Land off Burn Road,
Birchencliffe,
Huddersfield,
West Yorkshire

Geophysical Survey

Project Design

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Project Design for Geophysical Survey
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1. Introduction

1.1 This Project Design has been prepared by Archaeological Services WYAS (ASWYAS) for TJC Heritage (the Client) in advance of a magnetometer survey of land off Burn Road, Birchencliffe, West Yorkshore

1.2 The scheme of work will be undertaken in accordance with the requirements of the National Planning Policy Framework (MHCLG 2021).

1.3 This document details a proposed programme of non-intrusive geophysical (magnetometer) survey.

1.4 The Project Design was produced to the standards laid down in the European Archaeological Councils guideline publication EAC Guidelines for the Use of Geophysics in Archaeology (Schmidt *et al*. 2016) and the Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Archaeological Geophysical Survey (CIfA 2020).

2. Site location and Description

2.1 The survey area is located in Birchencliffe to the northwest of Huddersfield, West Yorkshire and centred at SE 1195 1890 (see Figure 1). The approximate 1ha survey area comprises two fields under pasture and is bound to the east by Burn Road, to the west by Halifax Road, St Philips Church to the south and farmland to the north. A water course runs through the Site dividing the fields. The above Ordnance Datum (aOD), on site varies from 182m aOD in the west sloping down to 170m aOD in the east.

3. Geology and Soils

3.1 The underlying bedrock of the site comprises mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Formation. Sedimentary bedrock formed approximately 318 to 319 million years ago in the Carboniferous Period. Superficial deposits have not been recorded (BGS 2021). Soils are described as freely draining slightly acid loamy soils (soilscape 6) (CSAI 2021).

4. Archaeological Background

4.1 The possible line of Roman Road 712 lies approximately 600m to the north of the Site and was investigated in 1974. This investigation revealed a surface of sandstone cobbles with a shallow eastern ditch and an agger.

4.2 Approximately 1km to the east of Site lies Grimscar Roman tilery (list entry 1016315). Grimscar Roman Tilery survives well within its woodland surroundings and is a rare example of this type of site in the north of England. The small scale excavations carried out in the 1950s and 1960s illustrate the diversity of the remains surviving beneath the ground. The recovery of stamped tiles at both Grimscar and Slack Roman fort demonstrates the contemporaneity of the two sites and the military involvement in both production and use of the tile and pottery. Such a clear relationship between two separate sites is unusual but vital for dating and understanding the context of the tilery (HEa 2021). This Site, along with the possible line of the Roman Road, emphasises the occupation of this area during the Roman period.

4.3 To the south of the Site lies the Church of St Philip the Apostle (list entry number 1231874) 'Parish church of 1878 by J.N. Cross (fl. 1868-83), architect of Liverpool. It was intended to have a north tower, and perhaps a spire, but it was not completed. Most of the furnishings are integral with the building of the church' (HEb 2021).

5. Aims and Objectives

5.1 The aims and objectives of the programme of geophysical and earthwork survey is to gather sufficient information to establish the presence/absence, character, extent, of any archaeological remains within the specific area and to inform further strategies should they be necessary.

The aims of the survey are to:

- to provide information about the nature and possible interpretation of any magnetic anomalies identified;
- to record height data of the earthwork remains;
- to determine the presence/absence and extent of any buried archaeological features;
- to produce a comprehensive site archive and report.

6. Fieldwork Methodology

6.1 A geophysical (magnetometer) survey will be carried out across all of the areas amenable for survey. The total area for survey will be approximately 1 hectares.

6.2 The geophysical survey site grid will be established using a Trimble R8s Virtual Reference Station (VRS) differential Global Positioning System (dGPS). The site grid will be tied into the Ordnance Survey National Grid so that the survey can be accurately re-located during any later stages of archaeological investigation.

6.3 The survey will be undertaken using Bartington Grad601 instruments. The Bartington instruments take readings at 0.25m intervals on zig-zag traverses 1m apart within 30m by 30m grid squares, allowing 3600 readings to be recorded in each grid square. These readings will be stored in the memory of the instrument and later downloaded for processing and interpretation. Bespoke in-house software will be used to process and present the data. This non-invasive technique will be able to detect the magnetic contrast between natural and infilled material for any archaeological material. This methodology is favoured over other methods (e.g. earth resistance), as it allows for a rapid assessment of the survey area and therefore subsequent analysis for potential further informed future work.

6.4 The geophysical survey will comply with guidelines outlined by the EAC (Schmidt *et al.* 2015) and by the Chartered Institute for Archaeologists (CIfA 2018). All figures will be reproduced from Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationery Office (Crown copyright).

6.5 On completion of the geophysical survey, a report will be produced containing all relevant information including:

i) Site code/project number; dates for fieldwork visits; grid references; location plan, and a plan showing the limits of the detailed study area.

ii) A non-technical summary of the reason, aims and main results of the assessment.

iii) An introduction to outline the circumstances leading to the commission of the report and any restrictions encountered.

iv) The aims and objectives of the study.

v) The methodology used.

vi) A summary and synthesis of the archaeological results in relation to the methods used. This shall be supported by a survey location plan (minimum scale 1:2500), a plot of raw data (preferred minimum scale 1:1000, greyscale format, and/or XY trace format as appropriate to the technique(s) used), a plot of enhanced data and one, or more, interpretative plots. Each plan/plot will have a bar scale and accurately oriented north sign.

vii) References to all primary and secondary sources consulted.

6.6 The project will be archived in-house in accordance with recent good practice guidelines (http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3). The data will be stored in an indexed archive and migrated to new formats when necessary.

6.7 If required, the archive will be deposited with the Archaeology Data Service (ADS).

6.8 Following completion and submission of the final report to the client, and compiling of the archive, copies of the report (digitally and if needed a hard copy) will be sent to the relevant Historic Environment Record, local authority Planning Archaeologist and/or Conservation Officer. In addition, ASWYAS will make their work accessible to the wider research community by submitting digital data and copies of the report on line to OASIS, after an appropriate length of time.

7. Copyright, Confidentiality and Publicity

7.1 The copyright of any written, graphic or photographic record and reports produced as part of this project shall belong to the client, unless otherwise agreed, with ASWYAS being acknowledged as the originating body.

7.2 The circumstances under which the report or records can be used by other parties will be identified at the commencement of the project, as will the proposals for the distribution of the report. ASWYAS will respect any requirements regarding confidentiality, but will endeavour to emphasise the company's professional obligation to make the results of archaeological work known to the wider archaeological community within a reasonable time.

8. Health and Safety

8.1 All work will conform to the ASWYAS Health and Safety Policy (a copy of which can be supplied if requested), which makes particular reference to the FAME (Federation of Archaeological Managers and Employers) Health and Safety Manual and will be carried out according to the relevant Health and Safety Legislation. This includes, in particular, the following regulations:

- Health and Safety at Work 1974
- Construction (Design and Management) Regulations 2007
- The Management of Health and Safety at Work Regulations 1999
- Personal Protective Equipment at Work Regulations 1992
- Provision and Use of Work Equipment Regulations 1998
- Manual Handling Operations Regulations 1992
- Workplace (Health, Safety and Welfare) Regulations 1992

8.2 In addition each project undergoes a 'Risk Assessment' which sets project specific Health and Safety requirements to which all members of staff are made aware of prior to on-site work commencing.

8.3 Health and Safety will take priority over archaeological matters. Necessary precautions will be taken with regard to protecting ASWYAS staff and the public.

8.4 Archaeological Services WYAS is a fully accredited member of the Contractors Health and Safety Assessment Scheme (CHAS).

9. Insurance

9.1 ASWYAS is covered by the insurance and indemnities of the City of Wakefield Metropolitan District Council. Insurance has been effected with: Zurich Municipal, PO Box 568, 1st Floor, 1 East Parade, Leeds, LS1 2UA (policy number QLA-03R896 0013). Any further enquiries should be directed to: City of Wakefield Metropolitan

District Council, Corporate Services, Financial Services (Insurance, Room 403), County Hall, Bond Street, Wakefield WF1 2QW.

10. Quality

10.1 ASWYAS is an accredited ISO 9001:2015 organisation and a Registered Archaeological Organisation with the Chartered Institute for Archaeologists, operating to nationally agreed guidelines, processes and procedures. These are set within a framework that endeavours to carry out the required work and submit the final report in a manner that meets with our client's specific needs, providing quality assurance throughout the project and for the end product. These guidelines, processes and procedures are contained within a Quality Manual and all staff work in accordance with this manual.

11. Monitoring

11.1 A standard working day will involve driving to site, condition surveys of the survey area, survey area setting out and detailed earth resistance and/or magnetic survey recording. Constant updating of the survey work will be relayed back to the office by telephone.

Contacts

Office Manager: Jane Richardson	0113 535 0182
Project Supervisor: Emma Brunning	0756 243 9487
Health and Safety Coordinator: David Williams	0113 535 0183
Survey team:	0756 243 9487

12. Staffing

12.1 Archaeological Services WYAS currently employs four dedicated geophysicists together with a further two staff with extensive field experience. Summary Curriculum Vitae for all the staff to be employed on the proposed project are detailed below together with their proposed role in the scheme.

Project Manager (Office):	Emma Brunning BSc MCIfA
Project Officer (Office/Field):	Alastair Trace BSc MSc
Geophysicist:	Jake Freeman BA
Geophysicist:	Amy Chatterton BSc MA

Name: Emma Brunning BSc MCIfA

Current Position: Project Manager (Geophysics)

Proposed Role: Geophysics Manager

Emma graduated in 2000 from the University of Bradford with a degree in Archaeology. In 2002 Emma began work as an archaeological geophysics assistant with GSB Prospection, working on hundreds of projects all over the UK. She worked herself up the ladder to become senior archaeological geophysicist supervising teams and writing projects. Emma was also involved with Channel 4's Time Team and became Survey Officer for the last 2 years of the programme. In 2004 Emma gained a Post Graduate Certificate in Landscape Archaeology through distance learning from the University of Leicester. Emma joined Archaeological Services WYAS in September 2015.

Name: Alastair Trace BSc (Hons) MSc

Current Position: Project Officer (Geophysics and Geomatics)

Proposed Role: Geophysics Project Officer

Alastair graduated from the University of Birmingham in 2014 with a BSc in Geology and Archaeology. He has since graduated from the University of Leeds with an MSc in Structural Geology and Geophysics in 2016, primarily researching how oil and gas industry standard techniques, can be applied to near surface geophysics, in the fields of Archaeology and Engineering using Ground Penetrating Radar data. Alastair joined Archaeological Services WYAS in September of that year. He is CSCS certified, CRB checked and has a full driving licence.

Name: Jake Freeman BA

Current Position: Archaeologist (Geophysics)

Proposed Role: Site Supervisor

Jake graduated from the University of York in 2014 with a BA in Archaeology. Post-graduation, Jake volunteered his services on community archaeological projects in South Yorkshire during the summer of 2015, assisting in both geophysical survey and excavation roles. Building on his university and community experience, he began working for Headland Archaeology as a geophysics assistant in September 2015.

Whilst working for Headland, Jake regularly performed a variety of archaeological prospection including, GPR, EM and ERT, and associated software packages. In addition to a broad range of survey skills, he has also worked on a variety of excavation projects across the country and has assisted with both environmental processing and osteology work in the lab.

Jake joined Archaeological Services WYAS in March 2017. He is CSCS certified and has a full driving licence.

Name: Amy Chatterton BSc (Hons), MA

Current Position: Archaeologist (Geophysics)

Proposed Role: Site Assistant

Amy joined ASWYAS in September 2018 after graduating from the University of Sheffield with a BSc degree in Archaeology and an MA degree in Landscape Archaeology, where she learnt how to conduct magnetometry survey work. Amy has been working on geophysics projects since 2016 including work in partnership with Snowdonia National Park to study the changing landscape and character of the Dysynni Valley, Wales. As part of her Landscape degree Amy managed and supervised a geophysical survey in search of Towthorpe DMV at the National Trust's Belton House, Grantham. This project led to the discovery of the extensive field systems and water management course relating to the DMV.

Having previously worked as an excavator for Trent and Peak Amy has also worked on a number of excavations for ASWYAS and on volunteer digs for the National Trust and the University of Sheffield. These have included the excavations at Thornton Abbey, North Lincolnshire to uncover the mansion and chapel at the Monastic site. Her experience has provided her knowledge of magnetometry, resistivity, GPS, Geoplot 4.0 and data processing. Amy has a full UK driving licence.

12.2 Archaeological Services WYAS project personnel may be subject to change.

13. References

British Geological Survey, 2021. http://mapapps.bgs.ac.uk/geologyofbritain/home.html (viewed September 2021)

CIfA, 2018. *Standard and Guidance for archaeological geophysical survey*. Chartered Institute for Archaeologists

CSAI, 2021. http://www.landis.org.uk/soilscapes/ Cranfield Soil and Agrifood Institute, Soilscapes Map (viewed September 2021)

David, A., N. Linford, P. Linford and L. Martin, 2008. Geophysical Survey in Archaeological Field Evaluation: Research *and Professional Services Guidelines (2nd edition)* English Heritage

HEa 2021. https://historicengland.org.uk/listing/the-list/list-entry/1016315 (viewed September 2021)

HEb 2021. https://historicengland.org.uk/listing/the-list/list-entry/1231874 (viewed September 2021)

MHCLG, 2021. National Planning Policy Framework. Ministry of Housing, Communities and Local Government

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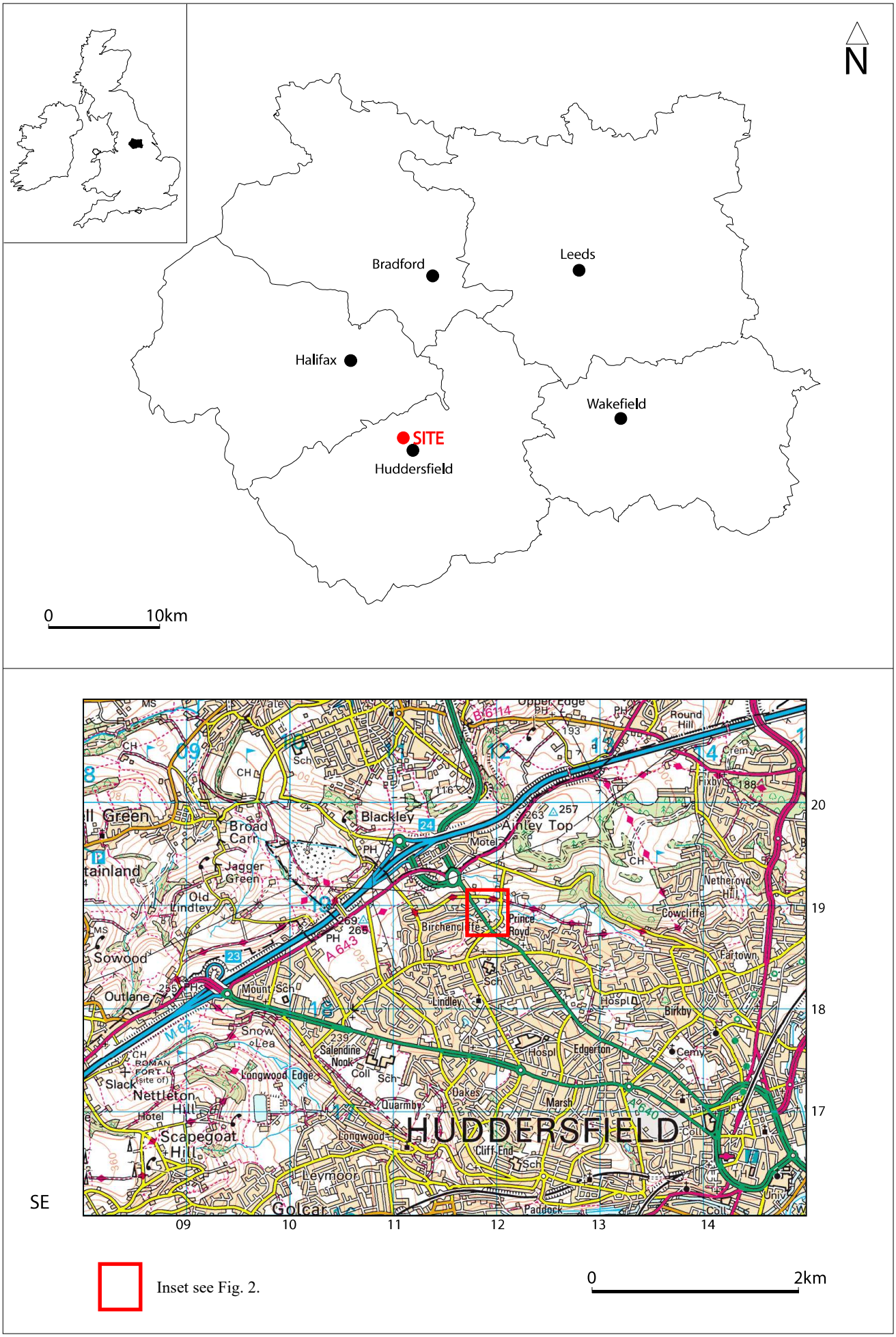


Fig. 1. Site location

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