1EW03 - Enabling Works Central

AWHh – Location Specific Written Scheme of Investigation for Archaeological Recording at Dews Farm C10055, Colne Valley, South Embankment (AC100/3)

MDL:

Document no 1EW03-FUS_MHI-EV-REP-CS01_CL01-000010

Revision	Author	Checked by	Approved by	Date approved	Reason for revision
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1 Executive Summary

1.1.1 This Location Specific Written Scheme of Investigation (LSWSI) sets out the methodology, deliverables, programme, health, safety and environmental requirements, resources and interfaces necessary to deliver archaeological investigations defined in the Fieldwork Change Control Form 124 (Document no. 1EW03-FUS-EV-FRM-CS01_CL01-000015) and Project Plan for Archaeological Recording at Dews Farm, Colne Valley South Embankment (Document No. 1EW03-FUS-EV-REP-CS01_CL01-012114)

1.1.2 Fieldwork Change Control Form 124 establishes the scope, aims and contribution to the Generic Witten Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS) objectives, techniques, deliverables and reporting mechanism for the archaeological works.

1.1.3 The works are being carried out in advance of main construction of the Harefield Lakes flood alleviation area, on behalf of Fusion for the HS2 Central Enabling Works.

1.1.4 The archaeological works will be undertaken within one parcel of land (C10055) with a total area of 0.458 hectares. For this land parcel the archaeological works will comprise:

- C10055 (NGR centre 505523 188146) Archaeological Recording

1.1.5 The Site lies within the Colne Valley Archaeological Priority Zone of the London Borough of Hillingdon, as identified by GLAAS. It is situated within HS2 archaeological character area ACA07-01 on the east side of the Colne Valley and ACA 07-02 Terrace Gravels within the Colne Valley. No designated heritage assets are recorded within the Site, although Dews Farm has been listed locally; however, trial trench investigation has identified evidence for later prehistoric activity in the form of a small number of pits and an undated gully on the terrace edge overlooking the Colne Valley.

1.1.6 The following documents detail works relevant to the archaeology of the Site and are summarised within this section:

- HS2 Phase One Environmental Statement and Supplementary Environmental Statements (ES 3.5.2.7.4, ES 3.5.2.7.5, ES 3.5.2.7.6, CH-001-007, CH-002-007 - ES 3.5.2.7.4, CH003-007, CH004-007, CH001-006, CH002-006, CH004-006).
- HS2 2013 LIDAR survey report
- Colne Valley East Detailed Desk Based Assessment (DDBA, 1D037-EDP-EV-REP-S000-000004).
- MOLA Headland Infrastructure 2019, Fieldwork Report for Test Pit and Trial Trench Evaluation (Phase 1) at Dews Farm, Colne Valley, South Embankment (AC100/3) 1C18CVDTT (1EW03-FUS-EV-REP-CS01_CL01-012108)

- MOLA 2020, Fieldwork Report for Test Pit and Trial Trench Evaluation (Phase 2) at Dews Farm, Colne Valley, South Embankment (AC100/3) 1C18CVDTT

1.1.7 The Project Plan (1EW03-FUS-EV-REP-CS01_CL01-012114 C02) contains a detailed archaeological baseline for the Site. A summary of the archaeological background and previous works relevant to the archaeology of the Site is included in the following section.

1.1.8 Previous investigations at the Site include HS2 Environmental Statements, Colne Valley East Detailed Desk Based Assessment (1D037-EDP-EV-REP-S000-000004), geo-archaeological deposit modelling (1EW03-FUS-EV-REP-CS01_CL01-0012008), geophysical report (1EW03-FUS-EV-REP-CS01_CL01-001788), the CFA7 Colne Valley survey reports (HS2 2013, CH-004-007, Cultural Heritage, ES3.5.2.7.7), archaeological monitoring of ground investigations (CPA, Central Package A, CA 2017), geotechnical trial pits (CA2 2017) and the CFA7 Colne Valley survey reports (HS2 2013, CH-004-007, Cultural Heritage, ES3.5.2.7.7). Trial trenching was conducted by MOLA Headland Infrastructure (MHI) in 2018-2019 (1EW03-FUS-EV-REP-CS01_CL01-012108) and 2018 (1EW03-FUS-EV-REP-CS01_CL01-0001818, 1EW03-FUS-EV-REP-CS01_CL01-0001819). Further trial trenching was undertaken in 2019 by MHI

1.1.9 The previous archaeological investigations in the surrounding area revealed evidence in the form of a number of prehistoric flints recovered from the subsoil and topsoil, a small number of prehistoric features were also noted.

1.1.10 The majority of the trial trenches produced no evidence of archaeological features, with the exception of TT23, TT24 and TT25. TT24 was expanded during the course of the evaluation, following discovery of archaeological features, which led to the discovery of further remains. Trial trenches 23, 24, and 25 contained evidence for archaeological features ranging in date from the Bronze Age to Mid-late Iron Age and in the forms of pits, post/stake-holes and a field boundary ditch. Further undated features were found in trenches 23 and 24.

1.1.11 The results of this archaeological excavation will inform the archaeological resource assessment for the Site and will contribute to the aims, objectives and knowledge gain defined in the GWSI: HERDS.

1.1.12 This LSWSI has been prepared in accordance with the standards and guidance provided by the GWSI: HERDS, the Technical Standards for Specification for historic environment project plans and location specific written schemes of investigation (Document No. HS2-HS2-EV-STD-000-000036) and Specification for Historic Environment Investigations (Document No. HS2-HS2-EV-STD-000-000035) and relevant CifA Standards.

2 Location and Site Background

2.1 Project Background

2.1.1 High Speed Two (HS2) is a new railway network proposed by Government to provide a new link between London, the West Midlands, the East Midlands, South Yorkshire, Leeds and Manchester. Phase One of HS2 will involve the construction of a new railway approximately 230km (143 miles) in length between London and the West Midlands. Powers for the construction, operation and maintenance of Phase One are conferred by the High Speed Rail (London - West Midlands) Act 2017.

2.1.2 The overall framework within which archaeological work will be undertaken is set out in the Environmental Minimum Requirements (EMR), in particular the Heritage Memorandum, the Code of Construction Practice (CoCP) for HS2 Phase One and the GWSI: HERDS. Accordingly, the nominated undertaker or the Enabling Works Contractor is required to implement appropriate and reasonable measures to identify, avoid or where practicable reduce impacts to the significance of heritage assets prior to the start of construction.

2.2 Site Locations

2.2.1 The Site is located within land parcel C10055, north of Dews Lane and west of Harvil Road. The excavation area measures approximately 0.458 hectares in size and is centred at NGR TQ 505523 188146. The excavation area is bounded by open fields to the north, east and south, with an open area, laid to grass to the west, with the Colne Valley Lakes to the west beyond that.

2.3 Geology and Topography

2.3.1 The land rises gently to the north of Dews Lane and to the west of the Colne Valley Lakes, peaking at c. 43.8m above Ordnance Datum (aOD) in the northern half of the Site; then moderately declines towards South Harefield to the north and Dews Farm to the south, at 39.48m aOD.

2.3.2 Geological mapping (BGS 2005) of the area indicates that the west of the site is underlain by bedrock of the Upper Cretaceous Chalk Group (undifferentiated Seaford Chalk and Newhaven Chalk Formations), whilst the remainder of the site lies on younger (Eocene, c. 60-58 million years ago) bedrock of the Lambeth Group (undifferentiated Reading and Upnor Formations) No overlying superficial deposits have been mapped at the site.

2.3.3 The soils over the Site are slowly permeable, seasonally wet, slightly acid but base rich loams and clays of moderate fertility (Cranford Online). Historically these soils have characterised a valley side pasture belt that supported seasonal pastures for extensive dairy herds (CH-001-07).

Table 1 Summary of solid geology and superficial deposits

Mitigation Area	BGS Solid Geology	BGS Superficial Geology	Geology confirmed by previous investigations
C10055	Cretaceous Seaford and Newhaven Chalk Formations (c. 92 – 70 million years old) across the majority of the area. In the north-eastern corner of the area the Chalk is overlain by tertiary bedrock comprising sands, silts and clay of the Lambeth Group (Woolwich and Reading Beds, and Upnor Sand) of Palaeocene date (c. 59 – 48 million years old).	Alluvial sands, silts and gravels formed up to 2 million years ago	Trial trench evaluation completed in March 2019 confirmed that Lambeth Group deposits are present across the Site overlain by a dark greyish-brown clayey silt topsoil

2.4 Archaeological Background

2.4.1 The Site lies within the Colne Valley Archaeological Priority Zone of the London Borough of Hillingdon, as identified by GLAAS. It is situated within HS2 archaeological character area ACA07-01 on the east side of the Colne Valley and ACA 07-02 Terrace Gravels within the Colne Valley.

2.4.2 No designated heritage assets are recorded within the Site, although Dews Farm has been listed locally; however, there is a high potential for prehistoric and Romano-British archaeological remains and further potential for later prehistoric through to medieval and post-medieval date, possibly sealed beneath alluvium deposits.

2.5 Late Mesolithic to Early Iron Age

2.5.1 Lacaille (1963) recorded a large assemblage of over 100 worked Late Mesolithic flints including blades, flakes and tranchet adzes (CVA021). These were recovered from an alluvium deposit in the valley of New Years Green Bourne, located to the immediate west of Dews Farm.

2.5.2 South of the site, six worked flints and one piece of burnt, unworked flint dated to the Mesolithic-Early Neolithic periods were recovered from Trial pit ML026-tp015, south of New Years Green Bourne (Project Plan Figure 10, Appendix A) during an archaeological watching brief on geotechnical investigations at New Years Green Bourne and Durdent Court. The flints were recovered from within a sequence of alluvial deposits at a depth of c. 1.25-0.95m (c. 36.5-36.2m aOD) below ground level (BGL) (CA 2017).

2.5.3 Archaeological features and artefacts attributed to tree felling and tool manufacture and repair in the Mesolithic –Early Neolithic were identified in Trenches 7 and 8 (Project Plan

Figure 8, Appendix A) during 2018 trial trench evaluations for the Fulmer to Haste Hill 450NB HP Pipeline Diversion (007), (1EW02-CSJ-EV-REP-S002-000019).

2.5.4 Mesolithic to early Neolithic features and an artefact scatter were identified in Trench 84 during 2019 Phase 1 evaluations at Dews Farm, approximately 570m south of the Site (1EW03-FUS-EV-REP-CS01_CL01-012108).

2.5.5 Later prehistoric settlement sites with preserved Neolithic and Bronze Age land surfaces have been identified on the west of the Colne Valley at Mopes and Warren Farms near the M25. These sites are situated overlooking the valley. The site has a potential for similar land surfaces overlooking the floodplains from this eastern side of the valley (1D037-EDP-EV-REP-S000-000004).

2.5.6 South of the site two late Neolithic–Early Bronze Age layers of burnt flint (a possible burnt mound) and a series of stake holes were identified on the lower river terrace in Trench 7 during 2018 trial trench evaluations for the Fulmer to Haste Hill 450NB HP Pipeline Diversion (007). The burnt flint was interpreted to have been used for heating water (1EW02-CSJ-EV-REP-S002-000019).

2.5.7 During 2019 Phase 1 evaluation works at Dews Farm A post-hole containing a Neolithic flint blade was identified in Trench 65 and residual Neolithic flints were recovered from features in Trench 106. A rim from a c 2500–1700BC Beaker and two fragments a possible Late Bronze Age clay plate or plaque were recovered from a ditch in Trench 74 (1EW03-FUS-EV-REP-CS01_CL01-012108).A possible Bronze Age barrow (ring ditch) was identified at CVA021, however its small 5m diameter has been argued to be more indicative of a quarry. Three other extraction pits have been identified in this area by historical mapping, LiDAR and aerial photography (1EW03-FUS-EV-REP-CS01_CL01-012002). A further Bronze Age ring ditch (CVA010) was recorded and removed by gravel extraction at Dews Pit (Lacaille 1963).

2.5.8 South of the site, a Bronze Age –Early Iron Age assemblage of ten struck flints and eight conchoidally shattered flint fragments evidencing post-depositional movement were recovered during a COPA archaeological evaluation in 2018 from the topsoil of Trench 60 during mitigation at the Harvil Road Woodland ecological site (1EW03-FUS-EV-REP-CS01_CL01-0001818).

2.5.9 Features datable to the Bronze Age were recovered from the evaluation Trench 24 during the Phase 2 evaluation on the Site, (AC100/3) 1C18CVDTT. These consisted of two small pits. The pottery assemblage included bucket urns dating to the Deverel-Rimbury period (c.1500–1150 BC) including sherds with bossed and perforated decoration.

2.6 Iron Age to Roman

2.6.1 Iron Age settlement activity was identified to the south and east of the Site during 2018 MHI Fulmer to Haste Hill trial trenching works. Linear and discrete features with pottery fragments

tentatively dated to the Iron Age were investigated in Trenches 8 and 14 (1EW02-CSJ-EV-REP-S002-000019).

2.6.2 Iron Age to Romano British settlement sites were identified to the immediate north and south of New Years Green Bourne in Trenches 65, 74 and 106 during Phase 1 works at Dews Farm (1EW03-FUS-EV-REP-CS01_CL01-012108).

2.6.3 An Iron Age to Romano-British agricultural settlement was identified at Denham Park Farm and The Chenies, approximately 3.3km north-west of the Site, on the opposite side of the Colne Valley.

2.6.4 Approximately 88m east of the Site, during pre-installation works of the Harefield to Southall gas pipeline in 2014 (Network Archaeology 2014), 1st to 2nd Century Romano British settlement activity was identified to the north of New Years Green Lane. A postulated line of a Roman road is located approximately 600m west of this settlement and 300m east of the Site. Roman flue tile (RUI013) and further sherds of Roman pottery have been recovered in the in the area of the settlement (Greenwood and Thompson 1992; 1D037-EDP-EV-REP-S000-000004).

2.6.5 Furthermore, 1st to 4th Century Romano-British settlement activity and a cemetery was identified at Lea Quarry, Denham, ca 1.6 km south of the Site (Coleman et al. 2004, 2006).

2.6.6 A possible stakehole was found in Trench 23 during the Phase 2 evaluation on the Site, (AC100/3). It produced one small sherd of pottery probably datable to the Iron age.

2.7 Early medieval to post-medieval

2.7.1 A number of early medieval findspots and an undated spearhead have been reported to the south or adjacent to the Site (1EW03-FUS-EV-REP-CS01_CL01-012002 C02). A single Saxon pit was excavated approximately 300m north of New Years Green Lane, approximately 1km east of the site during pre-installation works for the Harefield to Southall gas Pipeline (Network Archaeology 2014).

2.7.2 Evaluation trenching undertaken during 2018 MHI Fulmer to Haste Hill trial trenching works identified evidence of ridge and furrow in Trenches 11 and 12 and possible evidence of a medieval field system in Trench 7, located to the immediate north of the New Years Green Bourne. A pit and stake holes were also recorded in Trench 14 (1EW03-FUS-EV-REP-CS01_CL01-0001819).

2.7.3 Medieval drainage and boundary ditches were identified during pre-installation works for the Harefield to Southall gas Pipeline, located approximately 300m north of New Years Green Lane, approximately 1km north-east (Network Archaeology 2014).

2.7.4 Ditches of medieval to post-medieval date were identified in Trench 69 during Phase 1 works at Dews Farm (1EW03-FUS-EV-REP-CS01_CL01-012108). The ditches likely formed part of a field system. The works also identified post-medieval alluvium within the New Years green Bourne floodplain in trenches 73 and 76.

2.7.5 A field boundary ditch, truncating the colluvium, was recorded crossing TT24 on a NE-SW alignment. It was recorded for a length of 8.20m and was interpreted a modern field boundary ditch, though no dating evidence was recovered from it.

2.7.6 Evidence for remnant ridge and furrow has been recorded within the north of C10019. This may extend within the excavation area which has been open pasture farmland since at least 1884 (Ordnance Survey 1884). It is likely that post-medieval to Modern ploughing has also taken place within the Site (1EW03-FUS-EV-REP-CS01_CL01-012002).

2.7.7 The location and extent of modern quarrying pits and agricultural activity was identified in the area to the north of the Site during Geophysical survey (1EW03-FUS-EV-REP-CS01_CL-001788) and was confirmed during the Phase 2 evaluation. Remote sensing also confirmed Ordnance Survey mapping of the locations and extent of former sand extraction pits originally recorded in the 1930s.

Significance of the archaeological resource

2.7.8 Archaeological investigations undertaken across the land north of Dews Lane have identified remains of Bronze Age to Iron Age date.

2.7.9 These remains are of low to medium significance having the potential to contribute to the understanding of regional settlement patterns across the floodplains of the Colne Valley and the adjacent terraces.

3 Overview of Project Plan

3.1.1 This LSWSI has been prepared to provide the necessary specification and site-specific information to enable the delivery of the archaeological works defined in the Project Plan for Archaeological Recording and Construction Integrated Recording at Dews Farm, Colne Valley South Embankment (Fusion Site Project Plan 1EW03-FUS-EV-REP-CS01_CL01-012002 C02 for site details and 1EW03-FUS-EV-REP-CS01_CL01-012114 complimented by the fieldwork change control for scope and methodology).

3.1.2 The project plan establishes the scope, aims, objectives, methodology and deliverables for the archaeological excavation in accordance with the commitments made in Environmental Minimum Requirements (EMRs) for HS2 Phase One; the objectives set out in the GWSI: HERDS and HS2 Technical Standards. It also establishes the requirements for information management, quality assurance and the results of engagement with the archaeological advisor to the local planning authority.

3.1.3 Previous archaeological works undertaken within the area of C10055 demonstrate that the site has the potential to contain evidence of multi period activity dating from the Bronze Age to the Iron age period.

3.1.4 The project plan (section 4.1.4) therefore identifies a requirement to identify a programme of archaeological investigation. The following activities have been identified as being required.

- C10055 – Archaeological Recording comprising machine excavation of topsoil and subsoils, mapping of the archaeological resource revealed followed by hand excavation, sampling and recording.

3.1.5 For land parcels C10055, Section 4.2 of the project plan identifies the contribution the results of the archaeological investigation can make to a number of specific research objectives set out in the GWSI: HERDS. Sections 5 and 6 of the project plan provide the methodology and deliverables for the archaeological investigations. The full aims and objectives, scope and methodology for the Archaeological Recording within C10055 are set out in 'Appendix B: Fieldwork Change Control Acceptance Sheet' (Document No. 1EW03-FUS-EV-FRM-CS01_CL01-000015). The site-specific objectives referenced in the Change Control are summarised in the table below.

Table 2 Contribution to Specific Objectives

Specific objective	Investigation type	Contribution
KC5: Identifying settlement location and developing models for settlement patterns for	Archaeological Recording, comprising test pit sampling of subsoils to define the extent and depth of Mesolithic and Neolithic remains particularly ephemeral features such as lithic scatters and burnt mounds; followed by	The investigation has the potential to provide evidence for the location, form and frequency of Mesolithic/Early Neolithic settlement on the eastern side of the Colne Valley. This will

the Mesolithic, Neolithic and Early Bronze Age	careful machine excavation of topsoil and subsoils, mapping of the archaeological resource revealed, followed by hand investigation, sampling and recording.	contribute to both HS2 area wide and regional models for prehistoric settlement patterns.
KC11: Does the high density of prehistoric settlement evidence in the Colne Valley reflect a genuine focus of activity or does it reflect a bias in the archaeological record?	Archaeological Recording, comprising machine excavation of topsoil and subsoils, mapping of the archaeological resource revealed, followed by hand investigation, sampling and recording.	The Site is located in an area where evidence for prehistoric settlement has previously been recorded during mineral extraction. In addition, recent trial trench evaluation has already demonstrated the presence of Late Mesolithic to Early Neolithic, Bronze Age and Iron Age settlement activity within the Site. There is a clear potential to further contribute to the understanding of prehistoric settlement distribution and densities in the Colne Valley and to address the question of bias in the archaeological record.
KC16: Investigate the degree of continuity that existed between Late Bronze Age and Iron Age communities in terms of population, mobility and subsistence strategies	Archaeological Recording, comprising machine excavation of topsoil and subsoils, mapping of the archaeological resource revealed, followed by hand investigation, sampling and recording.	Trial trench evaluation has identified a possible continuity of occupation between the Bronze age and Iron Age on the River Terrace. The Archaeological evaluation trenches did not identify remains of this period in the immediate vicinity, but evidence may be found in the wider excavation area.
KC17: What evidence is there for regionality in the mortuary rites of the Late Bronze Age and Iron Age, and how does that alter over time?	Archaeological Recording, comprising machine excavation of topsoil and subsoils, mapping of the archaeological resource revealed, followed by hand investigation, sampling and recording.	The trial trench evaluation trenches did not uncover any evidence for human remains on the site, but any that might be found will add to the corpus of evidence from these periods.
KC18: Explore the evidence for increasing social complexity in the archaeological record in the Late Bronze Age and Iron Age, and identify patterns of intra-regional and regional variation	Archaeological Recording, comprising machine excavation of topsoil and subsoils, mapping of the archaeological resource revealed, followed by hand investigation, sampling and recording	Trial trench evaluation has identified a possible continuity of occupation between the Bronze Age and Iron Age on the River Terrace. This would allow for a study of the development of social complexity. The Archaeological evaluation trenches did not identify remains of this period in the immediate vicinity, but evidence may be found in the wider excavation area. Any such remains would add to the corpus of data informing this topic.

3.1.6 The aim of the archaeological recording is to:

- To investigate the potential existence of prehistoric features not identified in the trial trenches, and if found the extent, depth, character, form, function, state of preservation and significance of:

- Bronze Age to Iron Age occupation

- To recover a suite of environmental samples from which plant remains, charred remains, pollen, seeds and other environmental proxy indicators can be recovered, to inform our understanding of later prehistoric period:

  - natural habitats within the Site and adjacent transition zone from floodplain to terrace;
  - subsistence and use of edible herbs and plants
  - woodland use management; and
  - the possible use of toxic plants for medicinal/ritual use

- To examine features exposed within the excavation area, ascertain their date and function and how they relate to known settlements in the vicinity

- To examine the undated features identified in the trial trenches and investigate if they can be tied in to further, datable features.

3.1.7 Further details on the depth of significant deposits are provided in section 3.3 of the project plan.

4 Scheme Design Elements

4.1.1 The archaeological works are located at Dews Farm where key design elements include the Colne Valley South Embankment, Colne Valley Viaduct and associated Ickenham Feeder Station, and overhead electricity cable diversions (ZC Lines)

4.1.2 Construction impacts in this archaeological mitigation area are:

- Archaeological Recording area C10055 is located at the northern end of the Harefield Lake flood alleviation storage area. The creation of the flood alleviation area will require the current ground level to be reduced by approximately 2.50 to 4.30m as is rises west to east from Harefield Lake No.2. Construction of the flood alleviation storage area will therefore remove archaeological remains recorded within its northern footprint.

5 Programme

5.1.1 The anticipated start dates and duration of the works are outlined in the table below.

Table 3 Programme information

Start date / time:	C10055– Start date 11.01.2021 (for initial mobilisation – 5 day duration)

Duration:	C10055– 35 days. Completion 26.02.2021
Working times:	8:00-16:00 (archaeological contractor) 8:00-17:00 (machinery operator contractor) 8:00-18:00 (Civils contractor)

6 Specific Method Statements

6.1 Scope

6.1.1 This section of the LSWSI develops the methodology to provide a clear site-specific methodology and information to enable the Archaeological Contractor to successfully deliver the programme of archaeological excavation and recording.

6.1.2 All archaeological works will be carried out in accordance with this LSWSI and any further instructions from the *Contractor*. This design takes account of the guidance and specifications set out in the HS2 Phase One EMRs, CoCP, GWSI: HERDS, the Technical Standards principally the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035), the guidance provided by the Chartered Institute for Archaeologists (CIfA) Code of Conduct (CIfA 2014a), the Standard and Guidance for Archaeological Field Evaluation (CIfA 2014b), and Historic England's guidance documents on Geoarchaeology (HE 2015b), Environmental Archaeology (HE 2011) and Managing Lithic Scatters and Sites (HE 2019).

6.1.3 The scope of works is summarised in the table below.

Table 4: Scope of the Archaeological Recording

Site name	Site Code	Investigation type	Size (ha)
C10055	1C20CVDAR	Archaeological recording, comprising machine excavation of topsoil and alluvium, pre-excavation mapping of the archaeological resource revealed, followed by hand excavation, sampling and recording	0.458

6.2 Site Access

6.2.1 Access to the site for mobilisation and de-mobilisation and for the archaeological traffic will be by way of Gate 4 off Harvil Road. A track matted access route will lead from the site compound to the temporary haul road.

6.2.2 The Site lies within former agricultural fields to the north of Dews Lane and to the west of Harvil Road. Access points to the land parcels are illustrated on Error! Reference source not found.. The access points are summarised below.

6.2.3 C10055 can be accessed via the existing site Gate 4 on the Harvil Road as established and maintained by Babcock. The site compound will set up to the north of a spur from the temporary haul road. Deliveries of track matting, welfare units, tool store and equipment will initially be made through this access point during the mobilisation phase. During the works the plant will be stored in this compound. All site vehicles will be parked in the compound during the course of the works. Full details of the site access arrangements and location of the compound are set out in the Construction Logistic Plan (CLP – 1EW03-FUS_MHI-CL-PLN-CS01_CL01-000003).

6.3 Site Set-up

6.3.1 A pre-works site meeting has been made with the *Contractor's Historic Environment Manager and Babcock's Senior Engineer*. The meeting allowed the *Archaeological Contractor* to confirm the access points, ground conditions, site specific hazards and agreed the location for the welfare facilities and the storage of plant and materials. The Archaeological Contractor will undertake a precondition survey of all access points and site conditions in general. Following demobilisation, a post-condition survey shall also be undertaken.

6.3.2 Site set up will be conducted following the relevant guidance set out in the Enabling Works Information WI0200 General Constraints (Document No. 1E001-HS2-PR-ITT-000-000098) in particular Sections 6 *Construction site layout and good housekeeping*.

6.3.3 Full details on the proposed compound set up and location can be found in the Section D of the RAMS document (Document No. 1EW03-FUS_MHI-HS-MST-CS01_CL01-000002).

6.4 Setting Out

6.4.1 The location of the work areas is illustrated on Figure 1. All spatial setting out and recording shall be in accordance with The Ordnance Survey National Grid and Ordnance Survey Newlyn Datum (ODN) as defined by the OS Active GNSS network and use of a Virtual reference system. A minimum of three Permanent Ground Markers (PGM) shall be created using this system for each Archaeological Recording area.

6.4.2 The archaeological excavation area will be located to a horizontal accuracy of +/-500mm. The corner points of each area shall be set out with Real Time Kinematic (RTK) Global Navigation

Satellite System (GNSS) equipment or other suitable automated equipment referenced from the PGMs.

6.4.3 Surface heights shall be recorded using RTK GNSS and related to PGMs. Ordnance Survey Bench Marks (OSBM) are not to be used. Levelling accuracy shall be within 10 mmÖk: where 'k' is the total distance levelled in kilometres.

6.4.4 The Archaeological Contractor shall ensure that all archaeological recording areas or excavation limits, and significant archaeology detail are surveyed 'as dug' in relation to the project grid before leaving the site. Ground level height data shall be recorded for each area. Survey methodology and a detailed survey record shall be provided to HS2 Ltd within the survey report.

6.5 Specific methodology for C10055

Mechanical excavation

6.5.1 The first stage will comprise the machine excavation of the topsoil onto the surface of the subsoil across the Site. No machine excavation will be undertaken without a current and valid Permit to Dig issued by the *Contractor.* The excavation areas will be CAT scanned by a suitably qualified NVQ Level 2 operative using a Radiodetection CAT3+ and Genny in both Avoidance mode and in Genny mode to detect the presence of buried services and utilities prior to machine excavation.

6.5.2 The topsoil will be stripped with a 20t mechanical excavator fitted with a toothless ditching bucket as defined in section 3.14 of the HS2 Technical Standard for Historic Environment Investigations (Document No. HS2-HS2-EV-STD-000-000035). All machine excavation will comply with the *Employer's* Technical Standard - Route wide soil resources plan (Document No. HS2-HS2-EV-STD-000-000008). The spoil will be moved to the spoil storage area by. 12t dumpers in accordance with the procedures set out in spoil management plan (1EW03-FUS_MHI-EV-PLN-CS01_CL01-000001).

6.5.3 The topsoil strip will be carried out under constant supervision of the *Archaeological Contractor* who will excavate the ground in spits of between 100 and 300mm using their professional judgement. Once the topsoil strip is completed across the Site, the subsoil (including alluvial and/or colluvial layers) will be stripped in a similar fashion. Machine excavation will cease once the surface of the first archaeological horizon is reached, after which the surface will be cleaned by hand in order to define the archaeological features. If no archaeological horizon is present in the upper Holocene deposits, machining will cease once the surface of the tertiary deposits (Lower Lambeth Group) is reached.

6.5.4 It is the responsibility of the *Archaeological Contractor* to ensure that the finished surface is machined to a suitably 'clean' state in order to identify, define and investigate any exposed archaeological deposits. Machine excavation will comply with the *Employer's* Technical

Standard - Route wide soil resources plan (HS2-HS2-EV-STD-000-000008) and the Archaeological Contractors Soil Resource Plan (1EW03-FUS_MHI-EV-PLN-CS01_CL01-000001)

6.5.5 Where present, buried soil horizons will be inspected and recorded by the *Archaeological Contractor's* geoarchaeologist to provide data for understanding formation processes. Procedures and techniques for this data capture will be as outlined in Historic England guidance on geoarchaeology and environmental archaeology (HE 2015b; HE 2011). Samples for laboratory assessment, analysis and dating shall be collected where appropriate following agreement with the *Contractor's Historic Environment Manager* and the *Employer.*

6.5.6 Any variations to the excavation methodology shall be at the discretion of the Archaeological Contractor and recorded in writing for inclusion in the final report. Any changes required will be recorded via a change control form which will be submitted for approval by the Contractor and the Employer.

6.5.7 Metal detectors will be used by experienced staff to scan for metallic finds within the area. This will primarily comprise a sweep of the topsoil heaps following mechanical excavation and during the excavation of key archaeological features or deposits.

6.5.8 In addition to the methodology set out in the Project Plan the *Archaeological Contractor* will ensure that:

- the plant is only operated by trained, certified and competent drivers who have completed a safety critical induction;
- that mechanical excavation is only undertaken under the constant supervision of a sufficiently experienced and competent archaeologist and certified banksman;
- that all operatives are briefed daily on the risks of working with the mechanical excavator and proposed plant movements for each day; and
- that operatives do not enter or work within the swinging arm radius of the plant. When approaching the mechanical excavator operatives must only do so from a direction where both the driver and banksman can clearly see the operative (i.e. not from the rear or blind side) and must alert the banksman to their presence. If necessary, the banksman will signal to the driver who will ground the machine bucket.

Fencing arrangements.

6.5.9 The perimeter of the stripped area will be fenced off with pedestrian barrier to provide edge protection. The initial topsoil and subsoil strip across the area will progress from west to east. Therefore, pedestrian barrier will firstly be established across the southern perimeter of C10055. To facilitate plant and dumper access the fencing will be set out along the north and

eastern extent C10055 as the works progress. The western edge will be protected by fencing already erected by Babcock. The work area will be sealed off with fencing at the end of each working day.

Fieldwork Recording

6.5.10 Archaeological recording shall be undertaken by the Archaeological Contractor to the general requirements as described in the GWSI: HERDS, and the Technical Specification for Historic Environment Investigations. Structures, features, or finds which might reasonably be considered to merit preservation in-situ shall not be unduly damaged.

6.5.11 Once mechanical excavation has been completed the archaeological features present will be mapped to create a pe-excavation plan using Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) equipment or other suitable automated equipment referenced from the PGMs. Surface heights shall be recorded and related to PGMs. Ordnance Survey Bench Marks (OSBM) are not to be used. Levelling accuracy shall be within 10 mmÖk: where 'k' is the total distance levelled in kilometres.

6.5.12 Prior to commencing hand excavation and recording there will a 'Hold Point' and site meeting with the Contractor's HERDS Manager, HS2 Historic Environment Manager at which the pre-excavation plan will be used to:

- confirm the number of archaeological features present and the feature density;
- confirm the number of interventions required; and
- agree any changes to / specific requirements for the excavation and sampling strategy presented in this LSWSI.

6.5.13 For the Archaeological investigation and recording the methodology will follow the processes outlined in Table 5. Any alterations to his method will be agreed in consultation with the Contractor's Historic Environment Manager, Employer and stakeholders.

Table 5 excavation methodology for area C10055

Archaeological Deposit	Sample
All Mesolithic, Neolithic and Early Bronze Age remains	All non-structural discrete features, structural and linear features of Mesolithic, Neolithic and Early Bronze Age date will be 100% hand excavated and recorded.
Non-structural linear features (post-dating the Neolithic period)	A minimum of 20% of the feature (including terminals) will be excavated and recorded in order to determine its character, date, morphology and function. Each section will be excavated away from intersections with other features in order to recover an uncontaminated artefact assemblage and will measure not less than 1m long or a minimum of a 1m long section if the feature is less than 10m in length. In addition to the 20% sample:

	- all termini will be investigated to record the presence of 'special or placed artefact assemblages'; and - all intersections will be investigated to determine stratigraphic relationships between features.
Non-structural discrete features (post-dating the Neolithic period)	All pits, post-holes, tree throws and other isolated discrete features will be half-sectioned and recorded; unless it is proven that they are of modern origin. If large pits or deposits, e.g. quarry pits (over 1.5m diameter), are encountered then the sample excavated should be sufficient to define the extent and maximum depth of the feature but should not be less than a 25% quadrant
Structural remains (post-dating the Neolithic period)	E.g. post-holes, stake-holes, drip gullies and beam slots etc. shall be subject to 100% excavation and recording. All intersections will be investigated to determine the relationship(s) between the component features and must include representative profiles prior to 100% excavation.
Human remains	If present will be 100% excavated and recorded in situ and subsequently lifted, labelled and packed to the standard established by the Employer's Human remains and monuments procedure (HS2-HS2-EV-PRO-0000-000008) and the Excavation and post-excavation treatment of cremated and inhumed human remains (McKinley and Roberts 1993). Environmental samples will be recovered from grave fills and specific locations such as the abdominal cavity for specialist analysis. Site inspection will be made by a recognised specialist who will advise on the excavation and sampling strategy. The exhumation of any human remains will only be undertaken in accordance with Employer's Human remains and monuments procedure (HS2-HS2-EV-PRO-0000-000008).

6.5.14 In addition to the above strategy the Archaeological Contractor shall be aware that:

- all features demonstrated as being the earliest or latest in the stratigraphic sequence will be considered for full (100%) hand excavation. Selection will be based on whether they may belong to a transitional period; and
- where complex structures or significant/special activity areas are encountered additional detailed recording and specialist environmental sampling or scientific dating may be required, this will be confirmed at the pre-excavation site meeting.

6.5.15 Where areas of extensive archaeological stratification are encountered, the horizontal and vertical extent of archaeological stratification shall be assessed by the Archaeological Contractor through implementation of an appropriate strategy including, either the excavation of features cut into horizontal stratification, limited test pitting or auguring. The aim shall be to recover suitable stratigraphic, finds and environmental samples from the full, intended depth of the excavation area, as far as is practicable. The exact methodology may

need to be determined by the Archaeological Contractor during the excavation of individual features and agreed with the Contractor's Historic Environment Manager and the Employer.

6.5.16 Where deposits are investigated, and found to be undated, and where these have the potential to be of archaeological significance (e.g. of earlier prehistoric or early medieval date, or any other deposit types notable for artefactual scarcity) appropriate samples will be taken for artefact recovery. The soil should be hand excavated and then sieved or screened through ¼" or 6mm wire mesh to recover artefacts. Samples can be sieved on site or retained for immediate sieving off-site.

Fieldwork Recording

6.5.17 During the Archaeological Recording the Archaeological Contractor shall record the following observations on a daily basis. The record shall consist of, as a minimum:

- The site/trench codes as defined in the Employer's AIMS;
- the chainage/location of the area observed;
- the date(s) of the observation;
- personnel employed on site;
- a description of the construction works observed;
- the works (sub) contractor and personnel undertaking and supervising the construction activity;
- depths and extents of excavation works observed;
- measure of confidence that any archaeological remains would have been observed and reasons;
- the areas and horizons (both those containing archaeological or remains of quaternary geological importance and those which do not) unaffected by construction activity (with special reference to archaeological sites
- identified for preservation in situ);
- the reasons why any particular area of the works was not observed, and noting those areas not subject to disturbance from construction;
- location and description of any archaeological remains; and
- location and description of any modern remains.
- Heights for all deposits.

6.5.18 Heights for all deposits shall be related to approved HS2 Permanent Ground Markers (PGMs). Levelling accuracy between PGMs and site Temporary Bench Marks (TBMs) shall be within 10 mmık: where 'k' is the total distance levelled in kilometres.

6.5.19 Every effort shall be made by the Archaeological Contractor to establish the presence or absence of archaeological deposits by establishing the absolute ordnance datum (AOD) for the height of significant deposits, including the depth of modern intrusions, key stratigraphic components and natural deposits.

6.5.20 The Archaeological Contractor will ensure that the finished surface is machined to a suitably 'clean' state in order to identify, define and investigate any exposed archaeological deposits. If the surface is not sufficiently clean, hand cleaning of the surface will be undertaken.

6.6 General Requirements

General fieldwork recording standards

6.6.1 Archaeological recording in area C10055 will include, as a minimum:

- At least one representative section at (1:10 or 1:20 scale) of each Archaeological Recording area, from ground level to the base of the excavation. This will be drawn on gridded perma-trace, located on the Ordnance Survey National Gird, with levels recorded to the Ordnance Datum (OD).
- the written record of individual context descriptions on appropriate pro-forma. These records will be checked by the Site Supervisor and a relational matrix compiled;
- plans at appropriate scales (1:10, 1:20 or 1:50) – these will in general be captured digitally with GPS, although individual hand drawn plans may be produced for more complex features (i.e. floor layers, complex structural remains). Hand drawn plans will be produced on gridded perma-trace and located on the site gird. Archaeological features recorded directly by GPS will be automatically located in 3D in Ordnance Survey Grid and Datum coordinates.
- single context planning should be used only if appropriate. If single context recording is required the Site Supervisor will maintain a plan register, from which a plan matrix will be compiled on completion of the work.
- The photographic record will illustrate all significant phases, structures, important stratigraphic and structural relationships, and individual items of interest, including artefacts. All site photographs, except 'working shots', will include a photographic scale of appropriate size.
- other sections, including the half-sections of individual layers or features shall be drawn as appropriate to 1:10 or 1:20. These will be made on perma-trace and located by OS grid survey points.

6.6.2 A 'site location plan', indicating site north shall be prepared at 1:1250. Individual 'excavation area plans' at 1:200 (or 1:100) shall be prepared which show the location of archaeology investigated in relation to the investigation area. The location of site plans will be identified using OSGB co-ordinates.

6.6.3 Section drawings shall be located on the relevant plan and OSGB co-ordinates recorded. The locations of the PGM bench markers used and any site TBM shall also be indicated.

6.6.4 A record of the full extent in plan of all archaeological deposits as revealed in the investigation shall be made along with a measurement of their depth/thickness in order to obtain a metric volume. This data will allow volumetric analysis of finds and ecofacts during analysis. These plans will be based on digital survey data, taken with GPS and/or Total station, and supplemented where appropriate by hand drawn records on polyester based drawing film (at a scale of 1:10 or 1:20 unless otherwise agreed with the Contractor's Historic Environment Manager and the Employer). All hand drawn information shall be digitised (or preferably generated digitally in the first instance), and final deliverables will be supplied in an Esri format and adhere to standards set out in the Employer's Cultural Heritage GIS Standard (HS2-HS2-GI-SPE-000-000004). Single context planning shall be used where complex stratigraphy is encountered. This digital information shall be supplied in PDF and/or CAD format and presented with the archaeological contractor's weekly progress report. The plan will provide an overall pre-excavation plan and indicate excavated slots and features to date.

6.6.5 A 'Harris matrix' stratification diagram shall be employed to record stratigraphic relationships (Harris et al. 1993) where appropriate. This record shall be compiled and fully checked by the Archaeological Contractor during the course of the excavations. Spot dating shall be incorporated onto this diagram. The matrix will be compiled using the 'Bonn' programme.

6.6.6 Recording of structural evidence revealed below ground level will vary according to the level of special interest of the structure and its relationship to archaeological remains. Structures of little or no significance shall be noted on a site plan. Detailed drawings of important features revealed in investigations may be required in accordance with the aims and objectives of the investigation outlined in Section 3.

6.6.7 The photographic record will be in digital format, resulting in high resolution TIFF (uncompressed) images. Photographs will illustrate both the detail and context of the principal archaeological features discovered. In addition, the Archaeological Contractor shall take appropriate record photographs to illustrate work in progress. All photographic records will include information detailing: site name and number/code, date, context, scale and orientation. A selection of progress photos of publication quality must be submitted with the weekly progress report. A selection of progress photos of publication quality must be submitted with the weekly progress report.

Soil Storage

6.6.8 Topsoil and subsoil deposits arising from the mechanical excavation of area C10055 will be stock piled separately. Due to the confined nature of the site the topsoil will be stored to the east of the site compound and the subsoil to the north of the excavated area in accordance with the Employer's Technical Standard - Route wide soil resources plan (HS2-HS2-EV-STD-000-000008) and the Soil Resource Plan (1EW03-FUS_MHI-EV-PLN-CS01_CL01-000001). All works will be undertaken in accordance with the Temporary Works Design for the spoil heap (Fusion ref: C1/AWH/018).

6.6.9 The location of the spoil storage areas will be set out in Archaeological Contractor's RAMS documentation (1EW03-FUS_MHI-HS-MST-CS01_CL01-000002) and Spoil Resource Plan (1EW03-FUS_MHI-EV-PLN-CS01_CL01-000001). Estimates on the volume of spoil will be presented and a drawing provided clearly showing the location of each spoil store.

Human Remains

6.6.10 No human remains have been identified during previous trial trench evaluations; however, evidence for Bronze Age , Middle Iron Age and Romano-British settlement has been identified within areas C10046 and C10047 to the south of Dews Lane and possible Bronze Age barrows (ring ditches) identified within the floodplain of the Colne to the west of Dews Farm, and on the opposite bank of the Colne. Although the geophysical survey within the Site has not identified similar features, it is possible that burials, most likely of Bronze Age or Late Iron Age/Romano-British date, may be present within and on the edge of the floodplain within the Site. This does not preclude the possibility for burials of different periods to be present within the Site. Should human remains be discovered, the Archaeological Contractor shall notify the Contractor's Historic Environment Manager immediately, who will notify the Employer, so that these procedures can be implemented. This notification may be initially made personally or by telephone but shall be confirmed in writing (including email) within 24 hours of discovery.

6.6.11 The protocol for human remains is set out in paragraph 5.1.60 to 5.1.65 of the Project Plan (Document ref: 1EW03-FUS-EV-REP-CS01-012114. In all situations where human remains are considered to be present (prior to works commencing) or encountered unexpectedly during works the Burial grounds, human remains and monuments procedure (HS2-HS2-EV-PRO-000-000008) shall be complied with.

6.6.12 Human burials will be recovered individually, with the separate parts of the body (i.e. right arm, torso, left leg etc.) bagged separately on site. Samples will be taken for analysis of the abdominal area if soil conditions are wet or moist. Control samples will also be taken by consultation with the appropriate specialist.

6.6.13 Visible grave goods and other obvious artefacts shall be recorded and lifted before the end of the working day to avoid the risk of vandalism and theft. Where this is not feasible or

appropriate, the Contractor shall ensure, in liaison with the Contractor's Historic Environment Manager and the Employer that adequate site security is provided. As a minimum, this will require a 24 hour comprehensive security regime until sensitive remains have been recorded and lifted. This is a particular issue for rural sites and 'occasional burials'.

Environmental Sampling and Geoarchaeology

6.6.14 In accordance with the Sampling Policy set out in the Project Plan and The Employer's Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV-STD-000-000035) a sampling strategy is set out below for the Site. It should be noted that this strategy is in addition to that outlined for sampling flint scatters as set out in Section 6.5 (Micro-debitage, geoarchaeological and paleoenvironmental sampling).

6.6.15 The strategy is based on the existing information about the Site, gathered from non-intrusive surveys, previous trial trench evaluation results and the GWSI:HERDS objectives outlined in Table 2. However, the strategy will be reviewed throughout the Archaeological Recording and where unexpected features or deposits are identified, revised accordingly to take these into account.

6.6.16 The purpose of the environmental sampling strategy will be to record the character, morphology and state of preservation of any ecofact material within both archaeological features, particularly waterlogged feature fills/deposits and alluvial sediment sequences (including any buried soil horizons), in order to sufficiently inform the significance of the material and allow adequate post-excavation assessment and analysis of the recovered material.

6.6.17 The table below sets out the sampling approach for the feature types which may be encountered within the Site and indicates which specific HERDS and overall general objectives the sampling will address.

Table 6 Sampling approach by feature type

Mitigation Area	Feature type, period and ecofactual remains	HERDS objective	General objectives
C10055	pits, and possibly gullies and postholes associated with Bronze Age and Mid-late Iron Age 0ccupation activity	KC11, KC16, KC17 and KC18	• To contribute to the understanding of the layout, extent, phasing and principal land use activities of the River Terrace during the prehistoric period • To recover a suite of environmental samples from which plant remains, charred remains, pollen, seeds and other environmental proxy indicators can be recovered, to inform the understanding of the prehistoric

			subsistence economy and arable cultivation.
C10055	Post and stake-holes from which no dating evidence was recovered	KC11, KC16, KC17 and KC18	• To recover dating evidence in order to be able to tie in these features to the known archaeological resource in the vicinity

Sampling Strategy and quantities

6.6.18 Environmental samples will be taken from deposits that have the potential to provide information on the preservation conditions and potential for analysis of biological remains. During the works specialist advice will be sought form the Archaeological Contractors environmental archaeologist/geoarchaeologists, supported by site visits to develop the sampling strategy. The selection, preparation for and methods of taking samples together with their size, presentation and processing shall be in accordance with current best practice (e.g. ClfA 2014; Campbell et al. 2011; Historic England 2015a, Historic England 2019).

6.6.19 Deposits and features shall be selected for sampling in line with the following guidelines.

- Bulk samples will be taken from a selection of stratified contexts that have produced good dating evidence, and sufficient in number to establish the range and quality of the environmental evidence.
- Samples will comprise at least 40 litres per context or 100% where the total deposit is less than 40 litres for the recovery of charred plant remains, small bones and finds. They will be taken from appropriate contexts and shall be recovered based on the following:

- Fills of at least 25% of pits and post-holes focusing on basal fills particularly those with clay deposits where there is good potential for recovery of environmental evidence.
- Where there is clear evidence of burning within pits associated with occupation
- Any floor deposits or beam slots found associated with possible buildings should be subject to site specific sampling agreed in consultation with the appropriate specialist and agreed with the Employer and Historic England's Senior Science Advisor to HS2 to ensure a representative sample of the material is examined.
- Any Mesolithic features should be 100% sampled for microlith recovery. It must be established whether the bulk samples are to be wet sieved for finds retrieval only or if the

recovery of charred plant remains, and small bones are also required and if so the volume of the total sample that is to be subject to flotation for that purpose.

- Enclosure ditches with organic or alluvial fills should be subject to site specific sampling agreed in consultation with the geoarchaeologists and agreed with the Employer and Historic England's Senior Science Advisor to HS2 to ensure a representative sample of the material is examined (see geoarchaeological strategy).
- An appropriate level of sampling of all buried soils/old ground surfaces agreed with specialist support; (see geoarchaeological strategy).
- 50% of all positive features i.e. anthropogenic soil deposits not contained within a cut feature
- Samples will be taken from discreet, secure contexts

- Where good conditions for the preservation of bone have been identified, all large bones (long bones and flat bones) shall be collected by hand and sieving of soil samples up to 100 litres shall be undertaken as appropriate (English Heritage 2011, 12). Entire contexts shall be sampled if the volume is low.
- The sampling strategy shall also take account of the potential for calcined/cremated bone which may survive in less favourable conditions. Cremations will be 100% excavated.
- Samples will also be taken from undated contexts in exceptional circumstances that have the potential to yield important palaeoenvironmental evidence and provide material for scientific dating to enhance the results of the assessment.
- Samples may include bulk samples, waterlogged samples, radiocarbon samples, dendrochronology, archaeomagnetic, pollen samples and column or monolith samples (if/where appropriate).
- Samples from waterlogged and anoxic deposits, which might contain plant macros and entomological evidence shall be 20 litres in size (occasionally referred to as GBA – General Biological Analysis – samples).

6.6.20 Samples must be taken from appropriately cleaned surfaces, be collected with clean tools and be placed in clean containers. They will be adequately recorded and labelled, and a register of all samples will be kept. Samples shall be protected at all times from temperatures below 5°c and above 25°c and from wetting and drying out due to weather exposure. Samples will initially be stored on site, before transportation to the archaeological contractors processing facility.

6.6.21 Samples will be taken using ten litre plastic buckets (with lids and handles), or strong polythene bags (double bagged) secured at the neck, for the recovery of bulk 'disturbed'

environmental samples. Labelling will follow guidance set out in the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035).

6.6.22 All samples will be taken to address a specific question. The purpose of the sample and the research question it has been taken to address will be recorded on The Archaeological Contractor's sample record sheet.

6.6.23 Radiocarbon, dendrochronology, archaeomagnetic, pollen and monolith samples may be considered for collection where justified and warranted, i.e. from an important series of archaeological features, and ditch or channel sediments where both dating and pollen assessment may be needed to establish the palaeoenvironmental potential of the feature and buried soils such as where features are cut into and or truncated by former channels. Sampling of this nature would first have to be agreed in discussion with the HERDS team and the stakeholders.

6.6.24 Processing of soil samples shall be undertaken in line with the agreed strategy for the recovery and sampling of environmental remains and Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation (English Heritage 2011). Subject to variations agreed in writing based on this, samples shall be processed and assessed under the supervision of the Palaeoenvironmental Specialist in line with the following guidelines:

- soil samples selected for processing shall be wet-sieved/floated and washed over a mesh size of 250 microns for the recovery of palaeobotanical and other organic remains, and refloated to maximize recovery;
- both organic and non-organic residues shall be dried under controlled conditions;
- the dried inorganic fractions shall be sorted for small finds or any non-buoyant palaeoenvironmental remains, and scanned with a magnet to pick up ferrous debris such as hammerscale;
- in the event that waterlogged deposits are identified and sampled, further processing shall be undertaken as appropriate and agreed, including paraffin flotation to recover insect remains. Any such remains shall be scanned to identify and assess their potential; and
- selection of other types of sample for processing and the methods to be used for processing and assessment shall be undertaken on the advice of the relevant specialist and shall be agreed with the HERDS team before implementation.

6.6.25 Processing of all bulk soil samples collected for biological assessment will be completed within two weeks of collection. Processing samples at the time of fieldwork will allow this sampling strategy to be updated and refined where necessary. This information will be communicated in the form of a spreadsheet outlining the absence and/or presence of the major ecofactual

groups (i.e. charred seeds/plant remains; large/small animal bones; invertebrate remains). The preservation state, density and significance of material retrieved shall be assessed by the Archaeological Contractor's recognised specialist. Special consideration shall be given to any evidence for recent changes in preservation conditions that may have been caused by alterations in the site environment.

Metallic Objects and Residues

6.6.26 Should the works uncover the remains associated with industrial activity within the Site, macroscopic technological residues (or a sample of them) shall be collected by hand. Separate samples (c. 10ml) shall be collected for micro-slags (hammer-scale and spherical droplets). Reference should be made to Historic England's guidance on Archaeometallurgy. Assessment of any technological residues shall be undertaken. Assessment of finds assemblages shall, where appropriate, include x-radiography of all iron objects (after initial screening to exclude obviously recent debris) and nonferrous artefacts (including all coins). Where necessary, active stabilisation / consolidation shall be carried out to ensure long-term survival of the material, but with due consideration to possible future investigations.

Interim storage and processing facilities

6.6.27 Prior to final deposition of the archive, the storage and processing facilities available to MHI can be summarised as follows:

6.6.28 Excavated finds and samples will be held at the MHI premises at Mortimer Wheeler House, 46 Eagle Wharf Road, London. These premises meet the Standards in the Museum Care of Archaeological Collections (Museums and Galleries Commission, 1992).

6.6.29 Paper and digital records will be initially stored in appropriate environmental conditions at the MHI offices at Mortimer Wheeler House. Buildings have 24-hour security.

6.6.30 Cold and wet storage appropriate for organic finds and samples is provided at MHI's Mortimer Wheeler House premises. Both dry and wet processing facilities are available at these premises.

Backfilling

6.6.31 Backfilling will comply with the Employer's Technical Standard - Route wide soil resources plan (Document No. HS2-HS2-EV-STD-000-000008).

6.6.32 Within the excavation area features shall only be backfilled by machine under appropriate conditions and with direct archaeological supervision. Arisings from the excavated areas will be replaced strictly in the correct sequence, with subsoil/alluvial deposits being backfilled first and the topsoil being replaced last.

6.6.33 Land drains or drainage where encountered should not be disturbed. Accidental damage to land/mole drains shall be immediately notified to the Contractor. The Archaeological

Contractor will repair any damage to the satisfaction of the landowner or his agent. If a specialist contractor is required to meet this requirement the Contractor will be informed immediately.

7 Post-investigation reporting and archiving

7.1.1 Following completion of the Archaeological Recording the Archaeological Contractor shall, for each activity, prepare the archaeological deliverables set out in Table 7 and submit them to the Contractor, within the timescales indicated, for comment or approval. The table outlines the Archaeological Contractors approach to delivering the various reports within the defined timescales.

Table 7 Archaeological Fieldwork Deliverables to be submitted by the Archaeological Contractor

Deliverable	Specification	Submission to the Contractor Due
Fieldwork Sign-off Sheet	As defined at Section 7.9 of the GWSI:HERDS	Within 24hrs of completion of the fieldwork
Interim Report	As defined at Section 7.9 of the GWSI:HERDS	10 days after completion of the fieldwork – The summary report will be all inclusive covering the Site
Survey Report	As defined at Section 7.12 of the GWSI:HERDS	2 weeks after completion of the fieldwork – The summary report will be all inclusive covering the Site
Post-excavation Assessment	Including a full description of any archaeological remains as defined at Section 7.10 of the GWSI:HERDS	8 weeks after completion of the Archaeological Recording;
Summary Report	As defined at Section 7.11 of the GWSI:HERDS	10 weeks after completion of the Archaeological Recording
GIS data deliverable	As defined in the Employer's Technical Standard (Document No. HS2-HS2-EV-STD-000-000040)	8 weeks after completion of the Archaeological Recording with Fieldwork Report

7.1.2 To ensure a timely submission of all the key deliverables the archaeological contractor will produce a post-excavation phase programme that will be updated on a fortnightly basis. The project management team will be responsible for tracking progress and ensuring key milestones are met. This information will be communicated to the Contractor via the weekly progress reports. In the event that key target dates cannot be met the archaeological contractor will communicate this to the Contractor as soon as practicable and agree a revised date. The project management team will appoint a post-excavation co-ordinator who will liaise with the relevant specialists and other contributors to ensure target dates are achievable and on target. The post-excavation co-ordinator will maintain a work schedule throughout the course of the work, listing all specialist deliverables, time tables for processing, specialist report completion, co-ordination with existing work programmes, integration and synthesis of the results, edits and Q&A, and final submission of the draft report.

7.1.3 Following completion of the Archaeological Recording the Archaeological Contractor will provide the Contractor with the required data, metadata and digital material as specified in the Employer's Historic Environment Digital Data Management and Archiving Procedure (Document No. HS2-HS2-EV-STD-000-000040).

7.1.4 The Archaeological Contractor shall create a fully cross-referenced and internally consistent project archive as a repository for all evidence collected as a result of implementing the works defined in this LSWSI.

7.1.5 The Project archive will comprise the physical and digital archives prepared in accordance with the Employer's Historic Environment Physical Archive Procedures (HS2-HS2-EV-STD-000-000039) and Historic Environment Digital Data Management and Archiving Procedures (HS2-HS2-EV-STD-000-000040).

8 Health, Safety and Environment Management

8.1 Health and safety values

8.1.1 Safety is a core HS2 Ltd value, and is expressed as caring for your workforce, our passengers and the public by creating an environment where no one gets hurt.

8.1.2 The HS2 Health and Safety Strategy (Document: HS2-HS2-HS-STR-000-000002) describes HS2's approach, vision, mission, and values with respect to health and safety.

8.1.3 All archaeological works will be undertaken in accordance with the Employer's Health and Safety Policy (Document No. HS2-HS2-HS-POL-000-000001), the policies and guidance set

out in the Enabling Works, Works Information (WI0900) and the *Contractor's* Health and Safety Policy and Construction Phase Health and Safety Plan.

8.2 Site Inductions

8.2.1 Prior to the start of the archaeological works the *Archaeological Contractor's* site operatives will complete an Area Central Enabling Works induction provided by the *Contractor* and undertake a mandatory drugs and alcohol test.

8.3 PPE

8.3.1 Mandatory PPE to be worn by all members of the *Archaeological Contractor's* personnel will comprise:

- Full orange High Visibility jacket/vest and trousers;
- Hard Hat;
- Gloves;
- Light Eye Protection;
- Lace-up boots with ankle support, steel insoles and toe caps (rigger boots are not permitted).

8.3.2 For further information please refer to the Works Package Information for the Enabling Works Contract.

8.4 Site Specific Constraints

Land Access Requirements

8.4.1 Land access requirements for the archaeological mitigation areas are set out below. The Archaeological Contractor shall submit all land access requests to the Contractor allowing adequate time for the necessary written and telephone notifications to be made in accordance with the agreed access Schedules:

- C10055 will operate under the Fusion PC control and under an access agreement with National Grid/Babcock International Group.

Services and Utilities

8.4.2 PAS surveys and stats utility searches where undertaken by the Contactor and the Archaeological contractor as part of the evaluation phase of works. Therefore, no further surveys on desk based studies are necessary. However, the Archaeological Contractor has:

- visited the Site (with the *Contractor*) to confirm the location of known above or below ground services;

- consulted with the Contractor's *Utilities Coordination Manager* to confirm the location of all buried and overhead utilities; confirm any protection measures required and to confirm requirements for issuing of the Permit to Dig;
- contacted relevant asset owners e.g. National Grid, to confirm minimum plant exclusion zones, any protection measures required and consent to undertake intrusive works in the vicinity of the overhead and buried utilities;
- brief supervisors and all site staff as to the location of the overhead and buried utilities, protection measures to be employed and requirements of the permit to dig.

Overhead Services

8.4.3 One overhead utility has been identified near to the Site:

- a National Grid 11Kv OVPL (CSO-01-1405) runs south-west to north-east to the south of the haul road (see Figure 4). At its closest this overhead utility passes c. 40m to the south-east of C10055.

8.4.4 The overhead utility runs to the south of the temporary haul road. There will be no requirement for site plant or vehicles to cross under the utility. Vehicles and plant will not be permitted to leave the temporary haul road to the south.

Buried Utilities

8.4.5 There are no known buried utilities within the archaeological mitigation area C10055. This was confirmed by the PAS report undertaken for the evaluation phase. A buried foul water main is indicated to the west of the excavation area, but this could not be detected during the PAS survey. While these buried utilities are beyond the defined extents of the planned archaeological mitigation works the Archaeological Contractor should be aware of these utilities and ensure that appropriate protection measures, if required, are used when accessing/egressing the Site.

Unexploded Ordnance

8.4.6 The HS2 unexploded ordnance (UXO) hazard data provided on the Employer's gViewer GIS platform was consulted by the Contractor on 03.06.2019. This identified that the site has a LOW UXO hazard rating.

8.4.7 In the unlikely discovery of any UXO's the Archaeological Contractor's site supervisor will follow the Contractor's emergency procedure1:

[1] Fusion, 2017. Incident Management Plan (Document No. 1EW03-FUS-HS-PLN-C000-000001)

- Evacuate the area ensuring the completion of a roll call.
- Verify the location of the UXO and ensure it is quarantined.
- Contact the most *Contractor's* Project Manager to report issue and await instruction. The *Contractor's* Silver or Gold Command will contact the appropriate emergency services and contact any 3rd parties who have an interest in the site e.g. the *Employer's* Project Manager

Ecological Constraints

8.4.8 The *Contractor* has undertaken a review of ecological survey information available at the time of writing. This included a review of information held on the Area Wide Surveys ecology GIS platform which as accessed on 11 November 2020, and design information provided by the MWCC.

8.4.9 The *Archaeological Contractor* shall ensure that they are familiar with the constraints set out below and that they consult with the *Contractor* during preparation of their Archaeological Method Statement and RAMS documentation to ensure that any changes are captured and appropriate mitigation measures applied.

8.4.10 The *Archaeological Contractor* shall also ensure that a pre-works ecology check is undertaken within 48 hours prior to mobilisation and/or the start of intrusive works.

Badgers

8.4.11 No badger setts have been identified in the vicinity of C10055.

8.4.12 Nevertheless, in order to protect badgers against falling into the excavation area edge protection will need to be erected and several ramps created to ensure access/egress for badgers. The excavated area will need to be checked for badgers daily prior to starting work.

8.4.13 The *Archaeological Contractor* shall ensure that any badger exclusion zones that may be implemented will be physically demarcated on site and that all site staff, particularly plant operators and banksmen, are briefed and aware of the exclusion zone. The exclusion zone will be marked out with cone and rope.

Bats

8.4.14 Ecological surveys carried it by the Contractor have not identified any trees which have a high potential for being suitable bat roosts in the vicinity of C10055. The presence of bats has not been confirmed; however, a precautionary 10m diameter plant exclusion zone will be defined around any tree where bat roosts are identified.

8.4.15 The *Archaeological Contractor* shall ensure that all site staff are briefed and aware of any exclusion zones and that no plant or machinery operates within these areas.

Amphibians and Reptiles

8.4.16 There is no recorded presence of Great Crested Newts, other amphibians within the Site.

8.4.17 Reptiles have been recorded within the field to the south of Dews Lane and area C10046. A pre-works ecology check shall be completed by an ecologist approved by the *Contractor* within 48 hours of the start of mobilisation. The *Contractor* will, prior to the start of works, provide further advice in the event that reptiles are found with the C10055 works area.

Watercourses

8.4.18 There are no watercourses in the immediate vicinity of C10055.

Invasive Species

8.4.19 A stand of Himalayan Balsam has been recorded along the line of the Newyears Green Bourne to the south of Archaeological Recording area C10055 (see Figure 6 in the project plan).

8.4.20 Restrictions on the spread of this invasive species require a 7m diameter exclusion zone surrounding affected location. This exclusion zone has been considered during the design of the archaeological works. All intrusive works and access routes are located well beyond the 7m exclusion zone.

Mechanical Plant

8.4.21 Site plant and equipment operated by the *Archaeological Contractor* must be physically inspected, along with the required documentation, before being offloaded upon delivery to, and before being used on Site.

8.4.22 Records of daily/weekly plant inspections, including fault reporting, will be maintained on Site by the *Archaeological Contractor* and will be available for inspection by the *Contractor.*

8.4.23 Details of plant and equipment operators shall be maintained by the *Archaeological Contractor* and evidence of periodic checks from plant hirers that the plant has been adequately maintained shall be obtained. Copies of all plant operators' certification will be provided to the *Contractor* prior to the start of the archaeological investigations.

Construction Traffic

8.4.24 C10055 will be access via an operational National Grid/Babcock International Group work site, and therefore construction traffic is anticipated during the Archaeological Recording. This will be under the control of the Babcock International Group.

Temporary Works

8.4.25 It is anticipated that the excavation of Archaeological Recording Area C10055 will be shallow e.g. between 300-500mm in depth.

8.4.26 The *Archaeological Contractor* will assess the requirement for temporary works and will be responsible for their design, installation and maintenance.

8.4.27 Temporary works will be co-ordinated by the *Contractor's* Temporary Works Co-ordinator (TWC) who will be responsible for ensuring that the planning, erection, use, maintenance and dismantling of temporary works is undertaken in line with the *Contractor's* temporary works process and as agreed with the relevant Temporary Works Manager (TWM). A temporary works schedule will be produced and reviewed and updated at regular intervals.

8.4.28 All temporary works will be designed and installed in accordance with the *Employer's* Technical Standard for Temporary Works (Document No. HS2-HS2-CV-STD-000-000005), the *Contractor's IMS* and Construction Phase Health and Safety Plan.

8.5 Plant noise

8.5.1 The *Archaeological Contractor* shall only use plant that meets industry standards for noise and pollutant emissions and shall limit the operation of plan to the core working hours.

8.6 Site safety and security

8.6.1 The Site is located within arable land to the west of Harvil Road with the Hillingdon Outdoor Activity Centre (HOAC) and public rights of way immediately adjacent. The residential settlement of South Harefield is located approximately 0.5km to the north of the Site. Site specific security concerns include:

- a protest camp has been established on Harvil Road itself and in the field to the south of Dews Lane;
- C10055 is located within a former pastural field with access possible from Harvil Road and Dews Lane. The works area will be fenced with pedestrian barrier, while the *Archaeological Contractor's* welfare and storage area will be enclosed with HERAS.
- C10055 is located within a former pastural field but is surrounded by existing security fencing maintained by Babcock International Group.
- a Public Right of Way (PROW) runs north to south to the west of the Site (see Figure 2).

8.6.2 The Archaeological Contractor shall take precautions to ensure that all plant and materials are securely stored within the limits of the Site. Particular care should be taken to lock welfare and site accommodation when not occupied and for plant to be fitted with lockable screens and fuel caps. The archaeological contractors Civils Site Manager will ensure that all plant, equipment and welfare is secured and safe at the end of the working day.

8.6.3 Plant will be stored overnight adjacent to the welfare units and within a locked Heras fenced compound. The Contractor will provide manned 24hour security and will install CCTV cameras within the site compound.

8.6.4 All staff involved in the fieldwork should be CSCS qualified to a minimum standard as an 'Operative'. Staff CVs will include CSCS qualifications.

8.6.5 All site personnel will be provided with the Archaeological Contractor's Risk Assessment and will familiarise themselves with the following:

- Site emergency and evacuation procedures;
- The Site's health and safety coordinator;
- The first aiders; and
- The location of the nearest hospital and doctor's surgery.

8.6.6 The Archaeological Contractor shall satisfy themselves that they have visited the Site and understand the necessary security requirements as set out in the Contractor's IMS and the Employer's Works Information: WI1500 Security (Document No. 1E001-HS2-PR-ITT-000-000075. Details of the Archaeological C0ntractor's security arrangements shall be agreed with the Contractor prior to mobilisation and set out in Archaeological C0ntractor's CLP and RAMS documentation (Document Ref: 1EW03-FUS_MHI-CL-PLN-CS01_CL01-000003 and 1EW03-FUS_MHI-HS-MST-CS01_CL01-000002 respectively)

Accident and incident reporting

8.6.7 Accident and incident reporting will follow the guidance and procedures set out in the *Employer's* Works Information and the *Contractor's* Standard for Accident and Incident Investigation and Reporting (Document No. SH2 STD1) and Incident & Emergency Preparedness Plan (Document No. 1EW03-FUS-HS-PLN-C000-000001).

8.6.8 The *Archaeological Contractor's* Risk Assessment and Method Statement (Section G) will include a clear procedure for responding to an incident and list of emergency contacts including the *Contractor's* Duty Manager and SHEQ Manager.

8.6.9 All accidents and incidents must be recorded in the site accident book and entered onto the *Contractor's* SHEQ Tracker within 24 hours as well as the HS2 AssessNet incident reporting database. All incidents MUST be reported to the *Contractor's* Duty manager and SHEQ department immediately in person or by telephone.

8.6.10 Accidents and incidents defined by the *Employer* as level 1 or 2 are also to be immediately reported to the employers helpdesk on 0207 944 6570 which is available 365 days of the year, and open 24 hours.

8.6.11 Records of accidents or incidents reportable under the Reporting of Incidents Diseases and Dangerous Occurrences Regulations (RIDDOR) are confidential and must be stored securely on site.

8.6.12 Should the public or a utility be involved in an accident or incident, ensure that public liability claim forms are completed if necessary. All near misses and learning events MUST also be reported to the *Contractor's* SHEQ department

Core Working Hours

8.6.13 The *Archaeological Contractor* shall adhere to the core working hours below unless otherwise agreed with the *Contractor* and *Employer's Project Manager* and the relevant Third Party through a Consent.

8.6.14 The core working hours are from 08:00 to 18:00 on weekdays (excluding public holidays) and from 08:00 to 13:00 on Saturdays.

8.6.15 The *Archaeological Contractor* may utilise a period of up to one hour before and up to one hour after core working hours for start-up and close down of activities. Start-up and close down activities shall not include operation of plant or machinery likely to cause a disturbance and shall not be considered an extension of core working hours.

8.7 Welfare and First Aid

8.7.1 The welfare arrangements for C10055 are set out below.

8.7.2 The secure welfare facility will provide for ten people. Sufficient parking should be provided (approx. 10 spaces), but carpooling will be recommended unless Covid-19 restrictions are in place.

Welfare will consist of:

- Drying room for wet clothing/PPE at base;
- Male and female changing facilities;
- Powered canteens with washing facilities;
- Office units, separate from the canteen;
- Male and female/unisex toilets;
- Parking spaces;
- Waste Bins
- Storage container.

8.7.3 If welfare for more than 10 people is required, the Project Manager will arrange additional welfare to be delivered through the archaeological contractors Civils contractor. Site management will ensure that any accommodation or welfare facilities are kept clean, tidy and

in a fit state to be used. A daily check of welfare facilities will be undertaken to ensure they are tidy, clean and fit for purpose. Any consumables will be restocked as needed.

8.7.4 Cleaning materials will be on site along with fresh drinking water.

8.7.5 Appropriate waste disposal will be undertaken daily.

8.7.6 Posters will be displayed in the Archaeological Contractor's welfare/site accommodation stating the location of first aid boxes, first aiders, appointed persons and action to be taken in case of an incident.

9 Interface and Communication Plan

9.1 Interface with other Contractors

9.1.1 The Site is located in an area where National Grid/Babcock International Group are working:

- access into the C10055 site will be via the new construction access from Harvil Road (Gate 4). This access is controlled by Babcock International Group (BIG). All deliveries/collections and daily vehicle movements will have to be booked with BIG at least24hrs and preferably 48hrs in advance. Access to the C10055 area will be along the temporary haul road, and therefore an interface with BIG may be required.

9.2 Interaction with the general public

9.2.1 If approached by members of the public or local residents about any aspect of the archaeological evaluation the Archaeological Contractor shall maintain a cautious and polite response and, in the first instance, direct enquiries to the HS2 Helpline 020 7944 4908.

9.3 Rail Interface

9.3.1 The Site lies approximately 630m to the north of the Chiltern Line. No works are planned in the fields adjacent to the railway and no interface with the live railway is anticipated.

10 Site Monitoring and Engagement Plan

10.1.1 The *Archaeological Contractor* will produce weekly written progress during the duration of the fieldwork, which will provide the following information as far as reasonably practicable;

- progress on-site to date, illustrated with pre-excavation and post-excavation plans, with narrative text supported with photographs.
- preliminary results of any sample processing undertaken, providing an outline quantification on the major ecofactual groups by context.

- pottery spot dates from key features.
- GIS plots illustrating the flint densities across the site as modelled from the test pit results, with topographic plots of key flint bearing horizons.
- Stratigraphic, artefactual and environmental data will be available within two weeks of collection on site to meet review points

10.1.2 The last point will be key in determining the extent and nature of any in situ flint scatters that will be subject to gridded excavation and 3D recording.

10.1.3 In addition to the above the *Contractor's Historic Environment Manager* shall arrange periodic site visits with specialist stakeholders and expert bodies to provide advice on-site where this is considered beneficial and agreed with the *Employer*. This will be undertaken within the *Employer's* communication protocols set out in the *Employer's* Community Relations Strategy. The Archaeological Contractors representative will also attend these meetings.

10.1.4 The *Contractor's Historic Environment Manager* shall arrange and convene monitoring site visits with the *Employer* to assess the quality and progress of the archaeological works and their adherence to HS2 technical standards and procedures.

10.1.5 The *Employer* may invite the Local Authority Archaeologist to attend these meetings, as appropriate. The *Employer* will be responsible for informing Historic England and the local authority historic environment specialists on the progress of fieldwork activities and findings.

10.1.6 In addition to monitoring visits, the *Employer* may plan and host media events or documentary recording, particularly in the event of a significant archaeological discovery. If requested to do so, the *Archaeological Contractor* shall provide the HS2 media team with escorted access to the Site. Any request for media access will be confirmed in advance, in writing, by the *Contractor's Historic Environment Manager*.

10.1.7 There shall be no unauthorised access to the works in any other circumstances. Any visits to the works shall be in accordance with the *Contractor's* and Main Works Contractor's health and safety, site access and security requirements.

11 Quality Assurance Processes and Plan

11.1.1 All archaeological works will be delivered in accordance with the Area Wide HERDS Package Quality Plan (Document No. 1EW03-FUS-QY-PLN-C000-001658), the Archaeological Sub-contractors Quality Plan and the standards and guidance set out in the following documents:

- High Speed Rail (London-West Midlands) Environmental Minimum Requirements.
- High Speed Rail (London-West Midlands) Environmental Minimum Requirements Annex 3: Heritage Memorandum (Document No. CS755 02/17).

- High Speed Rail (London-West Midlands) Environmental Minimum Requirements Annex 1: Code of Construction Practice (Document No. CS755 02/17).
- HS2 Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (Document No. HS2-HS2-EV-STR-000-000015).
- HS2 Technical Standard - Specification for historic environment investigations. (Document No. HS2-HS2-EV-STD-000-000035).
- HS2 Technical Standard: Historic Environment Physical Archive Procedure (Document No. HS2-HS2-EV-STD-000-000039).
- HS2 Technical Standard: Historic Environment Digital Data Management and Archiving Procedure (Document No. HS2-HS2-EV-STD-000-000040).
- HS2 Cultural Heritage GIS Specification (Document No. HS2-HS2-GI-SPE-000-000004).
- Chartered Institute for Archaeologists (CIfA), 2014a. Code of Conduct.
- CIfA, 2014b. Standard and Guidance for Archaeological Field Evaluation.
- English Heritage, 2006. Management of research projects in the historic environment (and associated guides and project planning notes).
- English Heritage, 2007. Geoarchaeology: Using earth sciences to understand the archaeological record.
- English Heritage, 2011. Environmental Archaeology: A guide to the Theory and Practice of Methods, from Sampling and Recovery to post-excavation (second edition).

11.1.2 The *Archaeology Contractor* undertaking the trial trenching is expected to have Chartered Institute for Archaeologists (CIfA) accreditation as Registered Organisation (RO) and their supervisory staff to have an appropriate and relevant level of demonstrable experience for the specific task in question i.e. full (MCIfA) or Associate (ACIfA) members of the CIfA, or an equivalent demonstrable professional standing.

11.1.3 All members of the *Archaeology Contractor's* site team are expected to be suitably qualified, experienced and competent professionals. All site operatives will hold a current and valid CSCS qualification to at least 'Operative' level.

11.1.4 The Interim and fieldwork reports will be prepared and conducted by suitably qualified, experienced and competent professionals. The resultant reports will be issued in draft to the *Contractor*, whose Historic Environment Manager will check and review each report prior to issue to the *Employer* for acceptance. Final reports, following comments, will be checked and reviewed again prior to issue.

12 Resource Plan

12.1.1 The *Archaeology Contractor* shall provide project personnel of experience as described below. The personnel shall be approved by the Contractor. Approval may be withdrawn by the Employer at their discretion and in accordance with the contract conditions.

12.1.2 The *Archaeology Contractor* shall submit CVs of all proposed personnel including any specialists, but excluding site technician grades, to the Contractor for approval if this has not already been done as part of the pre-qualification process.

12.1.3 The works shall be managed, directed and staffed by appropriately qualified and experienced personnel. The *Archaeology Contractor's* Key Person shall possess at least ten years' relevant experience.

12.1.4 The excavation, sampling and recording of the works shall be directed by a Fieldwork Director who is a Member of the Chartered Institute for Archaeologists (MCIfA). Supervisory staff shall have an appropriate level of demonstrable experience commensurate with their specific role i.e. an appropriate level of membership of the CIFA, IHBC or an equivalent demonstrable professional standing.

12.1.5 The *Archaeology Contractor's* project team shall include an environmental archaeologist suitably qualified in archaeological science and geo-archaeological sediment description methods, and on site sample processing and assessment techniques.

12.1.6 The *Archaeology Contractor's* project team shall be staffed by technician grades with minimum six months' experience in appropriate aspects of excavation and recording.

12.1.7 Specialist staff employed on any aspect of the works, including post-excavation assessment or analysis of any kind including the writing of reports, shall be suitably qualified and shall be supervised by personnel with a minimum of ten years of relevant experience in their field (this may be inclusive of post-graduate studies).

12.1.8 Specialist staff shall be available, at 24 hours' notice, for the duration of the works to provide advice on any specialist tasks to be undertaken.

12.1.9 Based on the current programme it is anticipated that the following maximum staff will be required.

- C10055 – 1 Project Officer, 1 Supervisor 3 archaeologists. 1 Civils site manager, 2 labourers, 4 plant ops. Additional specialists (eg geoarchaeologists, environmental and finds) as necessary.

12.1.10 The archaeological contractor will provide a resource plan indicating the distribution of the staff resources across the duration of the site work. The resource plan can be found in Appendix 5.

13 Change Control

13.1.1 During the course of the archaeological investigation unexpected, complex or undated archaeological remains may be encountered. In order to inform the decision making process and to minimise delays to the enabling works construction programme it may be necessary to implement a contingency or vary the methodology or extent of the archaeological investigation.

13.1.2 The GWSI:HERDS establishes the need to manage unexpected discoveries and regularly review ongoing fieldwork events (Sections 7.6.5 and 7.6.17) (HS2 Document no.: HS2-HS2-EV-STR-000-000015). In order to promote rapid decision making and to minimise delays a clearly defined change control process will be followed. This change control process will enable:

- rapid decision making during historic environment investigations;
- the implementation of contingencies;
- the variation of methodologies being used on site;
- the localised extension of investigation areas: and
- the rapid implementation of mitigation measures.

13.1.3 The change control process will be recorded using the proforma *Historic Environment Fieldwork Change Control Acceptance Sheet* at Appendix 3 of this LSWSI and will comprise the following steps:

1) The *Archaeology Contractor* will:
   - prepare an interim summary of the investigation results noting key features or elements of the archaeological remains or structure;
   - provide a proposal for the variation to the works or methodologies; and
   - suggest any new or existing HERDS objectives to which the variation may provide opportunities for knowledge gain;
2) The interim summary will be submitted to the *Contractor's Historic Environment Manager* who will disseminate the results and arrange a meeting on site with the *Employer's Historic Environment Manager* and local authority (stakeholder) archaeologist;
3) At the site meeting all parties will:
   - review the nature, extent and significance of the archaeological remains;
   - review and agree the proposed variation to the works; and

- signify their endorsement or approval of the variation by signing the *Historic Environment Fieldwork Change Control Acceptance Form.*
- at the end of the site meeting the *Contractor's Historic Environment Manager* will instruct the *Archaeological Contractor* to implement the variation to the works.

4) Following the site meeting the *Contractor* will submit a copy of the completed the *Historic Environment Fieldwork Change Control Acceptance Form* to the *Employer* via eB.

14 Fieldwork sign off sheet

Historic Environment Fieldwork Sign-off Sheet			
Work Package Reference			
Historic Environment Investigation Type			
Contractor			
Fieldwork Conducted by (Site Director)		Dates	
Summary of Results			
Document References			
1.			
2.			
3.			
4.			

Compiled by	Name	Date	Signature
Checked by	Name	Date	Signature
Approved by	Name	Date	Signature

15 References

15.1 References

Title	Reference
HS2 Phase One Environmental Statement and Supplementary Environmental Statements	ES 3.5.2.7.4 ES 3.5.2.7.5 ES 3.5.2.7.6 CH-001-007 CH-002-007 - ES 3.5.2.7.4 CH003-007 CH004-007 CH001-006 CH002-006 CH004-006
HS2 Cultural Heritage GIS Specification	HS2-HS2-GI-SPE-000-000004
HS2 Cultural Heritage GIS Standard	HS2-HS2-GI-STD-000-000002 HS2-HS2-GI-STD-000-000010
HS2 Standard Template for Reports	HS2-HS2-PM-TEM-000-000004
HS2 Technical Standard Specification for Historic Environment Investigations	HS2-HS2-EV-STD-000-000035
HS2 Employer's Technical Standard - Route wide soil resources plan	HS2-HS2-EV-STD-000-000008
HS2 Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy	HS2-HS2-EV-STR-000-000015
HS2 Employer's Technical Standard – Temporary Works	HS2-HS2-CV-STD-000-000005
HS2 Human remains and monuments procedure	HS2-HS2-EV-PRO-0000-000008
British Geological Survey, Geology of Britain viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html	BGS Online
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Fusion 2018b HS2 Phase 1 Central Section, Archaeological Works, Harvil Road Woodland, LB Hillingdon. Site Code 1C17HRWTT Trial Trench Report	1EW03-FUS-EV-REP-CS01_CL01-007806
Fusion 2019 1EW03 - Enabling Works Central AWH – Fieldwork Report for Test Pit and Trial Trench Evaluation (Phase 1) at Dews Farm, Colne Valley, South Embankment (AC100/3) 1C18CVDTT	1EW03-FUS-EV-REP-CS01_CL01-0121081
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Interim Report for trial trenching at 18 inch pipe – spur, 450NB Pipeline Diversion (007) Fulmer to Haste Hill	1EW02-CSJ-EV-REP-S002-000018

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Wessex Archaeology, 2006, Units 300/305,310/315/320/325 and 400, Riverside Way, Uxbridge, London Borough of Hillingdon Archaeological Evaluation Report Unpublished client report ref 59990.02	WA 2006

15.2 List of acronyms

AIMS	Asset Information Management System
ANA	Archaeological Notification Area
ASZ	Archaeological Sub-Zone
BGS	British Geological Survey
CCB	Consolidated Construction Boundary
CFA	Community Forum Area
CIfA	Chartered Institute for Archaeologists
DDBA	Detailed Desk Based Assessment
ES	Environmental Statement

GIS	Geographical Information Systems
GNSS	Global Navigation Satellite System
GWSI: HERDS	Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy
HER	Historic Environment Record
KC	Knowledge Creation
LSWSI	Location Specific Written Scheme of Investigation
NGR	National Grid Reference
OASIS	Online Access to the Index of archaeological investigations
PDF	Portable Document Format
QA	Quality Assurance
RTK	Real Time Kinematic
TBM	Temporary Bench Mark

16 Glossary of Terms

1.1.1 The following terms have been used in this report:

- Archaeological Contractor – the organisation undertaking the specific historic environment works for the Contractor.
- Contractor – Fusion; the organisation undertaking the Enabling Works for Area Central on behalf of the Employer.
- Detailed Desk Based Assessment (DDBA) – analytical document that builds on the information gathered previously in the Environmental Statement to address particular issues, questions or uncertainties within a given area. It may be developed to provide a more detailed understanding of the resource in an area to inform design development or construction programming.
- Employer – HS2 Ltd, the organisation responsible for delivery of HS2 Phase One Scheme and all terms and conditions, policies and procedures, and payments.
- Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI:HERDS) – the framework for delivering all historic environment investigations undertaken as part of the HS2 Phase 1 programme.
- Location – a specific HS2 worksite or group of worksites that are being addressed as a combined historic environment investigation programmed of assessment, evaluation and investigation.
- Location Specific Written Scheme of Investigation (LSWSI) – specification document assembling one or more Project Plans within an area of land defined primarily for construction programme purposes. The LSWSIs will be agreed with the *Employer*'s *Project Manager* and would provide a costed and programmed approach to delivering outcomes.
- MWCC – Main Works Civils Contractor, the organisation undertaking construction of the railway within Area Central, Sector C1 on behalf of the Employer.
- Project Plans – specification document for each specific package of activity (e.g. a survey, desk-based assessment, excavation, recording project). The plans would respond to the Specific Objectives set out in the GWSI: HERDS and be delivered within an agreed budget.
- The Sites - the two areas (C10046 and C10047) to be subject the Archaeological Recording detailed in this Project Plan.
- Works – the specific historic environment assessment, evaluation or investigation

works at each location.

17 Figures

17.1.1 The following figures are included in Appendix 4

Figure title	Drawing No.
Figure 1 Site Location	1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009_1
Figure 2 Scheme design	1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009_2
Figure 3 Location of compound and spoil tips	1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009_3
Figure 4 Overheads line	1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009_4

18 Appendices

18.1 Appendix 1 - Project Plans

Document Number	Project Plan	Status
1EW03-FUS-EV-REP-CS01_CL01-012002 C02	1EW03—Project Plan for Test Pit and Trial Trench Investigations for Dews Farm Colne Valley South Embankment (AC100/3)	Code 1 accepted
1EW03-FUS-EV-REP-CS01_CL01-012114_C01	1EW03 – Enabling Works Central, AWHf - Project Plan for Archaeological Recording at Dews Farm, Colne Valley South Embankment (AC100/24)	Code 1 Accepted

18.2 Appendix 2 - Fieldwork Change Control Acceptance Sheet

Historic Environment Fieldwork Change Control Acceptance Sheet	
Site Code:	
Site Name:	
Historic Environment Investigation Type:	
Contractor:	
Project Plan Doc. No.:	
LSWSI Doc. No.:	
Summary of Results	
Fieldwork Director:	Date:
Description of Proposed Change:	

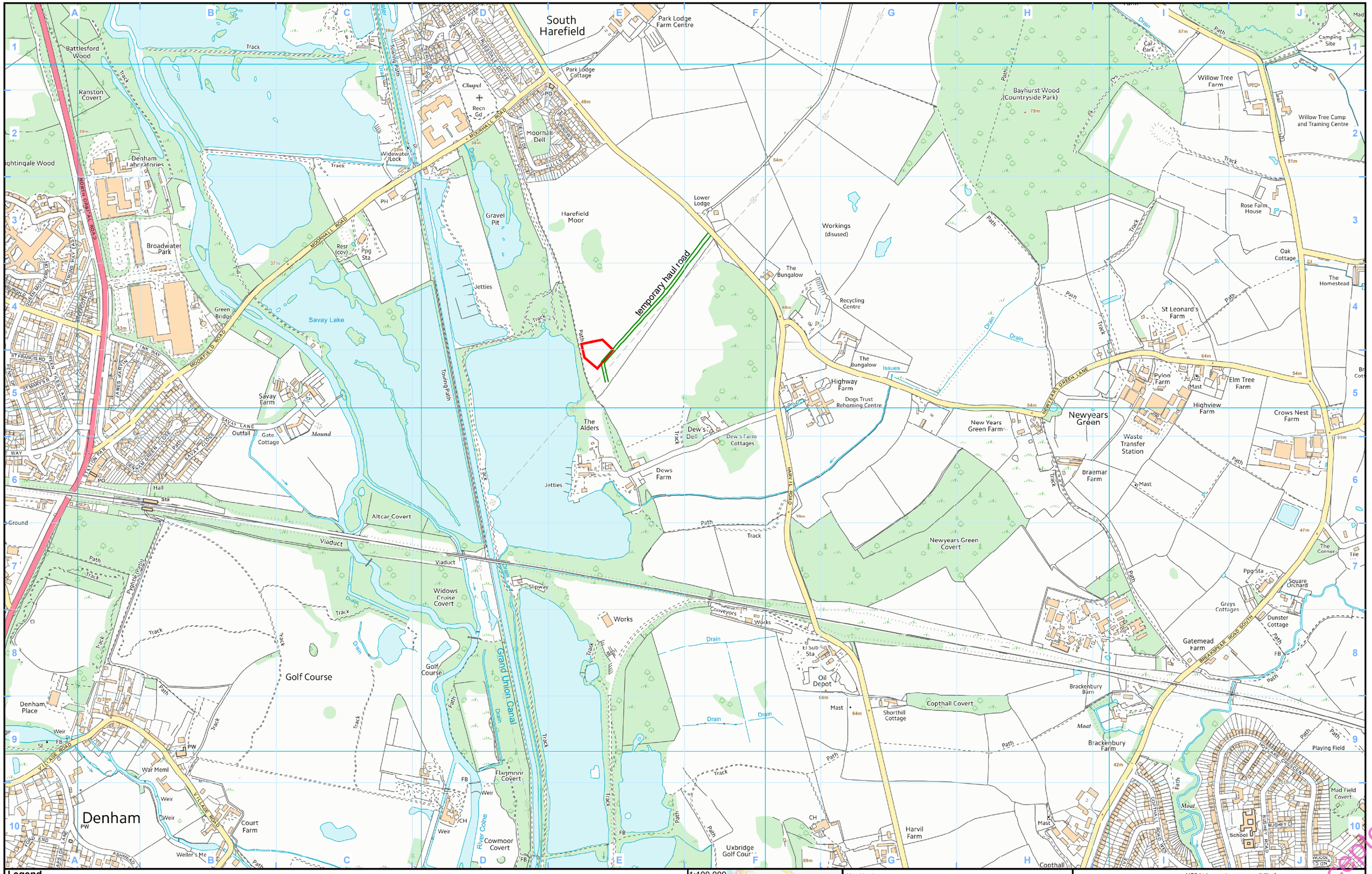
Drawing / Sketch:

Change type: (Delete as applicable)	Implementation of Contingency	Variation of Methodology	Rapid Investigation	Extension of Investigation Area

Proposed HERDS Objectives:

Compiled by: (Archaeological Contractor)	Name	Date	Signature
Checked by: (Contractor)	Name	Date	Signature
Consultation with: (Stakeholder Archaeologist)	Name	Date	Signature
Approved by: (HS2 Historic Environment)	Name	Date	Signature

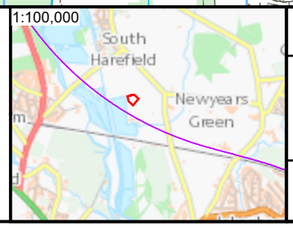
18.3 Appendix 3 - Figures



Legend

Project Plan Area (C10055)

1:100,000



Map Number
1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009

Map Name
Figure 1 Site Location

Community Forum Area 07:
Colne Valley

HS2

HS2 Ltd accept no responsibility for any circumstances, which arise from the reproduction of this map after alteration, amendment or abbreviation or if it is issued in part or issued incomplete in any way.

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Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

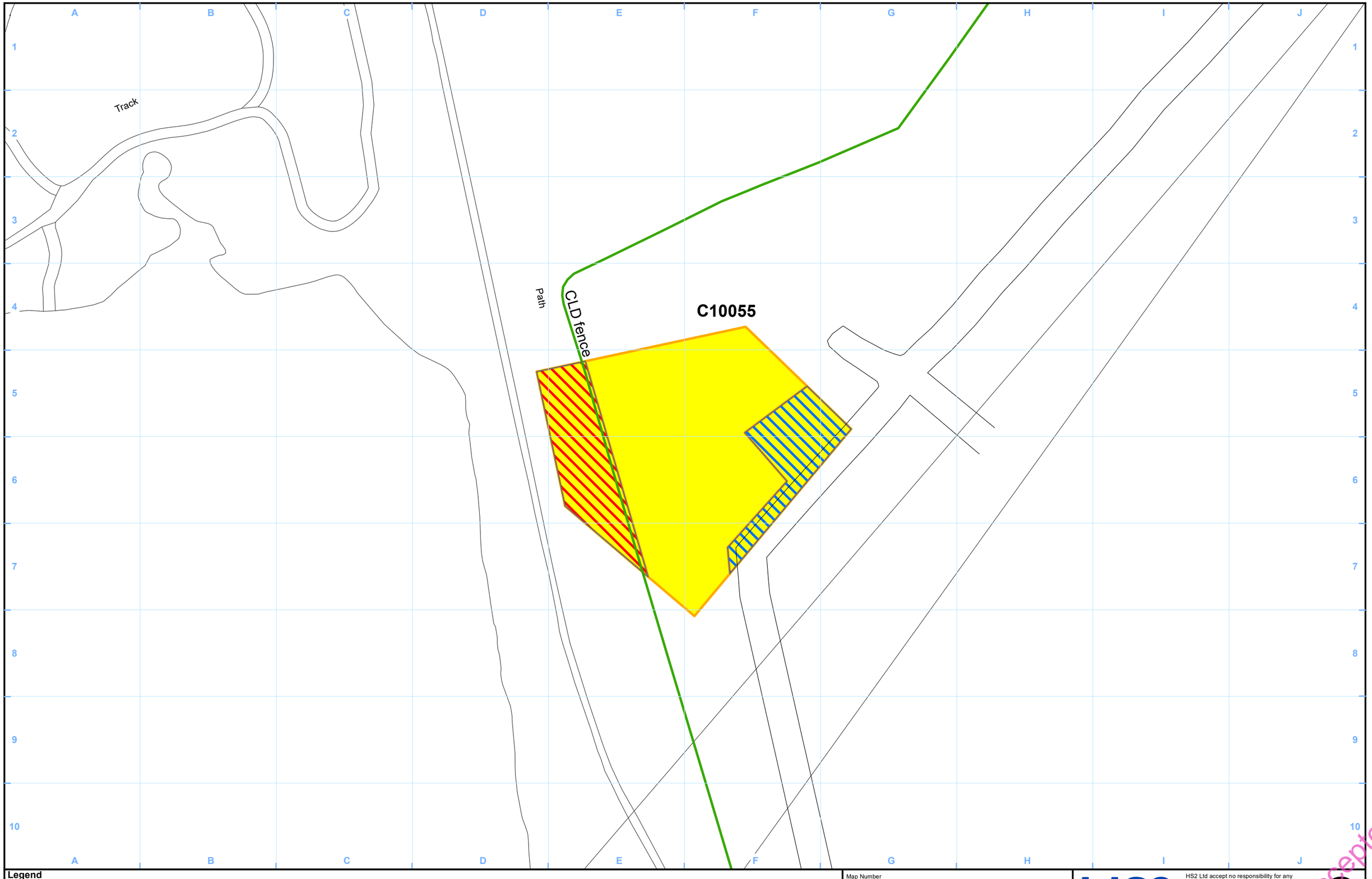
Doc Number: Figure 1

This figure forms part of report 1EW03-FUS_MHI-EV-REP-CS01_CL01-000010

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Date: 05/01/21



Legend

- CLD fence

C10055 Project Plan Area

- Excluded
- Proposed
- Initially excluded

Map Number
1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009

Map Name
Figure 2 Scheme design

Community Forum Area 07:
Colne Valley

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Scale at A3: 1:1,000

0 10 20 30 40
Metres

Doc Number: Figure 2

This figure forms part of report 1EW03-FUS_MHI-EV-REP-CS01_CL01-000010

Date: 05/01/21

CLD fence

Subsoil

C10055

Plant site access

Pedestrian access

Tool store

EC07

EC010 (Male toilets)

EC010 (Female toilets)

Drying room

Drying room

Plant storage area

Ped barrier storage area

FB

SK

Loading and unloading area

Site vehicle access

Topsoil

Legend

- spoil tip
- CLD fence
- **C10055**
- Excluded
- Proposed
- Initially excluded
- Trackmatted compound
- Unmatted area
- Fencing
- Pedestrian barrier
- Car park
- Loading unloading area
- ECO10 welfare
- ECO7 welfare
- Tool store
- Drying room
- Waste bin
- Recycle bin
- First Aid point
- Fire extinguisher
- Muster point
- Smoking Area
- Spill kit
- Fuel bowser

Map Number
1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009

Map Name
Figure 3 Location of compound and spoil tips

Community Forum Area 07:
Colne Valley

HS2

Scale at A3: 1:500

0 5 10 15 20
Metres

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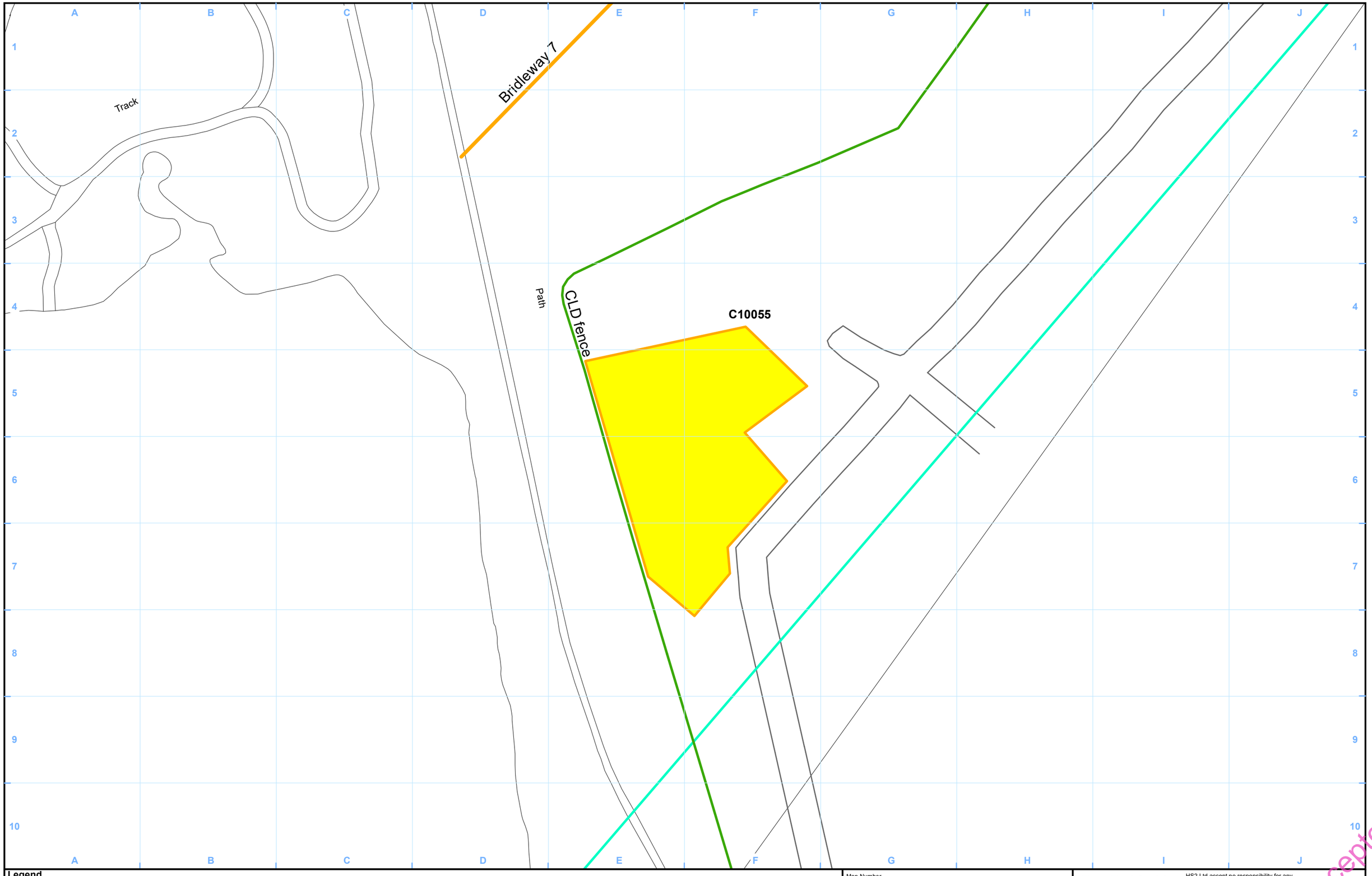
Doc Number: Figure 3

This figure forms part of report 1EW03-FUS_MHI-CL-PLN-CS01_CL01-000003

Date: 05/01/21



Legend

- Proposed extent of C10055
- overhead line
- CLD fence

Map Number
1EW03-FUS_MHI-GI-MAP-CS01_CL01-000009

Map Name
Figure 4 Overheads line

Community Forum Area 07:
Colne Valley

HS2

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Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,000

0 10 20 30 40
Metres

Doc Number: Figure 4

This figure forms part of report 1EW03-FUS_MHI-CL-PLN-CS01_CL01-000003

Date: 05/01/21

18.4 Appendix 4 – 3D Finds recording proforma

3D Finds recording sheet – Dews Farm, C10046

Site code - 1C19CVDAR

Date, initials	Find ID - Δ	Square E - XXX...	Square N - XXX...	Spit	Context	Material	L-axis dir/dip	Tr-axis dir/dip	Description (+ details of any excavation damage)	Max L - mm
		...	...				/	/		
		...	...				/	/		
		...	...				/	/		
		...	...				/	/		

18.5 Appendix 5 – Resource Plan

ORDER INSTRUCTION; MHI-FW-004 (HS2EWC / 00252)	**0 days**	**Wed 26/08/20**	**Wed 26/08/20**	
CONTRACT COMPLETION SUMMARY (32 WEEKS)	**163 days**	**Wed 26/08/20**	**Fri 09/04/21**	
Prelims (Document production)	**21 days**	**Wed 26/08/20**	**Wed 23/09/20**	1
Prepare documentation and plans	30 days	Wed 26/08/20	Tue 06/10/20	
Access date (indicative)	**0 days**	**Mon 11/01/21**	**Mon 11/01/21**	5
Mobilisation	10 days	Mon 11/01/21	Fri 22/01/21	
Set up compound	5 days	Mon 11/01/21	Fri 15/01/21	
Mitigation excavation	**25 days**	**Mon 18/01/21**	**Fri 19/02/21**	
Maintain compound	35 days	Mon 11/01/21	Fri 26/02/21	10
Mechanical Excavation	5 days	Mon 18/01/21	Fri 22/01/21	10
Archaeological excavation/recording	15 days	Mon 25/01/21	Fri 12/02/21	10
Excavation backfilling	5 days	Mon 15/02/21	Fri 19/02/21	
Complete backfilling	0 days	Fri 19/02/21	Fri 19/02/21	15
Demobilisation	**5 days**	**Mon 22/02/21**	**Fri 26/02/21**	
Remove compound, plant and materials from site	5 days	Mon 22/02/21	Fri 26/02/21	
MHI offsite	0 days	Fri 26/02/21	Fri 26/02/21	
Processing and Lab Works	**10 days**	**Mon 15/02/21**	**Fri 26/02/21**	
Processing finds/enviro material	10 days	Mon 15/02/21	Fri 26/02/21	
Complete processing	0 days	Fri 26/02/21	Fri 26/02/21	
Reporting	**45 days**	**Mon 01/03/21**	**Fri 30/04/21**	
Interim (Key Findings) Report	10 days	Mon 01/03/21	Fri 12/03/21	
Complete Interim Report	0 days	Fri 12/03/21	Fri 12/03/21	
Summary Report	5 days	Mon 05/04/21	Fri 09/04/21	27
Survey Report	5 days	Mon 01/03/21	Fri 05/03/21	27
Fieldwork Report	30 days	Mon 01/03/21	Fri 09/04/21	27
Complete Fieldwork Report	0 days	Fri 09/04/21	Fri 09/04/21	