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Cultural Heritage Mitigation Plan

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CVJV/AAR
3rd Floor
Longross Court,
47 Newport Road,
Cardiff
CF24 0AD

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1 INTRODUCTION

- 1.1.1** This report presents the Cultural Heritage Mitigation Plan (CHMP) produced with regard to the proposed M4 Corridor around Newport (M4CaN) (referred to as the Scheme), which includes a new section of motorway to the south of Newport. This CHMP forms an appendix to the Environmental Statement (ES).
- 1.1.2** This Cultural Heritage Mitigation Plan (CHMP) identifies the known archaeological and cultural heritage features and sites that would be affected by the construction and operation of the proposed new section of motorway and describes the scope and extent of any work that is to be undertaken in order to alleviate any adverse effects. It also identifies areas where further information regarding the presence/absence of archaeological features would be sought through a programme of archaeological evaluation. The CHMP goes on to describe the methodologies that would be employed within the programme of archaeological investigation and recording, along with the reports that would ultimately be produced following the completion of all site works and subsequent analysis of the results.
- 1.1.3** It should be noted that (despite the name of the document), none of the works proposed within this CHMP can be considered as 'mitigation' in the sense that the term is used within the EIA process. This is principally because the implementation of the programme of work described herein would not result in the avoidance or reduction of the impacts and effects of the Scheme; rather it would serve to 'remedy' the adverse nature of these impacts and effects. This would be achieved through the provision of information which can be disseminated through appropriate media to the widest possible audience.
- 1.1.4** Procedures for the mitigation of the impacts of UK trunk road schemes on archaeological resources (but not on any other aspect of cultural heritage) are identified in the Design Manual for Roads and Bridges (DMRB) produced by the Highways Agency. The relevant part of DMRB is Volume 10, Section 6, Part 1, HA 75/01 – *Trunk Roads and Archaeological Mitigation* (Highways Agency et al., 2001) (hereafter referred to as HA 75/01).
- 1.1.5** HA 75/01 defines mitigation as '*archaeological work intended to reduce the effect of a scheme on the archaeological resource....Mitigation may involve avoiding important archaeology, burying it or excavating and recording it*'.
- 1.1.6** A more recent section of DMRB (Volume 11, Section 3, Part 2, HA 208/07 – *Cultural Heritage*, hereafter referred to as HA 208/07) (Highways Agency et al., 2007) states: '*Mitigation aims to avoid or lessen the effect of negative impacts on the archaeological resource*' (Annex 5, paragraph 5.11.1) and goes on to state: '*Only for significant remains that cannot be avoided should the option of archaeological excavation be adopted. In such a case it is the effective investigation, recording, analysis, interpretation, and appropriate dissemination of the results that constitute mitigation – in that it addresses the effect of the scheme, as compared to the destruction of the site without understanding it*' (Annex 5, paragraph 5.11.2).
- 1.1.7** However paragraph 5.11.3 of Annex 5 of HA 208/07 states: '*The increase of knowledge gained through such an investigation should not normally be counted as a benefit, but should be offset against the loss of information that would otherwise occur if a site were to be damaged or destroyed unrecorded*'.

- 1.1.8** The methodologies presented in HA208/07 for assessment of impacts and effects on cultural heritage resources do not include any mechanism whereby the implementation of agreed 'mitigation' strategies would result in a reduction in either the magnitude of impact or the level of effect.
- 1.1.9** Thus the position described above with regard to the advice presented in HA 75/01 and HA 208/07 is confusing with regard to whether or not archaeological investigation (along with subsequent reporting and dissemination) constitutes mitigation that serves to reduce the effect or should in fact be seen as a means of 'off-setting' or 'remediating' that effect. The approach undertaken with regard to the assessment of the Scheme as presented in Chapter 8 of the ES is as described above (paragraph 1.1.3).
- 1.1.10** HA 208/07 advises that mitigation for impacts on historic buildings can include: moving the building; rebuilding for re-use; rebuilding as a museum exhibit; partial recovery of historic fabric; and recording prior to demolition or damage (Annex 6, paragraph 6.11.3). Mitigation for impacts on the character of the historic landscape requires consideration of preservation, conservation, repair, restoration, or reconstruction of features that contribute to historic landscape character (HA 208/07, Annex 7, paragraph 7.11.3).
- 1.1.11** HA 75/01 defines the role of Curator as '*the archaeologists charged with protecting and monitoring the archaeological resource.....Curators would normally advise on the significance of the archaeological resources, may prepare or advise on the contents of Project Briefs and Project Designs and may monitor the performance of Archaeological Contractors*'. The Curator appointed by Welsh Government for the Scheme is Neil Maylan (Glamorgan Gwent Archaeological Trust). None of the work described in this CHMP would be implemented until the final version of the document has been agreed in writing by the Curator appointed by Welsh Government as being appropriate and by Welsh Government as the Overseeing Organisation.
- 1.1.12** HA 208/07 includes an updated description of the role of Cadw with regard to trunk road schemes in Wales. Annex 8 of HA208/07 explains that for schemes procured through non-conventional contracts (including ECI schemes), '*Cadw's role will be limited to advising Transport Wales on the Scheme Brief, Scheme Design, assessment reports and the Cultural Heritage chapter of environmental statement for these schemes*'.
- 1.1.13** For the Scheme, Cadw has been consulted throughout the process of design and assessment leading to the production of the Environmental Statement. Specifically, Cadw has been involved in issues where Scheme design has the potential to impact upon Scheduled Monuments, listed buildings and Registered Landscapes of Special or Outstanding Historic Interest. Further consultation with Cadw would take place following the publication of the draft Orders for the Scheme.
- 1.1.14** The programme of work described in this CHMP is in general accordance with the procedures identified in HA 75/01 and HA 208/07.

2 SUMMARY SCHEME DESCRIPTION

- 2.1.1** A detailed description of the Scheme is provided in Chapter 2 of the ES. In summary, M4CaN comprises a new three lane motorway to the south of Newport between the existing M4 Junction 29 at Castleton and the existing M4 Junction 23 at Magor, along with Complementary Measures on the existing M4 between the same junctions.
- 2.1.2** Beyond the tie-in locations with the existing M4, additional measures associated with the Scheme would be installed, including road signage, lighting columns and vehicle restraining systems. However, these would not require any modifications to be made to the highway boundary and would not require any form of mitigation with regard to cultural heritage.
- 2.1.3** The proposed Complementary Measures on the existing M4 would include the following.
- Reclassification of the existing M4 between Junction 23A (Magor) and Junction 29 (Castleton) to a rural all-purpose trunk road.
 - Reclassification of the existing A48(M) between Junction 29 (Castleton) and Junction 29a (St Mellons) to a rural all-purpose trunk road.
 - Remodelling of Junction 25 and 25A on the existing M4 to improve access to Caerleon from the west.
 - Provision of non-motorised user friendly infrastructure.
 - Connection between M48, M4 and B4245.
- 2.1.4** None of the proposed Complementary Measures on the existing M4 would require any form of mitigation with regard to cultural heritage.
- 2.1.5** The proposed new section of motorway would be approximately 23 kilometres (km) in length and would provide three lanes in both directions.
- 2.1.6** In addition to the junctions at Castleton and Magor, two new junctions would be provided along the route of the new section of motorway (at Newport Docks and at Glan Llyn). New or diverted lengths of highway, public rights of way and private means of access would be provided to replace those affected by the Scheme.
- 2.1.7** Road drainage would be provided via grassed channels in the road verge, which would discharge into a series of water treatment areas and reed beds along the new section of motorway. These water treatment areas would attenuate and treat the collected surface water prior to discharging it into existing watercourses.
- 2.1.8** The existing Castleton junction on the M4 (J29) would be modified to incorporate the new section of motorway. The junction has been designed to provide a free flowing interchange giving priority to the M4 motorway (including the new section of motorway) with three lanes in both directions.
- 2.1.9** From the modified Castleton junction, the new section of motorway would curve to the south east on embankment, passing to the south of Berryhill Farm. Church Lane would be diverted from its current alignment to tie back into the existing highway to the north at a new roundabout junction. An overbridge would be provided to carry the realigned Church Lane.

- 2.1.10** To the south east of Church Lane, the alignment has been designed to follow the Duffryn Link Road corridor, where practicable. The proposed new section of motorway would pass over the South Wales to London Mainline railway on a skewed structure (the Duffryn Railway Underbridge). To the east of the railway, the alignment would continue on a low embankment across the Wentlooge Levels. A new overbridge would be provided at Lighthouse Road.
- 2.1.11** The new section of motorway would cross the River Ebbw and pass to the south of the Docks Way Landfill site. A new junction would be provided in this location to provide a connection from the new section of motorway onto the A48 Southern Distributor Road (SDR) and to the centre of Newport.
- 2.1.12** East of the Docks Way Junction, the alignment would continue in a north easterly direction towards the River Usk. The River Usk Crossing would cross the Newport Docks between the South Dock and North Dock, before straightening out over the main bridge crossing of the River Usk. The bridge crossing is proposed to take the form of a 2.1 km long elevated structure, including a high-level cable-stayed central bridge.
- 2.1.13** The structure can be divided into three main components as follows.
- The west approach viaduct, a 512 m long structure consisting of seven spans.
 - The cable-stayed bridge, a 752 m long structure consisting of two long back spans and a 440 m long main span over the river.
 - The east approach viaduct, a 888 m long structure consisting of 12 spans.
- 2.1.14** To the east of the River Usk Crossing, the alignment would cross the Caldicot Levels. A new overbridge would be provided at Nash Road which would be diverted offline to the east. The highway would be supported on a low embankment as it runs to the east towards the former steelworks.
- 2.1.15** A new junction would be provided at Glan Llyn, which would provide a connection for the new section of motorway, via a link road, to the Steelworks Access Road (SAR). From this junction the new section of motorway would run in an easterly direction parallel to the SAR and to the north of Whitson substation. A new overbridge would be provided at North Row and an underbridge would be provided at Bareland Street.
- 2.1.16** The new section of motorway would then ascend on an embankment to cross over the South Wales to London Mainline railway on a new structure and would then run in a north easterly direction towards Magor. New overbridges would be provided at Newport Road and Knollbury Lane and a new underbridge at Rockfield Lane.
- 2.1.17** The new section of motorway would re-join the existing M4 at Junction 23a to the north of Magor. From here, the new section of road would run alongside the existing M4 to Junction 23, where connections would be provided to the M48 and the B4245.
- 2.1.18** The new section of motorway would intersect a number of existing reens and field ditches. Culvert crossings or reen bridges would be provided for each main reen in order to maintain connectivity within the reen system.
- 2.1.19** The runoff from the new section of motorway would be intercepted and fed into grassed channels in the road verge. These channels would transfer the runoff to water treatment and attenuation areas. With the exception of discharges to the River Usk and the River Ebbw, all drainage would be treated through the identified water treatment areas.

- 2.1.20** The drainage on the River Usk Crossing would consist of kerb drainage to an outfall pipe that would run along the central reservation. On the west side of the River Usk, drainage would discharge into the River Ebbw via an oil separator. On the east side, drainage would discharge to the River Usk via a storage lagoon and a field ditch.
- 2.1.21** New reens would be provided along the north of the new section of motorway in areas where existing reens would be cut off by the highway. The proposed reens would be 2 metres deep with 1 in 1 side slopes (giving an approximate width of 5.7 metres at the surface). These new reens would connect reens cut off by the new section of motorway, with sluices to allow management of water levels.
- 2.1.22** Where existing field ditches would be cut off by the new section of motorway, new field ditches would be provided. These would be 2.5 metres wide with 1 in 1 slopes and a depth of 1 metre. These would connect to the nearest main reens to provide connectivity.
- 2.1.23** The network of new reens, ditches and culverts would capture overland water flow and route these flows to culverts beneath the embankment of the new section of motorway. The total length of replacement reens and field ditches would be equal to or greater than the length of reens and field ditches to be lost as a result of the new section of motorway.

3 SUMMARY ARCHAEOLOGICAL AND CULTURAL HERITAGE BACKGROUND

3.1 Introduction

3.1.1 A detailed description of the known and potential archaeological and cultural heritage resources within the vicinity of the proposed new section of motorway is presented in the Cultural Heritage Desk-based Assessment which forms Appendix 8.2 of the ES.

3.1.2 That description built on information that was presented in a previous report (Appendix F of Welsh Government, 2014). The Wessex Archaeology report represented a compilation and summary of work undertaken with regard to previous designs for a new motorway south of Newport.

3.1.3 Additional data have been gathered and collated as the design of the proposed new section of motorway has evolved to that presented at draft Orders. This has included survey work along the route of the new section of motorway in the form of the following.

- Detailed gradiometer (magnetometer) survey - Appendix 8.4 of the ES.
- Electrical resistance tomography (ERT) and electromagnetic (EM) surveys – Appendix 8.6 of the ES.
- Aerial and LiDAR surveys and satellite image analysis – Appendix 8.7 of the ES.

3.1.4 An Archaeological Deposit Model has been established for that part of the Gwent Levels to be crossed by the new section of motorway (Appendix 8.8 of the ES). This was based on information drawn from multiple sources including several phases of Ground Investigation undertaken for previous designs for a new section of motorway in this area as well work undertaken for M4CaN, along with the results of the ERT and EM surveys.

3.1.5 Further data have been collected through the following actions.

1. Collation and mapping of data obtained from the Regional Historic Environment Record (HER) maintained by the Glamorgan Gwent Archaeological Trust (GGAT).
2. Collation and mapping of data obtained from Cadw for designated heritage assets (Scheduled Monuments (SMs), listed buildings (LBs), Registered Parks, Gardens and Landscapes of Historic Interest.
3. Collation and mapping of data obtained from Newport City Council for Conservation Areas (CAs), Archaeologically Sensitive Areas (ASAs) and Locally Listed Buildings (LLBs).
4. Collation and mapping of data obtained from Monmouthshire County Council for Conservation Areas (CAs) and Areas of Special Archaeological Sensitivity (ASASs).
5. Examination of historic maps including the Ordnance Survey 25" 1st edition and the relevant Tithe Maps.
6. Field reconnaissance to identify other features of cultural heritage interest that may not have been identified through the acquired data as described above.

7. Preliminary background research (geology and historic environment), including examination of the Research Framework for the Archaeology of Wales.
8. Discussions with Cadw, the Conservation Officers at Newport City Council and Monmouthshire County Council, and the National Trust.

3.2 Summary Baseline

The Designated Historic Landscape

3.2.1 The Gwent Levels have been designated through their inclusion on the non-statutory Register of Landscapes of Outstanding Historic Interest in Wales: *'Three discrete and extensive areas of alluvial wetlands and intertidal mudflats on the north side of the Severn estuary', which collectively represent 'the largest and most significant example in Wales of a 'hand-crafted' landscape. They are entirely the work of man, having been reclaimed from the sea from the Roman period onwards. The areas have distinctive patterns of settlement, enclosure and drainage systems belonging to successive periods of use, and a proven quite vast potential for extensive, well-preserved, buried, waterlogged, archaeological and palaeoenvironmental deposits surviving from earlier landscapes'* (Cadw, 1998, 65).

3.2.2 The proposed new section of motorway would traverse the northern parts of the western and central of the three discrete areas that comprise the Gwent Levels Landscape of Outstanding Historic Interest (LOHI). The western one is known as the Wentlooge Levels and the central one as the Caldicot Levels. The extent of the proposed new section of motorway within the LOHI is indicated on Figures 1a to 1b and also 2a to 2g. This shows that there would be direct physical impacts on the LOHI as well as indirect (non-physical) impacts.

Other Historic Landscape Features

3.2.3 A number of additional historic landscape features have been identified as part of this desk-based assessment. These are identified in the Gazetteer (Annex A of Appendix 8.2, prefixed HL) and their locations are indicated on Figures 3a to 3f.

3.2.4 The identified historic landscape features include areas of historic woodland, major reens (former and present), trackways or green lanes (former and present) and sea defences (former and present).

Archaeology

3.2.5 In this section of the summary baseline, the known archaeological sites within a Defined Study Area are identified and described. This Defined Study Area comprises a corridor extending 200 metres beyond the highway boundary (including temporary land take). Further information on the known archaeological sites is provided in the Gazetteer (Annex A of Appendix 8.2, prefixed ARCH). The locations of the archaeological sites are indicated on Figures 4a to 4f. More detailed information is provided in Figures 8-20 of Appendix 8.2.

3.2.6 Although material of Palaeolithic date (c. 900,000 - 8,500 BC) has been recovered from the Gwent Levels, the earliest material found within the Defined Study Area is of Mesolithic date (c. 8,500 - 4,000 BC). At Llandeenny towards the eastern end of the proposed new section of motorway, archaeological investigations have identified a stratified occupation site of late Mesolithic to early Neolithic date at the very edge of the

dry land (ARCH038, Figure 4e). A lower occupation deposit contained worked flint of likely late Mesolithic date, whilst a second upper layer of occupation material produced a radiocarbon date suggesting activity in the early Neolithic period. The lack of any clear hiatus between the two deposits indicates that occupation here may have been continuous. The occupation deposits were sealed beneath approximately 1 metre of peat demonstrating the post-occupation encroachment of the wetland into this area of transition.

- 3.2.7** Other than this later Mesolithic/early Neolithic occupation at Llandeenny as discussed above, no material of definite Neolithic date has been found within the Defined Study Area. A single flake of worked flint found near to New Park Farm (just to the north of Junction 29 of the existing M4) may be of this date but could be Bronze Age (ARCH005, Figure 4a). The same applies to a small pit containing worked flint identified at Rogiet at the eastern end of the proposed new section of motorway, close to where the existing M4 crosses the railway line (ARCH059, Figure 4f). This latter feature is located on the edge of the Levels whereas the flint flake found near to New Park Farm was on the higher ground above the fen edge.
- 3.2.8** Within the Defined Study Area, the principal known site/findspot of likely Bronze Age date is a standing stone located between Undy and Llanfihangel, near to the current Junction 23 of the existing M4 (SM002, Figure 2f). It is very close to the toe of the motorway embankment but examination of historic maps demonstrates that it remains in its location as first mapped by the Ordnance Survey towards the end of the 19th century. The standing stone is a Scheduled Monument and is approximately 2.4 metres high (from current ground level). No archaeological investigation of this monument has taken place. However, a Bronze Age date is inferred through comparison with similar monuments investigated elsewhere in the region. Locally, the standing stone is known as The Devil's Quoit.
- 3.2.9** Geophysical survey undertaken in connection with the proposed new section of motorway shows a very distinct circular feature approximately 125 metres to the south of the standing stone. This may identify the location of a ring-ditch (suggesting the former presence of a Bronze Age burial mound) or a ring-gully more indicative of a former circular building. Further to the west the same survey suggests the presence of the remains of enclosures that could also be contemporary with the standing stone (Appendix 8.4 of this ES).
- 3.2.10** In the western part of the proposed new section of motorway, close to Coedkernew, an upright wooden post of Bronze Age date was found during archaeological investigation of a site that was predominantly of Roman date (see below – ARCH020).
- 3.2.11** During work associated with the construction of the Second Severn Crossing, a lynchet of probable prehistoric date was examined at a location close to the South Wales to London Mainline railway (ARCH060, Figure 4f). It may have been Iron Age in date but this could not be confirmed.
- 3.2.12** Just to the west of Magor, geophysical survey and trial trenching has identified a series of enclosures which appear to represent activity (including settlement) during the Late Iron Age and Early Roman periods (ARCH044; ARCH045, Figure 4e). This activity does not appear to extend as far south as the railway and it is possible that the enclosures occupy a knoll of higher ground here.
- 3.2.13** Just to the east of here, a projected alignment of the Whitewall (a road across the Levels) through Magor and on northwards has been proposed as a Roman road

(ARCH043, Figure 4e), but there is no real evidence to support this suggestion (Sherman and Evans, 2004). However, the aerial survey undertaken as part of the cultural heritage assessment (Appendix 8.7 of this ES) has identified a section of linear earthwork to the south of the existing M4 motorway that is in the same location (and on the same alignment) as ARCH043 and which may well therefore represent the remains of this putative Roman road.

- 3.2.14** Archaeological fieldwork has located another series of small enclosures just to the east of Llandeenny (ARCH037, Figure 4e). Analysis suggests that this represents settlement of Roman date and at least one building of this period was identified.
- 3.2.15** Another location where archaeological fieldwork has found settlement enclosures of Late Iron Age and Early Roman date is just to the east of Coedkernew (ARCH018; ARCH019, Figure 4b). Initially a small enclosure was identified and found to represent settlement of Late Iron Age to Early Roman date. A subsequent extension to the area covered by geophysical survey and trenching found a much larger rectangular enclosure that is likely to be of Roman date. This activity is located on a slightly raised piece of land that projects out into the levels, i.e. this is a fen edge settlement of later prehistoric and Roman date.
- 3.2.16** Just to the east of here, a Roman building was identified during archaeological work associated with the construction of a roundabout at the edge of the Imperial Park development. The building had a series of cobbled floors and was positioned next to a contemporary road (ARCH020, Figure 4b). An earlier underlying phase of Roman activity was characterised by the presence of a series of ditches (Yates, 2000).
- 3.2.17** On the higher ground at the western end of the study area, the section of Pen-y-lan Road to the north of New Park Farm (ARCH004, Figure 4a) has previously been suggested to be the line of a Roman road linking Caerleon to a fort at Cardiff. However, there is very little physical evidence to confirm this date (Sherman and Evans, 2004).
- 3.2.18** Some Roman pottery was found during archaeological excavation work on the eastern side of Undy in association with the construction of a pump station for a storage lagoon but the nature of activity here was not clear (ARCH053, Figure 4f; Page and Maylan, 1993).
- 3.2.19** It should also be noted here that the location of the Barland's Farm boat found during construction of the Gwent Europark (Nayling and McGrail, 2004) is just outside the Defined Study Area. This boat of early 4th century date provides evidence of Roman navigation along the network of channels within the levels and also demonstrates the potential within this landscape for the presence of well-preserved timber artefacts. The boat was found in association with a stone and timber structure in the bed of a former watercourse. This may represent the remains of a bridge providing access across the former channel.
- 3.2.20** The only find of probable Early Medieval date recorded within the Defined Study Area is the potential Viking ship found during the construction of Alexandra Dock in 1878 (ARCH025, Figure 4b). A timber from this vessel has been dated to approximately AD 950 (Hutchinson 1984), although this was from the inner rings and a slightly later (possibly 12th century) date may be more appropriate.
- 3.2.21** Documentary records indicate that Llanfihangel was already established as an estate by AD 905 at which point it was known as Trev Peren and/or Lann Mhacgel Maur (ARCH066, Figure 4f).

- 3.2.22** Important sites of medieval date within the Defined Study Area include three Scheduled Monuments. Wentlooge Castle at Castleton (SM010, Figure 2a) is a motte: an earthen mound that would have been surmounted by a wooden or possibly stone keep. This example is approximately 5 metres tall and 25 metres in diameter at the base; the flat upper surface has a diameter of approximately 12 metres. Very little is known about this monument although its medieval origin is not in doubt. It may have been the principal castle in the lordship of Gwynllwg in the immediate post-Conquest period, superseded by the castle at Newport. Archaeological trial trenching just to the west of the monument in 1997 did not find any features of interest (Barber, 1997). The motte is heavily overgrown and has residential development on three sides, with the only open aspect being to the west.
- 3.2.23** Another Scheduled Monument within the Defined Study Area is a moated site located just to the east of Undy (SM001, Figure 2f). A number of similar sites are recorded within the Gwent Levels and are possibly indicative of individual farmsteads that were subsequently abandoned. This example is well-preserved despite recent residential development on adjoining land.
- 3.2.24** The third Scheduled Monument within the Defined Study Area is a medieval stone cross within the churchyard of the Church of St Michael and All Angels at Llanfihangel (SM003, Figure 2f). The cross has three very weathered steps with the base of the shaft above and the monument reaches a total height of 1.3 metres. It is located on the south side of the church, not far from the door and is also a Grade II listed building (LB011).
- 3.2.25** There are several other locations within the Defined Study Area which contain evidence for medieval settlement or other activity. A small enclosure has been identified as a cropmark visible on aerial photographs just to east of New Park Farm, north of Castleton (ARCH008, Figure 4a). Initially considered to be of prehistoric date due to its form, this was not detected by geophysical survey here but a programme of trial trenching found features of medieval date, possibly settlement-related (ARCH007).
- 3.2.26** A small rectangular moated site located just to the west of Lighthouse Road was initially identified through examination of LiDAR data (ARCH022, Figure 4b). The platform measures 17 metres by 15 metres and is enclosed by a shallow ditch, with a small spur leading off to the east. This may be associated with the farmstead to the north east, which was historically named Ty-Hir. A second moated site is also present here immediately to the east of Lighthouse Road (ARCH023). This was also found through examination of LiDAR data and comprises two rectangular platforms within a single enclosing ditch.
- 3.2.27** A complex of earthworks has been identified along the Pont-y-Cwch Reen, north of New Dairy Farm (ARCH024, Figure 4b). These include at least two moated platforms as well as other small enclosures. By analogy these are considered likely to represent medieval activity, possibly settlement-related.
- 3.2.28** Another small enclosure of probable medieval date has been identified to the south west of Pye Corner, just to the south of Picked Lane (ARCH026, Figure 4c). To the south east of Pye Corner is another example (ARCH028, Figure 4c) which is located within a field later used as the site of a Heavy Anti-Aircraft Battery. Just to the north, on the opposite side of Broad Street Common, is a larger complex of earthworks which includes several rectangular platforms as well as a hollow way (ARCH029). This may represent the remains of settlement activity here that incorporated the precursor to the present Arch Farm.

- 3.2.29** Earthworks to the north and east of Tatton Farm represent a complex of at least five enclosures fronting onto a broad track (ARCH031, Figure 4c). Again these are likely to be medieval in date and could well be the remains of settlement activity subsequently abandoned. Another moated complex has been identified just to the east of Moor Barn, fronting onto Little Common (ARCH032, Figure 4d). Archaeological trial trenches were excavated here in 2000 and found structural remains and pottery of 12th/14th century date.
- 3.2.30** Medieval remains were identified during archaeological investigations associated with the construction of a distribution warehouse at the Gwent Europark. These included a ditch and a stone structure (ARCH035, Figure 4d).
- 3.2.31** Examination of a substantial stone wall at Old Court Farm in Llanfihangel confirmed that it was likely to be of medieval date (ARCH063, Figure 4f; Clarke and Bray, 2008). This settlement is known to have been much more extensive in the 17th century (Stopgate, 1986) and this was almost certainly the case in the medieval period (ARCH064). The trapezoidal churchyard was likely to have been established in its present form during the medieval period (ARCH065) and is raised considerably above the level of the land to the north and north east.
- 3.2.32** Some areas of probable post-medieval settlement have also been identified within the Defined Study Area. Just to the south of Penylan Farm at Castleton geophysical survey located a small enclosure containing possible structures (ARCH010, Figure 4a). Further examination by way of trial trenches found evidence for a small farmstead of 16th or 17th century date. This may be a later replacement for the medieval farmstead identified just to the west of here (ARCH007).
- 3.2.33** Earthworks of possible post-medieval date were identified just to the south of Gwaunshonbrown Farm and some features were located through geophysical survey (ARCH013, Figure 4a). However, a trial trench here failed to corroborate the presence of anything of archaeological interest.
- 3.2.34** A very small rectangular moated platform was identified through examination of LiDAR data at a location just to the west of Tonew Kennels, at the junction of North Row and Rush Wall (ARCH034, Figure 4d). This land was enclosed at a fairly late date and the moated site is likely to be of post-medieval date rather than medieval. A much more ephemeral ditched enclosure just to the west may also be of post-medieval date (ARCH033).
- 3.2.35** Just to the west of Magor and to the north of the South Wales to London Mainline railway is the location of a former quarry (ARCH042, Figure 4e). This is indicated on an OS map of 1882 and does not extend south of the railway. It may have been associated with the construction of the railway in the mid-19th century but could well have been a pre-existing quarry used for building stone.
- 3.2.36** Just to the north of the existing M4 at Castleton, archaeological work undertaken in advance of motorway widening work found a shallow pit that contained demolition debris of 19th century date (ARCH006, Figure 4a).
- 3.2.37** East of Pye Corner is the location of a Heavy Anti-Aircraft Battery (ARCH027, Figure 4c) which was established during the Second World War as part of the defences around Newport and particularly the docks. It was constructed around 1940; some of the ancillary buildings remain in place here but are in poor condition (CA 2005).

- 3.2.38** There is a second location just to the north west of Pye Corner that also contains potential evidence for the Second World War defence of Newport. In a field immediately north of the former Baptist Chapel here are a number of concrete blocks, some of which have an iron ring set into the top of the block. These may well represent the tether bases for barrage balloons that would have been flown during air raids. There are also two concrete platforms in the eastern side of this field that could have been bases for temporary buildings. This site is recorded in the Gazetteer (Annex A of Appendix 8.2) as HB087 on the basis that it represents the location of former buildings and structures (Figure 2c).
- 3.2.39** To the north east of Pye Corner is the location of a former army barracks (HB118, Figure 2c). This was constructed in the post-war period and was subsequently used for research associated with steel production in the area. Most of the former buildings here have been demolished and the site is now quite heavily overgrown.
- 3.2.40** There are a number of potential archaeological sites within the Defined Study Area which remain undated. On the south side of the A48 at Castleton, opposite the Coach and Horses public house, recent geophysical survey undertaken in connection with the design of the proposed new section of motorway has identified a complex of linear features that may represent elements of a former field system (ARCH009, Figure 4a see also Appendix 8.4, Figures 38-40).
- 3.2.41** To the north of the existing M4 at Castleton, geophysical survey identified anomalies that were considered to be potentially of archaeological interest, however subsequent examination by way of trial trenches found that the anomalies were more likely to represent changes in the subsurface geology (ARCH011, Figure 4a).
- 3.2.42** Further to the east and just south of the existing M4, geophysical survey has identified a possible ditch or potentially two features in close proximity (ARCH014, Figure 4a – see also Appendix 8.4, Figures 35-37). Just to the north and across the existing M4 motorway is the location of a possible earthwork enclosure noted as a cropmark on aerial photographs (ARCH015).
- 3.2.43** To the west and south west of Berryhill Farm, geophysical survey has identified a couple of linear features of possible archaeological interest (ARCH016, Figure 4a – see also Appendix 8.4, Figures 31-34).
- 3.2.44** West of Magor, recent geophysical survey has identified linear features that may represent elements of an earlier field system (ARCH041, Figure 4e - see also Appendix 8.4, Figures 26-28). These may be associated with the settlement enclosures of later Iron Age/Early Roman date located just to the north of here (ARCH044; ARCH045).
- 3.2.45** To the north of the existing M4 motorway and east of Magor services, recent geophysical survey has identified a number of anomalies that may represent pits or similar features of archaeological interest (ARCH047; ARCH049, Figure 4e see also Appendix 8.4, Figures 26-28). Previous surveys of land just to the north of here also located anomalies of possible archaeological origin but further examination by way of trial trenches found that the anomalies were of geological or agricultural origin (ARCH046; ARCH048).
- 3.2.46** Further to the east and still north of the existing M4 motorway, recent geophysical survey has identified a short isolated linear anomaly that may be of archaeological interest (ARCH051, Figure 4f – see also Appendix 8.4, Figures 20-22).

- 3.2.47** Further geophysical survey in this area and to the south of the B4245 road (east of the Scheduled moated site here) identified a number of linear anomalies that may be of archaeological interest (ARCH055, Figure 4f – see also Appendix 8.4, Figures 8-10). However the signal was quite weak.
- 3.2.48** East of here, between the existing M4 motorway, the M48 motorway and Bencroft Lane, geophysical survey indicates that the whole area of land surveyed has been previously heavily disturbed, probably when the M4/M48 junction was constructed (ARCH058; ARCH061, Figure 4f – see also Appendix 8.4, Figures 5-7).
- 3.2.49** To the north of the B4245 road at Llanfihangel the recent geophysical survey found a large linear feature that could represent archaeological activity, possibly a former field boundary and/or trackway that is shown on early Ordnance Survey mapping of the area (ARCH062, Figure 4f – see also Appendix 8.4, Figures 2-4).

Historic Buildings and Conservation Areas

- 3.2.50** Buildings or structures that are of special interest and meet the defined criteria are placed on the statutory List of Buildings of Special Architectural or Historic Interest and are referred to as listed buildings.
- 3.2.51** There are 19 listed buildings or groups of buildings within the Defined Study Area. The reference following the name of the listed buildings described below is the Scheme-specific reference to the entries in the Gazetteer (Annex A of Appendix 8.2) and the locations of these buildings are indicated on Figures 2a to 2e.
- 3.2.52** There is one Grade I listed building, one Grade II* listed building and 17 Grade II listed buildings. One of the Grade II listed buildings, a cross base in the churchyard of the Church of St Michael and All Saints at Llanfihangel Rogiet (LB018), is also a Scheduled Monument (SM003) and is described above.

Grade I Listed Buildings

Transporter Bridge, Newport (LB001)

- 3.2.53** Just to the north of the docks the River Usk is spanned by the Newport Transporter Bridge. This was constructed to link the town with industrial development on the east side of the river and was opened in 1906. A gondola or moving platform is suspended from a high level beam and carries vehicles and passengers across the river. The bridge spans more than 195 metres and is almost 74 metres high. This was required in order to allow tall-masted ships to reach the wharves upstream from the bridge.

Grade II* Listed Buildings

Church of St Michael and All Angels, Llanfihangel (LB002)

- 3.2.54** Situated between Green Farm and Old Court Farm, south of the B4245 Caldicot Road. This is a medieval church of mostly 13th century date (although a church here is mentioned in Domesday). The chancel was extended in the 14th century and the church was heavily restored in 1904. There is a tower of reasonable height at the west and a possible Norman arch around the main south door.

Grade II Listed Buildings

Castleton Baptist Church (LB003)

- 3.2.55** This is situated on the corner of the A48 and Marshfield Road. It was built in 1859 to the design of RG Thomas and is an early example of the Italianate-style façade chapel that later became popular in parts of south Wales. The chapel is built in limestone and red sandstone and has a bell-tower and spire.

Coach & Horses Public House, Castleton (LB004)

- 3.2.56** Located on the north side of the A48 road, this is a roadside coaching inn of 18th century date with modern alterations. It has two storeys with rendered elevations and a steeply pitched slated roof. The gable end chimneys have been rebuilt in brick. A lower two storey extension on the east side is probably of 19th century date.

Waterloo Hotel Public House, Pillgwenlly, Newport (LB005)

- 3.2.57** This substantial public house is situated on the corner of Alexandra Road and Watch House Parade. It opened in 1904 and replaced an earlier public house on the same site. A fine contemporary interior has survived including a long L-shaped faience bar and etched glass screens between booths. It is three storeys in red brick elevations with terracotta detailing. At the corner is a tall hexagonal clock tower with an ogee roof covered in fish-scale clay tiles.

Pye Corner Farm, Nash (LB006)

- 3.2.58** This farmhouse may well have been initially constructed in the 17th century although it was substantially rebuilt in the late 18th or early 19th century and was modernised in the later 19th century. It is stone-built in two storeys with render and has a slate roof and brick end chimneys. It has recently been restored following a period of deterioration.

Fair Orchard, Nash (LB007)

- 3.2.59** This is located approximately 400 metres south of Pye Corner and is a former farmhouse of early 19th century date. In two storeys with a hipped slate roof and cement-rendered walls this has partially been listed due to its group value with the adjacent barn.

Fair Orchard Barn and attached agricultural buildings, Nash (LB008)

- 3.2.60** Located just to the south of Fair Orchard, this is an 18th century barn with 19th century additions to the rear. It is stone-built with a slate roof and has a large threshing doorway. It is listed due to its group value with Fair Orchard.

Tatton Farm, Nash (LB009)

- 3.2.61** Approximately 1 km north east of Pye Corner this is a three storey asymmetrical farmhouse of early 19th century appearance but potentially with earlier origins. It is rubble-built with a slate roof and three red-brick chimneys. Currently uninhabited, this farmhouse is in a poor state of repair.

The Vicarage, Magor (LB010)

- 3.2.62** This vicarage is located on the western side of Magor, north of the B4245 Newport Road. It was built in 1861 to the designs of John Norton, and architect involved in the restoration of the Church of St Mary in Magor. The vicarage is in Tudor/Jacobean Revival style and has two storeys in rock-faced stone with ashlar dressings. There is a large external stack on the west elevation and a steeply gabled wooden porch with decorative bargeboards. The interior retains much of the original Tudor Revival material including the stone fireplaces and decoratively moulded panelled doors. To the rear of the vicarage are contemporary stables and a coach-house.

Great House Farmhouse, Undy, including attached range of farm buildings (LB011)

- 3.2.63** This farmhouse is located to the east of Undy, just to the south of the railway and was formerly known as Undy Farm. It may have originated in the late 17th century but has been subsequently extended and the roof pitch altered. It has two storeys and appears to be rubble-built with red-brick dressings. The attached stone-built range of outbuildings is one storey with a former cheese-loft above.

Old Court Farmhouse including attached cross wing known as Llanfihangel Court, Llanfihangel (LB012)

- 3.2.64** This farmhouse is located to the west of the Church of St Michael and All Angels and has a separate associated farmyard and farm buildings to the north. The house is mostly 16th century in date but the south porch and wall may be surviving elements of an earlier building, possibly a fortified house. A separate cross wing was added to the west of the farmhouse in the 19th century and a single storey former Brewhouse is adjoining to the east. The farmhouse has two storeys and is rubble-built, part whitewashed, with a slate roof.

Stables at Old Court Farm, Llanfihangel (LB013)

- 3.2.65** This is a small stable block of 19th century date. It has two storeys and four bays and is rubble-built with a slate half-hipped roof. There are steep external stone steps leading to a hayloft with pitching doors at either end. Listed for group value with the complex of buildings at Old Court Farm.

Farm range at Old Court Farm, Llanfihangel (LB014)

- 3.2.66** Situated directly adjacent to the churchyard wall, this range of farm buildings mainly post-dates the 1830 Ordnance Survey map and overall is likely to be of mid-19th century date. Rubble-built with Welsh slate roofs, the southern part of the range is two storeys and five bays with external stone steps leading to a granary or hayloft. The attached single storey cowshed has plank doors. Listed for group value with the complex of buildings at Old Court Farm.

Green Farmhouse (including attached walls and railings to front), Llanfihangel (LB015)

- 3.2.67** This is located to the east of the Church of St Michael and All Saints and has a separate associated farmyard and farm buildings to the south and west. The farmhouse is of 18th century date and was formerly known as New House Farm. It has two storeys and an attic and is rubble-built (now painted) with an artificial slate roof and brick end stacks. There are decorative iron railings which enclose the front garden and

extend from a wall adjoining the farmhouse. Listed in part for group value with the complex of buildings here and at Old Court Farm.

Barn to east of Green Farmhouse, Llanfihangel (LB016)

- 3.2.68** This barn is of early 19th century date and is built in coursed rubble with a slate roof. It has six bays and a high gabled porch to the west. Listed for group value with the complex of buildings here and at Old Court Farm.

Cowhouse range east of Green Farmhouse, Llanfihangel (LB017)

- 3.2.69** This cowshed forms the northern boundary of the farmyard and is of 19th century date. It is a long single storey building in rubble with a pantile roof and plank doors all facing south. Listed for group value with the complex of buildings here and at Old Court Farm.

Old Windmill, Rogiet (LB019)

- 3.2.70** This is situated on higher ground to the north of the village, immediately north of the M48 motorway. The windmill tower was probably built around AD 1500 and is referenced in a lease dated 1526. There is no evidence as to when it went out of use although it may have operated as a watch-tower in the 18th century. The earliest detailed mapping of the area dates from 1746 and shows a round building here; on the 183 Ordnance Survey map it is shown as 'Old Mill'.

Locally Listed Buildings

- 3.2.71** Local authorities have previously been encouraged to establish a 'local list' of buildings of historical or architectural significance and to develop local plan policies that seek to protect such buildings from demolition or inappropriate development within their settings.
- 3.2.72** Three of the buildings recorded on Newport City Council's 'local list' are located within the Defined Study Area; none of these would be physically impacted by the Scheme. The three locally listed buildings are identified below - the reference following the name of the building is the Scheme-specific reference to the entries in the Gazetteer (Annex A of Appendix 8.2) and the locations of these buildings are indicated on Figure 2b:
- Church Farm, Coedkernew (HB014);
 - Barn west of Church Farm, Coedkernew (HB114); and
 - Church of All Saints, Coedkernew (HB115).

Other Historic Buildings

- 3.2.73** A considerable number of other historic buildings have been recorded within the Defined Study Area which are not included on the national list nor on any local list. These are described in the Gazetteer (Annex A of Appendix 8.2) and their locations are indicated on Figures 2a to 2g. They include the locations of former buildings recorded on cartographic sources but no longer present.
- 3.2.74** The historic buildings range from farmhouses and farm buildings to mills, cottages, bridges, railway sidings and pillboxes, the latter being of Second World War date.
- 3.2.75** The largest concentration of historic buildings is within Newport Docks. This is partly the result of a detailed study of the historic built environment of the docks undertaken in

connection with previous studies of a route for a new section of motorway to the south of the city (Appendix 8.5 of this ES).

- 3.2.76** Surviving historic elements within the docks and within the Defined Study Area include dock basins, a graving dock, offices, transit sheds and (railway) engine running sheds and engineering workshops. There are also timber and concrete features within the intertidal muds on either side of the River Usk (Appendix 8.5 of this ES).

Conservation Areas

- 3.2.77** Conservation Areas are designated by local authorities but receive statutory protection. Their purpose is to preserve or enhance the character or appearance of an area of special architectural or historic interest.
- 3.2.78** There are two Conservation Areas within the Defined Study Area. These are named below - the reference following the name of the Conservation Area is the Scheme-specific reference to the entries in the Gazetteer (Annex A of Appendix 8.2) and the locations of these Conservation Areas are indicated on Figures 2b and 2f.

Rogiet Llanfihangel, Monmouthshire (CA001)

- 3.2.79** This Conservation Area is centred on the group of historic buildings at Llanfihangel Rogiet, comprising the Grade II* listed Church of St Michael and All Angels (LB002) and the two historic farmsteads of Old Court Farm (LB008, LB009 and LB010) and Green Farm (LB015, LB016 and LB017).
- 3.2.80** The Conservation Area extends north as far as the toe of the embankment for the westbound M48 motorway off-slip and west as far as the embankment for the existing M4 motorway. To the south it extends to the edge of the former railway sidings.
- 3.2.81** Recent study of Llanfihangel Rogiet has found that in 1651 there were 19 farmsteads and seven cottages in this parish along with an alehouse, bakehouse, parsonage and forge, all centred on a substantial village green located in the vicinity of the present farmyard of Green Farm. However, a programme of engrossment by the lord of the manor resulted in a settlement comprising just two farmhouses and four cottages by 1771 (Stopgate, 1986). Rippon (2014) considers that the field pattern here indicates the enclosure by agreement of former common fields. The Conservation Area actually takes in all of the land formerly occupied by this now much-reduced settlement as well as additional land that provides a 'buffer' to the current buildings here.

Waterloo, Newport (CA002)

- 3.2.82** This Conservation Area is within the Pillgwenlly area of Newport, close to the Alexandra Docks and the Grade I listed Transporter Bridge. It contains buildings largely of very early 20th century date, although the street layout dates from the first half of the 19th century and the later buildings represent a redevelopment following the opening of the Alexandra Docks. This is also reflected in the naming of Alexandra Road, formerly Inkerman Street (after the Crimean War battle). The Waterloo Hotel probably took its name from the nearby Waterloo wharf.

4 Research Strategy

- 4.1.1** The Research Framework for the Archaeology of Wales is a web-based resource subject to regular updates – the most recent round of revision took place in 2011-2014 and the documents relating to this are all now published at the following address: <http://www.archaeoleg.org.uk/documents2011.html>.
- 4.1.2** Most of the Research Framework comprises period-based summaries of the present state of knowledge along with research themes that should be addressed going forwards. There are also separate non-period based papers for Maritime and Intertidal Archaeology and for Palaeoenvironmental studies.
- 4.1.3** This approach builds on earlier versions of the Research Framework for the Archaeology of Wales that included regional period-based summaries which were mainly published in 2003. For South East Wales separate research frameworks were produced for most periods and each of these also included a list of Key Sites. This regional approach was changed to a more national one in 2004 following a National Seminar.
- 4.1.4** The Research Framework for the Palaeolithic and Mesolithic periods covers the time up to around 4,000 BC (<http://www.archaeoleg.org.uk/pdf/palaeo2011ver2.pdf>). It describes the relevant work undertaken during the five years prior to 2011 under a number of themes such as 'Colonisation and Recolonisation' and 'Settlement Patterns and Settlement Histories'. The document then goes on to identify the key research themes for the next five years.
- 4.1.5** References in the Research Framework for the Palaeolithic and Mesolithic periods that are relevant to the proposed new section of motorway are principally to issues regarding the Mesolithic period, as there is nothing clearly of Palaeolithic date known from within the Defined Study Area or the wider area of the Gwent Levels. Sites referenced in the Research Framework include Goldcliff (Mesolithic settlement) whilst the list of Key Sites identified in the 2003 regional review also included Magor Pill (Mesolithic footprints) and Uskmouth (Mesolithic footprints, mattock, pollen etc).
- 4.1.6** Research questions that may be relevant to the proposed new section of motorway include the following.
- Can Mesolithic sites be better related to the environmental record preserved in the coastal zone?
 - How extensively were upland zones and open-air locations occupied during the Mesolithic?
 - What were the relationships between sites and over what area can we identify these?
 - What is the social significance and patterning of sites?
 - Can social systems and social territories be elucidated at the regional, national and international scale?
 - What happened to the bodies of early Mesolithic people after death?
 - What raw materials were used in Wales at specific times?

- Can any patterns or trends be identified in their use that might indicate preferences for certain sources of raw materials at specific times?
- What processes might concentrate particular materials at specific locations?
- Was heat treatment of flint in Mesolithic times more common than we have previously thought? What are the core characteristics that determine the level of heating used and how can these best be identified?
- What changes were there in human diet throughout the Mesolithic and what were their causes?
- How far were people moving during lifetimes at different times in these periods?
- Can population relationships and dynamics be elucidated for specific times during the Palaeolithic and Mesolithic?

4.1.7 Those Key Sites identified above are all located in the coastal zone beyond the sea wall that protects the Gwent Levels from inundation. Here the evidence for Mesolithic activity is found at surface level due to the erosion of overlying peats and other deposits by marine regression, and in many cases is only accessible at low tide.

4.1.8 The proposed new section of motorway would not impact on any part of the coastal zone. However, it would impact at the interface between the Levels and the adjacent higher ground (i.e. the former coastline and fen edge) in two locations (Coedkernew in the west and Llandevenny in the east) and these are areas where the potential for archaeological activity of all periods is enhanced. Indeed, Mesolithic activity within the fen edge has previously been identified at Llandevenny (ARCH038) and the design of the proposed new section of motorway reflects the presence of this important archaeological site. Similar evidence may be present within the boundary of the proposed new section of motorway both here and in the vicinity of Coedkernew.

4.1.9 Additionally there may be evidence of Mesolithic activity (and possibly of Late Upper Palaeolithic date) within the Gwent Levels and within the boundary of the proposed new section of motorway at locations where the Holocene deposits are relatively shallow and reflect a higher underlying pre-Holocene landscape. During periods of lower sea level these areas of higher ground may have been islands of drier land within the intertidal mudflats and therefore more attractive for settlement and other activities.

4.1.10 The Archaeological Deposit Model (Appendix 8.8 of the ES) identifies areas of shallower Holocene sediment in the former Mendalgief Level (now occupied by Newport Docks), on the east bank of the River Usk (mostly occupied by modern industrial premises), around Pye Corner, in the vicinity of the Llanwern steelworks reed beds, on the eastern side of the Glan Llyn junction and to the north of Grangefield Farm. All of these areas have a higher potential for the presence of evidence for activity of Mesolithic and possibly Late Upper Palaeolithic date.

4.1.11 The Research Framework for the Neolithic and Early Bronze Age periods is published at <http://www.archaeoleg.org.uk/pdf/neolithic/version2neolithicandearlybronze.pdf>. It covers the time between 4,000 BC and 1,500 BC and describes the relevant work undertaken during the five years prior to 2011 under a number of themes and goes on to identify the key research themes for the next five years. The Framework references the important work undertaken on the Mesolithic in the Severn Estuary and this should be extended to cover all of the highly significant work on Bronze Age sites in the same area (cf. Goldcliff, Redwick, Cold Harbour Pill, Peterstone).

4.1.12 Research questions that may be relevant to the proposed new section of motorway include the following.

- At what date did the Neolithic begin in Wales?
- What is the date of the major monument and artefact types of Wales's Neolithic and Early Bronze Age?
- Did farming replace or supplement the economy of later Mesolithic communities?
- What was the environmental context for the transition?
- What was the relative significance of arable farming and of arable husbandry during the earlier Neolithic?
- Did farming practices change during the later Neolithic and Early Bronze Age?
- How mobile were communities across this period?
- Did settlement patterns vary in different parts of Wales?
- Did settlement focus on specific landscape zones and did these zones vary across periods?
- What evidence is there for different types of land use in different landscape zones?
- What do monuments tell us about the nature of society?
- What can their immediate environs tell us about the development, role and use of monuments?
- How did procurement strategies for stone and metal ores occur?
- What were the mechanisms for the dispersal of stone and metal goods?
- Can we identify trade in other materials
- How deliberate were deposition strategies at specific sites?
- What do material culture groups tells us about the societies that created them?

4.1.13 One key area within the boundary of the proposed new section of motorway with the potential to provide evidence for activity of this period is to the north east of Undy. A standing stone (known as The Devil's Quoit) is located at the foot of the embankment of the existing M4 motorway; this monument is likely to be of Early Bronze Age date. Although the stone would remain *in situ*, the work required for the proposed new section of motorway would lead to a requirement to investigate the land very close to the monument and in the wider landscape to the west. Geophysical survey here has identified potential archaeological features that could be contemporary with the standing stone.

4.1.14 Other areas of enhanced potential for evidence of activity of this period are those described above with reference to the earlier periods (paragraph 4.1.10), i.e. areas within the Gwent Levels where shallower Holocene deposits indicate underlying higher ground that would have been dry land during times when the sea level was lower than at present.

4.1.15 There is also the potential within the Gwent Levels (and within the boundary of the proposed new section of motorway) for the presence of boats or other timber vessels of Early Bronze Age date. These could be preserved in former channels that subsequently filled up with waterlogged sediments. Such vessels would be extremely important with regard to a number of the research questions identified above. A single

worked wooden stake of Bronze Age date has been identified from beneath a Roman site close to Coedkernew (ARCH020) and this demonstrates the potential for timber structures and other artefacts to be present within the boundary of the proposed new section of motorway.

4.1.16 The Research Framework for the Later Bronze Age and Iron Age periods covers the time between 1,500 BC and AD 43. It describes the relevant work undertaken during the ten years prior to 2014 and is published at <http://www.archaeoleg.org.uk/pdf/bronzeandiron/version2laterbronzeandiron.pdf>. It identifies the key research themes for the next five years. Key Sites of this period identified in the 2003 regional review included Caldicot Castle Lake (fishing structures, boat), Rumney Great Wharf (roundhouses, fishing structures), Greenmoor Arch (Iron Age timber structures) and Goldcliff (timber buildings, trackways).

4.1.17 Key research questions that may be relevant to the proposed new section of motorway include the following.

- Houses that have been looked at – do they highlight structural variations that are regional?
- Mobility versus permanence – do we understand this process?
- Houses – can we work out how they have been used internally?
- What do we know about the wider landscape, field systems, land-use patterns?
- What about communication/transport routes within the wider landscape?
- How were natural resources utilised?
- Ritual uses of natural places?
- Do ritual and burial go together in this period?
- Is there a shift from separately ‘created ritual spaces’ from earlier periods into ‘settlements as ritual spaces’ in this period?
- Issues of trade – sea-routes?
- Shifts in material culture practicalities. Development of iron. How are exchange networks established over time? Changes in dwelling practices. New forms of material culture manipulated – making opportunities for people – does this lead to social changes?
- Are there significant changes from Later Bronze Age to Early Iron Age, or not?
- Should we expect ‘significant’ change to happen across Wales at roughly the same time or are we facing a much more localised pattern of change?
- Do we see relevant and significant social change during the Iron Age?
- What evidence do we have for meaningful community interaction?
- When do regional entities like the Silures, Demetae, Venedoti, etc. emerge?

4.1.18 Within the boundary of the proposed new section of motorway, archaeological sites of this period are principally in the form of settlement enclosures. These have been identified on the higher ground at both ends of the route, overlooking the Levels. At Coedkernew a small enclosure was found to contain evidence for Late Iron Age and Early Roman settlement (ARCH018). To the west of Magor a series of small subrectangular enclosures also has evidence for settlement of the same date (ARCH044; ARCH045).

- 4.1.19** Additional evidence for activity of this period can be anticipated at almost any location within the Gwent Levels, although the potential is greater where Holocene deposits are shallow and indicate potential drier areas at times of lower sea level. Such areas within the boundary of the proposed new section of motorway are identified above (paragraph 4.1.10).
- 4.1.20** The Research Framework for the Roman period covers the time between AD 43 and AD 410 and is published at <http://www.archaeoleg.org.uk/pdf/roman2011.pdf>. It describes the progress made in the five years subsequent to 2011 in terms of the previous research agenda for this period. Key Sites of this period identified in the 2003 regional review included Great Pencarn Farm (building, surfaces), Rogiet (coin hoard, building), Nash Waste Water Treatment Works (occupation, burials, field system), Barland's Farm (boat, waterfront structure), Magor Brewery (burial), also Goldcliff Stone and other coastal locations with evidence of Roman activity.
- 4.1.21** No specific questions are raised within the Research Framework for this period which instead addresses issues under the following headings: settlement patterns; interaction between newcomers and indigenes; the archaeology of the early campaigning years (pre-Flavian and Flavian); funerary and ritual; and technology and industry.
- 4.1.22** Within the boundary of the proposed new section of motorway, sites of Roman date are principally those discussed above with reference to the Iron Age where settlement activity appears to continue on into the later period. At Coedkernew the small enclosure mentioned above with regard to the Iron Age and Early Roman period was replaced by a much larger rectangular enclosure (ARCH019). Just to the east an excavation at Great Pencarn Farm identified a Roman building adjacent to a contemporary road (ARCH020) and elements of this site may remain present within the boundary of the proposed new section of motorway.
- 4.1.23** The enclosed settlement to the west of Magor continued to be occupied into the Early Roman period (ARCH044; ARCH045) whilst further enclosed settlement of Roman date has been identified close by at Llandeveyney. Just to the north of Magor the route of a putative Roman road crosses the route of the proposed new section of motorway – examination of available remote sensing data confirms the presence of a section of linear earthwork (ARCH043) and there may be an opportunity to confirm the date of this feature.
- 4.1.24** Additional evidence for activity of this period can be anticipated at almost any location within the Gwent Levels, although the potential is greater where Holocene deposits are shallow and indicate potential drier areas at times of lower sea level. Such areas within the boundary of the proposed new section of motorway are identified above (paragraph 4.1.10). There is also the potential for the presence of boats and/or other timber structures (possibly bridges) within backfilled channels in the Levels, such as the site at Barland's Farm (now part of the Gwent Europark).
- 4.1.25** The Research Framework for the Early Medieval period covers the time between AD 410 and AD 1100. It describes the relevant work undertaken during the five years prior to 2011 and is published at <http://www.archaeoleg.org.uk/pdf/earlymed2011.pdf>. Key sites of this period identified in the 2003 regional review did not include any within the vicinity of the proposed new section of motorway and the only known find of this period from within the Defined Study Area is a potential Viking ship found during the construction of the Alexandra Dock in 1878.
- 4.1.26** There is some potential for the discovery of previously unknown settlements of this period on the higher ground at either end of the proposed new section of motorway;

metalwork of early medieval date has been found at Vinegar Hill, Undy, and it is likely that some if not all of the fen edge settlements could have their origins in this period. The Levels, on the other hand, are likely to have remained undrained and any evidence of early medieval activity is likely to be limited to boats or other timber structures preserved in backfilled channels.

4.1.27 The Research Framework for the medieval period covers the time between AD 1100 and AD 1539 and is published at <http://www.archaeoleg.org.uk/pdf/med/medieval.pdf>. It describes the progress made in the seven years subsequent to 2012 in terms of the previous research agenda for this period. Key sites of this period identified in the 2003 regional review included Elm Farm, Undy as well as the Gwent Levels more generally.

4.1.28 Key research questions that may be relevant to the proposed new section of motorway include the following.

- The identification of social hierarchy.
- Differentiating the settlement forms of native welsh and incoming Anglo-Normans.
- The location and distribution of settlement.
- The wider setting of settlements within their agrarian landscapes.
- Better identification of land use and its pattern throughout the Middle Ages.
- Linking settlement type to tenure and social hierarchy.
- Change and development in settlement across the medieval/post-medieval transition.
- Location and development of granges.
- The impact of monasteries on the wider landscape, in terms of both cultural and economic development.

4.1.29 There are several small moated sites of potential medieval date within the Defined Study Area and at least one of these (ARCH034 - although more likely to be post-medieval) is likely to require some level of investigation ahead of construction. The same applies to the shrunken medieval settlement of Llanfihangel which is outside of the Levels. A small area of possible medieval settlement has also been identified just to the east of New Park Farm at the western end of the proposed new section of motorway (ARCH008).

4.1.30 There is also the potential within the Gwent Levels (and within the boundary of the proposed new section of motorway) for the presence of boats or other timber vessels of medieval date (such as the Magor Pill boat which was found in 1994). These could be preserved in former channels that subsequently filled up with waterlogged sediments.

4.1.31 However, a much stronger contribution towards answering some of the questions raised in the Research Framework for this period is likely to come from the examination of documentary and cartographic sources relating to that part of the Levels traversed by the proposed new section of motorway in order to gain information regarding the use of the land. This would pertain to issues of social hierarchy, tenure, agrarian variation, the impact of monasteries etc.

4.1.32 The Research Framework for the post-medieval period covers the time between AD 1539 and AD 1750 and is published at <http://www.archaeoleg.org.uk/pdf/postmed2011.pdf>. It describes the progress made in the four years subsequent to 2011 in terms of

the previous research agenda for this period. Key sites of this period included the Gwent Levels with regard to agriculture and subsistence.

4.1.33 Key research questions that may be relevant to the proposed new section of motorway include the following.

- The mapping of landscape change – emparking, enclosure and desertion – needs to be integrated with the study of evolving social/tenurial relations and other social and economic drivers.
- Palaeoecological studies can be integrated with knowledge of rural crafts and with documentary research.

4.1.34 As described above with regard to the medieval period, the main contribution towards answering some of the questions raised in the Research Framework for this period is likely to come from the examination of documentary and cartographic sources relating to that part of the Levels traversed by the proposed new section of motorway. Much of the enclosure and drainage of the Levels took place during this period and the sequence and nature of this enclosure and the subsequent use of the land is not yet understood.

4.1.35 A small settlement enclosure of possible post-medieval date has been identified within the boundary of the proposed new section of motorway just to the south of Penylan Farm (ARCH010). The sites of former buildings likely to be of post-medieval date (or possibly medieval) are known at Lighthouse Road (HB024) and also adjacent to the South Wales to London Mainline railway at Duffryn (HB020), both of which are possibly just inside the boundary of the proposed new section of motorway.

4.1.36 The Research Framework for the Industrial and Modern period covers the time between AD 1750 and the present and is published at <http://www.archaeoleg.org.uk/pdf/ind2011.pdf>. It describes the progress made in the four years subsequent to 2011 in terms of the previous research agenda for this period.

4.1.37 This Research Framework emphasises the significance of major dock systems in Wales and clearly Newport Docks falls within this category. The impact of the proposed new section of motorway on the docks would predominantly be experienced through the loss of a number of historic dockyard buildings as well as the very visible nature of the new River Usk Crossing.

4.1.38 One other issue raised within the Research Framework for this period is the significance of military and defensive sites. Within the boundary of the proposed new section of motorway at Pye Corner is a piece of land containing a number of concrete block with iron rings set into their upper surface. It is considered that these are the tether points for barrage balloons used as part of the defences around Newport during the Second World War. There are also two concrete building bases in the same field and adjacent to the road that are likely to be part of the same installation.

4.1.39 The Research Framework for Palaeoenvironmental study is published at <http://www.archaeoleg.org.uk/pdf/palenv/paleoenvironmentalfinal.pdf>. It describes the progress made in the five years subsequent to 2010 in terms of the previous research framework for this topic. A number of additional research questions are also presented within this Framework.

4.1.40 Research questions that may be relevant to the proposed new section of motorway include the following.

- How did the availability of resources influence Mesolithic occupation?
- What were the environmental conditions in the immediate area and surrounding region of Neolithic and Bronze Age funerary and ritual monuments?
- Is there evidence of continuity of land-use and in the types of crops grown from the Roman period to the early medieval period?
- Is there similar evidence across the Iron Age/Roman boundary?
- What were the environmental conditions associated with wetland sites?
- Where and when did cereal cultivation and animal husbandry begin during the Mesolithic/Neolithic transition in Wales?
- What was the nature of farming activity during the Neolithic and earlier Bronze Age in Wales?
- When did changes in agricultural practices occur and what was the nature of these changes?
- What is the evidence for climatic change during the Holocene?
- What role have human communities played in changing coastal environments compared with 'natural' factors?
- How did marine transgression and regression phases affect human activities, especially in prehistory?
- How did humans adapt to the coastal environment?
- What is the evidence for the seasonal use of coastal wetlands in later prehistory and what was the nature of the economy practised?
- What was the relationship between wetland settlements and those on dry land?
- What was the role of hunting, fishing and wildfowling in agricultural societies in Wales?

4.1.41 There are several locations within the boundary of the proposed new section of motorway where archaeological investigation has the potential to provide information that can feed back into the research questions described above with regard to Palaeoenvironmental study.

4.1.42 All of the known sites of archaeological interest on the higher land at either end of the proposed new section of motorway should be considered likely to contain material that can be sampled and assessed for palaeoenvironmental evidence. This includes settlement remains of later Iron Age, Roman, medieval and post-medieval date. It also includes the possible archaeological features identified in the vicinity of the Devil's Quoit standing stone at Undy, which may well be contemporary with this monument and therefore of likely Bronze Age date.

4.1.43 The waterlogged nature of the Gwent Levels means that the potential for well-preserved material of palaeoenvironmental interest is very much enhanced. Activity of any date from Mesolithic through to post-medieval and modern date could be encountered here – known sites that would need to be investigated include moated settlements of medieval/post-medieval date as well as the locations of former buildings identified from historic cartographic sources.

5 Mitigation Strategy

5.1 Introduction

5.1.1 The proposed new section of motorway has been carefully designed to avoid, as far as possible, any impacts on significant cultural heritage sites. However, there would be some impacts on known heritage assets, whilst in certain areas it is possible that archaeological sites and features within the boundary remain unidentified and could be impacted by the construction phase.

5.1.2 A mitigation strategy that involves the use of several separate but complementary methodologies has been developed and is presented below. It includes the following elements.

- Detailed archaeological excavation.
- Detailed historic building recording.
- Basic historic building recording.
- Targeted archaeological watching brief.
- Archaeological evaluation in the form of trial trenches.
- Study of available documentary evidence regarding the development and use of the historic landscape.
- Reporting and dissemination of results.
- Preparation and deposition of all archive material.

5.1.3 The programme of cultural heritage mitigation would be undertaken by one or more experienced specialist contractors (hereafter referred to as the Archaeological Contractor) monitored by the Contractor's Archaeologist and the Curator appointed by Welsh Government. The Archaeological Contractor will be a Registered Organisation with the Chartered Institute for Archaeologists. The work would be in conformance with the standards and guidance identified in the following table.

Table 1: Standards and Guidance

<i>Standard and guidance for archaeological field evaluation</i> (Chartered Institute for Archaeologists, 2014a)
<i>Standard and guidance for archaeological excavation</i> (Chartered Institute for Archaeologists, 2014b)
<i>Standard and guidance for an archaeological watching brief</i> (Chartered Institute for Archaeologists, 2014c)
<i>Standard and guidance for archaeological investigation and recording of standing buildings or structures</i> (Chartered Institute for Archaeologists, 2014d)
<i>Standard and guidance for the collection, documentation, conservation and research of archaeological materials</i> (Chartered Institute for Archaeologists, 2014e)
<i>Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives</i> (Chartered Institute for Archaeologists, 2014f)
<i>Code of Conduct</i> (Chartered Institute for Archaeologists, 2014g)
<i>Guidelines to the standards for recording human remains</i> , M Brickley & J McKinley Institute for Archaeologists Practice Paper 7, (Brickley & McKinley, 2004)
<i>Standards in the Museum Care of Archaeological Collections</i> (Museums and Galleries Commission, 1992)
<i>Selection, Retention and Dispersal of Archaeological Collections: Guidelines for Use in England, Wales and Northern Ireland</i> (Society of Museum Archaeologists, 1993)
<i>Conservation Guidelines No. 2</i> (United Kingdom Institute for Conservation, 1983)
<i>First Aid for Finds</i> , (RESCUE & ICON, 2001)
<i>Guidelines for Finds Work</i> , (Chartered Institute for Archaeologists, 1992)

- 5.1.4** For the purpose of this report and for further work regarding the Scheme, 'Identified Cultural Heritage Remains' represent those heritage assets described in the gazetteer (Annex A of Appendix 8.2). The proposed mitigation for those assets that would be physically affected by the construction of the proposed new section of motorway (including areas affected by temporary land take) is described below and summarised in Table 2. This mitigation includes: archaeological evaluation; detailed archaeological excavation; detailed historic building recording; basic historic building recording; historic landscape study; protection of cultural heritage remains; and archaeological watching brief.
- 5.1.5** The proposed archaeological evaluation described below comprises the further examination of known archaeological sites along with the examination of land where there would be a high level of physical impact during construction and for which there is less known about the potential archaeological remains at that location.
- 5.1.6** For the purpose of this report, 'Discovered Cultural Heritage Remains' are taken as representing any heritage assets identified during the programme of mitigation that are not yet known and therefore not indicated on the gazetteer of heritage assets (Annex A of Appendix 8.2). Heritage assets could be identified through the programme of archaeological evaluation described below or any other form of archaeological evaluation, or during the archaeological watching brief undertaken by the Archaeological Contractor during construction, or through reporting by the Contractor with regard to works not covered by the archaeological watching brief.
- 5.1.7** The DMRB HA 75/01 (Highways Agency *et al.*, 2001) provides the following definition of a Project Brief: '*This defines the objectives of the whole Archaeological Recording Programme and is the basis for the Project Design produced by the Archaeological Contractor*'. For the purposes of the Scheme this CHMP should be regarded as the Project Brief.

- 5.1.8** Prior to the commencement of any works, and in line with the procedures defined within HA 75/01, the Archaeological Contractor would prepare a Project Design for those works identified within this CHMP, including detailed method statements for all activities that are proposed (from survey, machine excavation, hand excavation, environmental sampling etc. to office-based activities such as finds processing, database use, reporting etc.). The Project Design would respond to the scope of works described in this CHMP and would set out aims and objectives in keeping with relevant national and regional research frameworks (including period and materials based-frameworks). The Project Design would be submitted to, and agreed by, the Contractor's Archaeologist and the Curator appointed by Welsh Government and also by Welsh Government as the Overseeing Organisation.
- 5.1.9** Where 'Discovered Cultural Heritage Remains' are identified during construction (either through the archaeological evaluation, the archaeological watching brief, or Contractor observation and reporting), the Archaeological Contractor would immediately protect these remains and delineate them in such a manner as to ensure that they are clearly visible to any persons working in this area.
- 5.1.10** The Archaeological Contractor would inform the Contractor, the Contractor's Archaeologist and the Curator of the 'Discovered Cultural Heritage Remains' and would undertake a preliminary survey and investigation of the remains such as is necessary to establish their nature and significance.
- 5.1.11** As soon as is reasonably practicable (and in any event within five working days of the identification of the 'Discovered Cultural Heritage Remains', the Archaeological Contractor would submit a Further Archaeological Design to the Contractor, the Contractor's Archaeologist and the Curator. This would describe the nature and extent of the 'Discovered Cultural Heritage Remains' and would include plans at appropriate scales to show the location and the available details of the 'Discovered Cultural Heritage Remains'. It would also include a fully costed proposal for any further investigation and recording of the 'Discovered Cultural Heritage Remains'.
- 5.1.12** The Further Archaeological Design would be submitted to, and agreed by, the Contractor, the Contractor's Archaeologist and the Curator and by Welsh Government as the Overseeing Organisation prior to the commencement of any part of the mitigation described within that document.

5.2 The Identified Cultural Heritage Remains

Archaeological Evaluation

- 5.2.1** Archaeological evaluation of land within the boundary of the proposed new section of motorway that has a generally high potential for the presence of buried archaeological remains and/or where a significant impact is anticipated, but for which no detailed information is available, is addressed below in the section that deals with 'Discovered Cultural Heritage Remains'.
- 5.2.2** However, there are several locations where the presence of archaeological remains is known (i.e. they are 'Identified Cultural Heritage Remains' for the purposes of this document) but for which further information would be useful with regard to determining the nature and extent of further work (such as detailed archaeological excavation).
- 5.2.3** All of these locations are likely to require detailed archaeological excavation but some additional evaluation would enable the scope of the detailed excavation to be better-

defined. This evaluation is likely to be in the form of archaeological trial trenches. The trenches would generally each measure 30 metres by 2 metres and would be excavated through the topsoil and any underlying subsoil if this considered necessary. The work would be carried out in line with a Written Scheme of Investigation (WSI) prepared by the Contractor's Archaeologist and agreed by the Curator appointed by Welsh Government and by Welsh Government as the Overseeing Organisation. The detailed methodology for trial trenching is provided as Annex D of this CHMP.

5.2.4 The locations of the proposed areas of evaluation are shown on Figures 5a – 5k.

EVAL001

5.2.5 Located to the east of Gwaunshonbrown Farm, a possible earthwork enclosure has been noted on an aerial photograph (ARCH015). This is within land that is initially required for the winning of stone and subsequently for tree planting in order to provide replacement habitat.

EVAL005

5.2.6 At the southern edge of the Imperial Park industrial estate is the location of the former Great Pencarn Farm (HB016/017). This farmstead (farmhouse and associated buildings) is marked on historic maps from the mid-19th century onwards (as Great Pen-carn or Great Pencarn) and was demolished at some time between 2007 and 2009. The farmhouse appeared to be of around 1800 date, although examination indicated that this could be a rebuild of an earlier structure, possibly late 16th or early 17th century. The manor of Pen-carn or Great Pencarn is known from documentary sources dating from the 12th century but there is no information as to the location of any buildings – it is possible that a manor house or similar principal building subsequently developed to become Great Pencarn Farm. This land is required for a main construction compound.

EVAL006

5.2.7 Just to the south of the location of the former Great Pencarn Farm, archaeological investigations in advance of the construction of a roundabout found a Roman building associated with a series of cobbled surfaces and an adjacent road or track. An earlier phase of Roman activity comprised a series of drainage ditches. The Roman activity was underlain by waterlogged deposits, within which was a single upright wooden post of Bronze Age date (ARCH020).

EVAL039

5.2.8 Just to the north of Magor is the route of a putative Roman road (ARCH043). Although no physical evidence has been found that would confirm this suggestion, the detailed examination of aerial survey data undertaken in connection with the proposed new section of motorway has identified a linear earthwork whose location and alignment matches that of the proposed road. This land is required for Reed Bed 11b, a component of Water Treatment Area (WTA) 11b.

EVAL040

5.2.9 Geophysical survey to the east of the house known as The Cedars suggests the presence of features that may be small pits of archaeological interest (ARCH049). This is within the extended cutting to the north of the existing M4 motorway.

EVAL041

- 5.2.10** Geophysical survey to the west of the lane known as The Elms or Rockfield Lane and within the extended cutting to the north of the existing M4 motorway, suggests the presence of a linear feature that may be of archaeological interest (ARCH051).

EVAL042

- 5.2.11** Geophysical survey of land north of the B4245 road identified a ring-ditch or ring-gully, also a possible trapezoidal enclosure and a few linear anomalies (ARCH057). The land is required for the winning of stone needed for construction.

EVAL044

- 5.2.12** The hamlet of Llanfihangel was formerly much larger than its present form suggests (ARCH064). The proposed new section of motorway includes construction of various elements within land that is likely to contain evidence for medieval settlement.

Detailed Archaeological Excavation

- 5.2.13** Detailed archaeological excavation is required at a number of locations affected by the proposed new section of motorway. These represent areas where the presence of archaeological remains within the permanent or temporary land take has been confirmed and such remains would be physically impacted during construction.
- 5.2.14** The locations of areas requiring detailed archaeological excavation are indicated on Figures 5a-5k and further information on each location is provided below. The methodology for detailed archaeological excavation is provided as Annex A of this CHMP.

EXC001

- 5.2.15** A small enclosure identified as a cropmark on aerial photographs, located to the east of New Park Farm (ARCH007/008). Geophysical survey failed to provide further clarity; however trial trenches here found evidence for medieval activity, possibly a farmstead. This is partially within the extended cutting to the north of the existing M4 motorway and partially within land that is required for tree planting in order to provide replacement habitat.

EXC002

- 5.2.16** Just to the south of Penylan Farm, geophysical survey has identified an enclosure containing possible structures (ARCH010). Subsequent trial trenching here confirmed the presence of a small farmstead of post-medieval date, possibly 16th or 17th century. This is partially within the extended cutting to the north of the existing M4 motorway and partially within land that is initially required for the winning of stone and subsequently for tree planting in order to provide replacement habitat.

EXC003

- 5.2.17** Located to the north of the South Wales to London Mainline railway is the site of a former farmstead named on historic mapping as Pont-estyll (HB020). Any part of this former building complex within the boundary of the proposed new section of motorway would require detailed excavation.

EXC004

- 5.2.18** Located on the western side of Lighthouse Road and to the north of Fair Orchard Farm is the site of a former building named on historic mapping as 'Pheasant' (HB024). Any part of this former building within the boundary of the proposed new section of motorway would require detailed excavation.

EXC005

- 5.2.19** The embankment for the northern part of the New Dairy Farm Overbridge passes through part of a complex of earthworks on either side of the Pont-y-Cwch Reen (ARCH024). This may represent a medieval landscape feature, possibly a farmstead with external fields. Any part of this earthwork complex within the boundary of the proposed new section of motorway would require detailed excavation.

EXC006

- 5.2.20** Located immediately south west of the junction of Rush Wall and North Row is a small rectangular moated platform enclosed within a single ditch (ARCH034). This land was amongst the final part of the Levels to be enclosed and drained so this may represent an isolated farmstead of post-medieval or even early modern date. The realignment of North Row at this location in order to reach the North Row Overbridge would encroach very slightly onto this site.

EXC007

- 5.2.21** On the west side of Magor and immediately east of the A4180 road, geophysical survey has identified a series of enclosures (ARCH044/045). Trial trenches here have confirmed the presence of features of Late Iron Age through to Early Roman date. This area is within the permanent land take required for the proposed new section of motorway, including land required for mitigation planting.

Detailed Historic Building Recording

- 5.2.22** A total of 11 buildings or groups of buildings has been identified as requiring detailed recording ahead of demolition and these are identified below (described from west to east). Other buildings for which demolition is required have been appraised (see Appendix 8.2 of this ES) and no further recording is proposed; this is due to a lack of identified historic value. If additional buildings are proposed for demolition at any point within the development of the proposed new section of motorway, then the buildings would be individually appraised and an appropriate form of recording action would be agreed with the Curator appointed by Welsh Government. Similarly, if any building proposed for demolition and considered on the basis of current knowledge to have little or no historical value is subsequently found to have a higher historical value, then the building would be reappraised and an appropriate form of recording action would be agreed with the Curator appointed by Welsh Government and with Welsh Government as the Overseeing Organisation.
- 5.2.23** The methodology for Detailed Building Recording is presented as Annex B of this CHMP.
- 5.2.24** The locations of the structures requiring Detailed Building Recording are shown on Figures 5a – 5k.

HBR001 - White Cottage (HB116)

- 5.2.25** The Ordnance Survey 6" map of 1887 shows a building at this location which is named as Gwin-lewydd and which appears to be a small house or cottage. The current building is much altered but may well be based around the core of an early 19th century structure.

HBR002 - Myrtle House (HB007)

- 5.2.26** This is a late 19th century double pile plan cottage located on the north side of the A48, at the junction with Pound Hill. The rendered exterior and replacement windows mean that additional historical details remain unknown.

HBR003 - Berryhill Farm (HB010)

- 5.2.27** A farmstead has been here since at least 1844 and initially comprised a farmhouse along with a pair of stone-built cottages. Additional farm buildings have been added subsequently to establish a more typical linear farmyard.

HBR004 - Swing bridge operation building, Newport Docks (HB039)

- 5.2.28** This appears to have been constructed in the period 1907-1912. It comprises a single room with lobby and a simple fireplace. Windows provide a clear view to both east and west. This is probably the office for the operator of the former swing bridge that provided the connection for rail traffic (and possibly pedestrians) across the channel between the North and South Docks (Appendix 8.5, Component 07). This building has a clear connection with the former swing bridge and therefore with the railway maintenance sheds to the east (HB049 etc). It retains original internal features including a fireplace and is in a reasonable state of repair.

HBR005 - Group of locomotive running sheds and engineering workshops, Newport Docks (HB049)

- 5.2.29** This is a group of interconnected buildings located to the south of the former graving dock, all of which are associated with the maintenance of the dock railway engines and rolling stock (Appendix 8.5, Component 04a-04l). Much of the material coming through Newport Docks was transported by rail and this was also the prevalent method of transport within the docks.
- 5.2.30** The earliest detailed map of the original Alexandra Dock dates to 1887 and this shows a network of rail lines connecting to the wharves on the western side of the dock, with a single line also extending around the southern end of the dock that then branches out to reach two separate buildings. The western building is indicated as an 'Engine House' with adjacent 'Boilers' and 'Tanks', whilst the eastern building is not ascribed any particular function. The rail line diverges and splits into two parts just to the west of the building, both lines then run directly into the building and do not emerge from the other side (Appendix 8.5, Figure 4). This is likely to have been a running shed (i.e. for the night time storage of small tank locomotives) and it therefore appears that the locomotive sheds were established at this location as part of the initial establishment of the Alexandra Dock.
- 5.2.31** Following the construction of the South Dock (commenced in 1882), a narrow cut was established between the two docks. Access for rail traffic over the cut was by way of a swing bridge and therefore the locomotive sheds could be retained in their established

location. The layout is shown on a map of c. 1990 which indicates that the buildings here had been extended (Appendix 8.5, Figure 5). Later mapping describes the buildings here as 'Workshops'.

- 5.2.32** The earliest elements of the surviving structures within this group are likely to date to the initial establishment of the locomotive sheds in around 1883. One early element is a long rectangular building in pale white bricks and this was probably the building initially used as a running shed. It was recorded (as Component 04a) in the 2008 study (Appendix 8.5) but the roof has subsequently been replaced using modern materials.
- 5.2.33** To the north west is a second set of buildings that also appear to date to the initial establishment of the group in around 1883 (Appendix 8.5, Components 04h; 04i; 04j). These are in coursed sandstone and may represent the structure shown as an 'Engine House' on the 1887 map. As such these buildings probably housed a steam engine used to pump water out of the graving dock to the north.
- 5.2.34** The earlier running shed was subsequently extended at various times with additions to the west and east and also to the north. This all appears to have happened by 1901 and may have been associated with the construction of the south dock. The complex may well have developed a greater focus on maintenance at around this time. Most of the roofs here have been replaced since the 2008 study (Appendix 8.5).
- 5.2.35** The former 'Engine House' has also been extended since 1900 with various additions and amendments. At some point all of the buildings in this group (HB049) were converted to become workshops for the maintenance of locomotives and presumably any other equipment used within the docks. This use has continued until the present day. Some of the roofs here have been replaced since the 2008 study (Appendix 8.5).
- 5.2.36** This group of buildings therefore includes surviving elements from the initial construction and use of the Alexandra Dock. The buildings are in good condition and their continued use for the maintenance of dockyard equipment means that there has been no loss of significance due to change of use.

HBR006 - Former locomotive engine shed, Newport Docks (HB055)

- 5.2.37** This building is based around a series of iron columns with 'I' beam plates attached, which support a lightweight pitched roof that has recently been recovered using modern materials. The gaps between the columns have been infilled with red bricks (Appendix 8.5, Component 12).
- 5.2.38** A building is first indicated in this location on an OS map published in 1922 which shows a single rail line running through the building and another one passing just to the south. This was probably a running shed which was later incorporated into the maintenance works which are located immediately to the north west. The construction type is such that this could have been moved here from another location within the docks or even from an external site.
- 5.2.39** This likely initial use of the building as a locomotive running shed and its connection with the other running sheds and maintenance buildings to the north west (HB049) group contribute towards the significance of HB055, and there has been no loss of significance due to change of use.

HBR017 - Barecroft House (HB104/105)

- 5.2.40** A stone-built two storey cottage of unknown date which is rendered and heavily buttressed on the south side. The form of the building appears to match with what is shown here on the tithe and early Ordnance Survey mapping. Some later structures have been built just to the east but these would be retained outside the footprint of the proposed new section of motorway.

HBR018 - Magor Vicarage – Grade II listed building (LB010)

- 5.2.41** This is the only listed building for which demolition is required in order to implement the proposed new section of motorway (Figure 2e, LB010). It was built in 1861 and is in Tudor/Jacobean Revival style. The vicarage was designed by John Norton, who was also involved in the restoration of the Grade I listed Church of St Mary in Magor in 1868. The interior of the vicarage retains much of the original Tudor Revival material including the stone fireplaces and decoratively moulded panelled doors. To the rear of the vicarage are contemporary stables and a coach-house, which must be regarded as being 'curtilage buildings' and which would be subject to the same level of recording. The vicarage was listed as a good example of a largely unaltered mid-19th century architect-designed vicarage with mostly contemporary fittings.
- 5.2.42** For this building there is the opportunity for material to be recovered and presented to the Brooking National Collection. This collection preserves the physical remains of the United Kingdom's built environment and provides a teaching resource for conservation professionals, designers, architects and students, with Open Days where members of the public can attend (<http://thebrookingcollection.org/index.html>).

HBR019 - Dunline, aka The Cedars (HB109)

- 5.2.43** A house of late 19th/early 20th century date, stone-built with red brick dressings. The building has replacement windows and a cement tile roof.

HBR020 - Undy House (HB110)

- 5.2.44** Property of late 19th/early 20th century date including a house and three outbuildings, all in stone with red brick dressings. The house has been considerably altered as has the former cartshed/stables building, but there is some group value here.

HBR021 - Limekiln north of M4 at Undy (HB117)

- 5.2.45** The remains of a former limekiln are present within woodland just to the north of the existing M4, near to Undy. This is indicated on the 1st edition Ordnance Survey 6" map of 1887 and is likely to be of 19th century date. It is located on the northern edge of a small quarry.

Basic Historic Building Recording

- 5.2.46** This level of recording is required for those structures for which the more detailed level of recording described above is considered unnecessary. A detailed methodology for Basic Historic Building Recording is presented as Annex C of this CHMP. The locations of the structures requiring Basic Historic Building Recording are shown on Figures 5a – 5k.

HBR007 - Former ammunition store or air raid shelter, Newport Docks (HB035)

- 5.2.47** Located just to the west of the channel between the North and South Docks, this building is very similar in construction and appearance to another structure within the docks that is known to be an air raid shelter of Second World War date. This is considered to be a more likely use for the building than as an ammunition store (Appendix 8.5, Component 27).

HBR008 - Former mess or welfare building, Newport Docks (HB037)

- 5.2.48** This building is first shown on a map of 1921 date. The function is not recorded but the form suggests that it may have been a mess or welfare building for dockyard personnel (Appendix 8.5, Component 08).

HBR009 - Former air raid shelter, Newport Docks (HB038)

- 5.2.49** The form of this building suggests that it was an air raid shelter of Second World War date, one of at least four within this part of the docks (Appendix 8.5, Component 09).

HBR010 - Building of unknown function, Newport Docks (HB042)

- 5.2.50** Single storey building in red brick with flat concrete roof. The construction methodology indicates a date in the early 20th century. A building is shown in this location on maps of that period but is longer than the present structure. No clear function can be ascribed to this building (Appendix 8.5, Component 06).

HBR011 - Shed of unknown function, Newport Docks (HB043)

- 5.2.51** Building of concrete modular construction with a pitched roof. This construction type is likely to be mid-20th century in date. No clear function can be ascribed to this structure (Appendix 8.5, Component 05).

HBR012 - Former graving dock, Newport Docks (HB044)

- 5.2.52** Built in the late 19th century this is first shown on the OS map of 1883, later identified as a Graving Dock and in 1912 as a Dry Dock. It is now mainly infilled although there is water in the western end and the lock gates survive. Some elements associated with the dock are still present surrounding the infilled section, including concrete plinths with iron capstans on the upper surface (Appendix 8.5, Component 10).

HBR013 - Building of unknown function, Newport Docks (HB053)

- 5.2.53** Single storey rectangular building in pale orange brick with pitched slate roof (Appendix 8.5, Component 11). The construction methodology indicates a date in the early 20th century. Probably of early 20th century date but function remains unknown - there is a line shaft attached internally to the north wall but no indication as to what this might have been attached to. At some point there was certainly an engine placed within the building but its original use may not have been as an engine shed.

HBR014 - Building of unknown function, Newport Docks (HB057)

- 5.2.54** Single storey building of two distinct elements, both in similar style with red/brown bricks and a pitched roof recently replaced with modern materials, but with the northern part raised to be slightly higher than the southern part (Appendix 8.5, Component 13). The wide door opening in the northern end of the more elevated part of the building

suggests a requirement for vehicle access and this may be linked to the nearby maintenance sheds (HB049, HB055).

HBR015 - Building of unknown function, Newport Docks (HB058)

- 5.2.55** This building comprises a curtain wall of concrete blocks with a shallow pitched roof covered in corrugated iron sheeting (Appendix 8.5, Component 14). It had previously been identified as a possible air raid shelter but the flimsy nature of the roof does not support this suggestion and it may have been an external latrine.

HBR016 - Pye Corner barrage balloon tethers (HB087)

- 5.2.56** The field immediately to the north of the former Baptist Chapel at Pye Corner contains a number of concrete blocks with iron rings set into the upper surface. These are considered to be tether point for barrage balloons used for the defence of Newport during the Second World War. There are also two potential hut bases at the eastern edge of this field, adjacent to Nash Road, which may be associated with the tether points.

Historic Landscape Study

- 5.2.57** As described above (Section 3.2), the proposed new section of motorway traverses the northern parts of the western and central of the three discrete areas that comprise the Gwent Levels Landscape of Outstanding Historic Interest (LOHI), which is included on the non-statutory Register of Landscapes of Outstanding Historic Interest in Wales. The Levels represent land that has been reclaimed from the Roman period onwards, having formerly been tidal mud-flats and salt-marshes. The present field patterns and settlement locations (and types) demonstrate distinctive episodes of enclosure and drainage.
- 5.2.58** That part of the designated Gwent Levels most affected by the proposed new section of motorway is the back fen. This is the area closest to the junction between the Levels and the higher land to the north, known as the fen edge. The back fen is the lowest-lying part of the Levels and was amongst the last parts to be enclosed and drained – the earliest settlement on the Levels was on the slightly higher coastal and estuary-side areas.
- 5.2.59** Much of the former back fen has already been lost to development in the 20th and early 21st centuries, with major industrial use including the giant steelworks at Llanwern and more recently the Gwent Europark and the expanding development south of Liswerry. The construction of the proposed new section of motorway to the south of Newport would result in further direct loss of back fen, but another consequence is that remaining areas of back fen to the north of the proposed new section of motorway would become more vulnerable to development pressure. This includes land around Tatton Farm and to the north west of Pye Corner.
- 5.2.60** It is not possible to further reduce the direct physical impact of the proposed new section of motorway on the back fen through design – the horizontal alignment has been configured to keep away from the designated Landscape of Outstanding Historic Interest as much as possible, but even in places where the proposed new section of motorway is outside the designated historic landscape it can still directly impact on land sharing the same historic character. Development pressure on land adjacent to the proposed new section of motorway, particularly to the north, cannot be addressed through design (this is a matter for the local planning authorities), although the

identification of some of this back fen land as essential environmental mitigation land required as part of the Scheme gives it a greater level of protection from such pressures.

5.2.61 Previous research into the history and archaeology of the Gwent Levels has focused on coastal areas for three reasons: firstly, this is where the most settlements were located (these are archaeologically and historically the most prominent and accessible elements of the landscape: e.g. Rippon, 1996; 2008); secondly, this is where most recent development has taken place that has resulted in archaeological survey and excavation (e.g. Meddens and Beasley, 2001); and thirdly because the intertidal zone provides a window into the deep sequence of deposits that makes up the Levels (e.g. Fulford *et al.*, 1994; Allen and Rippon, 1997; Bell, 2013; Bell *et al.*, 2007). There has, in contrast, been very little work undertaken with regard to modern development within the back fen area, with the notable exception of the Gwent Europark.

5.2.62 Although only sparsely settled, the back fen was an important landscape for local communities. For most of its existence it comprised an area of open, unenclosed, and undrained wetland; this was a mixture of rough grassland, reed and sedge fen, and possibly some alder-carr woodland (examples of such habitats can be seen at Magor Marsh). In the winter months there may have been areas of very shallow open water but there is no evidence for permanent lakes. Although poorly drained and so not suitable for arable cultivation, these back fens did provide a range of resources that would have been extremely valuable for communities living elsewhere, both in settlements on the higher coastal areas of the Levels, and on the adjacent dry land areas. Indeed, the way in which settlements such as Magor, Llanwern and Great Pencarn were located on the fen edge reflects the desire of the communities living there to have access to both the good arable soils on the dry land and the rich pastures of the back fens.

5.2.63 In order to offset the impact of the proposed new section of motorway on the historic character of the remaining part of the back fen, three complementary strands of historic investigation would be undertaken which collectively have the following aims:

- to improve our understanding of the historic landscape that would be affected by the construction and operation of the proposed new section of motorway;
- to illustrate how the environment and ecology of this part of the Levels is not 'natural' in any way but results from the landscape being a cultural artefact that has been produced by past and present communities: and
- to provide ways of engaging with the public and raising awareness of the importance of the historic landscape of the Gwent Levels and of South East Wales more widely.

5.2.64 The three strands of complementary historical investigation comprise the following.

- The management of the unenclosed back fen: As large expanses of open, unenclosed pasture, there are few archaeological remains that relate to the management of the back fen pastures, although an examination of the post-enclosure field names may produce evidence for former stock pens etc. The construction of duck decoys – of which there were at least two examples (in Nash and Whitson) – are another example of now the rich natural resources of the back fens were managed.

Examining the allocation of land post-enclosure would allow those tenements that formerly had grazing rights in the back fens to be determined, while reconstructing

the pattern of droveways along which livestock were driven from distant settlements down to their summer pastures would also shed light on how this part of the Levels was integrated into the economy of a far wider area. The study of field and place names across the dry lands adjacent to the Levels may reveal evidence for this seasonal movement of livestock to complement the 'Summerways' and 'Esterweywlond' (land by the Easter Way', i.e. the droveways along which livestock would have been driven at Easter time) that have previously been identified on the Levels.

- The enclosure and drainage of the back fen: following the gradual enclosure of the back fen a complex hierarchy of drainage channels were created which started with spade-dug gullies cut into the surface of fields (known as gripes), through field boundary ditches, to major drainage channels (the reens) that discharged water into the estuaries. Other channels (such as Monk's Ditch) carried upland streams across the Levels and straight into the Severn Estuary. There was also a series of earthen embankments (known as walls) that were built to prevent waters in the back-fen from flooding enclosed farmland towards the coast. The way in which this drainage system functioned in the past and evolved over time has not previously been examined in any level of detail, although a wealth of documentary sources are available and along with relict and still-functioning elements surviving within the historic landscape would enable such an examination to be undertaken.
- Connected communities: From both of the themes above, drawing together the various strands of evidence that relate to how communities some distance away had connections to the Levels generally, and the back fens specifically, would provide a way of structuring a programme of public engagement whose themes would include past exploitation of the back-fens, the development of a complex water management/drainage system, and the way that the rich environment of the levels is not wholly 'natural' but is in fact a cultural artefact. This public engagement could include talks to local communities with whom a connection to the back fens has been established, also visits to key parts of the landscape, walks down droveways and 'Summerways' and/ or joint events with nature conservation groups.

5.2.65 The programme of historic landscape mitigation described above would be undertaken at the same time as the work on the buried archaeological sites as it may identify sites and features that require archaeological fieldwork ahead of any physical impact.

Protection of Cultural Heritage Remains

5.2.66 Only one cultural heritage asset has been identified that would require protection during construction of the proposed new section of motorway. This is a Scheduled Monument (SM002, Figure 2f) which comprises a standing stone of possible Bronze Age date located to the north of Undy. It is also known as the Devil's Quoit.

5.2.67 The standing stone is very close to the embankment of the existing M4 motorway. It would be retained *in situ* and following completion of construction it would be located within an embayment in the new embankment carrying the off-slip from the westbound M4 to the connection with the B4245 road. There would be a retaining wall around three sides of the standing stone which in each case would comprise an engineered 1:2 slope. The toe of the new embankment would be approximately 5 metres from the standing stone. To the south west of the standing stone would be a new highway drainage ditch (culverted at this point) and a Water Treatment Area. It is likely that there will be further discussions with Cadw regarding this monument.

5.2.68 During construction the standing stone would be surrounded by a secure perimeter fence (2 metres Heras anti-climb or similar). Signage would be placed on the fence to indicate that this is a Scheduled Monument and that any works in the vicinity must be notified in advance to the Contractor's Archaeologist before a permit for such works can be issued.

Table 2: Summary of Works Required with Regard to the Identified Cultural Heritage Remains

CHMP Code	Site Name	Site No.	Comment
Archaeological Evaluation			
EVAL001	East of Gwaunshonbrown Farm	ARCH015	Earthwork enclosure seen on aerial photographs
EVAL005	Great Pencarn Farm	HB016/017	Site of Great Pencarn Farm, recently demolished
EVAL006	South of Great Pencarn Farm	ARCH020	Close to ARCH020 – the known site may extend into the proposed new section of motorway boundary
EVAL039	North of Magor	ARCH043	Possible route of Roman road – linear earthwork feature
EVAL040	East of house known as The Cedars	ARCH049	Geophysical survey indicates a number of pits
EVAL041	West of The Elms/Rockfield Lane	ARCH051	Geophysical survey indicates a linear feature
EVAL042	North of the B4245, east of Undy	ARCH057	Geophysical survey indicates a number of features
EVAL044	Llanfihangel	ARCH064	Shrunken medieval settlement
Detailed Archaeological Excavation			
EXC001	East of New Park Farm	ARCH007/008	Small enclosure, possibly medieval farmstead
EXC002	South of Penylan Farm	ARCH010	Small enclosure, possibly post-medieval farmstead
EXC003	Site of former farmstead Pont-estyll	HB020	Recorded on historic maps
EXC004	Site of former building 'Pheasant'	HB024	Recorded on historic maps
EXC005	Earthwork complex north of New Dairy Farm	ARCH024	Possible medieval landscape features
EXC006	Junction of Rush Wall and North Row	ARCH034	Small moated platform, possibly post-medieval or early modern
EXC007	East of A4180 road and west of Magor	ARCH044/045	Series of enclosures, Late Iron Age to Early Roman
Detailed Historic Building Recording			
HBR001	White Cottage	HB116	
HBR002	Myrtle House	HB007	
HBR003	Berryhill Farm	HB010	Group of historic buildings
HBR004	Swing bridge operation building, Newport Docks	HB039	
HBR005	Group of locomotive running sheds and engineering	HB049	

CHMP Code	Site Name	Site No.	Comment
	workshops, Newport Docks		
HBR006	Former locomotive engine shed, Newport Docks	HB055	
HBR017	Barecroft House	HB104/105	
HBR018	Magor Vicarage	LB010	Grade II listed building
HBR019	Dunline, aka The Cedars	HB109	
HBR020	Undy House	HB110	
HBR021	Limekiln north of M4 at Undy	HB117	
Basic Historic Building Recording			
HBR007	Former ammunition store or air raid shelter, Newport Docks	HB035	
HBR008	Former mess or welfare building, Newport Docks	HB037	
HBR009	Former air raid shelter, Newport Docks	HB038	
HBR010	Building of unknown function, Newport Docks	HB042	
HBR011	Building of unknown function, Newport Docks	HB043	
HBR012	Former graving dock, Newport Docks	HB044	
HBR013	Building of unknown function, Newport Docks	HB053	
HBR014	Building of unknown function, Newport Docks	HB057	
HBR015	Building of unknown function, Newport Docks	HB058	
HBR016	Pye Corner barrage balloon tethers	HB087	
Historic Landscape Study			
	Gwent Levels Landscape of Outstanding Historic Interest		Study would focus on the development and use of the back fen areas
Protection of Cultural Heritage Remains			
	Devil's Quoit standing stone, Undy	SM002	Requires physical protection during construction

5.3 The Discovered Cultural Heritage Remains

5.3.1

As described above (Section 5.1), the 'Discovered Cultural Heritage Remains' are taken as representing any heritage assets identified during the programme of mitigation that are not yet known and therefore not indicated on the gazetteer of heritage assets (Annex A of Appendix 8.2). Heritage assets could be identified through the programme of archaeological evaluation described below or any other form of archaeological evaluation, or during the archaeological watching brief undertaken by the Archaeological Contractor during construction, or through reporting by the Contractor with regard to works not covered by the archaeological watching brief.

Archaeological Evaluation

5.3.2

Much of the land traversed by the proposed new section of motorway is considered to have a high potential for the presence of significant archaeological remains. This is certainly the case for any part of the proposed new section of motorway located within

the Gwent Levels with the exception of land that has been subject to substantial disturbance in the form of modern development (e.g. the Llanwern Steelworks or Newport Docks).

5.3.3 Outside of the Gwent Levels, archaeological evaluation with regard to the proposed new section of motorway has principally been undertaken through geophysical (fluxgate magnetometer) survey followed up where possible and appropriate by trial trenching. This approach has resulted in the identification of several archaeological sites for which further work is proposed. This would be in the form of detailed archaeological excavation, in some cases preceded by additional evaluation in order to better define the scope of the detailed excavation (see above with regard to the 'Identified Cultural Heritage Remains').

5.3.4 However, there are some locations outside the Gwent Levels, at each end of the proposed new section of motorway, where no archaeological evaluation has been possible. This is due to one or more of the following reasons:

- land not suitable for fluxgate magnetometer survey due to land-use (scrub, trees, silage etc) or topography (steep slopes);
- land occupied by livestock at time of proposed fluxgate magnetometer survey and therefore survey was not possible or landowner/tenant unwilling to allow access;
- landowner not contactable until all survey work had been completed; and/or
- land identified as required when all survey work had been completed.

5.3.5 For land outside the Gwent Levels where no archaeological fieldwork survey has been undertaken and where there would be considerable physical impact as a result of the construction of the proposed new section of motorway (e.g. borrow pits), a stage of archaeological evaluation in the form of trial trenches would be undertaken ahead of the commencement of construction activities.

5.3.6 The trenches would each measure 30 metres by 2 metres and would be excavated through the topsoil and any underlying subsoil if considered necessary. The work would be carried out in line with a Written Scheme of Investigation (WSI) prepared by the Contractor's Archaeologist and agreed by the Curator appointed by Welsh Government and by Welsh Government as the Overseeing Organisation. The detailed methodology for trial trenching is provided as Annex D of this CHMP.

5.3.7 Upon completion of the trial trenching, a report would be produced that describes the results of the work. Should any archaeological remains be located during the trial trenching these would be classed as 'Discovered Cultural Heritage Remains'. Any further archaeological work regarding such 'Discovered Cultural Heritage Remains' would be carried out following the preparation by the Archaeology Contractor of a Further Archaeological Design in accordance with the procedures described above in Section 5.1 of this CHMP.

5.3.8 Within the Gwent Levels there has been no archaeological fieldwork associated with the proposed new section of motorway in the form of fluxgate magnetometer survey as this technique is unlikely to be successful in the identification of archaeological sites due to the nature of the deposits in the wetlands.

5.3.9 Instead the process of identifying cultural heritage sites or features, or areas of higher archaeological potential, has been based on the combined results of a number of

studies including several complementary remote sensing surveys. These studies include:

- desk-based review of available documentary information regarding cultural heritage;
- examination of historic mapping including tithe maps and the 1st series Ordnance Survey 6" to the mile maps;
- examination of detailed aerial LiDAR data (Light Detection and Ranging) produced specifically for the Scheme by Network Mapping Ltd;
- examination of satellite data purchased from commercial suppliers;
- examination of bespoke aerial multi-spectral images;
- Electrical Resistance Tomography (ERT) and Electro-Magnetic (EM) survey; and
- examination of a geoarchaeological deposit model constructed using the results of Scheme-specific site Investigation work as well as borehole data obtained from the British Geological Survey (BGS).

5.3.10 This approach has provided two main types of input with regard to understanding the potential impact of the proposed new section of motorway on cultural heritage resources. Firstly it has led to the identification of features and sites that have either surface expression (earthworks visible on LiDAR or aerial-based Digital Terrain Models). This includes moated sites and other earthwork complexes, also recent (pre-enclosure) drainage channels that relate to the saltmarshes and tidal mudflats that preceded the current man-made landscape.

5.3.11 Secondly it has allowed a much greater understanding of the deposit sequence across the Levels, particularly the upper part of that sequence which relates to the formation of the deposits during the Holocene epoch. This has enabled an appreciation of where archaeological sites of any particular period are likely to be present in a three-dimensional basis, i.e. not just spatially along the proposed new section of motorway as it traverses the Levels but also at what depth below current ground level such sites are likely to be present.

5.3.12 In order to develop an appropriate strategy for the mitigation of the effects of the proposed new section of motorway on as yet unknown cultural heritage resources within the Levels, it is necessary to consider the nature and extent of the potential impacts on such resources.

5.3.13 Across almost all of that part of the Levels traversed by the new section of motorway, construction of the embankment for the new road would be preceded by the installation of vertical band drains. Each band drain comprises permeable plastic core wrapped in a filter membrane, pushed through the underlying deposit sequence using a bespoke stitcher mast. Each band drain would be approximately 100 mm in diameter and they would be installed at approximately 2.5 metre spacing to a depth of 8-12 metres depending on ground conditions. The purpose of the band drains is to speed up the rate of settlement (of the embankment) as their introduction allows pore water to drain away more quickly and therefore pore water pressure is reduced. The embankment is then constructed and additional material (surcharge) is then placed on the embankment in order to achieve full settlement – this additional material would be removed after a period of approximately 12 months.

5.3.14 In some locations driven piles would also be installed – this would principally be at the site of structures (overbridges, gantries, permanent box culverts etc) and also in areas where the embankment is greater than 5 metres in height.

5.3.15 The proposed sequence for general construction of the embankment across the Levels would be as follows (a more detailed description, including diagrams, is provided in Appendix 3.1 of the ES).

- Establish boundary fencing (temporary and permanent), construct re-en cut-off ditches where required to maintain connectivity.
- Construct haul road along centreline of new section of motorway – this may require soil stabilisation in some areas.
- Construct temporary runoff containment bunds on either side of embankment – this would not require removal of topsoil.
- Install piling mat across most of embankment width and over the top of the initial haul road - this would not require removal of topsoil.
- Installation of band drains and driven piles through the piling mat across most of the width of the embankment.
- Construction of embankment (and surcharge) across approximately half of the full width, with the haul road established adjacent to the embankment and on the piling mat.
- Haul road switched to top of constructed embankment, band drains and driven piles completed on remaining part of embankment width.
- Completion of construction of embankment and surcharge.
- Removal of surcharge and construction of carriageway, installation of permanent surface water drainage (re-en connections etc).

5.3.16 Consequently the minimum impact on the deposit sequence across the Levels would be the vertical band drains i.e. hollow pipes 100 mm in diameter at 2.5 metre spacing to a depth of 8-12 metres. The initial haul road may require ground stabilisation that could impact on cultural heritage sites that are present at ground surface level or immediately below the topsoil. Additional impacts would arise from the installation of temporary and permanent drainage features – compensatory reens would generally be up to 2 metres deep and up to 5.7 metres wide at the surface whilst compensatory field ditches would be 1 metre deep and 2.5 metres wide at the surface.

5.3.17 There would also be impacts from piling for structures (overbridges, gantries, permanent box culverts etc) and in areas where the embankment is greater than 5 metres in height, and from the establishment of Water Treatment Areas (WTAs). The locations of the permanent WTAs would initially be used as temporary storage lagoons, with earth bunds approximately 1 metre high installed around the periphery on top of the existing ground surface. Later on these temporary lagoons would be cleaned out (of sediments) and the permanent WTAs constructed. The depth of the WTAs below current ground level is variable but excavation would be required at each WTA for the attenuation lagoon, pollution control lagoon and reed bed.

5.3.18 It is not practicable to carry out extensive archaeological evaluation across the whole section of the Gwent Levels traversed by the new section of the new motorway. Initial evaluation would therefore be targeted on the following:

- land for which there is no current archaeological survey data and where there would be physical impact as a result of piling for structures such as overbridges, culverts etc;
- land for which there is no current archaeological survey data and where there would be physical impact as a result of the establishment of WTAs; and
- land for which there is no current archaeological survey data and where the remote sensing analysis and the geoarchaeological deposit model indicates higher archaeological potential.

5.3.19 The nature of the further evaluation would include trial trenching, but other methodologies would also be considered in consultation with the Curator appointed by Welsh Government, with Welsh Government as the Overseeing Organisation, and also with the Archaeological Academic Advisory Group established with regard to the Scheme. The methodologies utilised at each area of evaluation would respond to the nature and extent of the impact of the proposed new section of motorway at that location. The work would be carried out in line with a Written Scheme of Investigation (WSI) prepared by the Contractor's Archaeologist and agreed by the Curator appointed by Welsh Government and also by Welsh Government as the Overseeing Organisation.

5.3.20 The archaeological evaluation may be undertaken as a single piece of archaeological work, albeit with some locations being prioritised in order to expedite the overall programme.

5.3.21 The locations of the proposed areas of evaluation are shown on Figures 5a – 5k.

Table 3: Summary of Further Evaluation Required with Regard to Potential Discovered Cultural Heritage Remains

CHMP Code	Location	Reason for evaluation
EVAL002	South east of Berryhill Farm	WTA2 – not previously evaluated
EVAL003	Berryhill Farm	Location of borrow pit – not previously evaluated
EVAL004	West of Coedkernew	Piling for Church Lane Overbridge (south), also landscape planting area not previously surveyed
EVAL007	West of Duffryn railway crossing	WTA4a – not previously evaluated
EVAL008	West of Duffryn railway crossing	WTA4b – not previously evaluated
EVAL009	Duffryn railway crossing – south	Piling for railway crossing
EVAL010	Duffryn railway crossing – north	Piling for railway crossing
EVAL011	Morfa Gronw Reen	Piling for box culvert
EVAL012	West of Lighthouse Road	WTA5 – not previously evaluated
EVAL013	Lighthouse Road Overbridge - north	Piling for road overbridge
EVAL014	Lighthouse Road Overbridge - south	Piling for road overbridge
EVAL015	New Dairy Farm Overbridge - south	Piling for road overbridge
EVAL016	New Dairy Farm Overbridge - north	Piling for road overbridge
EVAL017	River Ebbw Underbridge – west	Piling for bridge abutment

CHMP Code	Location	Reason for evaluation
EVAL018	River Usk – east bank	Water storage lagoon – not previously evaluated
EVAL019	Picked Lane Culvert	Piling for box culvert
EVAL020	West of Nash Road	WTA5 – not previously evaluated
EVAL021	Either side of Nash Road	Area of shallower Holocene deposits – increased potential for buried archaeological remains
EVAL022	Nash Road Overbridge – north	Piling for road overbridge
EVAL023	East of Nash road Overbridge	WTA7 – not previously evaluated
EVAL024	Tatton Farm Culvert	Piling for box culvert
EVAL025	Culvert east of Tatton Farm	Piling for box culvert
EVAL026	Either side of Ellen's Reen Culvert	Area of shallower Holocene deposits – increased potential for buried archaeological remains
EVAL027	West of Glan Llyn Junction	WTA8 – not previously evaluated
EVAL028	East of Glan Llyn Junction	Area of shallower Holocene deposits – increased potential for buried archaeological remains
EVAL029	West of North Row Overbridge	Area of shallower Holocene deposits – increased potential for buried archaeological remains
EVAL030	North Row Overbridge – south	Piling for road overbridge
EVAL031	North Row Overbridge – north	Piling for road overbridge
EVAL032	East of North Row Overbridge	WTA9 – not previously evaluated
EVAL033	East of Petty Reen Culvert	WTA10 – not previously evaluated
EVAL034	Bareland Street Underbridge	Piling for road underbridge
EVAL035	Llandeenny Railway Crossing - south	Piling for railway crossing
EVAL036	Llandeenny Railway Crossing - north	Piling for railway crossing – also more general evaluation to confirm negative results of geophysical survey
EVAL037	West of Magor Vicarage	WTA11b (western part) – not previously evaluated
EVAL038	St Brides Road – west	Reed Bed 11b west – not previously evaluated
EVAL043	East of Undy	To confirm negative results of geophysical survey – land required for borrow pit
EVAL045	North of Bencroft Lane	Land required for borrow pit – not previously evaluated

5.4 Archaeological Watching Brief

5.4.1

An archaeological watching brief would be maintained during defined construction works at locations that have not been covered by other forms of archaeological mitigation and where impact on presently unknown buried archaeological sites is possible. Examples of such works include temporary and permanent drainage elements, establishment of haul routes and access tracks, establishment of construction compounds and excavations for pile caps etc. The requirement for an

archaeological watching brief during any identified works would be established through the environmental permitting system utilised during construction.

5.4.2 One area where an archaeological watching brief would definitely be undertaken is the new River Usk Crossing. The excavations required for the pile caps would be undertaken under archaeological observation, with the potential for investigation of any archaeological remains that may be identified. This procedure would also be applied to any excavations for test piles associated with the River Usk Crossing.

5.4.3 The procedure for dealing with any cultural heritage features identified through the Archaeological Watching Brief is described above in Section 5.1. A generic methodology for the targeted archaeological watching brief is presented as Annex E of this CHMP.

5.5 Reporting

5.5.1 It is proposed to produce two reports: an Academic Report and a Popular Report. These are additional to any reports that may be produced during the course of the programme of fieldwork, such as reports on the results of evaluation or Further Archaeological Designs. The Academic Report and Popular Report are required to be produced within two years of the completion of all fieldwork.

Academic Report

5.5.2 HA 75/01 (Highways Agency *et al.*, 2001) defines an Academic Report as '*The publication of a report containing all the evidence, analysis and synthesis necessary to fulfil the Updated Project Design*'. An Updated Project Design is produced following an initial assessment of the material and information recovered from the programme of archaeological and cultural heritage mitigation, leading to the production of an Assessment Report and then an Updated Project Design.

Assessment Report

5.5.3 The assessment phase represents the detailed characterisation of the materials recovered from the programme of cultural heritage mitigation and the records produced. The aim is to determine the potential of the examined sites and features to contribute to answering specific questions deemed of value to understanding past human development and history at local, regional and national levels.

5.5.4 The level of artefact assessment would be sufficient to:

- establish date ranges for features and deposits;
- provide an overall general appraisal of artefacts to assist in characterising the identified archaeological remains; and
- establish the potential for all categories of artefacts should further analysis be necessary.

5.5.5 Sufficient environmental samples would be processed and scanned to establish the sites' potential for providing additional information. Not all samples collected would have to be processed, and some may be retained for possible future detailed analysis.

5.5.6 Following completion of the on site works, the Archaeological Contractor would produce an assessment report on the results of the works. The report would include, as a minimum:

- a front sheet (setting out the project name, National Grid References to minimum eight figures, description of task undertaken, date and duration of the fieldwork, site code/number);
- a non-technical summary of the work including the results;
- a general introduction to the project including site description;
- aims and objectives;
- methodologies employed to undertake the works;
- descriptive text presenting the results of the work including finds and environmental data where appropriate;
- quantifications of the finds recovered and environmental samples taken;
- interpretation and discussion of the results;
- assessment of the significance of any cultural heritage and archaeological remains identified by the programme of work;
- assessment of the potential of any data for further analysis;
- proposals for publication of the further analysis in an appropriate format;
- an updated Project Design, with a costed task list, as well as a synopsis of the envisaged final report /publication;
- details of the scale, nature and location of the archive and the intended place of deposition;
- report bibliography; and
- sufficient illustrations to support the text including figures to show the location of the proposed new section of motorway in a regional and local context, locations of all works undertaken, detailed plans and sections as appropriate.

5.5.7 The assessment report would be produced within six months of the completion of the fieldwork and would be submitted for approval to the Contractor, the Contractor's Archaeologist and the Curator appointed by Welsh Government and to Welsh Government as the Overseeing Organisation.

Academic Report

5.5.8 As stated above, the assessment report would include proposals for publication of the further analysis in an appropriate format. This would be referred to as the Academic Report and the Archaeological Contractor would provide a detailed breakdown of the costs associated with the production of the Academic Report, including archive deposition.

5.5.9 The Academic Report would be to an appropriate academic standard and would be published in a suitable format, probably as a monograph or as an article in a recognised archaeological journal. If appropriate more than one article would be produced to be published in separate journals.

5.5.10 Following agreement of the Academic Report(s) by the Contractor, the Contractor's Archaeologist and the Curator appointed by Welsh Government and to Welsh Government as the Overseeing Organisation a copy of any final Academic Report would be provided to the regional Historic Environment Record.

- 5.5.11** The Academic Report would be completed to publication standard within two years of the agreement of the programme of further analyses as described within the Updated Project Design.

Popular Report

- 5.5.12** HA 75/01 (Highways Agency *et al.*, 2001) defines a Popular Report as ‘A *publication designed to present the results of an archaeological investigation simply for a lay audience in an attractive format*’.
- 5.5.13** The Updated Project Design produced by the Archaeological Contractor would include a fully costed proposal for the production of a Popular Report. This would include a description of the report format and a synopsis of the content. During the preparation of this part of the Updated Project Design, the Archaeological Contractor would consult with the Contractor, the Contractor’s Archaeologist and the Curator appointed by Welsh Government and with Welsh Government as the Overseeing Organisation with regard to the format and content of the Popular Report.
- 5.5.14** Copies of the Popular Report would be provided to appropriate bodies including Newport City Council and Monmouthshire County Council.

5.6 Copyright

- 5.6.1** Copyright of all reports would be retained by the Archaeological Contractor under the terms of the *Copyright, Designs and Patents Act* (1988) with all rights reserved, excepting that the Archaeological Contractor provides an exclusive licence to the Contractor and Welsh Government for the use of the reports in all matters relating to the Scheme, and to the relevant local planning authorities with regard to the provision of planning advice and public awareness of the historic environment.
- 5.6.2** The involvement of the Contractor, the Contractor’s Archaeologist and the Curator appointed by Welsh Government shall be acknowledged in any report or publication generated by the programme of cultural heritage and archaeological work associated with the proposed new section of motorway.

5.7 Archive

- 5.7.1** The project archive consists of the records relating to the programme of cultural heritage and archaeological work, including written records, photographs, drawings and artefacts. The Archaeological Contractor would ensure that the archive is fully catalogued, indexed, cross-referenced and checked for consistency. The digital archive generated by the project would be presented in accordance with the requirements of the receiving body.
- 5.7.2** The archive would be prepared in accordance with procedures outlined in *Standards in the Museum Care of Archaeological Collections* (Museums and Galleries Commission 1992) and any procedures adopted by the recipient museum. Consideration would be given to deposition of electronic data with a suitable hosting service, such as the Archaeological Data Service, as part of the strategy for dissemination of the results. The archive would conform with *Guidelines for Digital Archaeological Archives* (RCAHMW 2015) and with any subsequent standard and guidance issued by Welsh Government with regard to digital archives.

5.7.3 No recovered finds would be discarded without the written consent of the recipient body. Selection and retention policy would be guided by the document *Selection, Retention and Dispersal of Archaeological Collections; Guidelines for Use in England, Wales and Northern Ireland* (Society of Museum Archaeologists 1993).

5.7.4 The retained artefacts remain the property of the landowner with the exception of human remains and any artefacts that fall within the remit of the Treasure Act 1996. The Archaeological Contractor would endeavor to obtain written consent from the landowner for transfer of ownership to the recipient body, thus allowing the artefacts to be deposited along with the rest of the archive. Arrangements for the finds to be viewed by the landowner would be made on request. For any works carried out on land that has been subject to Compulsory Purchase Order with regard to the Scheme, the landowner is assumed to be Welsh Government.

5.8 Human Remains

5.8.1 In the event of the discovery of human remains at any location, these remains would be left *in situ* and not further examined. The Archaeological Contractor and the Contractor would cease work immediately in this area and the Contractor's Archaeologist, the Curator appointed by Welsh Government and the Coroner would be informed immediately. The human remains would be screened and arrangements would be made to secure the site to prevent vandalism and looting.

5.8.2 If the human remains are considered to be of archaeological origin and removal of such remains is necessary, the Archaeological Contractor would be instructed to obtain a licence from the appropriate authorities in order to effect this removal. The human remains would be classified as 'Discovered Cultural Heritage Remains' and the procedures described above for such remains would be implemented.

5.8.3 In the case of any human remains being uncovered that are considered to be of non-archaeological origin, the location of such remains would be secured and passed to the control of the Coroner.

5.9 Treasure

5.9.1 In the event of the discovery of an artefact that may fall within the remit of the Treasure Act 1996, the Contractor, the Contractor's Archaeologist, the Coroner and the Curator appointed by Welsh Government would be informed immediately. All finds of potential treasure would be removed to a safe place.

5.10 Monitoring

5.10.1 A programme of monitoring during archaeological fieldwork shall be agreed in advance between the Archaeological Contractor, the Contractor's Archaeologist and the Curator appointed by Welsh Government. The timing and frequency of each monitoring visits would be agreed in advance with all parties.

5.11 Media

5.11.1 Enquiries or releases through the media on archaeological finds and material found during the excavation would, in the first instance, be directed through the Contractor.

5.12 Outreach

- 5.12.1** There is the potential to develop and implement a programme of outreach designed to engage all sectors of the local population. This is most likely to take the form of presentations and talks to local interest groups and schools, also continued dissemination of information on any the results of any works undertaken. This could be via the Scheme website and/or newsletter, also press releases where appropriate.

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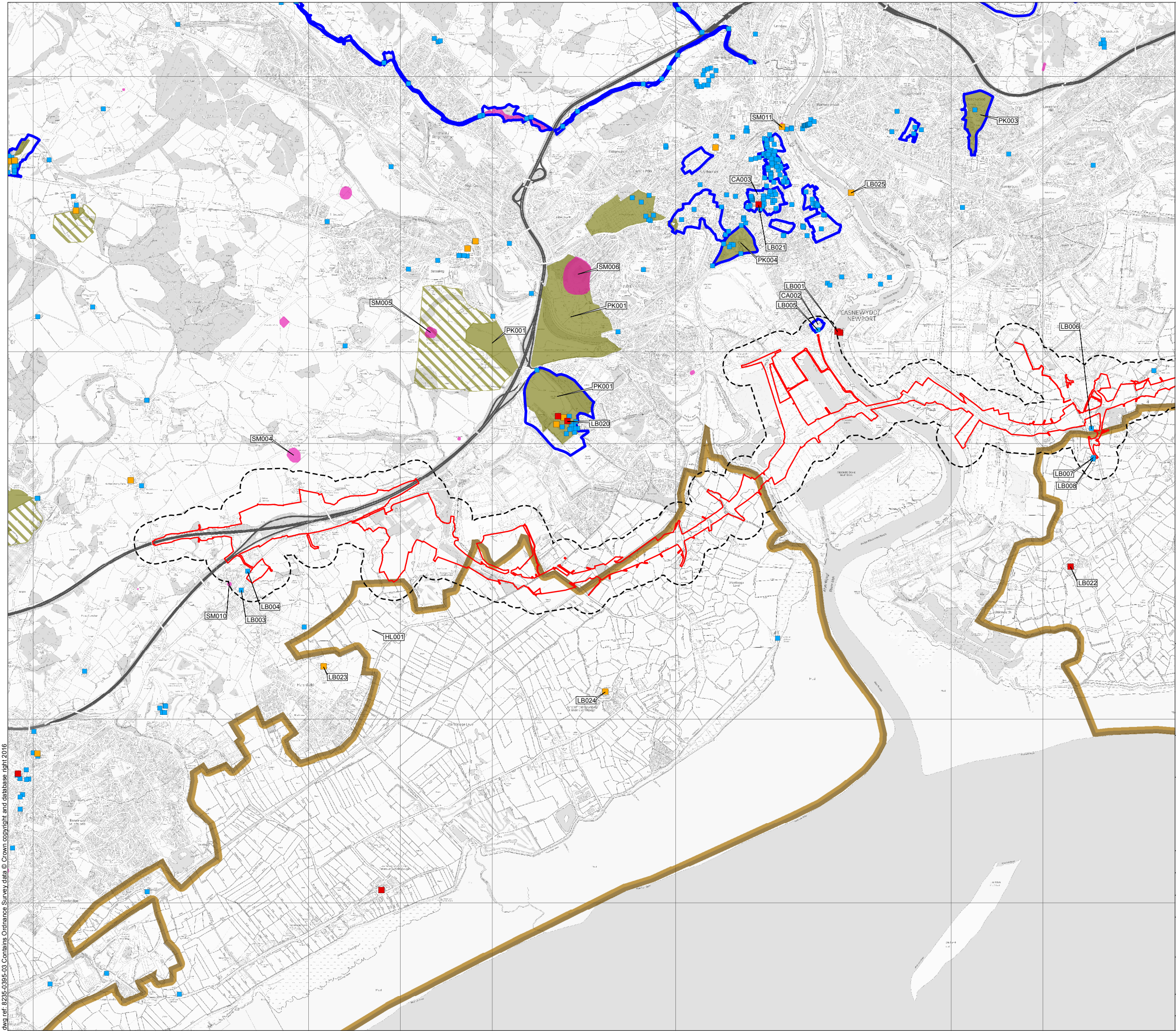
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Figures



Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Gwent Levels Landscape of Outstanding Historic Interest
- Listed Building Grade I
- Listed Building Grade II*
- Listed Building Grade II
- Scheduled Monument
- Registered Parks & Gardens of Special Historic Interest
- RPGs - Essential Setting
- Conservation Area



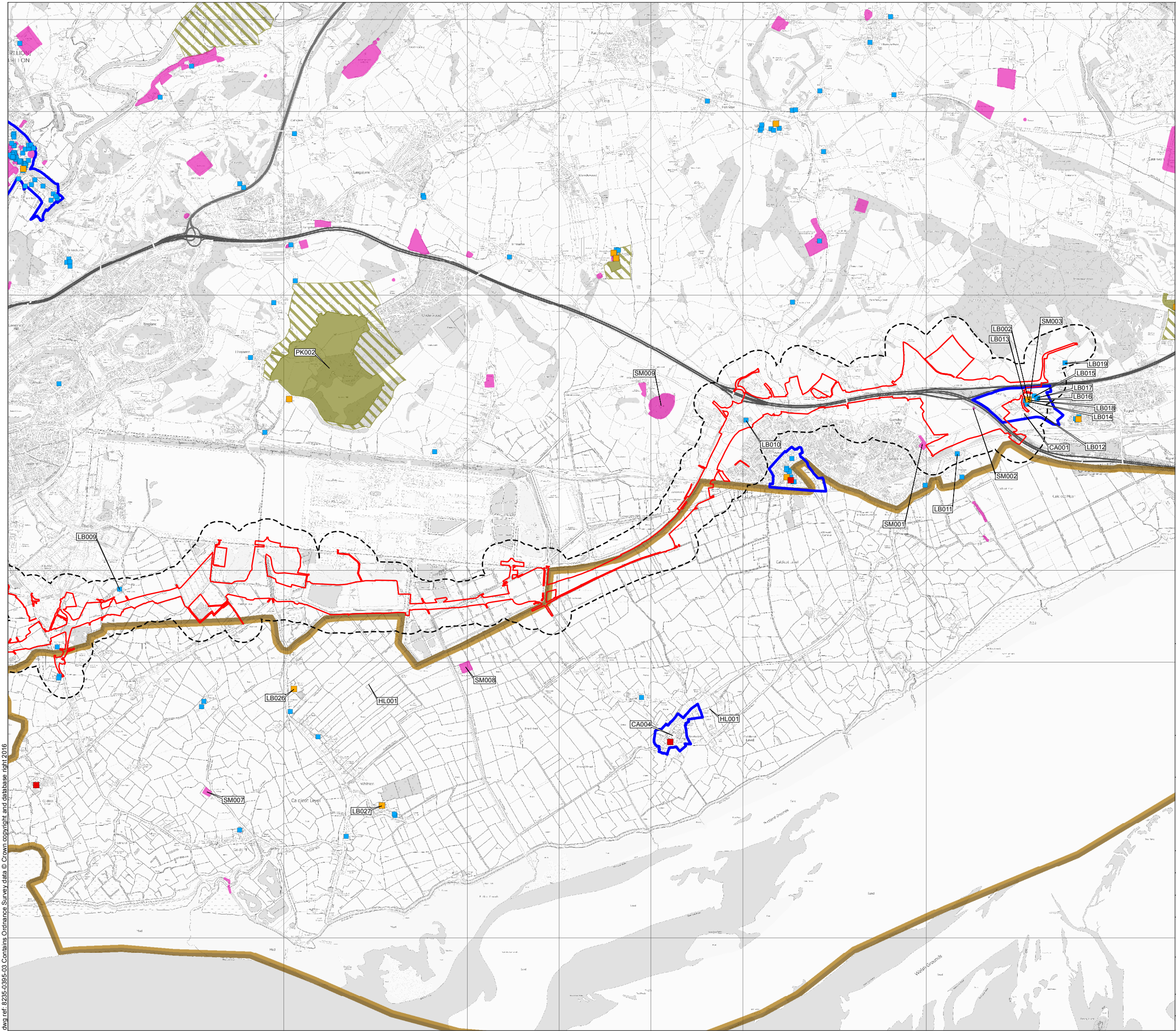
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Appendix 8.10:
Cultural Heritage Management Plan
Route of new motorway corridor around
Newport showing the locations of
designated heritage assets discussed in
the text


Figure: 1a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR

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- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Defined Study Area
 - Gwent Levels Landscape of Outstanding Historic Interest
 - Listed Building Grade I
 - Listed Building Grade II*
 - Listed Building Grade II
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Appendix 8.10:
Cultural Heritage Management Plan

Route of new motorway corridor around
Newport showing the locations of
designated heritage assets discussed in
the text

Figure: 1b	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR

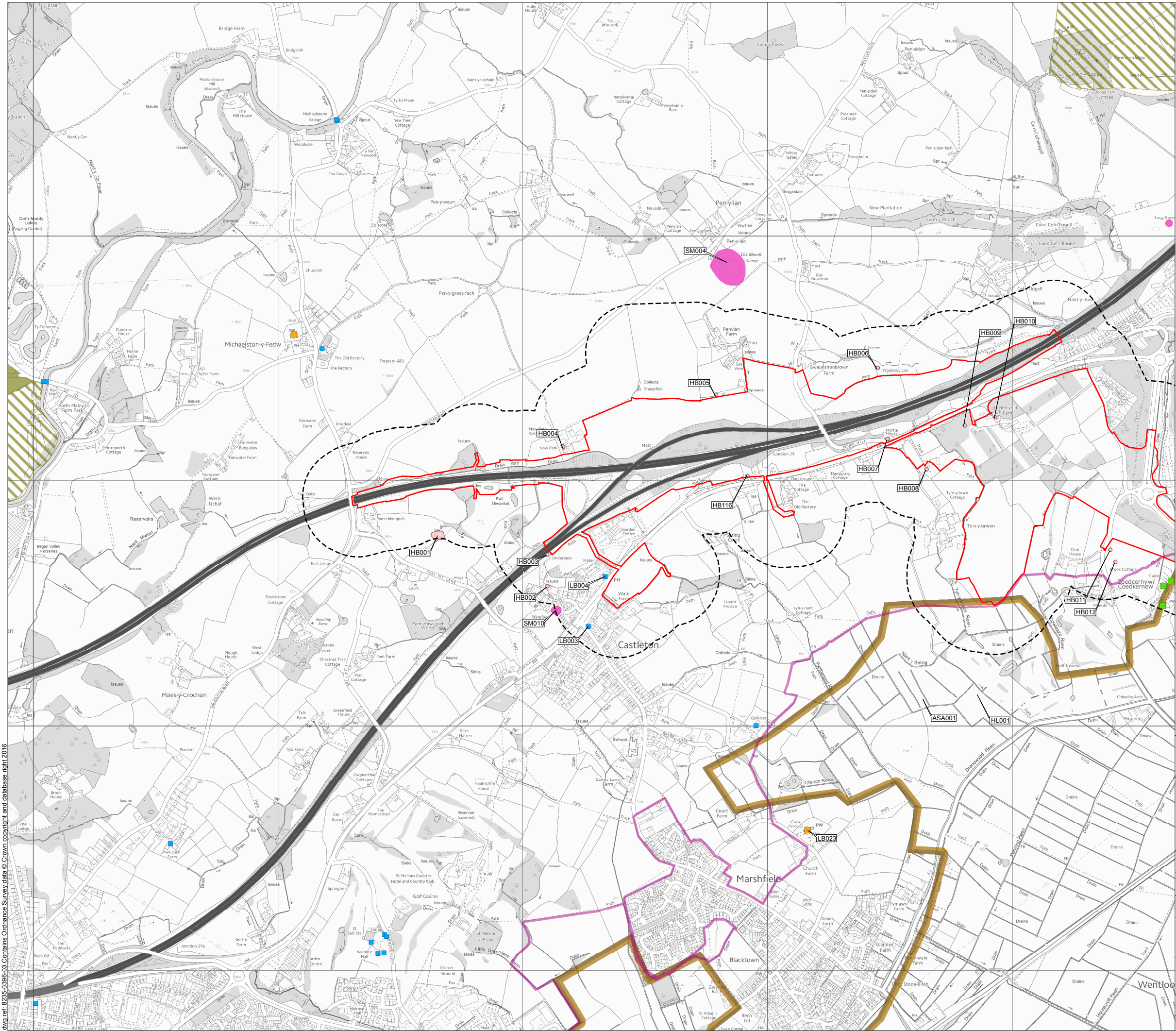
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Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Gwent Levels Landscape of Outstanding Historic Interest
- Listed Building Grade I
- Listed Building Grade II*
- Listed Building Grade II
- Scheduled Monument
- Registered Parks & Gardens of Special Historic Interest
- RPGs - Essential Setting
- Gwent Levels Archaeologically Sensitive Area
- Monmouth Area of Special Archaeological Sensitivity
- Conservation Area
- Locally Listed Buildings (Newport CC)
- Historic Building

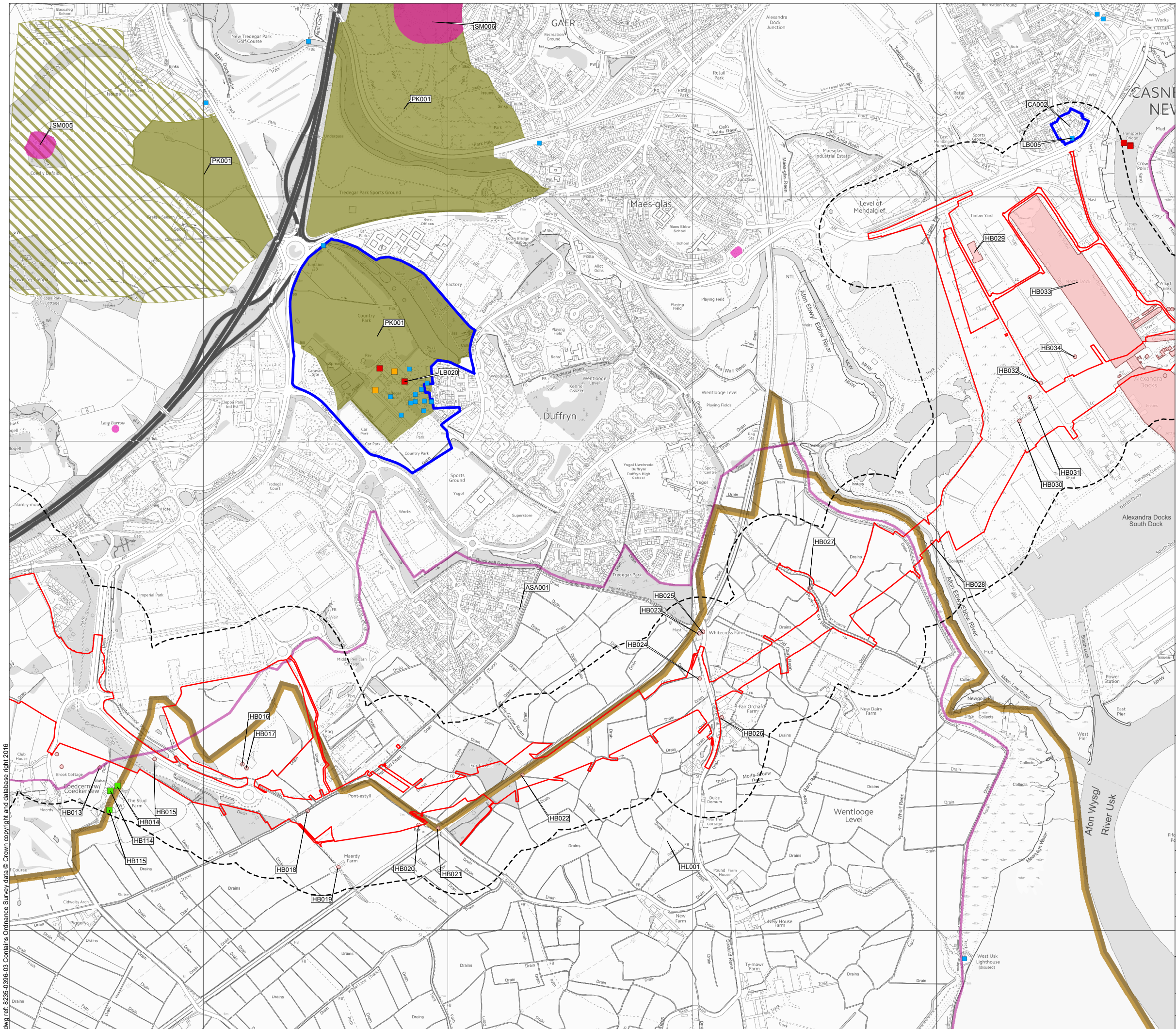


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Appendix 8.10:
Cultural Heritage Management Plan
Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





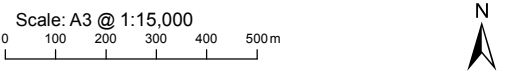
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 - Defined Study Area
 - Gwent Levels Landscape of Outstanding Historic Interest
 - Listed Building Grade I
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 - Scheduled Monument
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 - RPGs - Essential Setting
 - Gwent Levels Archaeologically Sensitive Area
 - Monmouth Area of Special Archaeological Sensitivity
 - Conservation Area
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 - Historic Building

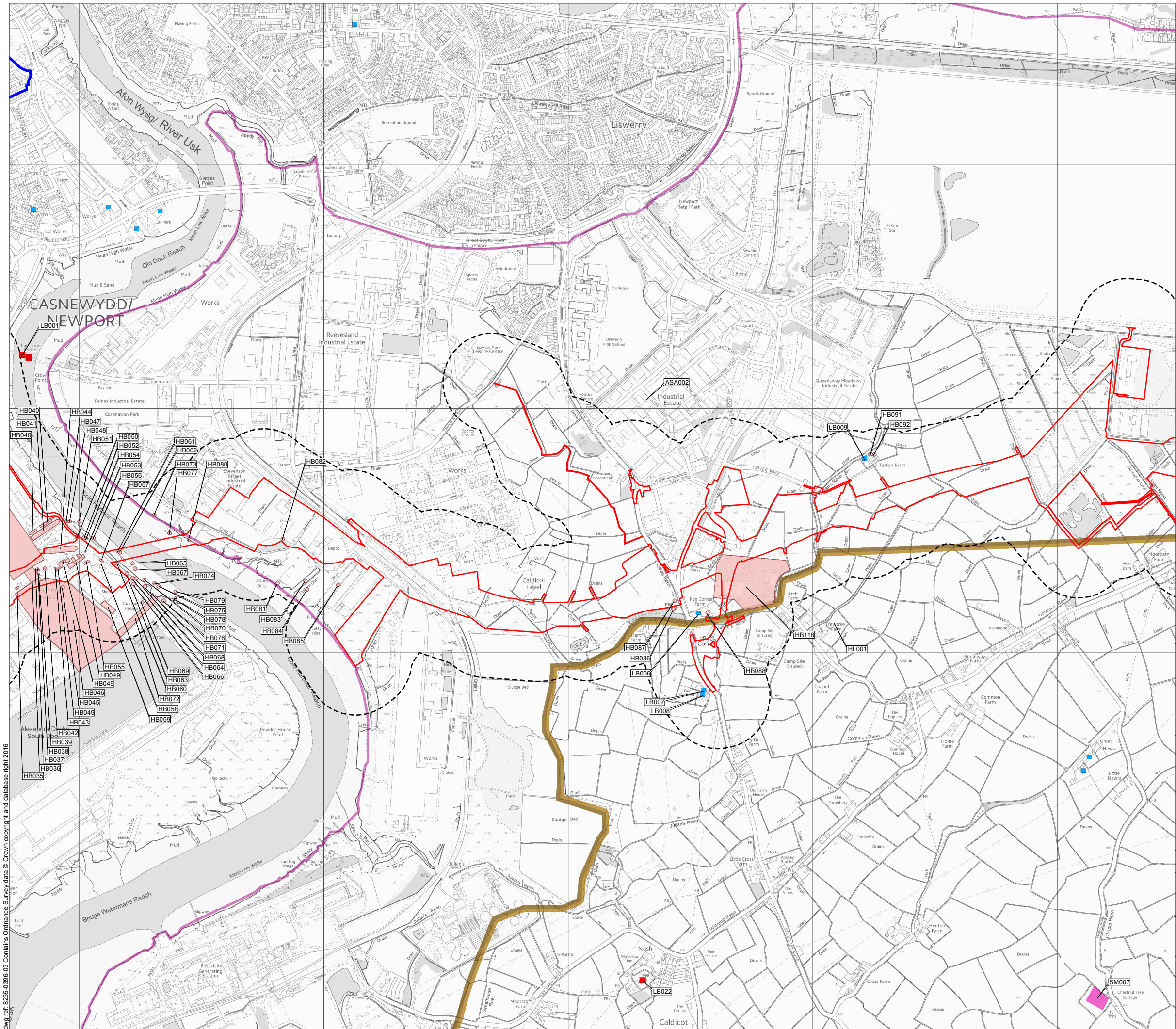


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Appendix 8.10:
Cultural Heritage Management Plan
Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2b	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Defined Study Area
 - Gwent Levels Landscape of Outstanding Historic Interest
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Appendix 8.10:
Cultural Heritage Management Plan

Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2C	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR

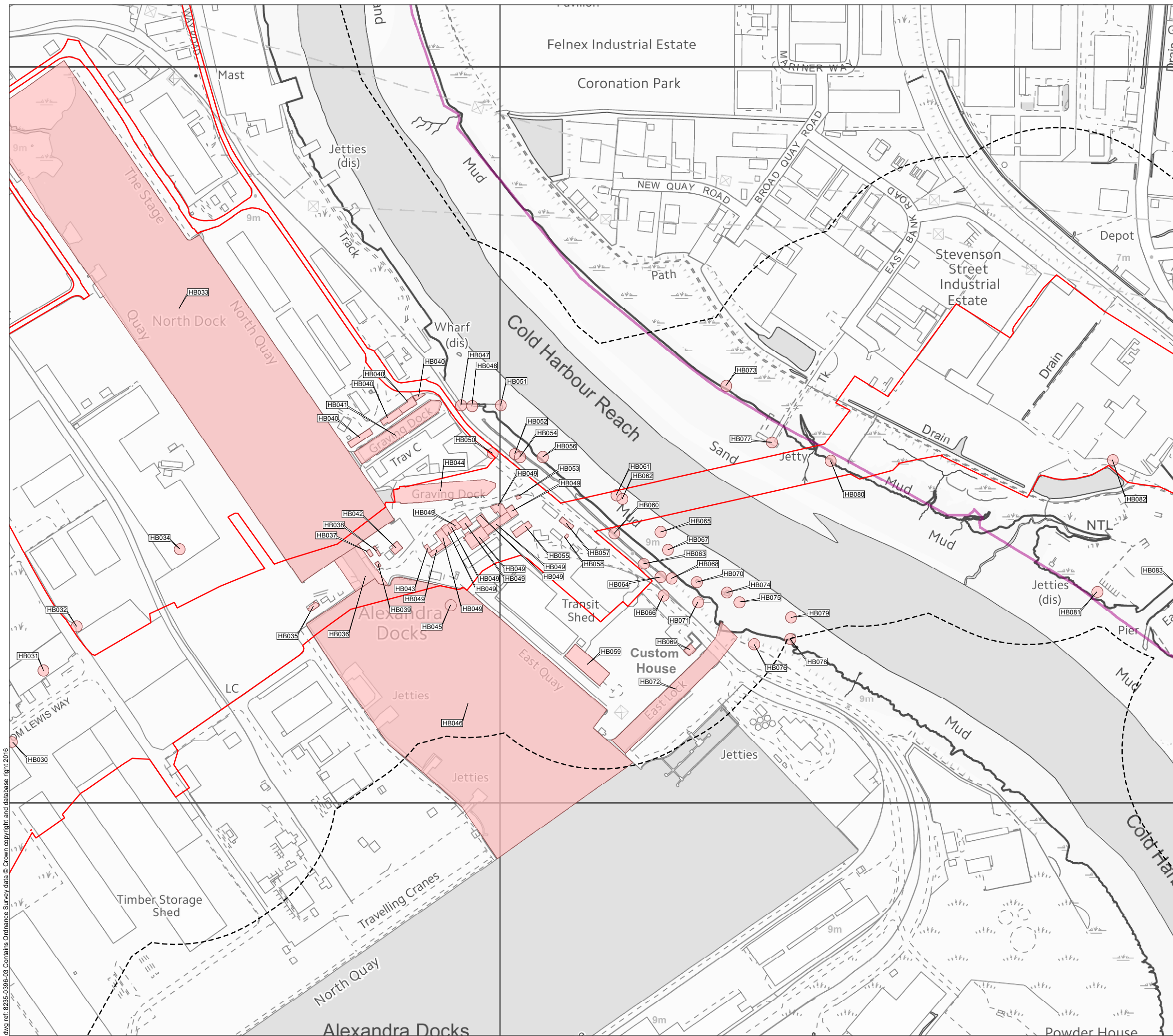
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- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Defined Study Area
 - Gwent Levels Landscape of Outstanding Historic Interest
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Appendix 8.10:
Cultural Heritage Management Plan

Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2d	Revision: -
Date: March 2016	Status: AT ISSUE
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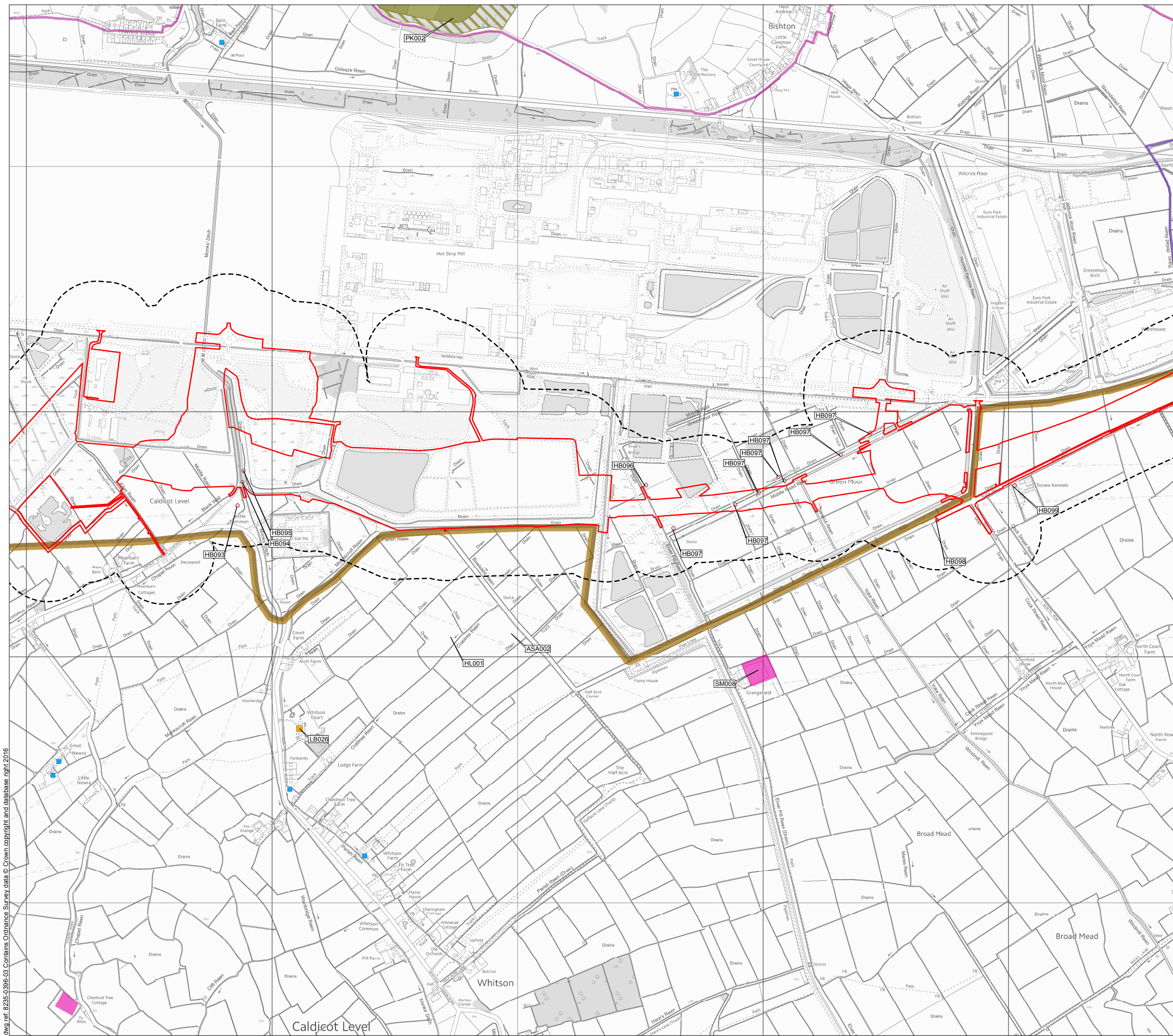
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- ### Legend
- Limit of Permanent and Temporary Works for New Section of Motorway
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 - Gwent Levels Landscape of Outstanding Historic Interest
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Appendix 8.10: Cultural Heritage Management Plan

Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2e	Revision: -
Date: March 2016	Status: AT ISSUE
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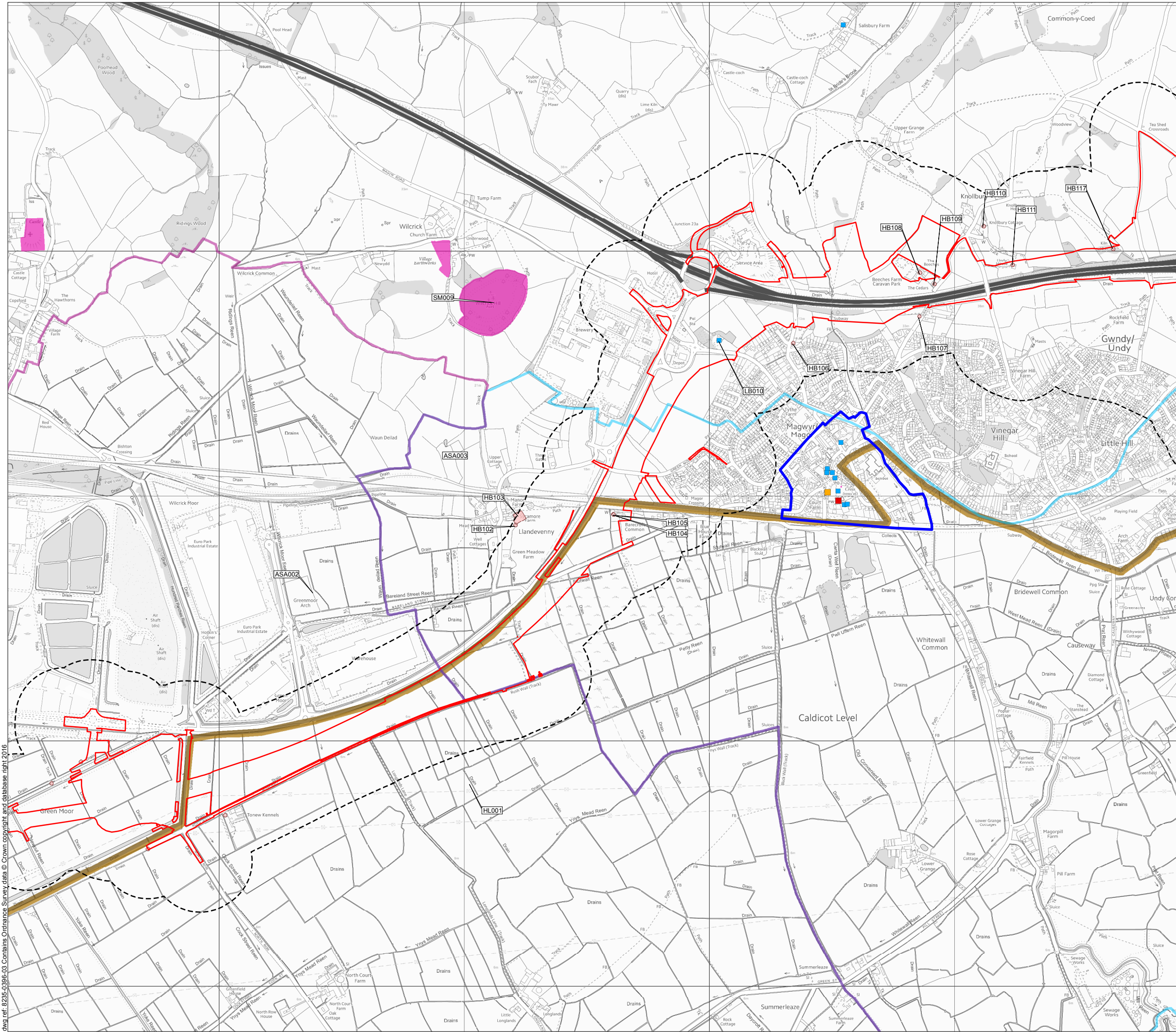
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Legend

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- Defined Study Area
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- Conservation Area
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- Historic Building

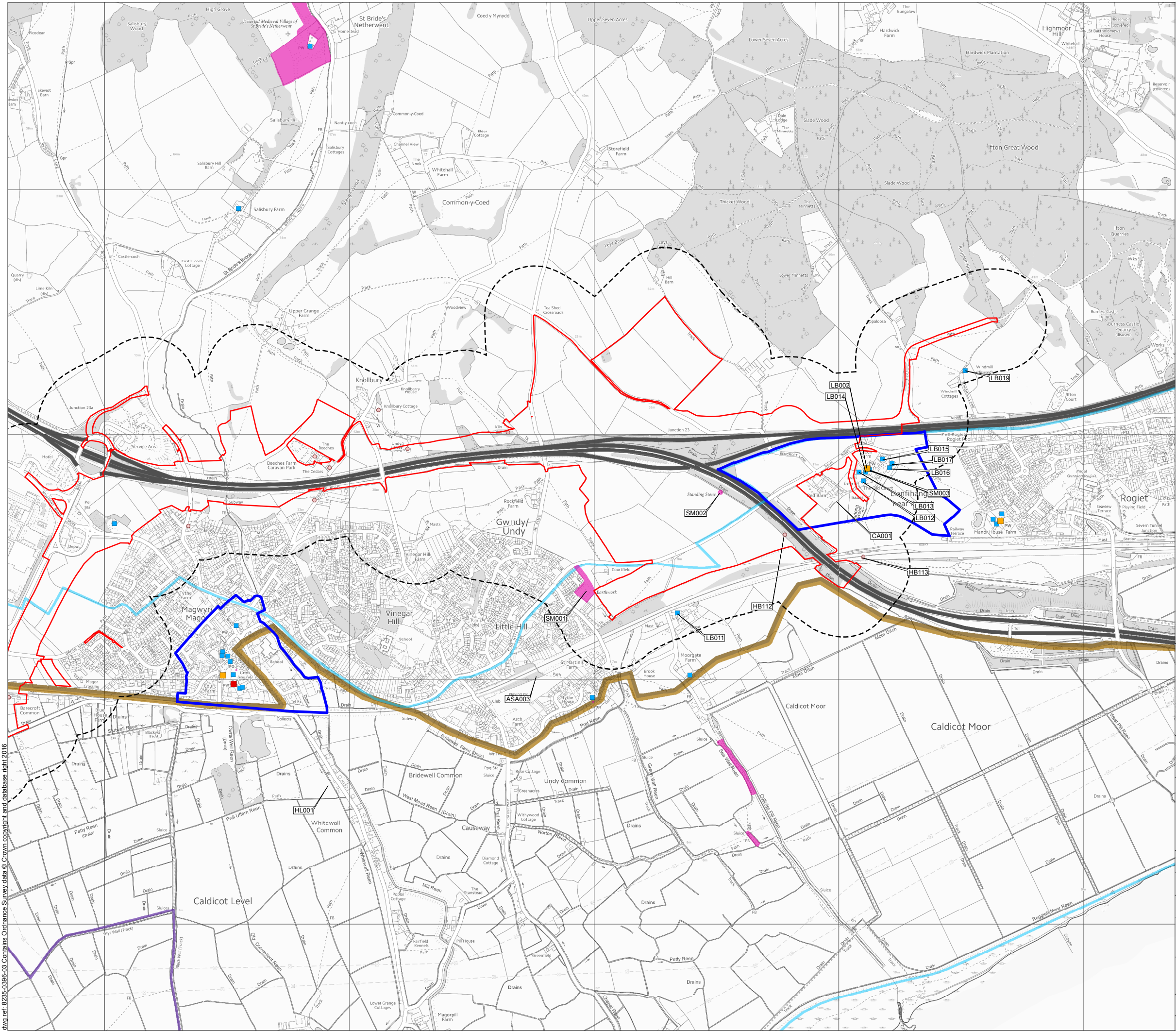


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Appendix 8.10:
Cultural Heritage Management Plan
Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2f	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





Legend

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- Defined Study Area
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Appendix 8.10:
Cultural Heritage Management Plan
Route of new motorway corridor around
Newport showing the locations of designated
heritage assets and non-designated historic
buildings within and adjacent to the Defined
Study Area

Figure: 2g	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Historic Landscape Feature
- UAV Survey Interpretation
 - Bank
 - Ditch
 - Extent of Area
 - Large Cut Feature
 - Ridge and Furrow (Extant)
 - Ridge and Furrow (No Surface Expression)
 - Structure



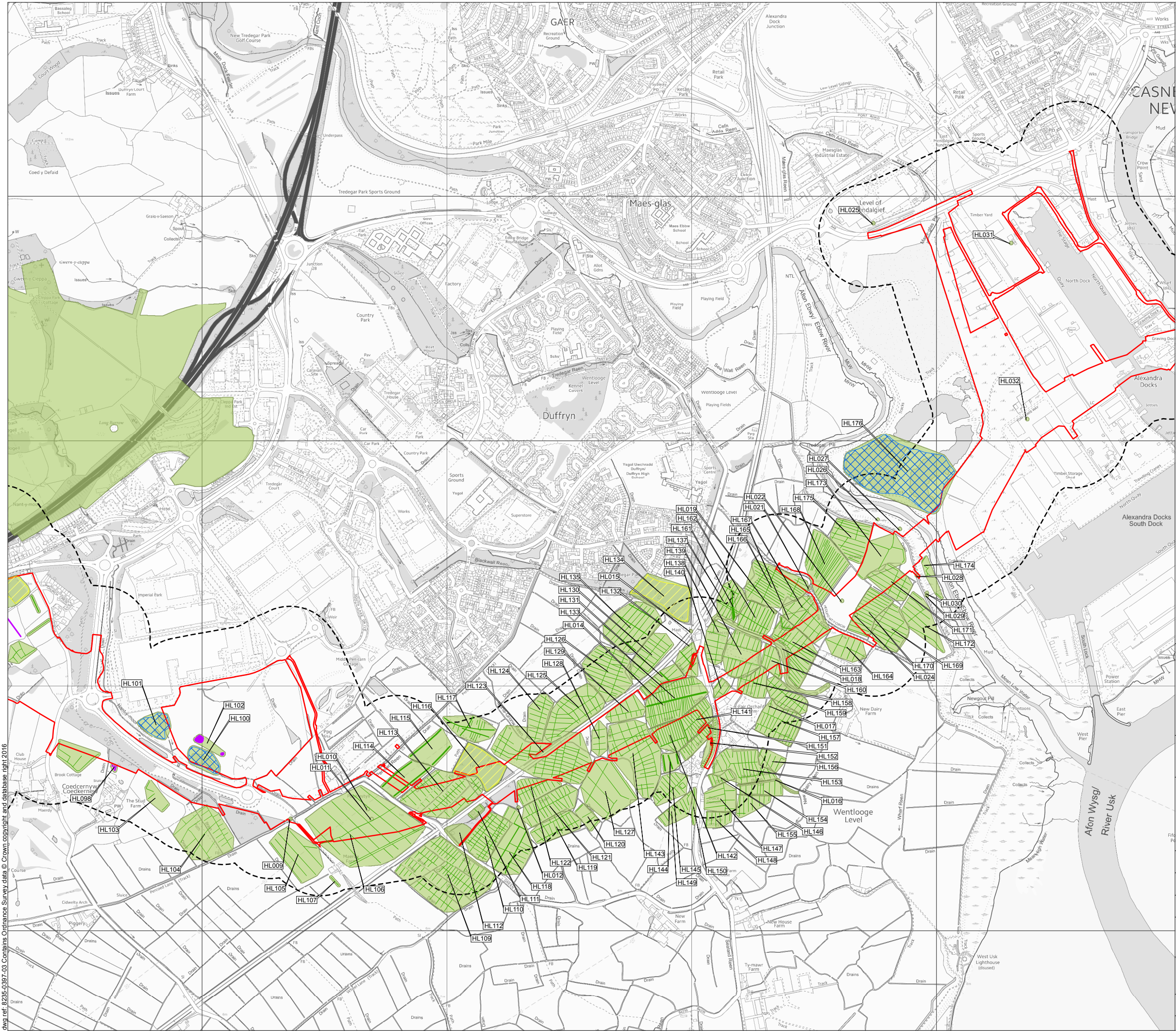
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Appendix 8.10:
Cultural Heritage Management Plan


**Route of new motorway corridor around
Newport showing the locations of
identified non-designated historic
landscape features**

Figure: 3a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Defined Study Area
 - Historic Landscape Feature
 - UAV Survey Interpretation
 - Bank
 - Ditch
 - Extent of Area
 - Large Cut Feature
 - Ridge and Furrow (Extant)
 - Ridge and Furrow (No Surface Expression)
 - Structure



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Appendix 8.10:
Cultural Heritage Management Plan

Route of new motorway corridor around
Newport showing the locations of
identified non-designated historic
landscape features

Figure: 3b

Revision: -

Date: March 2016

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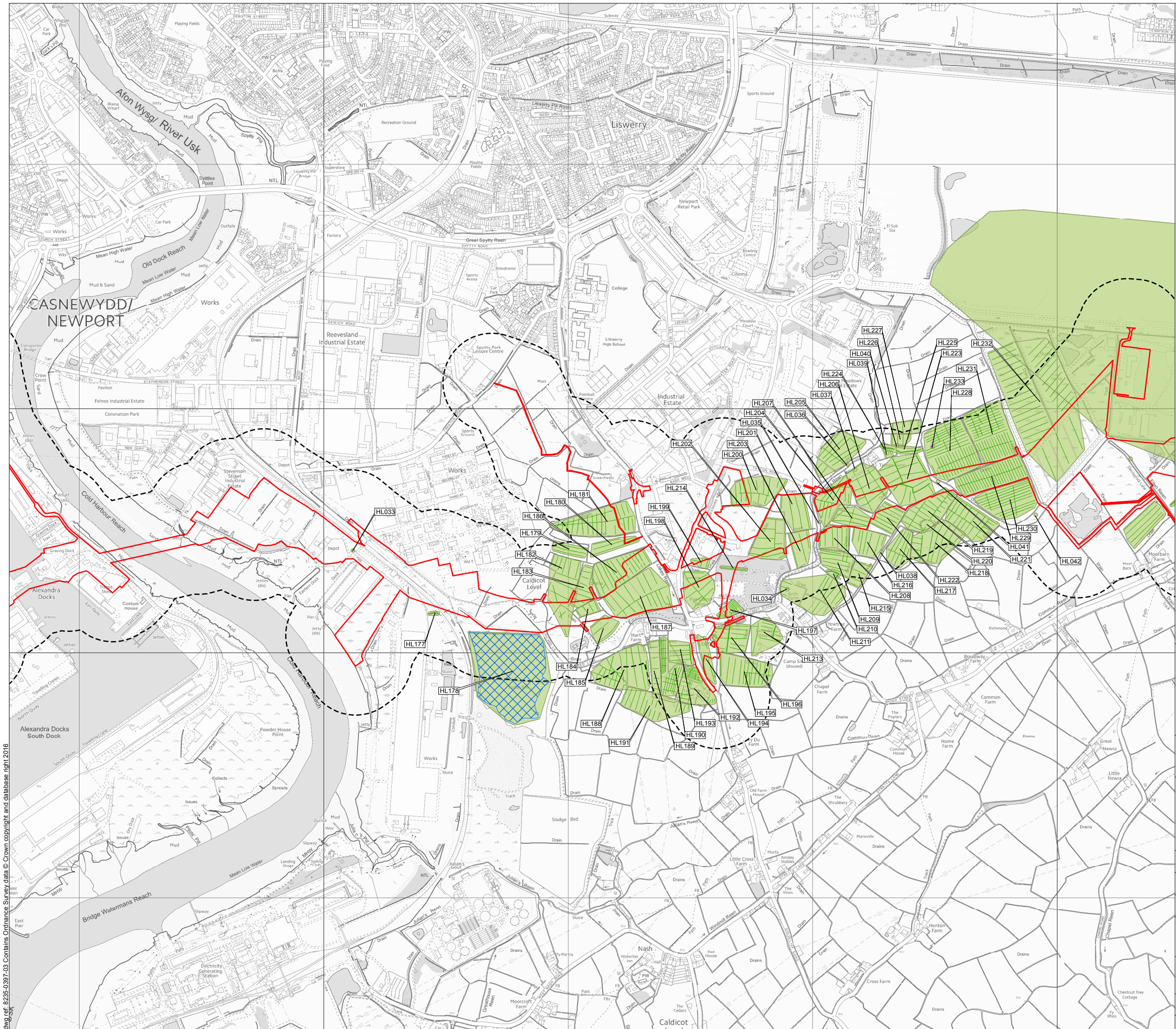
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Legend

Limit of Permanent and Temporary Works for New Section of Motorway

Defined Study Area

Historic Landscape Feature

UAV Survey Interpretation

Bank

Ditch

Extent of Area

Large Cut Feature

Ridge and Furrow (Extant)

Ridge and Furrow (No Surface Expression)

Structure

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Appendix 8.10:
Cultural Heritage Management Plan

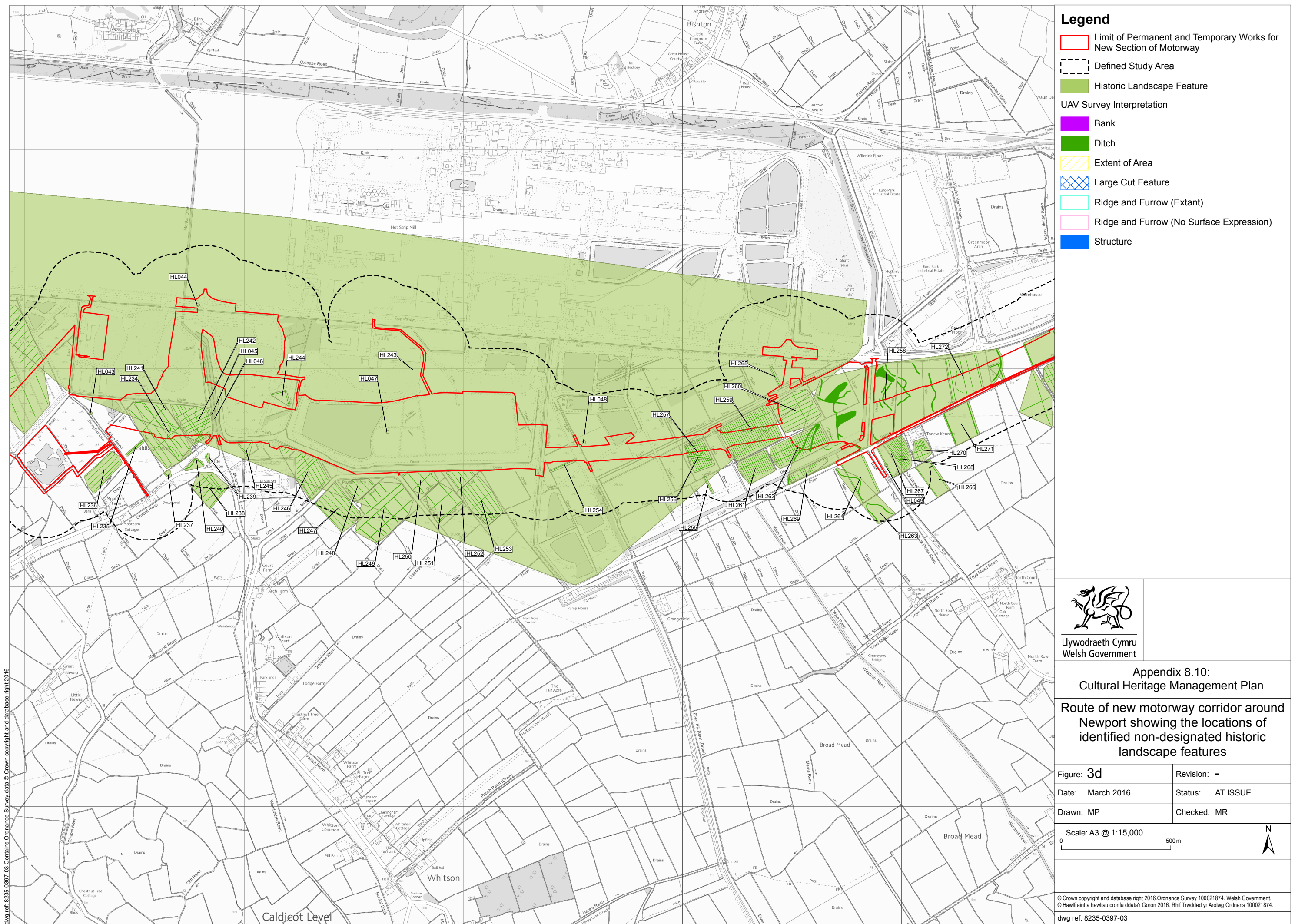
Route of new motorway corridor around
Newport showing the locations of
identified non-designated historic
landscape features

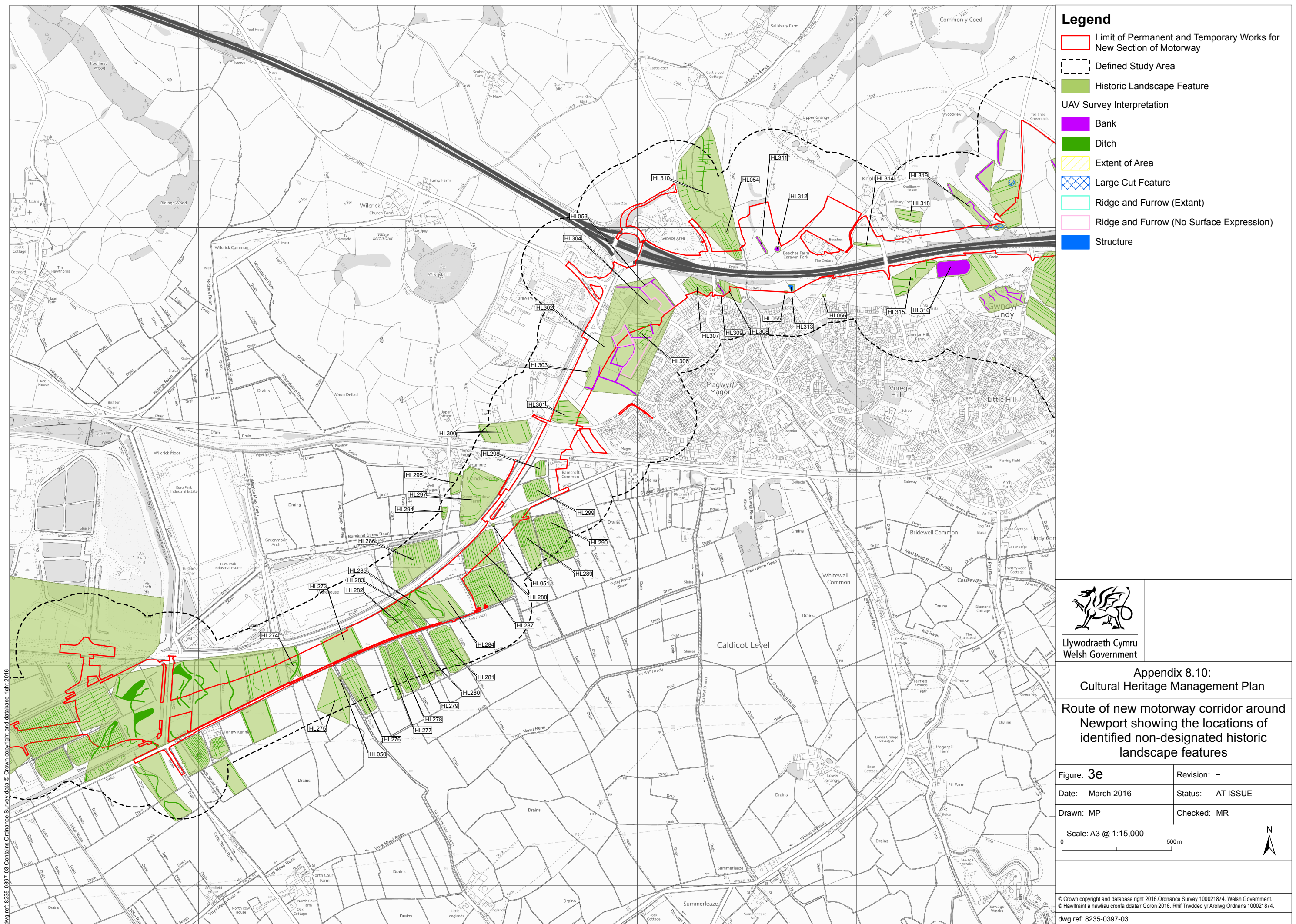
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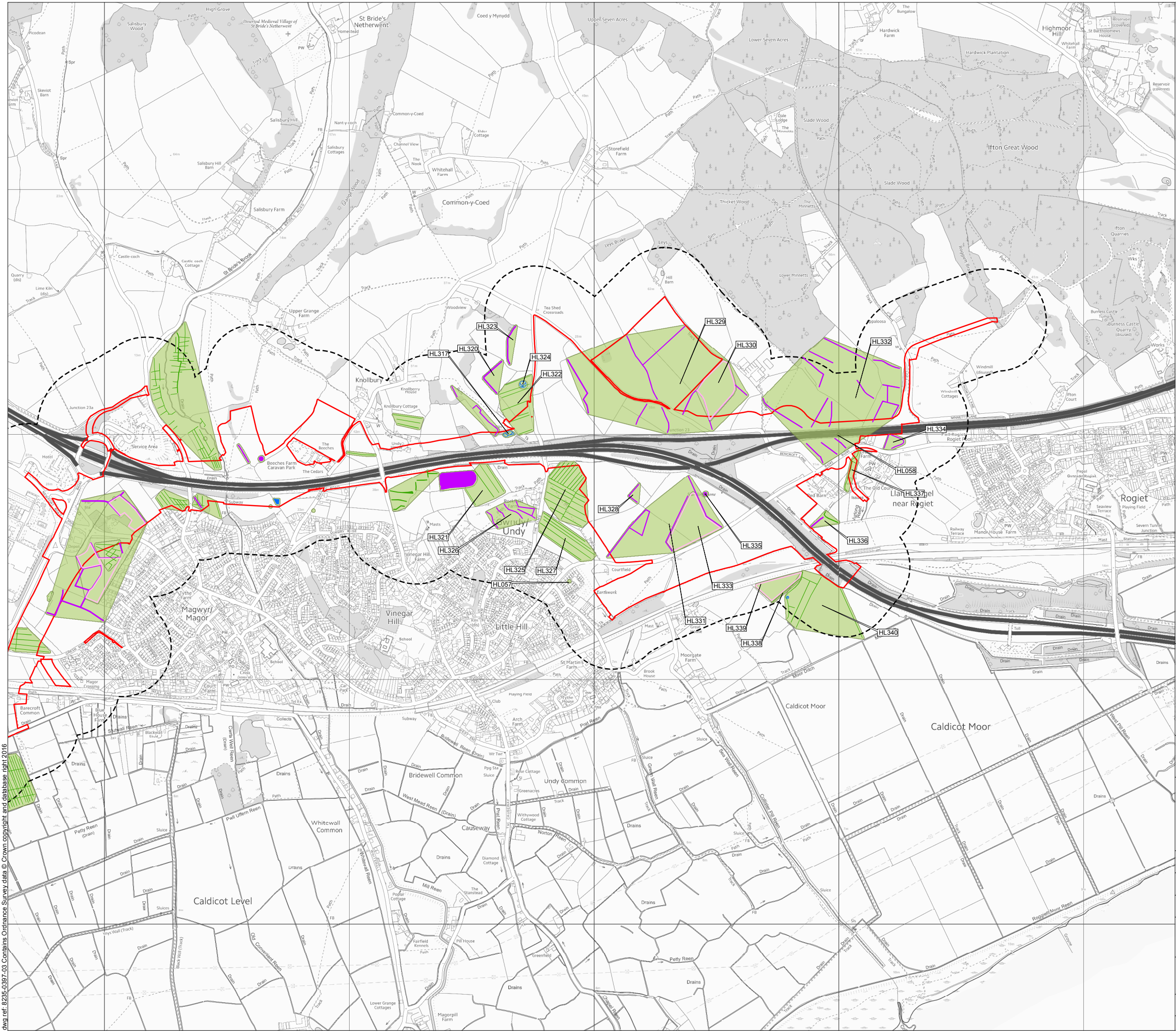
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dwg ref: 8235-0397-03







Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Historic Landscape Feature
- UAV Survey Interpretation
 - Bank
 - Ditch
 - Extent of Area
 - Large Cut Feature
 - Ridge and Furrow (Extant)
 - Ridge and Furrow (No Surface Expression)
 - Structure



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**Appendix 8.10:
Cultural Heritage Management Plan**

**Route of new motorway corridor around
Newport showing the locations of
identified non-designated historic
landscape features**

Figure: 3f	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Archaeological Feature

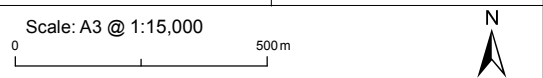


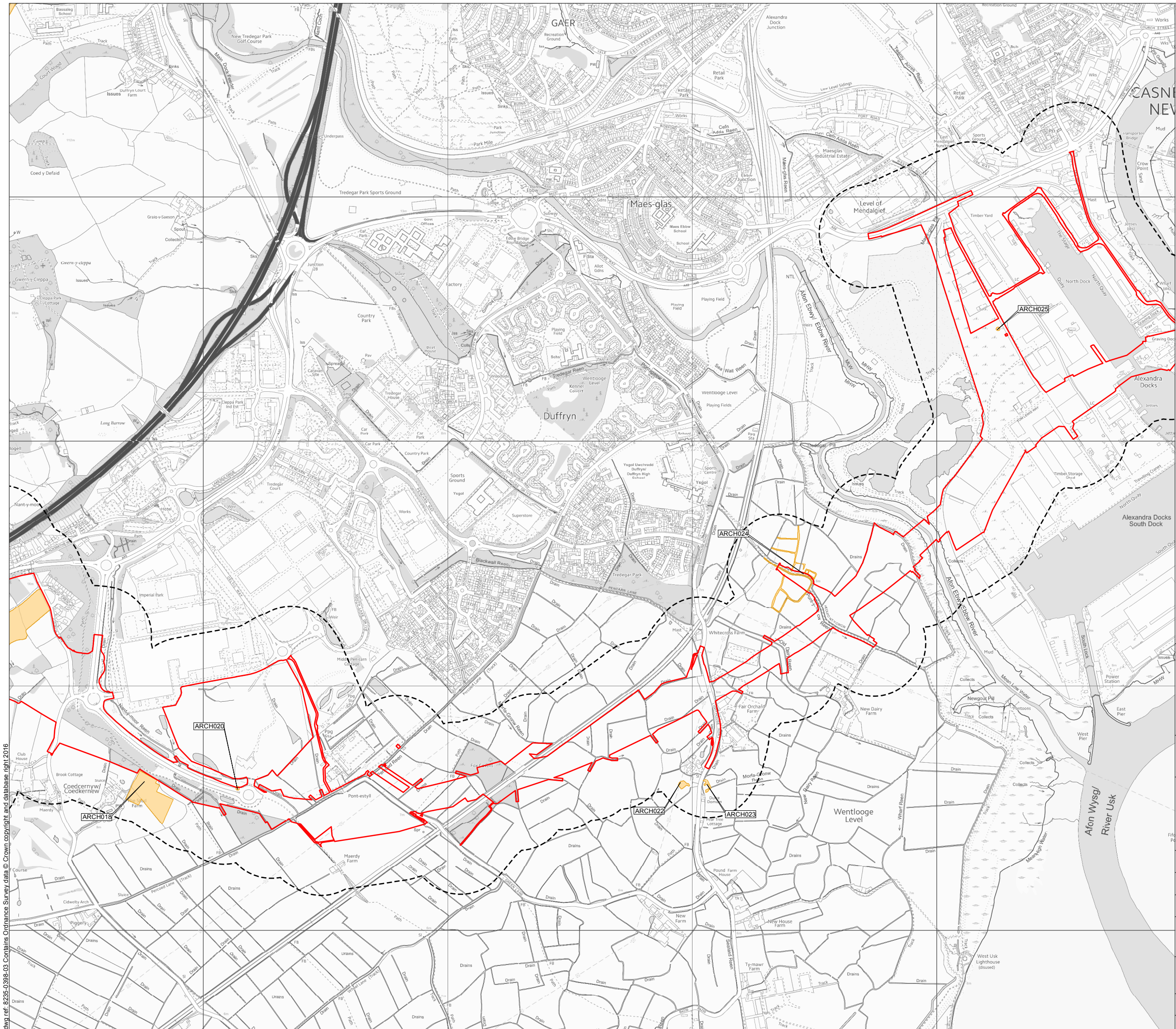
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**Appendix 8.10:
Cultural Heritage Management Plan**

**Route of new motorway corridor around
Newport showing the locations of non-
designated sites of archaeological
interest**

Figure: 4a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR






Legend

Limit of Permanent and Temporary Works for New Section of Motorway

Defined Study Area

Archaeological Feature



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Appendix 8.10:
Cultural Heritage Management Plan

Route of new motorway corridor around Newport showing the locations of non-designated sites of archaeological interest

Figure: 4b

Revision: -

Date: March 2016

Status: AT ISSUE

Drawn: MP

Checked: MR

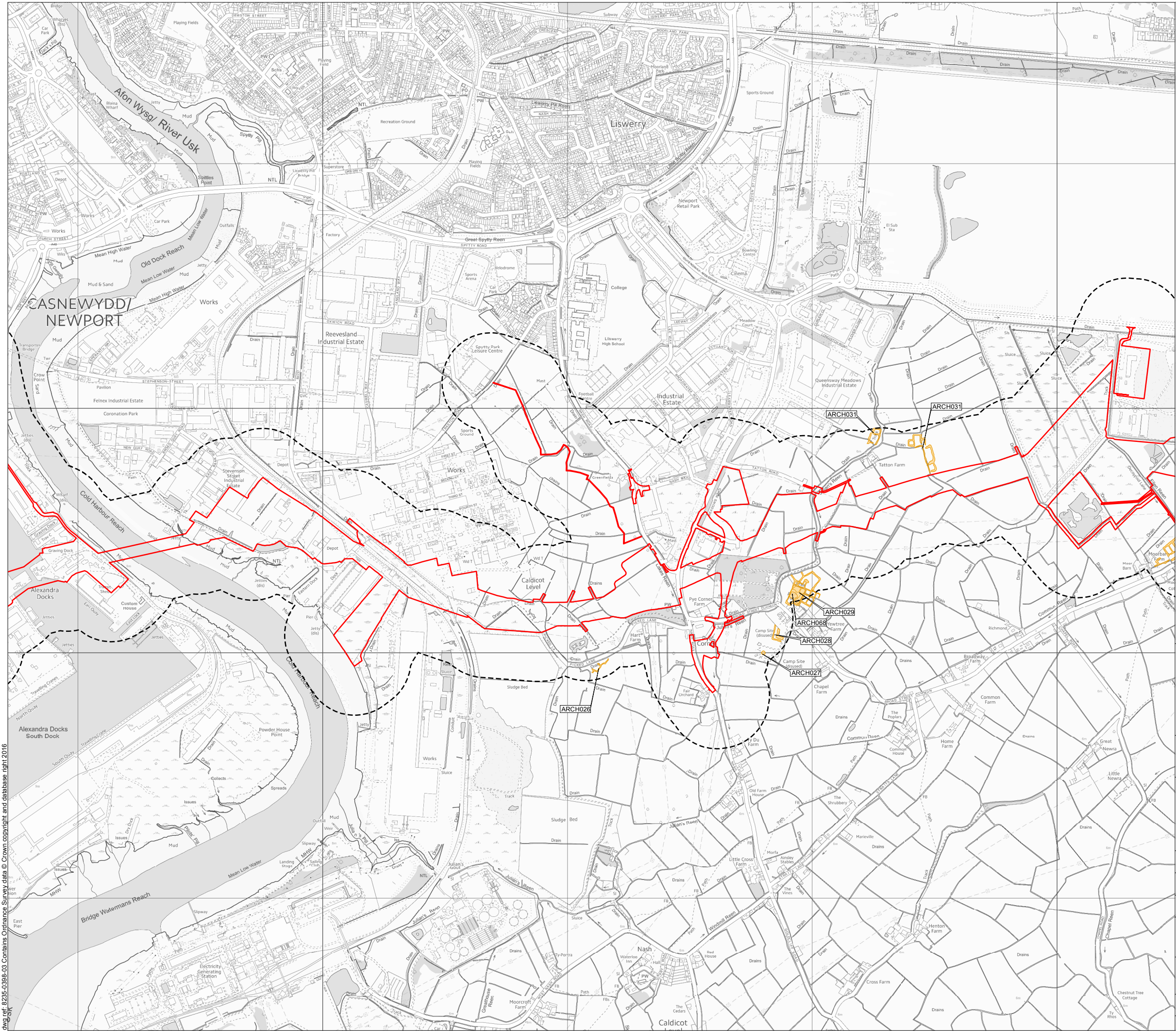
Scale: A3 @ 1:15,000

0500m

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dwg ref: 8235-0398-03



Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Archaeological Feature



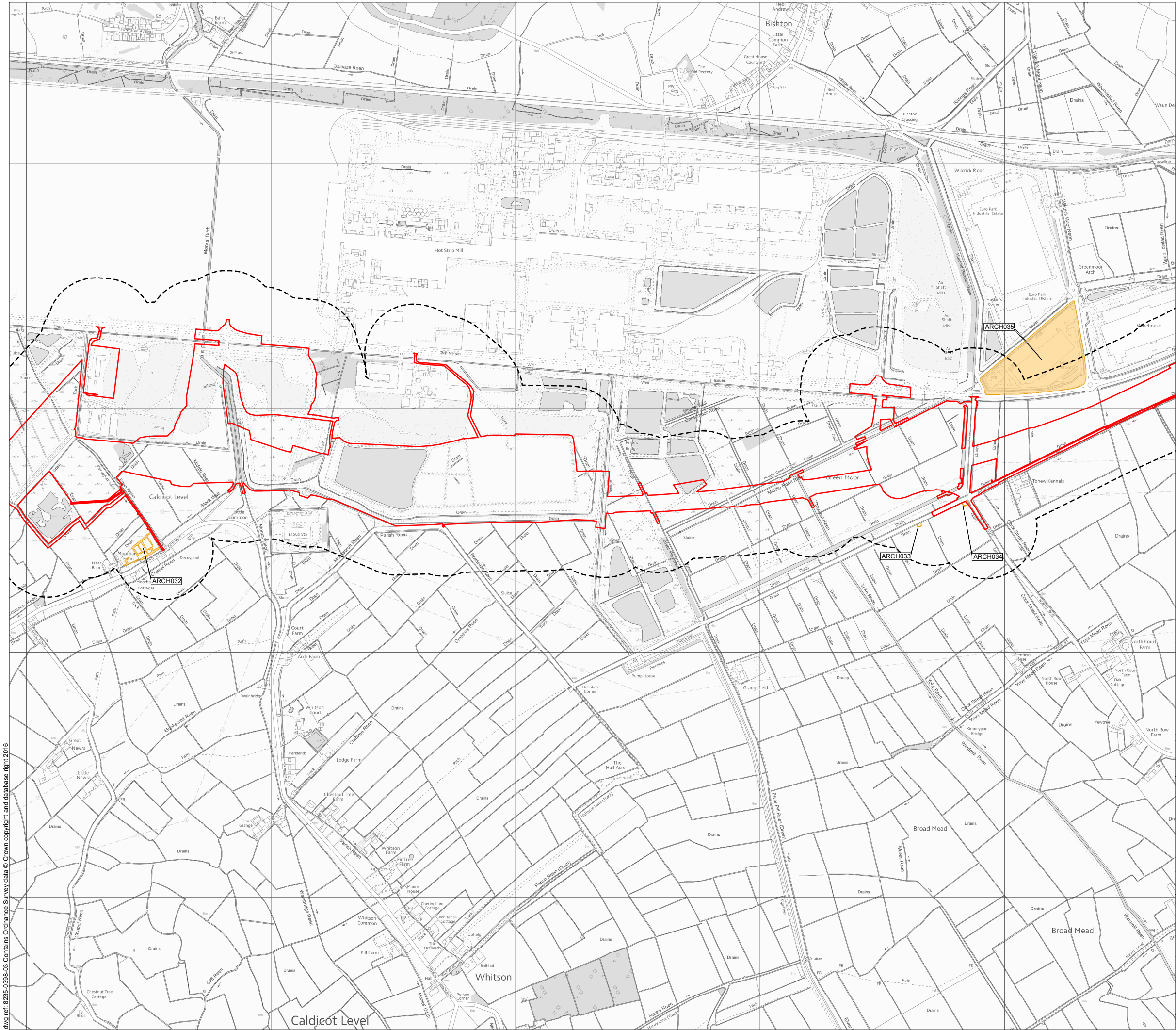
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**Appendix 8.10:
Cultural Heritage Management Plan**

**Route of new motorway corridor around
Newport showing the locations of non-
designated sites of archaeological
interest**

Figure: 4C	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Defined Study Area
 - Archaeological Feature



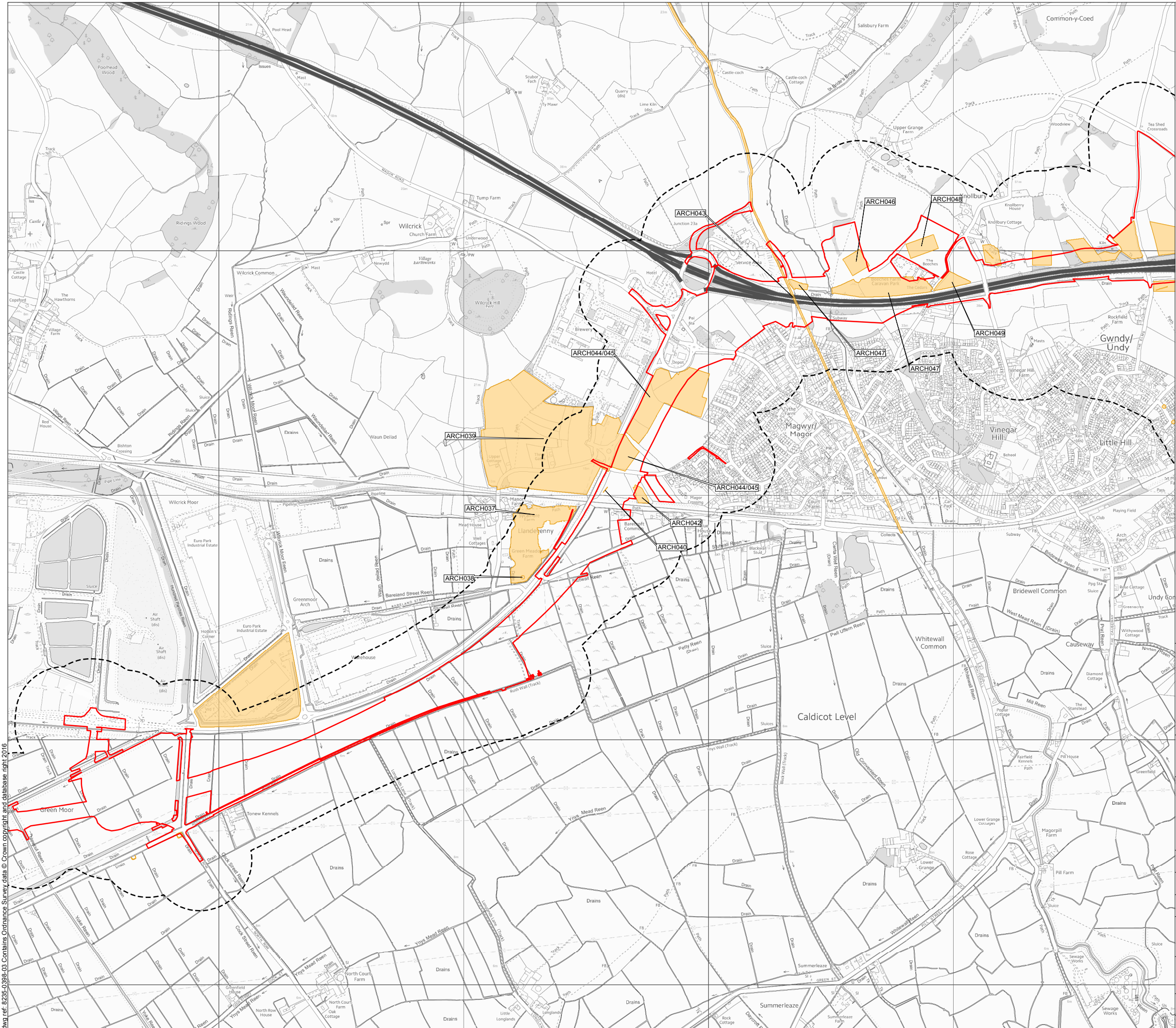
Llywodraeth Cymru
Welsh Government

Appendix 8.10:
Cultural Heritage Management Plan

Route of new motorway corridor around
Newport showing the locations of non-
designated sites of archaeological
interest

Figure: 4d	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Archaeological Feature

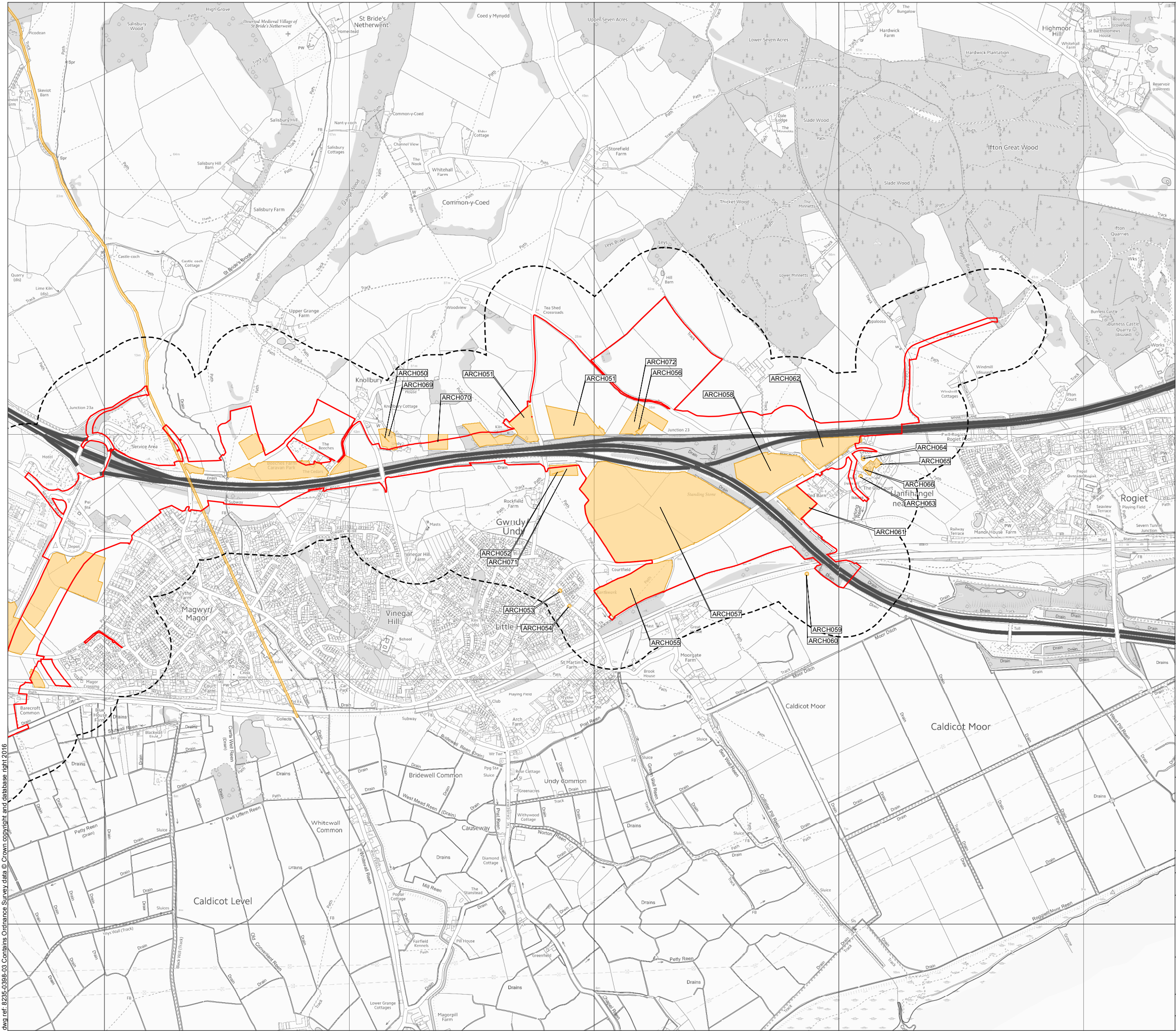


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Appendix 8.10:
Cultural Heritage Management Plan
Route of new motorway corridor around
Newport showing the locations of non-
designated sites of archaeological
interest

Figure: 4e	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR





Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Defined Study Area
- Archaeological Feature

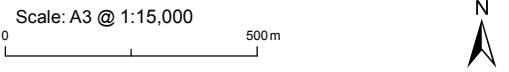


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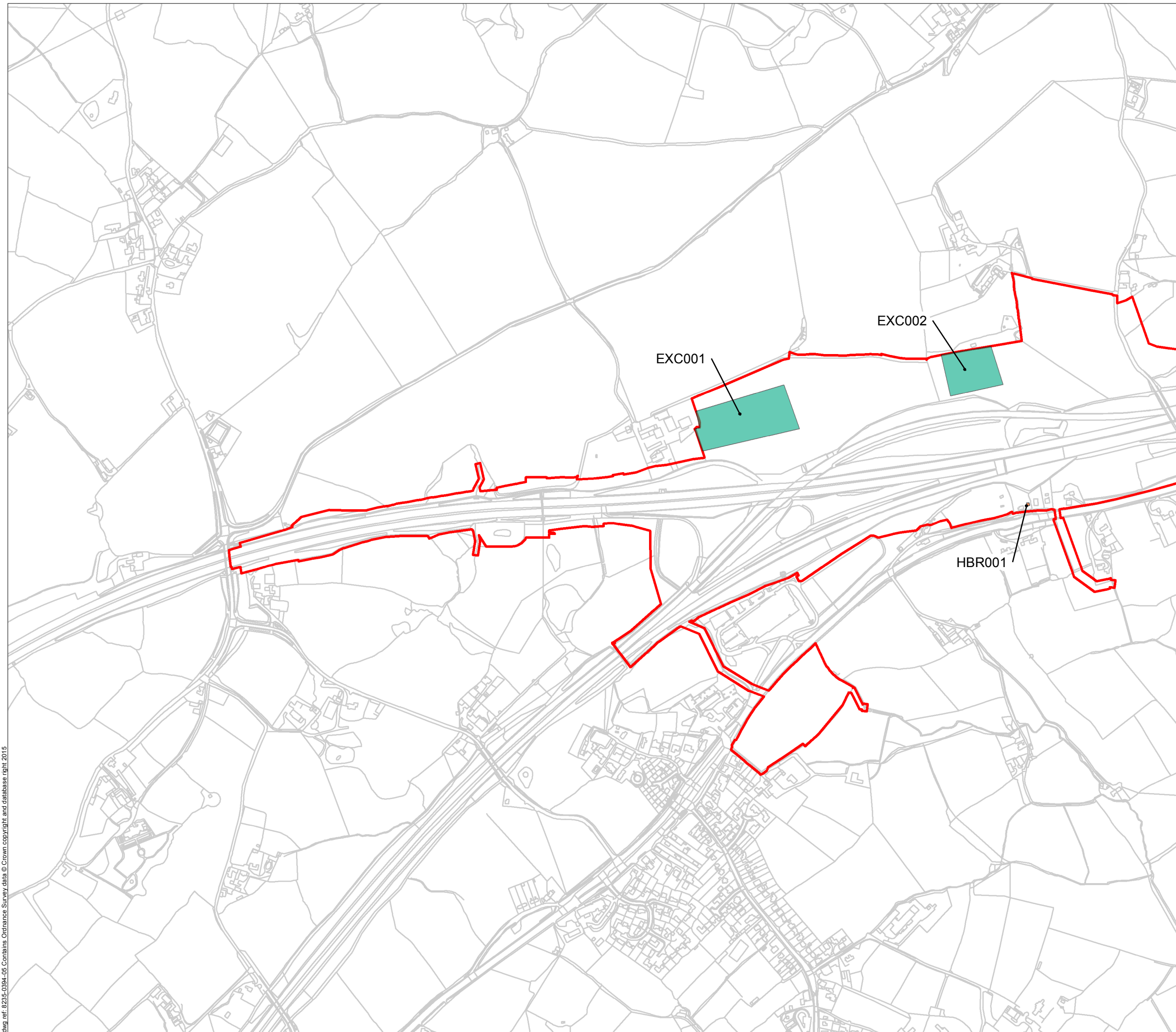
**Appendix 8.10:
Cultural Heritage Management Plan**

**Route of new motorway corridor around
Newport showing the locations of non-
designated sites of archaeological
interest**


Figure: 4f	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: MP	Checked: MR



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- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording



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Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5a	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR

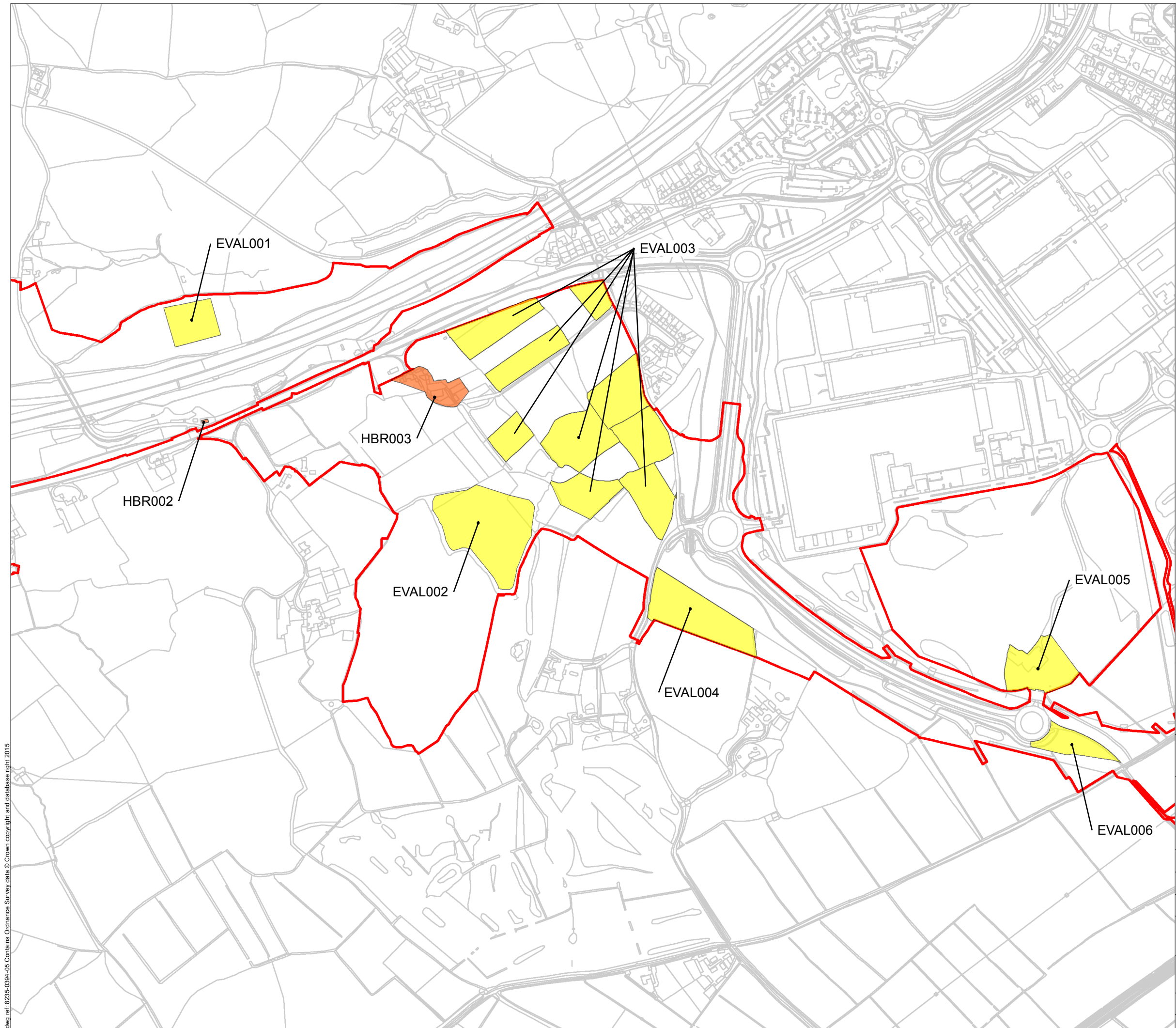
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0 125 250 m


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dwg ref. 8235-0394-05



- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording



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Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5b	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR

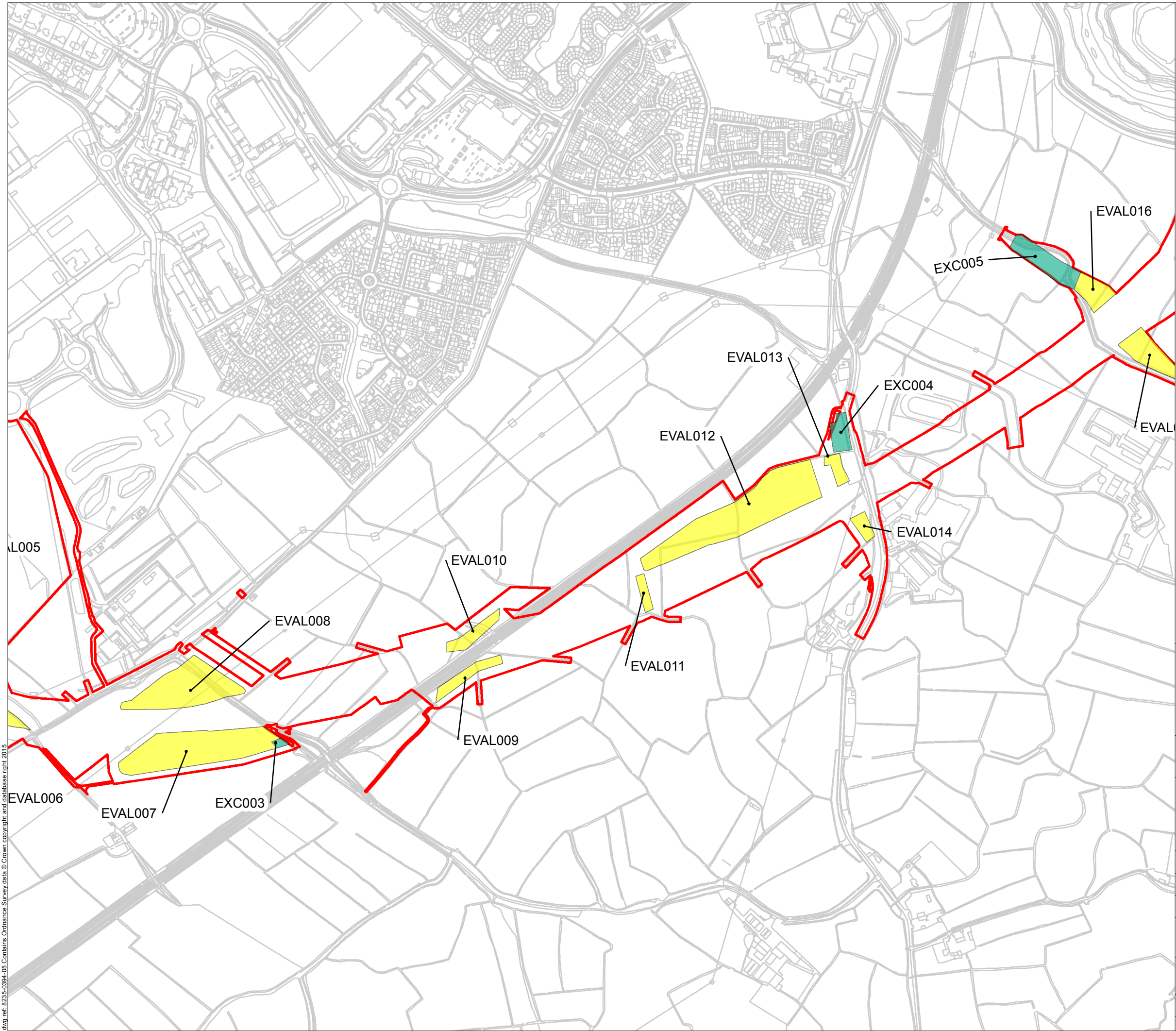
Scale: A3 @ 1:7,500

0 125 250 m

N

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dwg ref: 8235-0394-05



- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording

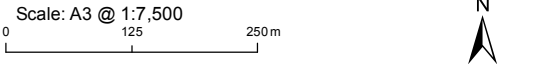


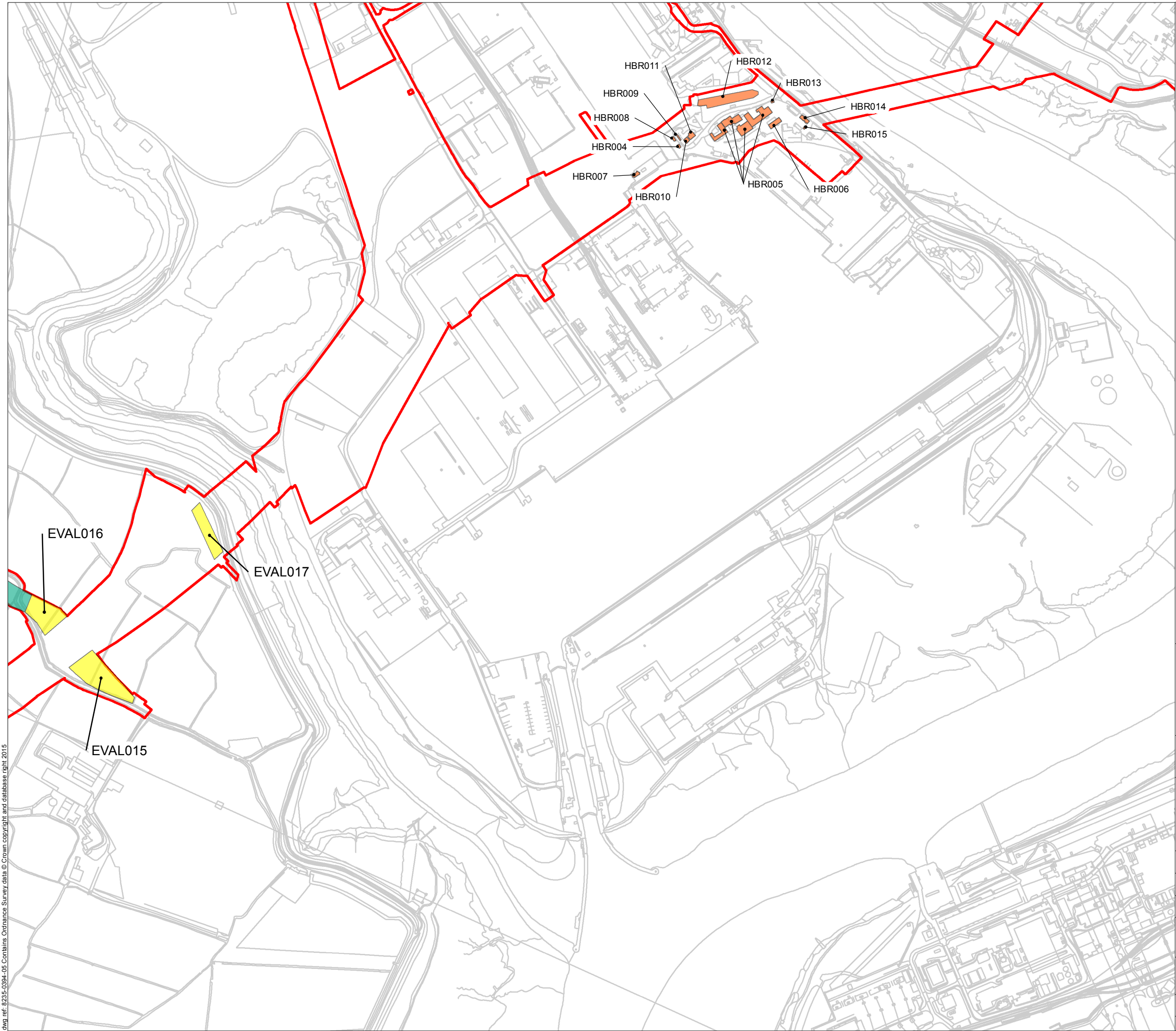
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Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5c	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR





Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Evaluation Site
- Excavation Site
- Historic Building Recording



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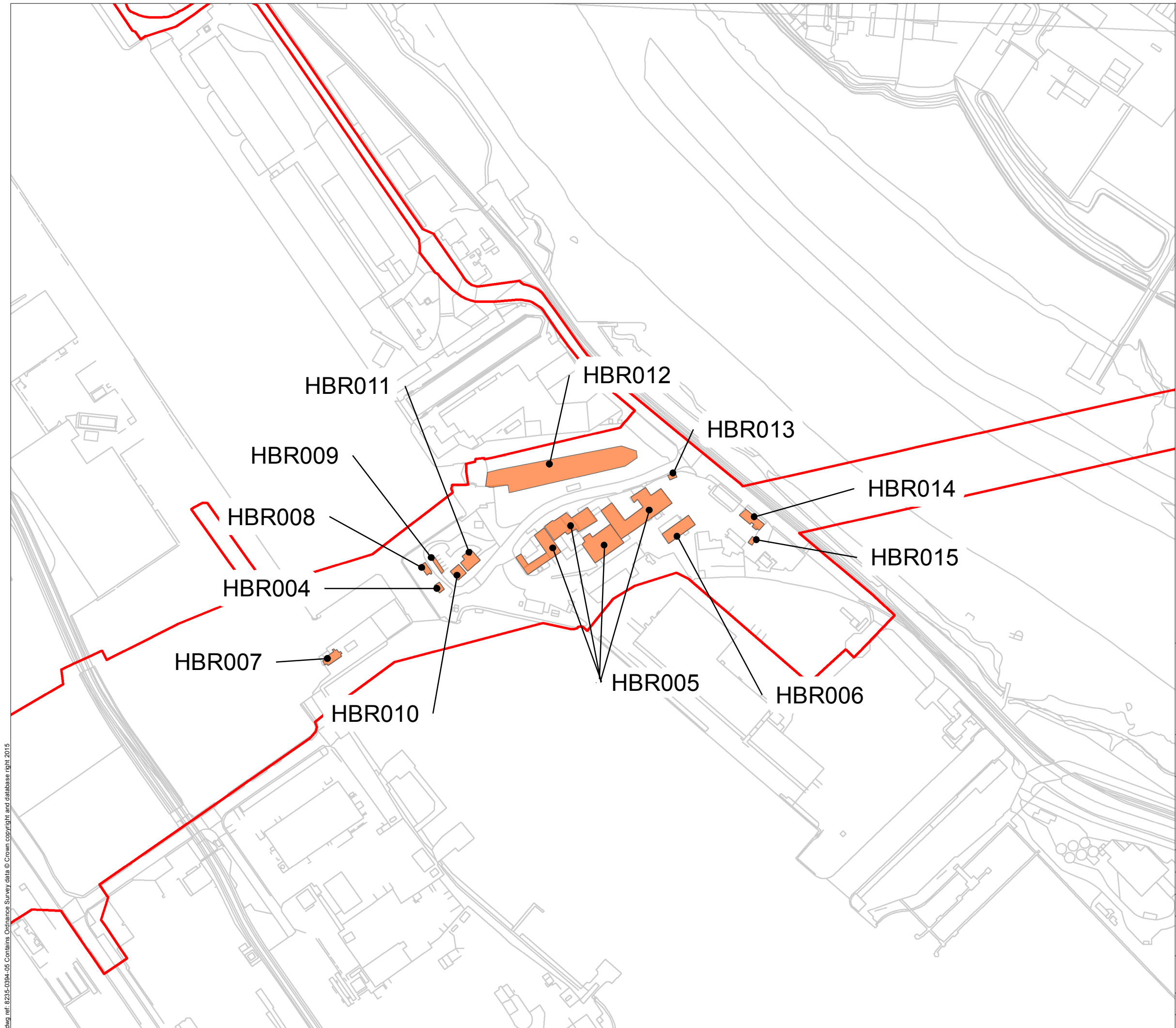
Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor
around Newport showing locations of
defined cultural heritage mitigation work

Figure: 5d	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR

Scale: A3 @ 1:7,500
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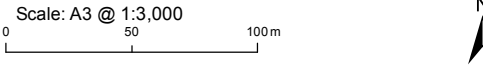
- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording



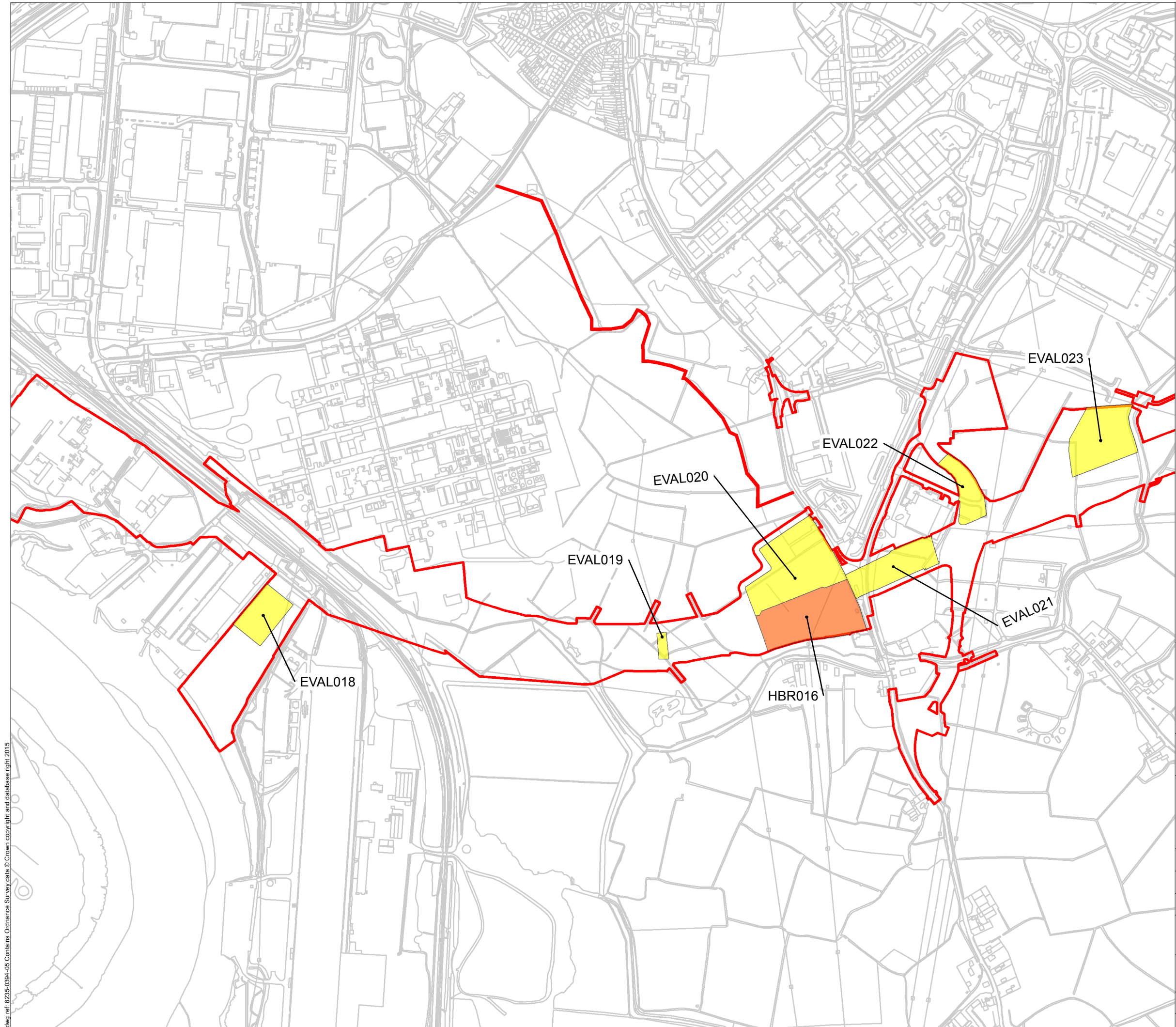
Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5e	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR



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Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Evaluation Site
- Excavation Site
- Historic Building Recording



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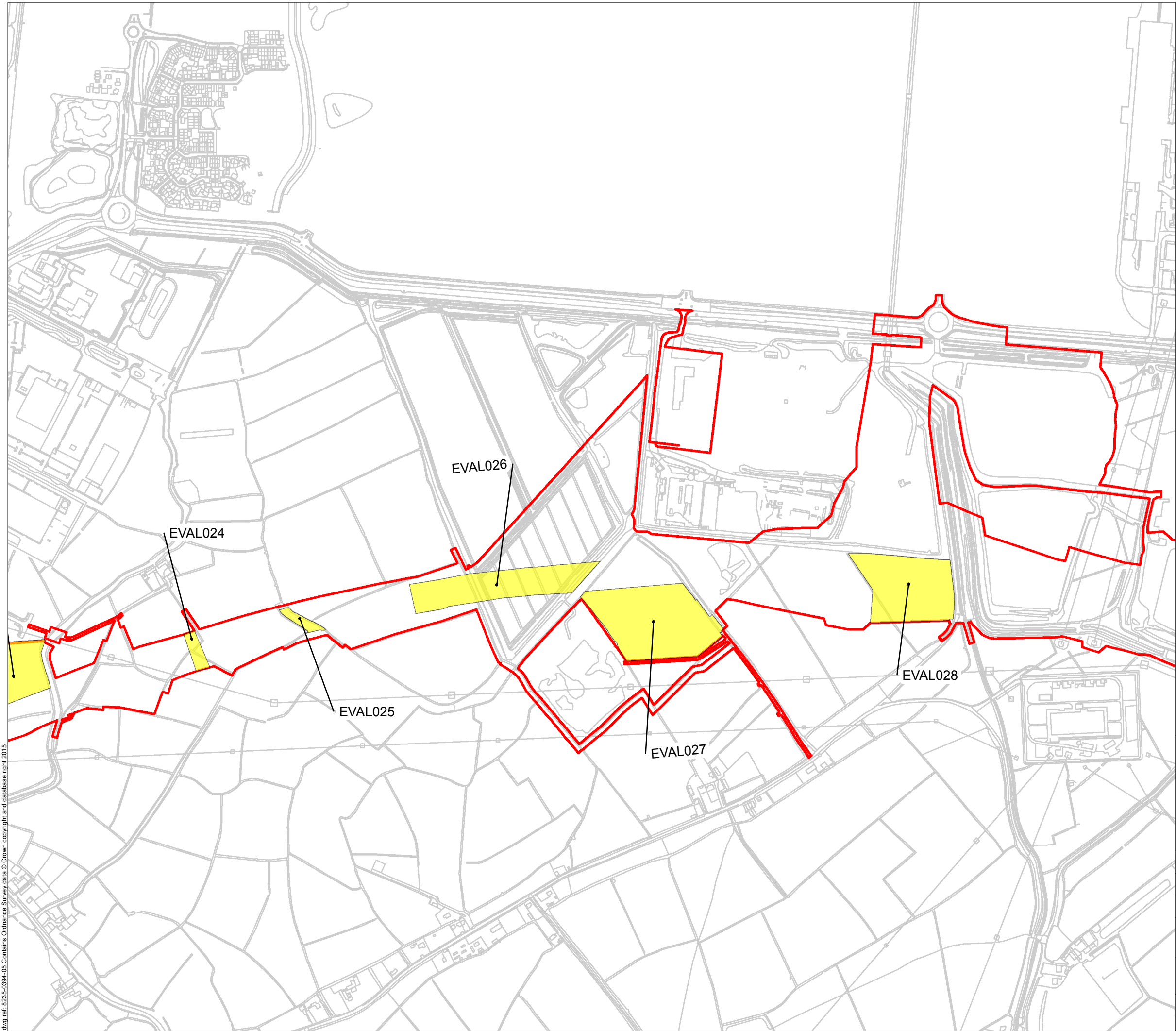
Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor
around Newport showing locations of
defined cultural heritage mitigation work

Figure: 5f	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR

Scale: A3 @ 1:7,500
0 125 250 m





Legend

- ▬ Limit of Permanent and Temporary Works for New Section of Motorway
- ▭ Evaluation Site
- ▭ Excavation Site
- ▭ Historic Building Recording

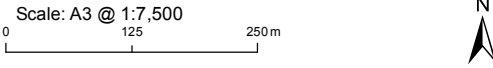


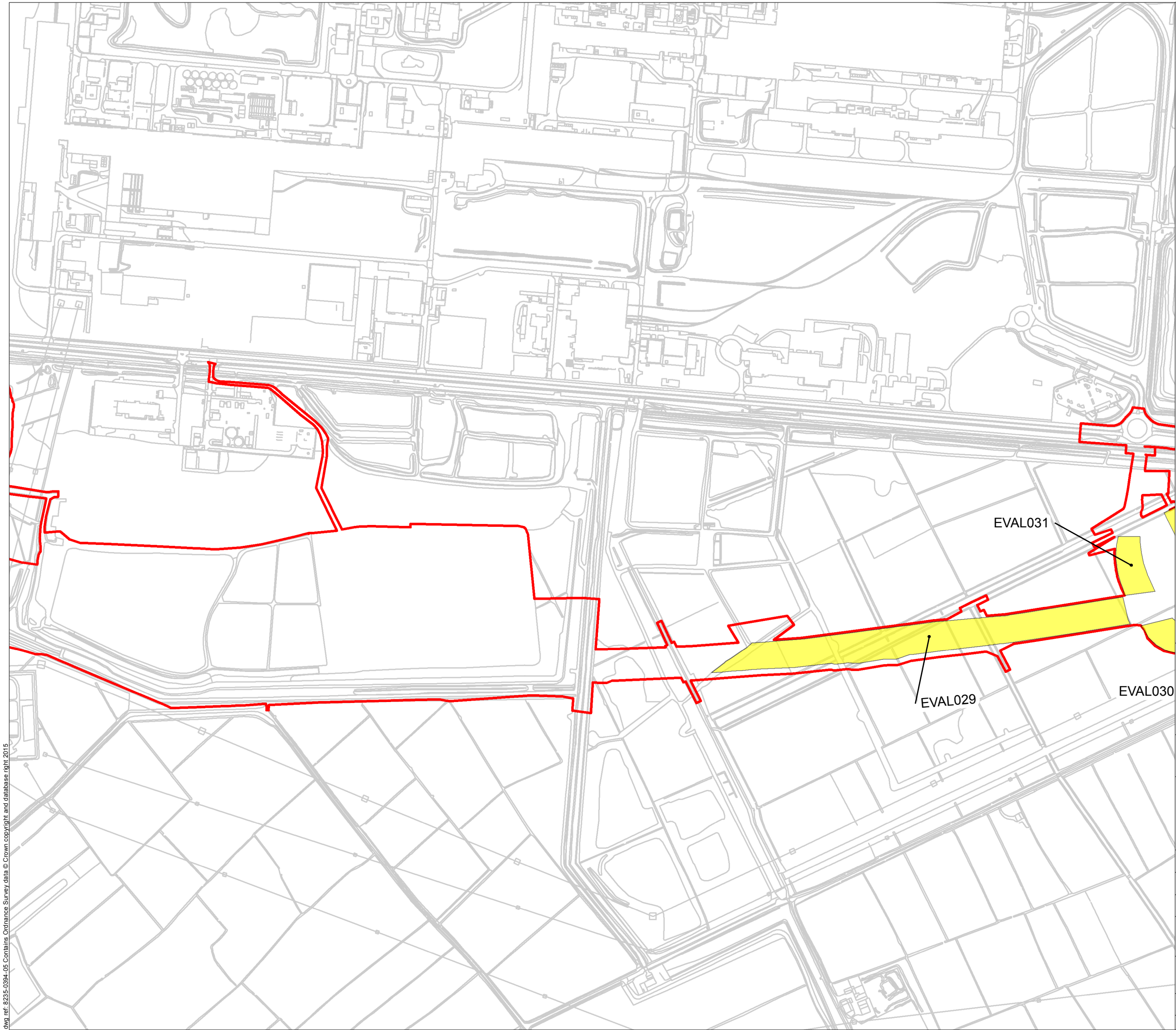
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Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)


Route of the new motorway corridor
around Newport showing locations of
defined cultural heritage mitigation work

Figure: 5g	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR





- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording



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Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5h	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR

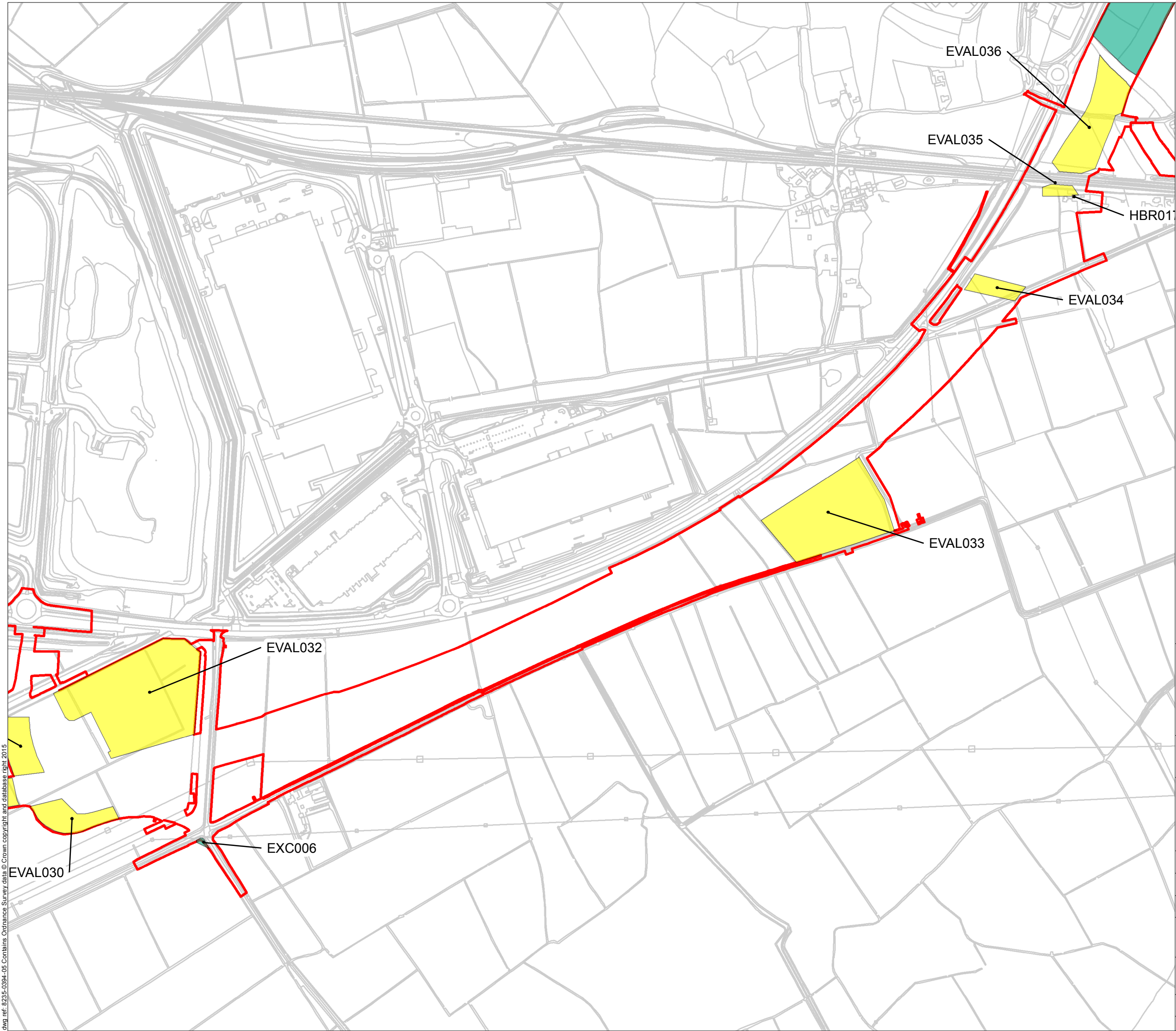
Scale: A3 @ 1:7,500

0 125 250 m

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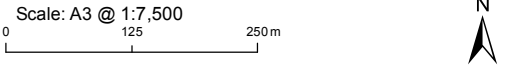
- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording



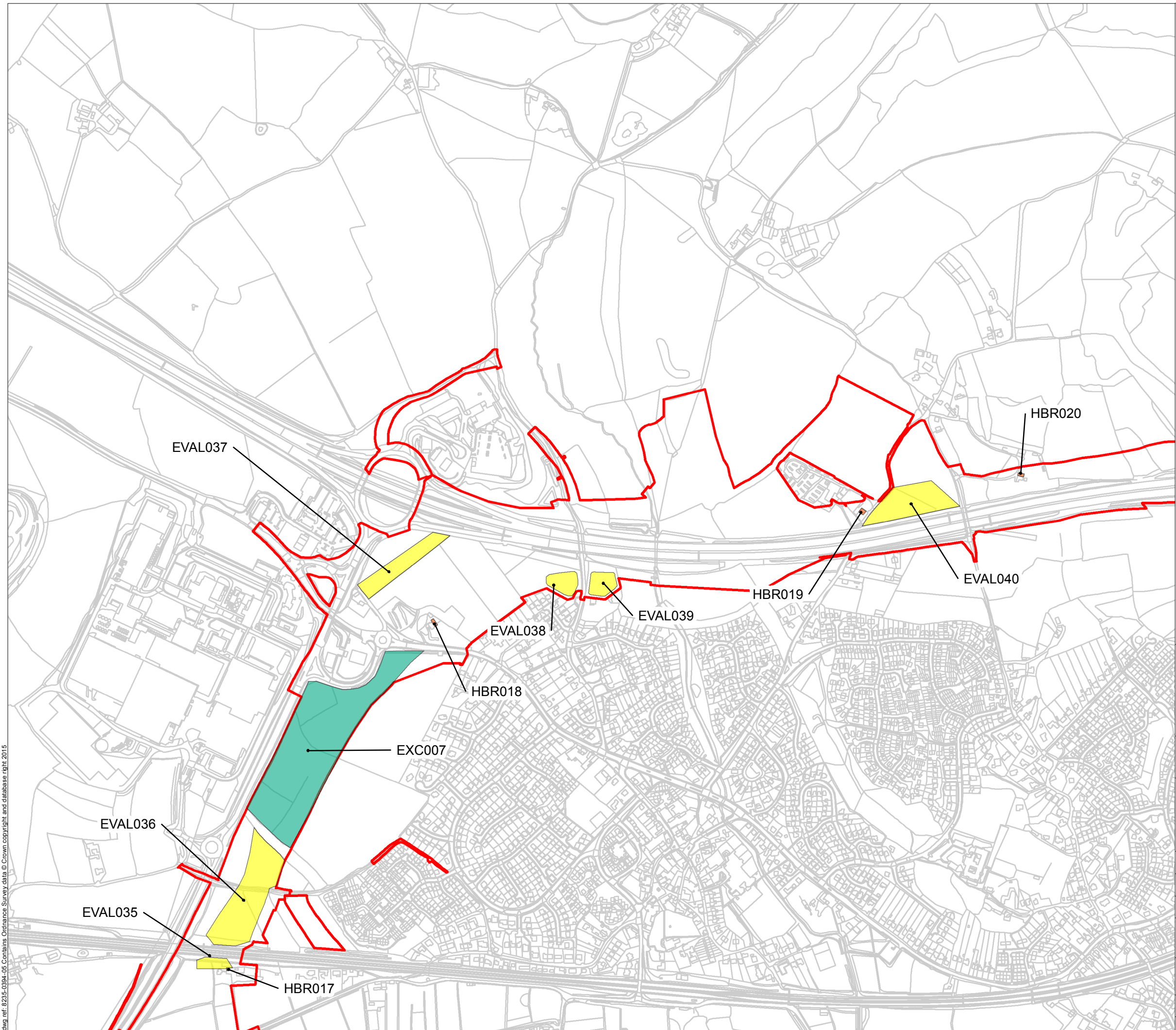
Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5i	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR



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Legend

- Limit of Permanent and Temporary Works for New Section of Motorway
- Evaluation Site
- Excavation Site
- Historic Building Recording

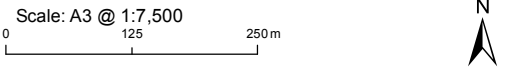


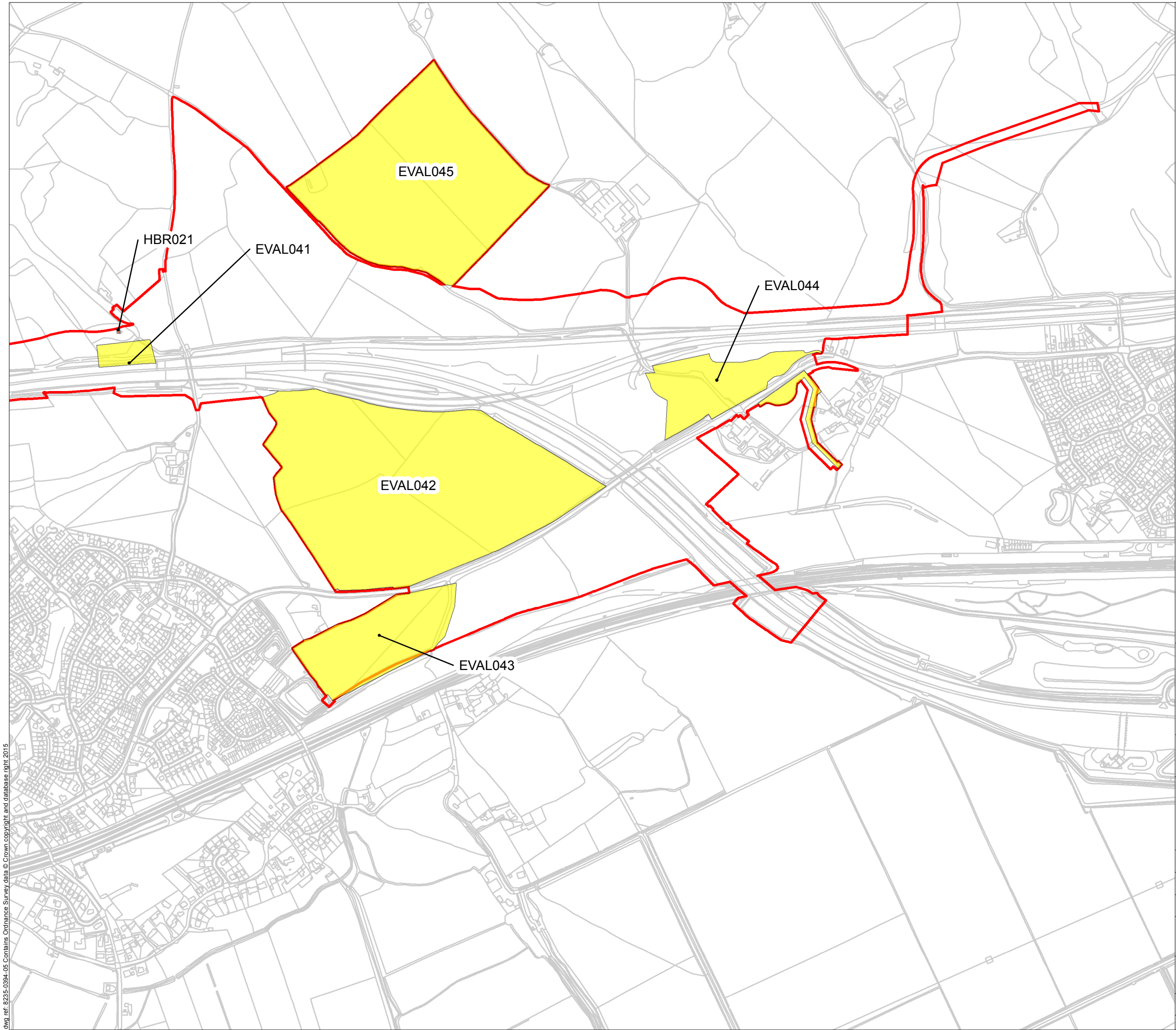
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Welsh Government

Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)


Route of the new motorway corridor
around Newport showing locations of
defined cultural heritage mitigation work

Figure: 5j	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR





- Legend**
- Limit of Permanent and Temporary Works for New Section of Motorway
 - Evaluation Site
 - Excavation Site
 - Historic Building Recording



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Appendix 8.10- Cultural Heritage Mitigation Plan (CHMP)

Route of the new motorway corridor around Newport showing locations of defined cultural heritage mitigation work

Figure: 5k	Revision: -
Date: March 2016	Status: AT ISSUE
Drawn: CR	Checked: MR

Scale: A3 @ 1:7,500

0 125 250 m

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dwg ref. 8235-0394-05

Annexes

Annex A

Methodology for Detailed Archaeological Excavation

- A1 Within areas identified for detailed archaeological excavation, and where appropriate, the topsoil and any underlying subsoils would be carefully removed using tracked mechanical plant equipped with toothless ditching buckets. Subsoils would be removed in horizontal spits of no more than 100mm. This machine removal of material would be undertaken under the close supervision of appropriately experienced and qualified archaeologists.
- A2 The plant would not run over stripped areas. Spoil would be hauled away to designated spoil storage areas and placed in accordance with the Contractor's requirements for spoil storage.
- A3 When machine stripping reaches the uppermost level of archaeological remains or the underlying basal geology, whichever is encountered first, use of the machines would cease. Where archaeological features or deposits are revealed, these would be hand-cleaned by the archaeological team. Where it is clear that areas do not contain archaeological features or deposits, further hand-cleaning would not be required.
- A4 All archaeological features present would be examined through detailed hand-excavation. There are no predicated likely **minimum** excavation levels for archaeological remains. Such levels would be subject to agreement with the Contractor's Archaeologist following the completion of hand-cleaning.
- A5 A context-based recording system acceptable to the Contractor's Archaeologist and the Curator would be used to record the investigations. Pro-forma sheets would be used to record all relevant information.
- A6 A programme of environmental sampling would be developed by the Archaeological Contractor in consultation with the Contractor's Archaeologist and the Curator. This strategy would be incorporated into the Project Design.
- A7 Environmental sampling would be targeted upon potentially significant archaeological deposits or features, and would predominantly examine sealed and well-dated contexts.

Sample size would take into account the frequency with which material appropriate for sampling would occur, but bulk samples would normally be 15-60 (normally 40) litres. Bulk sampling may also be used to collect charcoal for C14 dating where appropriate. Samples shall be suitably contained and identified, collected and prepared, securely stored and transported etc. in accordance with current best practice.

- A8 Artefacts and environmental samples would be returned to the Archaeological Contractor's premises at regular intervals. Sufficient work should be undertaken upon them in terms of processing and assessment to enable feedback of results to inform the direction of the fieldwork. It is envisaged that this would involve spot dating and processing and sorting of environmental samples to determine the adequacy of the sampling strategy, as well as the presence of scientifically dateable materials.
- A9 A location plan would be produced that would show the position of the excavated features at each location. This would be tied in to the site local grid, which is in turn tied in to the Ordnance Survey National Grid. Feature plans and sections would be drawn at appropriate scales; all site drawings would include relevant information including site name, number and/or code, scale, drawing number, orientation, date and name of compiler. Drawings would also show absolute heights derived from Ordnance Datum (Newlyn).
- A10 The photographic record would be in digital format, resulting in high resolution TIFF (uncompressed) images. Photographs would illustrate both the detail and context of the principal archaeological features discovered. 35 mm format colour transparencies and monochrome images may also be created. All photographic records would include information detailing: site name and number/code, date, context, scale and orientation. The digital images would be printed onto archive-stable media. The monochrome negatives and contact prints would be filed in appropriate media, and the transparencies would be mounted in appropriate hard cases. All photographs would be cross-referenced onto the context records.
- A11 All artefacts and animal bones would be recorded, collected and labelled according to their individual stratigraphic context. Artefacts of clearly modern date would be recorded but not retained for off-site assessment. Finds from each archaeological context would be allocated an individual finds tray/bag and waterproof labels would be used for each tray/bag to identify unique individual contexts.

- A12 Conservation advice may be necessary on site prior to lifting of and initial treatment of fragile objects. All finds and samples would be exposed, lifted, cleaned, conserved, marked, bagged and boxed according to the United Kingdom Institute for Conservation's *Conservation Guidelines No.2*, the RESCUE/ICON's *First Aid For Finds* (Third Edition, 2002) and the Institute of Field Archaeologists' *Guidelines for Finds Work* (1992). Iron finds may require X-rays prior to conservation and similarly residues on pottery may require study ahead of any conservation.
- A13 On completion of the excavation and recording at each location, no reinstatement is required.

Annex B

Methodology for Detailed Historic Building Recording

- B1 The methodology described below would apply to all historic buildings for which Detailed Historic Building Recording has been specified in Section 5 of this CHMP.
- B2 All parts of each building should be examined prior to the commencement of the drawn and photographic recording in order to identify all features relevant to its original and later uses. As part of this exercise, the recorder should produce written observations (e.g. on phasing; on building function) sufficient to permit the preparation of a report on the structure. This process should include the completion of a Room Data Sheet or similar structured recording pro-forma for each room or discrete internal space within the volume of the structure. The crucial requirement is that each room should be examined individually and the results of that examination noted in a systematic fashion.
- B3 Measured plans (to scale) would be produced of all floors, along with measured drawings of all elevations. Measured cross-sections would be produced as appropriate. These should show the form and location of any structural features including blocked doors, windows and fireplaces, also any visible masonry joints, ceiling beams and changes on floor or ceiling level.
- B4 Measured drawings should be produced to show the form of any architectural details or small-scale functional details not more readily captured by photography.
- B5 Drawings should be made at an appropriate scale (not smaller than 1:50 for plans). The structures should be recorded as existing, but a clear distinction should be made on the final drawings between surviving as-built features and later alterations as well as all material introduced into the structure during the later 20th-century.
- B6 Dimensional accuracy should accord with the following:
- at 1:20, measurements should be accurate to at least 10mm;
 - at 1:50, measurements should be accurate to at least 20mm; and

- at 1:100, measurements should be accurate to at least 50mm.

- B7 If finished drawings are generated by means of CAD or a similar proven graphics package, the software employed would need to be sufficiently advanced to provide different line-weight (point-size); this feature should then be used to articulate the depth of the drawings. What is required as an end product of the survey is a well-modelled and clear drawing; ambiguous flat-line drawings should be avoided.
- B8 An external photographic record should be made of all elevations of each building, from vantage points as nearly parallel to the elevation being photographed as is possible within the constraints of the site. All visible elements of each elevation should be recorded photographically; this may require photographs from a number of vantage points.
- B9 A general external photographic record should also be made which includes a number of oblique general views of each of the buildings from all sides, showing them in their setting.
- B10 A general internal photographic record should be made of each building. General views should be taken of *each room* or discrete internal space from a sufficient number of vantage points to adequately record the form, general appearance and manner of construction of each area photographed. In areas which are wholly modern in appearance, character and materials, a single shot to record current appearance would suffice.
- B11 In addition, detailed record shots should be made of all individual elements noted in A3.3 above. Elements for which multiple examples exist (e.g. each type of roof truss, column or window frame) may be recorded by means of a single representative illustration. Detail photographs must be taken at medium-to-close range and be framed in such a way as to ensure that the element being photographed clearly constitutes the principal feature of the photograph.
- B12 The photographic record would be in digital format, resulting in high resolution TIFF (uncompressed) images. 35 mm format colour transparencies and monochrome images may also be created. All photographs must contain a graduated photographic scale of appropriate dimensions (measuring tapes and surveying staffs are not considered to be acceptable scales in this context). A 2-metre ranging-rod, discretely positioned, should be included in a selection of general shots, sufficient to independently establish the scale of all elements of the building and its structure.

- B13 All photographic records would include information detailing: site name and number/code, date, context, scale and orientation. The digital images would be printed onto archive-stable media. The monochrome negatives and contact prints would be filed in appropriate media, and the transparencies would be mounted in appropriate hard cases.
- B14 A photographic register detailing (as a minimum) location, direction and subject of shot must accompany the photographic record; a separate photographic register should be supplied for any colour slides and/or monochrome images. The position and direction of each photograph should be noted on a copy of the building plan, which should also be marked with a north pointer; separate plans should be annotated for each floor of each building.
- B15 During the demolition of each building that has been recorded, the Archaeological Contractor should maintain a watching brief in order to record any pertinent historic structural or functional detail presently inaccessible, overbuilt or obscured by later alterations. This record should be obtained by means of notes, drawings and photographs as appropriate, to the standards outlined elsewhere in this Annex. This detail should then be incorporated into the completed record.
- B16 The written report would form part of the Assessment Report and should include:
- a brief architectural description of the building(s) presented in a logical manner (as a walk around and through the building(s), starting with setting, then progressing to all sides of the structure in sequence, and finally to the interior from the ground floor up); and
 - a discussion placing the building(s) in its local and historical contexts, describing and analysing the development and uses of the building(s).
- B17 Appropriate documentary research into the history of the buildings will be undertaken at the Gwent Archives and at the National Library of Wales.
- B18 Both architectural description and historical/analytical discussion should be fully cross-referenced to the drawn and photographic record, sufficient to illustrate the major features of the building and any issues raised. All relevant historic maps should be consulted and referenced, along with any appropriate documentary sources.

- B19 Images and information from the programme of Detailed Historic Building Recording may be used within the Academic Report and the Popular Report.

Annex C

Methodology for Basic Historic Building Recording

- C1 The methodology described below would apply to all structures for which Basic Historic Building Recording has been specified in Section 5 of this CHMP.
- C2 Measured plans (to scale) would be produced of all floors. These should show the form and location of any structural features including blocked doors, windows and fireplaces, also any visible masonry joints, ceiling beams and changes on floor or ceiling level. For industrial or functional buildings, plans should indicate fixed features which demonstrate past or current uses or evidence thereof (e.g. machinery, machine bases, evidence of power transmission, flues etc).
- C3 Measured drawings should be produced to show the form of any important or diagnostic architectural or small-scale functional details not more readily captured by photography.
- C4 Drawings should be made at an appropriate scale (not smaller than 1:50 for plans). The structures should be recorded as existing, but a clear distinction should be made on the final drawings between surviving as-built features and later alterations as well as material introduced into the structure during the later 20th-century.
- C5 Dimensional accuracy should accord with the following:
- at 1:20, measurements should be accurate to at least 10mm;
 - at 1:50, measurements should be accurate to at least 20mm; and
 - at 1:100, measurements should be accurate to at least 50mm.
- C6 If finished drawings are generated by means of CAD or a similar proven graphics package, the software employed would need to be sufficiently advanced to provide different line-weight (point-size); this feature should then be used to articulate the depth of the drawings. What is required as an end product of the survey is a well-modelled and clear drawing; ambiguous flat-line drawings should be avoided.
- C7 A photographic record should be that shows the detail of the structures as well as more general views that show the structures within their settings. In particular with regard to the

current A465, photographs should be taken from suitable vantage points that show the road within the overall area. Suitable locations for these viewpoints would be agreed with the Contractor's Archaeologist. More detailed photographs of sections of the road, including the principal structures, would also be undertaken.

- C8 The photographic record would be in digital format, resulting in high resolution TIFF (uncompressed) images. 35 mm format colour transparencies and monochrome images may also be created. Where appropriate, photographs should contain a graduated photographic scale of appropriate dimensions (measuring tapes and surveying staffs are not considered to be acceptable scales in this context). A 2-metre ranging-rod, discretely positioned, should be included in a selection of general shots, sufficient to independently establish the scale of all elements of the structure.
- C9 All photographic records would include information detailing: site name and number/code, date, context, scale and orientation. The digital images would be printed onto archive-stable media. The monochrome negatives and contact prints would be filed in appropriate media, and the transparencies would be mounted in appropriate hard cases.
- C10 A photographic register detailing (as a minimum) location, direction and subject of shot must accompany the photographic record; a separate photographic register should be supplied for any colour slides and/or monochrome images.
- C11 The written report would form part of the Assessment Report and should include:
- a brief description of the structure(s); and
 - a discussion placing the structure(s) in its local and historical contexts, describing and analysing the development and use of the structure(s).
- C12 Both architectural description and historical/analytical discussion should be fully cross-referenced to the photographic record, sufficient to illustrate the major features of the structure and any issues raised. All relevant historic maps should be consulted and referenced, along with any appropriate documentary sources.
- C13 Images and information from the programme of Basic Historic Building Recording may be used within the Academic Report and the Popular Report.

Annex D

Methodology for Archaeological Trial Trenching

- D1 Within each trench the topsoil and any underlying subsoils would be carefully removed using tracked mechanical plant equipped with toothless ditching buckets. Subsoils would be removed in horizontal spits of no more than 100mm. This machine removal of material would be undertaken under the close supervision of appropriately experienced and qualified archaeologists.
- D2 When machine stripping reaches the uppermost level of archaeological remains or the underlying basal geology, whichever is encountered first, use of the machines would cease. Where archaeological features or deposits are revealed, these would be hand-cleaned by the archaeological team. Where it is clear that areas do not contain archaeological features or deposits, further hand-cleaning would not be required.
- D3 Some further use of the mechanical excavator may be permitted on homogenous low-grade archaeological deposits, but this would only be undertaken with the consent of the Contractor's Archaeologist and the Curator appointed by Welsh Government.
- D4 Spoil from the trenches would be stored at a safe distance from the trench, at least 1.0 m from the edge of the trench. Any trenches left open overnight should be enclosed within Netlon fencing hung on road pins or similar.
- D5 All archaeological features present would be examined through detailed hand-excavation. Examination of areas of complex archaeological remains would be circumspect, being sufficient to meet the principal aims of the evaluation but not cause any damage to material that might be better excavated under different circumstances, i.e. a detailed excavation. As a general principle, discrete features such as pits and post-holes would be half-sectioned and at least one section would be excavated through any linear features.
- D6 A context-based recording system acceptable to the Contractor's Archaeologist and the Curator would be used to record the investigations. Pro-forma sheets would be used to record all relevant information. In the case of any trench containing no archaeological deposits or features, a single trench record sheet can be used to record basic information including size, orientation, depth of deposits etc. A 1.0 m wide representative section would

be drawn that would indicate the existing ground level, overburden and other deposits, and underlying natural subsoil or basal geology.

- D7 A programme of environmental sampling would be developed by the Archaeological Contractor in consultation with the Contractor's Archaeologist and the Curator. This strategy would be incorporated into the Project Design.
- D8 Environmental sampling would be targeted upon potentially significant archaeological deposits or features, and would predominantly examine sealed and well-dated contexts. Sample size would take into account the frequency with which material appropriate for sampling would occur, but bulk samples would normally be 15-60 (normally 40) litres. Bulk sampling may also be used to collect charcoal for C14 dating where appropriate. Samples shall be suitably contained and identified, collected and prepared, stored and transported etc. in accordance with current best practice.
- D9 Artefacts and environmental samples would be returned to the Archaeological Contractor's premises at regular intervals. Sufficient work should be undertaken upon them in terms of processing and assessment to enable feedback of results to inform the direction of the fieldwork. It is envisaged that this would involve spot dating and processing and sorting of environmental samples to determine the adequacy of the sampling strategy, as well as the presence of scientifically dateable materials.
- D10 A trench location plan would be produced that would show the position of all excavated trenches. This would be tied in to the site local grid, which is in turn tied in to the Ordnance Survey National Grid. Feature plans and sections would be drawn at appropriate scales; all site drawings would include relevant information including site name, number and/or code, scale, drawing number, orientation, date and name of compiler. Drawings would also show absolute heights derived from Ordnance Datum (Newlyn).
- D11 The photographic record would be in digital format, resulting in high resolution TIFF (uncompressed) images. Photographs would illustrate both the detail and context of the principal archaeological features discovered. 35 mm format colour transparencies and monochrome images may also be created. All photographic records would include information detailing: site name and number/code, date, context, scale and orientation. The digital images would be printed onto archive-stable media. The monochrome negatives

and contact prints would be filed in appropriate media, and the transparencies would be mounted in appropriate hard cases. All photographs would be cross-referenced onto the context and trench records. Trenches containing no archaeological deposits and features must be photographed from both ends.

- D12 All artefacts and animal bones would be recorded, collected and labelled according to their individual stratigraphic context. Artefacts of clearly modern date would be recorded but not retained for off-site assessment. Finds from each archaeological context would be allocated an individual finds tray/bag and waterproof labels would be used for each tray/bag to identify unique individual contexts.
- D13 Conservation advice may be necessary on site prior to lifting of and initial treatment of fragile objects. All finds and samples would be exposed, lifted, cleaned, conserved, marked, bagged and boxed according to the United Kingdom Institute for Conservation's *Conservation Guidelines No.2*, RESCUE/ICON's *First Aid For Finds* (Third Edition, 2002) and the Institute of Field Archaeologists' *Guidelines for Finds Work* (1992). Iron finds may require X-rays prior to conservation and similarly residues on pottery may require study ahead of any conservation.
- D14 On completion of the excavation and recording of the trenches, each trench would be backfilled by machine to existing ground level using the excavated material. No other reinstatement is required.

Annex E

Methodology for Targeted Archaeological Watching Brief

- E1 The targeted archaeological watching brief would be carried out in specific areas within the land affected by the proposed new section of motorway during works that may have the potential to impact on buried archaeological features and deposits. The Contractor would afford reasonable access in order that all archaeological features and deposits revealed during excavations and groundwork can be investigated and recorded appropriately.
- E2 The procedures for advising on, and progressing with, archaeological remains identified during the targeted watching brief, are specified in Section 5.1 of this CHMP.
- E3 All recording would be undertaken using an appropriate pro forma recording system, supported by a photographic record. A sufficient sample of each feature type/deposit would be examined in order to establish the date, nature, extent and condition of the archaeological remains.
- E4 Areas under archaeological observation would be surveyed using a Total Station or GPS and tied in to the site local grid, which in turn is tied in to the Ordnance Survey National Grid.
- E5 All archaeological features present would be examined through detailed hand-excavation. As a general principle, discrete features such as pits and post-holes would be half-sectioned and at least one section would be excavated through any linear features.
- E6 A context-based recording system acceptable to the Contractor's Archaeologist and the Curator would be used to record the investigations. Pro-forma sheets would be used to record all relevant information.
- E7 A programme of environmental sampling would be developed by the Archaeological Contractor in consultation with the Contractor's Archaeologist and the Curator. This strategy would be incorporated into the Project Design.

- E8 Environmental sampling would be targeted upon potentially significant archaeological deposits or features, and would predominantly examine sealed and well-dated contexts. Sample size would take into account the frequency with which material appropriate for sampling would occur, but bulk samples would normally be 15-60 (normally 40) litres. Bulk sampling may also be used to collect charcoal for C14 dating where appropriate. Samples shall be suitably contained and identified, collected and prepared, stored and transported etc. in accordance with current best practice.
- E9 Artefacts and environmental samples would be returned to the Archaeological Contractor's premises at regular intervals. Sufficient work should be undertaken upon them in terms of processing and assessment to enable feedback of results to inform the direction of the fieldwork. It is envisaged that this would involve spot dating and processing and sorting of environmental samples to determine the adequacy of the sampling strategy, as well as the presence of scientifically dateable materials.
- E10 Feature plans and sections would be drawn at appropriate scales; all site drawings would include relevant information including site name, number and/or code, scale, drawing number, orientation, date and name of compiler. Drawings would also show absolute heights derived from Ordnance Datum (Newlyn).
- E11 The photographic record would be in digital format, resulting in high resolution TIFF (uncompressed) images. Photographs would illustrate both the detail and context of the principal archaeological features discovered. 35 mm format colour transparencies and monochrome images may also be created. All photographic records would include information detailing: site name and number/code, date, context, scale and orientation. The digital images would be printed onto archive-stable media. The monochrome negatives and contact prints would be filed in appropriate media, and the transparencies would be mounted in appropriate hard cases. All photographs would be cross-referenced onto the context and trench records.
- E12 All artefacts and animal bones would be recorded, collected and labelled according to their individual stratigraphic context. Artefacts of clearly modern date would be recorded but not retained for off-site assessment. Finds from each archaeological context would be allocated an individual finds tray/bag and waterproof labels would be used for each tray/bag to identify unique individual contexts.

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