1EW03 - Enabling Works Contract

AWHf Project Plan for a Trial Trench Evaluation at Three Bridge Mill Twyford Buckinghamshire AC250

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1 Executive Summary

1.1.1 This Project Plan details the proposed methodologies, techniques and deliverables for an archaeological trial trench evaluation at Twyford, to the south of Three Bridge Mill, Buckinghamshire (hereafter referred to as 'the site'; Figure 1). The evaluation encompasses two parcels of land: C25077 (2.38ha) and C25082 (5.36ha) which in total comprise an area of 7.74ha. These land parcels are centred on NGR 467013, 226479. Only 5.95ha of the site will be evaluated due to a number of constraints including the presence of an otter holt, services and a watercourse.

1.1.2 The site is located in Buckinghamshire, and within the Calvert, Steeple Claydon, Twyford and Chetwode Community Forum Area (CFA 13). The evidence suggests there is a potential for the site to contain archaeological remains of prehistoric, Saxon, medieval and post-medieval date. A possible enclosure with associated linear features was identified within western parcel C25077 of the site. The date of these features is unknown, but they may be Saxon or medieval in date as a number of medieval earthworks and an 11th century enclosure have been identified nearby. Alternatively, they may be prehistoric in date as this area is situated on a gravel terrace above the floodplain. These features appear to be overlain by the later ridge and furrow. Further linear features have also been identified within land parcel C25082. The date of these features is unknown, and they will be tested during the evaluation. Land parcel C25077 has a higher potential for archaeological features as this area appears to have been used for pasture in the 20th-21st century, whereas the eastern parcel of the site C25082 appears to have been heavily ploughed.

1.1.3 The trial trench evaluation is required to identify the location, extent, survival and significance of any heritage assets of archaeological interest within the site (Figure 2) and will contribute to the following specific GWSI: Historic Environment Research and Delivery Strategy (HERDS) objectives:

- KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age.
- KC15: Can we identify regional patterns in the form and location of Late Bronze Age and Iron Age settlements across the route, and are there associated differences in landscape organisation and enclosure?
- KC31: Identify the location of Middle to Late Saxon settlement, explore processes of settlement nucleation and understand the development of associated field types and agricultural regimes.
- KC35: Investigate the impacts on rural communities of social and economic shocks in the mid-14th century and thereafter and their contribution to settlement desertion.
- KC40: Identify patterns of change within Medieval rural settlement from the 11th to

mid-14th century.

- KC47: Test and develop geophysical survey methodologies.
- KC49: Ground truth and develop multispectral and LiDAR prospection techniques.

1.1.4 The purpose of this Project Plan is to:

- define the scope of work for trial trench investigation;
- outline the aims of the investigations and how they will contribute to the specific objectives of the GWSI: HERDS;
- describe the methodology to be employed across the site; and
- set out the proposed deliverables and reporting mechanisms.

2 Scheme Design Element Impacts

During the main phase of works the site will be used by the HS2 rail alignment formation and associated earthworks. In addition, the western parcel of the site C25077 will be used for an ecological mitigation pond and part of the eastern area of the site will be used as a stockpile area and for several access roads. The location for the evaluation has been selected to address construction programme risk to land required for the proposed development.

3 Location / Site Background

3.1 Site Location

3.1.1 The evaluation encompasses two areas measuring in total 7.74ha: C25077 (2.38ha) and C25082 (5.36ha) within the Calvert, Steeple Claydon, Twyford and Chetwode Community Forum Area (CFA 13). The westerly land parcel of the site (C25077) is located within Archaeological Sub-zone (ASZ): ASZ 13-14 which is an area of fields north of Portway Road located on a slight south-facing slope. This area has a regular pattern of field boundaries suggests a planned programme of enclosure. This part of the site is close to the medieval village of Twyford and there is the potential for agricultural evidence dating from this period. There are also medieval village earthworks in this zone (CAL044, CAL050) which suggest that Twyford is a shrunken medieval village. The eastern parcel of the site (C25082) located within Archaeological Sub-zone (ASZ): ASZ 13-17 which is an area that contains Padbury Brook to the north of Twyford. This area has small regular fields indicative of planned enclosure. This ASZ also includes the site of a medieval mill, and there is potential for both redeposited Palaeolithic remains in the gravels and palaeoenvironmental remains to be 'sealed in' by alluvium.

3.1.2 The site is located on part of a slightly raised plateau at 86m aOD located east of a tributary flowing into the Padbury Brook to the north Land parcel C22077 is located adjacent to this steam and slopes down westwards towards it (to around 84m aOD). Land parcel C25082 is located on the eastern part of the slightly raised plateau.

3.2 Baseline Information

3.2.1 The information presented below has been derived from the Environmental Statement, prepared in 2013, Buckinghamshire Historic Environment Record (HER) data updated in August 2018, and results of the surveys undertaken within the site and in its environs, i.e. geophysical survey (report unavailable at the time of writing) and LiDAR survey (ES.3.4.5.13.7).

3.2.2 No designated heritage assets are recorded within the site. There are nine listed buildings located within the village of Twyford, one Grade I listed and eight Grade II listed. The Grade I listed building is the 12th century Church of St Mary (List Entry 1215009) is located 230m north-west of parcel C25077 of the site and its associated churchyard is 120m north-west of the site. The closest listed building to the site is the Grade I listed Old Post Office (List Entry 1215016) which is located 160m west of parcel C25077 of the site (Figure 2).

3.2.3 There are several Archaeological Notification Areas (ANA) as designated by Buckinghamshire HER in the vicinity of Twyford and the site. Land parcel C25077 is located within an ANA that contains extant ridge and furrow. There are a number of areas to the west, north-east, east and south of Twyford that are designated as an ANA for surviving ridge and furrow. There are also three ANAs around Twyford that contain evidence for medieval earthworks. This suggests that Twyford is shrunken medieval village and the settlement may have been larger in the medieval period than the present day (Figure 2).

Previous investigations

3.2.4 The site has been subjected to several non-intrusive surveys relating to the HS2 works. The non-intrusive HS2 investigations dating to 2013 were used to construct the gazetteer for the Environmental Statement. The findings of the Environmental Statement are shown on Figure 2 as series of designated and non-designated heritage assets. The non-designated assets have a reference starting with CAL (e.g. CAL044). In addition, a geophysical survey was undertaken on the site itself in 2017 and 2018 and the results from this are discussed below (Figure 5). No previous intrusive archaeological investigations have been undertaken on the site.

Environmental Statement 2013 Remote Sensing Survey

3.2.5 A remote sensing survey incorporating light detection and ranging (LiDAR), hyperspectral imagery and aerial photographic analysis of the site was conducted as part of the 2013 Environmental Statement (ES 3.5.2.13.7). The results of this survey are shown on Figure 4. The results showed that extant ridge and furrow was present within several fields of the site which is aligned north-south.

Geophysical Surveys in 2018

3.2.6 A part of the Hs2 works a geophysical survey was undertaken across the site in 2018 by Connect (Survey Report Doc. No.: 1EW03-FUS-EV-REP-CS06_CL09-007287; Figure 5). The results of the geophysical survey are discussed below. Across C25082, a probable linear settlements was identified, with trackways, rectilinear enclosures, smaller enclosure and pit like anomalies, located on an elevated position on river terrace gravels. In C25077, possible remains which could be relating to a former smithy or medieval water mill have been identified alongside with remains potentially related to the medieval village of Twyford, including a possible trackway and enclosures.

Site stratigraphy

3.2.7 The British Geological Survey (BGS) records the underlying geology as Peterborough Member (mudstone) formed 164 to 166 million years ago in the Jurassic Period. The majority of the site is located on a plateau of River Terrace Deposits (sand and gravel) formed up to 3 million years ago in the Quaternary Period. The western part of land parcel C25077 of the site may be located on Quaternary alluvial deposits of clay, silt, sand and gravel associated with the tributary of the Padbury Brook (Figure 3) (British Geological Survey 2019). The local soil type of the site is slowly permeable seasonally wet, slightly acid but base-rich loamy and clayey soils (Cranfield Online 2019).

Prehistoric (500,000 BC - AD 43)

3.2.8 The site is located to on alluvial and gravel terrace deposits associated with a tributary of the Padbury Brook. The terrace gravels associated with the Brook may preserve Pleistocene and Palaeolithic remains as faunal remains of this date have been recorded within gravels near the Padbury Brook, at Steeple Claydon and Twyford. The remains of at least three rhinoceros, a mammoth and a type of elephant were recorded from a gravel pit near Three Bridge Mill (CAL048) located 500m north-east of land parcel C25082. It has been suggested that these artefacts were located in an area of probable gravel extraction as defined by several ponds on the 1950s OS maps (Farley 2014, 11). Another gravel pit (CAL041) located 600m east of land parcel C25082 recorded mammoth bones and teeth.

3.2.9 The terrace gravels of the Padbury Brook may also provide evidence of Palaeolithic artefacts, but the heavy clay of the wider area does not produce significant quantities of raw material for early tool production.

3.2.10 The site may have been part of an area that would have been suitable for later prehistoric settlement, adjacent to a tributary of the Padbury Brook. A possible later prehistoric enclosure (CAL075) has been suggested from cropmarks east of Godington (2.4km north-west of the site) and adjacent to the Padbury Brook.

3.2.11 A number of anomalies, which have been interpreted as possible archaeological remains, have been identified across both areas of the site in the geophysical survey report. Within C25082

these include north-south and east-west linear anomalies, indicative of enclosures or field systems, as well as further weaker responses which could include rectilinear or curvilinear enclosures, and two potential linear trackways, which continue to the fields to the east and west (Doc. No.1 EW03-FUS-EV-REP-CS06_CL09-00728). In C25077, positive linear trends which could be possible archaeological features, such as former structures or enclosures. As these features cannot easily be seen on the LiDAR (Figure 4) it is likely that they pre-date the ridge and furrow. It is possible that these features date from the later prehistoric, Saxon or medieval period.

Romano-British (AD 43–410)

3.2.12 The site lies c. 5.5km east of the Roman road from Alcester (Bicester) to Towcester which follows the line of the present A4421 for part of its route. No Roman remains have been found within the site although a Late Iron Age to Roman settlement was found during HS2 works at Calvert located 1.5km south-east of the site. The evidence for this settlement included a trackway, enclosure ditches and field systems and appears to indicate settlement activity during the Late Iron Age to the mid-4th century AD. This previously unknown Roman site indicates that there may be additional later prehistoric/Roman settlements in the area (Hs2 2018) and it cannot be ruled out that some of the possible archaeological remains revealed in the geophysical survey could date to the Roman period..

Early Medieval (AD 410–1066) and Medieval (AD 1066–1540)

3.2.13 A number of medieval villages in the wider area are likely to have been founded as Saxon settlements. This includes the settlements of Twyford, Steeple Claydon, Preston Bissett, Godington, Chetwode and Barton Hartshorn which are all recorded in the Domesday Book of 1086. This area is likely to have been partly wooded during the Saxon period as part of the Forest of Bernwood. This woodland was designated as a royal forest following the Norman Conquest and after the 12th century the size of the forest contracted. The area of woodland around Chetwode was largely deforested by the end of the early medieval period. The southern part of Community Forum Area (CFA 13) remained part of the Royal Forest of Bernwood throughout much of the medieval period although this does not mean the whole area was covered in trees.

3.2.14 Twyford was founded before the Norman Conquest and the Domesday Book records Twyford as having had 34 households and 18 ploughlands, 3 ploughs of meadow and woodland with 100 pigs. The mention of woodland suggests that part of the parish was partly wooded in the late 11th century (Palmer 2019). The name Twyford means 'two fords' likely referring to the crossing points over both the Padbury Brook and Mill Stream to the north-west of the village. The medieval settlement of Twyford (CAL059), located 100m west of land parcel C25077 of the site, was located on the westerly gravel terrace above the floodplain of the Padbury Brook and associated tributaries. The village is centred on the 12th century Grade I listed Church of St Mary (List Entry 1215009) and the nearby manor house. The original manorial settlement

was likely to have been located near the 15th century Grade II listed St Mary's House (List Entry 1288292). A large number of earthworks (CAL051, CAL052) have been identified directly north and east of the church including a possible building, house platforms, holloways and fishponds. The nearest set of earthworks to the site (CAL051) are located 60m west of land parcel C25077. An evaluation east of the churchyard and 130m west of land parcel C25077 of the site (Figure 2) confirmed the presence of ditches, forming an enclosure around a raised platform, with pottery dating the abandonment of this enclosure to the 11th-13th centuries (possibly representing the Late Saxon settlement or manorial complex; John Moore Heritage Services 2013). Further earthworks (CAL050) including house platforms, holloway and enclosures have also been recorded 130m south-west of land parcel C25077 of the site and also to the west of Twyford (CAL054). A moated site (CAL044) was identified at Allen's Ground located 400m south of land parcel C25082 of the site but this may have now have been destroyed.

3.2.15 The 2018 geophysical survey of the site identified archaeological remains that could be Saxon or medieval in date (Doc. No. 1EW03-FUS-EV-REP-CS06_CL09-007287). In the western land parcel (C25077), the geophysical survey identified a possible enclosure or series of ditches located directly east of the tributary. As these features cannot easily be seen on the LiDAR (Figure 4) it is likely that they pre-date the ridge and furrow and could perhaps be Late Saxon or medieval in date as they are located only 120m east of the late Saxon/medieval manorial complex of Twyford. Anomalies recorded across C25082 could potentially represent part of a co-axial field system of later prehistoric, Roman or Saxon in date.

3.2.16 A number of areas of extant ridge and furrow have been identified around the village of Twyford from the remote sensing survey. Further analysis of LiDAR from the Environment Agency suggest that the majority of fields in the parish of Twyford have extant or levelled ridge and furrow. This suggests that much of the area is likely to have been deforested during the medieval period. Within the site, as the ridge and furrow appears to overlie the enclosure anomalies identified in the geophysical survey, it appears that land use within the site changed in the medieval period to agriculture.

3.2.17 The geophysical survey and LiDAR identified remains of ridge and furrow to the east of parcel C25077, aligned north-south (earthworks were also encountered in the site visit). The areas of the best surviving ridge and furrow around Twyford have been designated as Archaeological Notification Areas (ANA) by Buckinghamshire HER (Figure 2). There is no ridge and furrow recorded to the west of land parcel C25077 and this is perhaps because this is an area of alluvium and would have been more likely used as meadows (with arable cultivation of higher, drier ground).

3.2.18 Within land parcel C25082 the ridge and furrow (Figure 4) appears to have been partly levelled through ploughing although faint traces can be seen in a north-south alignment.

3.2.19 Twyford Mill is a Grade II listed 19th century building located 1.2km north-west of the site (List Entry 1215012). This building may have been the site of a medieval mill. A second medieval mill was likely to have been located at Three Bridge Mill (CAL047), located 130m north of land parcel C25082 and documentary evidence suggests it may have been recorded in 1252 and it certainly appears to have been extant by 1469.

Post-medieval and modern (1540 – present)

3.2.20 During the post-medieval period it is very likely the site was used for agricultural purposes associated with the nearby settlement of Twyford. The settlements of Twyford and Charndon were enclosed by Act of Parliament in 1774. The medieval open fields were divided into smaller, more regular fields including the fields within the southern part of land parcel C25082 of the site. The OS map of 1880 shows the regular fields to the south of land parcel C25082 that are very likely to post-date enclosure (Figure 6). The geophysical survey report (Doc. No.1 EW03-FUS-EV-REP-CS06_CL09-00728) suggested that across C25077, positive magnetic trends could be associated with a former smithy depicted on late 19th century maps.

3.2.21 The biggest change to the character of the area around Twyford was the construction of the Great Central Railway in 1899. Both land parcels of the site are located either side of this former railway. Two railway overbridges associated with the Great Central Railway are located adjacent to both parts of the site. One bridge, likely a footbridge (CAL046) is located 100m east of land parcel C25077 and the other bridge (CAL045) is located directly east of land parcel C25082. This railway line ceased to operate in the 1960s and was subsequently dismantled.

3.2.22 After the Great Central Railway line had been dismantled a sewage works was constructed west of land parcel C25082. An access road to the sewage works was created through land parcel C25082.

Previous disturbance

3.2.23 The site appears to have remained in agricultural use during the post-medieval period and this may have continued from a medieval agricultural use of the site. The LiDAR survey indicated the presence of a ridge and furrow orientated north-south within the eastern part of land parcel C25077. These may be indicative of medieval or earlier use of the landscape, but the surviving earthworks indicate limited modern impacts.

3.2.24 Aerial photography indicates that the eastern parcel of the site (C25082) appears to have been ploughed and ridge and furrow can only be faintly seen in this area on a north-south alignment so may have been levelled. This suggests that modern ploughing may have truncated the ridge and furrow in this area and in addition it may have damaged upper horizons of other buried archaeological features.

3.2.25 The construction of the Great Central Railway in 1899 may have caused some disturbance of earlier features. For example the landscaping for the road bridges may have required the excavation and removal of soil and other areas may have been landscaped.

3.2.26 The construction of the late 20th century sewage works to the west of land parcel C25082 required the construction of an access road through this part of the site. This track may have disturbed archaeological features within the footprint of this road.

3.2.27 The HS2 aerial photograph of the site, captured in 2012-2014 indicates that western part of land parcel C25077 may have been used for stockpiling or dumping waste material. This area of land measured 40m x 30m. This may explain why the geophysical survey of this area of land parcel C25077 of the site was not effective, as the results may have been obscured by waste material. This area, west of land parcel C25077 is also situated on alluvium and so this area is unlikely to have been used for arable farming.

3.2.28 The 2019 aerial photography (Google) shows a linear section of disturbed ground (aligned NE-SW) extant on the eastern parcel of the site (C25082). The purpose of this is unclear, but it may have been created as part of the service realignment works prior to the main HS2 works. These works may have disturbed or damaged archaeological features or finds within its footprint. This linear scheme may be part of a gas pipeline realignment and therefore it has been added as a constraint to the scheme design.

4 Aims and Specific Objectives

4.1 Need and Aims

4.1.1 The trial trench evaluation is required to determine, as far as reasonably possible, the nature of the archaeological resource within the site. The evidence suggests there is a potential for the site to contain archaeological remains of prehistoric, Saxon, medieval and post-medieval date. A possible enclosure with associated linear features was identified within western parcel C25077 of the site. The date of these features is unknown, but they may be Saxon or medieval in date as a number of medieval earthworks and an 11th century enclosure have been identified nearby. Alternatively, they may be prehistoric in date as this area is situated on a gravel terrace above the floodplain. These features appear to be overlain by the later ridge and furrow. Further linear features have also been identified within land parcel C25082. The date of these features is unknown. Land parcel C25077 has a higher potential for archaeological features to survive well as this area appears to have been used for pasture in the 20th-21st century, whereas the eastern parcel of the site C25082 appears to have been heavily ploughed.

4.1.2 The objective of the investigation is to identify the extent and character of any surviving archaeological remains within the site and to inform an archaeological resource assessment of its knowledge value and ability to contribute to Specific Objectives. The outcomes of the

investigation will be used to inform the requirement and strategy of further archaeological investigation. Where present the investigation will define the character, extent, quality, preservation and significance of the archaeology in order to determine its potential to contribute to Specific Objectives set out in the GWSI: HERDS.

4.1.3 The aims of the trial trenching evaluation are:

- to confirm the presence/absence, extent and depth of any surviving archaeological remains within the site;
- to determine the nature, date, condition, state of preservation, complexity and significance of any archaeological remains;
- to determine the likely range, quality and quantity of artefactual and environmental evidence present;
- suggest measures, if appropriate and feasible, for further archaeological investigation to mitigate identified significant impacts; and
- contribute to the delivery of GWSI: HERDS Specific Objectives as specified in Section 4.2.

4.2 Contribution to Specific Objectives

4.2.1 Through delivery of the works set out in Section 5 and through addressing the aims set out in 4.1, the trial trench evaluation will create knowledge and outputs that would contribute to the following specific objectives in the following ways:

Table 1 Contribution to HERDS Objectives

Specific Objective	Contribution
KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age	There is potential for Mesolithic, Neolithic and Early Bronze Age ephemeral settlement activity at such a location on a terrace above a watercourse, particularly if there are also alluvial deposits. The evaluation may have the potential to encounter remains associated with early prehistoric activity.
KC15: Can we identify regional patterns in the form and location of Late Bronze Age and Iron Age settlements across the route, and are there associated differences in landscape organisation and enclosure?	A possible enclosure and a number of linear features were identified on both parts of the site and these may be later prehistoric in date. Evaluating these features with trial trenches will hopefully give some indication of their nature and date.
KC31: Identify the location of Middle to Late Saxon settlement, explore processes of settlement nucleation and understand the development of associated field types and agricultural regimes	The location of the 11th century settlement of Twyford is thought to have been located west of the site but it may have extended over the western land parcel of the site (C25077). Twyford was in existence by the 11th century but is possible that this village had far earlier foundations. The

	features on both parts of the site will be investigated for 11th century or earlier remains.
KC35: Investigate the impacts on rural communities of social and economic shocks in the mid-14th century and thereafter and their contribution to settlement desertion	The site may contain evidence that indicates the medieval settlement of Twyford was larger than the present day. The features on both parts of the site may have been part of the settlement and/or wider agricultural landscape of Twyford and their investigation will contribute to this objective.
KC40: Identify patterns of change within Medieval rural settlement from the 11th to mid-14th century	The site may contain remains associated with the settlement of Twyford which originated in the early medieval period. The evaluation has the potential to investigate the eastern periphery of the settlement to better inform our understanding of this period. The features within land parcel C25082 may also be relate to medieval settlement or may be agricultural.
KC47: Test and develop geophysical survey methodologies	This evaluation would be an opportunity to test the results of the geophysical survey. In particular the possible enclosure and linear features which have been identified in land parcel C25077 and the linear features found on parcel C25082.
KC49: Ground truth and develop multispectral and LiDAR prospection techniques	A number of areas of ridge and furrow were identified on the site from the LiDAR. It would be useful to ground truth the results of the evaluation against the mapping of these features.

5 Scope and Methodology

5.1 Trench Evaluation Scope

5.1.1 The trial trench evaluation will be undertaken in accordance with specific guidance produced by HS2, namely the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

5.1.2 In the first instance, exploratory test pits will be excavated in trenches within land parcel C25077 to recover artefacts from the topsoil and upper subsoil horizons (see Section 5.2: Artefact Collection for methodology).

5.1.3 There are a number of constraints that reduce the area of the site that can be evaluated from 7.74ha to 5.95ha (Figure 9). This remaining 5.95ha of the site will be evaluated with 29 trial trenches measuring 30m (11 trenches), 40m (4 trenches) and 50m (14 trenches) x c. 2m (dictated by machine bucket width) (Figure 9).

5.1.4 The trench sizes and locations have been selected individually, using reconnaissance information gathered during the course of the ES and the subsequent phases of geophysical

survey. This evidence-led approach also draws on site-specific and local topographical and geological information, and known areas of past human activity within the immediate vicinity.

5.1.5 In determining the placement of trenches, the Site was divided into sub-zones, reflecting the geophysical and aerial survey results, topography, geology, constraints and summary archaeological potential. The trenches were designed to characterise anomalies revealed in the geophysical survey, test the recorded alluvial deposits for palaeo-environmental evidence as well as to target areas located on gravel terraces overlooking Padbury Brook which may have potential for earlier prehistoric activity. A c. 4% sample of the available area of the site is considered sufficient to characterise the archaeological presence, ground-truth the non-intrusive survey results and better investigate the areas of magnetic disturbance and riverside alluvial areas in accordance with the Aims and Specific Objectives.

5.1.6 If necessary, an additional contingency of up to 0.5% sample of the site, equating to 300m² of trenches will be excavated to further investigate and characterise significant or unexpected remains should they be encountered during the trial trench evaluation. Any contingency trenching will only be carried out following approval by the *Contractor*, should additional scope be required to meet the HERDS objectives.

5.1.7 The western part of land parcel C25077 has a high potential for alluvial deposits. Within this area sondages will be excavated within Trenches 1, 7 and 8 to check the alluvium for palaeoenvironmental and archaeological remains. The alluvium will be inspected by the *Archaeological Contractor's* geoarchaeologist to determine the potential and outline a sampling strategy. Further guidance on sampling is discussed in the section *Excavations into Alluvium* (5.2 below).

5.1.8 All trial trenches listed in Table 2 have been assigned a unique ID in accordance with the Employer's Asset Information Management System (AIMS). The trenches have been positioned to avoid the identified constraints, but targeted on known areas of highest impact from the development proposals and where applicable, they are targeted on anomalies identified by the geophysical survey.

Table 2 Schedule of trial trenches

AIM ID.	Tr. No.	Length	Tr. Width	Max Trench Depth	Objectives/Comments
	001	30	2	To bedrock geology	Targeting geophysical linear anomalies. Additionally, trench located in an area of alluvium and a sondage will be excavated within the trench to test for palaeoenvironmental and archaeological remains
	002	30	2	To natural geology	Targeting geophysical linear anomalies
	003	50	2	To natural geology	Targeted on geophysical anomaly (curvilinear and linear features)

	004	50	2	To natural geology	Targeted on geophysical anomaly (linear feature)
	005	40	2	To natural geology	Targeted on geophysical anomaly (linear features).
	006	50	2	To natural geology	Targeted on geophysical anomaly (linear and curvilinear feature)
	007	50	2	To bedrock geology	Trench to test an area of magnetic disturbance and also located in an area of alluvium and a sondage will be excavated within the trench to test for palaeoenvironmental and archaeological remains
	008	30	2	To bedrock geology	Trench to test an area of magnetic disturbance and also located in an area of alluvium and a sondage will be excavated within the trench to test for palaeoenvironmental and archaeological remains
	009	50	2	To natural geology	T shaped trench targeted on geophysical anomalies (linear features and several large cut features)
	010	30	2	To natural geology	Targeted on geophysical anomalies, including parallel linear features which could be indicative of a former trackway
	011	50	2	To natural geology	Targeted on geophysical anomalies including linear and curvilinear features
	012	40	2	To natural geology	Targeted on geophysical anomalies including linear and curvilinear features
	013	50	2	To natural geology	Targeted on geophysical anomalies including linear features likely representing former trackways
	014	30	2	To natural geology	Targeted on geophysical anomalies including linear features likely representing former trackways
	015	30	2	To natural geology	Targeted on geophysical anomalies including linear and curvilinear features
	016	50	2	To natural geology	Targeted on geophysical anomalies including linear and curvilinear features
	017	30	2	To natural geology	Targeted on geophysical linear anomalies which include potential enclosure

	018	30	2	To natural geology	Targeted on potential enclosure and linear anomalies
	019	50	2	To natural geology	Targeted on geophysical linear anomalies
	020	40	2	To natural geology	Targeted on geophysical linear anomalies and discrete anomalies
	021	50	2	To natural geology	Targeted on geophysical linear anomalies
	022	50	2	To natural geology	Targeted on geophysical linear anomalies
	023	50	2	To natural geology	Targeted on geophysical linear anomalies within an area of magnetic disturbance
	024	50	2	To natural geology	Targeted on geophysical anomalies including linear and curvilinear features within area of magnetic disturbance
	025	30	2	To natural geology	Targeted on geophysical anomalies in an area of magnetic disturbance
	026	50	2	To natural geology	Targeted on linear anomalies likely representing a trackway
	027	30	2	To natural geology	Targeted on linear anomalies likely representing a trackway
	028	40	2	To natural geology	Targeted on geophysical anomalies including curvilinear and linear features
	029	30	2	To natural geology	Targeted on geophysical anomalies including curvilinear features

5.2 Methodology

5.2.1 Tasks and activities that will be undertaken include:

Setting Out

5.2.2 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 trench or group of geographically related trenches.

5.2.3 Trial trenches shall be located to a horizontal accuracy of +/-500mm. The corner points of each trench location shall be set out with Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) equipment or other suitable automated equipment referenced from the PGMs.

5.2.4 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.

5.2.5 The *Archaeological Contractor* shall ensure that all trial trench 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 trench. Survey methodology and a detailed survey record shall be provided to HS2 Ltd within the survey report.

Artefact Collection

5.2.6 Prior to the excavation of each trial trench the *Archaeological Contractor* will sample the topsoil/ploughsoil for the recovery of artefacts.

5.2.7 Initially entire site was considered for artefact sampling. However, area C25082 (Trenches 11-29) was discounted as this area is known to have been subject to previous disturbance, including service runs, dumping, and construction of haul road. As such, artefact collection is proposed within area C25077 (Trenches 1-10).

5.2.8 Three sample locations will be tested at each 30m, 40m or 50m long trench location, for a total of 33 test pits. Each sample can be recovered using a shovel or mechanical excavator (in spits) fitted with a toothless ditching bucket and placed on an adjacent board or tarpaulin/ geotextile.

5.2.9 Samples are to be equivalent in volume to a 0.25m by 0.25m test pit which will be machine excavated (where practical) and the appropriate pro-rata volume of ploughsoil will be dry hand-sieved. The volume sieved for each test pit will corresponded to the pro-rata volume of a 0.25m by 0.25m test pit, of a depth corresponding to the particular ploughsoil depth at each test pit location. Soil samples should then be sieved or screened through ¼" or 6mm wire mesh to recover artefacts. Samples may be sieved on site or retained for immediate sieving off-site.

5.2.10 In the event of encountering substantial quantities of archaeological artefactual evidence during the test pit phase, an amended trenching strategy may be employed to better understand the factors behind the evidence. Any trial trench amendments would be discussed with the *Contractor* and a change control process (see Section 9) would be implemented if required.

Mechanical Excavation

5.2.11 Trial trenches shall be excavated to the first archaeological horizon or natural geology, whichever is encountered first. Excavation will be undertaken using a mechanical excavator with toothless ditching bucket. Test pits will be excavated down to the base of the Pleistocene deposits.

5.2.12 In the unlikely event that modern foundations are encountered, and where it is clear that these modern foundations have truncated archaeological levels, they should be removed. Where it is clear that modern foundations have truncated certain archaeological levels, they should be removed to assess lower archaeological levels. The *Archaeological Contractor* shall take all reasonable care to ensure that any damage to archaeological deposits is limited as far as practicable. If significant damage is likely to occur the work shall be suspended and the *Contractor's* Historic Environment Manager informed so that a technical solution can be agreed.

5.2.13 Machining shall be carried out under the constant supervision of a suitably qualified archaeologist to excavate the ground in spits. The *Archaeological Contractor* shall use their professional judgement to determine the appropriate depth of each spit. 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. Each spit shall be examined carefully to assist the recovery of any archaeologically significant artefacts and thus to determine when to cease machining. 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. If the surface is not sufficiently clean, hand cleaning of the surface will be required. Machine excavation will comply with the *Employer*'s Technical Standard - Route wide soil resources plan (HS2-HS2-EV-STD-000-000008).

5.2.14 Metal detectors will be used by experienced staff to scan for metallic finds during the excavation of key archaeological features or deposits. The spoil from each trench shall be subject to a metal detector survey; any finds shall be recorded on the relevant trench record sheet.

5.2.15 The *Archaeological Contractor* shall ensure that water is discharged and excavated material from archaeological excavations are stored in accordance with the *Contractor's* environmental protection requirements (as set out in the package Works Information and their Environmental Management Plan) and any relevant consents for the worksite. The *Contractor* shall monitor discharge rates and, if necessary, conductivity of discharge waters to ensure compliance.

5.2.16 In areas of deep stratigraphy such as alluvial sequences, each intervention shall be excavated to the base of the stratigraphic sequence, and shall be appropriately shored and kept free of water to allow 'person entry' to the excavations i.e. to allow the *Archaeological Contractor* to undertake investigation and recording to fulfil the aims of the work. The *Archaeological Contractor* will ensure that all works undertaken in deep stratigraphy will comply with the *Employer's* Technical Standard – Temporary Works (HS2-HS2-CV-STD-000-000005). When recording deep stratigraphic sequences, the Archaeological Contractor shall pay particular attention to establishing the vertical extent of layers of archaeological potential and shall be aware that horizons of cultural activity may be interdigitated with horizons of sterile

sediments. The *Archaeological Contractor* shall supervise the excavation in such a manner so as to allow a cumulative or continuous section to be recorded.

5.2.17 Should any material be excavated that is deemed to be contaminated or potentially contaminated it shall be investigated, controlled (e.g. placed separately from clean material) and removed from the site in accordance with the *Contractor's* environmental protection requirements (as set out in their Environmental Management Plan).

Sondages into Alluvium

5.2.18 Where present in the western part of the site (land parcel C25077), alluvial layers should be assessed on site by the *Archaeological Contractor's* geoarchaeologist and investigated for the presence of artefacts and palaeoenvironmental potential. This will establish the potential of the Holocene alluvial layers for artefacts as well as palaeoenvironmental remains. Additional mitigation may be required if these sondages into alluvium find a high potential for artefacts and palaeoenvironmental remains. These excavated sediments should be adequately sampled and interpreted by the *Archaeological Contractor's* geoarchaeologist.

5.2.19 Each sondage in the alluvium will measure no less than 1.5m x 1.5m and will be excavated to the top of the underlying solid geology. This will be undertaken through the excavation of a single machine-excavated sondage where the alluvium is expected to be at its deepest. It is expected that in practice this will mean excavating sondages within the ends of trenches closest to the watercourse in the centre of the valley.

5.2.20 Sondages will provide:

- the opportunity to observe the full stratigraphic sequence in section; and
- access larger volumes of sample than is achievable through coring.

5.2.21 Where identified, the alluvial layers will be first assessed by the *Archaeological Contractor*'s geo-archaeologist and investigated for the presence of artefacts, primarily lithic implements, flakes etc. Unless the initial inspection of the exposed alluvial deposits should produce surface finds, each slot will be excavated with the use of the machine under constant archaeological supervision. Arisings from each machine-excavated spit will be inspected for the presence of artefacts. Should lithic artefacts be identified, the machine excavation will be halted and the excavation of a sondage will be undertaken manually at minimum to the base of the discrete stratum that produced the artefacts.

5.2.22 The *Archaeological Contractor* shall supervise the excavation of each sondage in such a manner as to allow a cumulative or continuous section to be recorded. Particular attention will be made to establishing the vertical extent of layers of archaeological and/or palaeoenvironmental potential and must remain aware that horizons of cultural activity could be interlaced within layers of sterile alluvium. Archaeologically significant horizons will be cleaned and hand excavated.

5.2.23 The *Archaeological Contractor* shall ensure that any water is discharged and arisings stored in accordance with the *Contractor*'s environmental protection requirements and any other relevant consents for the Site. The *Archaeological Contractor* shall monitor discharge rates and if necessary conductivity of discharge waters to ensure compliance.

5.2.24 Where sondages into alluvium are unsafe to enter, the *Archaeological Contractor* shall direct excavation in a manner that will allow excavated sediments to be adequately sampled and interpreted by their geo-archaeologist. Material to be sampled will be placed by the excavator at a safe distance from both the sondage and plant, and scanned for finds. The sedimentary sequence will be recorded by the Archaeological Contractor's geo-archaeologist according to standard conventions (Historic England 2015) to include sediment structure, colour, texture, sorting and any identifiable boundary characteristics. Depths of each stratigraphic boundary will be recorded, or where full access is unsafe estimated and recorded as such. Should in-situ lithic horizons be discovered, and access to deep excavation be deemed necessary in prior consultation with the *Contractor*'s Historic Environment Manager, there may be a need for trenches to be stepped or temporary works to be installed, to provide safe access and working environment to adequately evaluate the archaeological horizons.

5.2.25 Where entry to a sondage is safe and practicable, buried soils will be inspected and recorded by the *Archaeological Contractor*'s geo-archaeologist to provide data for understanding formation processes. Procedures and techniques for this data capture will be as outlined in Historic England guidance (Campbell et al. 2011 and Historic England 2015). Samples for laboratory assessment, analysis and dating shall be collected where appropriate following agreement with *The Employer*.

5.2.26 All sondages into alluvium will be backfilled as soon as their stratigraphy has been recorded and arisings inspected/sieved for artefacts.

5.2.27 Where significant alluvial deposits, as identified by the geo-archaeologist, or archaeological remains are present within a sondage, the *Archaeological Contractor* with Fusion shall implement a change-control process (see Section 9) for additional sondages and, where appropriate, further surveys.

Hand Excavation

5.2.28 Archaeological hand excavation and recording shall be undertaken by the *Archaeological Contractor* to the general requirements as described in the GWSI: HERDS and the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035; section 4.14 and 4.17). The sufficient sample strategy will be guided by the CIfA Standard and guidance for archaeological field evaluation (2014), as well as, where applicable, Local Planning Authority guidance documents, and will be detailed in the *Archaeological Contractor's* LS-WSI. The *Archaeological Contractor* will ensure that sufficient sample of the features and deposits encountered will be sampled/fully excavated to allow the resolution of

the aims and objectives of the work. Structures, features, or finds which might reasonably be considered to merit preservation in-situ shall not be unduly damaged.

5.2.29 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 trench, as far as is practicable. The exact methodology may need to be determined by the *Contractor* during the excavation of individual trenches and agreed with the *Employer*.

5.2.30 All investigation of archaeological levels will usually be by hand, with cleaning, examination and recording both in plan and section.

5.2.31 Within significant archaeological levels, the minimum number and proportion of features required to meet the aims of the evaluation will be hand excavated. Pits and postholes will usually be subject to a 50% sample by volume, at sufficient frequency to characterise the archaeological activity across the Site. Linear features will be sectioned as appropriate. More complex features such as those associated with funerary activity will usually be subject to 100% hand excavation.

5.2.32 In the case of evaluations, it is not necessarily the intention that all trial trenches will be fully excavated to natural stratigraphy, but the depth of archaeological deposits across the Site will be assessed. The stratigraphy of a representative sample of the evaluation trenches will be recorded even where no archaeological deposits have been identified. Any excavation, both by machine and by hand, will be undertaken with a view to avoiding damage to any archaeological features or deposits, which appear to be worthy of preservation in situ.

5.2.33 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 should 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.

5.2.34 In order to protect any waterlogged remains during the works, the *Archaeological Contractor* may identify a requirement for trial excavations to be allowed to refill with water overnight. In such cases, the *Archaeological Contractor* shall ensure that any hazards to staff or 3rd parties are minimised.

Fieldwork Recording

5.2.35 Archaeological recording is to include, as a minimum:

- At least one representative section at (1:10 or 1:20 scale) of each evaluation trench, from ground level to the base of the excavation;
- the written record of individual context descriptions on appropriate pro-forma;
- plans at appropriate scales (1:10, 1:20 or 1:50);
- single context planning should be used only if appropriate;
- photographs and other appropriate drawn and written records; and ·
- other sections, including the half-sections of individual layers or features shall be drawn as appropriate to 1:10 or 1:20.

5.2.36 A 'site location plan', indicating site north shall be prepared at 1:1250. Individual 'trench 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.

5.2.37 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.

5.2.38 A record of the full extent in plan of all archaeological deposits as revealed in the investigation shall be made. These plans will normally be based on digital survey data (digital planning methods shall be agreed in advance with the *Contractor's* Historic Environment Manager and the *Employer*) 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.

5.2.39 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.

5.2.40 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 as defined in the Project Plan.

5.2.41 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

Human Remains

5.2.42 Where human remains are identified, all subsequent work must be undertaken in accordance with the *Employer*'s Human remains and monuments procedure (HS2-HS2-EV-PRO-0000-000008) and Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035 section 4.18 Methodology for archaeological excavation of human burials). There is a high potential for Saxon and medieval remains within the area of the site. The burials associated with the later medieval village of Twyford are likely to within the churchyard located 100m west of the site, but the village may have had earlier foundations. Should human remains be discovered, the *Archaeological Contractor* shall notify the *Contractor's* Historic Environment Manager immediately, who will notify the *Employer*, so that the procedures set out in the *Employer*'s Human remains and monuments procedure (HS2-HS2-EV-PRO-0000-000008) 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.

5.2.43 In the event that human remains are identified, the *Archaeological Contractor* will cease all works at that location until further instruction is provided by the *Employer* and communicated by the *Contractor's* Historic Environment Manager. The *Archaeological Contractor* shall undertake an initial in situ observation and assessment of the remains and shall advise the *Contractor's* Historic Environment Manager of the course of action required. The *Contractor's* Historic Environment Manager will then notify the *Employer*.

Environmental Sampling

5.2.44 In line with the Employer's Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV0STD-000-000035) an initial sampling strategy is set out below for the Site. This strategy is based on the existing information about the Site, gathered from non-intrusive surveys and the HERDS objectives outlined in Table 1.

5.2.45 This sample strategy, along with the HERDS objectives outlined in Table 1, identify the key elements that should, where present, be sampled during the evaluation. However, the strategy will need to be reviewed throughout the on-site work and, where unexpected features or deposits are identified, revised accordingly to take these into account.

5.2.46 The purpose of sampling at the evaluation stage is to identify the range of environmental materials present on site, their preservation, significance and distribution.

5.2.47 The Twyford site has potential for features associated with later prehistoric activity as well as with Saxon and medieval settlement and agricultural activity and post-medieval archaeological remains, which could include enclosures, house-platforms, land boundaries, trackways, and ridge and furrow earthworks as identified in Section 3.2.

5.2.48 Sampling will therefore target the following, where present, as a minimum:

- Archaeological features identified as cropmarks or geophysical anomalies which are likely associated with potentially prehistoric or medieval activity, including settlement and/or agricultural remains (i.e. ditches, banks, gullies, earthworks) as well as other relevant remains (i.e. pits or postholes); and
- Deposits representing the main phases of activity on site (to assess whether there are changes in rates of deposition or material survival over time).

5.2.49 Sampling will not only just target charcoal rich or wet deposits, but will be undertaken on those features outlined above, taking into account advice from the Contractor's environmental archaeologist. This will ensure that samples are recovered from a representative range of contexts, which adequately characterise past activities on site and allow an assessment to be made of the extent to which they help address palaeoenvironmental and palaeoeconomic questions.

5.2.50 Where unexpected deposits or features are identified during the evaluation which are not covered in the initial sampling strategy above, the need for sampling will be assessed in terms of the specific objectives (both those in Table 1 as well as the remaining HERDS objectives), the sampling strategy will be updated and the features will be sampled accordingly.

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

5.2.52 Samples will be take 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).

5.2.53 For non-waterlogged deposits bulk samples will normally be taken in the range of 40-60 litres. Where contexts have a volume of less than that stated above, then 100% of the context will be sampled. Each bulk sample will only contain sediment derived from a single context. Where waterlogged deposits are encountered, sample sizes will usually be in the range of 10-20 litres, which is suitable for the recovery of macrofossils from these contexts. 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.

5.2.54 Where house floors or other buried land-surfaces are encountered and these are sampled, appropriately sized monolith or kubiena boxes will be used for the recovery of 'undisturbed' monolith samples for soil micromorphology and to sub-sample for microfossils (e.g. polled and spores, diatoms, ostracods). Where longer sequences are sampled, contiguous column samples will be collected for the retrieval of macrofossils (e.g. molluscs, plant remains and insects). Further guidance on specialist samples is provided in the Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV-STD-000-000035 – Sections 4.21.22-26).

5.2.55 Processing of all bulk soil samples collected for biological assessment should 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. 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

5.2.56 Where works are intended to address Specific Objectives relating to industrial activity and there is evidence for industrial activity, 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 guidance on Archaeometallurgy (Historic England 2015 guidance). Assessment of any technological residues shall be undertaken. Assessment of finds assemblages shall, where appropriate to the Specific Objectives being addressed, include x-radiography of all iron objects (after initial screening to exclude obviously recent debris) and, where appropriate, 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.

Geoarchaeology

5.2.57 Sondages will be made within trenches 1, 7 and 8 in areas of alluvium towards the western part of land parcel C25077 of the site. Consideration will be given to the potential of any sediment body for palaeoenvironmental remains. If and when suitable sediments are encountered, samples will be taken for subsequent off-site processing. Samples collected for geoarchaeological assessment as part of the test pits and sondages in trenches will be processed promptly by the *Archaeological Contractor's* specialist, and appropriate assessment undertaken as agreed with the *Contractor*.

Preservation of Archaeological Remains

5.2.58 Where preservation has been identified as an option for areas of the site, or it becomes clear during the evaluation that certain parts of the site might be retained in situ within the scheme design, the *Archaeological Contractor* will ensure that suitable samples are taken to assess the

state of preservation (as set out in Historic England guidance on preserving archaeological remains). Where it is proposed that waterlogged deposits are preserved, discussion should be held with the *Contractor* about initiating a water environment study. If preservation is considered to be a viable and desirable option, the areas proposed should be excluded from further plant/vehicle movement, to minimise the possible effects of compression and loading on the physical integrity of the site. Thought should also be given to whether the proposed construction works will have any short or long term hydrogeological or chemical impacts on the archaeological remains.

Backfilling

5.2.59 Trenches shall only be backfilled following approval of the *Contractor*. The trenches shall be pumped dry (by the *Archaeological Contractor* under a permit to pump as per the *Contractor's* procedure) and any necessary protection measures for archaeological remains (in addition to those for below ground infrastructure, services or utilities) shall be completed prior to backfilling. Backfilling shall be undertaken in layers of 250mm whilst being adequately compacted. Trenches shall be commonly reinstated with arising, comprising subsoil first then topsoil (i.e. reverse order of excavation).

5.2.60 Generally, all backfill material shall consist of non-toxic, uncontaminated, non-putrescible, natural and inert material which shall be compacted and (if necessary) tested (dynamic compaction test or other) in accordance with a specification provided by the *Contractor*. Surface conditions shall be reinstated to the required standard.

5.2.61 Sondages into alluvium will be excavated and recorded rapidly so that deep trenches are not left overnight. These deeper pits will be backfilled as soon as their stratigraphy has been recorded.

5.2.62 The *Contractor* shall ensure, in liaison with the *Employer* that adequate protection is provided for any archaeological remains. Any specific archaeological requirements relating to backfilling including use of materials to mark excavated depth, such as geotextiles, shall be specified by the *Contractor* in the LSWSI.

6 Post-investigation reporting and archiving

6.1 Interim report

6.1.1 The *Archaeological Contractor* shall submit an interim statement to HS2 Ltd within two weeks of completion of the evaluation. The interim statement will be consistent with the requirements detailed in the Specification for historic environment investigations (Document no. HS2-HS2-EV-STD-000-000035) and will provide HS2 with the information necessary to inform design decisions relating to:

a. the next stage of archaeological works (if required) and

b. engineering design.

6.1.2 Interim reports are only used to inform decision-making on further works in programme-critical areas and when confidence in the geophysical survey/trial trenching results indicate that the Site has no significant archaeological potential. It is preferable that all decisions for further works are based on the full factual fieldwork reports.

6.2 Trial trenching report

6.2.1 The C01 fieldwork report will be produced within 6 weeks of completion of fieldwork, compliant with the following structure:

- Non-technical summary;
- Introduction;
- Summary of project's background (including the Specific Objectives addressed);
- Description and illustration of the site location;
- Previous work(s) relevant to the archaeology of the site (e.g. previous surveys);
- Geology and topography of the site;
- Specific Objectives and Aims;
- Methodology of site-based and off-site work;
- Results and observations, including quantitative report, stratigraphic report and any constraints on site;
- Assessment and interpretation of results against original expectations and objectives and, where appropriate, a review of evaluation strategy;
- Statement of potential archaeology;
- Conclusions and recommendations for appropriate archaeological investigation strategy or post–excavation assessment in light of Specific Objectives;
- Considerations of the results and conclusions within the wider context;
- Evaluation of methodology employed and results obtained (i.e. a confidence rating);
- Publication and dissemination proposals (in addition to fieldwork report);
- Archive deposition;
- Bibliography

- Acknowledgements;
- OASIS/HER form;
- Site matrices, where appropriate;
- Specialist assessment or analysis reports where undertaken;
- Illustrations, including location plans with scale and grid co-ordinates;

6.2.2 The trial trenching report will contain figures accompanied by supporting text. All figures within the report shall be on the same paper size, where appropriate. All categories of anomaly identified will be labelled with the appropriate assigned number code on the figures, which will be referred to in the text document.

6.2.3 The following figures will be included in trial trenching reports:

- General plan (mandatory)
- Engineering design (mandatory)
- Site location
- Survey extent and trial trench locations
- Survey results to include plans and sections of archaeological features, deposits and sequences
- Selected photographs of representative and/or significant features and finds

6.2.4 With regard to Digital Archival Material including OASIS/Historic Environment Record summary sheets, the *Archaeological Contractor* will provide the required data, metadata and digital material as specified in the Historic Environment Digital Data Management and Archiving Procedure (C262-ARP-EVSPE-000-000003).

6.3 Survey Report

6.3.1 A survey report will be produced This will include a written and graphic survey report for the works upon completion of fieldwork as an appendix to the Fieldwork report. Evidence shall be provided for check measurements and results of levelling for establishment of TBMs. Unless otherwise agreed, the survey report shall be submitted by the *Archaeological Contractor* to the *Contractor* and *Employer* within two weeks of completion of fieldwork.

6.3.2 The *Archaeological Contractor* shall prepare and submit site area outlines and levels in accordance with the *Employer's Cultural Heritage GIS Standard* (HS2-HS2-GI-STD-000-000010) and BIM requirements. Each drawing shall identify the relevant event code and sub-site division, if applicable.

6.4 Archaeological Summary Report

6.4.1 A short summary report of no more than 500 words (the Summary Report) for the works shall be prepared by the *Archaeological Contractor* for submission to the *Contractor* for subsequent publication within an appropriate journal or publication outlet specified by the *Employer*.

6.4.2 The *Archaeological Contractor* shall submit the draft summary report to the *Contractor* for approval within 8 weeks of the completion date of the fieldwork event. The *Contractor* will review the draft summary report and then issue it to the *Employer* for comment and approval. The *Archaeological Contractor* shall allow two weeks in the programme of works for *Contractor* and *Employer* to provide comments.

6.4.3 The *Archaeological Contractor* shall include any amendments required by the *Contractor* and *Employer* in the final Summary Report which shall be submitted within one week of receiving comments on the draft report.

6.5 GIS Deliverables

6.5.1 GIS Deliverables will be provided to the *Contractor* for approval within 8 weeks of the completion date of the fieldwork. The specific requirements of this deliverable are provided by HS2 in the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

7 Information Management

7.1.1 GIS deliverables will be provided in accordance with the *Employer's* Cultural Heritage GIS Specification (HS2-HS2-GI-SPE-000-000004). CAD files will be GIS compatible and follow standards set out in the same Specification. Figures may be produced using CAD but final deliverables must be supplied in GIS format.

7.1.2 Mapping and spatial data deliverables will conform to the *Employer's* GIS Standards as set out in HS2-HS2-GI-STD-000-000002 and other associated referenced documents.

7.1.3 The *Employer's* standard template for reports (HS2-HS2-PM-TEM-000-000004) will be used.

8 Quality Assurance Processes

All archaeological works will be delivered in accordance with the *Contractor's* AWH Quality Plan (ref. 1EW03-FUS-QY-PLN-C000-001658). The trial trenching report will be prepared and conducted by suitably qualified, experienced and competent professionals.

Trial trenching report will be checked and then reviewed by senior qualified, experienced and competent professionals prior to issue to the *Employer* for acceptance. Final reports, following comments, will be checked and reviewed again prior to issue.

9 Change Control

9.1.1 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.

9.1.2 The GWSI: HERDS establishes the need to manage unexpected discoveries and regularly review ongoing fieldwork events (Sections 7.6.5 and 7.6.17; 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.

9.1.3 The change control process will also enable effective cost control while minimising the risk to the enabling works programme.

9.1.4 The change control process will be recorded using the proforma Historic Environment Fieldwork Change Control Acceptance Sheet at Appendix B of this project plan and will comprise the following steps:

1. The *Archaeological 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.
- Following agreement with the Fusion commercial team a work instruction will be issued to the subcontractor via the Fusion Package Manager.

4. Following the site meeting the *Contractor* will submit a copy of the completed Historic Environment Fieldwork Change Control Acceptance Form to the *Employer* via eB.
5. Where the rapid implementation of mitigation measures is required the *Contractor* will, prior to completion of the ongoing archaeological investigation:
   - prepare a new Project Plan detailing the aims, HERDS objectives and specification of the archaeological mitigation and submit it to the *Employer* for acceptance;
   - Request a new site code from the *Employer*; and
   - Update and resubmit the existing LSWSI to include the archaeological mitigation works.

10 Evidence of engagement

The archaeological advisors to the local planning authority (Philip Markham and Lucy Lawrence at Buckinghamshire County Council) were consulted for initial advice and comment with regard to the site by email on 2 April 2019. Phil Markham responded on 17 April to say they have no comments at this stage.

11 Community engagement proposals

Due to the nature of the proposed works, it is considered that community engagement is not applicable for this trial trench evaluation. The results of the investigations will be disseminated to the wider public in due course, as appropriate (details to be provided by the *Archaeological Contractor*).

12 LS-WSI strategy and structure

Location Specific Written Scheme of Investigation will be prepared by the *Archaeological Contractor* for approval, along with the Risk Assessment Method Statement (RAMS), prior to commencing the works. The LS-WSI will be prepared in line with relevant *Employer's* specifications and Fusion Project Plan and LSWSI Contents Structure (Document no. 1EW03-FUS-EV-SPE-C000-008268).

The LSWSI will include the following sections:

- Executive summary;
- Site location, extent and condition;
- Summary overview of the Project Plan that are delivered under the LSWSI;
- The *Archaeological Contractor's* Programme: detailed programme (including schedule of dates and a detailed Gantt chart baseline programme – for onsite works and post-excavation reporting);
- *Archaeological Contractor's* Topic Specific Method Statements This will specify the methods and sampling strategy for fieldwork hand-excavation and recording, in line with the guidance documents referred to in section 5 of this Project Plan: Hand Excavation and Fieldwork Recording;
- *Archaeological Contractor's* Health, Safety and Environment Management and RAMS;
- *Archaeological Contractor's* Interface and Communication Plan;
- *Archaeological Contractor's* site Monitoring and Engagement;
- *Archaeological Contractor's* Quality Assurance Processes and plan;
- *Archaeological Contractor's* resource plan;
- *Archaeological Contractor*'s site Management Plan;
- *Archaeological Contractor's* Safe Method of Working;
- References and glossary of terms; and
- Figures (as relevant).

13 References

13.1 References

Title	Reference
Ayala, G, Canti, M and Heathcote, J 2015 Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record. Historic England guidance	Historic England 2015
AWHb Final Report for Geophysical Magnetometer Survey at Three Bridge Mill, Calvert Cutting and Twyford Embankment, and Twyford Padbury Brook, Twyford Cutting and Twyford Embankment, Buckinghamshire (AC250/10)	1EW03-FUS-EV-REP-CS06_CL09-007287

British Geological Survey, Geology of Britain viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html	BGS Online 2019
CIfA 2014 Standard and guidance for archaeological field evaluation. Chartered Institute for Archaeologists	CIfA 2014
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Farley, M, Upper Palaeolithic and Mesolithic Buckinghamshire 38,000-4000 BC	Farley 2014
Fusion AWH Quality Plan	1EW03-FUS-QY-PLN-C000-001658
Fusion Construction Phase Health and Safety Plan	1EW03-FUS-HS-PLN-C000-000053
Fusion Incident & Emergency Preparedness Plan	1EW03-FUS-HS-PLN-C000-000001
Fusion Standard for Accident and Incident Investigation and Reporting	SH2 STD1
Fusion Project Plan and LSWSI Contents Structure	1EW03-FUS-EV-SPE-C000-008268
Harris, E C 1989 Principles of Archaeological Stratigraphy (2nd ed.) Academic Press	Harris 1989
Hey, G and Lacey, M 2001 Evaluation of archaeological decision-making processes and sampling strategies. Kent County Council	Hey and Lacey 2001
High Speed Rail (London-West Midlands) Environmental Minimum Requirements Annex 1: Code of Construction Practice	CS755 02/17
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Historic England 2010 Waterlogged Wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood. Historic England	Historic England 2010
Historic England 2011 Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and recovery to Post-excavation (2nd ed.). Historic England	Historic England 2011
Historic England 2012 Waterlogged Organic Artefacts: Guidelines on their Recovery, Analysis and Conservation. Historic England	Historic England 2012
Historic England 2014 Animal Bones and Archaeology: Guidelines for Best Practice. Historic England	Historic England 2014
Historic England 2015a Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide	Historic England 2015a
Historic England 2015b Management of research projects in the historic environment (and associated guides and planning notes)	Historic England 2015b
Historic England 2015c Geoarchaeology: Using earth	Historic England 2015c

sciences to understand the archaeological record	
HS2 Historic Environment Digital Data Management and Archiving Procedure	C262-ARP-EVSPE-000-000003
HS2 Country South Utility Drawing, Sheet 38	C222-ATK-UT-DPL-020-211300-FPD
HS2 Cultural Heritage GIS Specification	HS2-HS2-GI-SPE-000-000004
HS2 Cultural Heritage GIS Standard	HS2-HS2-GI-STD-000-000002
HS2 *Employer's* Technical Standard - Route wide soil resources plan	HS2-HS2-EV-STD-000-000008
HS2 *Employer's* Technical Standard – Temporary Works	HS2-HS2-CV-STD-000-000005
HS2 Enabling Works Information WI0200 General Constraints	1E001-HS2-PR-ITT-000-000098
HS2 Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy	HS2-HS2-EV-STR-000-000015
Hs2 Geoarchaeological Desk Based Assessment (GDBA): review of the geoarchaeological potential of High Speed Two Phase One	1D037-EDP-EV-REP-000-000031
HS2 Human remains and monuments procedure	HS2-HS2-EV-PRO-0000-000008
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HS2 Phase One Environmental Statement and Supplementary Environmental Statements - Calvert, Steeple Claydon, Twyford and Chetwode Community Forum Area (CFA 13).	CH-001-011 - ES 3.5.2.13.4 CH-002-011 - ES 3.5.2.13.5 CH-003-011 - ES 3.5.2.13.6 CH004-011 – ES.3.4.5.13.7
HS2 Phase One Great Crested Newt Unexpected Finds: Method Statement	1EW03-FUS-EV-MST-C000-000014
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 Technical Standard: - Route wide soil resources plan	HS2-HS2-EV-STD-000-000008
HS2 Technical Standard: – Temporary Works	HS2-HS2-CV-STD-000-000005
HS2 Technical Standard: Cultural Heritage GIS Specification	HS2-HS2-GI-SPE-000-000004
HS2 Technical Standard: Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy	HS2-HS2-EV-STR-000-000015
HS2 Technical Standard: Historic Environment Digital Data Management and Archiving Procedure	HS2-HS2-EV-STD-000-000040
HS2 Technical Standard: Historic Environment Physical	HS2-HS2-EV-STD-000-000039

Archive Procedure	
HS2 Technical Standard: Specification for historic environment investigations	HS2-HS2-EV-STD-000-000035
HS2 Technical Standard: Specification for Project Plans and Location Specific Written Scheme of Investigations	HS2-HS2-EV-STD-000-000036
John Moore Heritage Services, 2013 Archaeological Evaluation Report on land to the northeast of the present burial ground of the church of the assumption of the blessed Virgin Mary, Twyford, Buckinghamshire, TYBG13, unpublished client report	John Moore Heritage Services, 2013
Palmer, J N, 2019 Open Domesday https://opendomesday.org/	Palmer 2019
Page, W, 1927 Parishes: Twyford with Charndon and Poundon', in *A History of the County of Buckingham: Volume 4*, 254-259. British History Online http://www.british-history.ac.uk/vch/bucks/vol4/pp254-259 [accessed 9 April 2019].	Page 1927

13.2 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
GWSI: HERDS	Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy
HER	Historic Environment Record
LSWSI	Location Specific Written Scheme of Investigation
NGR	National Grid Reference
PDF	Portable Document Format
QA	Quality Assurance

14 Figures

The following figures are included in this Project Plan:

- Figure 1 Site Location

- Figure 2 Heritage Assets
- Figure 3 Superficial geology
- Figure 4 LIDAR survey and remote sensing interpretation
- Figure 5 Geophysics results
- Figure 6 OS map of 1880
- Figure 7 Ecological constraints
- Figure 8 Utilities constraints
- Figure 9 Scheme design

15 Glossary of terms

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, 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 combine historic environment investigation programme 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 Project Manager and would provide a costed and programmed approach to delivering outcomes.

Project Plans – specification document for each specific package of activity (e.g. a survey, desk based assessment, excavation, recoding project). The plans would respond to the Specific Objectives set out in the GWSI: HERDS and be delivered within an agreed budget.

Sondage – A small test pit to examine the deeper stratigraphy of a site; usually a deeper investigation of a small part of a larger trench.

Works – the specific historic environment assessment, evaluation or investigation works at each location.

Appendices

Appendix 1: Site Information prepared by the design consultant for the sub-contractor

Site Access

A site visit from public rights of way was undertaken on 10 April 2019 and the access arrangements as listed below have been noted (Figure 1). A suitable access point within the CCB to C25082 has been identified off the unnamed Charndon to Steeple Claydon Road, where a wide gap in roadside hedge and track leading to the Sewage Works are present. This part of the site is currently in arable use. There may be the requirement for signage with regard to traffic management. In addition there are several overhead services which run parallel and cross over the track leading to the sewage works (Figure 8 and discussed below).

C25077 contains a pasture field. It is considered that the best access would be to use to track along the old railway line, which can be accessed to the south and west of the Charndon/Steeple Claydon overbridge which carries the road over the former railway line. This track leads onto the route of the dismantled railway line and continues north-westwards. A bridge over this railway line just west of C25077 has a locked gate with a warning against a 'wild boar' – the access through this route would need to be confirmed by the *Contractor*. The access into C25077 would need to be created by breaching a wire fence/bank.

The *Archaeological Contractor* will satisfy themselves that the access points are suitable and safe prior to the start of the evaluation and will undertake all due care when accessing the site from either the public highways or private tracks. The method for and controls placed on site access/egress will be set out in the *Archaeological Contractor*'s Method Statement and will comply with the *Contractor's* Construction Phase Health and Safety Plan.

Prior to the start of the trial trenching evaluation, the *Archaeological Contractor* will attend a pre-works site meeting with the *Contractor*. The purpose of this meeting will be to allow the *Archaeological Contractor* to confirm the access points, ground conditions, site-specific hazards and to agree the location for the welfare facilities and the safe storage of plant and materials.

Information on site-specific undertaking and assurances, land access arrangements, site specific arrangements and site logistics and traffic management will be provided by the *Contractor*.

The access for each part of the site varies and is discussed below:

Constraints

Given the present status of the site as a mixture of arable and pastoral land it will be necessary for the *Archaeological Contractor* to ensure that the fields are in a suitable condition for the investigations (i.e. no livestock, mature crops) prior to commencement.

Several of the constraints listed below include existing services and this information has been prepared from data provided by the *Contractor*. It is the responsibility of the *Archaeological Contractor* to conduct a review of the services including new searches before works commence.

Survey data indicates there is a low potential for unexploded ordnance (UXO) on the site.

Site specific constraints/hazards include:

- The following ecological constraints will require advice from a Fusion ecologist who will suggest mitigation for these constraints:
  - Otters. The stream to the west of C25077 contains one confirmed otter holt (Figure 7). A 30m buffer from this holt has been included in the scheme design.
  - Bats. Several trees have been noted as suitable for nesting bats within the site including two within C25082 and one bat building roost to the south of the access track into parcel C25077. The *Archaeological Contractor* should seek advice from an ecologist on the potential of bats on the site and whether certain trees can be removed if needed for access.
  - Wild boar. During the site visit a sign along the former railway track warns against wild boar. Advice should be sought on how to mitigate the risk from these animals as they can be dangerous to people especially when guarding young.
  - Great Crested Newt populations (AMP 039) have been recorded in the area of the site (C25077; Figure 7). An ecologist will need to be present during the trial trenching works to conduct a fingertip search. In order to protect GCN against being trapped in the trenches, access ramps should be excavated at the ends of the nearby trenches and each trench will be checked for newts daily prior to starting work. In the event that GCN are encountered, appropriate procedures, defined within the Great Crested Newt Unexpected Finds Method Statement (doc. No. 1EW03-FUS-EV-MST-C000-000014) will be followed, with any work carried out by accredited agents (under the licence issued to HS2 by Natural England).
  - Barn owl. There is one possible location for barn owls in the south-west corner of C25082 (Figure 7). The *Archaeological Contractor* should seek advice from an ecologist on the potential of barn owls and any mitigation procedures that may be required.
  - Badgers. Although there are no badger setts on the site itself there are four setts mid-way between the two areas of the site (Figure 7). This suggests that both areas of the site are likely to form part of a wider badger territory. In order to protect badgers against falling into trenches, fencing will need to be erected and ramps left overnight within each trench. Each trench will also need to be checked for badgers daily prior to starting work
- Weight limit of the existing Charndon to Steeple Claydon Road Bridge. There is an 18TN weight limit on this weak bridge so plant and delivery items which exceed this must come from the north and east rather than the south of the access point.

- Overhead services. Three Overhead Medium Voltage Powerlines (OVMPL) are located on or near the site including: one which bisects land parcel C25077, one which bisects land parcel C25082 and one directly to the south-west of land parcel C25082. A buffer of 10m was applied for the overhead service lines when designing the trench layout and it will need to be visibly demarcated on site with a physical barrier and fenced crossing point with goal posts. Appropriate measures will need to be implemented by the *Archaeological Contractor* when manoeuvring machinery in the vicinity of the overhead cables. In addition, an overhead telecommunication line is located along the dismantled railway line to the south of land parcel C25082 (Figure 8)
- Buried services. A buried water pipe is located east of land parcel C25082 of the site (Figure 8). A 10m buffer was applied for this service although it appears to be located under the Charndon/Steeple Claydon road
- Possible haul road or service diversion. A possible haul road or service diversion was identified from Google satellite view bisecting land parcel C25082. This area was not recorded on the geophysical survey or was recorded as a disturbed area of ground. This may be part of a gas pipeline or National Gird diversion and should be treated as a constraint. A 30m buffer has been created either side of this possible line of services but the *Archaeological Contractor* will need to check whether any services are present
- Public Rights of Way. There are two public footpaths within land parcel C25077 and one in the northern part of land parcel C25082 (Figure 1). The scheme design has allowed for these footpaths and a 1m barrier either side of these footpaths is required for the safety of pedestrians. These footpaths are to remain open during the works and extreme care will be required when manoeuvring vehicles close to these footpaths
- Watercourses. A watercourse is located directly west of land parcel C25077. A buffer of 8m will be established from this watercourse in which no excavation or spoil storage will be undertaken. The buffer has been taken into account in trench design and will need to be visibly demarcated on site (Figure 9)

Other considerations

Site security requirements

Following site set-up, the archaeological evaluation will be conducted in accordance with the information provided in the Project Plan and LSWSI and the safe methods of work described in the *Archaeological Contractor's* Risk Assessment and Method Statement.

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

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.

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.

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.

Temporary Works

It is anticipated that most trial trenches excavated within the site will be shallow and that they will not require temporary works. However, should the access to deep excavation be deemed necessary in prior consultation with the *Contractor's* Historic Environment Manager, and a need for temporary works identified, works will cease at that location, and the trench will be temporarily backfilled. The *Contractor* will assess the requirement for temporary works and will be responsible for their design, installation and maintenance.

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 produced at tender stage will be reviewed and updated at regular intervals.

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.

Site Monitoring and Engagement

Requirements for site monitoring and engagement with HS2, Historic England and LPA advisors will be will be agreed with the *Contractor's* Historic Environment Manager and discussed in detail by the *Archaeological Contractor* in the LSWSI.

Facilities and attendances

Prior to the start of the archaeological evaluation the *Archaeological Contractor* shall prepare and submit a draft Health and Safety Plan and Risk Assessment and Method Statement (RAMS) for the works to the

Contractor for review and approval. The *Archaeological Contractor's* Method Statement will clearly identify the methods and processes that will be implemented to fulfil the aims, objectives and requirements of the Project Plan and this LSWSI. The Method Statement will be prepared in liaison with the *Contractor*, taking account of the *Contractor's* Area Wide HERDS Environmental Management Plan and other relevant site information provided by them and requirements for the works set out in the Works Information (e.g. relating to health and safety, security, engineering design requirements and attendances). This will include the *Archaeological Contractor's* requirements and specification for services and facilities and attendances required to be supplied by the *Contractor* or the *Employer*.

Site Specific Undertaking and Assurances

Site-specific U&As (undertaking and assurances) will be provided by the *Contractor*, with reference to WPP U & A register. Local community and general public arrangements, including effects on Neighbouring properties and businesses, and any mitigation measures required to be implemented by the *Archaeological Contractor* will be defined.

Designer's risk assessment summary

The abovementioned hazards and site constraints, identified on the basis of information available at the time of the preparation of this Project Plan, have been considered in the design and appropriate mitigation measures have been proposed. It is the responsibility of the *Archaeological Contractor* to conduct a review of the services including new searches before works commence.

Appendix 2: The Change Control Proforma

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

Appendix 3: 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

Appendix 4: Decision record notice (DRN)

Site Details			
Sector and Work Package:			
Site Code:			
GIS_UID			
EWC Site Name			
DES / Main Asset:			
NGR (site centre):			
Site size (ha)			
Survey Type:			
Summary the scheme impacts:			
Baseline Evidence	Yes	No	Details
Did the HS2 Phase 1 ES identify known heritage assets within the site?	☐	☐	
Did the PSC geophysical survey identify probable or possible archaeology?	☐	☐	
Is there any remote sensing data (NMP/LiDAR/hyperspectral/APs) which identify possible heritage assets?	☐	☐	

Is the site located within an Archaeological Notification Area?	☐	☐	
HERDS objectives identified in the Project Plan?			
Survey/Fieldwork Results	Yes	No	Details
Has the fieldwork confirmed the presence/absence of known heritage assets?	☐	☐	
Has the geophysical survey shown any positive anomalies which are considered probable archaeology?	☐	☐	
Has the geophysical survey shown any positive anomalies which are considered to be possible archaeology?	☐	☐	
Has intrusive fieldwork identified previously unknown heritage assets?	☐	☐	
Do the geology maps indicate there is alluvium or colluvium over the study area?	☐	☐	
Does the GI or trial trenching confirm the presence of alluvium or colluvium?	☐	☐	
Are there any other landscape features within the study area?	☐	☐	
Summary overview of fieldwork results:			

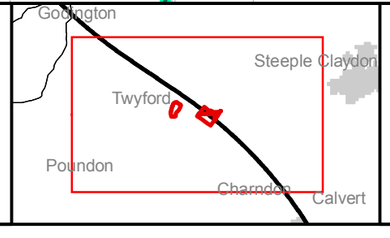
Fieldwork Report Document No.			
HERDS Assessment	Yes	No	Details
Did the fieldwork/survey contribute to, or, fulfil the HERDS objectives set out in the Project Plan?	☐	☐	
Is there potential for further knowledge creation contributing to existing HERDS objectives?	☐	☐	
Is there potential for knowledge creation requiring a new HERDS objective?	☐	☐	
Recommendation:	Yes	No	Details
Is further historic environment investigation recommended?	☐	☐	
Type of fieldwork/technique Recommended:			
Recommended HERDS objectives:			
Possible new HERDS objective:			

Assessed by: (Contractor)	Name:	Date	Signature
Approved by (HS2 Historic Environment)	Name	Date	Signature

13-19
13-18
13-16
13-17
13-13
C25077
13-15
C25082
13-14
13-07
13-06

Legend

- Route
- Site
- Access Point
- CXXX Fusion Site GIS ID No.
- Consolidated Construction Boundary
- Local Authority Boundary
- Archaeological Character Sub Zones
- Watercourse
- Waterbody
- Public Right of Way



High Speed Two

FIG. 1
Twyford Three Bridge Mill:
Site location

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

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

Scale at A3: 1:10,000

0 100 200 300 400
Meters

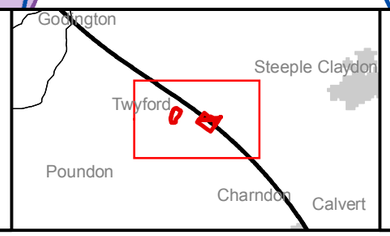
Coded - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 03/05/19

CAL062
CAL060
CAL052
CAL053
CAL048
CAL125
CAL047
CAL051
Twyford Vicarage Medieval Building Twyford
Ridge & furriow
CAL055
CAL058
CAL054
1288292
1288314
N/A
1215009
1215010
Shrunken village
CAL041
1214979
St Mary's Church Twyford
Shrunken medieval settlement earthworks
Ridge & furrow
CAL046
C25077
CAL018
PRM053
CAL042
CAL124
CAL029
1215007
1215016
CAL059
1288274
1215050
CAL050
C25082
CAL121
CAL030
Shrunken village
CAL045
Ridge & furrow
Ridge & furrow
CAL043
Ridge & furrow
CAL044
CAL024

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Local Authority Boundary
- Watercourse
- Waterbody
- Grade I Listed Building
- Grade II Listed Building
- Grade II* Listed Building
- Archaeological Notification Areas
- Non Designated Heritage Assets_pt
- Non Designated Heritage Assets_ln
- Non Designated Heritage Assets_ply
- John Moore Heritage Services 2013 evaluation
- Gazetteer ID Group



High Speed Two

FIG. 2
Twyford Three Bridge Mill:
Heritage assets

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

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

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Code 1 - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 03/05/19

Former gravel pit where Pleistocene remains were found

C25077

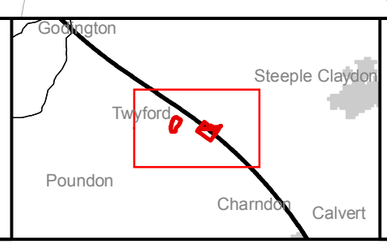
C25082

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Local Authority Boundary
- Watercourse
- Waterbody

BGS geology types

- River terrace deposits (undifferentiated)
- Till, mid-Pleistocene
- Alluvium



High Speed Two

FIG. 3
Twyford Three Bridge Mill:
Superficial geology

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

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

Scale at A3: 1:5,000

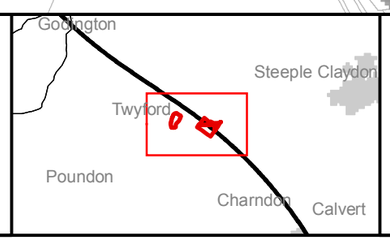
0 50 100 150 200
Meters

Code 1 - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 03/05/19

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Local Authority Boundary
- Watercourse
- Waterbody
- Remote sensing interpretation
- Remote sensing interpretation



High Speed Two

FIG. 4
Twyford Three Bridge Mill:
LiDAR survey and remote sensing interpretation

Community Forum Area (CFA13)
Calvert, Steeple Claydon, Twyford & Chetwode
Internal

HS2

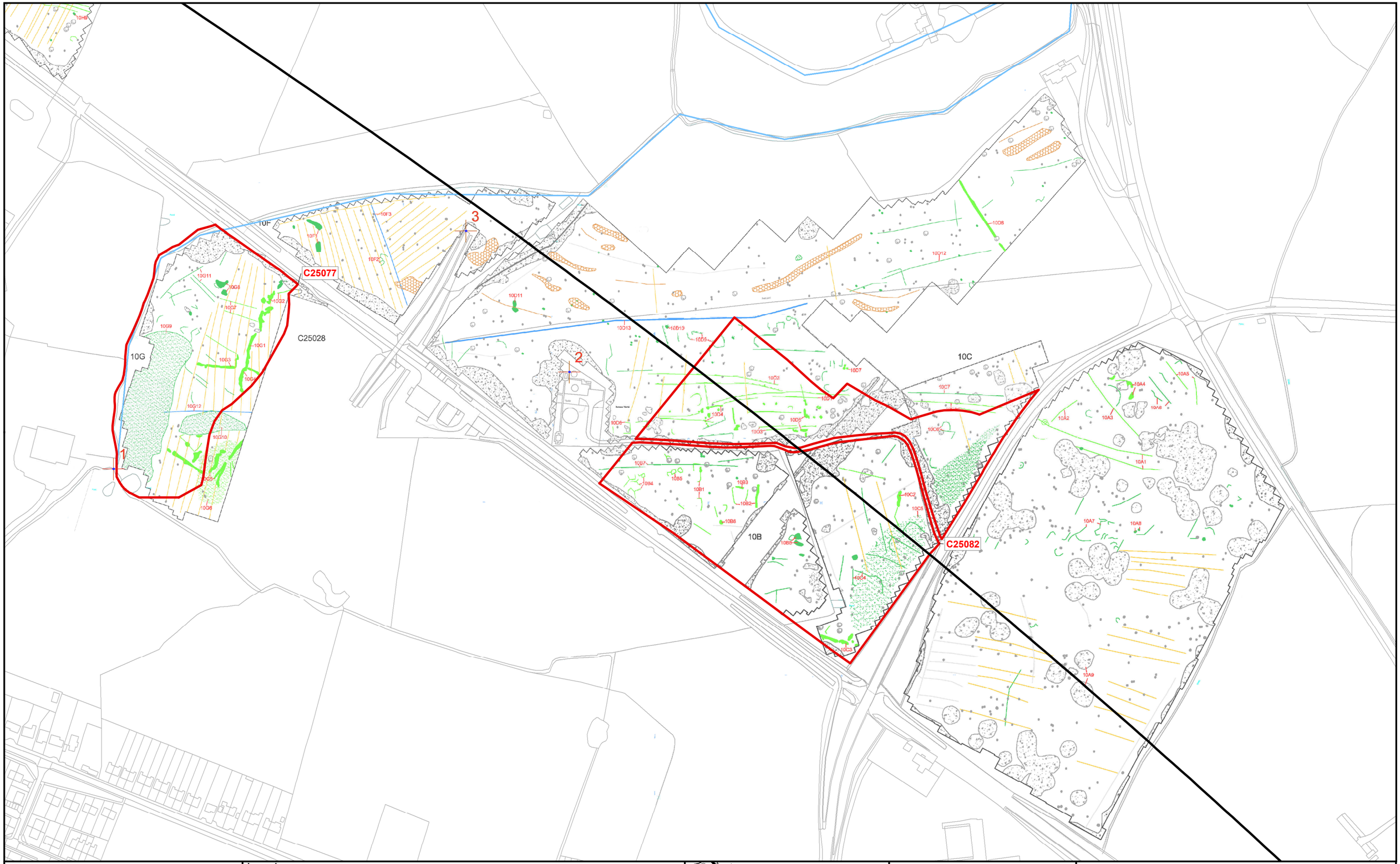
Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:4,000

0 40 80 120 160
Meters

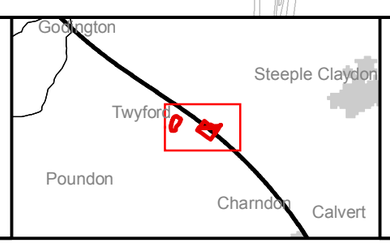
Coded - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 03/05/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Watercourse
- Archaeology - Definitive
- Archaeology - Possible
- Uncertain Origins
- Industrial - Burnt / Fired
- Agricultural / Field Drains
- Old Field Boundary
- Geology / Natural
- Magnetic Disturbance / Pipe
- Ferrous



High Speed Two

FIG. 5
Twyford Three Bridge Mill:
Geophysics results

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

Scale at A3 (left inset): 1:3,002
Scale at A3 (right inset): 1:1000

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

0 37.5 75 112.5 150
Meters

Code 1 - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 13/08/19

C25077

C25082

Twyford

Threebridge Mill

Rectory

St Marys Church

Red Lion

Bell Vue

The Crown

Elm Grove

Seven Stars

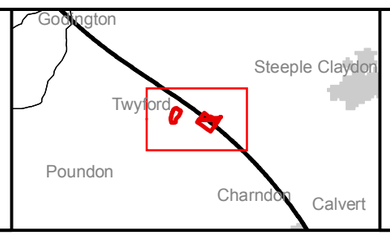
Post Bridge

Goodge Barn

Boundary

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

FIG. 6
Twyford Three Bridge Mill:
OS map of 1880

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

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

Scale at A3: 1:4,000

0 40 80 120 160
Meters

Code 1 - Accepted

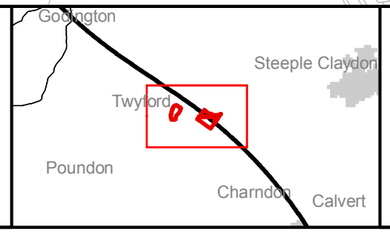
Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 03/05/19

C25077

C25082

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Watercourse
- Watercourse buffer 8m
- Otters holt
- Otters holt buffer 30m
- Great Crested Newt AMP 039
- Badger Territory
- Badger Sett
- Badger sett buffer 30m
- Barn Owl
- Bat Tree Roost



High Speed Two

FIG. 7
Twyford Three Bridge Mill:
Ecological constraints

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

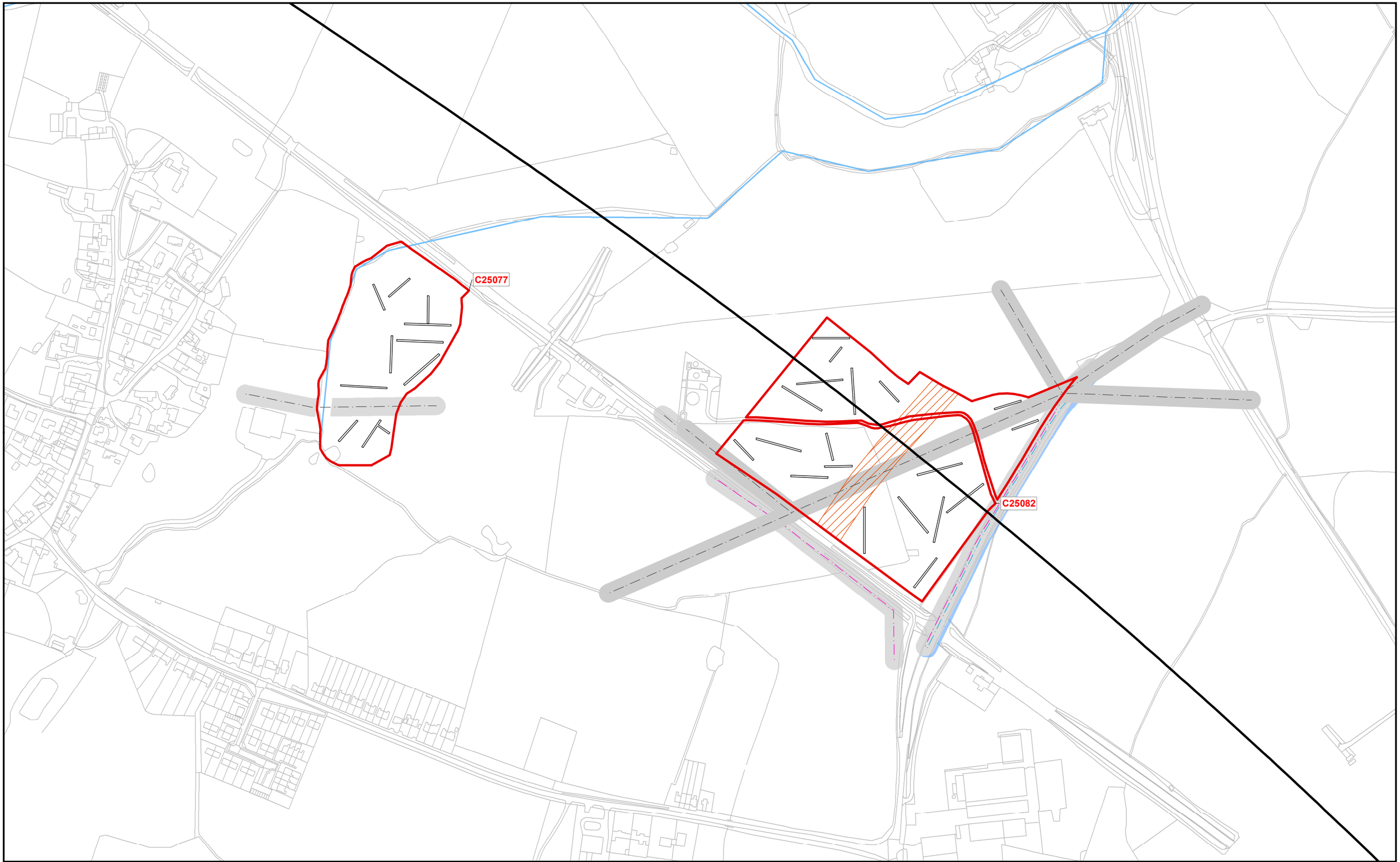
Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:4,000

0 40 80 120 160
Meters

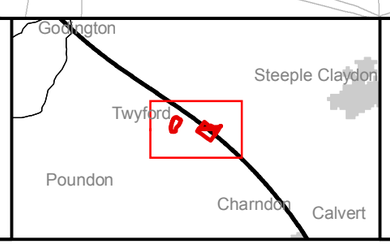
Coded - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 07/05/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Watercourse
- MV Overhead line
- Telecom
- Water pipe
- MV Overhead buffer 10m
- Telecom buffer 10m
- Water pipe buffer 10m
- possible haul road/service road disturbance
- OV cable
- OH cable 10m buffer
- Trench Locations



High Speed Two

FIG. 8
Twyford Three Bridge Mill:
Utilities constraints

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

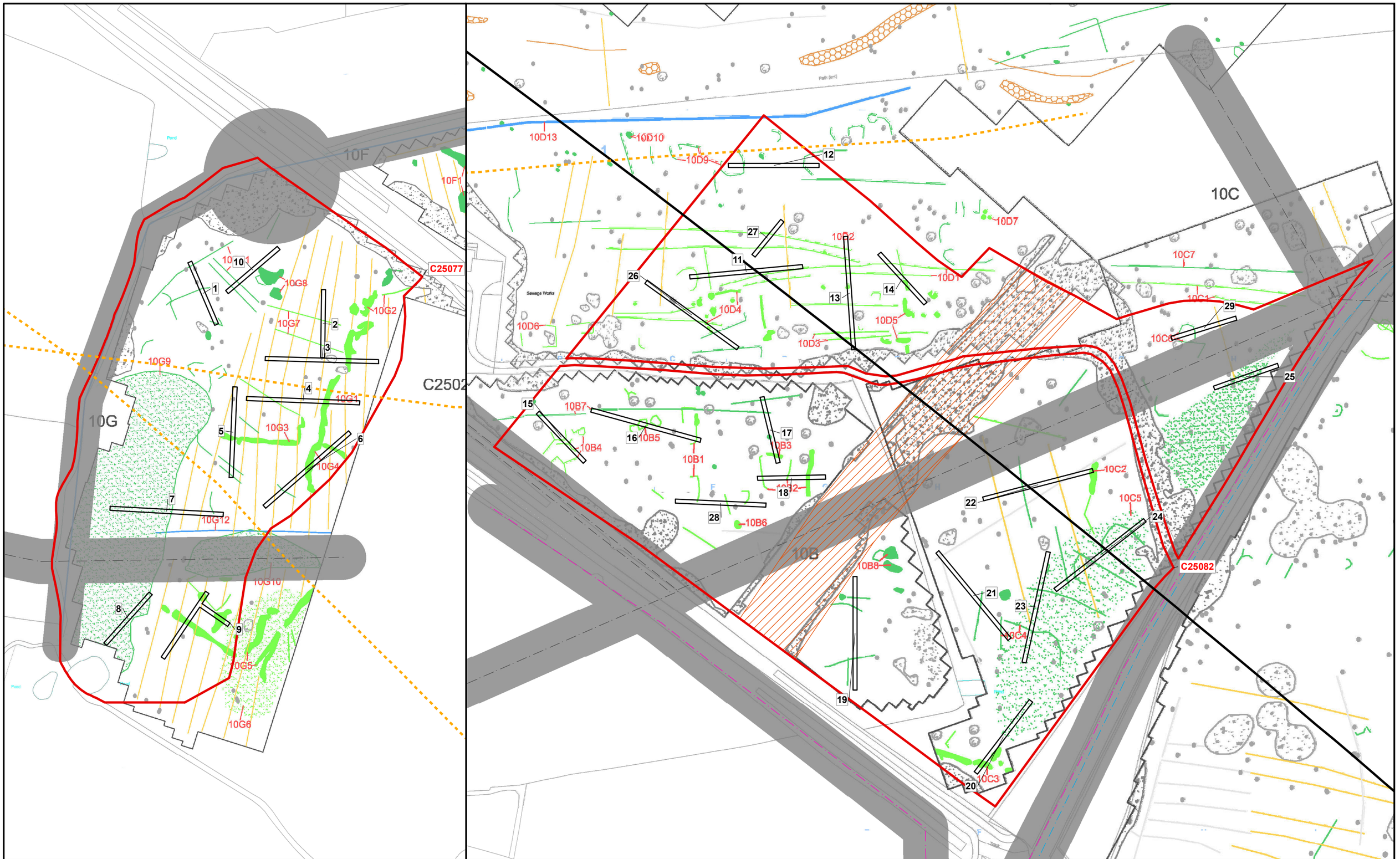
Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:3,658

0 35 70 105 140
Meters

Code 1 - Accepted

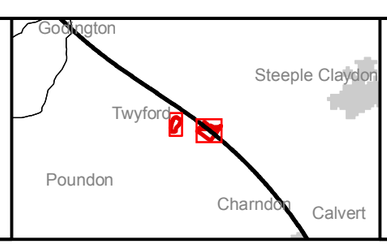
Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 14/08/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Watercourse
- Constraint
- Public Right of Way
- Proposed trench location
- Possible haul road/service road disturbance
- OV cable

- Archaeology - Definitive
- Archaeology - Possible
- Uncertain Origins
- Industrial - Burnt / Fired
- Agricultural / Field Drains
- Old Field Boundary
- Geology / Natural
- Magnetic Disturbance / Pipe
- Ferrous



High Speed Two

FIG. 9
Twyford Three Bridge Mill:
Scheme design

Community Forum Area (CFA13)
Calvert, Steeple Claydon,
Twyford & Chetwode
Internal

HS2

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

Scale at A3: 1:1,500

0 15 30 45 60
Meters

Code - Accepted

Doc Number: 1EW03-FUS-GI-MAP-CS06_CL09-000008 **Date:** 14/08/19