines of palaeo-environmental data shall be used to produce a landscape reconstruction of the contemporary environment.

5.2.5 Structured deposition in pits is noted across the route and chronologically appears to be the first indication of a change in the material assemblage and level of activity. What evidence does this dataset lend to our further understanding of the adoption and distribution of the traditional themes of sedentism, plant and animal domestication, mixed farming, and interment of human remains?

5.2.6 Does the discovery of preserved settlement evidence within dry valley sequences at White Horse Stone suggest that lack of evidence for 'residence' elsewhere maybe a characteristic of preservation conditions? What other evidence is there for 'residence'? What does the range of secondary evidence and subsequent landuse pattern suggest about the location of possible 'lost ' settlements?

5.2.7 What is the range and distribution of animal and plant remains in the Earlier and Later Neolithic? Do they represent 'economic' data or are they limited to contexts demonstrating a 'ritual' or 'socio-structured' role?

5.2.8 The Neolithic structures at White horse Stone are unique to Kent at this time. Detailed research objectives require finalising with reference to the White Horse Stone assessment report. It will be necessary to refer to these in detail in preparing the archive research report for this site.

5.2.9 Updated research framework – Early Bronze Age Landscape:

5.2.10 Can a distinction between 'private/domestic' and 'corporate/ritual' activity be identified spatially? An analysis of the distribution of 'ritual' and domestic' activity should carried out with regard to a range of attribute variables to demonstrate the interrelation or interdependence(?) of the two classes of evidence.

5.2.11 Discuss the distribution, development across the sample, chronology, topographical location, orientation, altitude and associated activities (with/without burial; accompanied structured deposition?) of the ring ditch monuments. What evidence is there for re-use of earlier ritual sites? Can a pattern for location be identified? What are the governing environmental (soils, altitude, aspect) or social attributes for chosen sites? How do they relate to settlement evidence and secondary flint scatters? What do later activities demonstrate about the longevity of the monuments and what has been the effect of later agricultural land-use? What patterns do the finds assemblage at these sites present? Do they represent distinct and recurrent combinations, or variable finds groups (Bruck 2000)? What does this indicate about social relations between different site types?

5.2.12 Is there evidence for an expanse of clearance and agricultural pastoralism or crop production in the EBA? Quantify and plot crop and animal bone evidence. What is the context of this evidence (ritual or domestic deposition)? Do early land boundaries appear in the data? Consider the socio-political role of these features if they are present.

5.2.13 Updated research framework – Early Bronze Age / Middle Bronze Age Transition:

5.2.14 Were economic changes, suggested by the appearance of settlements and field systems, the consequence or the cause of wider social transformation?

5.2.15 The appearance of farms and field systems has been taken to indicate agricultural intensification. What evidence is there is there in the CTRL dataset to support this? What can we identify about agricultural technology and farming regimes to contribute to this question? Are new soil types exploited in this period or earlier in the Bronze Age?

Farming Communities – The Later Bronze Age and Iron Age Landscape

5.2.16 Updated research framework – The Later Bronze Age Landscape:

5.2.17 What do the plant and animal assemblage data indicate about the relative role of pastoral or mixed farming? How is the evidence related to the expansion of field systems and land division? What evidence is there for increasing use of plant and animal resources for non-subsistence uses such as textile production?

5.2.18 Is there evidence for processing and storage of agricultural products in this period? Can we talk of an agricultural surplus, and if so can this be related with other lines of enquiry to demonstrate the socio-political drivers of the expanse of formally exploited agricultural landscapes?

5.2.19 Updated research framework – The Early and Middle Iron Age Landscape (c.800 to 300 BC):

5.2.20 In terms of the analysis and publication of the assemblages more attention needs to be paid to contextualising material culture as opposed to strict division of specialist work. Minimum levels of quantitative and contextual data must be presented to allow others to consider issues of structured deposition and spatial organisation. Finds catalogues need to be cross-referenced to phase and context data. (Haselgrove 1999)

5.2.21 Is the 'expansion' of settlement related to increased production specialisation, as inferred by the large scale exploitation of the weald iron ore for example, or increased standardisation or centralisation of pottery production. Can the evidence for agricultural regimes be integrated also to demonstrate region-wide socio-economic change?

5.2.22 Detailed knowledge of agricultural practise in this period is poor (Champion 1994). Effort will be made to maximise reporting of animal and plant remains to help inform 1st Millennium practises.

5.2.23 Can patterns of variable crop and animal husbandry (arable versus pastoralism) be related to different altitude and soil types? Is the introduction of bread wheat grain (spelt wheat replacing traditional emmer varieties) related to the expansion onto heavier soils?

5.2.24 Environmental analysis will be based on a routewide environmental reconstruction of change, overlaid with studies of crop and animal distributions through time. Major patterns will be identified and discussed in terms of environmental and social change.

Towns and their Rural Landscapes I – The Later pre-Roman Iron Age and Romano-British landscapes (c.300Bc to c.AD500)

5.2.25 Original research objectives:

5.2.26 Did population increase and concentration effect natural resource exploitation and accelerate environmental change?

5.2.27 Updated research framework – The Later Iron Age and Romano-British Transition:

5.2.28 Settlement: The final centuries of the 1st millennium BC sees an intensification in the landscape, that most believe is almost certainly connected to population rise that may be attributable to a combination of factors (see Haselgrove et al 1999). This model will be tested by mapping the available sites and quantification of material culture associated with find spots. Increased level of activity is often linked to the use of iron in agricultural technology that allowed exploitation of heavier soils, but can we also see expansion in light lowland soils? Did the introduction of the rotary quern together with possible climatic improvements after 400Bc 'aid' this expansion? Or is new technology and introduction of field systems a result of social organisation changes that demand increased production (Haselgrove et al 1999)?

5.2.29 The date and quantification of Roman finds should be analysed spatially and through time and comparable databases of imported and 'local/regional' types produced. This to be compared to a similar model for agricultural production products and discussions written up.

5.2.30 Updated research framework – Romano-British Landscape:

5.2.31 Identify the range and type of settlement and agricultural land-use evidence present. How do the patterns illustrate continuity into the period of Roman administration.

5.2.32 How is Romanisation indicated through the study of agricultural regimes and crop husbandry practise. What major patterns can be identified for the distribution of pastoral vs. arable land management? (Taylor 2001, 55).

5.2.33 Animal domesticates are expected to be dominated by cattle sheep and pigs. Can we recognise in the CTRL data any patterns of change in the quantification and distribution of these species through time? Generally an increase in cattle exploitation at the expense of sheep has been noted (ibid. p171). Bi-modal kill patterns are also to be expected. What patterns are there in the CTRL assemblage to indicate a balance or otherwise between young and mature kills?

5.2.34 Do choices in agricultural production reflect any regional diversity within the study sample? Can differing patterns of subsistence vs. surplus production be identified between areas or different site types? (Taylor 2001, 55). What do such patterns demonstrate about the relative importance of market economies?

5.2.35 The term 'Villa' is derived directly from classical texts and only one is actually known from historical sources on Britain (Rivet 1969:174). Is this the correct term to apply to the Thurnham complex. Use of the term is most closely connected to the structural elements of the building demonstrating clear surplus wealth in the use of elite building materials etc. Was it an estate owned by an urban dweller? Does the function of the complex indicate an entirely agricultural function or is it serving industrial and/or trade functions also? What is the nature and context of the associated settlement evidence on the 'estate'?

5.2.36 Non-villa settlements are often thought to belong to the poor and lowly and those who failed to become 'Romanised'. They tend to be defined by absence. No stone and ceramic building material. Lack of imported pottery and other items of material wealth such as decorative metal work, fewer coins etc. Do the non-CTRL sites support this model? What do quantification analyses of material culture indicate about the connection between villa and non-villa settlements and their economic and social relationships? For example numerous coins have been noted on 'rural' sites. This may suggest that their role in the economy may not be adequately reflected by their lack of structural evidence (Taylor 2001, 56). Map the relative wealth between different site types.

5.2.37 Updated research framework - The late Roman-medieval transition:

5.2.38 No animal bone evidence

Towns and their Rural Landscapes II – The Post Roman and Anglo-Saxon Landscape (500 AD to 1000AD)

5.2.39 No animal bone evidence

The Medieval and Recent Landscape" – 1000 AD to the modern day

5.2.40 Updated research framework – Medieval period and recent landscape:

5.2.41 What function do the structures at West of Sittingbourne Road, Bowers Road and Saltwood have, and how does this relate to changes in landscape and resource utilisation?

5.2.42 Can changes through time in resource use/industrialisation (eg. changes in Mersham iron working) be identified in the CTRL sample? Is there evidence for inter-site specialisation?

5.3 Methodology

Quantification

5.3.1 The number and percentage of fragments recovered (Total fragment Method) should be recorded and separated by species. Recovery techniques should be noted and hand collected and sieved bone should be separated.

5.3.2 The representation of skeletal elements should be noted for the hand collected material. This should be recorded in tabular form for larger assemblages.

5.3.3 The minimum number of individuals (MNI) following published guidelines (e.g. Chaplin 1971) should only be calculated when sufficient numbers of bone are present.

5.3.4 Identification method. State location of reference collection and published guides e.g. Schmidt (1972), Hillson (1992), Boessneck (1969), Payne (1985)

Taphonomy

5.3.5 The condition of the bone should be measured against published guides e.g. Lyman (1999) with record of presence of evidence of chemical etching, weathering of the bones.

5.3.6 Evidence of butchery must be recorded to included location and type of cut mark.

5.3.7 The severity of burning on burnt bones should be recorded.

5.3.8 The severity and location of gnaw marks should be recorded in addition to agent type e.g. rodent, herbivore, carnivore

Ageing

5.3.9 Epiphyseal fusion rate after Silver (1969).

5.3.10 Tooth wear stages for main domestic species recorded according to Grant (1982), Payne (1973), Higham (1967), Halstead (1985), Bull and Payne (1982), Levine (1982).

Sexing

5.3.11 The sexing of the animals according to the pelvis using published texts and comparative material e.g.Grigson (1982), Boessneck (1982) in addition to presence and absence of tusks in horses and size of tusks in pigs.

Osteometric analysis

5.3.12 Osteometric analysis should follow Driesch (1976) for mammal and Cohen & Searjeantson (1996) for bird.

Pathology

5.3.13 Any pathological changes to bone must be recorded in addition to pseudopathology and congenital traits. Published guides may be used for comparison e.g. Baker & Brothwell (1980)

Presentation of Data

5.3.14 The total number of elements recovered should be presented according to hand collected and sieved material including comparison of relative proportions of main domestic taxa (cattle, pig, sheep/goat). The Minimum number of Individuals should be calculated for the main domestic species from the hand collected material where sufficient number of bones have been recovered. The skeletal representation of the elements should be noted and the spatial distribution of elements across the site should be commented on where warranted.

5.3.15 Information regarding the condition of the bones including cultural (butchery, burning, modern breakage) and non-cultural modifications (gnawing, weathering etc) should be commented on.

5.3.16 Age profiles must be noted. Tooth wear stages would be the preferred method followed by bone fusion rates. However, occurrences of foetal, neonatal and juvenile bones should also be noted.

5.3.17 Sex identification should be noted and quantified.

5.3.18 The prevalence and type of pathology should be noted.

5.3.19 Osteometric results should be included and summarised where necessary with reference to the primary recording data for additional measurements.

5.3.20 Photographs of burials and unusual bones should be included in the main text. It would be of value to include a compendium of digital photographs to illustrate interesting butchery marks and pathological changes in the digital archive for future research purposes.

References

5.3.21 Baker, J & Brothwell, D., 1980 *Animal Diseases in Archaeology.* Academic Press

5.3.22 Boessneck, J., 1969 Osteological Differences in Sheep (*Ovis aries* Linné) and Goat (*Capra hircus* Linné), in D. Brothwell and E. Higgs (eds) Science in Archaeology. *Thames and Hudson*. 331 - 358

5.3.23 Bull, G. & Payne, S., 1982 Tooth Eruption and Epiphyseal Fusion in Pigs and Wild Boar. In Wilson, B et al. Ageing and Sexing Animal Bones from Archaeological Sites. *BAR British Series 109.* 55 - 71

5.3.24 Cohen, A. & Serjeantson, D., 1996 A Manual for the Identificationof Bird Bones from Archaeological Sites (Revised Edition).

5.3.25 Chaplin, R.E., 1971 *The Study of Animal Bones from Archaeological Sites.* Seminar Press. London and New York.

5.3.26 Grant, A., 1982 The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates. In Wilson, B et al. Ageing and Sexing Animal Bones from Archaeological Sites. *BAR British Series 109.*

5.3.27 Grigson, C., 1982 Sex and Age Determination of Some Bones and teeth of Domestic Cattle: A review of the literature. In Wilson, B et al. Ageing and Sexing Animal Bones from Archaeological Sites. *BAR British Series 109.* 7 - 23

5.3.28 Halstead, P., 1985 A study of Mandibular teeth from Romano-British contexts at Maxey. In F. Pryor and C. French. Archaeology and environment in the lower Welland valley. Clo. 1. East Anglian Archaeology Report 27:219-224.

5.3.29 Hambleton, E., 1999 Animal Husbandry Regimes in Iron Age Britain. A comparative study of faunal assemblages from British Iron Age sites. BAR British Series 282.

5.3.30 Higham, C.F.W., 1967 Appendix, Stock rearing as a cultural factor in Prehistoric Europe. *Proceedings of the Prehistoric Society* 33. 84-106

5.3.31 Hillson, S., 1992 *Mammal Bones and Teeth.* Archetype press, London.

5.3.32 Levine, M.A., 1982 The Use of Crown Height Measurements and Eruption-Wear Sequences to Age Horse Teeth. In Wilson, B et al. Ageing and Sexing Animal Bones from Archaeological Sites. *BAR British Series 109.* 223 - 250

5.3.33 Lyman, R.L., 1996 *Vertebrate Taphonomy*. Cambridge Manuals in Archaeology. Cambridge University Press.

5.3.34 Payne, S., 1973 Kill-Off Patterns in Sheep and Goats: The Mandibles from Asvan Kale. Anatolian Studies. Journal of the British Institute of Archaeology at Ankara. Vol XXIII. 281 - 303

5.3.35 Payne, S., 1985 Morphological distinctions between the mandibular teeth of young sheep, *Ovis,* and goats, *Capra. Journal of Archaeological Science* 12, 139 - 47

5.3.36 Prummel, W and Frisch, H,-J., 1986 A Guide for the distinction of species, sex and body size in bones of sheep and goat. *Journal of Archaeological Science XIII. 567 – 77*

5.3.37 Schmidt, E., 1972 *The Atlas of Animal Bones.* Elsevier Publishing Company.

5.3.38 Silver, I.A. 1969 The Ageing of Domestic Animals. Science in Archaeology. Edited by Don Brothwell and Eric Higgs. Thames and Hudson.

5.3.39 Von den Driesch, A., 1976 A Guide to the Measurement of Animal bones from Archaeological Sites. *Peabody Museum Bulletin 1.*

6 SMALL FINDS RECORDING AND ANALYSIS: RESEARCH AIMS, GENERAL METHODOLOGY AND TASK LISTS

6.1 Introduction

6.1.1 The artefact categories included in this method statement are stone (including shale, amber and precious stones), metalwork (including gold, silver, copper alloy, iron and lead), worked bone, glass (including frit), organics/textiles and slag/metalworking debris.

6.1.2 All the artefact categories from the 29 principal site fieldwork events have been assessed by the relevant specialist according to the specifications laid out by RLE. This process has included the x-radiography of all the metalwork and a certain amount of conservation work where first aid attention was deemed necessary.

6.1.3 The research aims listed below are a compilation of aims to which small finds studies can directly contribute, extracted from Part 2.40 of the UPD. Research questions concerned with patterns at a regional level will be addressed by a programme of small finds research, comprising baseline quantification of principal site small finds assemblages and targeted detailed analysis of key groups. Data that is relevant to questions of site interpretation will be included as a baseline record in the site digital archive and considered at a synthetic level in the appropriate principal site report.

6.1.4 It is important that research questions are specifically addressed by the analysis programme. Additional lines of research that are not currently included, or which become apparent as the analysis progresses, will normally be noted as an area of future research potential, but will not be undertaken as part of the CTRL works, except with the written instruction of the Project Manager.

6.1.5 Of the 29 principal fieldwork events assessed there are 7 sites for which no further work on the artefacts has been recommended. The remaining 22 sites have assemblages of varying sizes and of various dates ranging from the Bronze age to the Post Medieval period. The large assembles from Thurnham Roman Villa, Waterloo Connection and Saltwood Anglo Saxon cemetery make up the bulk of the work but smaller assemblages from Cuxton Anglo Saxon cemetery, White Horse stone, Beechbrook Wood and Northumberland Bottom Gravesham have there own particular requirements.

6.1.6 There was some variation in the level of recording of the different material categories at the assessment stage. Certain artefact categories have been recorded in more detail than others for example the large assemblages of ferrous slag have only been sampled, and many of the artefacts from Saltwood Anglo Saxon cemetery were still in soil blocks at the time of the assessment. Some material categories will therefore require more work than others to complete the detailed recording.

6.1.7 It is assumed that one of the principal aims of the assessment of the material has been to highlight those objects that require further work and those that do not. Material not recommended for further work will be presented in summary

table form. It is hoped that this information can be taken straight from the assessment reports without the need to refer to the objects again.

6.1.8 Where possible the organisations or individuals who carried out the assessment work will carry out the post excavation work. To ensure consistency a minimum requirement for the recording of artefacts is recommended below.

6.2 Research objectives

Farming Communities – The Later Bronze Age and Iron Age Landscape

6.2.1 Updated research framework – The Early and Middle Iron Age Landscape (c.800 to 300 BC):

6.2.2 The LBA to EIA transition is often characterised by the cessation of bronze hoarding. However much continuity in settlement and material culture is generally evidenced and questions of precise chronology are especially significant for any sites within the EIA/MIA bracket. There is an imbalance in the extent and quality of evidence available in the later pre-Roman Iron Age, and therefore reporting EIA and MIA data must concentrate in the basic questions of chronology, identification, quantification and distribution.

6.2.3 In terms of the analysis and publication of the assemblages more attention needs to be paid to contextualising material culture as opposed to strict division of specialist work. Minimum levels (as stated in works specification for assemblage recording, UPD part 4) of quantitative and contextual data must be recorded to allow others to consider issues of structured deposition and spatial organisation. Finds catalogues need to be cross-referenced to phase and context data.

6.2.4 Is the 'expansion' of settlement related to increased production specialisation, as inferred by the large scale exploitation of the weald iron ore for example, or increased standardisation or centralisation of pottery production. Can the evidence for agricultural regimes be integrated also to demonstrate region-wide socio-economic change?

6.2.5 Knowledge of the early use of iron is rare in the region and priority should be given to close dating of such evidence and technological analysis of any production evidence. Slags, moulds, crucible and hearth linings should be targeted for precision dating if suitable samples are available (White Horse Stone). Ore sources may be determined through geological analysis.

6.2.6 Metal working. Can ore sources be related to specific ore types (such as high carbon or high phosphorous) that may indicate different tool type preferences? Within sites does the distribution of smelting and smithing evidence reflect a pattern of smelting outside/smithing within settlement boundaries?

6.2.7 Within settlements it is has often been difficult demonstrate distribution of contemporary structures. Can this be achieved, and what residential functions and productions can be mapped from structures and artefact spatial analysis? Are extensive open settlements the result of frequent locational shifts of small communities?

6.2.8 What do isolated pits and burials indicate about land division and boundary and symbolic or ritual activity in the open landscape? Utilise evaluation and watching brief data to discern the overall level of activity across the sample landscape.

6.2.9 The middle to later IA transition is characterised by a marked increase in material culture and the types of context in which it is found. Analyse the available data to illustrate this. How much is this a question of preservation or location investigation bias (destruction of earlier evidence by the increased agricultural intensification of the period and subsequent periods?). What maybe the reasons behind this perceived 'abundance'?

Towns and their Rural Landscapes I – The Later pre-Roman Iron Age and Romano-British landscapes (c.300Bc to c.AD500)

6.2.10 Updated research framework – The Later Iron Age and Romano-British Transition:

6.2.11 The recent literature on research agendas for the later Iron Age (Haselgrove et al. 1999; English Heritage 1997) calls for effort to made to understand indigenous transformations in the later 1st millennium distinct from the influence of Roman rule and continental contacts. Important for Kent is to understand the cultural and more precise chronological origins of the 'new' material culture as defined by the introduction of coinage and wheel made pottery, as well as new settlement types (fortified enclosures, numerous smaller enclosures), and ritual practise (increased symbolic deposition and hoarding, cremation cemeteries).

6.2.12 It will be imperative to attempt to develop and refine the chronology using the ceramic assemblages in conjunction with other artefactual evidence (and supported by absolute dating where appropriate). This will provide a framework for understanding and examining the changes and themes identified in this section.

6.2.13 Settlement: The final centuries of the 1st millennium BC sees an intensification in the landscape, that most believe is almost certainly connected to population rise that may be attributable to a combination of factors (see Haselgrove et al 1999). This model shall be tested through mapping the available sites and quantification of material culture associated with find spots. Increased level of activity is often linked to the use of iron in agricultural technology that allowed exploitation of heavier soils, but can we also see expansion in light lowland soils? Did the introduction of the rotary quern together with possible climatic improvements after 400Bc 'aid' this expansion? Or is new technology and introduction of field systems a result of social organisation changes that demand increased production?

6.2.14 A simple model sees changes in SE England from 150BC onwards as a peripheral product of European developments. From what point does imported material culture appear in the CTRL data, and what types? Does the archive represent Gallo-belgic 'imports' or locally produced stylistic influences? Does the evidence suggest direct political contact, immigration or other types of cultural affiliation? What 'kingdom' hinterland do the CTRL sites fall within, an indigenous and largely independent local hierarchy or one with increasing manipulation from Rome? Can any variation in political allegiance be identified

from east to west across the sample? The ceramic and other artefact assemblages should help us to investigate the emergence of local and regional identities and evaluate broader networks of contacts (Millet n.d.).

6.2.15 How does the evidence for Iron Age burial (inhumation/disarticulated bone or cremation, grouped or isolated) help to inform our understanding of changing burial rite in the later 1st millennium? Do cremation cemeteries appear to be linked to increasing continental influence in the LIA? Is inhumation an equal but alternative rite dictated by local socio-political conditions?

6.2.16 The date and quantification of Roman finds should be analysed spatially and through time and comparable databases of imported and 'local/regional' types produced. This to be compared to a similar model for agricultural production products and discussions written up.

6.2.17 Updated research framework – Romano-British Landscape:

6.2.18 The key transitional theme is the relative expression of 'Romanisation'. The synthesis should attempt to 'identify and assess the changes in landscape organisation resulting from the Roman conquest'. Can we observe settlement shift, the creation of new field systems and shifts in plot boundaries? A contextual synthesis is proposed through quantification of the data and its statistical manipulation and graphical display through use of a GIS. Such a presentation that centres on social and economic structures and change through time will underpin the explanatory framework, avoiding purely empirical presentation and at the same time opening up the dataset for researchers to interrogate within more sophisticated theoretical frameworks.

6.2.19 Can phases be identified during which the pattern of production and consumption (= whole finds assemblage) at Thurnham distinguish it from the other excavated sites. If so, do they correlate with changes in the structural forms present?

6.2.20 Does Bower Road represent a villa settlement? Is the aisled building actually the principal building of a small villa type settlement or a subsidiary building within a larger estate?

6.2.21 Non-villa settlements are often thought to belong to the 'poor and lowly' and those who failed to become 'Romanised'. They tend to be defined by absence. No stone and ceramic building material. Lack of imported pottery and other items of material wealth such as decorative metal work, fewer coins etc. Do the non-CTRL sites support this model? What do quantification analyses of material culture indicate about the connection between villa and non-villa settlements and their economic and social relationships? For example numerous coins have been noted on 'rural' sites. This may suggest that their role in the economy may not be adequately reflected by their lack of structural evidence (Taylor 2001, 56). Map the relative wealth between different site types through assemblage summary distribution plots.

6.2.22 Good bone preservation is important to address of age sex distribution, subsistence, and pathology injury and ethnic origins. The cemetery at Pepper Hill however fails to meet this basic criterion. Therefore the Pepper Hill cemetery data are largely limited to study of the grave assemblages

themselves, the dating, interment sequence and type, orientation, type of container and generalised review of grave goods to inform status, belief and ethnic origin. Clearly the most important potential for research lies in the relationship of the cemetery evidence to Springhead itself. Because the CTRL work will be undertaken at a later date on this site it is recommended that these questions be revisited during any subsequent post excavation analysis in CTRL Section 2.

6.2.23 Post excavation work for Pepper Hill will be aimed at maximising the presentation of factual data for future research by others. This will be accompanied by a detailed archive report on the sequence, structures and grave assemblages. Consideration of the cemetery, its sequence and range of burial rites will be synthesised with same period burial evidence from throughout the route in support of a high level statement on the distribution and type of RB burial practice from differing contexts (see above 17).

6.2.24 Updated research framework - The late Roman-medieval transition:

6.2.25 Perhaps the key question should be “do we know what we’re looking for?” Has a reliance on relative dating obscured a slow rather than abrupt ‘departure’ of the Romano-British cultural horizon? Selected late contexts should be subject to AMS dating of ceramic residues to attempt to see whether the fall off in Romanised material culture is as dramatic as we are led to believe (suitable contexts at Thurnham and Pepper Hill should be utilised if appropriate deposits are present, Millet n.d). The relative fall off of Romano British material culture will then be mapped and integrated with the limited environmental evidence to attempt to understand 5th and 6th century landuse patterns.

6.2.26 The study of difference and differentiation will be central to understanding the period. Does the earliest clearly Anglo-Saxon material occur in clear stratigraphic and spatial relationships to the ultimate Romano-British contexts? NW European parallels may be an important source of comparanda for this discussion. What does the 5th and 6th century evidence from CTRL illustrate about the relative socio-economic or political contacts that were developing towards the end of the RB period with the NW European Germanic ‘homelands’ and Gallo-Roman provinces.

Towns and their Rural Landscapes II – The Post Roman and Anglo-Saxon Landscape (500 AD to 1000AD)

6.2.27 Updated research framework – Anglo-Saxon period:

6.2.28 In general the relationship of Britons and Saxons is difficult to interpret from the archaeological record due to the lack of settlement evidence. C the dating of the earliest Saxon contexts be correlated temporarily to the latest Romano-British contexts?

6.2.29 The presence of two population groups at Saltwood and Cuxton and the siting of the cemeteries within established prehistoric landscapes will provide a framework for discussing issues of migration, integration, and socio-political or ideological meaning behind the material cultures represented and the relationship with past landscapes and peoples.

6.2.30 The CTRL sample includes transects either side of the Medway valley. Current models propose that up to the mid 7th century the valley formed a territorial boundary between a Jutish Kent to the east and a predominantly Germanic or Saxon Kent to the west. In comparing the two cemeteries can we distinguish this difference? Previously little early Saxon evidence has been recovered from the area west of the Medway. CTRL Section 2 fieldwork around the Ebbsfleet Valley and Springhead town is beginning to transform this picture with the discovery of early Saxon settlement succeeding Roman levels at both sites and a cemetery on Winfield bank. A detailed consideration of this evidence is not envisaged in the current stage of work although its presence should be noted when discussing the A2 corridor west of Medway landscape development.

6.2.31 Distinctive grave goods at Kentish cemeteries suggest that Frankish influence was also prevalent in the Eastern Kent region. Can separated Jutish and Frankish traditions be illustrated at Saltwood or is the presence of diverse material culture merely a reflection of close integration between diverse immigrant groups mixing lineage's during the establishment of the kingdom?

6.2.32 What do the cemeteries indicate about the social organisation of the populations? What similarity and differences can be ascertained? Is a range of social groups represented? Utilise the grave groups to propose a model or models for the source populations. How do different burial rites inhumation architecture and spatial distribution reflect cultural origins (for example the row graves at Saltwood could be assimilated to Frankish traditions, does the accompanying material culture?).

6.2.33 Key objectives for the cemetery analyses will be to:

6.2.34 Accurately phase the development of the cemeteries through adoption of an absolute dating programme of C14 dates integrated with stratigraphic data.

6.2.35 Provide a grave good seriation correlated to the absolute dating programme to demonstrate the use and deposition of funerary objects.

6.2.36 Can analysis of the burial ritual help in assessing cultural affiliations.

6.2.37 How far can the evidence provided by the CTRL sample be used to inform on the territorial context of the cemeteries.

The Medieval and Recent Landscape – 1000 AD to the modern day

6.2.38 Updated research framework – Medieval period and recent landscape:

6.2.39 Can changes through time in resource use/industrialisation (eg. changes in Mersham iron working) be identified in the CTRL sample? Is there evidence for inter-site specialisation?

6.2.40 Trade and exchange. Do distributions of ceramics (and other classes of artefactual and environment/economic material) fall into meaningful patterns? Can economic/political/social affiliations be identified in such patterns? Eg. Church/secular lordships. Influence of urban centres, Canterbury/London. Pottery supply, Ashford/Canterbury etc.

6.2.41 Can changes in domestic life be determined through the archaeological record? Can the range of activities associated with domestic dwellings be determined? Do these changes with time, and if so is such a change related to general changes in the modes of production as the economic basis changes? Is this reflected in the studies of standing buildings undertaken as part of the CTRL project?

6.3 Method Statement

Pre-PX planning

6.3.1 There are a number of material categories that will require analysis by a number of different specialists. In the case of the swords from Saltwood, they will need to be seen by a conservator, a mineralised textile and organic remains specialist, a metallurgist and the sword specialist. Careful programming for these tasks will be essential in order to keep to the programme. Objects will need to have been fully recorded and preferably illustrated, x-rayed and photographed before they are sampled.

6.3.2 Time will be allocated for liaison between the various specialist, conservators and analysts.

6.3.3 Particular analytical processes requiring timetabling and specific costing include:

- Additional conservation
- Additional x-radiograph
- Petrological analysis including thin sectioning)
- Metallurgical analysis including X-ray flourescence (XRF) and Scanning electron microscopy (SEM).

6.3.4 All scientific analysis that involves the destruction of an object or part of an object will be carefully documented.

6.3.5 All conservation record numbers and records will form part of the archive and the relevant information will be added to the artefact database to form a complete record of the object.

6.3.6 Many artefact categories are being dealt with by external specialists and will need to be transported. All movements of artefacts will be overseen by the lead finds manager and will be carefully documented.

Recording, analysis and report

6.3.7 Completion of full recording of the artefact assemblages will be carried out following any investigative conservation.

6.3.8 Compilation of full and detailed catalogue entries of all objects highlighted for further work will be carried out, and this information will be recorded on to a database with agreed field headings (see below) and using a standard nomenclature (see below)

6.3.9 The detailed catalogue entries should as a minimum include the information listed in Table 1. This gives the database field headings that should be used and indicates where further information on the nomenclature can be located.

TABLE 5: CATALOGUE ENTRY DETAILS

Catalogue headings	Database Field Headings	Further details
Object name	Object	See Appendix 1
Material	Material	See Appendix 2
Composite Material	Material 2	Where a second material exists
Quantification	Count	Number of objects
	Weight	in grammes
Object primary function	Function	See Appendix 1
Typology	Typology	See section 3.2.1
Object date	Object date	
Condition	Condition	
Completeness	Completeness	See Appendix 3
Description	Description	Free text
Dimensions	Length	in mm
	Width	in mm
	Thickness	in mm
	Diameter	in mm
X ray plate number(s)	X-ray No.	
Record photograph number(s)	Photo No.	
Conservation record number	Conservation No.	
Conservation details		
To be illustrated for publication	illustrate	Yes/No
To be photographed for publication	Photo	Yes/No
Site Code	Site	
Context	Context	
Small Find Number	SF No.	
Sample Number	Sample No.	
Specialist name	Specialist	

6.3.10 Reference will be made to a limited number of standard typologies. A list of the typologies used in the assessment is included below, but it is envisaged that this list will expand as work progresses.

6.3.11 Other tasks are as follows:

- Full integration of the artefact details and the contextual information
- Report preparation or the reworking of assessment report to publication standard will include
- Integration of analytical reports
- Library and research time
- Comparison with literature on relevant sites
- A study of the assemblage in its local/regional/national context
- Results will be presented by functional category on a site by site basis.
- In the case of the cemeteries results will also be produced by grave group with particular reference to costume, weapon combinations, object technology and coffin, chamber and grave structure.
- Production of summary tables of the material not requiring further work at the PX stage. This information will be taken directly from the assessment reports and could be carried out by a technician.
- Drawing briefs will be supplied on OWA proforma sheets. Briefs will include sketches, detailed notes, a copy of the catalogue entry and any other relevant information such as published examples.
- All documents will be supplied in Microsoft Word format, all databases will be Microsoft ACCESS or directly compatible format.

TABLE 6: OBJECT NAME AND OBJECT PRIMARY FUNCTION

(This is not a comprehensive list it will need adding to as work progresses)

Object	Object Primary Function
Adze	Tool
Altar	Religious
Ampulla	Personal Ornament
Amulet	Religious
Anchor	Transport
Angle Binding	Structural
Angon	Arms/Armour
Antler	
Antler-Working Debris	Craft/Industry
Anvil	Tool
Architectural Fragment	Structural
Ard	Tool
Armour	Arms/Armour
Arrowhead	
Astragulus	
Atlas	
Awl	Tool
Awl/piercer	
Axe	Tool
Axe Sharpening Flake	
Axe/adze sharpening	
Axe/core tool	
Axis	
Bag	Personal
Balance	Commercial
Bar	Commercial
Barrel	Vessel
Barrel Hoop	Vessel
Barrel Stave	Vessel
Bead	Personal
Beam	Structural
Beater	Craft/industry
Bell	Musical
Bell Clapper	Musical
Bellows	Tool
Belt	Personal
Billhook	Tool
Binding	Miscellaneous
Bit	Horse gear
Blade	Tool
Blade/broken blade	
Bladelet	
Block	Miscellaneous
Bloom	Craft/Industry

Object	Object Primary Function
Boat	Transport
Bobbin	Craft/industry
Bolt	Arms/armour
Bone-working Debris	craft/industry
Boot	Personal
Boss	Miscellaneous
Bottle	Vessel
Bow	Arms/armour
Bowl	Vessel
Box	Vessel
Brace	
Bracelet	Personal
Bracket	Miscellaneous
Brick	Structural
Briquetage	Vessel
Brooch	Personal
Brush	Personal
Bucket	Vessel
Buckle	Personal
Buckle-Plate	Personal
Bullet	Arms/armour
Burin	
Burin spalls	
Button	Personal
Calcaneus	
Came	Structural
Candle Snuffer	Furniture
Candlestick	Furniture
Cannon	Arms/armour
Cannonball	Arms/armour
Carpal	
Catch	Structural
Cauldron	Vessel
Chain	Miscellaneous
Chain Link	Miscellaneous
Chainmail	Arms/armour
Chair	Furniture
Chair Leg	Furniture
Chalice	Religious
Chape	Personal
Chatelaine	Personal
Cheekpiece	Horse gear
Cheese Press	Vessel
Chess Piece	Leisure
Chisel	Tool
Chopper	Tool
Chopping Board	Tool
Cinder	Craft/industry
Cistern	Structural

Object	Object Primary Function
Clasp	Personal
Clavical	
Clay pipe working debris	Craft/industry
Cleat	Personal
Cleaver	Tool
Clock	Furniture
Coffin	Religious
Coin	Commercial
Colander	Vessel
Collar	Miscellaneous
Column Base	Structural
Column Capital	Structural
Column Shaft	Structural
Comb	Personal
Compass	Tool
Core preparation flakes etc	
Core/core fragment	
Coulter	Agricultural
Counter	Leisure
Cresset	Furniture
Crook	Tool
Crowbar	Tool
Crucible	Craft/industry
Crucifix	Religious
Cup	Vessel
Currency Bar	Commercial
Curry Comb	Horse gear
Dagger	Arms/armour
Daub	Structural
Dice Box	Leisure
Die	Leisure
Disc	Miscellaneous
Dish	Vessel
Dividers	Measuring Instrument
Drinking glass	Vessel
Droplet	Craft/industry
Ear Scoop	Personal
Earring	Personal
Escutcheon	Furniture
Fastening	Personal
Femur	
Ferrule	Miscellaneous
Fibula	
Figurine	Ornamental
File	Tool
Finger Ring	Personal
Firedog	Furniture
Fish Hook	Tool
Fish Net	Tool

Object	Object Primary Function
Fitting	Miscellaneous
Flagon	Vessel
Flake Tool	
Flake/broken flake	
Flask	Vessel
Flesh Hook	Tool
Flute	Musical
Font	Religious
Fork	Tool
Fuel Ash Slag	Craft/industry
Gaming Board	Leisure
Gaming Piece	Leisure
Gargoyle	Structural
Girdlehanger	Personal
Glass-working Debris	Craft/industry
Gouge	Tool
Grappling Iron	Tool
Gravestone	Religious
Gridiron	Tool
Gun	Arms/armour
Gun Flint	Arms/armour
Haft	Tool
Halberd	Arms/armour
Hammer	Tool
Hammerscale	Craft/industry
Hammerstone/rubber	
Handle	Miscellaneous
Harness	Horse gear
Harness Fitting	Horse gear
Hasp	Structural
Hearth Lining	Structural
Heckle Tooth	Tool
Heel Iron	Personal
Helmet	Arms/armour
Hinge	Structural
Hinge Pivot	Structural
Hippo Sandal	Horse gear
Hobnail	Personal
Hoe	Tool
Hook	Miscellaneous
Hooked Tag	Personal
Horn	Musical
Horse shoe	Horse gear
Humerus	
Ingot	Commercial
Intaglio	Personal
Jar	Vessel
Jar/Bowl	Vessel
Javelin	Arms/armour

Object	Object Primary Function
Jetton	Commercial
Jews Harp	Musical
Joiner's Dog	Structural
Jug	Vessel
Key	Tool
Key hole	
Kiln Furniture	Craft/industry
Knife	Tool
Knocker	Structural
Lace Tag	Personal
Ladder	
Ladle	Tool
Lamp	Furniture
Last	Tool
Latch	Structural
Latchlifter	Tool
Lid	Vessel
Ligula	Personal
Link	Miscellaneous
Lock	Structural
Lock-Plate	Structural
Long Bone	
Loomweight	Craft/industry
Lynch Pin	Transport
Mace head	Arms/armour
Mallet	Tool
Mandible	
Mandibula Tooth	
Manuscript Pricker	Personal
Mattock	Tool
Maxilla	
Maxillary Tooth	
Metacarpel	
Metapodial	
Metatarsal	
Microburin	
Microlith/backed bladelet	
Millstone	Agricultural
Misc/Multi Tools	
Miscellaneous unworked timber	Miscellaneous
Miscellaneous worked timber	Craft/industry
Mortar	Vessel
Mould	Craft/industry
Mount	Miscellaneous
Nail	Nail
Nail Cleaner	Personal
Natural Debris	
Necklace	Personal
Needle	Tool

Object	Object Primary Function
Net Float	Tool
Net Sinker	Tool
Nodule	
Nose Ring	Personal
Offcut	Craft/industry
Ore	Craft/industry
Oven plate	Structural
Ox Goad	Agricultural
Ox Shoe	Agricultural
Paddle	Transport
Padlock	Tool
Palstave	Arms/armour
Pan	Vessel
Patella	
Paten	Religious
Patera	Vessel
Peg	Structural
Pelvis	
Pen	Personal
Pendant	Personal
Perforated tablet	Structural
Pestle	Tool
Phalanx	
Phial	Vessel
Pick	Tool
Pilgrim's Badge	Religious
Pillar	Structural
Pin	Personal
Pin Beater	Craft/industry
Pincers	Tool
Pinner's bone	Craft/industry
Pintle	Structural
Pitchfork	Tool
Pivot	Miscellaneous
Plank	Structural
Plaque	Ornamental
Plate	Vessel
Platter	Vessel
Pliers	Tool
Ploughshare	Agricultural
Plumb Bob	Tool
Pocketwatch	Personal
Point	Miscellaneous
Post	Structural
pot rivet	
Pounder	Tool
Punch	Tool
Purse Frame	Personal
Purse Mount	Personal

Object	Object Primary Function
Quern	Agricultural
Radius	
Rake	Tool
Rapier	Arms/armour
Rasp	Tool
Razor	Personal
Reaping hook	Tool
Reliquary	Religious
Retouched blade/flake	
Rib	
Ring	Miscellaneous
Rivet	Miscellaneous
Rod	Miscellaneous
Rope	
Roundel	Miscellaneous
Rubber	Tool
Rule	Tool
Sacrum	
Saddle	Horse gear
Salt-working Debris	Craft/industry
Sandal	Personal
Saw	Tool
Scabbard	Arms/armour
Scale	Commercial
Scapula	
Sceatta	Commercial
Scissors	Tool
Scraper	
Sculpture	Ornamental
Scythe	Tool
Seal	Personal
Seal-box	Personal
Serrate/denticulate	
Sesamoid	
Shank	Miscellaneous
Shears	Tool
Sheath	Arms/armour
Sheet	Miscellaneous
Shield	Arms/armour
Shield Boss	Arms/armour
Shield Fitting	Arms/armour
Shield Grip	Arms/armour
Shield Stud	Arms/armour
Shingle	Structural
Shoe	Personal
Shovel	Tool
Sickle	Tool
Skate	Leisure
Skewer	Tool

Object	Object Primary Function
Skillet	Vessel
Skull	
Slingshot	Arms/armour
Smithing slag	Craft/industry
Smoother	Tool
Socket	Miscellaneous
Socket Stone	Structural
Spade	Tool
Spadeshoe	Tool
Spall/spall bag	
Spatula	Tool
Spear	Arms/armour
Spear Head	Arms/armour
Spear Thrower	Arms/armour
Spike	Tool
Spindle Whorl	Craft/industry
Spit	Furniture
Spoon	Tool
Spur	Horse gear
Stake	Structural
Stamp	Tool
Staple	Miscellaneous
Statue	Ornamental
Stave	Miscellaneous
Steelyard	Commercial
Stirring Rod	Tool
Stirrup	Horse gear
Stopper	Vessel
Stove Tile	Structural
Strainer	Vessel
Strap	Miscellaneous
Strapend	Personal
Strigil	Personal
Strike-a-light	Tool
Strip	Miscellaneous
Stud	Miscellaneous
Stylus	Personal
Swivel Hook	Structural
Sword	Arms/armour
T-Clamp	Structural
Table	Furniture
Tack	
Tally Stick	Commercial
Tang	Miscellaneous
Tank	Arms/armour
Tankard	Vessel
Tap	Furniture
Tap Slag	Craft/industry
Tarsal	

Object	Object Primary Function
Tarsus-metatarsus	
Tenter Hook	Tool
Terret	Horse gear
Thimble	Tool
Tibia	
Tile	Structural
Tile-working Debris	Craft/industry
Toe Ring	Personal
Toggle	Personal
Token	Commercial
Tongs	Tool
Tooth, unspecified	
Toothbrush	Personal
Torc	Personal
Tray	Vessel
Trencher	Vessel
Tripod	Tool
Trough	Vessel
Trowel	Tool
Tub	Vessel
Tube	Miscellaneous
Tuyere	Craft/industry
Tweezers	Personal
Ulna	
Unidentified	Miscellaneous
Urinal	Vessel
Urn	Vessel
Utilised blade/flake	
Vertebra	
Vessel	
Vitrified Clay Lining	Structural
Washer	Miscellaneous
Waste	Miscellaneous
Waster	Craft/industry
Water Pipe	Structural
Wedge	Tool
Weight	Tool
Wheel	Transport
Whetstone	Tool
Whistle	Musical
Wig Curler	Personal
Window Glass	Structural
Window Grill	Structural
Wire	Miscellaneous
Wood Working Debris	Craft/industry
Wristguard	Personal
Yoke	Agricultural
Zale	Structural

TABLE 7: MATERIAL CLASSIFICATION

Material	Material Group
Amber	Stone
Amethyst	Stone
Animal Bone	Bone
Antler	Bone
Burnt Flint, Unworked	Stone
Burnt Stone	Stone
CBM	Ceramic
Chalk	Stone
Clay Pipe	Ceramic
Clinker	Other
Coal	Other
Copper Alloy	Metal
Fired Clay	Ceramic
Flint	Stone
Frit	Glass
Garnet	Stone
Glass	Glass
Gold	Metal
Human Bone	Bone
Iron	Metal
Jet	Stone
Lead/Lead Alloy	Metal
Leather	Organic
Opus Signinum	Ceramic
Other Metal	Metal
Plastic	Other
Pottery	Ceramic
Shale	Stone
Shell	Bone
Silver	Metal
Slag	Metal
Stone	Stone
Textile	Organic
Wall Plaster	Ceramic
Wood	Organic

TABLE 8: LEVELS OF COMPLETENESS

Completeness
Complete
Incomplete
Indeterminate

6.4 Reference typologies used in the assessment reports

Bronze Age Metalwork

Burgess, C B, and Gerloff, S, *1981 The dirks and rapiers of Great Britain and Ireland*, Prähistorische Bronzefunde, IV(7), München
Gerloff, S, 1975 The Early Bronze Age daggers in Great Britain and a reconsideration of the Wessex Culture, Prähistorische Bronzefunde, VI(2), München

Roman Metalwork

Coinage: Casey, J and Brigstock, R, forthcoming, 'The Roman Coinage', in I D Riddler, M Lyne and Q Mould, The Roman Watermills at Ickham, Kent, *Canterbury Archaeological Trust Occasional Papers* (Canterbury)
Brooches: Mackreth, D M, forthcoming, Romano-British Brooches: Studies in Typology and Design (London)
Brooches: Hattatt, R, 1989 *Ancient brooches and other Artefacts,* Oxford (figs. 154-230).
Amphora-shaped strap end: Ager, B, forthcoming, Late Roman Belt- and Strap-Fittings, in I D Riddler, M Lyne and Q Mould, *The Roman Watermills at Ickham: Salvage Excavations of a Roman Industrial Complex by Jim Bradshaw and Chris Young, 1972-1975*, Canterbury Archaeological Trust Occasional Papers (Canterbury)
Copper alloy and silver pins: Cool, H E M, 1990, 'Roman Metal Hair Pins from Southern Britain', *Archaeological Journal* **147**, 148-82
Mirror fragments: Lloyd-Morgan, G, 1983, 'Some Mirrors from Roman Canterbury', *Archaeologia Cantiana* **99**, 231-6
Bracelets: Mould, Q and Riddler, I D, forthcoming, 'The Bracelets', in I D Riddler, M Lyne and Q Mould, *The Roman Watermills at Ickham*. *Salvage Excavations of a Roman Industrial Complex by Jim Bradshaw and Chris Young, 1972-1975*, Canterbury Archaeological Trust Occasional Papers (Canterbury)
Finger rings: Henig, M, 1974 *A corpus of Roman engraved gemstones from British sites*, BAR Brit. Ser. 8, Oxford
Crummy, N, 1983 The Roman small finds from excavations in Colchester 1971-9, Colchester Archaeol Rep **2**, Colchester
Penannular Brooch: Fowler, E, 1960 The origins and development of the penannular brooch in Europe, *Proc Prehist Soc* **26**, 149-77
Knife: Manning, W H, 1985, Catalogue of Romano-British Iron Tools, Fittings and Weapons in the British Museum

Roman worked bone

Counters: Greep, S, 1995 Objects of bone, antler and Ivory from C.A.T. sites in Blockley, K, Blockley, M, Blockley, P, Frere, S S and Stow, S, *Excavations in the Marlowe car park and surrounding areas*, Archaeology of Canterbury V, Canterbury, 1112-52
Hair pins: Crummy, N, 1983 *The Roman small finds from excavations in Colchester 1971-9*, Colchester Archaeol. Rep. 2, Colchester

Roman Glass

Roman Vessel Glass: Cool, H E M and Price, J, 1995 *Roman vessel glass from excavations in Colchester 1971-85*, Colchester Archaeol Rep **8**, Colchester
Price, J and Cottam, S 1998 *Romano-British glass vessels: a handbook*, CBA Practical Handbook in Archaeology **14,** York
Romano-British Beads: Guido, M, 1978 *The glass beads of the prehistoric and Roman Periods in Britain and Ireland,* Rep Res Comm Soc Antiq London **35**, London

Roman Worked Stone

Shale Bracelets: Blockley, K, Blockley, M, Blockley, P, Frere, S S and Stow, S, 1995, *Excavations in the Marlowe Car Park and Surrounding Areas*, The Archaeology of Canterbury **5** (Whitstable)

Houliston, M, 1999, 'Excavations at the Mount Roman Villa, Maidstone, 1994', *Archaeologia Cantiana* **119**, 71-172

Anglo-Saxon Metalwork

Swords:Behmer, E, 1939, Das zweischneidige Schwert der germanischen Völkerwanderungszeit (Stockholm)
Koch, U, 1977, Das Reihengräberfeld bei Schretzheim
Menghin, W, 1983, Das Schwert im frühen Mittelalter
Spears: Swanton, M J, 1973, The Spearheads of the Anglo-Saxon Settlements (London)
Angons: Swanton, M J, 1973 The Spearheads of the Anglo-Saxon Settlements (London)
Arrowheads: Arnold, C J, 1982, The Anglo-Saxon Cemeteries of the Isle of Wight (London)
Shields: Dickinson, T M and Härke, H, 1992, Early Anglo-Saxon Shields, Archaeologia **110** (London)
Evison, V I, 1963, 'Sugar-loaf Shield Bosses', Antiq J **43**, 38-96
Horse Harness: Vierck, 1970-71, in M Müller-Wille, 'Pferdegrab und Pferdeopfer im frühen Mittelalter', Berichten van de Riksdienst voor het Oudheidkundig Bodemonderzoek **20-21**, 119-248

Anglo-Saxon Jewellery

Brooches: Parfitt, K and Brugmann, B, 1997, The Anglo-Saxon Cemetery on Mill Hill, Deal, Kent, Soc Med Archaeol Monogr **14**, London
Other items: Geake, H, 1997, The Use of grave-goods in Conversion-period England, c. 600 – c. 850, Brit Archaeol Rep **261** (Oxford)
Metalwork: Evison, V I, 1987, Buckland Anglo-Saxon Cemetery. HBMCE
Ross, S, 1991, Dress pins from Anglo-Saxon England: their production and typo-chronological development, unpublished DPhil thesis, University of Oxford
Beads: Hirst, S, 1999, 'An approach to the study of Anglo-Saxon glass beads'
Beads: Evison, V I, 1987b, 'Glass beads' in (Evison, V I,1987a, Buckland Anglo-Saxon Cemetery. HBMCE. pp61-78)
Gold Strip: Crowfoot, E and Hawkes, S C, 1967, 'Early Anglo-Saxon gold braids', Med Archaeol **11**, 42-86 & 209-10
Walton, P, 1989, Textiles, Cordage and Raw Fibre from 16-22 Coppergate, (The Archaeology of York, **17/5**), Counc Brit Archaeol

Other Anglo-Saxon Items

Buckles & Belt Fittings: Marzinzik, S, 2000, Anglo-Saxon Belt Buckles: Their Classification and Context, unpublished PhD thesis, Oxford University
Knives: Drinkall, G and Foreman, M, 1998, The Anglo-Saxon Cemetery at Castledyke South, Barton-on-Humber, Sheffield Excav Rep **6** (Sheffield)
Härke, H, 1992, Angelsächsische Waffengräber des 5 bis 7 Jahrhunderts, Zeitschrift für Archäologie des Mittelalters Beiheft **6** (Cologne)
Keys and Girdle Hangers: Evison, V I, 1987, Dover: Buckland Anglo-Saxon Cemetery, HBMC Archaeol Rep 3 (London)
Hawkes, S C, 1973, 'The Dating and Social Significance of the Burials in the Polhill Cemetery', in B Philp, Excavations in West Kent 1960-1970, Dover 1973, 186-201
Perkins, D R J, 1991, 'The Jutish Cemetery at Sarre revisited: a rescue evaluation', Archaeologia Cantiana **109**, 139-66
Coptic Bowls: Bruce-Mitford, R L S, 1983, 'The Coptic Bowl', In A Care-Evans, The Sutton Hoo Ship-Burial. Volume III, 732-52 (London)
Iron Bound Containers: Böhner, K, 1958, Die Fränkischen Altertümer des Trierer Landes (Bonn)
Box Fittings: Evison, V I, 1987, Dover: Buckland Anglo-Saxon Cemetery, HBMC Archaeological Report **3** (London)
Gaming Pieces: Youngs, S, 1983, 'The Gaming-Pieces', in A Care-Evans (ed.), The Sutton Hoo Ship-Burial. Volume 3, 853-74 (London)

Structural Ironwork: Riddler, I D, forthcoming, 'Clench Nails in East Kent graves', Archaeologia Cantiana
Copper Drinking Vessels: Care Evans, A, 1983, The Sutton Hoo Ship-Burial: volume 3 (London)
Copper Alloy Mounts: Evison , 1987, Dover: Buckland Anglo-Saxon Cemetery, HBMC Archaeological Report **3** (London)

Anglo-Saxon Worked Stone

Spherical Rock Crystal: Meaney, A L, 1981, Anglo-Saxon Amulets and Curing Stones, Brit Archaeol Rep **96** (Oxford)

Anglo-Saxon Glass

Harden, D B, 1956, Glass Vessels in Britain and Ireland, AD 400-1000, In D B

Anglo-Saxon Worked Bone

Double-pointed pinbeater: Riddler, I D, forthcoming, Quantifying Pinbeaters, Archaeologia Cantiana
Iron weaving battens: Walton Rogers, P, 1997, Textile Production at 16-22 Coppergate, The Archaeology of York 17/ 11 (London)
Comb: Hawkes, S C, 1958, 'The Anglo-Saxon Cemetery at Finglesham, Kent: a reconsideration' Medieval Archaeol 2, 1-71.

Anglo-Saxon Organics

Mineralised Leather: Cameron, E, 2000, Sheaths and Scabbards in England AD400-1100, Brit Archaeol Rep 301 (Oxford)
Textile Remains: Walton, P, and Eastwood, G, 1988, *A Brief Guide to the Cataloguing of Archaeological Textiles*, IAP (4th edition) (London)

Bone & Shell

Pendants: Lethbridge, T C, 1931, 'The Anglo-Saxon Cemetery at Burwell Cambridgeshire' *Cambridge Antiq Soc New Series, 3.*
Cowrie Beads: Meaney, A L, 1981, 'Anglo-Saxon Amulets and Curing Stones' *BAR Brit Ser 96.*

7 HUMAN REMAINS RECORDING AND ANALYSIS: RESEARCH AIMS, GENERAL METHODOLOGY AND TASK LISTS

7.1 Introduction

7.1.1 The research aims listed below are a compilation of aims to which human remains studies can directly contribute, extracted from Part 2.41 of the UPD. Research questions concerned with patterns at a regional level will be addressed by a programme of human remains research, comprising baseline quantification of principal site human remains assemblages and targeted detailed scientific dating and analysis of key groups. Data that is relevant to questions of site interpretation will be included as a baseline record in the site digital archive and considered at a synthetic level in the appropriate principal site report. Integration of the various strands of evidence, and consideration of route-wide research questions, will be undertaken by the lead specialist and presented in the relevant route-wide specialist package report.

7.1.2 It is important that research questions are specifically addressed by the analysis programme. Additional lines of research that are not currently included, or which become apparent as the analysis progresses, will normally be noted as an area of future research potential, but will not be undertaken as part of the CTRL works, except with the written instruction of the Project Manager.

7.1.3 Human remains – cremated and unburnt - were recovered from a total of 18 sites, from deposits spanning a broad temporal range from the late Neolithic to the middle Saxon period. The assemblages from seven sites cover several phases, with up to five phases being encompassed within the assemblages from three sites (West Northumberland Bottom, Saltwood Tunnel and White Horse Stone). Material from the remaining 11 sites represent a single phase.

7.1.4 Of the four contractors involved in the project, the majority (11) of the sites from which human remains were recovered were excavated by Oxford Archaeology (OA). Of the remaining seven sites, four were excavated by the Museum of London Archaeological Service (MoLAS) and three by Wessex Archaeology (WA) and/or Canterbury Archaeological Trust (CAT). The data recovery and analysis of material from the individual sites will be undertaken by osteologists within the individual organisations, Ann Sofie Witkin under the supervision of Angela Boyle for OA, Bill White for MoLAS and Jacqueline McKinley for WA and CAT. It is proposed that a minimum of one liaison meeting is held between specialists undertaking the analysis and the lead specialist during the basic data recovery stage.

7.1.5 The Method Statement identifies the principal categories for data recovery and analysis, and outlines the methods of data collection and analysis to be employed. Specialist scientific analysis to be undertaken on material from specific sites is presented by site in Table 1. One of the aims is to ensure data recovery and analysis of a comparable form and level (where the condition of the assemblages allows), using standard terminology to enable the collation of an integrated human bone discussion report and for the data to comply with accepted Standards of recording.

7.2 Research Aims

Early Agriculturalists – The Neolithic and Early Bronze Age Landscape

7.2.1 Updated research framework – Early Bronze Age Landscape

7.2.2 How does the CTRL evidence from grave contexts relate to wider interpretations of Late Neolithic and Early Bronze Age funerary traditions at regional and national scales?

7.2.3 Can a distinction between 'private/domestic' and 'corporate/ritual' activity be identified spatially? An analysis of the distribution of 'ritual' and domestic' activity should carried out with regard to a range of attribute variables to demonstrate the interrelation or interdependence(?) of the two classes of evidence.

7.2.4 Does the CTRL evidence contribute to our understanding of the social and political significance of funerary monuments and monument groups in the Late Neolithic and Early Bronze Age? In particular, to what extent do they 'reflect' social organisation or were they more concerned with expressing idealised relationships among particular elite groups?

7.2.5 What are the chronologies of funerary monument groups and individual monuments along the CTRL corridor and is it possible to recognise tempos of monument building?

7.2.6 How do sequences of burial events and material deposits relate to monument histories?

7.2.7 What were the spatial lay-outs of the CTRL ring-ditch/barrow groups?

7.2.8 Updated research framework – Early Bronze Age / Middle Bronze Age Transition:

7.2.9 The onset of the MBA at around 1500BC is characterised by the following broad trends. *Increased regionalism*, as demonstrated by Urn styles and regionally discreet Deveral Rimbury styles. *Increased residential evidence*, as indicated by the development of enclosures, settlements and land division. *A change in burial rite*, small cremation groups now dominate with no grave goods.

7.2.10 What is the CTRL evidence for MBA (Deveral Rimbury associated) settlement and continued structural deposition practices (e.g. artefact deposition as Thurnham)?.

7.2.11 Does the distribution and chronology of cremation burial reflect social change.

Farming Communities – The Later Bronze Age and Iron Age Landscape

7.2.12 Updated research framework – The Later Bronze Age Landscape:

7.2.13 Significant Deverel Rimbury and plainware assemblages have been recovered. A detailed seriation analysis coupled with absolute dating and

residue analysis will be used to present a ceramic chronology (correlated to existing series) for the CTRL sites. The context (settlement/burial), source of raw material, distribution of vessel types, of the ceramic assemblages will enable questions of regionality, production and trade, role of structured deposition and 'feasting' economy, and visibility of the burial rite to be integrated with the above framework.

7.2.14 Updated research framework – The Early and Middle Iron Age Landscape (c.800 to 300 BC):

7.2.15 In terms of the analysis and publication of the assemblages more attention needs to be paid to contextualising material culture as opposed to strict division of specialist work. Minimum levels (as stated in works specification for assemblage recording, UPD part 4) of quantitative and contextual data must be recorded to allow others to consider issues of structured deposition and spatial organisation. Finds catalogues need to be cross-referenced to phase and context data.

7.2.16 What do isolated pits and burials indicate about land division and boundary and symbolic or ritual activity in the open landscape? Utilise evaluation and watching brief data to discern the overall level of activity across the sample landscape.

7.2.17 Cremation evidence in the MIA is rare since the occurrence of cremation is generally associated with later continental influences. Poorly preserved cremation residues may be found at Beechbrook Wood in this period. Dating of these will be important with high precision AMS dates if the rite is associated with the MIA enclosed settlement.

Towns and their Rural Landscapes I – The Later pre-Roman Iron Age and Romano-British landscapes (c.300Bc to c.AD500)

7.2.18 Updated research framework – The Later Iron Age and Romano-British Transition:

7.2.19 The recent literature on research agendas for the later Iron Age calls for effort to made to understand indigenous transformations in the later 1st millennium distinct from the influence of Roman rule and continental contacts. Important for Kent is to understand the cultural and more precise chronological origins of the 'new' material culture as defined by the introduction of coinage and wheel made pottery, as well as new settlement types (fortified enclosures, numerous smaller enclosures), and ritual practise (increased symbolic deposition and hoarding, cremation cemeteries).

7.2.20 It will be imperative to attempt to develop and refine the chronology using the ceramic assemblages in conjunction with other artefactual evidence (and supported by absolute dating where appropriate). This will provide a framework for understanding and examining the changes and themes identified in this section.

7.2.21 How does the evidence for Iron Age burial (inhumation/disarticulated bone or cremation, grouped or isolated) help to inform our understanding of changing burial rite in the later 1st millennium? Do cremation cemeteries appear to be

linked to increasing continental influence in the LIA? Is inhumation an equal but alternative rite dictated by local socio-political conditions?

7.2.22 There is a further (or more specific) question about burials: how far did organised cremation burials replace other modes of disposal (single cremations in settlement areas or ditches, exposure and/or /disarticulation for example)? Did cemeteries (whether cremation or inhumation) replace other modes of disposal as totally as we think?

7.2.23 Updated research framework – Romano-British Landscape:

7.2.24 Good bone preservation is important to address of age sex distribution, subsistence, and pathology injury and ethnic origins. The cemetery at Pepper Hill however fails to meet this basic criterion. Therefore the Pepper Hill cemetery data are largely limited to study of the grave assemblages themselves, the dating, interment sequence and type, orientation, type of container and generalised review of grave goods to inform status, belief and ethnic origin. Clearly the most important potential for research lies in the relationship of the cemetery evidence to Springhead itself. Because the CTRL work will be undertaken at a later date on this site it is recommended that these questions be revisited during any subsequent post excavation analysis in CTRL Section 2.

7.2.25 At Pepper Hill the detailed chronology is vital and AMS dates should be used to assess the dating of the latest phases. Nationally, it is still not clear how many "Late Roman" cemeteries continue beyond the fourth century.

7.2.26 With the sample of landscape available it is crucial to look at the overall distribution of burial within the landscape in the IA/RB period to assess whether the patterns change through time. This should also be done both for bits of human body (cf. classic Wessex IA) which do seem to continue to be deposited into the Roman period but are rarely reported upon and infant burials. Contextual study of these could make a vital contribution.

7.2.27 Post excavation work for Pepper Hill will be aimed at maximising the presentation of factual data for future research by others. This will be accompanied by a detailed archive report on the sequence, structures and grave assemblages. Consideration of the cemetery, its sequence and range of burial rites will be synthesised with same period burial evidence from throughout the route in support of a high level statement on the distribution and type of RB burial practice from differing contexts.

Towns and their Rural Landscapes II – The Post Roman and Anglo-Saxon Landscape (500 AD to 1000AD)

7.2.28 Updated research framework – Anglo-Saxon period:

7.2.29 In general the relationship of Britons and Saxons is difficult to interpret from the archaeological record due to the lack of settlement evidence. Can the dating of the earliest Saxon contexts be correlated temporarily to the latest Romano-British contexts? Mapping well dated activity across the sample may illustrate hiatus or contemporaneous activity zones in the landscape. Can

changes in the existing settlement patterns be correlated with differing occurrence of artefact groups and perhaps immigration patterns?

7.2.30 The presence of two population groups at Saltwood and Cuxton and the siting of the cemeteries within established prehistoric landscapes will provide a framework for discussing issues of migration, integration, and socio-political or ideological meaning behind the material cultures represented and the relationship with past landscapes and peoples.

7.2.31 What do the cemeteries indicate about the social organisation of the populations? What similarity and differences can be ascertained? Is a range of social groups represented? Utilise the grave groups to propose a model or models for the source populations. How do different burial rites inhumation architecture and spatial distribution reflect cultural origins (for example the row graves at Saltwood could be assimilated to Frankish traditions, does the accompanying material culture?).

7.2.32 Key objectives for the cemetery analyses will be to:

7.2.33 Accurately phase the development of the cemeteries through adoption of an absolute dating programme of C14 dates integrated with stratigraphic data.

7.2.34 Provide a grave good seriation correlated to the absolute dating programme to demonstrate the use and deposition of funerary objects.

7.2.35 Where appropriate to the quality of bone preservation, undertake selected scientific analysis to determine age, sex and pathology, and geographic origin of individuals.

7.2.36 Can analysis of the burial ritual help in assessing cultural affiliations.

7.2.37 How far can the evidence provided by the CTRL sample be used to inform on the territorial context of the cemeteries.

Data Recording and Analysis

7.2.38 Data recovery and recording is required to cover five main categories of enquiry;

- taphonomy
- demographic data
- metric data (skeletal indices) and morphological variations
- pathological lesions/conditions
- Mortuary studies; particularly data pertaining to pyre technology and cremation ritual

7.2.39 Some categories of data will inform on more than one area of enquiry.

Unburnt Bone

7.2.40 Data recording to follow a number of standard procedures for the collection of different categories of data, many of which are presented in Brothwell 1972 (and later editions), Bass 1987, and Buikstra and Ubelaker 1994. Data recovery will, as far as is practical and where appropriate dependent on the condition of the individual assemblages, include the following areas of data recording. Levels of detail will vary dependent on bone preservation.

7.2.41 The *condition* of the bone – degree of abrasion/erosion and root/fungal marking, fragmentation, any warping – to be observed. Reference to Behrensmeyer 1978 (Table 5 Buikstra and Ubelaker 1994) may provide guide to severity, or definitions for grading to be provided. Preservation will also be reflected in percentage of skeletal recovery (inhumation burials) or number and size of fragments (disarticulated material). Link to data on microenvironmental variations within grave fills e.g. proximity of grave goods/different artefact types, variations in burial/grave form to ascertain any patterns in degrees of preservation.

7.2.42 *ancient modification* – this category of data is of particular importance for disarticulated prehistoric material where there may have been deliberate manipulation of material or exposure/excarnation. Evidence of animal gnawing – carnivore or rodent – will record skeletal element, position and nature of marks (puncture marks, crenulation, grooving). Broken ends of bones will be examined to deduce if deliberate or accidental, green/dry (Binford 1981). Evidence for cut marks will include bone, position of cut, number, average and range of length and type of cut represented (Binford 1981). Drawings and/or photographs should be used to demonstrate appearance and position of any modification.

7.2.43 *skeletal inventory* – record of all recovered bone and teeth; to give minimum numbers of each bone type, major joint surfaces and tooth/socket to allow calculation of prevalence of pathological conditions, and assist in count of minimum number of individuals from disarticulated material

7.2.44 *sex* – sexually dimorphic traits of skeleton (Brothwell 1972, Bass 1987, Buikstra and Ubelaker 1994). In view of the very poor skeletal recovery from some cemeteries, where most individuals are represented by little other than tooth crowns, it is proposed to attempt to sex individuals using multivariate analysis of measurements taken from the tooth crowns (Ditch and Rose 1976). The integrity of the attributed sex will be indicated by one of three confidence levels – confident, probable (?), possible (??)

7.2.45 *age* – to be assessed using standard criteria based on stages of skeletal and tooth development (Beek 1983, Buikstra and Ubelaker 1984, Bass 1987, Scheuer and Black 2000), and age-related changes to the bone (Brothwell 1972, Buikstra and Ubelaker 1984, Bass 1987, Lovejoy *et al* 1985, Miles 1962a and b, 1963). Poor skeletal recovery will limit tightness of definition in many cases and broad age bands will be applied (see Catalogue).

7.2.46 *metric data* – the poor level of skeletal preservation will limit the taking of measurements in most cases. Reconstruction will be necessary in some cases to enable measurements to be taken. Where possible a minimum set of measurements on the skull (Brothwell 1972 fig. 33a, and in prep.) and post-cranial skeleton (Brothwell 1972, 85, and in prep.) will be taken. Comparable and more detailed measurements are also shown in Buikstra and Ubelaker (1984, 69-84) and should be taken where appropriate. Data to assist with sexing, calculation of various indices (e.g. stature estimation - Trotter and Gleser 1952 and 1958, Trotter 1970; cranial index – Brothwell 1972, 88; Platymeric and platycnemic – Bass 1987), and assessment of population homogeneity.

7.2.47 *non-metric traits/morphological variations* – the systematic recording of traits will be adversely affected by the poor condition of the bone. Traits (Berry and Berry 1967; Finnegan 1978) should be recorded where the appropriate skeletal area is present. Traits may be of assistance in demonstrating genetic links. As much of the overall assemblage comprises tooth crowns, any variations in tooth crown form will be noted (Hillson 1990, 256-270).

7.2.48 *pathological lesions* will be described – bone/tooth affected, position of lesion on bone/tooth and a non-technical simple description. The position and size of lesions may be illustrated (dental inventory often includes diagrams). Recording and terminology will follow standard usage, for example Rogers *et al* 1987, Rogers and Waldron 1995, Lovell 2000. Where necessary x-radiographs will be taken to assist description and diagnosis of lesions. Unusual lesions will be photographed.

Cremated Bone

7.2.49 Data recording will follow standard procedures (McKinley 1994, 5-21; 2000a; and in prep.).

7.2.50 All unsorted small fraction *residues* (1mm and 2mm) will be scanned by the osteologist for recovery of identifiable osseous material and any other archaeological components (pyre goods and/or pyre debris).

7.2.51 Comment will be made on the *condition* of the bone from each assemblage, including observations on the relative proportion of trabecular bone and any chalky appearance to cortical bone (indicators of poor preservation of bone).

7.2.52 Levels of *disturbance/truncation* to deposits will be noted to ensure comparison of deposits of comparable integrity with respect to aspects reflective of mortuary rite (undisturbed - deposit intact with no bone loss likely due to truncation; slightly disturbed – all remains *in situ* but some movement of material likely; disturbed – some bone loss likely from deposit; badly disturbed/truncated).

7.2.53 *Demographic data* assessed following same criteria as for unburnt bone, with additional metric methods (Gejvall 1969; Vark 1974, 1975; Wahl 1982 – all outlined in McKinley 1994 and 2000a) utilised where appropriate.

7.2.54 *Metric analysis* is not possible due to nature of material. *Morphological variations* will be recorded where observed but standard recording as for inhumation burials is not practical.

7.2.55 Position and form of *pathological lesions* to be described as for unburnt bone. Diagnosis may be possible in many cases but nature of material and assemblages precludes calculation of prevalence rates. X-radiographs will be taken to assist diagnosis where necessary and photographs taken of unusual pathological conditions where appropriate.

7.2.56 Aspects of *pyre technology and cremation ritual* may be reflected by a variety of factors and form an essential part of the osteological analysis:

- efficiency of cremation; degree of fragmentation; skeletal elements represented; presence and type of pyre goods (including animal bone) and pyre debris; and formation process of the burial as reflected in undisturbed urned burials excavated in spits (see Pepper Hill). The processes involved in the formation of the Pepper Hill *busta,* in terms of factors such as pyre site manipulation and the making of the burial will also be investigated.
- records for each deposit will be accompanied by a note of the type of deposit represented (for which access to site context data is essential) to enable comparison between comparable deposit types (i.e. urned burials, unurned burials, *busta*, pyre sites, redeposited pyre debris, redeposited) and between deposit types. More than one type of deposit may be represented within a cut/associated group and relationships between associated deposits and the processes involved in their formation will be investigated.
- It is advised that terminology for deposit type follows that outlined in McKinley 1997, 56-7 and McKinley 2000b NB. 'Memorial' may also be termed 'Cenotaph'.
- an exchange of data between specialists working on the other various components of the deposits – animal bones, charred plant remains, artefacts – is necessary to aid interpretation of deposit type, the formation processes and mortuary rite.

7.2.57 Cremated bone from a number of sites was noted in assessment as not requiring any further analysis. It will be ensured that the assessment records comply with the requirements outlined above as far as is possible and enhanced if necessary.

7.2.58 The type of deposit represented was not always clear at time of excavation/assessment. This will be given full consideration in all cases; where a deposit type is unclear or questionable the assigned category will be qualified or denoted 'cremation-related context' (crc).

7.3 Presentation of data

7.3.1 The recorded data for each context is to be presented for publication in catalogue form together with the stratigraphic data and other archaeological components. This will represent a summary of the main categories of data and will be extracted from the database record. The proposed categories of data for inclusion within the publication catalogue are:

Unburnt Bone

- context number
- cut number
- group/sub-group number
- % skeletal recovery with skeletal areas represented – skull, axial skeleton, upper limb, lower limb (s.a.u.l.)
- condition of bone
- sex of individual(s) – integrity of assessment to be qualified as probable (?) or possible (??) where necessary. Multiple entries for more than one individual per context with prefix or separate entry using same no. (database decision?)
- age of individual(s) – main categories of neonate (<6mths), infant
- (<5yr.), juvenile (5-12 yr.), subadult (13-18 yr.), adult (>18 yr.) to be qualified with approx. (*c.*) age in years. These are likely to cover broad bands in adult category. Multiple entries as for sex.
- skeletal indices
- pathology summary – summary of the type of lesions/conditions
- observed and skeletal elements affected e.g. osteoarthritis – left calcaneum (use of key to reduced length of entries).
- non-metrics summary – summary of observed morphological
- variations/non-metric traits

Cremated Bone

- context number
- cut number
- group/sub-group number
- deposit type – with indication of integrity (see above)
- associations – to indicate where bone has been disturbed from another
- deposit, or where deposit types are related
- total weight of bone (inclusive of osseous pyre goods)
- skeletal areas represented – as for unburnt bone
- sex of individual(s) – as for unburnt bone
- age of individual(s) – as for unburnt bone
- pathology summary – as for unburnt bone
- pyre goods – includes input of other specialist but distinguish from …
- grave goods – other specialist input
- pyre debris – type and quantification (input of other specialist)
-

Reports

7.3.2 A publication level text for the principal site report is to be produced per Site, by the individual specialist. These reports are to comprise factual statements pertaining to the individual assemblages, divided by phase in multi-phase sites. They will comprise an introduction including basic quantification's and phasing; method statement (which could be generic but since these are to potentially comprised stand-alone reports it should be included in each); results.

7.3.3 The results will address each area of enquiry as outlined above in *Data Recording and Analysis* at a level appropriate to the individual assemblage. These should include at minimum; quantified comment on the condition of the assemblage and its nature; presentation of the minimum number of individuals, numbers of each sex and age categories; summary of skeletal indices and summary of morphological variations; prevalence rates for all pathological conditions, distinguished by age and sex where assemblage size appropriate (number of individuals showing given conditions divided by total

number of individuals for which observation could be made; forms of presentation should follow as far as practicable standards as presented in e.g. Mays *et al* in press and Roberts and Connell in prep. The mortuary rite of cremation will be considered in terms of the factors outlined above in *Data Recording and Analysis*.

7.3.4 Each area of enquiry will include discussion on significant aspects of the data and how it may contribute and potentially expand the aims outlined in the *Research Framework*. Intra- and infra- site comparative data should be included in the discussion to place the assemblages in their wider site, regional, national and international context. Whilst repetition is to be minimised, these reports may ultimately form stand-alone documents and should be presented as such.

7.4 Specialist Scientific Analysis

7.4.1 The specialist requirements for each assemblage are presented in Table 1 and include primary suites of samples for radio-carbon (C14), Carbon/Nitrogen (C/N) and Strontium/Lead/Oxygen (Sr/Pb/O) isotope analysis. The unburnt human remains are largely in very poor condition and unsuitable for DNA analysis, and additional advice from English Heritage has recommended no DNA sampling or analysis is required

7.4.2 An initial suite of C14 dates is proposed on 75 samples from 16 sites, in order to confirm or further define dates of various mortuary deposits (Table 1). Analysis is to be undertaken using two different techniques. Dates from unburnt human bone and charcoal - representing fuel ash from cremation-related contexts - will be extracted from the organic components of the material. Dates are also to be obtained from the mineral component of cremated bone, as this technique is still being developed and not wholly reliable, each cremated bone sample is to be corroborated by a date taken on associated fuel ash (charcoal). All dates to be AMS, except where High Precision specified.

7.4.3 Samples are to be collected for various forms of stable isotope analysis prior to reburial of the human remains – to facilitate possible future study of diet (and, thereby, potentially status) and geographic origins of individuals (Mays 2000). A proposed 30 samples from nine sites for C/N and 13 samples from three sites will be collected for Sr/Pb/O and archived. As the nitrogen isotope is held within the organic component of bone/teeth, it is not necessary (with the possible exception of very poorly oxidised material) to take samples from cremated remains.

7.4.4 AMS radio-carbon dates to be procured through Kiel. Resolutions of +/- 35 required.

7.4.5 High Precision radio-carbon dates to be procured through Belfast.

7.5 Archive

7.5.1 All human remains are to be securely packaged for deposition in sealable plastic packaging. The outside of the package must be clearly labelled and a

water-proof label should be included inside the package, using archivally stable markers. Package specification to be agreed with PM.

7.6 Bibliography

Bass, W.M. l987 *Human osteology.* Missouri. Archaeological Soc.
Beek, G.C. van 1983 *Dental Morphology: an illustrated guide* Wright PSG (Bristol)
Berry, A.C. and Berry, R.J. 1967 Epigenetic variation in the human cranium *Jnl. Anatomy* 101(2), 261-379.
Binford, L.R. 1981 *Ancient Men and Modern Myths* Academic Press (London)
Brothwell, D.R. 1972 *Digging up bones* (2nd edition) British Museum Natural History
- in prep. Metric and non-metric studies in *Standards for Skeletal Recording* British Association of Biological Anthropology and Osteoarchaeology (BABAO)/Institute of Field Archaeologists (IFA) joint publication
Buikstra, J, E and Ubelaker, D, H, 1994 *Standards for data collection from the human skeleton*, Arkansas Archaeological Survey Research Series 44, Fayetteville, Arkansas *(plus numerous references which appear in this publication)
Ditch, L.E. and Rose, J.C. 1976 A multivariate dental sexing technique American Journal Physical Anthropology 37(1), 61-4
Finnegan, M. 1978 Non-metric variation of the infracranial skeleton, *Jnl. Anatomy* 125, 23-37
Hillson, S. 1986 *Teeth* Cambridge Manuals in Archaeology
Larsen, C.S. 1999 Bioarchaeology; interpreting behaviour from the human skeleton Cambridge University Press
Lovejoy, C, O, Meindl, R, S and Barton, T, J, 1985 Multifactorial determination of skeletal age at death: a method and blind test of its accuracy, *Amer J Physical Anthropol,* 68, 1-14
Lovell, N.C. 2000 Palaeopathological description and diagnosis, in M.A. Katzenburg and S.R. Saunders (eds.) *Biological Anthropology of the Human Skeleton* Wiley Liss (New York) 217-248
Mays, S. 2000 New directions in the analysis of stable isotopes in excavated bones and teeth, in M. Cox and S. Mays (eds.) *Human Osteology in Archaeology and Forensic Science* Greenwich Medical Media Ltd (London)
Mays, S., Brickley, M. and Dodwell, N. in press Guidelines for the production of assessment documents and analytical reports on human skeletal remains excavated from archaeological sites. British Association of Biological Anthropologists and Osteoarchaeologists/English Heritage joint publication
McKinley, J l 1994 The Anglo-Saxon cemetery at Spong Hill, North Elmham. *Part VIII: the cremations*, East Anglian Archaeology Rep No 69
- 2000a The Analysis of Cremated Bone, in Cox, M. and Mays, S. (eds.) *Human Osteology* Greenwich Medical Media (London), 403-421
- 2000b Phoenix Rising: aspects of cremation in Roman Britain, in J. Pearce, M. Millet and M. Struck *Burial, Society and Context in the Roman World* Oxbow Books (Oxford) 38-44
- in prep. Compiling a skeletal inventory, Cremated Bone, in *Standards for Skeletal Recording* British Association of Biological Anthropology and Osteoarchaeology (BABAO)/Institute of Field Archaeologists (IFA) joint publication
McMinn, R.M.H. and Hutchings, R.T. 1985 *A colour atlas of human anatomy* London: Wolfe Medical Publications.
Miles, A, E, W, 1962 The assessment of age from the dentition, *Proc Royal* Soc Medicine, 55 881-5
-1962 Assessment of age s of a population of Anglo-Saxons from their dentition Proc. Royal Soc. Medicines
- 1963 The dentition in the assessment of individual age in skeletal material, in D R Brothwell (ed), *Dental Anthropology*, Pergamon Press
Roberts, C. and Connell, B. in prep. Palaeopathology in *Standards for Skeletal Recording* British Association of Biological Anthropology and Osteoarchaeology (BABAO)/Institute of Field Archaeologists (IFA) joint publication

Rogers, J, Waldron, T., Dieppe, P and Watt, I. 1987 Arthropathies in Palaeopathology: the basis of classification according to most probable cause, *Jnl. Archaeological Science* 14, 179-193.

Rogers, J. and Waldron, T. 1995 A field guide to Joint Disease in Archaeology Wiley (Chichester)

Scheuer, L. and Black, S. 2000 *Developmental Juvenile Osteology* Academic Press (London)

Steele, D, G and Bramblett, C, A 1988 The anatomy and biology of the human *skeleton*, Texas, A & M Press

Trotter, M. and Gleser, G.C. 1952 Estimation of stature from long bones of American whites and Negroes, *American Jnl. Physical Anthropology* 10 (4), 463-514.

– – 1958 A re-evaluation of estimation of stature bases on measurements of stature taken during life and of long bones after death, *American Journal Physical Anthropology* 16 (1), 79-123.

Trotter, M. 1970 Estimation of stature from intact long bones, in T.D. Steward (ed.) *Personal identification in Mass Disasters* Smithsonian Institution Press (Washington) 71-83

8 INTEGRATED SITE REPORT METHOD

8.1 Introduction

8.1.1 Aspects and themes developed and presented in the project monograph will be supported by a series of integrated research reports for the more significant principal sites listed below, to be made available as a print-ready component of the CTRL digital archive.

TABLE 9: PRINCIPAL SITE IDENTIFYING CODES

Principal Site	Principal Site Code	PX Assessment Contractor
Pepper Hill Roman Cemetery	PHL	OA
330Z1 and 330Z2 WB	330	MoLAS
Northumberland Bottom	WNB	MoLAS
Tollgate	TLG	MoLAS
Cobham Golf Course	CGC	MoLAS
Cuxton	CXT	MoLAS
White Horse Stone	WHS	OA
Thurnham Roman Villa	THM	OA
South of Snarkhurst Wood	SNK	OA
South-east of Eyhorne Street	EYH	OA
Sandway Road	SWR	WA
Leda Cottages	LED	OA
Tutt Hill	TUT	OA
Parsonage Farm	PFM	MoLAS
Beechbrook Wood	BWD	OA
Mersham	MSH	CAT
Bower Road	BOW	OA
Little Stock Farm	LSF	WA
North of Westenhanger Castle	WGR	CAT
Saltwood Tunnel	SLT	CAT/ WA

8.1.2 The fieldwork evidence and results of analysis will be presented in the form of integrated, illustrated site narratives. It is intended that these reports will be interpretative summaries of the site sequence, incorporating key supporting evidence and including, where relevant, the summary results and interpretation of specialist analyses. The level of descriptive detail provided for particular site components will be commensurate with the significance of the evidence and its ability to address the questions posed in the CTRL Research Strategy (See UPD part 2). The reports will be cross-referenced to the scheme-wide specialist reports (which will report in detail on the results of specialist studies) and the digital archive datasets (which will contain feature and interpretative group descriptions and documentation of phasing decisions).

8.1.3 The detail at which principal sites have been reported in the assessment phase is an adequate archive fieldwork record for sites of limited significance. In addition to the more significant sites listed above, post-excavation

assessment reports have been completed for principal sites at Nashenden Valley, West of Sittingbourne Road, Chapel Mill, A20 Diversion Holm Hill, Hurst Wood, Lodge Wood, Boys Hall Balancing Pond, West of Blind Lane and East of Station Road. The stratigraphic data from these sites are considered to be of no more than local importance and separate site reports will not be prepared. Brief summaries will appear in the site gazetteer, as published in Volume 2 of the Scheme-wide synthesis. For some of these sites, items of specialist work have been recommended as a contribution to scheme-wide specialist artefact or environmental studies. The results of such work will be reported in the relevant scheme-wide specialist reports.

8.2 Integration of Specialist Data and Report Synopses

8.2.1 The integrated approach to archaeological reporting outlined above, coupled with a readily accessible digital research archive is considered preferable to more traditional descriptive site reports divided into separate stratigraphic narrative and specialist sections. However, experience is showing that this style of report is more difficult to achieve in practise than traditional formats. For integrated reporting to work efficiently, POs and specialists must start with a very clear idea from the outset how their report will be structured and how it will appear on-screen or in print.

8.2.2 Production of each site report will be guided by a report synopsis. These have been drafted in outline during the project design phase and will be finalised early on in the post-excavation programme. The report synopsis comprises a breakdown of the planned report into its component parts. Limits for the number of words, figures, plates and tables in each section are defined. These figures are to be regarded as absolute limits and changes may only be made with the approval of the Project Manager and Senior Editor.

8.2.3 Indicative word limits are also given for anticipated individual specialist contributions, to ensure that they are provided at the required level of detail and interpretation, although these should not be regarded as absolute. The word limits may seem low, but specialist contributions to site reports are intended to be at a summary level, focussing on aspects of site interpretation, phasing and dating. The scheme-wide specialist package reports provide the opportunity for more detailed consideration of the artefact and environmental assemblages and their wider significance.

8.2.4 The report synopsis will be reviewed by the Period Team Leader and approved by the Senior Editor before any analysis or report writing takes place. (In most cases there should be no reason why specialists cannot proceed with detailed recording of their assemblages in the absence of the report structure and phase divisions, but no analysis or report writing can take place until this information is available). Any modifications to the report synopsis that may be required as the project progresses must be approved by the relevant Period Team Leader.

8.2.5 An essential early task for Project Officers will be to refine the report synopsis, including further definition of the site phases (see below) and interpretative groups that will form the main sections of the site narrative (eg the White Horse Stone Neolithic longhouse, Saltwood Tunnel Barrow C3766 or the

Beechbrook Wood triple-ditched enclosure). For most sites the narrative will be most accessible if the descriptive units are major interpretative feature groups (whole buildings or groups of contemporary structures, pit groups, field systems, etc). In the case of the cemeteries, an illustrated grave catalogue will be produced as part of the site digital archive, but the print-ready site report will be an integrated narrative in the same style as the other reports, illustrated with general phase and distribution plans, but only selected individual grave groups. Much of the description and detailed justification of phasing decisions traditionally included in site reports will instead be documented in the site database, which will be made available as part of the digital archive.

8.2.6 The PO assigned to each site report will be responsible (under guidance from the Senior Editor and Period Team Leaders) for analysing the site data, co-ordinating specialist analyses, maintaining the site database and finally, preparing drawing briefs and writing the site narrative.

8.2.7 This style of reporting means that a large part of the POs role in the report writing phase will involve compiling and editing specialist reports into a single narrative, generating drawing briefs and planning the report layout, rather than producing large quantities of descriptive text. Specialists will need to be carefully briefed so that they generate their reports and catalogues divided into the correct sections, so that, for example, pottery, flint, radiocarbon dates and animal bone reports relating to the Neolithic longhouse at White Horse Stone can be easily incorporated into the Neolithic section of the narrative report, while the pottery, slag, metalwork and charcoal evidence relating to the Early Iron Age metal-working area can be slotted into the Iron Age narrative section. The detailed Report Synopsis will be essential to this process.

8.2.8 It should be noted that integration does not mean ‘cutting and pasting’ unmodified specialist contributions uncritically into the report. The process is intended to encourage an holistic approach to site analysis and interpretation, and a selective approach to reporting, focussed on addressing specific questions. Specialist data may be excluded from the Site Report if it does not to contribute significantly to the site narrative, it may require re-interpretation (in discussion with the specialists concerned) and new interpretations may be suggested by the combination of various lines of evidence.

8.2.9 The site narrative will not be drafted until the research database is complete (ie all specialist datasets and report contributions have been checked and the site phasing has been finalised). Up-dates of the report synopsis may be required as the analysis proceeds, to inform team members of changes to the structure or emphasis of the reports, and changes in site interpretation.

8.3 Site Report Specification

8.3.1 The following specification outlines the required content and format for the site reports (also refer to individual site report synopses):

8.3.2 The reports will form part of the CTRL digital archive, to be made available on the ADS website (See UPD Part 3). To improve accessibility and facilitate possible future hard copy publication by a third party, the reports will be posted in print ready format (*.pdf). (NB. Other elements of the digital site archive may include a variety of file formats, as detailed in the CTRL Database

and GIS Method Statement). Reports will be edited to publication standard, indexed, and provided with a full bibliography, an abstract and foreign language summaries. The text and illustrations will follow the house style adopted by the project, currently intended to be the South-East Archaeology (SEARCH) series format (in preparation).

8.3.3 The report sections will be limited by word length and number of illustrations, to ensure that the narratives are focussed, non-repetitive and give due weight to the most significant elements of the site data.

8.3.4 Use of colour will be agreed with the Project Manager before any illustrations are produced. For very large sites, careful consideration will need to be given to appropriate illustration formats. Drawings will normally be limited to A4, but A3 or larger pullouts may be possible in exceptional cases, by agreement with the production editor and Project Manager.

8.3.5 The reports as posted on the ADS will be paragraph numbered to aid cross-referencing with specialist package reports. A typical report outline will be as follows:

Abstract
Acknowledgements
1 Introduction
1.1 Project background
1.2 Location, topography and geology
1.3 Archaeological and historical background
2 Aims
3 Fieldwork Standards and Methods
4 Excavation Results
4.1 Phase summary
4.2 "Hunter-gatherers" – Late Glacial, Mesolithic and Early Neolithic Transition (c13,000 uncal bc-c4000 cal BC)
4.3 "Early Agriculturalists" – The Neolithic and Early Bronze Age Landscape (c 4000 BC – 2000 BC)
4.4 "Farming Communities" – The Later Bronze Age and Early Iron Age Landscape (c1600 BC - c300 BC)
4.5 "Towns and their Rural Landscapes I" – The Later pre-Roman Iron Age and Romano-British landscapes (c300BC to cAD500)
4.6 "Towns and their Rural Landscapes II" – The Post Roman and Anglo-Saxon Landscape (c410 AD to c1000AD)
4.7 "The Medieval and Recent Landscape" – c1000 AD to the modern day
Bibliography
Index

Abstract

8.3.6 The abstract will be limited to 500 words, to be provided in English, with translations in French, German and Spanish.

Acknowledgements

8.3.7 The acknowledgements section will include a full list of contributors to the report and a select list of support staff and contributors to the fieldwork, PX assessment and analysis phases.

8.3.8 Joint authorship will be credited in abbreviated form at the start of each report section. Abbreviations will refer to the list of contributors included in the acknowledgements section. Illustrations will be credited in the same manner. All specialists contributing text to a specific report section (as detailed in the synopsis) will be credited as joint author of that action if any element of their text is used, including data or ideas contained therein. By default, the cited main author will be the PO responsible for compiling the site report, although in certain cases, exceptionally large contributions by individual specialists may result in their inclusion as joint main author (at the discretion of the Senior Project Manager and Senior Editor). The Period Team Leader will normally be credited as Editor.

8.3.9 Each report will display the company logos of Union Railways (South) Limited, Rail Link Engineering and Oxford Wessex Archaeology JV.

8.3.10 Copyright of all works belongs to Union Railways (South) Limited.

Introduction

8.3.11 The introduction will give details of the site location, NGR, area investigated, tabulated component fieldwork events, project background (including previous investigations, topography, geology, etc). This section should be ordered as for the PX assessment reports and will be based on the assessment introductory sections (up-dated and condensed as necessary and excluding generic elements that will be included in the scheme-wide publications). Illustrations will include a location map as a minimum. Topographical and geological mapping will be presented for major sites. All introduction figures will be produced to a standard series format.

Project Design

8.3.12 Site specific aims and objectives will be drawn selectively from the CTRL Section 1 Up-dated Project Design Research Framework and the PX assessment updated research aims and objectives. Generic project aims will be discussed in the route-wide volumes and need not be repeated here unless directly relevant. Original fieldwork aims do not need to be re-stated unless still relevant (refer instead to the WSI, which will be included in the archive).

Methods

8.3.13 This section should be brief, and focussed on site specific issues. Supporting illustrations will comprise an overall site plan indicating the extent of excavations.

Results

Phase Summary

8.3.14 Outline main phase sequence in chronological order from earliest to latest, as a series of bullet points or in table form, listing the main interpretative groups included in each phase.

8.3.15 Main phase divisions should correspond to the archaeological period divisions listed below, which will not be assigned numbers, always being described by name (normally in full, with calendar dates in brackets when appearing in titles - see list of terms below; where abbreviation is necessary follow the selected house style). Where site phases straddle scheme-wide phase boundaries, compound terms may be used (eg Late Neolithic/early Bronze Age for Beaker material). Corresponding database abbreviations should follow the CTRL dataset specification, which refers to NMR standard data terms (National Monuments Record, RCHME, 1993 *Recording England's Past: A data standard for the Extended National Archaeological Record*, Royal Commission on the Historical Monuments of England/Association of County Archaeological Officers).

8.3.16 Numbered phases will be avoided and will normally be restricted to individual feature groups to identify phases of structural development, where necessary. So, for example, the Thurnham Roman Villa main house will be included in the Middle Roman phase in the narrative report, while episodes of the buildings' structural development may be numbered phases 1 to 3. The aisled building will also appear in the Middle Roman phase and will have its own phase sequence, which need not necessarily correspond chronologically with the main house phasing.

8.3.17 The CTRL Research Design provides a chronological framework based on scientific dating (OSL, radiocarbon) and current thinking on period divisions. Conventional period labels (eg. Iron Age) will be adhered to, together with the period divisions suggested by the CTRL Research Strategy (eg. Early Agriculturalists). The suggested chronological framework will be presented in uncalibrated radiocarbon years for the period covering the late Glacial and Mesolithic and calibrated radiocarbon or calendar years for the late Mesolithic onwards. In the case of the prehistoric period there may be grounds to revise the framework in the light of results obtained from the proposed radiocarbon programme that reflect more accurately local and regional developments (eg. the beginnings of agriculture in the early Neolithic or the appearance of land divisions in the later Bronze Age).

Scheme-wide phases:

"Hunter-gatherers" – Late Glacial, Mesolithic and Early Neolithic Transition (c13,000 uncal bc-c4000 cal BC)

Late Glacial (13000-9000 bc)
Early Mesolithic (9000 bc - 6500 bc)

Late Mesolithic (6500 bc-4000 BC)

"Early Agriculturalists" – The Neolithic and Early Bronze Age Landscape (c 4000 BC – 2000 BC)

Early Neolithic (c4000 BC - c3300 BC)
Middle Neolithic (c3300 BC - 2800 BC)
Late Neolithic (c2800 BC - 2200 BC)
Early Bronze Age (c2200-1600 BC)

"Farming Communities" – The Later Bronze Age and Early Iron Age Landscape (c1600 BC - c300 BC)

Middle Bronze Age (c1600 BC - c1100 BC)
Late Bronze Age (c1100 - c700BC)
Early Iron Age (c700 BC - c300 BC)

"Towns and their Rural Landscapes I" – The Later pre-Roman Iron Age and Romano-British landscapes (c300BC to cAD500)

Middle Iron Age (c300 BC - c100 BC
Late Pre-Roman Iron Age (c100BC-c43AD)
Early Roman (c43AD-c120AD)
Middle Roman (c120AD - c250AD)
Late Roman (c250AD - c410AD)

"Towns and their Rural Landscapes II" – The Post Roman and Anglo-Saxon Landscape (c410 AD to c1000AD)

Early Anglo-Saxon (c410AD - c650AD)
Middle Anglo-Saxon (c650 - c850AD)
Late Anglo-Saxon (c850 - c1000AD)

"The Medieval and Recent Landscape" – c1000 AD to the modern day

Early medieval (c1000 - c1350)
Late medieval (c1350 - c1500)
Post-medieval (c1500 - c1800)
Modern (c1800 - present)

Site Narrative

8.3.18 The site narrative should comprise SUMMARY description at a structural level, divided by major archaeological period, fully integrated with finds and environmental information, with sufficient discussion to justify/ qualify the main phasing decisions only. (Justification/ qualification of phasing decisions at a lower level should be documented in the digital dataset in the course of the stratigraphic analysis, normally as free text in the relevant Group or Sub-Group comments field).

8.3.19 The site narrative is not intended to be an exhaustive stratigraphic description of every feature. Nor is it intended to justify phasing decisions in any detail. It is intended to tell the story of the sites' development in a continuous narrative stream, integrating all available strands of evidence (including, where relevant, stratigraphy, spatial evidence, topography, artefacts, scientific dating and environmental data). The amount of stratigraphic and specialist information presented in each report section should be commensurate with the ability of the data to address the research questions posed at the outset of the report. The text should be strongly weighted in favour of the most significant findings. Descriptive detail (in text or graphical form) should be included in the narrative as a means of characterising the evidence, but should be carefully selected to support the interpretations offered, not presented as an end in itself. A more exhaustive and objective record will be contained in the archive, accessible through the digital datasets. Groups of features with little or nothing to add to the narrative may be excluded from the report entirely or summarised in table form, as appropriate. Feature groups or sequences may be excluded from discussion if one or more of the following are true:

- they are undated
- they cannot be related stratigraphically or spatially to the main interpretative groups
- they have no bearing on the identified research questions
- in addition to other criteria, they have no significant associated artefactual or environmental evidence
-

8.3.20 It is generally preferable to replace descriptive text with illustrations where possible. There is certainly no need to verbally describe individual feature profiles and dimensions as a matter of routine. An interpretative feature group that consists of large numbers of pits, postholes or other features with similar characteristics may usefully be presented in tabular form (in support of a particular argument) as tables allow selected characteristics to be presented for comparison without recourse to illustration or descriptive text. Similarly, when describing linear features or whole field boundary systems, there is no need to describe every single feature, section or relationship; The narrative should concentrate on describing the overall layout, characterising the scale and profile of the boundaries in general terms and succinctly summarising the reasons for assigning the boundary system to a particular phase. Soils and fill sequences typical of the site may be described and discussed in general terms in the introduction or specialist geoarchaeology contributions, but do not need to be included routinely throughout the site narrative, except in support of specific arguments.

8.3.21 Considerable emphasis should be placed on interpretation, based primarily on the various strands of excavated and specialist evidence from the site itself, but with appropriate reference to detailed studies of comparable features in

other contexts (archaeological, historical or ethnographic). The questions posed in the Aims section should be explicitly addressed.

8.3.22 One of the purposes of the Site Narrative is to qualify or justify the main phasing decisions when the evidence is not conclusive. It is therefore important to openly discuss shortcomings of the evidence, in general terms, and outline the basis of the major phasing decisions, although detailed documentation should be confined to the database.

Site narrative illustrations

8.3.23 Illustrations accompanying the site narrative may include the following:

8.3.24 Summary overall phase plans, normally based on the overall site plan, with current phase features indicated in bold. Features originating in earlier periods but having an impact on landscape development in the current phase should be indicated in grey-scale and uncertain features in outline. Earlier or later features with no relevance to the current phase may be omitted for clarity. Normally one drawing will be required for each main phase for which there is significant evidence. Phase drawings will, where possible, include the whole of the excavated area, although separation into smaller areas may be appropriate for very large landscape blocks containing much archaeological detail.

8.3.25 Phase plans will be included for the main interpretative feature groupings, with additional data, such as sections or finds, provided alongside if necessary to support specific arguments.

8.3.26 Detail drawings of features or feature groups may be selectively included in support of specific arguments. The criteria for illustrating features in the site report will vary from site to site, but in general only the most significant features or feature groups will be illustrated in detail, although there may be a case for characterising large groups of similar features by illustrating single examples discussed in the text. The CAD drawings, provided as CAD and pdf files in the digital archive, will serve the purpose of a comprehensive 'site atlas', but will not form an integral part of the site reports.

8.3.27 Feature sections may be illustrated alongside the plan to illustrate the text (where possible at the same scale) but do not need to be illustrated as a matter of course (it is intended that scanned images of original site drawings will be made available in the digital archive).

8.3.28 Selected artefacts crucial to the dating and/ or characterisation of important feature groups may be illustrated alongside the relevant site plans, in support of the narrative. Specialists and POs will need to give specific consideration to the selection of finds illustrations for the site reports, as the selection criteria will differ from the specialist package reports.

8.3.29 The cemetery site reports will follow a slightly different pattern. A full grave catalogue will be generated in database form and all graves containing significant artefacts and/ or human remains will be illustrated. This will be an essential part of the digital archive, particularly for the Anglo-Saxon cemeteries, providing a link between the site report, site database and the various specialist package reports and datasets. However it is intended that

only selected grave plans, along with general cemetery plans showing artefact distributions and site phasing, will appear in the print-ready site report, in support of an integrated thematic discussion of the cemetery. Grave sections will not normally be included, except to illustrate specific points. Graves with no bone preservation or significant artefactual evidence will not be illustrated.

8.3.30 Discussion of the main interpretative groups will normally be incorporated in the relevant section of the site narrative (eg In the case of the White Horse Stone Neolithic longhouse, interpretation of the sequence, discussion of the topographical context and identification of parallels for the structure, etc, will be integrated in the Neolithic longhouse site narrative section, rather than appear in a separate discussion section at the end of the report).

8.3.31 Some sites may require a review of results from thematic intra-site or local landscape analyses, which do not easily break up into chronological sections. For example, results of palaeoenvironmental studies from a waterlogged or dry valley sequence may be best included as an introductory section that discusses the changing environmental setting of the site, rather than attempting to integrate it into the chronological narrative, particularly if interpretation of the sequence is not clear-cut. However, the aim should be to integrate discussion into the narrative where possible.

8.3.32 The site narrative will describe the development of the inhabited landscape at a local level (the scale of the study area considered will vary from site to site). It will not include significant discussion of the regional context as this will be the subject of the scheme-wide synthesis.

9 DIGITAL DATA ARCHIVE METHOD

9.1 Deliverables

9.1.1 All digital data-sets constructed in the course of the post-excavation analysis will be collated into a CTRL Section 1 project digital archive. Data suitable for inclusion in the CTRL ADS archive (Phase 2) will be selected for deposition with the ADS to be made available to authorised users for further research use. All data will be accompanied by appropriate meta-data records.

9.2 Post-Excavation: A Digital Expansion

9.2.1 In addition to the existing specialist assessment data tables, further analysis of the sites excavated in the course of the project will result in the creation of detailed data-sets for those sites which warrant further work.

9.2.2 The primary purpose of the specialist data tables is to allow the specialists to contribute effectively to the project and to successfully manage their own data requirements. The secondary purpose is to facilitate communication between specialist and project staff undertaking intra- and inter-site analysis. The third purpose to provide consistent final data sets for dissemination to the archaeological community through the ADS archive.

9.3 Existing Level of Archive and Proposals

9.3.1 Detailed digital archives have been generated for all archaeological works undertaken in the course of the Channel Tunnel Rail Link. These archives consist of CAD plans of site locations and trenching arrays, detailed maps of the sites and the archaeological interventions into those sites. Databases listing the site records and databases quantifying the artefacts and ecofacts have been constructed for each site.

9.3.2 The analysis archive will consist of databases, spreadsheets, computer aided drafting files and geographic information systems files.

9.4 Proposed Databases

9.4.1 The term database is used to describe any list or series of lists regardless of the category of software used to create the list.

TABLE 10: DATABASE FORMATS

Specialism	Class of Database	Creation Format	Project File Format	Transfer File Format	Task Status
Animal Bone	flat file	Access 97	Access97	Access 97	Data capture
Botany	relational	Oracle	Access 97	Access 97	Data capture
Human Bone: uncremated	relational	Access 97	Access 97	Access 97	Design and build and data capture
Human Bone: cremated	relational	Access 97	Access 97	Access 97	Data capture

Specialism	Class of Database	Creation Format	Project File Format	Transfer File Format	Task Status
Pottery	relational	Access 97	Access 97	Access 97	Design and build and data capture
Flint	relational	Access 97	Access 97	Access 97	Data capture
Assessment Stratigraphy	relational	Excel	Access 97	Access 97	See site phasing
Site Phasing	relational	Access 97	Access 97	Access 97	Design and build and data capture

9.4.2 For the databases containing detailed artefact and ecofact data minimum data fields are defined in the relevant specialist method statements. Each database will be checked by the Data Manager to ensure that it provides suitable data for use by other members of the project team. Queries will be set up as required to address specific research questions.

9.4.3 As a minimum, the fields in Table 11 will be completed by the specialist. These are the minimum needed for the purposes of general stratigraphic analysis. While it is necessary to define and name these here, the names may not be appropriate to particular specialisms and some fields may not be particularly relevant or better as a series of fields using codes/keywords. The list below should therefore been seen more as a guide rather than as a prescription. Data fields specific to each specialism are listed in the specialist package method statements.

9.4.4 Additional fields to satisfy the required recording standards and to provide the necessary functionality to ensure the successful completion of the specialist tasks may be added at the discretion of the lead specialists for each area, but only with the approval of the Data Manager.

TABLE 11: TYPICAL MINIMUM FIELDS

Field Name or Alias	Data Type	Field Size	Description
Event_Code	Text	10	The unique identifier assigned to each site
Context	Number	6	The unique identifier assigned to a context
Small Find No	Number	6	The unique identifier assigned to an artefact
Sample Number	Number	6	The unique identifier assigned to a sample
Material	Text	25	A keyword describing the material type from which an object is fashioned
Object 1*	Text	Maximum 254	A short keyword summary of the object/ecofact.
Object 2**	Text	Maximum 254	An additional keyword summary of the object/ecofact which might be typically a more detailed classification of the object or contain data pertaining to a second classification system such as function
Object Date	Text	Maximum 254	The typological date of the object
Object	Text or	No limit	A precise free text description of the object

Field Name or Alias	Data Type	Field Size	Description
Description	Memo as required		

9.4.5 *For ecofacts such as animal bone, Object 1 might be named Species and contain data about the species identifications.

9.4.6 ** For ecofacts such as animal bone, Object 2 might be named Element and contain data concerning the body part.

9.4.7 The following documentation shall be provided along with each database:

- Every table will be accompanied by a brief description of the purpose of the table
- Every field will be accompanied by a brief description describing the purpose of the field
- Fields containing NULL values will be additionally described with a statement as to whether the NULL value means unknown, not available, or not applicable.
- All codes used in the databases will be accompanied by a list of codes and a short free text explanation of the code.
- An Entity-Relationship diagram will accompany each relational database.

9.5 Identified Tasks

TABLE 12: DATA TASKS

Task	Task Description	Responsibility
1	Design and build database structures where no suitable existing format exists	OWA Joint Venture or sub-contractor's IT support
2	Check specialist databases	OWA Joint Venture Lead Specialists
3	Enter data	Specialists or project staff
4	Provide documentation	Specialist /IT support if specifically designed for project
5	Construct appropriate data structures for inter-site analysis	OWA Joint Venture IT support

9.6 CAD files

9.6.1 The computer aided drafting files currently making up the assessment archive have all been constructed using the standard methodologies of the parent organisations and are located on the RLE engineering grid.

9.6.2 For the post-excavation project the CAD files will have at least two of the following purposes:

- Enable the construction of the ESRI format shape files
- Provide the location of the site and thereby facilitate the inter-site analysis aims of the project
- Where appropriate, display the setting and detail of particular sites
- Where appropriate, facilitate any spatial analysis of particular sites as and when required
- Where appropriate, facilitate the production of final illustrations for particular sites
-

9.6.3 Processing of CAD drawings will be handled centrally, in discussion with Project Officers, to ensure a consistent end-product.

9.6.4 The following steps are proposed in order to produce the deliverables and to allow the project access to the county wide data held by the Kent County Sites and Monuments Record.

- Conversion of all site plans, trenching and retrieval grids to the Ordnance Survey Grid system
- Production of ESRI format shape files suitable for use in ArcView of each site plan. A single shape file will be created for the entire project to allow route-wide GIS queries. The attribute data for each shape file will consist of the following fields:

TABLE 13: DATABASE FIELDS

Field Name	Data Type	Data Size	Description	Source
Event_Code	Text	10	The unique site identifier	Derived from ARCHIVE table in the assessment data sets. Field: Event_Code
Context	Number	6	The context number. Detail may not be necessary to define what a thing is at an interpretative level: A phase category is included in the Level field so that for sites where little work is required, the drawing can be organised at a phase level. Some fields necessarily become optional	Derived from CAD files, stored either as object data or derived from the layer or block name. This corresponds to either a site assigned context number or a phase number where detailed mapping is not required.
Type (Optional)	Text	25	The type of context	Derived from the CONTEXT table in the assessment data sets. Field: Type
Interpreta (Optional)	Text	50	The interpretation of the intervention or feature	Derived from the CONTEXT table in the assessment data sets. Field: Interpretation
Comments	Text	100	Free text description of the feature	Derived from the Comments field of either the Contexts, Sub-Group or Group tables.
Period	Text	100	The final phasing for the site	Derived from phasing database
ILevel	Text	9	Permitted terms: Context, Sub-Group, Group, Phase	Indicates whether the text in the comments field is derived from the CONTEXT, GROUP, SUB_GROUP table or PHASES table

9.6.5 Production of a single shape file locating each of the sites. This shape file will show the extents of each event which may be drawn using multiple polygons as appropriate. Attribute data will consist of a single field:

TABLE 14: EVENT CODE ATTRIBUTE DATA

Field Name	Data Type	Data Size	Description	Source
Event_Code	Text	10	The unique site identifier	Derived from Event table in the assessment data sets. Field Event Code

9.7 Requirements

9.7.1 All drawings to be drawn using closed polylines.

9.7.2 All drawings to be fitted with a suitable data hook to enable the linking of the drawing detail to the assessment data sets. In those situations where the drawing detail includes the differentiation of excavated and unexcavated parts of features, the data hook should be attached to the unexcavated as well as the excavated parts of each features.

9.7.3 Drawings for sites that require spatial analysis will require some means of distinguishing excavated and unexcavated parts for features. The precise method used to achieve this will be agreed with the OWAJV project Manager prior to implementation. Possible methods include:

- Adding a separate field containing a value indicating that a polygon represents an excavated or unexcavated segment.
- Constructing a drawing in such a way that a separate polygon layer can be produced for just the excavated segments.
- Assigning the group context number to unexcavated portions of features and the intervention context number to the excavated portions of features. This method will require that every feature drawn with more than one polygon has a corresponding group number in the assessment data-set and is therefore the least favoured of these listed methods.
- Each contractor /sub-contractor will provide documentation on the actual method of construction used for each drawing.

9.8 Identified CAD tasks

- Convert all drawings to Ordnance Survey Grid
- Construct drawings to identified requirements using an appropriate methodology
- Provide metadata documentation
- Convert and merge multiple CAD drawings to ESRI shape file format for delivery to Kent County Council

9.9 Protocol for Transferring Data

9.9.1 Transfer of all files should be accompanied by a statement indicating the completion status of the file, included on the Document Control Proforma. Three categories are proposed:

- Sample data set: this is not live data but is provided as an example of data format in course of communication between different team members and organisations. This data must be filed separately from live data sets.
- In progress data set: this is live data that is transferred between organisations to enable concurrent running of separate project tasks.
- Final data set: this the completed data set that will be included as one of the deliverables. These should not be filed alongside in progress or sample data sets.

9.9.2 All data sets will be posted on the extra-net, in the relevant Principal Site folder, with sample, in progress, and final data sets filed in separate sub-folders.

10 DOCUMENT AND ARCHIVE CONTROL METHOD

10.1 Document Administration

10.1.1 All data, text, figures and plates will be submitted to the Senior Project Manager (SPM), as soon as they are produced in draft form. The SPM will be responsible for distributing documents to the relevant reviewers and posting them on the **project extra-net**. This procedure will allow progress to be tracked and problems to be detected at an early stage, and must not be by-passed.

10.1.2 The administration of the procedure will be delegated to a Project Assistant, who will be responsible for integrating specialist data tables into databases where necessary, maintaining the extra-net and distributing documents. It is intended that current version draft figures and text will be posted for reference by all team members (text in Microsoft Word, in accordance with a standard document template, paragraph numbered in accordance with the Report Synopsis; figures and plates will normally be posted in *.pdf format, datasets in Microsoft Access or Excel).

10.2 Document Review

10.2.1 Edited final draft versions of principal site reports, routewide specialist reports and project monograph chapters shall be posted on the extranet for review by the Project Manager and editorial team. The documents shall be

10.2.2 All digital and hard copy submissions must be accompanied by a document review proforma, which will be filled in by the relevant reviewers at each review stage. Comments and changes to data and text may be marked up digitally using the track changes function, or in hard copy as tabulated comments lists, referenced by paragraph number. The document review proforma template will be included on the Project Data CD, circulated to staff and sub-contractors at the outset of the project.

10.3 Project Extra-net

10.3.1 The extra-net will be organised by Site Report, with text and drawing files located in folders labelled with the relevant report section headings, in accordance with the approved Report Synopses. Previous versions of text and illustrations will be filed on the extra-net for reference, accompanied by review comments. Datasets will be filed under the relevant Principal Site. The extra-net will also contain the Up-dated Project Design and project background information, filed by Principal Site, including post-excavation assessment reports, written schemes of investigation, CAD drawings and assessment level datasets.

10.3.2 Up-dated administrative information, including progress reports, the latest version of the programme and any design change information, will be posted on a weekly basis.

10.4 File Management

10.4.1 As incomplete and unedited documents will be posted on the extra-net and will need to be circulated for information and review as the project proceeds, it is essential that the current review status of all digital files and hard copy is indicated in the file reference (which will be the same as the digital file name) (See Table 1 for explanations of Review Status codes). Version issues will be rigorously controlled by the SPM, to ensure that the version posted on the extra-net is the latest. The file reference will comprise a three letter principal site code, report section number, file content and version number, so that readers are aware of where it belongs in the integrated site report and its current review status (See Table 2 below for examples of file names).

TABLE 15: PRINCIPAL SITE IDENTIFYING CODES

Principal Site	Principal Site Code	PX Assessment Contractor
Pepper Hill Roman Cemetery	PHL	OA
330Z1 and 330Z2 WB	330	MoLAS
Northumberland Bottom	WNB	MoLAS
Tollgate	TLG	MoLAS
Cobham Golf Course	CGC	MoLAS
Cuxton	CXT	MoLAS
White Horse Stone	WHS	OA
Thurnham Roman Villa	THM	OA
South of Snarkhurst Wood	SNK	OA
South-east of Eyhorne Street	EYH	OA
Sandway Road	SWR	WA
Leda Cottages	LED	OA
Tutt Hill	TUT	OA
Parsonage Farm	PFM	MoLAS
Beechbrook Wood	BWD	OA
Mersham	MSH	CAT
Bower Road	BOW	OA
Little Stock Farm	LSF	WA
North of Westenhanger Castle	WGR	CAT
Saltwood Tunnel	SLT	CAT/ WA

Examples of file name formats

10.4.2 WHS_1.0_FIG1_01.doc = White Horse Stone Site Report_ Report Section 1.0_Figure 1_Version 01 (1st draft). File type

TABLE 16: EXAMPLE FILE NAME FORMATS

Example	File Name format
White Horse Stone location drawing (1st draft)	WHS_1.0_FIG1_01.ai
Parsonage Farm overall site drawing (2nd draft)	PFM_2.1_FIG2_02.ai
Beechbrook Wood unintegrated specialist pot report text for MBA Phase, as approved by PO	BWD_4.3.3_POT_02.doc
Northumberland Bottom Introductory Text, as approved by Organisational Manager and PO	WNB_1.0_02.doc
Thurnham pottery drawings for Early Roman Phase - proto-villa (3rd draft), approved by Lead Specialist	THM_4.1.2_ POT_03.pdf
Saltwood Tunnel integrated site report (edited final draft text) approved by Senior Editor	SLT_1.0_TEXT_04.pdf
Synthetic volume unedited draft text contribution - Chapter 1	SYN_CH1_TEXT_01.doc
Bower Road final version site report, formatted for ADS posting and print-ready	CTRL_BOW_ADS.pdf

TABLE 17: REVIEW STATUS OF REPORT AND ARCHIVE COMPONENTS

Version	Item	Review status	prepared by	Checked by:	Approved for Issue to Project Manager by
Site Reports and datasets					
01	Report Synopsis	Unchecked	Project Officer		
01	Draft specialist text	Unintegrated and unchecked	Specialist		
01	Draft site drawing	Unchecked draft	Illustrator		
01	Artefact drawing	Unchecked draft	Illustrator		
01	CAD drawing	Unchecked draft	CAD Draughtsman		
01	Research dataset	Unchecked draft	Data Technician/ PO		
02	Report synopsis	Checked draft	Project Officer	Period Team Leader	Organisational Manager
02	Unintegrated specialist report	Checked draft	Specialist	Lead Specialist	Organisational Manager
02	Site drawing	Checked draft	Illustrator	Project Officer	Period Team Leader
02	Artefact drawing	Checked draft	Illustrator	Specialist	Project Officer
02	CAD drawing	Checked draft	CAD draughtsman	Project Officer	(interim up-dates approved by CAD Manager - label 02A, 02B etc)
02	Research dataset	Checked draft	Data technician/ PO	Project Officer	(interim up-dates approved by Period Team Leader - label 02A, 02B etc)
03	Report synopsis	Checked draft	Project Officer	Period team leader	Senior Editor (any subsequent up-dates, approved by Senior Editor, label 03A, 03B etc)
03	Site report	Edited, integrated draft text and figures	Project Officer	Period Team Leader	Senior Editor
03	Finds illustration and finds report	Edited, integrated draft text and figures	Specialist	Lead Specialist	Senior Editor
03	CAD drawing	Complete draft	CAD draughtsman	PO	CAD Manager
03	Research dataset	Complete draft	Data technician/ PO	PO	Period Team Leader
04	Site report	Copy edited, indexed final draft report	Project Officer	Senior Editor	Senior Project Manager
04	CAD drawing	Final version, ADS formatted	CAD draughtsman	CAD Manager	Senior Project Manager
04	Research dataset	Complete final version	Data technician/ PO	Data Manager	Senior Project Manager

Version	Item	Review status	prepared by	Checked by:	Approved for Issue to Project Manager by
05	Site report	Final version	Project Officer	Senior Editor	Senior Project Manager
ADS	Research dataset	Final version	Senior Project Manager	Senior Project Manager	Senior Project Manager
ADS	CAD drawing	Final version, ADS formatted	Senior Project Manager	Senior Project Manager	Senior Project Manager
ADS	Site report	Final version, ADS formatted	Senior Project Manager	Senior Project Manager	Senior Project Manager
Synthetic volume					
01	Synthetic volume text	Unedited draft chapters (text only)	Academic co-author Period team leader		
01	Synthetic volume illustrations	Unchecked draft illustrations and plates	Illustrator	Drawing office manager	
02	Synthetic volume illustrations	Checked draft illustrations and plates	Illustrator	Academic co-author Period team leader	Senior Editor
02	Synthetic volume	Edited chapters (with draft illustrations and plates)	Academic co-author Period team leader	External copy-editor	Senior Editor
03	Synthetic volume	Edited chapters (with finalised illustrations, plates and indicative page layout) incorporating referees comments if required	Academic co-author Period Team Leader	External copy-editor	Senior Editor
04	Synthetic volume	Unchecked proofs (Copy-edited, indexed, typeset)	External copy-editor	Senior Editor	Senior Project Manager
05	Synthetic volume	Corrected proofs	External copy-editor	Senior Editor	Senior Project Manager

10.5 Finds and Archive Transit Control

10.5.1 The transportation of artefacts, samples residues and paper archives will be subject to rigorous control procedures, which will ensure that the location of all primary archive material is tracked throughout the lifetime of the project.

10.5.2 Database inventories of all primary archive material will be compiled at the outset of the project, for material held by all organisations and individuals.

10.5.3 A digital archive transit record system will be administered by the Project Assistant and relevant co-ordinators. Each transfer will be recorded by an exchange of emails between the sender and receiver, copied to the Project Assistant. The email will include a digital proforma detailing:

- content of consignment
- source organisation/ person
- destination organisation/ person
- date of transfer

10.5.4 Each transfer will be referenced by a unique identifying code. This will comprise a 2-letter code identifying the person or organisation dispatching the consignment, a 3 letter code identifying the type of consignment (Finds, Environmental, Paper or Digital archive) and a 4 digit number identifying the consignment (eg MO_ENV_0001, OA_FIN_0102 or CA_PAP_0015). Each organisation/ person will maintain their own register of consignments dispatched and will issue their own reference codes. The Project Assistant will maintain a central register of all consignments, including details of current location.

TABLE 18: PRIMARY ARCHIVE TRANSIT CONTROLS AND RESPONSIBILITIES

Material	Controls	Person Responsible	Position
Environmental samples and residues	Transit proforma and database	E Stafford	Environmental coordinator
Artefacts	Transit proforma and database	L Allen	Artefact coordinator
Paper archives	Transit proforma and database	R Devaney	Project Assistant
Digital archives	Daily data back-up in accordance with standard OWA procedures	Paul Miles	OWA IT Manager

10.5.5 On completion of recording and cataloguing work on artefact and environmental assemblages, material will be transported to the CTRL store at Aylesford, unless otherwise instructed by the RLE Project Manager.