Historic England

Call for Proposals for: aerial investigation and mapping to enhance local authority Historic Environment Records and address research agendas.

Project No: 7639

Date of Issue: April 2025

Summary

Historic England seeks proposals for archaeological surveys using aerial photographs and lidar as a main source. This call is for projects (or project stages) lasting no more than about 12 months and which start between mid-July 2025 and December 2025. A maximum of two proposals is sought from each organisation. Previous proposals will be accepted if they have substantially revised aims. Funding of projects will depend on Historic England grant capacity. Proposals with other sources of funding are welcomed.

The projects must use Historic England Aerial Investigation and Mapping Standards but should also consider multi-disciplinary approaches. Projects will be chosen that make best use of resources to identify, and therefore protect, important aspects of our historic environment. Project results should champion the outstanding quality of our historic surroundings – explaining the many diverse influences in their development, inspiring their celebration as a source of local and national pride.

Mapping and recording from aerial photographs and lidar are proven techniques for identifying and analysing archaeological sites and landscapes, particularly over large areas. This information is most effective when available through Historic Environment Records (HERs) where it can directly influence planning decisions and inform further work. Proposals must be for areas with a high potential for archaeological discovery from aerial sources and where this information will have the greatest impact in terms of improved understanding and heritage protection.

Proposals must demonstrate how they will contribute to the strategic activities of Historic England as set out in the Corporate Plan, Future Strategy and Research Agenda. Historic England has adopted a public value framework (PVF) to provide assurance to its stakeholders, including the taxpaying public, that it invests public money in ways that optimise value. Proposals should therefore make a convincing case that the project will make a real and positive impact on England's heritage. It should address the following questions:

- How will the project represent a good return on investment?
- Why do we need the project now? What are the consequences if it doesn't happen?
- How does the project address other strategies such as local research frameworks or local government plans?

Background

Historic England, and its predecessors, developed Aerial Investigation and Mapping Standards, formerly called the National Mapping Programme (NMP), to ensure effective use of aerial photographs and lidar to identify, map, record and better understand archaeological sites and landscapes. Area based projects, covering 100 square kilometres or more, can efficiently process large volumes of archive material to collate archaeological information into a Geographic Information System (GIS) for use in a Historic Environment Record. This provides data for strategic decision making and research. Analysis and synthesis of this archaeological information, usually in a report, communicates better understanding of the character and significance of landscapes.

Over half of England has been covered by Historic England (and predecessors) aerial investigation and mapping surveys and these have had a significant impact on the historic environment record. Over 120,000 archaeological sites have been discovered and each year thousands more are added to the record as a result of aerial investigation and mapping projects.

New projects will examine areas where aerial investigation and mapping is most needed and where this technique will be most effective. Proposals should target areas where there are demonstrable regional priorities (identified in consultation with the relevant Local Authority) and strategic threat priorities. These may include increased pressure on land due to the need for more housing, amenities or major infrastructure; major changes in land use due to woodland creation or changes in agricultural practices; and direct/indirect climate change threats. Projects must be in areas with a high potential for archaeological discovery and improved understanding from aerial photographs and lidar. Projects can be in areas covered by older NMP projects, if there is a demonstrable need and high potential for improved information.

Aims

The main aim of the Call for Proposals is to ensure we target resources in areas where demonstrable regional priorities can be addressed through aerial investigation and mapping. These might include areas where our heritage is subject to strategic threat or where there are significant opportunities for improved heritage management.

The Call will enable Historic England to create new knowledge in areas where there is greatest archaeological potential for surveys using aerial photographs and lidar as the main sources.

The main aim of the resulting projects will be to improve planning decisions at local, regional and national levels by providing significant amounts of new and improved information for local Historic Environment Records.

Projects should address significant physical or thematic gaps in archaeological knowledge identified in regional research frameworks or other published material.

Projects should aim to cover areas not already subject to Historic England aerial investigation and mapping surveys. However, areas already covered by older (pre-digital) projects will be considered if there is a strong business case and a new project will add significantly to the knowledge of the area. See appendix 1 for map of previous and current project areas.

Projects will identify and describe local, regional and nationally significant archaeological sites or landscapes to enable appropriate levels of protection.

Project results will champion our ‘hidden heritage’ by making information available on previously unrecognised or poorly recorded archaeological sites and landscapes.

Project results will champion the use of archives by demonstrating the archaeological value contained in physical and online archives with aerial photographs and lidar.

The project results should demonstrate the potential to compile, improve and promote the National Heritage List for England (NHLE).

Proposers are strongly advised to consider ‘added value’ elements to the project and consider seeking joint funding. This could include partnerships with other conservation, heritage or academic bodies. Projects could aim to provide wider context for development-led work (including large-scale strategic projects), thematic/synthetic approaches linked to research framework objectives.

Business Case

There is much that we do not know about England’s historic environment. Important archaeological sites and landscapes remain hidden or are poorly understood. We need to identify and better understand this archaeological resource in order to protect it effectively. Mapping and recording from aerial photographs and lidar are proven techniques for identifying and analysing archaeological sites and landscapes, particularly over large areas. This information is most effective when available through Historic Environment Records where it can directly influence planning decisions and inform further work.

We need to identify those areas most in need of aerial investigation and mapping. These must be areas where this technique will significantly improve our knowledge and understanding of the historic environment. Proposals should demonstrate how effective aerial investigation and mapping would be in identifying and improving our understanding of the archaeological resource in the proposed area.

Each project proposal should identify potential strategic threats or opportunities to archaeological remains in the suggested area and explain how the survey will address these. Potential survey areas must be subject to one or more of the following criteria:

- Demonstrable and specific threats to archaeology from the direct or indirect effects of climate change (eg dewatering, erosion, changes in agricultural practices).
- Demonstrable and specific threats to, or potential impacts on archaeology from climate change mitigation measures (eg rewilding, forestry, flood mitigation).
- Significant knowledge gaps which have a clear impact on the ability to manage the historic environment.
- Significant or complex development pressures (eg major infrastructure, growth areas).
- Regional, thematic or period-based research questions that will significantly enhance landscape-scale understanding and subsequently improve protection of the historic environment.
- Opportunities to develop methods for the application of airborne remote sensing techniques to record, understand and manage the historic environment.
- Opportunities to engage communities with the heritage in the project area.

Project proposals must demonstrate how they meet the purpose, values and strategic objectives set out in the Historic England Corporate Plan. In particular, how the project will improve people's lives by championing and protecting the historic environment.

Proposals will be assessed on the business case including the following:

- Brevity and clarity of information provided.
- Adherence to Historic England Aerial Investigation and Mapping Standards (see Appendix 3).
- Realistic costs, timescale and value for money. This should include evidence for how timescale was calculated, including the potential impact of type and quantity of aerial sources and the density and complexity of known archaeological sites in the proposed area.
- Potential of the project to address key threats/opportunities in national and local contexts.
- Potential of the project to significantly improve understanding and appreciation of the historic environment and contribute to research frameworks.
- Ability of the project team to deliver high quality work to agreed timescale and cost.
- A strategy to communicate project results to a diverse range of people in inclusive ways.

Project proposals received in the last Call (December 2023) will only be considered if significantly repurposed to meet current priorities.

Stakeholders

The key stakeholders in aerial investigation and mapping projects are local planning authority historic environment services. Project proposals must demonstrate that they were prepared in close consultation with the relevant local authority staff to identify key priorities in the area proposed.

Proposals must include an agreed mechanism for incorporation of textual monument record data into the Historic Environment Record. This should ideally be direct entry into the HER. Where this is not possible, a cost-effective and timely means of data exchange and full incorporation must have been agreed with the relevant HER(s).

The relevant Historic England regional team, in particular the Inspector of Ancient Monuments, must be consulted to discuss priority areas and topics.

The Historic England Archive is a major stakeholder and air photo loans for aerial investigation and mapping projects are subject to terms and conditions. See appendix 3 for further details. Cover search requests should be made well in advance to allow time for analysis. Cover search requests should make it clear that they are for project planning purposes only and not an indication of a future loan request as proposed project areas may change.

Partnerships are encouraged with universities, protected landscapes (National Landscapes, National Parks) and other heritage organisations (eg National Trust, National Lottery Heritage Fund) especially if they bring funding for some, or all, of the aerial investigation and mapping.

Methods

Proposals must be laid out using the Project Planning template in appendix 2 – proposals in other formats will be rejected.

Projects must use the Historic England Aerial Investigation and Mapping Standards in appendix 3.

Projects must contact the Historic England Archive for a cover search to inform timetable assessment.

Proposals should describe the likely methods for disseminating and communicating project results to professionals and the general public.

Products, Communication and Engagement, and Archiving

The main products will be digital mapping, records in the relevant local authority Historic Environment Record, a report, and material for the Historic England website (including the Aerial Archaeology Mapping Explorer).

Regular communication with key stakeholders should be scheduled throughout the project.

The project will follow Historic England grants processes and will be monitored by a Project Assurance Officer. Progress updates are supplied as brief statistics each quarter and in highlight reports. Historic England's Aerial Survey team will carry out quality control on all projects.

Projects should enhance the National Heritage List for England via the Missing Pieces Project through links to the final project report. The relevant Historic England Listing team should be consulted to discuss if and how information that could enhance existing list entries or support designation assessment of new schedulings should be communicated.

A strategy to communicate project results to a diverse range of people in inclusive ways must be considered and included in the proposal. This could be through publication, events, social media or other means.

Copyright for the mapping remains with the grant recipient but Historic England are licenced to use the data as set out in the funding agreement. This will include release of the data under the Open Government Licence v3 via Historic England's Open Date Hub. Monument records and mapping must be integrated into the relevant local Historic Environment Record as part of the project. Mapping data will be added to the Aerial Archaeology Mapping Explorer.

Historic England air photograph loans must only be used for the agreed project. Scans of Historic England Archive aerial photographs must be deleted on completion of the project.

The hard copy and digital documentation produced under this project will be the copyright of Historic England. Copyright on all reports submitted will reside with Historic England, although a third-party in-perpetuity licence will automatically be given for reproduction of the works by the originator, subject to agreement in writing from Historic England.

The author should ensure that copyright permission is obtained for any images used in the report and be aware that Historic England may wish to make the report available on its website.

The author should also make certain that all material copied from other sources is fully acknowledged and the relevant copyright conditions pertaining to that data will be observed.

Accessibility

As a government body, any digital service, website or app Historic England provides or funds must meet government accessibility requirements.

Suppliers are also made aware that their product or service may also be subject to 3rd party testing of the deliverables for accessibility.

We must make sure new content or features meet the standards. This includes:

- Making sure any new PDFs or other documents are accessible
- Writing good link text
- Structuring content well
- Publishing accessible images and videos
- Making sure new features work on assistive technologies

It’s much easier to make things accessible from the start than it is to go back and fix them.

Assessing Impact

Impact assessment is a means of measuring the effectiveness of activities and projects and judging the significance of the changes or benefits brought about by these actions. Impact can be gauged in terms of reach (how many people/organisations were influenced by the work) and significance (the difference it made to these people/organisations). Gathering and assessing evidence of impact should be considered in proposals.

Historic England has adopted a public value framework (PVF) to provide assurance to its stakeholders, including the taxpaying public, that it invests public money in ways that optimise value. Proposals should therefore make a convincing case that the project will make a real and positive impact on England’s heritage. It should address the following questions:

- How will the project represent a good return on investment?
- Why do we need the project now? What are the consequences if it doesn’t happen?
- How does the project address other strategies such as local research frameworks or local government plans?

Budget

The maximum grant available per project is £80,000. Project proposals should include detailed costs as set out in the Guidance for Grants and must include the costs spreadsheet.

How to apply

Proposals should be based on the template attached to this document and must include a task list, timetable and costs. We will not be commissioning Project Designs.

Please submit proposals by emailing HPCPcalls@HistoricEngland.org.uk

The Heritage Protection Commissions Programme Guidance for Grants can be downloaded from the HPC web pages. https://historicengland.org.uk/services-skills/grants/our-grant-schemes/hpc/

Timetable

Proposals must be submitted by 2nd June 2025. Applicants will be informed of the decision by late June 2025.

Further information

For questions about the project please contact Matthew Oakey at Matthew.Oakey@HistoricEngland.org.uk

For further queries about the application process, deadlines etc please contact Tim Cromack at Tim.Cromack@HistoricEngland.org.uk

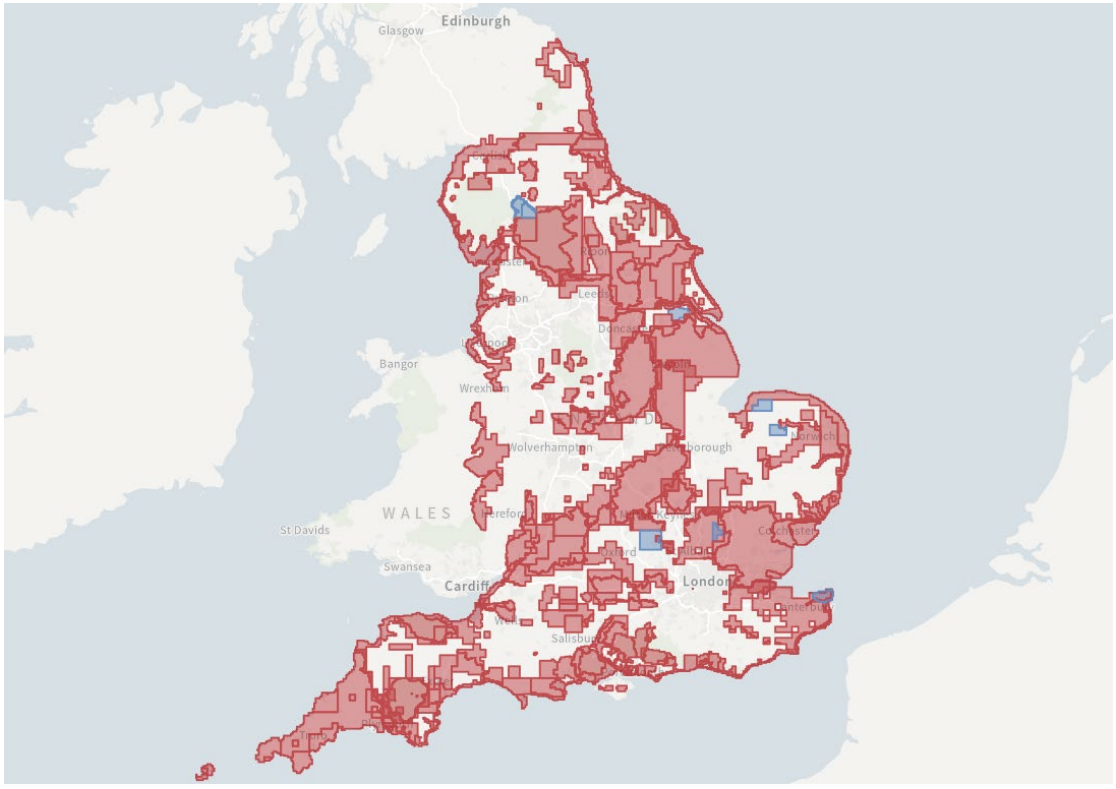
If you would like this document in a different format please contact our Customer Services department:

Telephone: 0370 333 0607

Email: customers@HistoricEngland.org.uk

Appendix 1. Previous and current project areas

The results of previous Aerial Investigation and Mapping projects can be viewed on the Aerial Archaeology Mapping Explorer or accessed via the Historic England Open Data Hub.



AI&M project areas as of February 2025. Completed (red), ongoing (purple) and planned (green). Base mapping © Crown Copyright and database right 2025. All rights reserved. Ordnance Survey Licence number 100024900.

Appendix 2. Format for proposals

This template should be used in conjunction with the information in the Call document.

Document control

Title:	*Include a document control grid in your proposal*
Author(s):	
Derivation:	
Origination Date:	
Reviser(s):	
Date of last revision:	
Version:	
Status:	
Summary of Changes:	
Circulation:	
Required Action:	
File Name/Location:	
Approval:	

1. **Project Name and Area**

Background

A brief summary of the context and motivation for the project. Provide an accurate location map – projects must be defined by full OS one kilometre squares irrespective of crossing county or other administrative boundaries. The only exception to this is along the Welsh or Scottish borders. Please provide a shape file of the project area with your proposal.

Aims and Objectives

Refer to potential protection outcomes in this area. Describe the opportunities for the project to deliver additional benefits beyond heritage protection, for example research potential, partnerships or community work. Refer to how the project will meet the key research questions relevant to this area.

Business Case

Include a brief business case explaining how the project will meet the aims of relevant areas of the Historic England Corporate Plan, Future Strategy, and Research Agenda as well as regional or local strategies and research agendas. Include a statement of the archaeological potential of your area and the impact of the project.

Methods

A brief outline of how you will achieve your project aims and objectives. Why and how using Historic England standards will be effective in achieving the aims of the project. Describe how you propose to access material at the Historic England Archive. You must specify how data will be entered into the local authority historic environment record and how results will be disseminated.

Stages, Products and Tasks

Provide a list of main stages and products. Provide a task list with allocation of days required for each of the main tasks. This should include time allocations for each member of the project team.

Interfaces

Mention who has been consulted in the relevant Local Authority and the Historic England Regional team, in particular the Inspector of Ancient Monuments and Listing advisor. Mention interfaces with other local initiatives where relevant.

Project team

Include a brief outline of the relevant project team members' experience (including delivery of aerial investigation and mapping projects) and their roles on the proposed project. Any changes to the project team must be discussed with the Historic England Aerial Survey team.

Project timescale and budget

Include the project timescale (including proposed timescale for each mapping block if necessary) and budget. Provide a brief explanation of how the budget or resources were calculated including a short timetable assessment based on available sources and archaeological knowledge of the area.

Appendix 3. Aerial Investigation and Mapping Standards and Guidelines

Version 1.0 March 2025

Contents

1. Summary

Aerial Investigation and Mapping (AI&M) Standards aim to promote best use of aerial photographs and lidar data to create archaeological maps and descriptions suitable for historic environment records. This systematic synthesis of archaeological information is intended to assist research, planning, and protection of the historic environment.

This Standards and Guidelines document provides details of the processes involved in the production of mapping and recording from aerial photographs and lidar.

AI&M Standards apply to all Historic England projects and those undertaken by external contractors funded by Heritage Protection Commissions (HPC) grants. Adherence to the Standards and Guidance is a requirement of all internal and grant-funded projects.

These Standards and Guidelines may be used and adapted by those using airborne remote sensing data in other contexts including smaller area or site-based work such as desk-based assessments.

For the purposes of this document the following definitions are used:

- **Standard** – a clear, concise measure against which a product or task can be assessed for compliance. Standards are listed in the text box at the beginning of each section.
- **Guidance** – supporting reference material that can be used to ensure that a product or task meets the required **standard**.

This document replaces Winton 2021 *Standards for Aerial Investigation and Mapping Projects* and Historic England 2019 *Aerial Investigation and Mapping Technical Specification*. A revision history can be found in **Appendix 3** and will be updated when future versions are issued.

Please refer to this document as:

Historic England 2025 *Historic England Aerial Investigation & Mapping Standards and Guidelines.*

2. Project planning

- Projects must be planned and executed in accordance with project management best practice, see Historic England Guidance for Grants Projects.
- A timetable assessment, which includes a quantification of aerial photography and lidar coverage, must be used to determine the required staff resource and duration.
- Mechanisms for accessing and viewing aerial photograph archives must be agreed at Project Proposal or Design stage.
- Consultation with relevant local and national stakeholders must be carried out in advance of submission of a Project Proposal or Project Design.
- Project Experts must have a minimum of 4-6 months professional experience of interpretation and mapping of archaeological landscapes using aerial photographs or have an agreed training plan.

2.1. General considerations

Projects must be planned and executed in accordance with project management best practice, see Historic England Guidance for Grants Projects. The following sections identify aspects to be considered during the planning of an AI&M project.

From the outset there should be consultation with potential stakeholders including the relevant Local Authority or National Park Authority. For projects funded via Historic England's Heritage Protection Commissions (HPC) programme this consultation must also include the appropriate Historic England Regional team and the Aerial Survey team.

Early consultation with relevant aerial photograph archives is necessary to ensure that access or loan arrangements are agreed.

Consider these aspects when planning AI&M projects:

- Clear project objectives and scope.
- Clear definition of the project area.
- Required AI&M products.
- Quantification of aerial photographs and lidar.
- Quantification of current archaeological knowledge.
- Costs of copyright and licensed use of source material.
- Timetable assessment.
- Project stages and tasks.
- Team structure and skills.
- Allowance for liaison with stakeholders.
- Risks and their management.
- Hardware and software costs.
- Clear mechanisms for population of the Historic Environment Record.
- Archive and dissemination.
- Project Closure.

2.2. Setting objectives

Objectives should be clearly articulated and include their expected contribution to the understanding, management and protection of the historic environment.

Reference should be made to relevant strategic documents such as Regional Research Frameworks, World Heritage Site Research Agendas and National Park or Landscape Management Plans. Projects must also reference the Historic England Corporate Plan and Future Strategy.

2.3. Defining the project area

Describe the project area and provide an illustration in the Project Proposal or Project Design. It may be necessary to subdivide the project area for loan management purposes. Details should be discussed with the Historic England Archive.

AI&M projects should usually be 100 square kilometres or more and take account of the location of previous digital AI&M projects. Existing AI&M data are available via the Aerial Archaeology Mapping Explorer or the Historic England Open Data Hub.

Single contiguous project areas are encouraged unless there is a strong business case for sampling areas – even then the areas should be of a size to ensure significant results. A single project area with straight sides is more efficient for archive retrieval and re-filing, and is a more efficient use of sources. Whole kilometre squares should be completed unless they cross the Scottish or Welsh borders.

2.4. Products

- A georeferenced digital map of the form and extent of all archaeological features visible on aerial photographs and lidar.
- New and amended HER records.
- A summary report in the Historic England Research Report Series, with an overview of the archaeology recorded by the project, analysing its character, diversity, distribution and associations in the landscape as well as recommendations for future work.
- An OASIS record.

2.5. Quantification of aerial photographs and lidar

The identification and quantification of available aerial photographs and other sources is an essential part of project planning. Identify the numbers and types of aerial photographs held in archives, and any other readily available sources of images and remote sensed data. See section **5. Sources** for further details of the mandatory sources for AI&M projects.

Historic England grant-funded AI&M projects are eligible to receive loans from the Historic England Archive subject to certain conditions and requirements. Request a list of aerial photographs (knows as a ‘coversearch’) from the Historic England Archive by providing a shapefile of the proposed project area.

Ascertain any costs, and conditions of use, associated with acquiring sources from aerial photograph archives.

Present the aerial photograph quantification in the Project Proposal or Design.

2.6. Quantification of current archaeological knowledge

Assess existing historic environment monument records to evaluate the density, geographic location, distribution, period and type of archaeological sites within the project area.

Present the quantification in the Project Proposal or Design.

2.7. Timetable assessment

Assess the time required for the project based on:

- Experience of previous projects.
- Experience of project team.
- Quantification of aerial photographs and other data.
- Access arrangements at archives.
- Quantification of archaeological knowledge to anticipate the expected density of archaeological features.
- Additional tasks beyond interpretation, mapping and recording.

2.7.1. Mapping and recording rate

The timetable assessment should estimate the expected rate of mapping and recording in person days per square kilometre. An average of 1.1 person days per square kilometre is usual for the interpretation, mapping and recording phase of AI&M projects.

More, or less, time may be required depending on the density and complexity of the archaeological remains, the number of aerial photographs and the scope of the project. Analysis of previous projects has demonstrated that the number of monuments per square kilometre is the key factor impacting time taken for mapping and recording (Evans 2019).

The Project Proposal or Design must demonstrate how the quantification of aerial photographs and other sources, and current archaeological knowledge have been used to estimate time allocations for mapping and recording.

2.7.2. Other project tasks

Itemise time for tasks such as visiting aerial photograph archives, aerial photograph loan management, field trips, meetings, progress reports, dissemination, and report writing. Time allocated to these tasks, especially report writing, must reflect the size of the project area and the anticipated density and character of archaeological sites.

Include a GAANT chart in the Project Proposal or Design to illustrate the timetable of tasks for the duration of the project.

2.8. Team structure and skills

Project Experts must have a minimum of 4-6 months professional experience of interpretation and mapping of archaeological landscapes using aerial photographs. Training of new staff should be carried out by an AI&M Investigator with at least two years' experience.

Calculate the effect of training on the project timetable and cost. Training requirements vary but up to 45 person days for the trainee is usual.

Historic England staff may be able to provide training but this would need to be approved in advance and will be dependent on staff capacity and sufficient lead-in time.

2.9. Copyright and licensed use of source material

Copyright permission and referencing information must be sought for all material sourced from the Historic England Archive, CUCAP, HERs or other third parties. The Historic England Archive and HERs etc do not always hold the copyright for items in their collections. It is the responsibility of the Project Team to ensure that conditions of use are adhered to.

Intellectual Property Rights of products produced by grant-funded AI&M projects are held by the grant recipient. Historic England have a perpetual non-exclusive license which allows use of the products for any purpose, including hosting mapping on the Aerial Archaeology Mapping Explorer and Historic England Open Data Hub.

3. Project setup

- An event record must be created for each aerial investigation and mapping project using OASIS.

3.1. Hardware, software and storage

Hardware and software should be of appropriate capacity to handle, visualise and store large image files and mapping datasets. This includes a computer suitable for moderate data processing, two high-quality monitors and a scanner.

Software requirements include:

- A Geographic Information System (GIS) such as ArcGIS Pro or QGIS.
- Adobe Photoshop or equivalent.
- Aerial 5.36.
- Relief Visualization Toolbox (standalone or Esri ArcGIS Pro/QGIS plug in).
- Google Earth Pro (or web version).
- Set-up to enable direct input to the relevant Historic Environment Record or Warden.
- Microsoft Office.

3.2. Data security and backup

Ensure systems and processes are in place regular and secure backup of project data.

3.3. OASIS

OASIS is an online system for reporting investigations into the historic environment and linking research outputs and archives. It also allows for project reports to be shared with HERs and for public release in the Archaeology Data Service (ADS) library.

An event record must be created for each AI&M project using OASIS.

4. Sphere of Interest

- Aerial Investigation and Mapping projects must follow the scope outlined below.

4.1. AIM scope

Aerial Investigation and Mapping projects produce high quality data by collating all the archaeological information available on aerial photographs and lidar. This approach helps in identifying multi-period remains, visible as cropmarks, earthworks, stonework, and structures. The earliest sites recognised on aerial sources usually date from the Neolithic onwards. Projects therefore record all archaeological features from the Neolithic through to 20th-century military and industrial remains.

AI&M Standards ensure a consistent national methodology, but they also offer flexibility to adapt and expand based on specific project needs. This adaptability is essential for addressing the unique challenges and opportunities presented by different archaeological landscapes or stakeholder requirements.

4.1.1. Cropmarks, parchmarks, soilmarks

Map and record all sub-surface archaeological visible as cropmarks, parchmarks or soilmarks.

4.1.2. Earthworks

Map and record all archaeological earthworks. This includes features visible as earthworks on historic photographs which have since been levelled. Archaeological features within the AI&M scope that are depicted on Ordnance Survey mapping are should be mapped and recorded (e.g. medieval moats).

4.1.3. Buildings and Structures

Map and record all foundations of buildings visible as cropmarks, soilmarks, parchmarks, earthworks or ruined stonework, unless depicted on historic Ordnance Survey mapping. Standing roofed or unroofed buildings are generally out of scope, exceptions being in industrial or military contexts (see below).

Map and record structures formed of stone, concrete, metal and timber that are of archaeological relevance such as fish traps, wrecks, timber circles and military remains, including ephemeral features such as barbed wire and lines of tank cubes.

4.1.4. 20th-century military remains

Mapping 20th-century military remains can become very complicated due to changes and modifications within the date range of the photographic coverage. Depict a representative phase of the site, such as its latest development (e.g. 1945).

4.1.5. Industrial Features and Extraction

Industrial features and extraction site are in scope for AI&M projects. Features typically mapped include buildings (roofed or unroofed), structures, spoil heaps, and transport features associated with industrial processes.

The strategy for mapping and recording widespread and common small-scale resource extraction for local use (e.g. chalk pits) should be discussed with project

partners and outlined in the project design, considering resourcing constraints and research agendas.

4.1.6. Parkland, Landscape Parks, Gardens and Country Houses

Map and record all relict park and garden features within landscape parks, country houses and urban parks.

4.1.7. Natural features

Geological or geomorphological features are out of scope. Any potential confusion between archaeological and geological marks can be discussed in the archaeological monument record.

5. Sources

- All readily available sources of aerial photographs must be assessed. As a minimum this will include the following:
    - Historic England Archive.
    - APGB orthophotographs.
    - Local HER(s).
    - Google Earth.
    - Bing Maps.
- Environment Agency lidar at a minimum resolution of 1m must be assessed.
- Projects encompassing the coastal zone must assess the aerial photograph and lidar datasets available via the National Network of Regional Coastal Monitoring Programmes.
- Vertical print photographs must be viewed in 3D, using a stereoscope.
- Appropriate supplementary sources of information must be used to inform interpretation of aerial photographs and lidar.
- Copyright permission and referencing information must be sought for all material as required.

5.1. Historic England Archive

The Historic England Archive is the largest repository of aerial photographs in England and the primary source for AI&M projects. A list of aerial photographs held for a project area (known as a coversearch) is provided by the Archive Services team.

Historic England grant-funded projects are eligible to receive loans from the Historic England Archive subject to certain conditions and requirements. The Historic England Archive can provide further information on the loans policy and guidance on request.

Historic England do not always hold the copyright for aerial photographs held in the archive. Check permissions before reproducing any images – this can include scanning of images for rectification and mapping purposes.

See the Historic England website for contact details.

5.2. Aerial Photography for Great Britain (APGB)

Orthophotographs are supplied by Bluesky International via the APGB agreement in 1km tiles at 25cm or 12.5cm resolution. False-colour infrared photography is also available at 50cm resolution. As well as the most recent coverage, archive photography dating back to 1999 is available and should be assessed.

Under the terms of the APGB agreement, Historic England can supply data to external contractors funded by a Heritage Protection Commissions grant. A sub-contractor licence must be signed before data can be provided. The Historic England Aerial Survey team should be contacted at the beginning of the project to arrange data provision and licencing.

5.3. Lidar

The most comprehensive source of lidar in England is the Environment Agency which has national coverage at a minimum of 1m resolution. Environment Agency lidar is free to use under the Open Government Licence.

Other sources of lidar data may be available and on rare occasions lidar may be commissioned as part of an AI&M project. Copyright, reproduction and access conditions must be established and outlined in the Project Proposal or Design.

See section **7. Use of lidar** for further details.

5.4. Historic Environment Record Aerial Photograph Collections

Most HERs hold a collection of oblique and vertical aerial photographs. In some counties the aerial photograph collection is held by an archive or County Records Office.

Images can often be duplicated in the Historic England Archive so it is recommended that an assessment of duplication is made before planning an in-person visit to the HER. If an in-person visit is required, it may be most efficient to assess HER aerial photographs last.

HERs do not always hold the copyright for the aerial photographs they hold. Access arrangements, scanning policies and any costs should also be considered at Project Proposal or Design stage.

5.5. Cambridge University Collection of Aerial Photography (CUCAP)

CUCAP comprises almost 500,000 aerial photographs. However, the CUCAP library is currently closed and therefore inaccessible. The Historic England Archive and some HERs hold duplicate prints of selected images.

Some low-resolution thumbnail images are available to view via the online CUCAP catalogue. Additionally, a small number of aerial photographs have been scanned at high-resolution and are available to view on the Cambridge University Library website.

Permission to scan or reproduce CUCAP photographs must be sought from Cambridge University, even when prints are held in another archive.

5.6. Google Earth and Bing

Google Earth contains multiple years of aerial photography and satellite photography. The aerial photograph layers often replicate data available via the APGB agreement. APGB data should be used in preference to Google Earth for mapping due to the greater resolution and spatial accuracy.

Bing Maps provides online access to a single later of vertical photography. For some urban and peri-urban areas oblique photography is also available.

5.7. Other aerial photograph collections

Other collections of aerial photographs may be held by local archaeological societies, museums, archives or universities. The potential archaeological value of local collections should be evaluated at Project Proposal or Design stage. Access arrangements, scanning policies and any costs should also be considered.

5.8. Uncrewed Aerial Vehicle (UAV) data

Site specific UAV-born photography and lidar are becoming increasingly common. Photography is often processed using digital photogrammetry – commonly known as Structure from Motion (SfM). Products can include seamless photo-mosaics and orthophotographs, as well as 3D height data. If use of UAV-borne SfM products or lidar is anticipated, this should be outlined at Project Proposal or Design stage.

5.9. Assessment of images

Aerial photographs and lidar should be evaluated together for each site or area. Studying the imagery in date order can help to understand how the landscape has changed over time.

Stereo photography must be viewed in 3D using a stereoscope. This is the only way to fully assess the source and ensure that all archaeological features are identified.

5.10. Non-aerial photograph and lidar sources

Consulting other sources of information is essential when undertaking mapping from aerial photographs and lidar. As a minimum, the following sources should be routinely consulted:

- Existing historic environment monument records.
- British Geological Survey geology data.
- UK Soil Observatory soil data.
- Historical OS maps (and other readily available sources such as tithe maps).
- Previous archaeological investigations, including any adjacent AI&M project data.
- Relevant published material and grey literature.

An increasing number of sources are freely available online. For spatial data, it is recommended that they are incorporated into the project GIS as standalone datasets or dynamic links such as a Web Map Services (WMS) to enable them to be viewed alongside aerial photographs and lidar.

Historic environment record data should be acquired as spatial data and text records. The level of data available from HERs varies but as much information as possible should be obtained.

Existing AI&M data are available via the Aerial Archaeology Mapping Explorer or the Historic England Open Data Hub.

6. Photo rectification

- The specialist AERIAL 5.36 software must be used for photograph rectification.
- Control must be derived from OS 1:2,500 scale MasterMap (or equivalent) and/or orthophotographs supplied through the APGB agreement.
- Digital Terrain Model (DTM) height data at a minimum of 5m intervals must be incorporated into the rectification process.
- Best practice in the use of rectification software must be followed and staff appropriately trained.

6.1. AERIAL 5.36

The specialist AERIAL 5.36 rectification software accurately transforms and georeferences aerial photographs, removing height and tilt distortions. This differs from 'rubber-sheeting' – a common function of GIS software – which distorts the image to align it to a map base.

It is important that users are familiar with best practice, including an awareness of potential limitations and pitfalls. They should receive training from a suitably experienced member of staff. The Historic England Aerial Survey team can be contacted to discuss any training requirements.

AERIAL is now freely available from the Historic England Aerial Survey team on request.

6.2. Control information

The absolute accuracy of mapped features is partially dependent on the source of control information used during the rectification process. Ordnance Survey MasterMap – or map data with an equivalent level of accuracy – is a minimum requirement of AI&M projects.

APGB orthophotographs can provide a useful supplementary source of control as they show features that are not depicted on maps. They can be particularly valuable in areas such as open moorland where there are relatively few structures such as field boundaries.

6.3. DTM data

Incorporation of DTM data into the rectification process increases the accuracy by accounting for distortions in the image caused by topographical variation. These exist in both oblique and vertical photographs.

DTM data should have a minimum contour interval of 5m. Do not use Digital Surface Model (DSM) data as there is a high probability that this will introduce errors into the rectification.

In areas where there have been significant changes in the ground surface between the date of the source photography and the DTM data (for example large areas of quarrying), errors can be caused. In cases such as this, it may be acceptable to omit DTM data from the rectification process.

AERIAL 5.36 can import height data in a number of different file formats but the use of ASCII grid data is recommended.

Under the terms of the APGB agreement, Historic England can supply height data to external contractors funded by a Heritage Protection Commissions grant. A sub-contractor licence must be signed before data can be provided. The Aerial Survey team should be contacted at the beginning of the project to arrange data provision and licencing.

6.4. Scanning

Photographs should be scanned for rectification at a resolution that allows for an appropriate level of detail to be captured. This will depend on the scale of the photograph and the nature of the archaeology. A minimum resolution of 400dpi for oblique photographs and 600dpi for vertical photographs is generally recommended, but for small details a higher resolution may be appropriate. Save files as an uncompressed Tagged Image File (.tif) used for storing high quality raster images.

7. Use of lidar

- Environment Agency lidar at a minimum resolution of 1m must be assessed.
- Multiple lidar visualisations created using RVT must be used.
- Lidar must be viewed in conjunction with aerial photographs to aid interpretation.

For detailed guidance see: Historic England 2018 *Using Airborne Lidar in Archaeological Survey: The Light Fantastic*. Contact the Historic England Aerial Survey team for advice if required.

Guidelines for the use of lidar in heritage management across Europe are currently being developed by the European Archaeological Council (EAC). They will be published in 2025 and this document will be updated with a link.

7.1. Environment Agency lidar

Environment Agency lidar at a minimum resolution of 1m is available for the whole of England and is a standard source for AI&M projects. Where higher-resolution data exist (50cm or 25cm) these should be prioritised as they are likely to show additional detail. Environment Agency lidar is free to use under the Open Government Licence and can be downloaded from the Defra Survey Data Download portal. Further guidance can be found here.

Some areas of the country now have multiple years of coverage. This may record features that were extant on early data, but which have subsequently been denuded, levelled or destroyed. A balance between the time taken to assess multiple layers of coverage and the potential benefits needs to be struck. It is recommended that the 'National LIDAR Programme' data are used as the standard source with additional data used when appropriate. This should be considered at Project Proposal or Design stage.

7.2. Use of Digital Terrain Model (DTM) and Digital Surface Model (DSM) data

The algorithm used to produce DTM data can have a softening effect on archaeological features. It will also interpolate data where surface features have been removed.

In open areas, it is recommended that DSMs are used for mapping in preference to DTMs to avoid this phenomenon and aid interpretation. DTM data should always be assessed in areas of woodland or other vegetation that is likely to have a masking effect on archaeology.

7.3. Visualisations

The visualisation process analyses lidar data and presents the results of this analysis as a 2D image. A variety of visualisations are available, some of which are effective at showing particular forms of archaeological feature. Some visualisations can also be particularly effective in different landscapes such as flat, lowland environments. Detailed guidance can be found in: Kokalj, Ž and Hesse, R 2017 *Airborne Laser Scanning Raster Data Visualization. A Guide to Good Practice*.

To get the most out of lidar data, multiple visualisations should be used – these should always include a multi-direction hillshade which is easiest to interpret. It is

recommended that the most effective visualisations for the project area are assessed at an early stage so that they can be prioritised for mapping.

The Relief Visualization Toolbox (RVT) is free software developed by the Institute of Anthropological and Spatial Studies at the Research Centre of the Slovenian Academy of Sciences and Arts. Development was part financed by the European Commission's Culture Programme through the ArchaeoLandscapes Europe project and by the Slovenian Research Agency.

A standalone version of RVT is available to download here. Alternatively, RVT GIS plugins for ArcGIS Pro, QGIS and Python are available to download here. These can streamline the lidar visualisation and mapping workflow.

8. Mapping

- Mapping must be undertaken in a Geographic Information System (GIS).
- The coordinate system must be set to British National Grid (EPSG:27700).
- Mapping and symbology must conform to 8.3 below.
- Attribute data is mandatory and must use the schema described in Appendix 1.
- The FISH heritage standards must be maintained for attribute data.
- The HER or Warden identifier must be the permanent UID and not an interim identifier.
- Attribute data is required to feature level, not monument level.

8.1. Software.

Mapping must be undertaken in a GIS, such as ArcGIS Pro or QGIS, which allows for the archaeological information on aerial sources to be accurately mapped and descriptive information added.

8.2. Mapping Outputs

There are four spatial data outputs required from AI&M projects; they are:

- AI&M_Lines (as shapefile or feature class).
- AI&M_Polygons (as shapefile or feature class).
- Monument_Polygons (as shapefile or feature class).
- Project_Area (as shapefile or feature class).

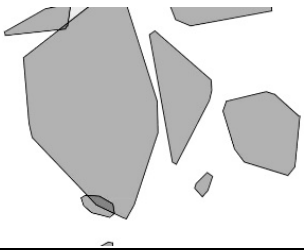
8.3. Mapping and Symbology

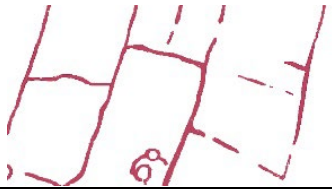
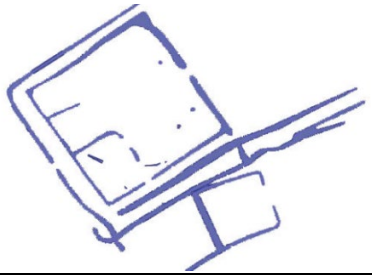
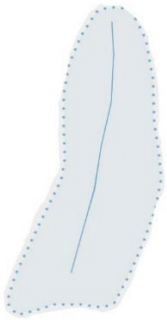
The extent of each archaeological feature is mapped as seen. This means that almost all archaeological remains will be mapped as polygons. Single line depiction is only used for ridge and furrow alignment and slopes for those using the t-hachure symbol.

Each archaeological feature is mapped using the convention below. When undertaking mapping, symbology should be set to layer name.

The attribute names need to be exactly as outlined in the table in Appendix 1 (i.e. using capital letters and underscores) to ensure consistent symbolisation across AI&M projects.

The table below provides clarity on when to use each layer:

LAYER NAME	DESCRIPTION	TYPE
MONUMENT_POLYGON	Polygon encompassing features recorded within a single monument record	Polygon 

BANK	Polygon for features such as banks, platforms, mounds and spoil heaps	Polygon 
DITCH	Polygon for cut features such as ditches, hollows, pits or hollow ways	Polygon 
EXTENT_OF_FEATURE	Polygon outlining a large area feature or group of features such as industrial complexes or boundaries of military complexes.	Polygon 
RIDGE_AND_FURROW_AREA RIDGE_AND_FURROW_ALIGNMENT	Polygon depicting the outline of a ridge and furrow plot Polyline depicting the direction and form of a block of ridge and furrow	Polygon and Polyline 
STRUCTURE	Polygon for built features including stone, concrete, metal and wood	Polygon 
SCARP_SLOPE_EDGE	Polylines in form of a schematic t-hachure depicting break of slope	Polyline 

8.4. Attribute Data (textual data)

GIS attribute data is essential for each mapped element or feature. This allows interrogation of the spatial data during the reporting stage. More importantly, it enables the mapping data to function independently of HER monument records, increasing flexibility for AI&M data users and ensuring greater functionality in the Aerial Archaeology Mapping Explorer.

The attribute requirements for AI&M_Lines, AI&M Polygons, Monument_Polygons and Project_Area are outlined in Appendix 1. It is crucial that the field names and field types exactly match those used in the table to maintain consistency with the data already held on the Aerial Archaeology Mapping Explorer.

Use of the FISH heritage standards is mandatory for attribute data. The vocabularies for period, monument types and evidence can be downloaded here http://www.heritage-standards.org.uk/fish-vocabularies/.

Standardised aerial photograph and lidar references should be used - the Historic England Aerial Survey team will supply up to date reference formats. It is recommended that picklists are created within the project GIS at the start of any project to save time during attribute data creation and to reduce the likelihood of errors such as typos, abbreviations, symbols and use of non-standard terminology.

All attributes must be capitalised. The most likely interpretation should be given for monument type and period, with any uncertainty explained in the monument record. It is advisable to avoid using "uncertain" and multiple indexed monument periods and types, as this makes it difficult to query the data for AI&M users. Where multiple indexed features are required, only a backslash should be used between thesaurus terms, for example, MEDIEVAL\POST MEDIEVAL or ROUND BARROW\WINDMILL MOUND.

The HER numbers in the attribute table must be the permanent UID, not an interim identifier so that the link between the spatial data and monument record is maintained. Every attribute field needs to be populated except where that data does not exist. For example, if monument recording was carried out in the HER then there will not necessarily be a Historic England identifier (HE_UID) in which case a null value is appropriate.

8.5. Data Cleaning

All teams working on AI&M projects are expected to quality assess their own teams' project data to ensure consistency. This includes checking that the attributes tables are complete (i.e. no empty fields) and that thesaurus terms have been used consistently across the project. This is particularly relevant when more than one individual has worked on a project. The attributes for each archaeological feature must be correct and match those recorded in the monument record.

All archaeological monuments should have a monument polygon defining its full extent. Check for features located outside of a monument polygon as they may not have been recorded in the historic environment record or the monument polygon may need expanding to incorporate the additional elements.

9. Monument Recording

- All archaeological monuments mapped by the project need a monument record creating in an appropriate database.
- The interpretations and text within the historic environment record must match the attributes in the spatial mapping.
- Monuments dating to separate periods must be recorded separately.

9.1. HIAS principles.

Heritage Information Access Simplified Principle 1 states that Local Authority HERs should be the first point of call for and primary trusted source of investigative research data and knowledge. The National Record of the Historic Environment (NRHE) is currently being dispersed to local providers. Therefore, monument recording is ideally carried out by direct input to the appropriate local HER monument recording system.

Where this is not possible the Historic England monument recording database (Warden) may be used. The method of data exchange from Warden to the HER needs to be arranged at the project design stage and any associated costs agreed.

All recording must follow HE/MIDAS Heritage (the UK Historic Environment Data Standard) and Association of Local Government Archaeological Officer (ALGAO) guidelines (available online at https://archaeologydataservice.ac.uk/ifp/).

9.2. Unit of Record

All archaeological monuments mapped by the project need a monument record creating. The interpretations and text within the monument recording database must match the attributes in the spatial mapping.

Monuments dating to separate periods should be recorded separately. For example, a post medieval quarry on the same site as a medieval settlement would require two monument records. A single record can be created for complex sites where overlapping phases cannot be clearly dated or where there is continuity of use, such as an Iron Age/Roman field system visible as cropmarks.

Each monument record should describe the full extent of the monument, not separated by artificial boundaries such as the parish boundary, modern field system or the edge of the project area.

9.3. Location Data

Monument polygons, rather than points or lines, defining the full extent of the archaeological monument are preferred.

9.4. Indexing

Period, monument type and evidence are mandatory and must match the types mentioned in the summary text and attribute data of the spatial mapping. Ensure use of standard heritage vocabulary. The latest evidence should be recorded demonstrating if the remains are upstanding, levelled or destroyed. Each monument record should reference the OASIS event record UID.

9.5. Summary Text

This should be a short summary of all the evidence for the site. Use full sentences, avoid abbreviations and acronyms.

The first sentence should read as follows:

A [period] [monument type] is/are visible as a(n) [evidence 1] seen on [source 1]. The feature is/has been [latest evidence, evidence 2 in attributes] on the latest [year] [source 2 in attributes]. This monument was recorded as part of the [project name] aerial investigation and mapping project.

More detail can be added as required. Where the main source of the monument record is not an aerial source this sentence should be adapted to reflect that.

9.6. Sources

Sources must list the key aerial photographs that were used to map the site, including any that best illustrate the site and the source used to record the latest evidence for the site's condition.

Use standard aerial photograph references including the archive name as outlined by the relevant archive. Photograph and lidar reference formats will be supplied by the Historic England Aerial Survey team.

10. Reporting

- A Historic England Research Report must be produced summarising the results of the project.
- Research Reports must conform to the Historic England guidance, including accessibility requirements.
- Text must conform to the Historic England House Style guide.
- Reproduction permissions must be sought for any illustrative material and appropriate copyright and acknowledgement statements must be included.
- Accessible colours, as specified in Appendix 2, must be used for any illustrations.
- The completed RRS report must be uploaded to the OASIS record.

10.1. Research Report Series

Historic England's Research Report Series (RRS) summarises research carried out or funded by Historic England. An RRS report must be written on completion of the mapping and recording stage of the AI&M project, preferably by the project experts. Reports forming part of the RRS series must follow the Historic England House Style guide and use the RRS template. The RRS templates (Word and InDesign) and guidance on using the RRS template can be found on the Historic England website. https://brand.historicenglandservices.org.uk/document/4#/templates/research-reports.

10.2. Process for RRS Reports

Chapter plans and report content should be agreed with the Aerial Survey team at an early stage.

The draft report should be forwarded to the Project Assurance Officer who will arrange circulation to Historic England staff for comment.

The final RRS report and RRS approval form should be forwarded to the Project Assurance Officer who will sign off on the final version of the report and approve the report's inclusion on Historic England's Research Reports Database.

10.3. Illustrations

Authors must ensure that reproduction permissions are sought for any illustrations used in the report. The Historic England Archive will advise on reproduction of aerial photographs held in their collection and provide appropriate photograph references and copyright statements.

Accessible colours, as specified in Appendix 2, must be used to ensure that AI&M features are clearly distinguishable.

11. Quality Assurance

- Quality Assurance must be carried out by Historic England's Aerial Survey team.
- Any issues identified must be resolved ahead of project completion.

11.1. Quality Assurance Requirements

Historic England's Aerial Survey team will undertake quality assurance (QA) on projects using Historic England AI&M standards.

All teams working on grant funded AI&M projects are expected to quality assess their own teams' project data to ensure consistency prior to the Quality Assurance process described below. Historic England's Aerial Survey team will provide general advice and perform QA on the analysis of aerial sources, mapping outputs and monument recording.

The project team will liaise with Historic England staff to decide on the format and timetable for QA in the Project Proposal or Design. This will vary depending on the experience of each team member. For experienced teams, a minimum of 5% of the total project area will usually be quality assured. A greater proportion (up to 100%) should be considered for new or less experienced team members.

During the project delivery phase, project teams will identify a specific area for QA in discussion with Historic England staff. This area should encompass a diverse range of archaeology and include work completed by each team member. It may include areas where issues have arisen, such as challenges with interpretation or depiction.

The AI&M project team are responsible for providing all aerial sources that were assessed for that area (including those that weren't used for mapping), all rectified photographs and associated files, and all monument records. The mapping must be supplied in a format suitable for use in ArcGIS Pro.

11.1.1. Quality Assurance Checklist

The project team to supply (for the QA area only):

- All aerial photographs, lidar etc.
- Rectified photographs.
- DTM data used in rectifications.
- All Warden/HER monument records as spatial data.
- All new or amended monument records (as pdf).
- AI&M spatial data.

If in-person QA is not possible, data can be supplied digitally.

12. Archiving and dissemination

- Project outputs must be supplied to the Historic Environment Record(s), and Historic England's Aerial Survey team in order that they are publicly accessible.
- The AI&M data must be complete and meet the AI&M standard.

Upon project completion, ensure that all deliverables are provided to the HER(s). This will allow the project data to inform future planning decisions.

Additionally, the data should be submitted to the Aerial Survey team, who will upload the spatial data to the Aerial Archaeology Mapping Explorer and the Historic England Open Data Hub.

Project teams must also ensure that the final report is made available on the Historic England Research Report Database and uploaded to the OASIS V record.

Contact details

Suggestions for amendments or corrections are welcomed. For this, and information on any aspect of this document, please contact:

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Appendix 1: Attribute data tables

For AI&M_lines and AI&M_polygons the minimum attribute data requirements are as follows:

Field Name	Type	Description	Sample data
LAYER	Text (50)	The form of the archaeological feature (AI&M Layer Name)	BANK
PERIOD	Text (254)	Date of feature (Periods List). Single or dual indexed terms.	MEDIEVAL or MEDIEVAL\POST MEDIEVAL
NARROWTYPE (please note lack of underscore, otherwise the field name is too long in GIS)	Text (254)	Monument Type (from Monument Types Thesaurus). Specific monument type for individual features. Avoid dual indexing.	TOFT
BROAD_TYPE	Text (254)	Monument Type (from Monument Types Thesaurus). Broader monument type to enable grouping of individual features. This field may not be useful in all cases, if not simply repeat the narrow type field. Avoid dual indexing.	SETTLEMENT
EVIDENCE_1	Text (254)	Form of remains (Evidence Thesaurus) as seen on SOURCE_1	EARTHWORK
SOURCE_1	Text (254)	Source feature was mapped from aerial photograph or lidar	HISTORIC ENGLAND ARCHIVE OS/67307 V 0065 20-AUG-1967
EVIDENCE_2	Text (254)	Latest form of remains (Evidence Thesaurus) as seen on SOURCE_2. If EVIDENCE_1 is CROPMARK, simply repeat CROPMARK (unless now quarried away then this would be DESTROYED MONUMENT).	LEVELLED EARTHWORK
SOURCE_2	Text (254)	Latest available source aerial photograph or lidar to give indication of current state of preservation. For cropmarks	LIDAR English Heritage Trust DSM 03 14-MAR-2016

		sites repeat original source. Some professional discretion may be required if an earthwork shows well on lidar but is not visible on later but poorly lit photography.	
HE_UID	Text (254)	National Record of the Historic Environment (Warden) Unique Identifier (UID) for those monuments recorded in Warden or concorded with existing NRHE records.	23092
HER_NO	Text (254)	HER number for those monuments recorded in the HER or concorded with existing HER records.	10928 or HER5683
HER_PREF_REF*	Text (254)	Alternative HER UID that is used to create the Heritage Gateway URL	MNN10928 or MBD1198

*In some cases, this may be the same as the HER number.

There may be the need to add additional attribute fields if the monument has been recorded in another monument recording system previously. Use only as necessary HER_NO_2, HER NO_3 or HE_UID_2, HE_UID_3.

HE_UID_2	Text (254)	NRHE Unique Identifier (UID) for those monuments recorded in the NRHE or concorded with existing NRHE records.	23092
HER_NO_2	Text (254)	HER number for those monuments recorded in the HER or concorded with existing HER records.	10928 or HER5683

For MONUMENT_POLYGONS the attribute data is as follows:

HE_UID	Text (254)	NRHE Unique Identifier (UID) for those monuments recorded in Warden or concorded with existing Warden records.	23092
HER_NO	Text (254)	HER number for those monuments recorded in the HER or concorded with existing HER records.	10928 or HER5683

HER_PREF_REF*	Text (254)	Alternative HER UID that is used to create the Heritage Gateway URL	MNN10928 or MBD1198

*In some cases, this may be the same as the HER number.

There may be the need to add additional attribute fields if the monument has been recorded in another monument recording system previously. These should only be added as necessary e.g. HER_NO_2, HER NO_3 or HE_UID_2, HE_UID_3. Examples of when to use this include a monument recorded in Warden (HE_UID) but is located across two HERs (e.g. Essex/GLHER), or the HER has recorded two separate sites which the mapping confirms is two parts of a larger monument.

For PROJECT_AREA the attribute table is as follows:

PROJECT_NAME	Text (254)	Official name of project	Bedford Borough

Appendix 2: Accessible colours for illustrations

Layer Name	Colour (Hex)	Colour (RGB)
STRUCTURE	F46D43	244,109,67
DITCH	313695	49,54,149
BANK	A50026	165,0,38
RIDGE_AND_FURROW _AREA	74ADD1	116,173,209
RIDGE_AND_FURROW_ ALIGNMENT	74ADD1	116,173,209
EXTENT_OF_FEATURE	FDAE61	253,174,97
SLOPE	4575B4	69,117,180

Appendix 3: Revision History

Date	Version	Revisions
March 2025	1.0	• Reformatting of Winton 2021 *Standards for Aerial Investigation and Mapping Projects* version 0.2 (October 2021). • Incorporation of relevant parts of MoRPHE PPN 7. • General updates.