In Parliament – Session 2021 - 2022

HS2

High Speed Rail (Crewe to Manchester)

Background information and data

Historic environment

BID HE-004-0MA04

MA04: Broomedge to Glazebrook

Historic environment field survey report

HS2

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Historic environment field survey report

M203

Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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Contents

Tables

Figures

1 Introduction

1.1.1 This report presents the results of analysis of field survey data relating to the historic environment.

1.1.2 Baseline data have been collected for the Proposed Scheme in relation to the Broomedge to Glazebrook area (MA04).

1.1.3 All identified heritage assets discussed in this report are shown in the Volume 5, Historic environment Map Book, Map Series HE-01, HE-02 and HE-03[1].

1.1.4 The historic environment detailed gazetteer is set out in Appendix A of the Historic environment baseline report (see Background Information and Data: BID HE-001-0MA04). It sets out Unique gazetteer identifier (UID) codes for the heritage assets considered in the baseline data; these are used for reference across all the historic environment reports and maps in the Environmental Statement (ES)[2] and BID reports.

1.1.5 The approach to assessing the archaeological potential of the landscape is outlined in the Historic environment summary gazetteer, impact assessment table and archaeological character areas report (HE-002-0MA04[3]). This breaks the study area down into areas of archaeological character; initially into broad Archaeological Character Areas (ACA), and then more narrowly defined Archaeological Sub-zones (ASZ).

1.1.6 The approach used for assessing historic landscape character (HLC) is described in the Historic environment Historic landscape character areas report (HE-003-0MA04[4]). The approach is used to determine Historic Landscape Character Areas (HLCA). HLCA are areas of coherent or distinctive historic landscape characteristics.

1.1.7 Within the historic environment reporting, various reference numbers have been used to provide a unique identifier to the heritage assets, HLCA, ACA/ASZ, geophysical survey anomalies and remote sensing features identified. These unique identifiers are referenced throughout the ES, BID reports and Map Books, and in summary are as follows:

[1] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Volume 5, Historic environment Map Book.* Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

[2] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

[3] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Broomedge to Glazebrook, Summary gazetteer, impact assessment table and archaeological character areas, Volume 5: Appendix HE-002-0MA04.* Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

[4] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Broomedge to Glazebrook, Historic landscape character areas, Volume 5: Appendix HE-003-0MA04.* Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

- heritage assets have been given a Unique gazetteer identifier (UID), for example MA04_0001. These have been allocated to all heritage assets within the gazetteer of heritage assets, provided in Volume 5: Appendix HE-002-0MA04 (summary gazetteer) and BID HE-001-0MA04 (detailed gazetteer);
- historic landscape character areas have been given a unique identifier, for example MA04_HLCA02. These have been allocated to all HLCA within the Historic landscape character assessment, provided in Volume 5: Appendix HE-003-0MA04;
- archaeological character areas and archaeological sub-zones have been given a unique identifier, for example: archaeological character area MA04_AC01; and archaeological sub zone MA04_AC01.002. These have been allocated to all of the assessed archaeological character areas and archaeological sub-zones, provided in Volume 5: Appendix HE-002-0MA04;
- geophysical survey areas and features identified through the geophysical survey have been allocated a unique identifier, for example: geophysical survey area MA04_GP001, and geophysical survey feature MA04_GP001.001. These have been allocated to all of the identified geophysical survey areas and features, provided in BID HE-004-0MA04; and
- features identified through remote sensing have been allocated a unique identified, for example MA04_RS001. These have been allocated to all of the identified remote sensing features, provided in BID HE-005-0MA04.

2 Geophysical survey

2.1 Introduction

2.1.1 This report provides the results of geophysical surveys undertaken within the Broomedge to Glazebrook area.

2.1.2 The geophysical survey was undertaken in accordance with the guidance and standards set out in:

- Generic written scheme of investigation for non-intrusive archaeological survey[5];
- Standards and Guidance for Archaeological Geophysical Survey[6];
- Geophysical Survey in Archaeological Filed Evaluation: Research and Professional Services Guidelines[7]; and
- Guidelines for the Use of Geophysics in Archaeology, Questions to Ask and Points to Consider[8].

2.1.3 The aims and general method for the geophysical survey are as set out in the GWSI (HE-006-00000).

2.1.4 Survey locations were identified in accordance with the method for risk assessment and survey prioritisation presented in Technical Note: Risk-based approach to prioritising archaeological surveys which is in the Environmental Impact Assessment Scope and Methodology Report (SMR)[9].

[5] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Generic written scheme of investigation for non-intrusive archaeological survey, Volume 5: Appendix HE-006-000000.* Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

[6] Chartered Institute for Archaeologists (CIfA) (2020), *Standards and Guidance for Archaeological Geophysical Survey,* Reading.

[7] David, A., Linford, N. and Linford, P. (2008), *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines*, English Heritage, Swindon. On 1 April 2015 the part of English Heritage responsible for this guidance note changed its name to Historic England, this note remains valid but has not been updated to reflect this rebranding.

[8] Schmidt, A. R., Linford, P., Linford, N., David, A., Gaffney, C. F., Sarris, A. and Fassbinder, J. (2016), *Europae Archaeologogiae Consilium (EAC) Guidelines for the Use of Geophysics in Archaeology, Questions to Ask and Points to Consider*, Namur, Belgium.

[9] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report, Volume 5: Appendix CT-001-00001*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

2.2 Survey objectives

Aims of the survey

2.2.1 The aim of this survey is to establish the presence/absence, extent and character of detectable archaeological assets within the survey area, including both the testing of previously recorded assets and the identification of additional locations of archaeological potential not previously recorded.

Objectives of the survey

2.2.2 The results of the surveys have been combined with data from other archaeological assessments carried out as part of the project, such as desk-top studies, aerial photographic transcription and LiDAR[10] data, in order to analyse the archaeological potential of the survey locations.

2.3 Survey methodology

2.3.1 This section provides an overview of the used survey methods.

Data collection

2.3.2 The detailed magnetic survey was chosen as an efficient and effective method of locating archaeological anomalies. The survey was undertaken between 18 February 2019 and 20 February 2019 by MOLA-Headland using Bartington Grad-01-1000L sensors, variously configured for use on a magnetometer cart (six sensors at 0.8m interval/ eight sensors at 0.5m intervals).

Data processing

2.3.3 A zero median traverse function was used to remove the striping apparent in the raw data. In some cases, where beneficial, a high-pass filter was also applied to smooth the data.

2.3.4 The unprocessed and processed data sets have been presented in this report in greyscale format, the unprocessed data at a range of -8nT to 8nT and the processed at -3nT to 3nT. A comparison of the plots shows how the processing has removed the effects of drift in instrument calibration and maximised the clarity and interpretability of the detected anomalies.

[10] LiDAR (meaning 'light detection and ranging') is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor; this can be used to identify archaeological earthwork evidence.

Data presentation

2.3.5 A general site location plan showing the location of the individual survey area is shown on Figure 1 at a scale of 1:75,000. Large-scale, fully processed (greyscale) data, unprocessed magnetometer data and an accompanying interpretative plot of the individual survey area is presented at a scale of 1:2,500 in Figures 2 to 4 inclusive.

2.3.6 When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated and the local conditions at the site (geology, phenology, topography etc.). Anomalies are categorised by their potential origin and divided into categories that are used in the graphical interpretation of the magnetic data:

- archaeology definitive/probable;
- archaeology possible;
- industrial/burnt flint;
- extraction;
- agricultural historic;
- agricultural modern;
- natural;
- ferrous;
- magnetic disturbance;
- uncertain; and
- modern service.

Assumptions and limitations

2.3.7 The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by intrusive archaeological investigation of sub-surface deposits.

2.3.8 Substantial parts of the survey area are affected by magnetic disturbance, comprising zones of magnetic noise from green waste[11] and large halos from buried pipelines. This disturbance may have masked weaker anomalies of archaeological origin. It is unclear whether one of the affected areas is the presumed location of the former Rixton corn mill. It is unlikely that the feature has not been detected due to the local soils due to the identification of former field boundaries throughout the survey area.

[11] Used to increase efficiency of composting operations providing nutrients for plant growth (manufactured topsoil).

3 Geophysical survey results

3.1 Introduction

3.1.1 Geophysical Survey was undertaken at one location in the Broomedge to Glazebrook area, comprising Hollins Lane, Dam Lane (MA04_GP002), see Figures 2 to 4.

3.1.2 The survey results are presented for this area, providing a brief background to the survey location, the results obtained and a brief discussion of those results.

3.1.3 In the following paragraphs magnetic anomalies identified in the course of the survey are discussed across the survey area within classification types based on their origin. Only anomalies that are distinctive or unusual are discussed individually. Where appropriate, such congruent groups of anomalies and individual anomalies have been identified by alphanumeric identifiers, e.g. MA04_GP002.001 refers to a feature or group of features within survey area MA04_GP002.

3.2 Hollins Lane, Dam Lane - MA04_GP002

Survey location

3.2.1 The survey area consisted of nine arable fields, with a combined extent of 32.6ha. It was located to the south and west of Mount Pleasant Farm and was centred on NGR 369549 391664. The survey area was bounded by B5212 Glazebrook Lane to the south, Dam Head Lane to the west and fields to the north and east. The site was slightly undulating, being situated at 18 mAOD in the east and west, rising to 22 mAOD towards the centre. The underlying geology is mapped as Tarporley Siltstone Formation mudstone with superficial glaciofluvial (sands and gravels) and till deposits.

3.2.2 The survey area was located within the Hollinfare to Glazebrook Moss ASZ (MA04_AC01.008). The ASZ covers an area of agricultural land located on the northern edge of the River Mersey floodplain, and includes the site of Rixton Corn Mill (MA04_0178) and an associated mill pond. The area is bounded on its northern edge by the Liverpool to Manchester Line (via Warrington Central). The superficial geology of the area is mapped as glacial till and sands and gravel deposits. These have the potential for palaeoenvironmental remains that can provide evidence of past environments dating to the prehistoric to medieval periods. The ASZ purportedly contains the remains of a medieval chantry chapel (MA04_0168), which has possibly been confused with the chapel at Hollins Green. Documentary sources and the remote sensing survey (see BID HE-005-0MA04) indicate the site of a possible medieval or post-medieval mill (MA04_0169) to the north-west of the ASZ. Where the Liverpool to Manchester line (via Warrington Central) bisects the ASZ, remains are unlikely to survive.

Survey results

Extraction

3.2.3 Two areas of high magnetic disturbance were observed, these correspond with former ponds (see Figures 3 and 4, anomalies MA04_GP002.003 and MA04_GP002.004) depicted on the 1849 Ordnance Survey map[12]. The disturbance was caused by the magnetic properties (brick, tile, iron etc) of the material used to infill the former ponds.

Agricultural historic

3.2.4 Across the survey area several former field boundaries (see Figures 3 and 4, anomalies MA04_GP002.005 to MA04_GP002.010) were identified and these are depicted on the 1849 Ordnance Survey map[12].

Agricultural modern

3.2.5 Across the fields several linear anomalies were identified, oblique to the former field boundaries. These exhibit a 'speckled' appearance and were caused by modern field drains and coincide with the location of the possible mill pond associated with Rixton Corn Mill (MA04_0178).

3.2.6 A faint positive linear feature (see Figures 3 and 4, anomaly MA04_GP002.011) may represent a former path also shown on the 1849 Ordnance Survey map. Its alignment and appearance, however, exhibit the same properties as the field drains and has been classed as such[12].

3.2.7 Parallel linear trend anomalies on north to south alignments in the northern field and on east to west alignments in the southern field were identified. These anomalies ran parallel or at right angles to the former field boundaries and predominantly reflect recent ploughing.

Natural

3.2.8 Numerous low magnitude discrete anomalies were identified across the survey area. These were likely to be due to the variation in the depth and composition of the soils and superficial deposits from which the soil was partly derived.

Magnetic disturbance

3.2.9 Magnetic disturbance around the field edges was due to ferrous material within, or adjacent to the boundaries. A large spread of magnetic disturbance by the field entrance may be caused by green waste.

[12] Ordnance Survey (1849), *Lancashire County Series, Map Sheet CIX*, 2nd edition, Scale: 1:10,560.

Ferrous

3.2.10 Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. The 'spike' responses are likely to be caused by the random distribution of ferrous debris in the upper soil horizons.

Modern service

3.2.11 Through the western end of the survey area (see Figures 3 and 4, MA04_GP002.001 and MA04_GP002.002) the survey detected two highly magnetic dipolar linear anomalies, aligned north-west to south-east. These responses were interpreted as buried service pipes.

Conclusions

3.2.12 The survey did not identify any anomalies of archaeological potential. It has identified two buried service pipes and anomalies which reflect the historic/modern agricultural landscape. These included modern field drains in the area of the former ponds shown on 1849 Ordnance Survey map[12]. The survey identified discrete areas of magnetic disturbance which could potentially correspond with infilling of former ponds.

3.3 Geophysical survey conclusions

3.3.1 This geophysical survey has provided an overview of the archaeological character of the Broomedge to Glazebrook area. The ground conditions were good; however, the overall data quality was varied. The survey area highlighted former field boundaries depicted on 19th century mapping and magnetic disturbance that corresponds with the sites of former ponds. Modern features include buried services, ferrous debris and a large area of magnetic disturbance at the field entrance possibly caused by green waste.

3.3.2 The survey did not identify any anomalies of archaeological potential and therefore the archaeological potential of the site is assessed as low. The survey did not detect the large mill pond associated with Rixton Corn Mill (MA04_0178). It is unlikely to be a result of the local soil types due to the identification of former field boundaries. There is, however, strong disturbance from green waste and a service pipe which may at least partly mask the remains of the mill pond.

4 Gazetteer of identified features in MA04

4.1.1 Table 1 provides a summary of the features identified during the field surveys described above.

Table 1: Gazetteer of identified features in MA04

Reference	Asset UID	Anomaly category	Feature type	Period	Comment	Figure	NGR
MA04_GP002.001		Modern service		Modern	Interpreted as a buried service pipe.	Figures 3 and 4	369721 391439
MA04_GP002.002		Modern service		Modern	Interpreted as a buried service pipe.	Figures 3 and 4	369597 391495
MA04_GP002.003		Extraction	Quarry	Post-medieval	A former extraction site, later used as a pond, as shown on 1849 Ordnance Survey map. Disturbance likely caused by magnetic objects within the backfill.	Figures 3 and 4	369815 391577
MA04_GP002.004		Extraction	Quarry	Post-medieval	A former extraction site, later used as a pond, as shown on 1849 Ordnance Survey map. The magnetic disturbance likely caused by magnetic objects within the backfill.	Figures 3 and 4	369772 391623
MA04_GP002.005		Agricultural historic	Field boundary	Post-medieval	A field boundary shown on the 1849 Ordnance Survey map.	Figures 3 and 4	369792 391423
MA04_GP002.006		Agricultural historic	Field boundary	Post-medieval	A field boundary shown on the 1849 Ordnance Survey map.	Figures 3 and 4	369781 391453
MA04_GP002.007		Agricultural historic	Field boundary	Post-medieval	A field boundary shown on the 1849 Ordnance Survey map.	Figures 3 and 4	369800 391494
MA04_GP002.008		Agricultural historic	Field boundary	Post-medieval	A field boundary shown on the 1849 Ordnance Survey map.	Figures 3 and 4	369812 391523
MA04_GP002.009		Agricultural historic	Field boundary	Post-medieval	A field boundary shown on the 1849 Ordnance Survey map.	Figures 3 and 4	369842 391565

Reference	Asset UID	Anomaly category	Feature type	Period	Comment	Figure	NGR
MA04_GP002.010		Agricultural historic	Field boundary	Post-medieval	A field boundary shown on the 1849 Ordnance Survey map.	Figures 3 and 4	369787 391572
MA04_GP002.011		Agricultural modern	Path	Post-medieval	A faint positive linear feature, may correspond with a path shown on 1849 Ordnance Survey map. However, the alignment and appearance follows the pattern of field drains.	Figures 3 and 4	369769 391652

5 List of acronyms

5.1.1 The following acronyms in Table 2 have been used in this report.

Table 2: List of acronyms

Acronym	Meaning
ACA	Archaeological Character Areas
mAOD	metres above Ordnance Datum
ASZ	Archaeological Sub-zones
BID	Background Information and Data
CIfA	Chartered Institute for Archaeologists
EAC	Europae Archaeologogiae Consilium
GWSI	Generic Written Scheme of Investigation
HER	historic environment record
HLC/ HLCA	historic landscape character/ Historic landscape character area
LiDAR	Light Detection and Ranging
NGR	National Grid Reference
UID	Unique gazetteer identifier

6 References

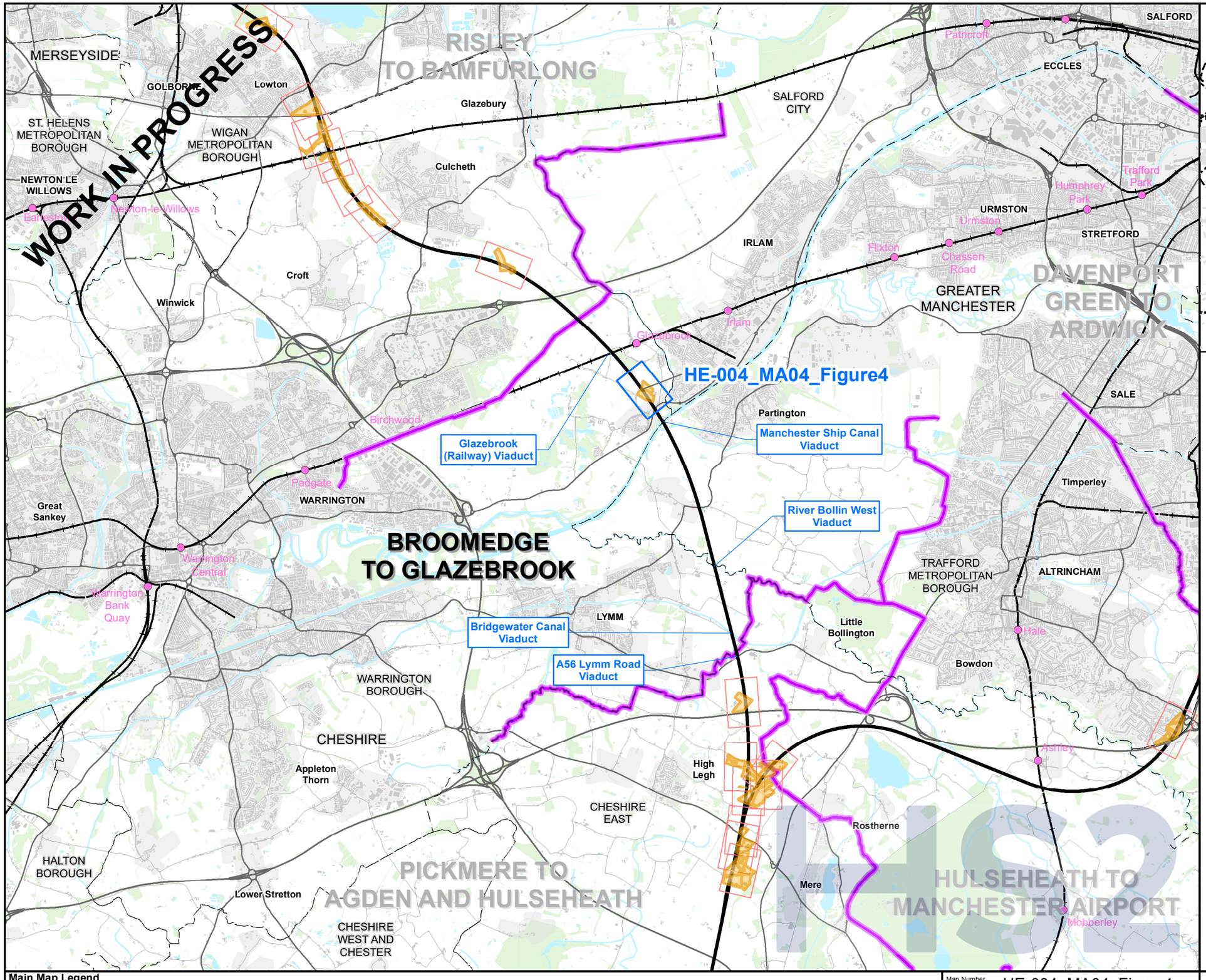
Chartered Institute for Archaeologists (CIfA) (2020), *Standards and Guidance for Archaeological Geophysical Survey*, Reading.

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

High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement.* Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

Schmidt, A. R., Linford, P., Linford, N., David, A., Gaffney, C. F., Sarris, A. and Fassbinder, J. (2016), *Europae Archaeologogiae Consilium Guidelines for the Use of Geophysics in Archaeology, Questions to Ask and Points to Consider,* Namur, Belgium.

Ordnance Survey (1849), *Lancashire County Series*, *Map Sheet CIX, 2nd edition,* Scale 1:10,560.



Map Series Information:

These maps show the results of the geophysical surveys in relation to the land required for the construction of the Proposed Scheme.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community area
- Map sheets not included in this community area
- Survey areas

Map Number: HE-004_MA04_Figure1

Map Name: Geophysical Survey Index map

Community Area MA04: Broomedge to Glazebrook

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:75,000

0 750 1,500 2,250 3,000 Metres

Doc Number: 2DE01-MWJ-EV-MAP-M000-002476-P01

Date: 22/06/21

WORK IN PROGRESS

DAM LANE

DAM LANE

WARRINGTON

DAM LANE

287+000

A559 MANCHESTER ROAD

MA04_GP002

GLAZEBROOK LANE

SALFORD
DISTRICT

Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Land potentially required during construction
- Community area boundary
- County boundary
- District/Borough boundary
- Watercourse
- Water body
- Survey area

Unprocessed Greyscale (nT)

Value

High : 8

Low : -8

Map Number: HE-004_MA04_Figure2

Map Name: Site MA04_GP002 Unprocessed Greyscale

Community Area MA04: Broomedge to Glazebrook

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:2,500

0 25 50 75 100 Metres

Doc Number: 2DE01-MWJ-EV-MAP-M000-002477-P01

Date: 22/06/21

WORK IN PROGRESS

DAM LANE

WARRINGTON

287+000

A559 MANCHESTER ROAD

GLAZEBROOK LANE

SALFORD
DISTRICT

MA04_GP002

Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Land potentially required during construction
- Community area boundary
- County boundary
- District/Borough boundary
- Watercourse
- Water body
- Survey area

Processed Greyscale (nT)

Value

High : 3

Low : -3

Map Number	HE-004_MA04_Figure3
Map Name	Site MA04_GP002 Greyscale
	Community Area MA04: Broomedge to Glazebrook

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:2,500

0 25 50 75 100 Metres

Doc Number: 2DE01-MWJ-EV-MAP-M000-002478-P01

Date: 22/06/21

WORK IN PROGRESS

DAM LANE

WARRINGTON

287+000

MA04_GP002.001

MA04_GP002.002

MA04_GP002.003

MA04_GP002.004

MA04_GP002.005

MA04_GP002.006

MA04_GP002.007

MA04_GP002.008

MA04_GP002.009

MA04_GP002.010

MA04_GP002.011

MA04_GP002

A559 MANCHESTER ROAD

GLAZEBROOK LANE

SALFORD DISTRICT

Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Land potentially required during construction
- Community area boundary
- County boundary
- District/Borough boundary
- Watercourse
- Water body

Geophysical survey results

- Archaeology definitive/probable
- Archaeology possible
- Industrial/burnt-fired
- Extraction
- Agriculture historic
- Natural
- Ferrous
- Magnetic disturbance
- Uncertain
- Modern service
- Archaeology definitive/probable
- Archaeology possible
- Agricultural historic
- Agricultural modern
- Natural
- Uncertain
- Modern service
- Survey area

Map Number: HE-004_MA04_Figure4

Map Name: Site MA04_GP002 Interpretation

Community Area MA04: Broomedge to Glazebrook

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Scale at A3: 1:2,500

0 25 50 75 100 Metres

Doc Number: 2DE01-MWJ-EV-MAP-M000-002479-P01

Date: 22/06/21