Plan Overview

A Data Management Plan created using DMPonline

Title: Geophysical Survey at Kings Weston Roman Villa, Lawrence Weston, Bristol

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Funder: University of Bristol

Template: University of Bristol General Template

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Project abstract:

A geophysical survey undertaken at Kings Weston Roman Villa, Bristol (ST 53399 77558) [NHLE: 1006999], outside the scheduled area. on between May 8th and September 7th, 2024 by the University of Bristol.

The primary aim is to investigate the area of unexcavated ground to the west of Kings Weston Roman Villa where, during the 1947 excavation, a wall was noted at the limits of the excavation to the west. This may be evidence of ancillary buildings or boundary walls commonly associated with Roman Villas. This survey should add to the understanding of the site and highlight potential areas of archaeological interest.

A secondary aim is to identify the potential for further investigation of areas within the scheduling later in the year.

A tertiary aim is to provide opportunities for students and members of the public to engage with geophysics and archaeological investigations. Furthermore, this will aid future public engagement exercises as part of the Bristol Museum and Art Gallery open day.

ID: 150022

Start date: 08-05-2024

End date: 07-09-2024

Last modified: 22-04-2024

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Geophysical Survey at Kings Weston Roman Villa, Lawrence Weston, Bristol

Project Summary

Provide a brief description of the project and the research being carried out. State if the research is part of a larger project, if there are any funders involved, and how data fits in.

This method statement covers the work to be undertaken to the west of Kings Weston Roman Villa outside the scheduled area, between May 28th and 5th 2024 by Alexander Birkett, the Specialist Teaching Technician and Students from at the Department of Anthropology and Archaeology, University of Bristol.
The aim is to identify potential ancillary buildings to the Roman Villa [NHLE: 1006999] excavated by George Boon in 1947, and currently managed by the Bristol City Museum and Art Gallery.
The results would add to the current understanding of the site and the Roman villas in region and provide educational opportunities to both higher education students as well as students and members of the public from the local area.
The two methods employed will be Electrical Tomographic Resistance (Resistivity) using a Geoscan RM15-D resistivity meter, on a PA20 frame with an MPX15 multiplexer. This instrument uses an electrical current to This instrument uses an electrical current to penetrate the subsurface, with the resistance measured by electrodes to detect variations in the soil composition. These variations can indicate the presence of archaeological features such as walls, voids, and ditches.
A Ground Penetrating Radar (GPR) using a MALÅ Ground Explorer GX with the GX450 HDR Antenna (450Mhz) will also be used. This instrument uses high powered emitting electromagnetic pulses into the ground and recording the reflections of these pulses caused by changes in the subsurface materials. This can be used to identify buried features such as stone or masonry walls, ditches, and hard surfaces.
The use of Gradiometry (Magnetometry) has been discounted due to the large number of metallic objects on the surface, the metal fence, sign post, and near-by cars and lampposts in the area.

Data Types

What types of data will be involved?

Geophysics data	working files
	preservation files
	image files
Project material	project notes
	project report
Project documentation	geophysics metadata
	geophysics georeferencing
	project metadata
	file description

What file formats will be used?

Geophysics data	working files	.shp; .xyz; .tiff
	preservation files	.shp; .xyz; .tiff
	image files	.tiff
Project material	project notes	.PDF/A
	project report	.PDF/A
Project documentation	geophysics metadata	.csv
	geophysics georeferencing	.shp
	project metadata	.csv,
	file description	.txt

What will be the approximate size of the files?

- 0 - 50 GB

Around 100 MB

Data Capture

How will the data be generated and/or gathered?

Permissions

- The survey is deliberately avoiding the scheduled area, and its scheduled boundary plotted using RTK GNSS to pinpoint the boundary.
- If deemed necessary due to the success of the results, a later investigation of the scheduled area will be proposed with a Section 42 License obtained.

Dates of Survey

- The survey will be conducted between May 8th and September 7th, 2024.

Location of Survey

- Grids 1-8, centred at ST 53345 77532, oriented 344° North.
- Grids 4 and 5 will abut the boundary of the scheduling.
- Grids 9-11, centred at ST 53430 77562, oriented 336° North.
- Grid 09 will not survey the upper north-eastern portion covered by the scheduling.
- Grids 12-15, centred at ST 53349 77541, orientated 20° North.
- Grids 16-17, centred at ST 53436 77573, orientated 20° North.
- In total an area of 995 m2 of the total 1,677 m2 of the surveyable land within and without the scheduling will be surveyed, equating to around 60% coverage.

Data Capture: Resistivity

- The survey will be conducted using a Geoscan RM15-D resistivity meter, on a PA20 frame with an MPX15 multiplexer.
- The mobile probes are to be set in a parallel Twin Probe (3-probe) configuration.
- The sample interval was set to 0.5 meter intervals (four readings per-metre).
- The traverse interval was set to 1.00 metres, within 10.00 × 10.00 metre grids.
- Each grid will be conducted in a zig-zag pattern, starting in the lowest left corner of each grid facing north.
- Remote probes will be inserted at a distance of c.30 times the mobile electrode separation from the area surveyed.

Data Capture: Ground Penetrating Radar

- The survey was conducted using the MALÅ Ground Explorer GX
- Ground Penetrating Radar (GPR) using a GX450 HDR Antenna (450Mhz) and rough-terrain cart.
- A 3D-Grid layout will be used to undertake the survey using a single 20.00 × 40.00 metre grid (compromising of grids 01-08) and a single 10.00 × 20.00 metre grid (comprising grids 10-11) as the outline of survey.
- The sample interval will be set to 0.05m intervals (twenty readings per-metre).
- The traverse interval will be set to 1.00 metres.

Data Processing

- Data will be offloaded and opened in TerraSurveyor 3.0.37 and MALÅ Vision.
- The grids were assembled into their position and orientation.
- The GPS coordinates of the grids were offloaded into ArcGIS Pro
- So not to remove any anomalies of archaeological potential, or to create any spurious responses that could be considered anomalies with archaeological potential, the raw data from the surveys will be minimally processed to both enhance the data's visuals and remove any defects.
- The assembled and processed grids will be exported as TIFF image files with each stage of processing captured as individual composite images.

Data Presentation

- The assembled and processed TIFF images will be imported into ArcGIS Pro 3.0.3 and georeferenced using the grid coordinates.
  The interpretation of the results was conducted within ArcGIS Pro, with the responses highlighted and outlined using georeferenced polygons and linear trends noted with georeferenced polylines.
- These responses and linear trends will be classified according to the following classifications:

Classification	Definition
Natural	Features likely of natural origin
Modern	Definite or known modern features
?Modern	Features likely of modern origin
Archaeological	Definite or known archaeological features
?Archaeological	Features likely of archaeological interest
Magnetic response	Features or areas of noticeably positive or negative magnetism, suggesting interest but of unclear origin
Ferrous	Dipole responses from ferrous objects
Trend	Linear features of noticeably positive or negative magnetism

Data Storage and Preservation

How will the data be backed up?

Data prior to processing will be stored on University of Bristol SharePoint servers with one off-site backup of all data.
All processed data will be stored in The University of Bristol Research Data Storage Facility (RDSF), which provides secure, long-term storage for research data. This major investment provides nightly backup of all data, with further resilience provided by three geographically distinct storage locations. A tape library is used for backup purposes and also for long-term, offline data storage. Only authorised users can access data stored within the RDSF. The RDSF is managed by Bristol’s Advanced Computing Research Centre (ACRC) which has a dedicated steering group and a rigorous data storage policy (https://www.acrc.bris.ac.uk/acrc/RDSF_policy.pdf). The RDSF upholds and reinforces Bristol’s wider Information Security Policy(www.bris.ac.uk/infosec/policies/docs/isp-01.pdf).

Do you have security procedures in place for sensitive data?

No personal data is captured.

What are your plans for long-term storage of the data?

Data will be stored with the University of Bristol's Research Data Repository (data.bris) will preserve research data for a minimum of 20 years. The report will be submitted to the local HER via email and OASIS V record. Any additional report data will be made available upon request.

Data Organisation

How will data be organised?

Data will be stored, recorded, and organised according to the best practices outlined by the Archaeology Data Service (ADS) for the storage and archiving of Geophysical Survey data.

Geophysics data	working files
	preservation files
	image files
Project material	project notes
	project report
Project documentation	geophysics metadata
	geophysics georeferencing
	project metadata
	file description

Data Documentation and Description

What documentation will you keep?

Data will be stored, recorded, and organised according to the best practices outlined by the Archaeology Data Service (ADS) for the storage and archiving of Geophysical Survey data.

Will you be using any metadata standards?

Data will be stored, recorded, and organised according to the best practices outlined by the Archaeology Data Service (ADS) for the storage and archiving of Geophysical Survey data.

Data Sharing and Publication

What data do you plan to share?

All processed and raw survey data will be made publicly available.

Are there any ethical, commercial, legal or IPR issues which might apply when publishing your data?

There are no ethical, commercial, legal or IPR issues with publishing this data.

How will your data be shared?

Data will be published through the University of Bristol Research Data Repository (data.bris). The data.bris Repository offers a means for Bristol’s researchers to openly share non-confidential research data, without the need for external data users to undergo any form of authentication. Each deposit is accompanied by appropriate metadata and is assigned a unique Digital Object Identifier (DOI) via the DataCite scheme. All data published by the Repository is available under a permissive re-use license.

Will there need to be controlled access procedures in place for your data?

There is no need for controlled access procedures to be in place for this data.

Planned Research Outputs

Interactive resource - "Geophysical Survey Report: Resistivity and Ground Penetrating Radar Survey to the West and East of Kings Weston Roman Villa, Lawrence Weston, Bristol."

Planned research output details

Title	DOI	Type	Release date	Access level	Repository(ies)	File size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Geophysical Survey Report: Resistivity and Ground ...		Interactive resource	2024-11-30	Open	data.bris Research Data Repository ADS	6 MB	Creative Commons Zero v1.0 Universal	None specified	No	No