

High Speed Rail (Crewe – Manchester)

Background information and data

Historic environment

BID HE-005-0MA05

MA05: Risley to Bamfurlong

Historic environment remote sensing report

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Department
for Transport

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1 Introduction

- 1.1.1 This report presents the results of analysis of remote sensing data relating to the historic environment.
- 1.1.2 Baseline data have been collected for the Proposed Scheme in relation to the Risley to Bamfurlong area (MA05).
- 1.1.3 All identified heritage assets discussed in this report are shown in the Volume 5, Historic environment Map Book, Map Series HE-01, HE-02, HE-03¹.
- 1.1.4 The historic environment detailed gazetteer is set out in Appendix A of the Historic environment baseline report (see Background Information Data: BID HE-001-0MA05). It sets out Unique gazetteer identifier (UID) codes for the heritage assets considered in the baseline data; these are used for reference across all the historic environment reports and maps in the Environmental Statement (ES)² and BID reports.
- 1.1.5 The approach to assessing the archaeological potential of the landscape is outlined in the Historic environment summary gazetteer, impact assessment table and archaeological character areas report (HE-002-0MA05³). This breaks the study area down into areas of archaeological character; initially into broad Archaeological Character Areas (ACA), and then more narrowly defined Archaeological Sub-zones (ASZ).
- 1.1.6 The approach used for assessing historic landscape character (HLC) is described in the Historic landscape character areas report (HE-003-0MA05⁴). The approach is used to determine Historic Landscape Character Areas (HLCA). HLCA are areas of coherent or distinctive historic landscape characteristics.
- 1.1.7 Within the historic environment reporting, various reference numbers have been used to provide a unique identifier to the heritage assets, HLCA, ACA/ASZ, geophysical survey anomalies and remote sensing features identified. These unique identifiers are referenced throughout the ES, BID reports and Map Books, and in summary are as follows:

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

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

³ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Risley to Bamfurlong, Summary gazetteer, impact assessment table and archaeological character areas, Volume 5: Appendix HE-002-0MA05*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

⁴ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Risley to Bamfurlong, Historic landscape character areas, Volume 5: Appendix HE-003-0MA05*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

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- heritage assets have been given a Unique gazetteer identifier (UID), for example MA05_0001. These have been allocated to all heritage assets within the gazetteer of heritage assets, provided in Volume 5: Appendix HE-002-0MA05 (summary gazetteer) and BID HE-001-0MA05 (detailed gazetteer);
- historic landscape character areas have been given a unique identifier, for example MA05_HLCA02. These have been allocated to all HLCA within the historic landscape character assessment, provided in Volume 5: Appendix HE-003-0MA05;
- archaeological character areas and archaeological sub-zones have been given a unique identifier, for example: archaeological character area MA05_AC01; and archaeological sub zone MA05_AC01.002. These have been allocated to all of the assessed archaeological character areas and archaeological sub-zones, provided in Volume 5: Appendix HE-002-0MA05;
- geophysical survey areas and features identified through the geophysical survey have been allocated a unique identifier, for example: geophysical survey area MA05_GP001, and geophysical survey feature MA05_GP001.001. These have been allocated to all of the identified geophysical survey areas and features, provided in BID HE-004-0MA05; and
- features identified through remote sensing have been allocated a unique identified, for example MA05_RS001. These have been allocated to all of the identified remote sensing features, provided in BID HE-005-0MA05.

2 Remote sensing

2.1 Introduction

- 2.1.1 This report sets out the results of a review, and the systematic mapping, recording, analysis and interpretation of potential archaeological sites from aerial photographs and LiDAR⁵ data within the Risley to Bamfurlong area.
- 2.1.2 The remote sensing was undertaken in accordance with the guidance and standards set out in:
- the Historic England standards for aerial investigation and mapping (formerly known as the National Mapping Programme, NMP)⁶; and
 - the Forum on Information Standards in Heritage (FISH) vocabularies⁷.

2.2 Survey objectives

Aims of the survey

- 2.2.1 The aim was to accurately map and record the form and extent of archaeological features visible as cropmarks, soil marks, earthworks or structures in order to inform the assessment of baseline conditions for the historic environment.

Objectives of the survey

- 2.2.2 The results of the survey have been combined with data from other archaeological assessments carried out as part of the project, such as desk-top studies and geophysical surveys in order to help analyse the archaeological potential of the Proposed Scheme.

⁵ LiDAR (meaning 'light detection and ranging') is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor; this can be used to identify archaeological earthwork evidence.

⁶ Winton, H. (2018), *Standards for Aerial Investigation and Mapping projects*, Historic England internal document.

⁷ FISH (2020), *Heritage Data; Linked Data Vocabularies for Cultural Heritage*. Available online at: <https://www.heritagedata.org/blog/vocabularies-provided/>.

2.3 Survey methodology

2.3.1 This section provides an overview of the survey methods. The aims and general method for the remote sensing assessment are set out in the Generic Written Scheme of Investigation (HE-006-00000⁸).

Data collection

2.3.2 The data collection phase of the survey took place between April 2017 and December 2018. The following sources were consulted:

- historic aerial photographs;
- online aerial and satellite-derived images;
- HS2 vertical aerial photographs;
- Environment Agency vertical aerial photographs;
- HS2 (BLOM Aerofilms) LiDAR data;
- Environment Agency LiDAR data;
- Historic Environment Record (HER) data;
- National Record of the Historic Environment (NRHE) data;
- National Heritage List for England (NHLE) data; and
- historic cartographic sources.

Data processing

2.3.3 The following processing steps have been carried out on the data used in this survey:

- all spatial data was collated and generated in GIS (Geographic Information System) ArcMap 10.5 using the British National Grid (EPSG: 2770) map projection;
- both the HS2 Ltd and Environment Agency LiDAR datasets were processed using the software Relief Visualisation Toolkit (RVT 1.3) to create eight different advanced visualisation models, prior to their import into GIS ArcMap 10.5;
- the HS2 Ltd and Environment Agency vertical aerial photographic cover was already georeferenced and required no further processing; and
- selected archive aerial photographs were orthorectified (processed to accurately fit the map and terrain) using the software Aerial 5.33 prior to their import into GIS.

⁸ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Generic written scheme of investigation for non-intrusive archaeological survey, Volume 5: Appendix HE-006-000000*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

Data presentation

- 2.3.4 A general location plan showing the survey area is shown on Figure 1 at a scale of 1:75,000. Details of sites or features transcribed during this project are presented at a scale of 1:5,000 on Figures 2 to 10 inclusive.
- 2.3.5 When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated, the local conditions at the site (geology, topography, etc.). The identified features are categorised by their potential origin and divided into categories that are used in the graphical interpretation of the remote survey data:
- bank;
 - ditch;
 - levelled ridge and furrow;
 - extant ridge and furrow;
 - extent of area;
 - services;
 - structure; and
 - large cut feature.
- 2.3.6 The identified categories are subsequently discussed by the period in which they most likely originated.

Assumptions and limitations

- 2.3.7 The results and subsequent interpretation of data from remote sensing surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by intrusive archaeological investigation of sub-surface deposits.
- 2.3.8 In some areas, the HS2 Ltd purpose-flown LiDAR and aerial orthophotography did not cover the full extent of the Proposed Scheme. Gaps in both the HS2 LiDAR coverage and aerial orthophotography comprised an area of approximately 18ha immediately north of Golborne and one of 24ha southwest of Culcheth. This is not anticipated to present a significant limitation as the areas were covered by alternative sources of orthophotography and 1m resolution Environment Agency LiDAR data.
- 2.3.9 The HS2 Ltd purpose-flown LiDAR survey took place during the summer, when leaf canopies, foliage and crop growth created unfavourable conditions for the collection of bare earth points. As a result, the quality of the Digital Terrain Model (DTM) generated from this LiDAR data is of low quality for areas beneath tree cover and may not represent a true ground surface model in areas of crops or dense foliage. Where available, the use of Environment Agency LiDAR data of a lower resolution has partially mitigated this issue.

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- 2.3.10 HER, NRHE and NHLE data was obtained in 2018. Any information added to these databases after that time will not have been available as a reference during the course of this survey.
- 2.3.11 The Cambridge University Collection of Aerial Photographs (CUCAP) archive of historic aerial photographs was closed for consultation at the time of this remote sensing survey. Although a small proportion of the collection was available online, the limited nature and low resolution of the images was inadequate for aerial analysis.
- 2.3.12 Local collections of aerial photography, potentially held by the HERs, were not consulted for this remote sensing survey.

3 Remote sensing survey results

3.1 Survey location

- 3.1.1 The study area for this remote sensing survey covers the entire length of the Risley to Bamfurlong area, which falls within both Warrington borough and Wigan metropolitan borough.
- 3.1.2 The study area generally comprised a 700m-wide strip centred on the Proposed Scheme (350m either side). This provided a buffer to offer contextual information for all recorded sites. In total the archaeological remote sensing survey for the Risley to Bamfurlong area covered an area of 9.3km².

3.2 Archaeological background

- 3.2.1 At the end of the last glaciation the retreat of the ice sheet resulted in the deposition of tills, sands and gravels. Within these formed wetlands known as mosses⁹ on the land south-west of Manchester including Holcroft Moss, Glazebrook Moss and Chat Moss. Farming communities emerged in the study area from the early Bronze Age, with evidence of associated woodland clearance shown by pollen found in the peat deposits in mosses. These people buried their dead in funerary mounds known as round barrows, some of which survive today to the west of the study area in Winwick. The earliest observable prehistoric settlement, located just south of the study area, is an Iron Age promontory fort at Great Woollen Hall Farm (MA04_0142, see BID HE-001-0MA04). Settlement within the study area is mostly likely to have consisted of isolated settlements and farmsteads in enclosures established during the Iron Age and Roman periods.
- 3.2.2 In the early medieval period, the existing settlement pattern of rural hamlets and farmsteads emerged. The earliest manors were located at Lowton, Culcheth and Golborne. There is a concentration of moated sites in the study area. These were a status symbol from the 12th to 14th century and are found in isolated locations including at Lightshaw Hall (MA05_0045) and Bamfurlong Hall (MA05_0094). Curvilinear field enclosures, characteristic of woodland clearance for agriculture, are visible as ancient field systems around Culcheth and Croft (MA05_HLCA02⁴). The mosses were exploited for seasonal pasture, hunting and turbage¹⁰.
- 3.2.3 Some halls continued to be occupied into the post-medieval period, and private parkland became a popular status symbol such as Kenyon Hall park (MA05_0136). The mosses began to be enclosed and reclaimed for agricultural land from the 18th century. Coal mining began in the medieval period, but by the post-medieval period there were many small coal mines around Wigan. Technological advances from the 18th century allowed for the working of

⁹ Mosses or mosslands are areas of wetland formed from peat.

¹⁰ Turbage is the right of preparing, storing and cut and carry away turf from the mosses.

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deeper mines such as Mains Colliery site (MA05_0137). This coincided with improved infrastructure including railways, roads and canals, such as the Leigh branch of the Leeds and Liverpool Canal (MA05_0116). The coal industry reached its peak in the early 20th century when c. 50 mines operated in Wigan but declined after that and all the mines closed. During the Second World War, the area was used for munitions production and other industrial support to the war effort, such as at the Royal Ordnance Factory (ROF) Risley (MA05_0124).

- 3.2.4 As Greater Manchester expanded, the small villages of Risley, Birchwood, Golborne and Lowton grew to become commuter settlements (see HE-003 MA05_HLCA01 and MA05_HLCA03). This was accompanied by improved infrastructure such as the M62 and A580 East Lancashire Road. The rural landscape of fields and former mosses survives between the settlements. Mines are no longer extant in the north of the study area and much of the area has been returned to agricultural use, while country parks have been created on areas of former spoil tips (see HE-003, MA05_HLCA04 and MA05_HLCA05). Large areas of flashes¹¹ still occur due to the effects of subsidence resulting from the mines.

3.3 Survey results

- 3.3.1 The results of this survey are summarised below by period. Since the data from the visualised LiDAR and the aerial photographs are mutually supporting, the results have not been separated by source.
- 3.3.2 The remote sensing survey mapped 29 individual areas, labelled from MA05_RS001 to MA05_RS029. These areas indicate the extent of sites, landscapes or parts of landscapes recorded. They are summarised in the gazetteer of identified features in Section 4 (Table 1).

Prehistoric (1,000,000 BC – AD 43)

- 3.3.3 A possible circular ditched enclosure (MA05_RS017/MA05_0163) measuring approximately 50m in diameter was visible on historic aerial photographs of 1946 as a cropmark on the south-eastern side of Byrom Wood. This feature was originally interpreted during the survey as a possible prehistoric enclosure. However, consultation with Greater Manchester Archaeological Advisory Service¹² has suggested the alternative possibility that the feature may be a medieval moated site (see 3.3.4). The area has been altered through the creation of a path and development of a woodland which may have truncated or obscured any associated features, and there is currently no available evidence to conclusively support either interpretation.

¹¹ Flashes are pools formed where mining activity has led to subsidence of the land. In the subsided land, wetlands and pools form which over time are recolonised by wetland flora and fauna.

¹² Pers comm Norman Redhead, Greater Manchester Archaeology Advisory Service, dated 9 September 2020.

Roman and early medieval (AD 43 –1066)

- 3.3.4 No features of Roman, or early medieval date were recorded during the remote sensing survey of this area.

Medieval (1066 – 1540)

- 3.3.5 As discussed above (3.3.3), a possible circular ditched feature (MA05_RS017/MA05_0163) may potentially be a medieval moated site.
- 3.3.6 The medieval moated site of Bamfurlong Hall is recorded in the HER, but the survey provided the opportunity to transcribe the visible extents of the site (MA05_RS029/MA05_0094). LiDAR data revealed the surviving extents of the moat beneath foliage and tree cover. The moat has been partially truncated by modern hardstanding to the north, and by a field boundary that partially follows the south edge from east to west before cutting diagonally across to the northwest corner of the site. The southwest corner of the moat was infilled, levelled and incorporated into the field south of the hall between 1970-1980, but a slight depression remains that allows the original extents of the moat to be discerned. No structural elements are apparent within the moated island, but LiDAR data shows variations across the surface including an elevated section on the east side. These may represent overgrown and levelled structural material but could be non-archaeological in origin. Further field investigation is required to establish the nature and extent of any remains.
- 3.3.7 The survey also recorded numerous areas of extant and levelled ridge and furrow (MA05_RS001, MA05_RS003-006, MA05_RS008-016, MA05_RS018-023, MA05_RS025-028) dating from the medieval or early post-medieval periods⁴. The presence of ridge and furrow across the study area was sporadic. The limited observation of ridge and furrow may be in part due to impacts on agricultural land from urban and industrial development from the later post-medieval period to the present. Of the recorded ridge and furrow, three broad groupings are apparent:
- levelled ridge and furrow (such as MA05_RS001, MA05_RS003) associated with ancient and reorganised field systems around the former medieval manor at Culcheth (see HE-003, MA05_HLCA02);
 - extant and levelled ridge and furrow (such as MA05_RS008 to MA05_RS016) between the medieval manors of Golborne and Lowton. These survive as amalgamated and enclosed fields (see HE-003, MA05_HLCA03); and
 - extant and levelled ridge and furrow close to Lightshaw Hall (MA05_0045), a moated site surrounded by piecemeal enclosed fields and floodplain water meadows along the Hey Brook (see HE-003, MA05_HLCA05).
- 3.3.8 With the exception of MA05_RS023, geophysical survey (BID HE-004-0MA05) has been unable to confirm anomalies that would be consistent with ridge and furrow within the related

areas to these features. However, the geophysical survey did identify modern land drains at some of the sites in an arrangement that would align with a pattern of furrows. Modern drains are sometimes laid to follow existing furrows, which may be the case here, but it is also possible for striations resulting from drain installation to be misinterpreted as levelled ridge and furrow.

Post-medieval (1540 – 1901)

- 3.3.9 Leigh Golf Course, which was developed within the former grounds of Kenyon Hall, is partly within the Risley to Bamfurlong area. The outline of the former post-medieval parkland (MA05_RS007/MA04_0136) has been largely preserved through both the retention of tree lines that formed the park boundary and fainter remnants of former fence boundaries that are still visible despite the golf course landscaping. Together, these remains were sufficient for a transcription of the park boundary.
- 3.3.10 As noted above, extant or levelled ridge and furrow may have been post-medieval in date.

Modern (1901 – present)

- 3.3.11 A section of the former railway line which served the Second World War Royal Ordnance Factory Risley; MA05_0124) military munitions site crosses the study area. This is visible on LiDAR and aerial imagery as a faintly extant embankment (MA05_RS002/MA05_0165).
- 3.3.12 The extent of the substantial 20th century Mains Colliery site (MA05_0137) has been recorded by the survey (MA05_RS024). Although also recorded on historic maps such as the Ordnance Survey six-inch map of Lancashire¹³, additional details have been recorded as a part of this survey. This area was levelled by 1975 and the land now forms part of Viridor Wood recreational woodland. The colliery was adjacent to the west of the London and North Western Railway and contained numerous pits and structures along with associated railway infrastructure.

3.4 Remote sensing survey conclusions

- 3.4.1 A total of 29 individual or grouped possible archaeological features were identified by the survey, 28 of which were not previously recorded by the HER, NRHE or NHLE. These include:
- the extents of the Bamfurlong Hall moated manor house (MA05_RS029). Although the site has an HER record, the survey provided the opportunity to enhance the spatial extents of the site;
 - one cropmark near Byrom Wood, probably relating to a previously unrecorded moated site¹² (MA05_RS017);

¹³ Ordnance Survey (1929), *Lancashire County Series, Map Sheet CI.NE.*

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- the extent of the post-medieval park belonging to Kenyon Hall (MA05_RS007);
- the former 20th century Mains Colliery site (MA05_RS024);
- a section of railway line servicing Royal Ordnance Factory Risley (MA05_RS002), related to the munitions factory which supported the war effort during the Second World War; and
- the remaining archaeological features were all areas of extant and/or levelled ridge and furrow, relating to medieval and post-medieval agriculture.

- 3.4.2 Although a definitive interpretation is not certain, the form of the cropmarks near Byrom Wood (MA05_RS017) and their location adjacent to the Hey Brook strongly suggest a medieval moated site. This interpretation would fit well within the context of known medieval sites across the landscape demonstrated by a concentration of moated sites along the Hey Brook, including Mossley Hall Moat (MA05_0101) and Byrom Hall (MA05_0057) to the south and Lightshaw Hall (MA05_0045) to the north. Along with Bamfurlong Hall (MA05_RS029), these features are consistent with the existing pattern of medieval settlement within the landscape of the Risley to Bamfurlong area, where moated sites are the most prevalent type of recorded medieval site. Other examples from the study area include Kignall Hall (MA05_0008) and Abram Hall (MA05_0095). Such sites are thought to have originated in the 12th to 14th century and were mainly associated with isolated settlements consisting of farmsteads and hamlets.
- 3.4.3 Kenyon Hall was one of a number of large private residences in Culcheth in the post-medieval period and the only one that remains extant. Despite the incorporation of the hall's parkland (MA05_RS007) into a golf course, a lack of development surrounding the park has fossilised the boundaries of the park.
- 3.4.4 The former 20th century Mains Colliery site (MA05_RS024) was an extensive mining landscape that is now part of Viridor Wood recreational woodland. The site is representative of the coal mining industry that was present in the Manchester and Wigan landscape since the 14th to 15th century, but which intensified significantly as demand for coal increased from the 18th into the early 20th century. Such sites formed a dominant part of the late post-medieval and early modern landscape, transforming the tangible and intangible landscape not only through extraction and infrastructure, such as railways and canals, but also through socio-economic transformations in settlement and land use. Other collieries within the study area were Edge Green Colliery (MA05_0112) and Platt Bridge Colliery (MA05_0134).
- 3.4.5 The Second World War railway (MA05_RS002) formed part of the infrastructure serving the Royal Ordnance Factory Risley (MA05_0124) that specialised in the filling and priming of shells and bombs. During the war, many new munitions factories were created in the north of England, offshoots of the Royal Arsenal in Woolwich. The dispersed and remote locations provided the facilities with protection from destruction and reduced risks of disruption to the supply of armaments.

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4 Gazetteer of identified remote sensing features in MA05

4.1.1 The following gazetteer provides a summary of the identified features.

Table 1: Gazetteer of identified features in MA05

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA05_RS001		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within enclosed agricultural ground to the southeast of Culcheth. This plot is located south of the former Wigan Junction Branch railway.	Figure 3	367083 394009
MA05_RS002	MA05_0165	Railway	Extent of area	Modern	Route of the former railway that crossed the study area from the Wigan Junction Branch line, heading south towards the Royal Ordnance Factory Risley site. Only the section within the study area has been transcribed.	Figure 3	366451 394189
MA05_RS003		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within enclosed agricultural ground to the south of Culcheth, just to the south of Taylor Business Park.	Figure 3	365623 394233
MA05_RS004		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Four areas of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field to the	Figure 4	365178 394709

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					south of Culcheth, west of Newchurch Refectory (also known as Newchurch Old Rectory). The boundaries of the two western historic plots have been removed and become amalgamated into a larger modern field.		
MA05_RS005		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Group of three areas of levelled ridge and furrow observed from historic aerial photographs. These areas are located: 1. Within enclosed agricultural ground to the west of Culcheth, north of Wigshaw. This plot has been truncated by the former Wigan Junction Branch railway. 2. Within an enclosed agricultural field to the north-west of Blakely Farm Cottage, north of Kenyon Farm. 3. Within common land to the southwest of Culcheth, west of Wigshaw and south of Blakely Farm Cottage.	Figure 5	364180 395038
MA05_RS006		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Group of three areas of levelled ridge and furrow observed from historic aerial photographs. These areas are located: 1. Within enclosed agricultural ground to the west of Culcheth,	Figure 4	364418 395306

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					north of Wigshaw. This plot is located to the north-east of the former Wigan Branch railway. 2. Within common land to the southwest of Culcheth, to the south of Leigh Golf Course. 3. Within common land to the southwest of Culcheth, North of Wigshaw.		
MA05_RS007	MA04_0136	Park	Extent of area	Post-medieval	The grounds of Kenyon House, as observed in the 1st edition Ordnance Survey map of 1849 ¹⁴ . The south-western extents of the grounds are within the Risley to Bamfurlong area, although landscaped as part of Leigh Golf Course, Culcheth.	Figures 5 and 6	364494 395818
MA05_RS008		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within enclosed agricultural field to the south of the A580 East Lancashire Road, north of Clough Farm. This plot has been truncated by the former Wigan Branch line.	Figure 7	363553 396807
MA05_RS009		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of extant ridge and furrow observed within enclosed agricultural ground to the north of	Figure 7	363180 397116

¹⁴ Ordnance Survey (1849), *Lancashire County Series, Map Sheet CII*, 1st edition.

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					the A580 East Lancashire Road, south of Lowton St Mary's.		
MA05_RS010		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field to the north of the A580 East Lancashire Road, south of Lowton St Mary's. This plot has been truncated by the former Wigan Branch line.	Figure 7	363297 397161
MA05_RS011		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of extant ridge and furrow observed within an enclosed meadow on the western edge of Lowton Common, to the north of A572 Newton Road.	Figure 7	363196 397791
MA05_RS012		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field to the east of Lowton, west of Lowton Common. This plot is adjacent to the former St Helens Branch line, to the south of the former sidings.	Figures 7 and 8	362717 398003
MA05_RS013		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Two areas of levelled ridge and furrow observed from historic aerial photographs. These areas are located: 1. Within an enclosed agricultural field to the north of Small Brook, adjacent to the west of Sandy	Figure 7	363119 398296

Background Information and Data
 Historic environment
 BID HE-005-0MA05
 MA05: Risley to Bamfurlong
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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					Lane, north of Lowton Common. There appears to have been subsequent truncation of this field by a possible utility trench. 2. Within a very small, enclosed field to the northwest of Small Brook, and West of Sandy Lane. This plot was possibly once part of larger plot, but appears to have been intentionally divided by a drainage ditch that created three smaller plots.		
MA05_RS014		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of extant ridge and furrow observed within an enclosed meadow ground, adjacent to Laburnum Farm.	Figure 8	362680 398526
MA05_RS015		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field to the north-west of Slag Lane, south of Little Byrom Hall Farm, and north-east of the former St Helens Branch line. A small stream forms the northern boundary of the plot.	Figure 8	362214 398489
MA05_RS016		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of extant ridge and furrow observed within enclosed agricultural ground to the west of Little Byrom Hall Farm, just south of the Byrom wood.	Figure 8	362214 398828

Background Information and Data
 Historic environment
 BID HE-005-0MA05
 MA05: Risley to Bamfurlong
 Historic environment remote sensing report

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA05_RS017	MA05_0163	Enclosure	Ditch	Uncertain Neolithic Bronze Age Iron Age	Circular cropmark with partial linear feature observed in historic aerial photograph of 1946. The feature has not previously been recorded and there is no evidence of an existing earthwork in modern LiDAR or aerial images. The circular feature measures approximately 50m in diameter. The feature has been transcribed as seen, and there are gaps where a former field boundary has truncated the eastern section. A larger gap to the southeast, where the cropmark is less visible, may indicate an entrance, but this is not clear. A linear feature, of which approximately 65m is visible, enters the circular feature from the southwest. The form of the feature may indicate a prehistoric circular enclosure, although this identification is uncertain from the available evidence.	Figure 8	362132 398852
MA05_RS018		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Group of three areas of extant ridge and furrow. These areas were located: 1. Within enclosed agricultural ground to the west of Byrom Wood, to the east of A573 Wigan	Figure 9	361373 399077

Background Information and Data
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 BID HE-005-0MA05
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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					Road and east of Windy Bank Farm. The evidence for these earthworks is faint. 2. Within enclosed agricultural ground to the east of the West Coast Mainline (WCML), and west of A573 Wigan Road. Aye Bridge Farm is located to the south and the southern extent of the plot is marked by a small former watercourse. 3. Within enclosed agricultural ground close to Byrom wood.		
MA05_RS019		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field to the south of The Old Shippen.	Figure 9	361505 399339
MA05_RS020		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of extant ridge and furrow observed within enclosed agricultural ground near to The Old Shippen.	Figure 9	361650 399574
MA05_RS021		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of extant ridge and furrow observed within enclosed agricultural ground to the east of Windy Bank Farm and A573 Wigan Road.	Figure 9	360801 399336
MA05_RS022		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed	Figure 9	361031 399727

Background Information and Data
 Historic environment
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 MA05: Risley to Bamfurlong
 Historic environment remote sensing report

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					agricultural field to the south of Balmer's Farm and north of Lightshaw Lane.		
MA05_RS023		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field adjacent to Aye Bridge Farm, to the east of the mainline railway and to the west of Warrington Road.	Figure 9	360555 400193
MA05_RS024	MA05_0137	Colliery	Extent of area	20th century	Mains Colliery site, including pits, structures and railway infrastructure. The site is visible in historic mapping from the early 20th century until the 1970s. The site covers a large area, extending to the west of the WCML and to the north-east of Ashton in Makerfield. This site was levelled in the 1970s and the land now forms part of Viridor Wood recreational woodland.	Figure 10	359991 400674
MA05_RS025		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field located to the east of the WCML, to the west of A573 Wigan Road, and to the north of Aye Bridge Farm.	Figure 10	360362 400844

Background Information and Data
 Historic environment
 BID HE-005-0MA05
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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA05_RS026		Ridge and furrow	Levelled ridge and furrow	Medieval Post-medieval	Area of levelled ridge and furrow observed from historic aerial photographs within an enclosed agricultural field located to the west of the WCML, and south of Bamfurlong.	Figure 10	359891 401209
MA05_RS027		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of faint extant ridge and furrow observed within enclosed public green space to the south of Bamfurlong, south of the A58 Lily Lane and west of the Leeds and Liverpool Canal.	Figure 10	359904 401473
MA05_RS028		Ridge and furrow	Extant ridge and furrow	Medieval Post-medieval	Area of faint extant ridge and furrow observed within waste ground to the west of the Leeds and Liverpool Canal, and to the south of the A58 Lily Lane.	Figure 10	360211 401741
MA05_RS029	MA05_0094	Moat Manor House	Ditch Bank	Medieval	Remains of the moat of Bamfurlong Hall. Partially concealed beneath foliage and tree cover but visible in LiDAR data as ditches and a depression forming a sub-rectangular arrangement. The feature is partially truncated by modern construction to north, and in the southwest by a field boundary that cuts across the feature. The southwest section is now infilled, but the overall shape of the moat appears to still be discernible as a	Figure 10	360115 401602

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					<p>depression. Moat shown as continuous in Ordnance Survey maps until 1970s, suggesting that the corner was infilled between 1970-1980.</p> <p>No Structural remains are visible from photographs or evident in LiDAR data. The LiDAR data indicates that the surface of the island fluctuates, but the most significant feature is an elevated section that corresponds approximately with the east wing of the house shown in 19th century Ordnance Survey mapping¹⁵. There is no visible evidence of structural remains. These have probably been levelled or removed, but it is possible that they are obscured by dense foliage.</p>		

¹⁵ Ordnance Survey (1894), *Lancashire County Series, Map Sheet CI*, 2nd edition.

5 List of acronyms

5.1.1 The following acronyms have been used in this report.

Table 2: List of acronyms

Acronym	Meaning
ACA	Archaeological Character Area
ASZ	Archaeological Sub-zone
BID	Background Information and Data
CUCAP	Cambridge University Collection of Aerial Photographs
Defra	Department for Environment, Food & Rural Affairs
DSM	Digital Surface Model
DTM	Digital Terrain Model
GIS	Geographical Information System
HER	historic environment record
HLC/HLCA	historic landscape character/ Historic Landscape Character Area
LiDAR	Light Detection and Ranging
NHLE	National Heritage List for England
NMP	National Mapping Programme
NRHE	National Record of the Historic Environment
PDF	Portable Document Format
RAF	Royal Air Force
ROF	Royal Ordnance Factory
RMSE	Root Mean Square Error
RVT	Relief Visualisation Toolkit
SLR	Single Lens Reflex
UID	Unique gazetteer identifier
WCML	West Coast Mainline

6 References

FISH (2020), *Heritage Data; Linked Data Vocabularies for Cultural Heritage*. Available online at: <https://www.heritagedata.org/blog/vocabularies-provided/>.

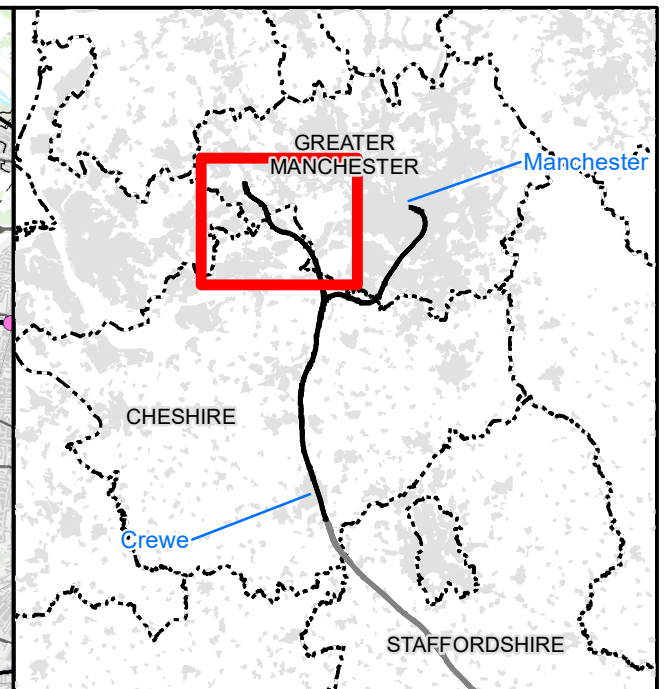
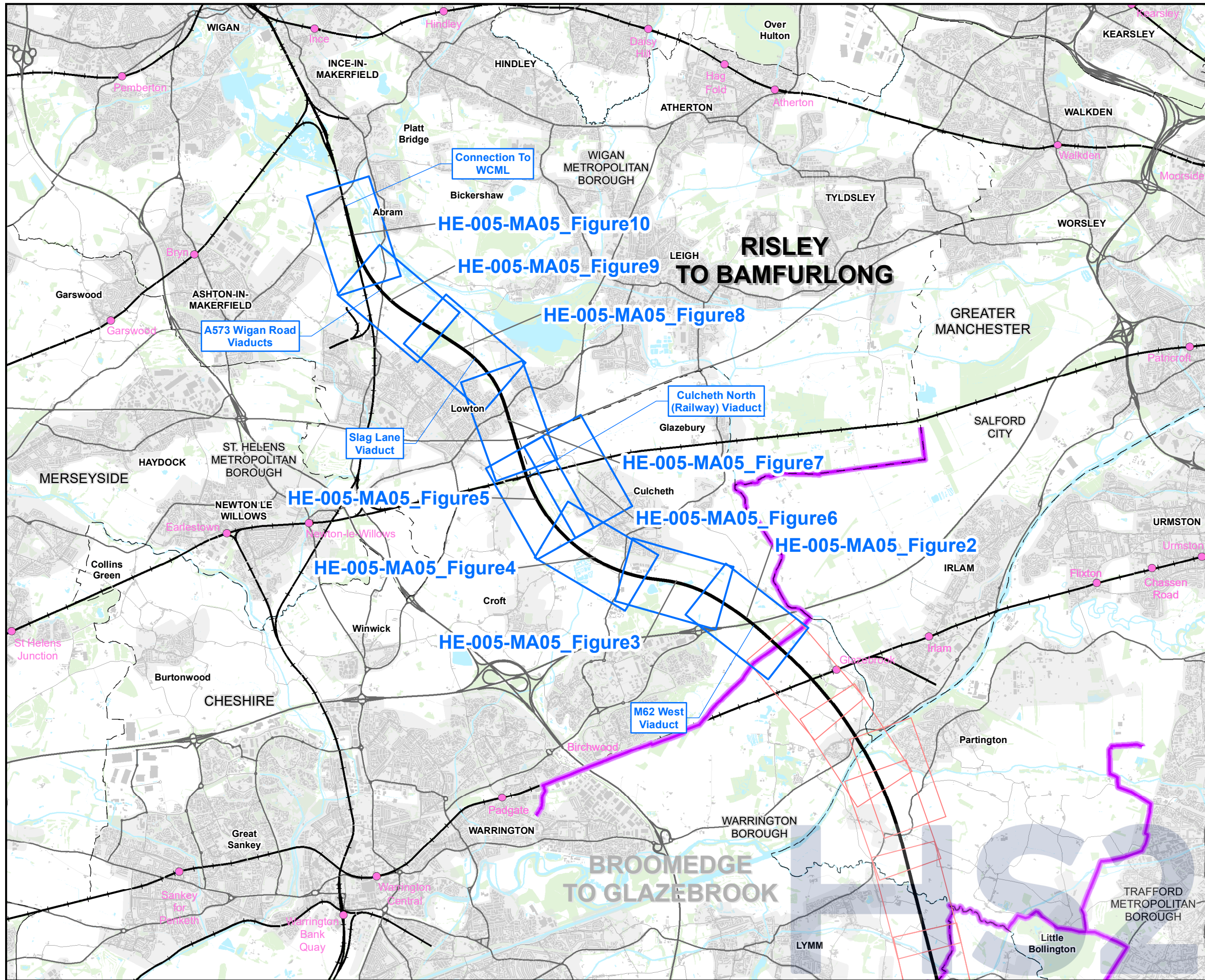
High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

Ordnance Survey (1929), *Lancashire County Series, Map Sheet CI.NE*.

Ordnance Survey (1849), *Lancashire County Series, Map Sheet CII*, 1st edition.

Ordnance Survey (1894), *Lancashire County Series, Map Sheet CI*, 2nd edition.

Winton, H. (2018), *Standards for National Mapping Programme projects*, Historic England, Technical Guidance.



Map Series Information:

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

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

Map Number	HE-005_MA05_Figure1
Map Name	Remote Sensing Survey Index map
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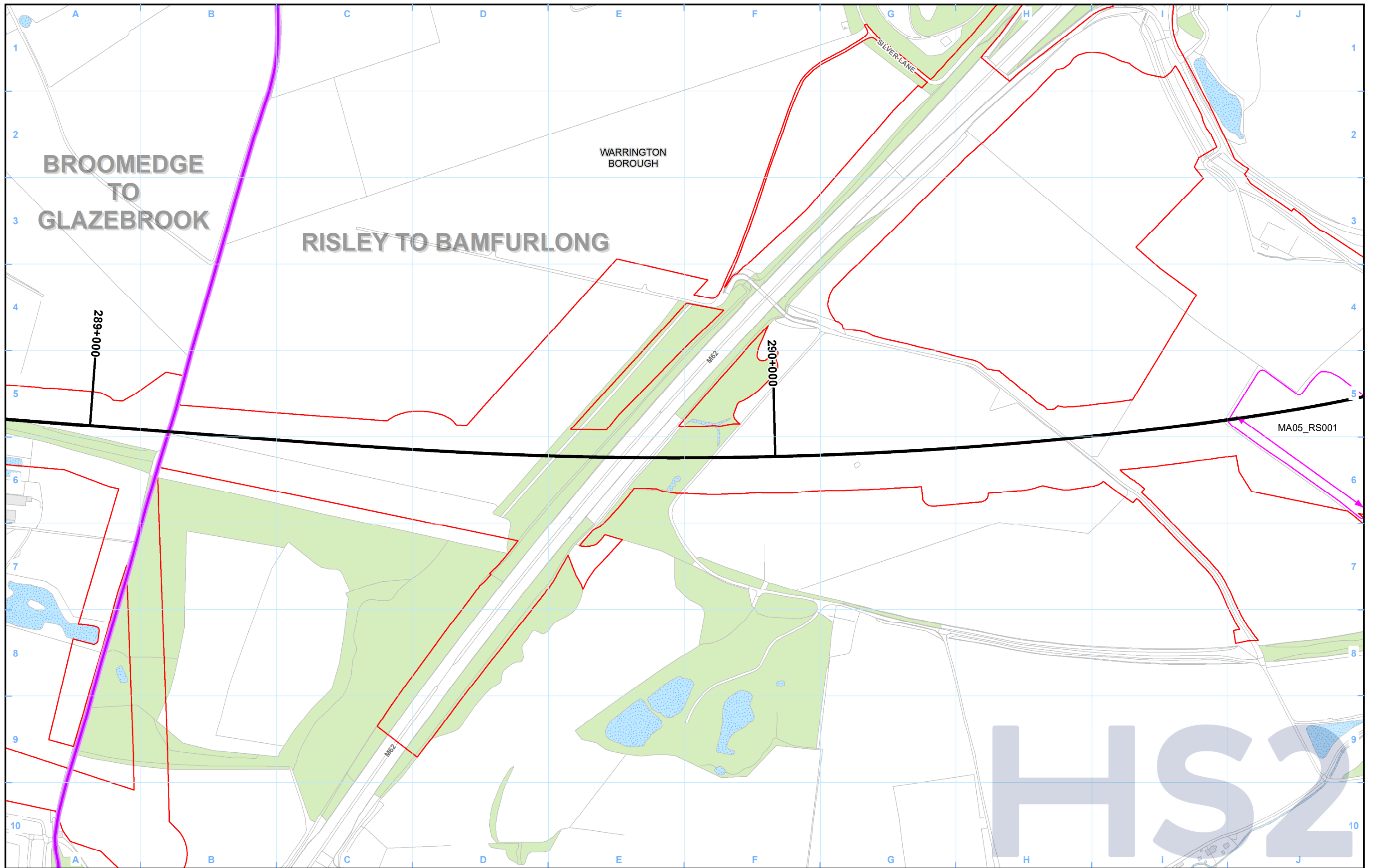
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Legend		
	Remote sensing feature type	

Map Number HE-005_MA05_Figure2

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Risley to Bamfurlong

HS2

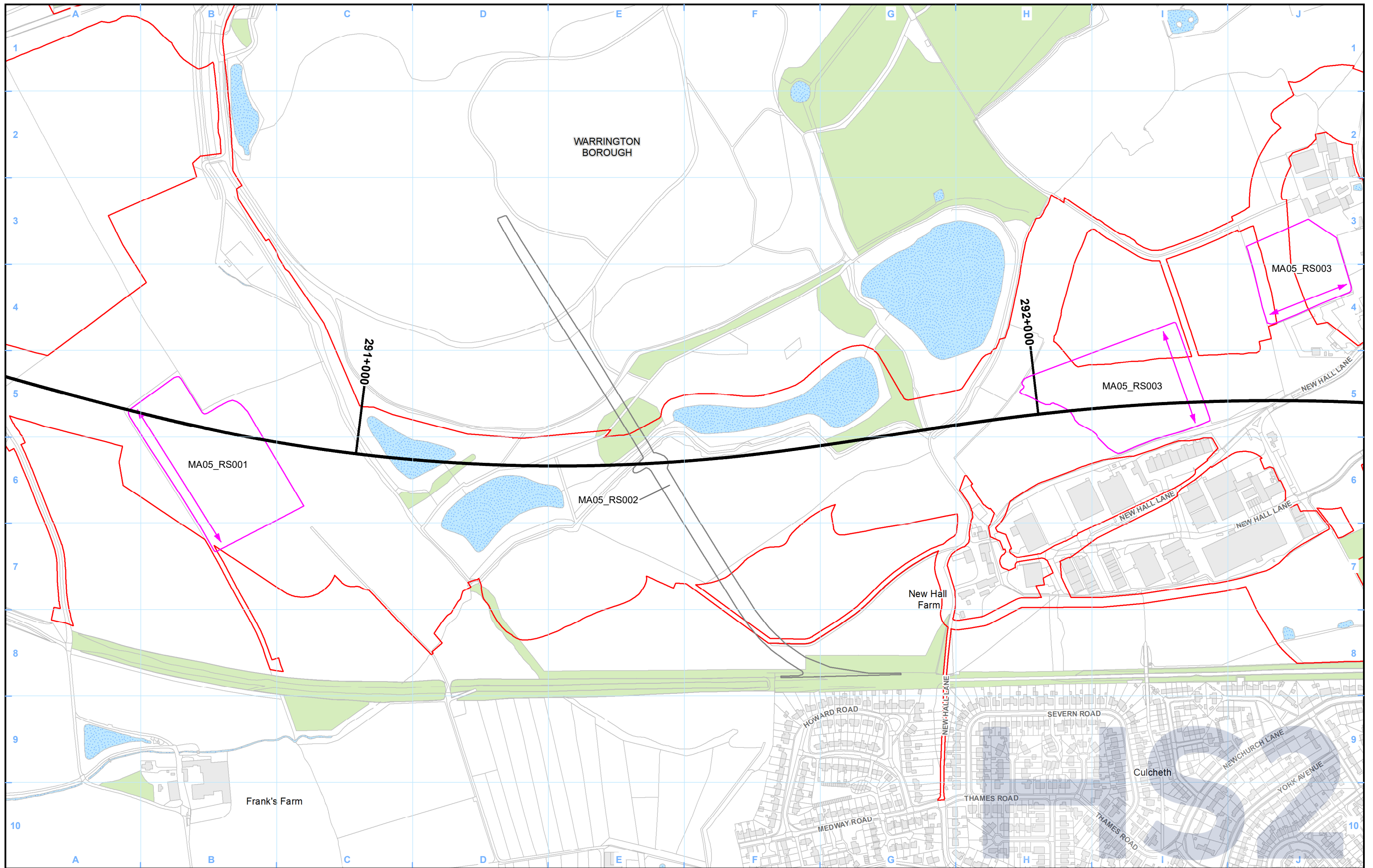
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Legend					
	Route in tunnel		Watercourse		Extant ridge and furrow area
	Route on surface		Water body		Extant ridge and furrow direction
	Depot, station, headhouse or portal building	Remote sensing feature type			Extent of area
	Land potentially required during construction		Bank		Large cut feature
	Community area boundary		Ditch		Services
	County boundary		Levelled ridge and furrow area		Structure
	District/Borough boundary		Levelled ridge and furrow direction		T-hachure

Map Number HE-005_MA05_Figure3

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Risley to Bamfurlong

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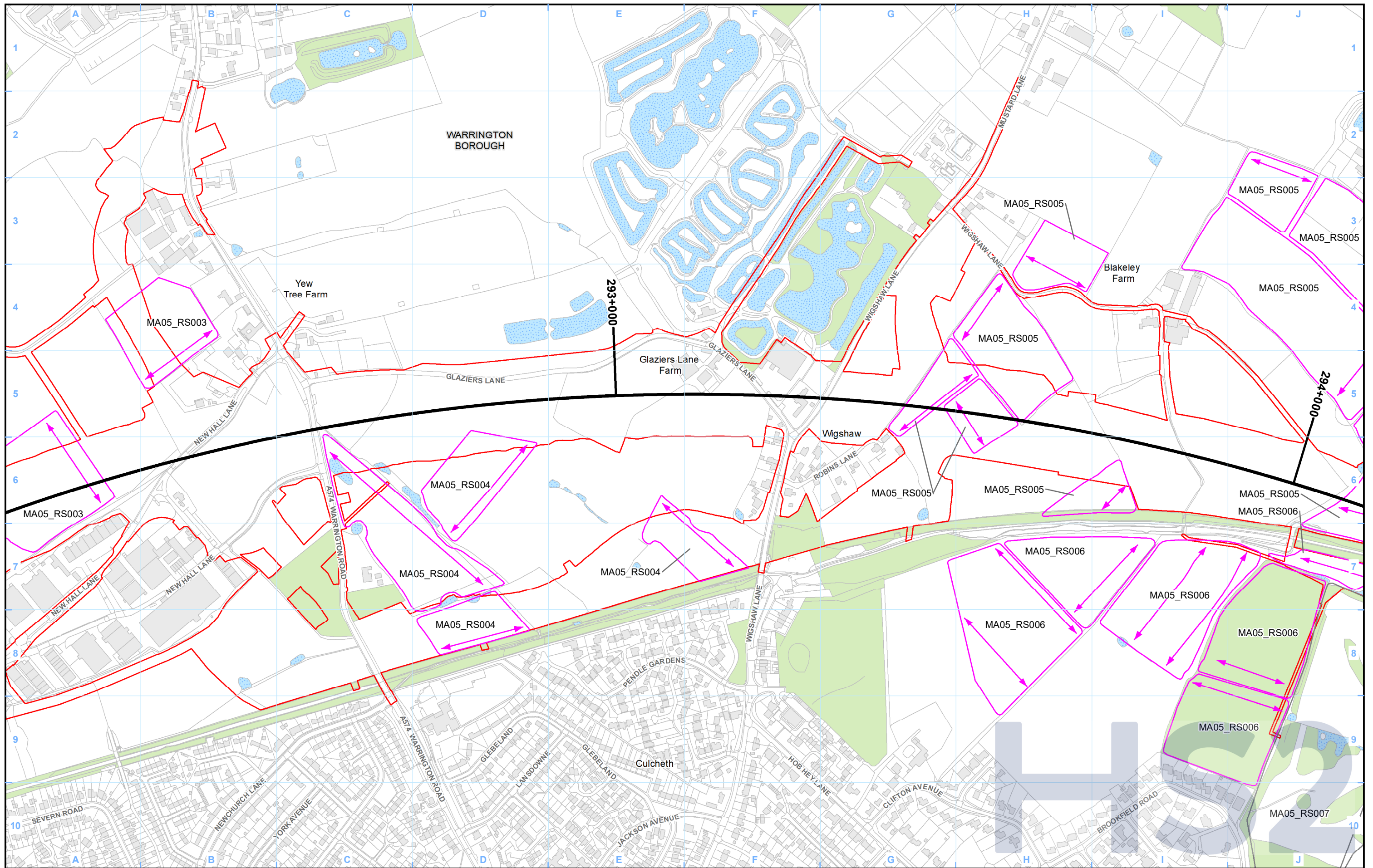
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0 50 100 150 200 Metres



Legend		
	Route in tunnel	
	Route on surface	
	Depot, station, headhouse or portal building	
	Land potentially required during construction	
	Community area boundary	
	County boundary	
	District/Borough boundary	
	Watercourse	
	Water body	
	Bank	
	Ditch	
	Levelled ridge and furrow area	
	Levelled ridge and furrow direction	
	Extant ridge and furrow area	
	Extant ridge and furrow direction	
	Extent of area	
	Large cut feature	
	Services	
	Structure	
	T-hachure	

Map Number HE-005_MA05_Figure4
 Map Name Remote Sensing Survey Interpretation
 Community Area MA05:
 Risley to Bamfurlong

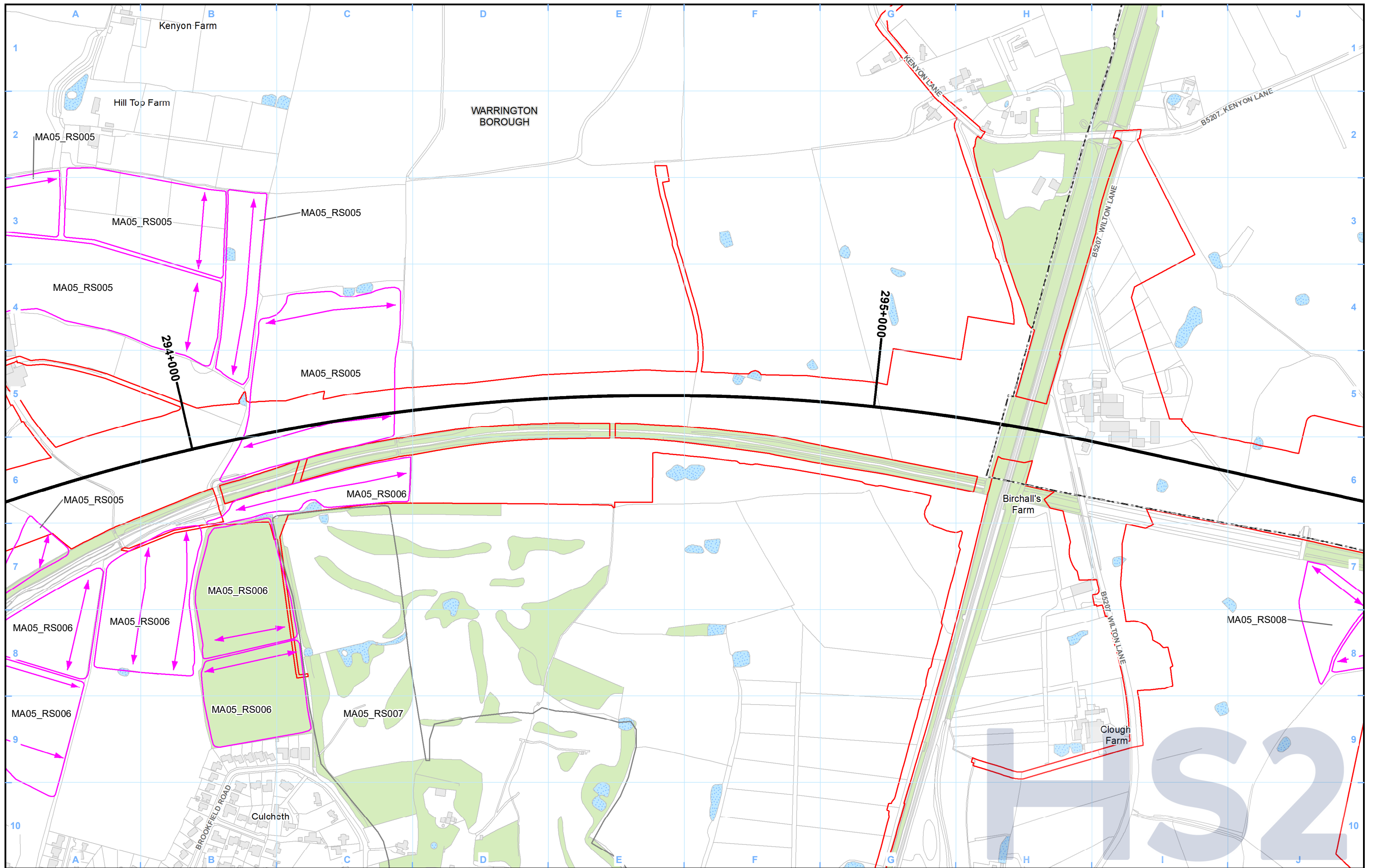
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Legend					
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	Route on surface		Water body		Extant ridge and furrow direction
	Depot, station, headhouse or portal building	Remote sensing feature type			Extent of area
	Land potentially required during construction		Bank		Large cut feature
	Community area boundary		Ditch		Services
	County boundary		Levelled ridge and furrow area		Structure
	District/Borough boundary		Levelled ridge and furrow direction		T-hachure

Map Number HE-005_MA05_Figure5

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Risley to Bamfurlong

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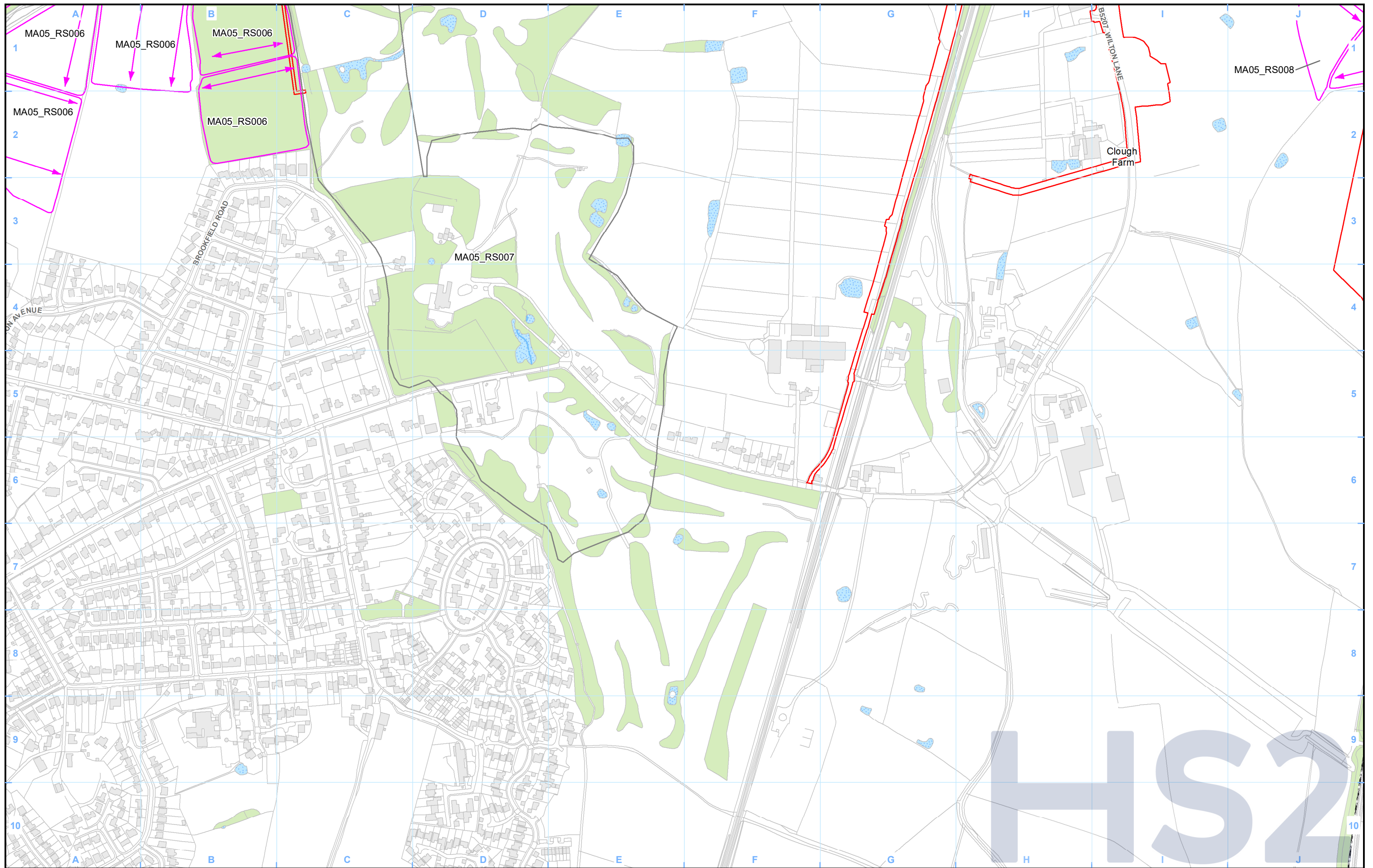
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Legend		
	Remote sensing feature type	

Map Number HE-005_MA05_Figure6

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Risley to Bamfurlong

HS2

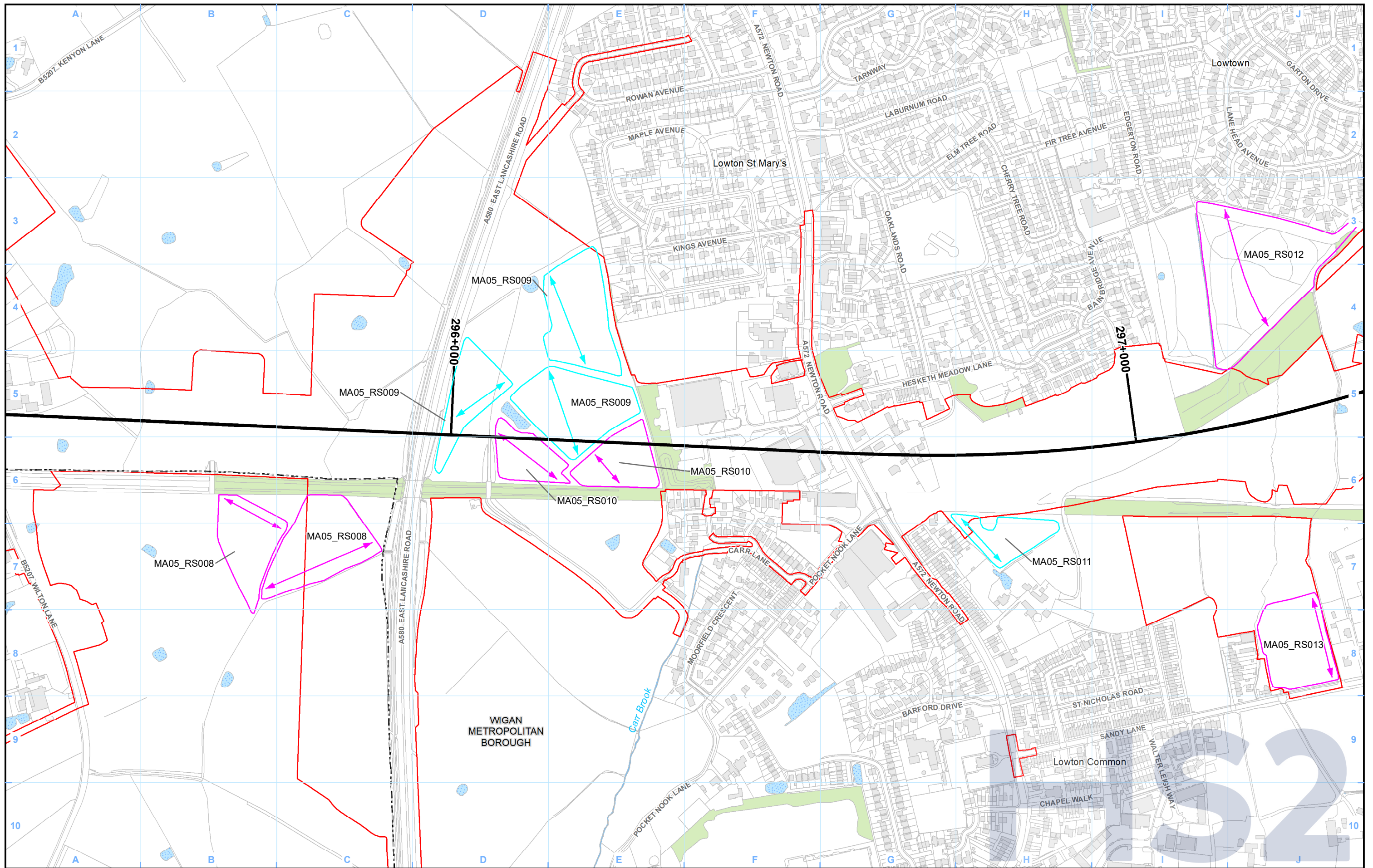
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Legend	
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	Route on surface
	Depot, station, headhouse or portal building
	Land potentially required during construction
	Community area boundary
	County boundary
	District/Borough boundary
	Watercourse
	Water body
	Remote sensing feature type
	Bank
	Ditch
	Levelled ridge and furrow area
	Levelled ridge and furrow direction
	Extant ridge and furrow area
	Extant ridge and furrow direction
	Extent of area
	Large cut feature
	Services
	Structure
	T-hachure

Map Number HE-005_MA05_Figure7

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Risley to Bamfurlong

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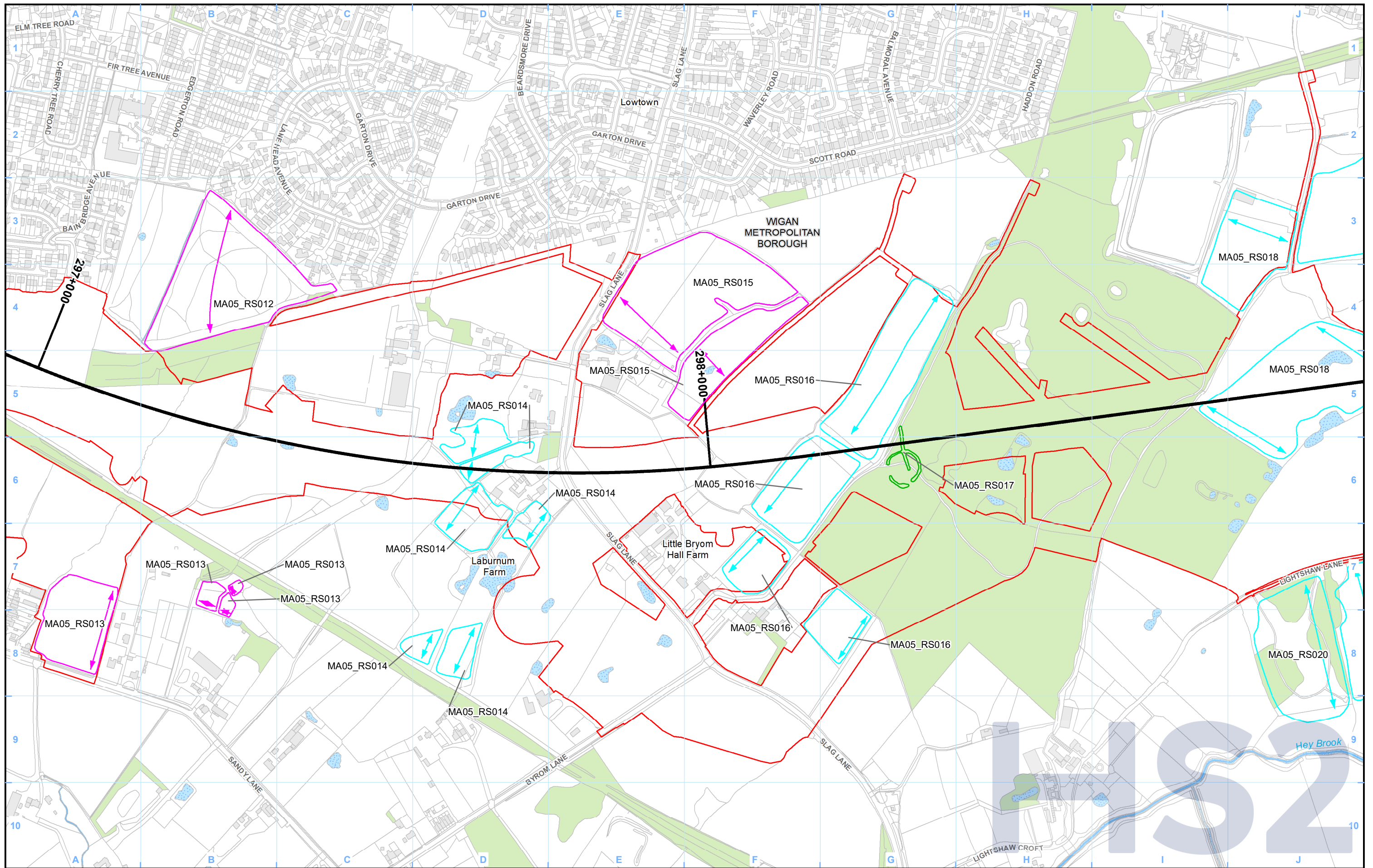
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Legend					
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	Route on surface		Water body		Extant ridge and furrow direction
	Depot, station, headhouse or portal building		Remote sensing feature type		Extent of area
	Land potentially required during construction		Bank		Large cut feature
	Community area boundary		Ditch		Services
	County boundary		Levelled ridge and furrow area		Structure
	District/Borough boundary		Levelled ridge and furrow direction		T-hachure

Map Number HE-005_MA05_Figure8

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Risley to Bamfurlong

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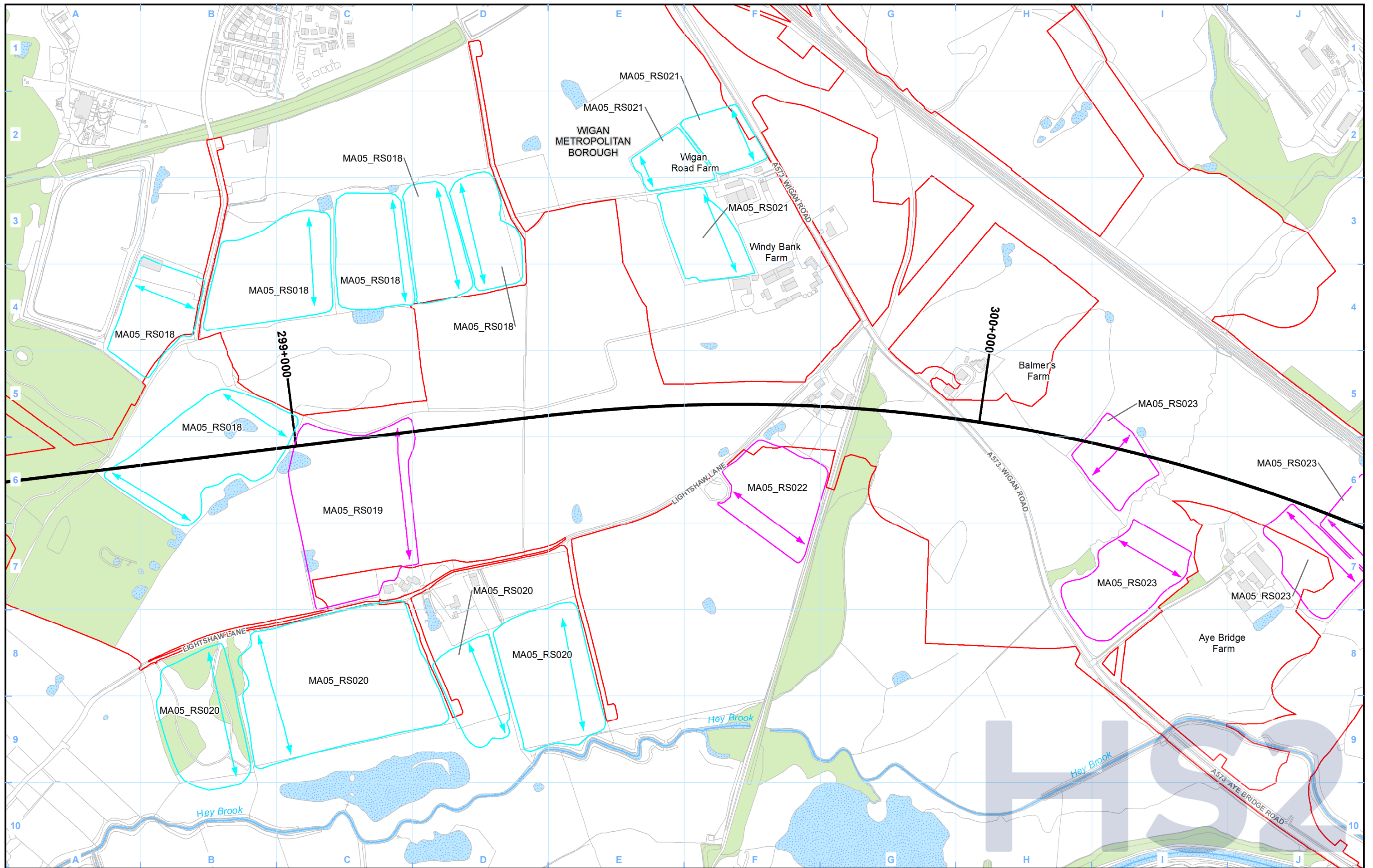
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Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Land potentially required during construction
	Community area boundary
	County boundary
	District/Borough boundary
	Watercourse
	Water body
	Bank
	Ditch
	Levelled ridge and furrow area
	Levelled ridge and furrow direction
	Extant ridge and furrow area
	Extant ridge and furrow direction
	Extent of area
	Large cut feature
	Services
	Structure
	T-hachure

Map Number HE-005_MA05_Figure9

Map Name Remote Sensing Survey Interpretation

Community Area MA05: Rislely to Bamfurlong

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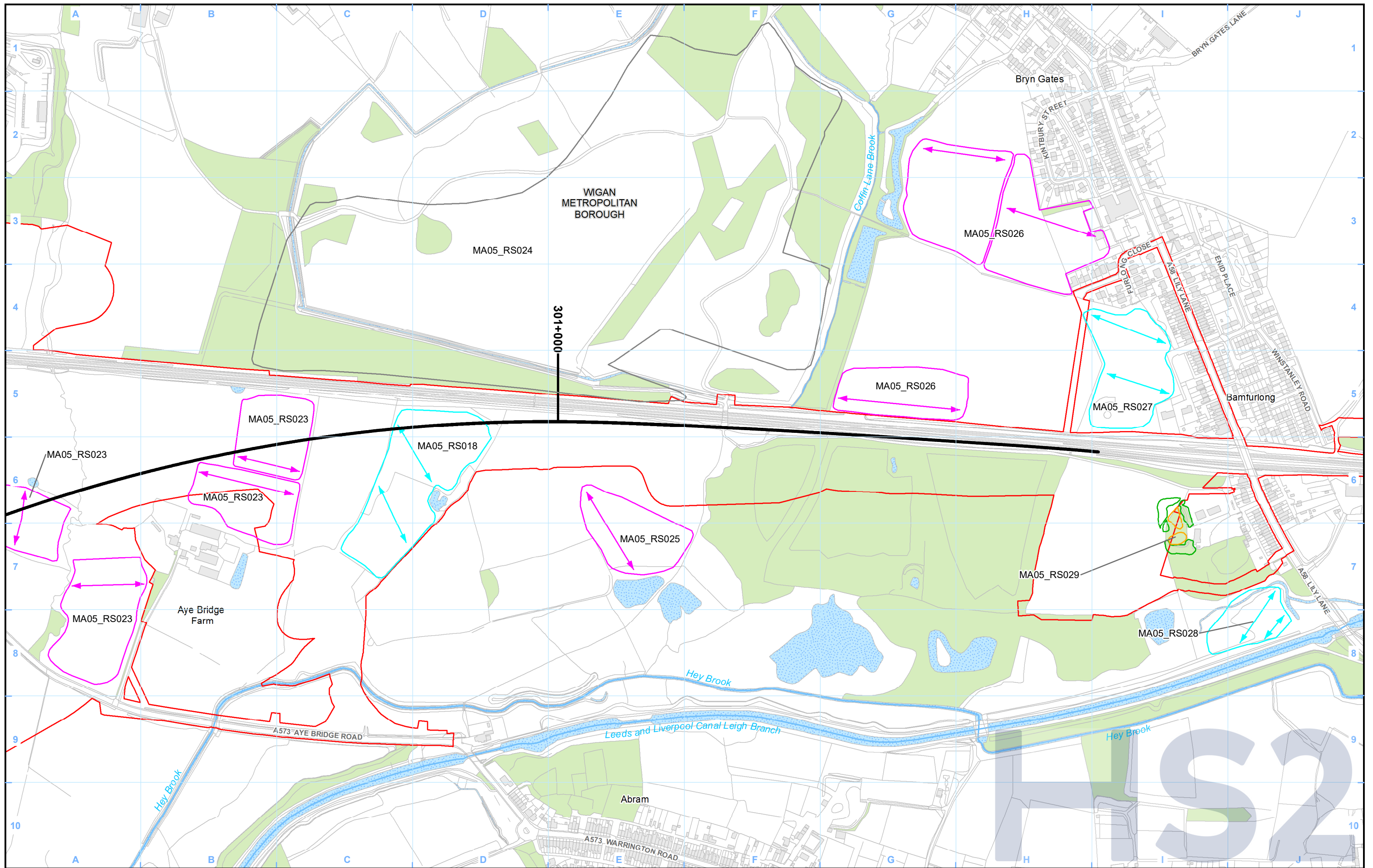
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Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Land potentially required during construction
	Community area boundary
	County boundary
	District/Borough boundary
	Watercourse
	Water body
	Remote sensing feature type
	Bank
	Ditch
	Levelled ridge and furrow area
	Levelled ridge and furrow direction
	Extant ridge and furrow area
	Extant ridge and furrow direction
	Extent of area
	Large cut feature
	Services
	Structure
	T-hachure

Map Number HE-005_MA05_Figure10

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Community Area MA05: Risley to Bamfurlong

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