This document is shared for the purposes of learning legacy. It is a snapshot in time and hence many of the links within the document will become obsolete over time. Some links will refer to a document storage location that isn't accessible. Users should refer to the learning legacy website where these documents may be published separately.

TECHNICAL DIRECTORATE

Archaeology

Specification for Detailed Desk Based Assessment

Document Number: CRL1-XRL-T1-ASM-CRG03-50001

Document History:

Revision:	Date:	Prepared by:	Checked by:	Authorised by:	Reason for Issue:
1.0	25-11-11	[redacted]	[redacted]	[redacted]	For Implementation

Document History: CR-PN-PRW-EN-PD-00008 (Previous document version)

Version:	Date:	Drafted by:	Authorised by:	Reason for Revision:
1.0	28 Sept 2007	[redacted]	[redacted]	First Draft
1.1	18 Oct 2007	[redacted]	[redacted]	2nd draft incorporating CM & AWG comments
1.2	12 Nov 2007	[redacted]	[redacted]	3rd draft incorporating RP comments
1.3	14 Dec 07	[redacted]	[redacted]	Final draft

This document contains proprietary information. No part of this document may be reproduced without prior written consent from the chief executive of Crossrail Ltd.

© Crossrail Limited RESTRICTED

Learning Legacy Document

Contents

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED

1 Purpose

1.1 Introduction

1.1.1 A Generic Written Scheme of Investigation (WSI) (Document Number: CRL1-XRL-T1-XWI-CRG03-50001) has been developed for Crossrail that sets out the project strategy for archaeology design, evaluation, mitigation, analysis, dissemination and archive deposition that will be adopted during the design and construction of Crossrail. The Generic WSI presents a general statement of objectives, standards and structure for the planning and implementation and reporting of archaeological works.

1.1.2 This procedure sets out the detailed scope, standards and reporting requirements for Detailed Desk Based Assessment (DDBA) which may need to be undertaken as part of the Archaeology work stream for Scheme Design.

1.1.3 Detailed Desk Based Assessment (DDBA) is a programme of targeted research utilising existing written, graphic, photographic and electronic information, undertaken in order to identify the likely character, extent, quality and significance of the known or potential archaeological resource at a specific site.

1.1.4 The Crossrail Environmental Statement (ES) provides the following definition for DDBA:

> *"Intensive site-specific archaeological impact assessment(s) … carried out to address in detail issues of the survival or past removal of potential archaeological remains, localised truncation from individual basements etc., and (to identify) any pertinent historical records."*

1.1.5 For the purposes of this document (and following the approach taken in the ES), the definition of 'archaeology' is taken to include resources below-ground (including remains of archaeological, palaeo-environmental and quaternary geological importance) and above-ground non-listed built heritage structures[1].

1.1.6 The purpose of carrying out DDBA is to:

- Determine the potential for, and survival of, archaeological resources within a given area or site;

[1] This reflects Crossrail Policy as set out in Information Paper D22: 'The archaeological mitigation strategy will also include consideration of important above ground historic features and structural elements of historic interest, including for example buildings, structures or standing remains.'

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

Learning Legacy Document

- Provide additional information relating to the archaeological impacts of the scheme, taking into account the more detailed engineering design; and
- Inform subsequent phases of mitigation planning i.e. focus and refine the proposed mitigation measures for works at a particular site.

1.1.7 The outcomes of DDBA will be used to formulate site-specific Written Schemes of Investigation (WSIs).

2 Scope

2.1 Site Selection

2.1.1 DDBA will not necessarily be required for every worksite. It consists of selective problem-orientated research undertaken in cases where additional information is needed to make informed decisions regarding an appropriate mitigation strategy. The archaeologist will make a judgement on the need for DDBA at a particular site based on:

- The importance of the known or potential archaeological resource;
- The nature of the proposed construction works; and
- Any gaps in the existing archaeology information gathered to date for the Crossrail ES and Crossrail Archaeology Programming Assessment (Document nos. CRL1-XRL-T1-TSC-CRG03-50001 and CRL1-XRL-T1-ASM-CRG03-50002).

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

2.1.2 Archaeological Desk Based Assessment (DBA) was carried out in 2003/4 as part of the Crossrail ES and the outcomes were used to establish the archaeological baseline for the scheme2 . The level of research undertaken was generic or area based, involving the analysis of readily available data sources (see Appendix A1) in order to identify potential archaeological resources, and the likely impacts of the scheme upon them.

2.1.3 For some sites, DBA has already provided enough information about the importance of the resource and potential impacts upon it to enable mitigation strategies to be designed and set out in site-specific WSIs[3] . For other sites, further DDBA will be required.

2.1.4 DDBA builds upon the DBA, utilising all sources and data gathered previously for the archaeological assessment, but involves more focused and extensive research of both archaeological and non-archaeological sources[4] . Table 1 highlights the main differences between DBA and DDBA.

	Desk Based Assessment (DBA)	**Detailed Desk Based Assessment (DDBA)**
Sources	High level, existing knowledge	Extensive, new data from site specific surveys or additional documentary searches
Level of analysis	Generic/area based, largely predictive	Qualitative, detailed by site
Reporting	Broad statement of potential conditions and impacts	Detailed factual statement and scope for WSI. Interpretative site deposit model and detailed plans Outline costs and scope of mitigation

Learning Legacy Document

[2] This is set out in the main ES (Volumes 1 – 9), February 2005 (and Supplementary Environmental Statements and Amendment of Provisions Environmental Statements published subsequently) and the supporting Specialist Technical Report (STR): Assessment of Archaeology Impacts (Parts 1-6), February 2005.

[3] In such cases, and prior to formulating the site-specific WSIs, the Archaeological Design Consultant should first confirm that there have been no design changes since the ES which would require further DDBA to be carried out.

[4] This includes unpublished geotechnical monitoring data held by MoLA.

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

	Desk Based Assessment (DBA)	Detailed Desk Based Assessment (DDBA)
Project Stage	Bill Scheme (Environmental Statement)	Scheme Design

Table 1: Comparison of DBA and DDBA

2.2 DDBA data source types

2.2.1 DDBA will need to include consideration of updated archaeology baseline information which reflects:

- Design development since the ES;
- Changes to Statutory and Local Authority designations; and
- Any additional data (e.g. chance finds and/or the results of any relevant fieldwork) that has become available since the original dataset was collected that may alter the perceived archaeological importance of individual sites.

2.2.2 The Archaeological Design Consultant will identify design changes since the ES and any relevant new designations and fieldwork data in order for an updated archaeology baseline for DDBA to be produced.

2.2.3 Examples of the type of activities that may be undertaken as part of DDBA include:

- Targeted archaeological and documentary research to provide more detailed information about a specific known or potential archaeological resource e.g. the presence or absence, character and extent, date, integrity, state of preservation and relative quality (see Appendix A2);
- Targeted historical research e.g. map regression, to clarify former land use or individual resource location and quality (see Appendix A3);
- Visual site appraisal (where feasible, taking into account any site access constraints) to clarify current/former uses, access, land configuration and condition, and resource survival etc. (see Appendix A4);
- Assessment of geotechnical or geological data (both historic and that being collected as part of the site investigations for Crossrail) and aerial and ground survey data to determine depth and/or nature of archaeological deposits and survival (see Appendix A5). For the largest sites on alluvium this might include establishing a site-specific predictive deposit model (see Appendix B2);
- Reviewing and analysing a wide range of scheme design information e.g. engineering design detail, construction methods and programme, in order to update and/or confirm the archaeological impacts set out in the ES.

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED

2.2.4 It is not envisaged that, for each of the sites subject to DDBA, all these activities will be undertaken. Instead, only those methods which have the potential to contribute towards the site-specific WSIs will be required.

2.3 Procedure for DDBA

2.3.1 In response to the DDBA scope set out above, the Archaeological Design Consultant will submit a 'Schedule of Requirements for Further Research' to the Project Archaeologist. The Schedule will consist of a comprehensive list of all sites within the design contract scope, stating for each one whether DDBA is required or not prior to the preparation of site-specific WSI(s).

2.3.2 For sites where further research is required, the Schedule will detail the exact nature of the information being sought and the suggested research method for undertaking the work. Figure 1 provides a typical illustration of this process.

2.3.3 To ensure consistency across the project, the Schedules will be reviewed by the Project Archaeologist and revised by the Archaeological Design Consultant, where necessary, to address any comments and recommendations.

2.3.4 The research work will subsequently be undertaken in accordance with the accepted Schedule.

2.4 Standards

2.4.1 The Archaeological Design Consultant will take account of the following standards and guidance where relevant in undertaking their DDBA:

- Institute for Archaeologists (IFA), 2008. Standard and Guidance for Desk Based Assessment.
- Greater London Archaeology Advisory Service: Standards for Archaeological Work London Region, English Heritage External Consultation Draft July 2009.
- Corporation of London Department of Planning and Transportation, 2004. Planning Advice Note 3: Archaeology in the City of London, Archaeology Guidance.

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

2.5 Deliverables

2.5.1 The Archaeological Design Consultant will use the updated archaeology baseline, engineering scheme design and outcomes of the DDBA to draft a series of site-specific DDBA reports. Each report will include factual and interpretative statements regarding the conditions at the site (i.e. the potential for, and survival of, archaeological resources[5]), the detailed impacts of the scheme and recommendations on the scope of any further evaluation and mitigation required. A template for the DDBA reports is provided in Appendix B1.

2.5.2 Detailed site plans will be prepared to accompany each DDBA. In accordance with Crossrail CAD standards and procedures, the plans will be prepared at an appropriate scale to illustrate the extent of the site which has been subject to DDBA, the location and extent of archaeological areas (and areas of no archaeological survival) and non-listed heritage assets within the site, zones subject to construction impacts and the scope and extent of further work required.

2.5.3 Where relevant, an interpretative site deposit model (visually indicating the horizontal and vertical site conditions and archaeology) will also be produced alongside the DDBA (see Appendix B2).

2.5.4 The DDBA reports, detailed site plans and site deposit models will be submitted to the Project Archaeologist for review and together they will inform the subsequent production of site-specific WSIs (see Figure 1).

2.5.5 The archaeologist will maintain a digital file (the site survey file) containing all the deliverables outlined above and supporting evidence collected and assembled as part of the DDBA during the design phase (including native format GIS, CAD, database, MS Office, pdf and image files and others). Reports and data stored in the site survey file will be prepared to an appropriate format, content and presentation standard and will be identifiable to a strict file and folder naming and index convention in accordance with best practice for data management and applicable Crossrail standards.

Learning Legacy Document

[5] Including, where the data is available, a clear indication of the likely quality of the stratigraphic, environmental and artefact assemblages present on the site and/or sufficient primary data to allow the validity of the conclusions to be assessed.

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED

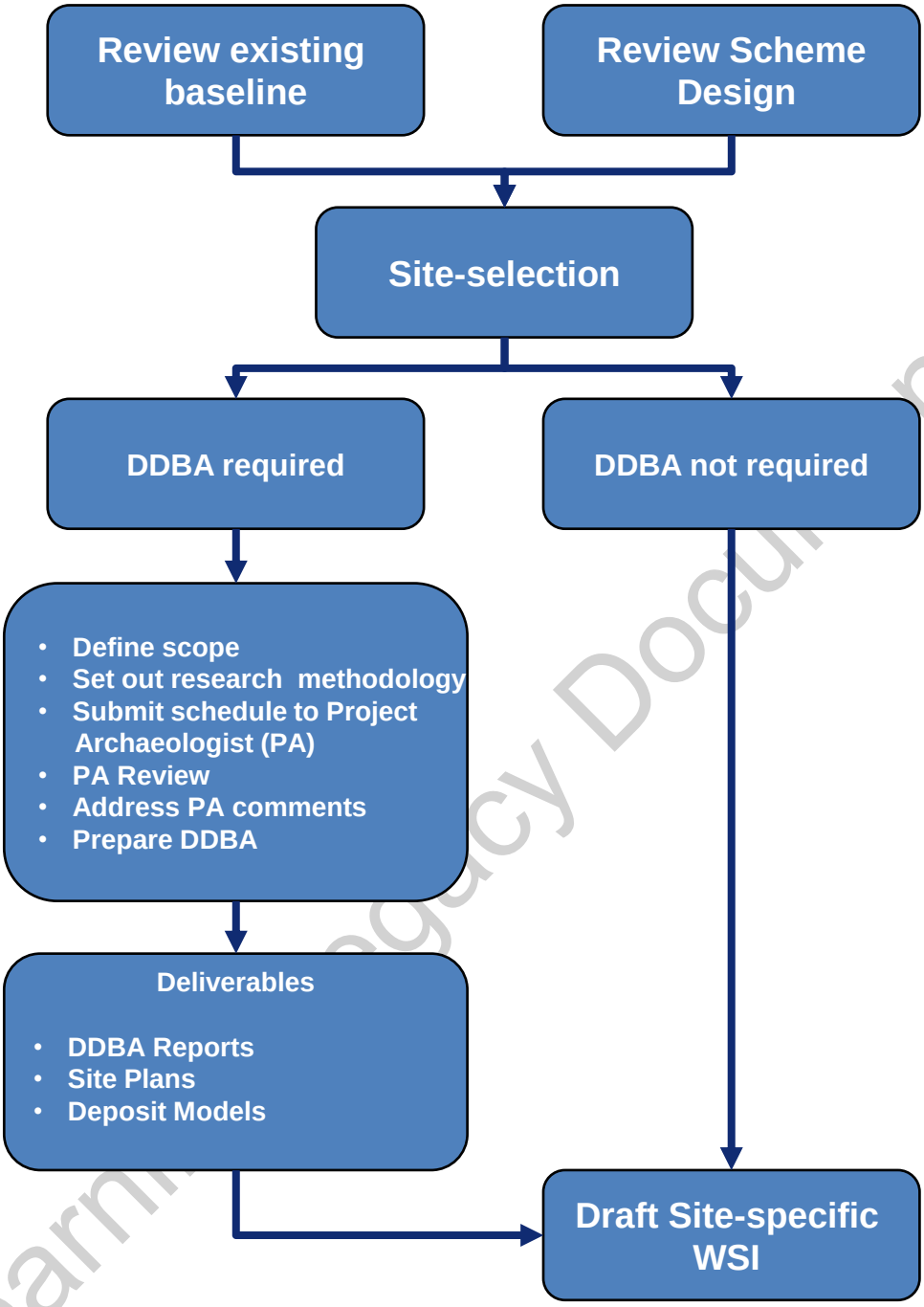

Figure 1: DDBA Process Map

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED

3 APPENDIX A

A1: Documentary evidence consulted for DBA

In producing the archaeology baseline for the ES, data relevant to the individual sites was collected from the following sources:

- NMR/SMR records, held by English Heritage and local authorities;
- Records of archaeological priority zones or equivalent areas designated by local authorities;
- lists, plans, and information held by English Heritage on scheduled ancient monuments and the draft register of historic battlefields;
- LAARC (London Archaeological Archive and Resource Centre) fieldwork database and summaries;
- geological mapping (held by the British Geological Survey);
- aerial photographs;
- published secondary sources dealing with the geology, archaeology, and built environment along the Crossrail route;
- maps and records held by local history collections and groups;
- archaeological and geological data held in MoLAS' Geographic Information System (GIS);
- data from preliminary works, such as boreholes or test pits, conducted in advance of construction;
- consultation with users, custodians, and interested bodies; and
- fieldwork comprising monitoring of geotechnical trial pits and boreholes plus site visits to all sites (where access was available at the time of writing the ES).

A2: Additional documentary evidence to be considered for DDBA

Additional documentary materials may need to be sourced and utilised where appropriate to inform the DDBA. Such materials may include but are not necessarily limited to:

- Historic mapping, aerial photographic and other remote sensing datasets (e.g. Lidar, hydrobathic, satellite);
- Historic building records and conservation area appraisals and management plans;
- Historic place names records;
- Unpublished archaeological reports;
- Trade directories; wills; rate books; census returns, business accounts; advertisements; historic photographs, lithographs, prospects and paintings; sale particulars; inland revenue maps; fire insurance plans;

Leading Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

- Land registry for property registers, title deeds and title plans, registered leases, conveyances, transfers, deeds, property agreements;
- Technical reports (e.g. geotechnical, contaminated land, Envirocheck) held by Crossrail.

Data sources may include but not necessarily be limited to:

- English Heritage;
- County, Borough, Metropolitan area or relevant private Sites and Monuments Records/Historic Environments Records databases;
- National Monuments Record;
- Local and County Records Office;
- Published and unpublished material in local libraries and local and national museums;
- Private collections including local historical societies;
- Private individuals;
- National Archives;
- National Railways archives;
- British Geological Survey; and
- Archaeological units and contractors holding recent archives.

A3: Former landuse evidence

Historic mapping (particularly OS sets from 1st edition onwards), modern and historic aerial photographic sets, other remote sensing datasets and visual site appraisal can be used to determine and record evidence for previous activities at a site.

Where appropriate the above analysis can be enhanced by detailed map regression to assess previous land use and ownership, historical changes in levels, layout and sequence of structures and changes in place/road names. The map regression can be used to facilitate an understanding of the phasing of a site and the development of the immediate area, and the extent to which the potential archaeological deposits and/or features have been disturbed by construction, demolition and levelling. Site investigation data shall be used where possible to refine the detailed site deposit model and challenge or corroborate assumptions or presumptions provided by historic datasets.

The results of map regression will be illustrated and described in the site deposit model and detailed plans.

A4: Visual site appraisal

All sites were visited during preparation for the ES. Where appropriate, further visual inspection will be undertaken by the archaeologist in strict accordance with CLRL

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED

site access and health and safety policies and procedures, and MDC Health and Safety Plans and approved individual hazard assessments.

Proposed worksites and the structures within them will be inspected (as far as is practicable) to identify and locate any previously unrecorded historic assets, analyse the topography of the area and identify buildings, services or structures (above and below ground) which will have compromised the integrity of the resource or may act as a constraint on future evaluation or mitigation. The immediate surroundings of the site will also be examined for features that may continue into the site and the existing boundaries will be inspected and their type and pattern noted.

Any topographical features, which might be a focus for human activity will be noted, even where there are no current indications of archaeological features being present (e.g. springs, level platform areas etc.,). Similarly any manmade or geomorphic activity that could have masked archaeological sites (e.g. tipped material and marshy ground/peat) will be identified and described.

The current state of preservation of monuments and surrounding land-use will be determined, noting any current and potential activities that threaten their long term preservation.

Where sites visits are undertaken, a written record incorporating sketch plans and photographs will be made for each site appraisal. The results will be incorporated into the site survey file and DDBA as appropriate.

A5: Geotechnical & geological data

Where appropriate, the archaeologist will be required to take account of information collected during geotechnical and geophysical site investigations. This information may be used to:

- Further understanding of the importance of the resource/s being assessed;
- Obtain further relevant information on local geologies and superficial deposits;
- Obtain information on the subsurface depths and thicknesses of potential archaeological deposits;
- Aid in understanding the degree of preservation of any archaeological deposits;
- Determine the potential of the archaeological resource detailed in previous reports to occur within a site or particular area; and
- Identify significant Quaternary deposit sequences with particular emphasis on the Pleistocene (lower, middle and upper) and Holocene geo-archaeological potential of specific sites.

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED

4 APPENDIX B

B1: Template & guidance for drafting DDBA reports

The DDBA reports will be written in a clear, concise and consistent style following the nomenclature used in the main ES.

The report should adhere to Annex 2 of the Standard and Guidance of the IFA and be presented in the following structure:

- Executive Summary (of no more than 1 page): outlining in plain non-technical language the principal reason for the work, the aims and objectives, methodologies used, main results and conclusions;
- Introduction: detailing the circumstances leading to the works, the nature and extent of the work, any restrictions on reporting or access to relevant records, surface geology and topography of the area;
- Aims and objectives of assessment: recording the stated aims and objectives of the DDBA report;
- Methodology: methodologies used and a list of sources consulted;
- Results: consisting of a series of objective statements regarding the known archaeological potential for an area or site and the significance of the identified resource. The structure of the results should be logical and include the following as a minimum: Chronological Summary; Map Regression, evidence for recent or previous truncation/disturbance to archaeological horizons;
- Discussion: summarising and interpreting the results of the DDBA, and indicating the context of the remains in research terms. It should also include a statement on the impacts of the scheme design on the archaeology and provide full justification for any further evaluation or mitigation actions;
- Recommendations: i.e. mitigation proposals consisting of further archaeological work;
- Appendices: incorporating copies of all relevant research documents and supporting information e.g. copies of all relevant maps, plans and illustrations referred to in the text (at appropriate scales[6]); site deposit

[6] Copies of historic maps shall be related to the particular site: through imposition of site boundary and cross referenced to the text. Where reproduction is not possible (e.g. fragile estate maps which the

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

Learning Legacy Document

model (where relevant); and gazetteer of known archaeological sites. Each site should have a sufficiently full description, be fully referenced, including the existing Project Record Number (PRN) if already identified within the HER/SMR;

- References: for all primary and secondary sources utilising the Harvard referencing system.

The reports should identify all the individuals involved in undertaking the DDBA, citing their name(s) qualifications and relevant experience.

Material copied or cited in reports will be duly acknowledged and all copyright conditions (such as those for Ordnance Survey maps) observed.

B2: Site deposit model and detailed plans

Where appropriate, a site deposit model describing factual and interpretative (predictive) horizontal and vertical dimensions of the site will be prepared. The site deposit model will utilise detailed 2d plans, cross sections, and 2.5d and 3d representational images to illustrate the archaeological potential of the site. Engineering design and construction planning detail will be used to indicate the extent of impact in the horizontal and vertical plane.

The deposit model will be produced as a fully geo-referenced and scaleable CAD model showing as a minimum:

- Colour and fill pattern differentiation;
- Suitable vertical and horizontal scales and orientation; and
- Full explanatory legend and annotation as appropriate.

The deposit model will represent the following, as appropriate:

- The nature and origin of the Tertiary topographic template;
- The lithology, origin and sequence of the Quaternary deposits present;
- Evidence for post depositional events that would limit the significance of the above units;
- The lithology and sequence of Holocene deposits present (and their origins, e.g. colluvial, alluvial, sea level change events);

Learning Legacy Document

Record Office will not permit to be copied), all relevant data should be transcribed onto the DDBA mapping.

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System

© Crossrail Limited RESTRICTED

- The evidence for potential high archaeological value depositional environments and potential for important palaeo-environmental and artefactual assemblages;
- The location and extent of archaeological deposits;
- Evidence for truncation of archaeological deposits including: levelling layers, demolition events, intrusive structures and services;
- Recent made ground (20th century onwards);
- Contamination; and
- Areas affected by aerial bombardment noting (a) bomb type, (b) degree of damage and (c) potential location of unexploded ordnance (UXO).

Learning Legacy Document

Document uncontrolled once printed. All controlled documents are saved on the CRL Document System
© Crossrail Limited RESTRICTED