

# **A12 Chelmsford to A120 widening scheme TR010060**

## **6.1 ENVIRONMENTAL STATEMENT CHAPTER 7 CULTURAL HERITAGE**

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## ENVIRONMENTAL STATEMENT CHAPTER 7 CULTURAL HERITAGE

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## 7 Cultural heritage

### 7.1 Topic introduction

- 7.1.1 This chapter presents the information required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) to be provided in the Environmental Statement for the proposed A12 Chelmsford to A120 widening scheme (the proposed scheme) in respect of cultural heritage.
- 7.1.2 This chapter addresses the likely significant effects of the proposed scheme on cultural heritage in accordance with the Design Manual for Roads and Bridges (DMRB) LA 106 Cultural Heritage Assessment (Highways England, 2020c). The chapter considers the known heritage baseline and the changes (impacts) on heritage assets that may occur due to the construction and operation of the proposed scheme and the resultant potential effects.
- 7.1.3 Cultural heritage includes consideration of the following matters: archaeological remains, built heritage and the historic landscape. This chapter considers the historic evolution of the landscape and the potential effects to the settings of heritage assets. The likely change to the present day landscape and to people's views and visual amenity is addressed within Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1].
- 7.1.4 This chapter is supported by the following figures [TR010060/APP/6.2]:
- Figure 7.1: Cultural Heritage Archaeological Remains
  - Figure 7.2: Cultural Heritage Built Heritage and Historic Landscape
- 7.1.5 This chapter is supported by the following appendices [TR010060/APP/6.3]:
- Appendix 7.1: Cultural Heritage Gazetteer
  - Appendix 7.2: Cultural Heritage Desk-Based Assessment
  - Appendix 7.3: Palaeolithic Desk-Based Assessment
  - Appendix 7.4: Aerial Investigation and Mapping (AIM) Report
  - Appendix 7.5: Geophysical Survey Phase 1 Report
  - Appendix 7.6: Geophysical Survey Phase 2 Report
  - Appendix 7.7: Archaeological Trial Trenching Final Report
  - Appendix 7.8: Palaeolithic and Palaeoenvironmental Evaluation Report
  - Appendix 7.9: Cultural Heritage Impact Assessment Summary Tables
  - Appendix 7.10: Archaeological Mitigation Strategy

## 7.2 Competent expert evidence

7.2.1 The assessment has been undertaken and reported by a team of competent heritage specialists. The competent expert responsible for the built heritage assessment is a Heritage Consultant, BA (Hons), MA, Member of the Institute of Historic Building Conservation, and Member of the Chartered Institute for Archaeologists (MCIfA). The competent expert responsible for the archaeological and historic landscape assessment is a Senior Archaeologist, BSc (Hons) and MCIfA. They have, respectively, 24 years' and 20 years' experience of undertaking cultural heritage for major infrastructure and linear projects, including major highways schemes, for which the process of Environmental Impact Assessment (EIA) has been required.

## 7.3 Stakeholder engagement

7.3.1 There has been engagement with stakeholders throughout the preliminary design process to steer the development of the proposed scheme in terms of cultural heritage considerations.

7.3.2 Table 7.1 summarises the key feedback received from the Scoping Opinion in relation to cultural heritage (Planning Inspectorate, 2021).

7.3.3 Consultation has been ongoing with key stakeholders throughout development of the Environmental Statement as summarised in Tables 7.1 to 7.3 below.

**Table 7.1 Key Scoping Opinion feedback for cultural heritage**

Stakeholder	Comment	Response
Planning Inspectorate	The assessment needs to take into account Boreham House's setting including the grade II listed registered park and garden.	The Environmental Statement has considered the impact to the setting of Boreham House, and this has been reported in Section 7.11 of this chapter.
Planning Inspectorate	The two historic greens, Easthorpe Green and Potts Green, which form the landscape settings of Easthorpe Green Farmhouse grade II listed building, and the junction of two Roman roads (where the A12 meets Easthorpe Road) should be included within the non-designated archaeological assets assessment.	Easthorpe Green (Asset 902) and Potts Green (Asset 909) have been included in the baseline for assessment.

Stakeholder	Comment	Response
<p>Planning Inspectorate</p> <p>Historic England</p>	<p>Taking into consideration the nature of the proposed scheme is to replace the existing A12, it is unlikely that the scheme would result in significant operational effects to the historic landscape. Therefore, the Inspectorate agrees that this matter can be scoped out of the Environmental Statement.</p> <p>Historic England advised that operational effects should be scoped in to the Environmental Statement due to the proposed scheme potentially having a harmful impact on the value of historic landscapes, in terms of the impact of the views, lighting and noise on setting, and the way in which the historic landscape is experienced.</p>	<p>The Applicant has taken a precautionary approach by scoping operational phase impacts on the historic landscape into the assessment (see Section 7.11 of this chapter).</p>
<p>Planning Inspectorate</p>	<p>The Environmental Statement should provide a detailed archaeological baseline including summaries of the results of archaeological investigations undertaken, and these investigations should be appended to the Environmental Statement to support its conclusions. Furthermore, where additional data is available, such as within the Colchester Historic Environment Record (HER), the desk based assessment should be updated with this information.</p>	<p>Data from the Colchester HER have been obtained and included in the baseline for this assessment, as have the results of geophysical surveys, an AIM Report, and the results of archaeological trial trenching and Palaeolithic archaeological evaluation. Please refer to Appendices 7.4 to 7.8 of the Environmental Statement [TR010060/APP/6.3] for the investigation results.</p>
<p>Planning Inspectorate</p>	<p>The nature and scope of specialist palaeolithic survey and assessment ahead of the preparation of the Environmental Statement should be devised in consultation with relevant statutory heritage consultees. An initial deposit model for the proposed scheme should be prepared that could be enhanced following later specialist geoarchaeological sampling. Geophysical and geoarchaeological techniques that can investigate deeper deposits of archaeological interest should be considered.</p>	<p>A programme of archaeological evaluation including an evaluation of Palaeolithic archaeological potential and creation of a deposit model (Appendices 7.4 to 7.8 of the Environmental Statement TR010060/APP/6.3]), has been conducted in line with an archaeological Written Scheme of Investigation prepared in consultation with stakeholders. The results of the archaeological evaluation have informed the assessments in this chapter.</p>

Stakeholder	Comment	Response
<p>Planning Inspectorate</p> <p>Historic England</p> <p>Colchester Borough Council</p> <p>Essex County Council</p>	<p>The Planning Inspectorate stated that the extent of the study area should be informed by the nature of the heritage assets in addition to the type and extent of likely impacts on them, rather than an arbitrary pre-determined distance.</p> <p>Historic England stated that the study area for designated heritage assets should extend to 2km based on the preliminary zone of theoretical visibility (ZTV). If significant effects on the heritage assets beyond 1km are scoped out, this needs to be evidence-based. The assessment study area should be based on the sensitivity of the receiving environment and the potential impacts of the proposed scheme.</p> <p>Colchester Borough Council and Essex County Council agreed that a 300m study area for designated and non-designated heritage assets and a 1km study area for designated heritage assets is reasonable apart from assets of the greatest sensitivity where a greater catchment area should be considered.</p>	<p>A study area extending 1km from the Order Limits has been used to identify designated cultural heritage assets where impacts from the proposed scheme could occur to their setting. Assets have been selected for assessment of potential significant effects on their setting beyond 1km (see Section 7.7 of this chapter) informed by professional judgement guided by the ZTV. Please refer to the ZTV in Figure 8.3 [TR010060/APP/6.2], which supports the landscape and visual impact assessment (LVIA) reported in Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1].</p>
<p>Planning Inspectorate</p>	<p>The Environmental Statement should avoid a generalised approach as no systematic archaeological investigation has been undertaken at this stage and it is difficult to establish the value of the majority of below-ground archaeological remains along the proposed route.</p>	<p>Although some non-designated archaeological sites have been assessed as being of low or negligible value based on their morphology and the absence of associated surface finds, the programme of archaeological evaluation has provided a more detailed understanding of the nature, date and state of preservation of such sites within the footprint of the proposed scheme. Please refer to Appendices 7.4 to 7.8 of the Environmental Statement [TR010060/APP/6.3] for the investigation results. The value of archaeological sites identified in the evaluations is recorded in Appendix 7.1 [TR010060/APP/6.3].</p>

Stakeholder	Comment	Response
Colchester Borough Council	The Colchester 'local list' should be integrated into the assessment.	Assets from the Colchester Borough Local List have been integrated into the assessment where they are within the 300m study area.
Essex County Council	Updated conservation area boundaries for Braintree District Council and Colchester Borough Council should be used for the assessment.	Updated conservation area boundaries were obtained from the relevant local authorities in January 2021.
Historic England	<p>There are concerns about the impacts of the route between junction 24 (Kelvedon North interchange) and junction 25 (Marks Tey interchange). The proposed bypass would impact the grade II listed buildings at Easthorpe Green Farm (Easthorpe Green Farmhouse and Church View/Flispes). There would also be impacts on the grade II* listed barn at Marks Tey Hall. Associations with historic Easthorpe Green and Potts Green, which form their settings, require detailed assessment in the Environmental Statement.</p> <p>The Environmental Statement should clearly cross-reference to the baseline landscape chapter data. The landscape and visual assessment should include heritage specific viewpoints (photographs, photomontages and wirelines) to illustrate and support the results of the heritage assessment.</p> <p>Setting impacts on heritage assets should not be restricted to visual impacts and should include other factors during construction and operation.</p>	<p>A detailed assessment of visual effects on receptors from representative viewpoints, which includes these heritage assets, is presented in Appendix 8.3 of the Environmental Statement [TR010060/APP/6.3], which supports Chapter 8: Landscape and visual [TR010060/APP/6.1], and was undertaken in accordance with DMRB LA 107 (Highways England, 2020b). Historic England have also been consulted on these representative viewpoints. Appropriate mitigation measures in accordance with DMRB LA 106 (Highways England, 2020c) have been developed and included in Section 7.10 of this chapter and Appendix 7.9 [TR010060/APP/6.3].</p> <p>Impacts from other aspects such as noise and groundwater have also been taken into account in Section 7.11 of this chapter.</p>

7.3.4 The full Scoping Opinion, as well as the Applicant's response regarding how and where comments have been addressed in the Environmental Statement and draft Development Consent Order (DCO), is included within Appendix 5.1 [TR010060/APP/6.3] of the Environmental Statement.

7.3.5 Table 7.2 identifies the key feedback received from the statutory consultation. All comments raised during the statutory consultation, as well as the Applicant's responses, are included in the Consultation Report [TR010060/APP/5.1].



**Table 7.2 Key statutory consultation feedback for cultural heritage**

Stakeholder	Comment	Response
Historic England	Advise that the scheduled monument known as 'Roman villa, Anglo-Saxon hall, cemetery and church site, around and to the north and east of St Mary and All Saints Church' (LEN 1013831) is included in the assessment as it lies immediately outside the 1km study area. This is consistent with our advice to the Environmental Scoping Report (Highways England, 2020a).	This cultural heritage asset has been included in the baseline for assessment in the Environmental Statement as Asset 976 (see Section 7.8 of this chapter).
Historic England	We note that only grade I and II* listed buildings are included in the baseline section of the Preliminary Environmental Information Report (PEIR) (Highways England, 2021) because of the high number of listed buildings in the study area. The large number of grade II designated heritage assets should not preclude them from assessment, unless they are grouped together within conservation areas. We would strongly recommend that these designated assets are also assessed in the Environmental Statement.	Grade II listed buildings have been included individually in the assessment for the Environmental Statement. An assessment of the impact of the proposed scheme on all assets, including grade II listed buildings, has been provided in Tables A.2 and A.5 of Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].
Historic England	We note that conservation areas and Grade II parks and gardens are identified in the PEIR as receptors of medium value (sensitivity), at the same level (i.e. medium value) as some non-designated heritage assets. In our opinion, all designated heritage assets should be categorised as being of high value or significance.	Registered parks and gardens are a non-statutory designation, and their value has been assessed on a case-by-case basis using professional judgement, and the criteria contained in DMRB LA 106 (Highways England, 2020c).
Historic England	We have previously advised the need for care with the use of fixed criteria and matrices. In terms of the assessment of setting, we consider the analysis of setting (and the impact upon it) as a matter of qualitative and expert judgement which cannot be achieved solely by use of systematic matrices or scoring systems, as proposed in the PEIR.	All impacts have been assessed using professional judgement, guidance contained within DMRB LA 104 (Highways England, 2020d) and DMRB LA 106 (Highways England, 2020c) and other best practice guidance. All guidance used in the course of the assessment is listed in Section 7.5 of this chapter.
Historic England	Advise that the Environmental Management Plan (EMP) is agreed with stakeholders in advance of submission of the Environmental Statement.	In line with our detailed programme of engagement, the first iteration of the EMP [TR010060/APP/6.5] has been shared with stakeholders prior to its submission for the DCO application and will be available for review during examination.

Stakeholder	Comment	Response
Historic England	<p>The PEIR states that no impacts have been predicted for the six scheduled monuments identified in the archaeological remains baseline, all of which are located outside the Order Limits. Two scheduled monuments are located, however, within 300m of the Order Limits (Assets 399 and 646; LEN nos. 1008980 and 1013515).</p>	<p>The existing A12 highway and associated infrastructure, as well as the effects of traffic movement and noise, are already prominent elements in the setting of these assets. Although there may be temporary impacts on their setting during construction, and medium to long-term operation of the proposed scheme, it is not considered that they would be significant in heritage terms (see Section 7.11 of this chapter).</p>
Historic England	<p>We would advise that Asset 902 (Easthorpe Green, Copford) should be assessed together with nearby listed buildings (as well as each asset individually), as they derive significance from their group value, and also their spatial relationship to the historic line of the A12.</p> <p>Likewise, Potts Green, Marks Tey and nearby listed buildings.</p>	<p>The historic greens have been assessed under the built heritage and historic landscape matters, and their inter-relationships (including those with other assets) taken into consideration where appropriate.</p>
Historic England	<p>The proposed offline section of raised road, between Kelvedon and Marks Tey, is positioned in the gap between the current, and historic, alignment of the A12 and these settlements. We would advise the need for detailed visual assessment, as well as noise and light assessments, for all these settlements, in order to assess the impact of the proposed offline section, both during construction and operation.</p>	<p>These types of impacts on settlements in general have been assessed as part of the LVIA presented in Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1], and the results taken into consideration in Section 7.11 of this chapter.</p>

Stakeholder	Comment	Response
<p>Historic England and Essex County Council</p>	<p>The ZTV, and proposed viewpoints, should be produced in relation to the cultural heritage, and in relation to designated heritage assets – and this should be used to inform the assessment, and to inform the heritage viewpoints for further analysis. It is unclear how viewpoints have been informed by the assessment of cultural heritage, and this needs to be clarified in the Environmental Statement. These have not been discussed with Historic England.</p> <p>No photomontage has been proposed for Marks Tey Hall, which includes one Grade II* and two Grade II listed buildings (one viewpoint, 24, is proposed but no other visualisations). No photomontages are proposed for Braxted Park, which is a Grade II* park and garden (one viewpoint, 12, is proposed). Viewpoints should be agreed with Historic England and the local authority historic environment advisers to assess the impact of the proposed development on the setting of these assets.</p> <p>A 1km study area has been used for designated assets. While a 300m study area has been used for all other heritage assets (non-designated). A selection of assets will be assessed for potential significant effects beyond the 1km study area in the Environmental Statement, using informed judgement and forthcoming data from the ZTV study. The study areas indicated are appropriate, although the methodology for the ZTV and how heritage assets will be assessed would need to be clearly set out.</p>	<p>Viewpoints for the landscape and visual assessment have been chosen in accordance with DMRB LA 107 Landscape and Visual Effects (Highways England, 2020b) and Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013). The results of visual effects on receptors from representative viewpoints, which includes these heritage assets, is presented in Appendix 8.3 [TR010060/APP/6.3], which supports Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1].</p> <p>There has been discussion and agreement between Historic England and the proposed scheme landscape team regarding the viewpoint locations and requested photomontages.</p> <p>The methodology for the selection of assets over 1km from the proposed scheme for assessment is described in Section 7.7 of this chapter.</p>
<p>Historic England</p>	<p>We would ask that a non-technical summary of noise, light, traffic, and landscape impacts on the designated heritage assets is also provided in the cultural heritage chapter, with cross-referencing. This should be aimed at helping us to interpret the technical data and assess the impact.</p>	<p>A non-technical summary of the results of these assessments is included in the Environmental Statement Non-Technical Summary [TR010060/APP/6.4].</p> <p>The results of these assessments are presented in Chapter 8: Landscape and visual and Chapter 12: Noise and vibration, of the Environmental Statement [TR010060/APP/6.1], and have been taken into account in the assessment of impacts on cultural heritage assets where relevant.</p>

Stakeholder	Comment	Response
Historic England	We would advise that the cumulative impacts of the proposed A120 Braintree to A12 project should be assessed in the Environmental Statement. Two options were proposed in 2018 for the junction with the A12. The project is currently being reviewed and updated, with a preferred route selection in March 2022. We would strongly advise that the cumulative impact of this scheme, and the new junction, is assessed for both proposed locations because a preferred route has not yet been announced.	The A120 Braintree to A12 project is scoped out of the cumulative effects assessment reported in Chapter 16 of the Environmental Statement [TR010060/APP/6.1]. It is included in the Road Investment Strategy 3 pipeline and will therefore be implemented after the proposed scheme. It would be for the A120 project EIA to consider the cumulative effects in due course.
Historic England	Careful assessment will be required to establish the significance of any palaeolithic deposits and discussion to minimise, and mitigate, the impact of the proposed scheme on any remains. We would expect the assessments to build on the findings and recommendations presented in the Palaeolithic Desk-based Assessment prepared for this project.	Specialist fieldwork has been undertaken to evaluate the Palaeolithic archaeological potential of the Order Limits. The results are presented in Appendix 7.8 of the Environmental Statement [TR010060/APP/6.3].
Historic England	The results of the archaeology evaluation, specialist palaeolithic survey and deposit model, and the proposals for mitigation, should be discussed and agreed in advance of the submission of the Environmental Statement. We note that copies of the full survey reports will be included in the appendices to allow the information to be critically assessed.	The results of the archaeological evaluation were discussed and agreed with Historic England and the local authority heritage advisors on 13 April 2022.  The evaluation reports are presented as Appendices 7.4 to 7.8 of the Environmental Statement [TR010060/APP/6.3].
Historic England	We note that non-designated archaeological remains such as field boundaries, undated cropmark features, are categorised as negligible in the PEIR. For example, it is suggested that archaeological remains including possible ring ditches, enclosures or trackways identified through aerial photographs and geophysical survey are of low value. The significance of such remains needs to be properly assessed; it is possible that their value could be of medium, if not high, value, depending on, for example, date, preservation and association of the archaeological remains.	The value of archaeological sites can vary depending on a wide variety of factors, and the assessments presented in the PEIR were based on the information available at the time. The results of the archaeological trial trenching have allowed the value of those assets affected by the proposed scheme to be assessed in more detail, and this has been taken into account in Section 7.8 of this chapter.

Stakeholder	Comment	Response
Historic England	<p>Deposits of palaeoenvironmental and geoarchaeological potential should be included and discussed in terms of the impact that the proposed development may have on them. For example, deposits can be physically removed or damaged or could experience changes to the preservation conditions if groundwater levels are changed or if contaminants are present. It is stated in the Palaeolithic Desk-based Assessment that the ground investigation boreholes will be investigated in terms of their archaeological potential, but this information will also help to characterise and understand the palaeoenvironmental and geoarchaeology potential.</p>	<p>Potential impacts on Palaeolithic archaeological potential have been assessed in this chapter, informed by the results of specialist evaluation. The palaeoenvironmental potential of deposits encountered has also been assessed.</p> <p>A programme of archaeological excavation, and investigation of Palaeolithic and Quaternary deposits, will be developed and implemented. Full details of the scope and extent of the required work is contained in Appendix 7.10: Archaeological Mitigation Strategy, of the Environmental Statement [TR010060/APP/6.3].</p>
Historic England	<p>Undated archaeological remains identified, for example, by aerial photography or geophysical survey, need to be further assessed by trial-trenched evaluation. This is to establish their significance with more certainty before values, and also magnitudes of impact, are attributed that could be otherwise misleading. For example, the magnitude of impact has been assessed to be moderate for any archaeological remains associated with the Kelvedon Iron Age Warrior and mitigation for this impact would include archaeological excavation of the affected area. Depending on the significance of any below-ground remains identified by trial-trenching, however, it is possible that the magnitude of impact could be much higher.</p> <p>The assessment of the likely significant effects presented in the PEIR will need to be supported by the detailed evidence in the Environmental Statement.</p>	<p>Such assets have been included in the trial trenching where they are within the Order Limits. It is not possible to invasively investigate archaeological sites outside the Order Limits and the value of such assets have been assessed using professional judgement guided by the criteria contained in DMRB LA 106 (Highways England, 2020c) and other best practice guidance (see Section 7.5 of this chapter).</p>
Historic England	<p>Church Field at Hatfield Peverel (Asset 133) is recorded to be the location of a church demolished during the Dissolution. The value of this asset has been assessed to be low. It is possible that the value of this site could be significantly higher, and this needs to be established by archaeological evaluation, especially as a temporary site compound/laydown area is proposed in this area.</p>	<p>Assessments of impact presented in this chapter reflect the results of the trial trenching and other specialist surveys completed to date.</p> <p>The evaluation report has been included as Appendix 7.7 of the Environmental Statement [TR010060/APP/6.3].</p>

Stakeholder	Comment	Response
Historic England	<p>The geology and soils and road drainage and the water environment assessments will aid the assessments of the potential impact of the proposed scheme on the historic environment. For example, the potential for groundwater contamination has been discussed, which may impact the preservation conditions of deposit of archaeological interest. The proposed development may also alter the groundwater levels, temporarily or permanently, as well as potentially affecting the flow of groundwater. Assessments should also include the impacts of contaminants. The mitigation strategy proposed to manage these issues should also consider how the measures may impact on the historic environment. We would recommend that the Historic England documents 'Preserving Archaeological Remains' (2016a) and 'Piling and Archaeology' (2019a) are referred to.</p>	<p>Potential for impacts from changes to the groundwater regime and watercourses have been assessed in Section 7.11 of this chapter, based on data presented in Appendix 14.4: Groundwater Assessment, of the Environmental Statement [TR010060/APP/6.3].</p> <p>Preserving Archaeological Remains (Historic England, 2016a) and Piling and Archaeology (Historic England, 2019a) are among a number of guidance documents used to inform the assessment of impacts and design of mitigation measures.</p>
Essex County Council	<p>The built heritage impact assessment should be prepared in line with Historic England's guidance GPA3, The Setting of Heritage Assets (2017a).</p>	<p>Assessments of the contribution of setting to the value of heritage assets, and of the impact of the proposed scheme upon it, have been conducted using professional judgement guided by the methodology in Historic England's (2017a) guidance GPA3, The Setting of Heritage Assets.</p>
Essex County Council	<p>Continued and detailed assessment, particularly of operational impacts, will be required in the forthcoming Environmental Statement. The visual impact and the effect of the proposed scheme on the setting of heritage assets should be fully explored, with multiple photographs to and from the heritage assets. The non-visual impacts also require further assessment, with other factors such as noise, dust, light, traffic and vibration, along with seasonal and diurnal changes, being considered. There are concerns that these non-visual impacts have been considered for the construction phase but have not yet been considered for the operational phase. These are potentially more significant impacts for built heritage.</p>	<p>The effects of impacts on the setting of cultural heritage assets during construction and operation of the proposed scheme have been assessed and are presented in Section 7.11 of this chapter.</p>

Stakeholder	Comment	Response
Essex County Council	<p>Mitigation included in the PEIR, such as retained mature vegetation, new tree planting and new hedgerow planting, can help to soften the visual impact, however, it can also be subject to change through seasonal changes, pruning or complete removal. Further design mitigation methods should be fully explored. A photographic survey and historic landscape survey is suggested, to make a record of the historic landscapes, the condition of the heritage assets and their setting before construction begins. This should also provide data for landscaping and embedded (design) mitigation, along with additional bespoke mitigation measures, specifically designed to reduce the impact of the proposed scheme on the setting of the heritage assets that are adversely affected. A full account of these proposed mitigation measures should be included within the heritage chapter of the Environmental Statement, along with an assessment of their effectiveness. Using photographs and photomontages, the mitigation measures should be cross-referenced with the landscape and visual assessment, with particular focus on heritage specific viewpoints, to demonstrate their effectiveness.</p>	<p>A range of mitigation methods has been considered and details are presented in Section 7.10 of this chapter.</p>
Colchester Borough Council	<p>The most notable affected listed buildings impacted by the proposed scheme are the Parish Church of All Saints, Inworth (Grade I) and the important group of listed buildings that comprise Marks Tey Hall (Grades II-II*). Marks Tey Hall is very close to the proposed new junction 25. Whilst it is accepted that in an ancient landscape of settled character, potential impacts on the wider setting of listed buildings is inevitable, it is consequently essential that the proposed scheme makes provision for effective mitigation of the adverse impacts identified to ensure that the long term future of these designated heritage assets is not prejudiced. The use of embedded design mitigation as the foundation approach is valid but will inevitably require additional asset specific mitigation to address residual impacts. In particular, those assets identified as having a moderate adverse impact must have bespoke solutions identified to mitigate this material harm.</p>	<p>A range of mitigation methods has been considered and details are presented in Section 7.10 of this chapter.</p>

Stakeholder	Comment	Response
Colchester Borough Council	It is stated that the trial trenching is scheduled to be completed before DCO submission, and that these surveys will be completed in full during summer 2021 and reported on within the Environmental Statement. 'Completion in full' should also mean completion of all necessary post excavation work.	<p>A full report on the trial trenching with specialist assessment was completed in December 2021 and is presented in Appendix 7.7 [TR010060/APP/6.3].</p> <p>The results of the trial trenching have informed assessments of both the value of, and effects of impact upon, archaeological remains.</p>

**Table 7.3 Record of consultation undertaken with key stakeholders**

Date	Stakeholder	Topic
25/11/2020	Essex County Council, Colchester Borough Council and Historic England	Discussed the scope of intrusive evaluation. Agreed trial trenching sample size, targeted specialist geophysical survey, Palaeolithic evaluation methodology, and fieldwork monitoring arrangements.
29/01/2021	Essex County Council, Colchester Borough Council and Historic England	Discussed their comments on the draft intrusive evaluation Written Scheme of Investigation. Agreed responses to their comments to finalise the Written Scheme of Investigation for issue.
03/02/2021	Essex County Council, Colchester Borough Council, Chelmsford City Council and Historic England	Discussed the proposed heritage assessment methodology. Agreed approach to assessment and selection of baseline assets.
07/10/2021	Essex County Council and Colchester Borough Council	Discussed the initial trial trenching results.
24/11/2021	Essex County Council, Colchester Borough Council, Chelmsford City Council and Historic England	Discussed progress of the built heritage assessment and identified key constraints.
26/01/2022	Essex County Council, Colchester Borough Council and Chelmsford City Council	Discussed final trial trenching results and agreed an approach to development of an archaeological mitigation strategy.
13/04/2022	Essex County Council, Colchester Borough Council, Chelmsford City Council and Historic England	Discussed the results of trial trenching in detail and agreed the approach to mitigation in principle.
16/05/2022	Historic England, Colchester Borough Council, Chelmsford City Council	Discussed conclusions of the built heritage assessment and the outcomes in relation to likely significant effects and proposed mitigation.



## 7.4 Legislative and policy framework

### Legislation

#### Scheduled monuments

- 7.4.1 Scheduled monuments are of national importance and are protected by law under the Ancient Monuments and Archaeological Areas Act 1979. It is a criminal offence to damage a scheduled monument, and consent (known as scheduled monument consent) must be obtained from the Secretary of State for Digital, Culture, Media and Sport before any works affecting a scheduled monument may take place (although this consent would be part of the DCO application for a scheme).

#### Listed buildings

- 7.4.2 The Planning (Listed Buildings and Conservation Areas) Act 1990 empowers the Secretary of State for the Environment, Food and Rural Affairs to maintain a list of built structures of special historic or architectural significance. There are three grades of listed building (grade I, grade II\* and grade II), all of which are of special architectural or historic interest and are considered to be of national importance. The Act establishes that it is a criminal offence to carry out any works to a listed building without listed building consent. Section 66(1) of the Act, in the determination of applications affecting listed buildings, states:

*'In considering whether to grant planning permission or permission in principle for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.'*

- 7.4.3 In addition, fixtures and curtilage buildings, that is any object or structure which is fixed to the building or is within the curtilage and forms part of the land and has done so since before July 1948, are also treated as part of the building for the purposes of listed building control.

#### Conservation areas

- 7.4.4 Section 69(1)(a) of the Planning (Listed Buildings and Conservation Areas) Act 1990 requires local authorities to designate any '*areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance*'.

- 7.4.5 Section 72(1) of the Act imposes the following statutory duty on local authorities in determining planning applications:

*'...with respect to any buildings or other land in a conservation area... special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area.'*

#### Registered parks and gardens

- 7.4.6 Under powers conferred on Historic England through the Historic Buildings and Ancient Monuments Act 1953 (as amended), parks and gardens which are assessed by Historic England to be of special historic interest may be recorded

on the Register of Parks and Gardens of Special Historic Interest in England (Historic England, 2022). There are three grades of registered parks and gardens (grade I, grade II\* and grade II). Inclusion of a site on the Register does not confer any additional legal protection of the site, but makes the effect of proposed development on the sites and their settings a material consideration in the determination of planning applications.

## National policy

### National Policy Statements

7.4.7 The National Networks National Policy Statement (NNNPS) (Department for Transport, 2014) sets out the Government's policies to deliver the development of Nationally Significant Infrastructure Projects on the national road and rail networks in England. The Secretary of State uses the NNNPS as the primary basis for making decisions on DCO applications.

7.4.8 Key policy from the NNNPS relevant to cultural heritage is set out in Table 7.4.

**Table 7.4 NNNPS requirements for cultural heritage**

NNNPS paragraph	NNNPS requirement	How this is addressed in the assessment
5.120	Paragraph 5.120 of the NNNPS states that the construction and operation of national networks infrastructure has the potential to result in adverse impacts on the historic environment.	This chapter assesses the impacts of the proposed scheme on the historic environment.
5.122	This paragraph defines heritage assets as those elements of the historic environment that hold value to current and future generations because of their historic, archaeological, architectural or artistic interest. The sum of the heritage interests that a heritage asset holds is referred to as its significance (heritage value). Significance derives not only from a heritage asset's physical presence, but also from its setting.	This chapter quantifies heritage assets at risk of potential impacts from the proposed scheme, and assesses their significance (see Section 7.11 of this chapter).
5.124	Paragraph 5.124 requires that non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments should be considered subject to the policies for designated heritage assets.	Non-designated cultural heritage assets have been identified through desk-based study (Appendices 7.1, 7.2, 7.3 and 7.4 of the Environmental Statement [TR010060/APP/6.3]), supplemented by a programme of non-intrusive and intrusive field evaluation (Appendices 7.5, 7.6 and 7.7 of the Environmental Statement [TR010060/APP/6.3]).

NNNPS paragraph	NNNPS requirement	How this is addressed in the assessment
5.127	<p>Paragraph 5.127 states that the applicant should describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset's importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the relevant HER should be consulted and the heritage assets assessed using appropriate expertise. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, the applicant should include an appropriate desk-based assessment and, where necessary, a field evaluation.</p>	<p>Non-designated cultural heritage assets have been identified through desk-based study (Appendices 7.1, 7.2, 7.3 and 7.4 of the Environmental Statement [TR010060/APP/6.3]), supplemented by a programme of non-intrusive and intrusive field evaluation (Appendices 7.5, 7.6 and 7.7 of the Environmental Statement [TR010060/APP/6.3]).</p>
Footnote 96	<p>Footnote 96 describes the setting of a heritage asset as:</p> <p><i>'...the surroundings in which it is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.'</i></p>	<p>The contribution of setting to the significance of cultural heritage assets has been assessed as part of the baseline data gathering to inform this chapter (see Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3]).</p>
5.129	<p>Paragraph 5.129 requires that in considering the impact of a proposed development on any heritage asset, the Secretary of State should take into account the particular nature of the significance of the heritage asset.</p>	<p>The significance of cultural heritage assets has been assessed as part of the baseline data gathering to inform this chapter (see Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3]).</p>
5.130	<p>Paragraph 5.130 states that the Secretary of State should take into account the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets, the contribution of their settings and the positive contribution that their conservation can make to sustainable communities, including their economic vitality.</p>	<p>Measures to sustain and, where practicable, enhance the significance of cultural heritage assets are included in Section 7.10 of this chapter.</p>

NNNPS paragraph	NNNPS requirement	How this is addressed in the assessment
5.131	Paragraph 5.131 states that substantial harm to or loss of grade II listed buildings and grade II registered parks and gardens should be exceptional and that substantial harm to, or loss of, scheduled monuments, grade I and II* listed buildings and grade I and II* registered parks and gardens should be wholly exceptional.	No physical impacts or setting impacts of substantial harm on designated cultural heritage assets have been identified in the assessment.
5.132	Paragraph 5.132 states that any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset, the greater the justification that will be needed for any loss.	Significant effects on designated cultural heritage assets, during the construction and operational phases, have been identified and, where practicable, mitigation proposed (see Sections 7.10 and 7.11 of this chapter). Where significant residual effects remain following mitigation, effects of only large or very large adverse significance are considered to equate to 'substantial harm' within the definition of the NNNPS (Department for Transport, 2014). This is discussed in more detail in Section 7.5 of this chapter. A summary of all effects, including those assessed not to be significant, is presented in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].

7.4.9 As set out in Chapter 1: Introduction, of the Environmental Statement [TR010060/APP/6.1], the assessment has considered the Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (Department of Energy and Climate Change, 2011a; 2011b) in relation to the diversion of an existing high pressure gas main (the 'gas main diversion') owned and operated by Cadent Gas Limited (Cadent). Draft versions of the updated EN-1 and EN-4 NPS have also been considered (Department for Business, Energy and Industrial Strategy, 2021a; 2021b).

7.4.10 A review of the relevant requirements of EN-1 and EN-4 (including the draft updated versions), relating to the EIA of the gas main diversion works, identified that the requirements are not materially different to those set out in the NNNPS. As such, it is considered that by meeting the NNNPS requirements set out in Table 7.4, the requirements of EN-1 and EN-4 are also met.

#### **National Planning Policy Framework**

7.4.11 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) defines the setting of a heritage asset as:

*'The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral' (Annex 2: Glossary of NPPF).*

- 7.4.12 Where a development affects a heritage asset the NPPF requires an assessment to be made of whether this constitutes less than substantial or substantial harm the result of which affects the policies which should be applied. The NPPF does not define what constitutes substantial harm, however, the accompanying Planning Practice Guidance states that *'Whether a proposal causes substantial harm will be a judgment for the decision-maker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases'* (Ministry of Housing, Communities and Local Government 2019, Para 18).

### Local policy

- 7.4.13 In addition to the national policy set out in the NNNPS, the proposed scheme has also had regard to relevant local plans and policy. A summary of the policy framework is provided in Appendix 1.1 of the Environmental Statement [TR010060/APP/6.3].
- 7.4.14 The policies contained in these policy documents reflect and reiterate those of the NNNPS, and the assessments of heritage value and significance of effects, as well as proposals for mitigation contained in this chapter, have been made in accordance with both national and local policy requirements.
- 7.4.15 Key local policy relevant to this aspect is summarised in Table 7.5 below, and set out in more detail in Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3].

**Table 7.5 Local policy requirements for cultural heritage**

Local policy document	Policy	How this is addressed in the assessment
Chelmsford Local Plan 2013-2036 (Chelmsford City Council, 2020)	DM13 sets out Chelmsford City Council's approach to development affecting designated heritage assets. It includes the statement <i>'Where there is substantial harm or total loss of significance of the designated heritage asset, consent will be refused unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss'</i> .	No impacts on designated cultural heritage assets resulting in substantial harm have been identified in Section 7.11 of this chapter.

Local policy document	Policy	How this is addressed in the assessment
Chelmsford Local Plan 2013-2036	DM14 sets out Chelmsford City Council’s approach to development affecting non-designated heritage assets. It requires the applicant to demonstrate that <i>‘harm is minimised through retention of features of significance and/or good design and/or mitigation measures’</i> .	Mitigation measures for impacts on cultural heritage assets are proposed in Section 7.10 of this chapter, and set out in detail in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].
Braintree District Local Plan Review (Braintree District Council, 2005)	RPL 95 sets out Braintree District Council’s intent to <i>‘encourage the enhancement of, the character and appearance of designated Conservation Areas and their settings’</i> .  RPL 103 sets out Braintree District Council’s intent to protect the <i>‘historic character, or setting’</i> of registered parks and gardens.	Mitigation measures for impacts on cultural heritage assets are proposed in Section 7.10 of this chapter, and set out in detail in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].
	RPL 104 sets out Braintree District Council’s approach to development affecting scheduled monuments and other archaeological sites and their settings <i>‘whether scheduled or not’</i> .	Archaeological remains have been identified through a programme of non-intrusive and intrusive field evaluation (Appendices 7.5, 7.6 and 7.7 of the Environmental Statement [TR010060/APP/6.3]).  The contribution of setting to the significance of cultural heritage assets has been assessed as part of the baseline data gathering to inform this chapter (see Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3]).
	RPL 105 sets out Braintree District Council’s approach to development affecting archaeological sites, in particular the requirement for pre-determination investigations to <i>‘assess the character, importance and extent of the archaeological deposits’</i> to <i>‘allow an informed and reasonable decision to be made on the planning application’</i> .	Archaeological remains have been identified through a programme of non-intrusive and intrusive field evaluation (Appendices 7.5, 7.6 and 7.7 of the Environmental Statement [TR010060/APP/6.3]).

Local policy document	Policy	How this is addressed in the assessment
	<p>RLP 106 sets out Braintree District Council's requirements for the development of mitigation measures where archaeological remains are affected by development.</p>	<p>Mitigation measures for impacts on cultural heritage assets are proposed in Section 7.10 of this chapter, and set out in detail in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].</p>
<p>Braintree Publication Draft Local Plan (Braintree District Council, 2017)</p>	<p>LPP 56 sets out Braintree District Council's approach to development affecting conservation areas. It requires the applicant to use materials of <i>'high quality and appropriate to local context'</i>.</p>	<p>Mitigation measures for impacts on cultural heritage assets are proposed in Section 7.10 of this chapter, and set out in detail in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].</p>
	<p>LPP 60 sets out Braintree District Council's approach to cultural heritage assets and their settings. This includes the requirement for <i>'details of the significance of the heritage asset'</i> including <i>'any contribution made by their setting'</i> to be contained in any application.</p>	<p>The contribution of setting to the significance of cultural heritage assets has been assessed as part of the baseline data gathering to inform this chapter (see Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3]).</p>
	<p>LPP 63 sets out Braintree District Council's approach to archaeological remains. It includes a requirement for archaeological evaluation to be carried out by the applicant and submitted as part of an application where archaeological remains are thought to be at risk from development. It also includes a presumption in favour of retaining such remains in situ where possible, and where not, that <i>'conditions ensuring an appropriate programme of archaeological investigation, recording, reporting and archiving prior to development commencing'</i>.</p>	<p>Archaeological remains have been identified through a programme of non-intrusive and intrusive field evaluation (Appendices 7.5, 7.6 and 7.7 of the Environmental Statement [TR010060/APP/6.3]).</p> <p>Mitigation measures for impacts on cultural heritage assets including archaeological remains are proposed in Section 7.10 of this chapter, and set out in detail in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].</p>

Local policy document	Policy	How this is addressed in the assessment
Chelmsford Local Plan 2013-2036	<p>S3 sets out Chelmsford City Council's strategic approach to heritage assets including archaeological remains.</p> <p>DM15 sets out Chelmsford City Council's approach to development affecting archaeological remains, including the requirement for assets to be assessed in consultation with the Historic Environment Record; for their archaeological importance to be assessed and recorded, and for the effectiveness of preservation by record to be considered.</p>	<p>The archaeological baseline has been developed in consultation with the HER and includes the results of desk-based assessment (Appendices 7.2, 7.3 and 7.4 of the Environmental Statement [TR010060/APP/6.3]), non-intrusive fieldwork (Appendices 7.5 and 7.6 [TR010060/APP/6.3]) and a programme of trial trenching and post-excavation assessment (Appendix 7.7 [TR010060/APP/6.3]). Detailed mitigation measures are presented in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].</p>
Colchester Local Development Framework – Core Strategy and Development Policies (Colchester Borough Council, 2014a; 2014b)	<p>DP14 sets out Colchester Borough Council's approach to archaeological remains. It includes the requirement for archaeological evaluations to provide sufficient information to assess the impact of development upon them, and the effectiveness of mitigation measures.</p>	<p>The archaeological baseline has been developed in consultation with the HER and includes the results of desk-based assessment (Appendices 7.2, 7.3 and 7.4 of the Environmental Statement [TR010060/APP/6.3]), non-intrusive fieldwork (Appendices 7.5 and 7.6 [TR010060/APP/6.3]) and a programme of trial trenching and post-excavation assessment (Appendix 7.7 [TR010060/APP/6.3]). Detailed mitigation measures are presented in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement [TR010060/APP/6.3]).</p>
Colchester Borough Local Plan 2017-2033 – Publication Draft (Colchester Borough Council, 2017)	<p>PP1 (vi) sets out Colchester Borough Council's approach to archaeological remains affected by infrastructure projects, including requirements to assess the significance of assets including the use of geophysical survey and trial trenching, and for the development of a mitigation strategy. These requirements are amplified by DM16.</p>	<p>The archaeological baseline has been developed in consultation with the HER and includes the results of desk-based assessment (Appendices 7.2, 7.3 and 7.4 of the Environmental Statement [TR010060/APP/6.3]), non-intrusive fieldwork (Appendices 7.5 and 7.6 [TR010060/APP/6.3]) and a programme of trial trenching and post-excavation assessment (Appendix 7.7 [TR010060/APP/6.3]). Detailed mitigation measures are presented in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement [TR010060/APP/6.3]).</p>



Local policy document	Policy	How this is addressed in the assessment
Maldon District Local Development Plan 2014-2029 (Maldon District Council, 2017)	D3 sets out Maldon District Council's approach to archaeological remains including the requirement that where a development may affect such remains an assessment be carried out, including consultation with the Historic Environment Record, to confirm the likely impact of the development, and to confirm likely mitigation strategies.	The archaeological baseline has been developed in consultation with the HER and includes the results of desk-based assessment (Appendices 7.2, 7.3 and 7.4 of the Environmental Statement [TR010060/APP/6.3]), non-intrusive fieldwork (Appendices 7.5 and 7.6 [TR010060/APP/6.3]) and a programme of trial trenching and post-excavation assessment (Appendix 7.7 [TR010060/APP/6.3]). Detailed mitigation measures are presented in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement) [TR010060/APP/6.3].

## 7.5 Assessment methodology

### Scope of the assessment

- 7.5.1 A scoping exercise was undertaken in 2020 to establish the form and nature of the cultural heritage assessment, and the approach and methods to be followed.
- 7.5.2 The Environmental Scoping Report (Highways England, 2020a) sets out the matters to be assessed in this chapter, and the criteria which have been used to assess significance for this aspect.
- 7.5.3 The Planning Inspectorate agreed that operational effects to the historic landscape could be scoped out of the assessment; however, following feedback from Historic England in the Planning Inspectorate's (2021) Scoping Opinion, operational effects have been scoped in as a precautionary approach.
- 7.5.4 The scope of this assessment is summarised in Table 7.6. This scope is compliant with the Scoping Opinion (Planning Inspectorate, 2021).

**Table 7.6 Summary of cultural heritage scope**

Matter	Scoped in – construction	Scoped in – operation
Archaeological remains	✓	✓
Built heritage	✓	✓
Historic landscape	✓	✓

### Historic England guidance

- 7.5.5 The following Historic England guidance has been used during preparation of this chapter:

- Historic England Advice Note 1: Conservation Area Appraisal, Designation and Management (Second Edition) (Historic England, 2019b)
- Historic Environment Good Practice Advice in Planning 2: Managing Significance in Decision-Taking in the Historic Environment (Historic England, 2015)
- Historic Environment Good Practice Advice in Planning 3: The Setting of Heritage Assets (Second Edition) (Historic England, 2017a)
- Historic England Advice Note 7: Local Heritage Listing: Identifying and Conserving Local Heritage (Second Edition) (Historic England, 2021)
- Historic England Advice Note 10: Listed Buildings and Curtilage (Historic England, 2018)
- Historic England Advice Note 12: Statements of Heritage Significance: Analysing Significance in Heritage Assets (Historic England, 2019c)
- Historic England Advice Note 2: Making Changes to Heritage Assets (Historic England, 2016b)
- Preserving Archaeological Remains: Decision-taking for Sites under Development (Historic England, 2016a)
- Piling and Archaeology: Guidelines and Good Practice (Historic England, 2019a)

### **General approach**

- 7.5.6 This assessment has been undertaken in accordance with the relevant sections of DMRB LA 106 Cultural Heritage Assessment (Highways England, 2020c).
- 7.5.7 A programme of non-invasive archaeological evaluation, comprising geophysical survey and AIM, has been completed and the results are presented in Appendices 7.4, 7.5 and 7.6 of the Environmental Statement [TR010060/APP/6.3]. These surveys were followed by a programme of archaeological trial trenching and test-pitting within the Order Limits, the results of which are presented in Appendix 7.7 of the Environmental Statement [TR010060/APP/6.3]. This programme of evaluation has been designed to establish the nature, extent and survival of known and unknown subsurface archaeological remains and geoarchaeological potential.
- 7.5.8 The cultural heritage desk-based assessment (DBA) (Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3]) was originally prepared and issued in 2018. It has been updated to include design changes and the results of invasive and non-invasive archaeological evaluations and has helped to inform the detailed assessment of potential impacts on cultural heritage assets in this chapter.
- 7.5.9 The Hedgerows Regulations 1997 provide for the protection of certain hedgerows, including on grounds of archaeology and history (Schedule 1, Part II). Hedgerows are not considered to be heritage assets in their own right but do

contribute to the understanding of historic landscape types (HLTs) through their historic use as land parcel boundaries. Hedgerows within the Order Limits have been assessed as part of the biodiversity assessment (see Chapter 9: Biodiversity, of the Environmental Statement [TR010060/APP/6.1]). A schedule of hedgerows that satisfy the archaeology and history criteria of the Hedgerow Regulations 1997 is presented in Annex F to Appendix 9.7: Hedgerow Survey Report, of the Environmental Statement [TR010060/APP/6.3]. Under Regulation 6(1)(e), *'The removal of any hedgerow to which these Regulations apply is permitted if it is required ... for carrying out development for which planning permission has been granted or is deemed to have been granted'*. Therefore, consent to remove hedgerows would be authorised through consent of the DCO application, not through an application to the relevant local authority.

- 7.5.10 As discussed in Chapter 5: Environmental assessment methodology, of the Environmental Statement [TR010060/APP6.1], cultural heritage receptors can be impacted from multiple sources. Consideration of these combined impacts (intra-project effects) is an integral part of assessing the effect on cultural heritage assets. Impacts from other aspects, such as landscape and visual, noise and vibration, and groundwater, have therefore been taken into account when determining the likely significant effects on cultural heritage assets presented in Section 7.11 of this chapter. Cross-references to other aspect chapters are provided where relevant.

### **Assessing the value and sensitivity of receptors**

- 7.5.11 The value of archaeological assets is based on a number of qualities, including intrinsic, contextual and associative characteristics, such as age, state of preservation and level of supporting knowledge. These characteristics are independent of the various potential impacts on the cultural heritage asset from the proposed scheme.
- 7.5.12 Built heritage assets can be valued based on a number of heritage criteria, principally those defined in Conservation Principles, Policies and Guidance (English Heritage, 2008), which are historical value, evidential value, aesthetic value and communal value. This value is further supported by the contribution made by the heritage asset's setting, which is the surroundings in which the heritage asset is experienced.
- 7.5.13 The value of historic landscape assets derives from a combination of quantitative characteristics, such as their relative abundance at a local, regional or national scale, as well as any associated designations. It also takes into account qualitative factors like evidence of the evolving tenurial structure; relationships with wealth, status and power; the contribution of and to designed landscapes; and the evolution of a sense of place.
- 7.5.14 All receptors within the baseline have been assigned a value based on professional judgement together with guidance in DMRB LA 104 (Highways England, 2020d). Table 7.7 provides examples of the value of receptors in the cultural heritage baseline. Full details of all cultural heritage assets including assessments of value are presented in the Cultural Heritage Gazetteer (Appendix 7.1 of the Environmental Statement [TR010060/APP/6.3]).

**Table 7.7 Value of receptors in the study area for cultural heritage**

<b>Value and sensitivity</b>	<b>Description</b>	<b>Examples within the study area</b>
Very high	Very high importance and rarity, international scale and very limited potential for substitution.	None in the cultural heritage baseline
High	High importance and rarity, national scale, and limited potential for substitution.	<ul style="list-style-type: none"> <li>• Scheduled monuments</li> <li>• Listed buildings</li> <li>• Registered parks and gardens</li> <li>• Potential archaeological remains of Palaeolithic date</li> <li>• Non-designated archaeological remains and built heritage assets, assessed on a case-by-case basis</li> </ul>
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.	<ul style="list-style-type: none"> <li>• Conservation areas, assessed on a case-by-case basis</li> <li>• Non-designated archaeological remains and built heritage assets, assessed on a case-by-case basis</li> </ul>
Low	Low or medium importance and rarity, local scale.	<ul style="list-style-type: none"> <li>• Non-designated archaeological remains and built heritage assets, assessed on a case-by-case basis</li> </ul>
Negligible	Very low importance and rarity, local scale.	<ul style="list-style-type: none"> <li>• Non-designated archaeological remains and built heritage assets, assessed on a case-by-case basis</li> </ul>

### **Assessing the significance of effects**

- 7.5.15 The general approach to assessing the significance of effects is set out in Chapter 5: Environmental assessment methodology, of the Environmental Statement [TR010060/APP/6.1], and is based on DMRB LA 104 Environmental Assessment and Monitoring (Highways England, 2020d). This methodology has been used because it is required by paragraph 3.10 of DMRB LA 106 (Highways England, 2020c).
- 7.5.16 The assessment of value (sensitivity) of assets has been undertaken based on the assessment criteria in Table 7.7 above. The magnitude of impact and significance of effects has been assessed in accordance with the standards in

DMRB LA 104 (Highways England, 2020d) (see Chapter 5: Environmental assessment methodology [TR010060/APP/6.1]).

- 7.5.17 The assessment of cultural heritage effects involves combining the value of a heritage asset with the predicted magnitude of impact from the proposed scheme, using professional judgement guided by the significance matrix set out in DMRB LA 104 (see Chapter 5: Environmental assessment methodology [TR010060/APP/6.1]).
- 7.5.18 Within the DMRB methodology, significant effects comprise those effects that are assessed as being either within the moderate, large or very large categories, as set out in DMRB LA 104. Where there are significant effects identified on heritage assets during the construction and operational phases, mitigation has been proposed wherever practicable to reduce the significance of effects.
- 7.5.19 However, only those significant residual impacts which are assessed as being either large or very large, using the DMRB LA 104 methodology, are considered to equate to 'substantial harm' within the definition provided in the NPPF. This is because the planning practice guidance supporting the NPPF (Ministry of Housing, Communities and Local Government, 2019) defines 'substantial harm' as being a 'high test' which may not arise in many cases.
- 7.5.20 Where the significance of an effect has the option to be attributed to two descriptors within the DMRB LA 104 matrix, for example large/very large, professional judgement has been used to determine which of the descriptors is most appropriate.

## 7.6 Assessment assumptions and limitations

- 7.6.1 The information presented in this assessment reflects that obtained and evaluated at the time of reporting and is based on the preliminary design of the proposed scheme and the full extent of land required for its construction and operation. It is assumed that data provided by third parties are accurate and up to date at the time of reporting.
- 7.6.2 The built heritage assessment is based on an evaluation of the impacts on the settings of built heritage assets conducted on a site-by-site basis. The assessment takes into consideration the ZTV, plus key representative viewpoint analysis and photomontages which support it, as detailed in the LVIA (see Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1]). However, the ZTV is based upon a 'bare-earth' ground model, so it only considers the screening provided by the existing topography and does not take into account the visual screening provided by surface features such as buildings, tree cover and other vegetation.
- 7.6.3 It is assumed that utility diversion works would result only in temporary impacts to the setting of built heritage assets, and that these would be managed through standard mitigation and good site practice.
- 7.6.4 The limits of deviation shown on the Works Plans [TR010060/APP/2.2] have been taken into account in the preparation of the cultural heritage assessment, and the potential impacts of a deviation within the permitted limits have therefore been assessed.

7.6.5 The Palaeolithic and Palaeoenvironmental Evaluation Report presented as Appendix 7.8 of the Environmental Statement [TR010060/APP/6.3] contains a number of specialist annexes, some of which are draft and may be updated. If updates are required, it is considered unlikely that the content of any of these reports will materially affect the conclusions upon which the assessment and any mitigation has been based.

## 7.7 Study area

7.7.1 DMRB LA 106 (Highways England, 2020c) states that a study area for new roads '*shall include the footprint of the scheme plus any land outside that footprint which includes any heritage assets which could be physically affected*', and that it should include '*the settings of any designated or other cultural heritage resource in the footprint of the scheme or within the zone of visual influence or potentially affected by noise*'.

7.7.2 A 300m study area has been applied to all heritage assets, which is considered appropriate to assess the potential physical and setting impacts on designated and non-designated assets.

7.7.3 The assessment has also considered a wider study area of 1km from the Order Limits for impacts on the settings of designated heritage assets, comprising scheduled monuments, listed buildings (all grades), registered battlefields, registered parks and gardens, and conservation areas.

7.7.4 Beyond 1km, a selection of heritage assets has been assessed for setting impacts based on professional judgement, informed by the ZTV and viewpoint analysis provided in the LVIA (Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1]).

7.7.5 The study area for the cultural heritage assessment is shown on Figures 7.1 and 7.2 [TR010060/APP/6.2].

## 7.8 Baseline conditions

### Baseline sources

7.8.1 To inform the cultural heritage baseline, the following sources of information were consulted:

- The National Heritage List for England for information on designated heritage assets (scheduled monuments, listed buildings, registered parks and gardens, registered battlefields, world heritage sites, and protected wrecks) provided by Historic England (2022)
- Heritage assets recorded on the Essex HER provided by Essex County Council in January 2021
- Essex Historic Landscape Characterisation Project (Bennett, 2013)
- Heritage assets recorded on the Colchester HER were provided by Colchester Borough Council in January 2021
- Information on conservation areas and locally listed buildings from Braintree District Council and Colchester Borough Council websites

- Conservation Area Character Appraisals and Management Plans for Feering (Braintree District Council, 2020a) and Kelvedon (Braintree District Council, 2020b)
- Witham Town Centre, Newland Street Conservation Area Appraisal and Management Plan (Braintree District Council, 2007)
- A DBA which sets out the known assets within the study area. The DBA was originally prepared in 2018 and has been updated to align with the Order Limits and include results of the geophysical survey (Appendix 7.2 of the Environmental Statement [TR010060/APP/6.3])
- A Palaeolithic DBA (Appendix 7.3 of the Environmental Statement [TR010060/APP/6.3])
- An AIM Report (Appendix 7.4 of the Environmental Statement [TR010060/APP/6.3])
- Geophysical (magnetometer) surveys undertaken between 6 December 2019 and 6 March 2020 (Appendices 7.5 and 7.6 of the Environmental Statement [TR010060/APP/6.3])
- The final report on the archaeological trial trenching (Appendix 7.7 of the Environmental Statement [TR010060/APP/6.3])
- Palaeolithic and Palaeoenvironmental Evaluation Report (Appendix 7.8 of the Environmental Statement [TR010060/APP/6.3])

## Baseline information

### Summary of the cultural heritage baseline

7.8.2 There are 946 cultural heritage assets within the baseline of the proposed scheme. The values of all cultural heritage assets in the baseline are summarised in Table 7.8.

**Table 7.8 Summary of cultural heritage baseline**

Matter	Negligible	Low	Medium	High	Very high	All values total
Archaeological remains	301	106	45	10	0	462
Built heritage (inc. conservation areas)	5	23	9	428	0	465
HLTs (inc. registered parks and gardens)	7	6	2	4	0	19
<b>Total</b>	<b>313</b>	<b>135</b>	<b>56</b>	<b>442</b>	<b>0</b>	<b>946</b>

- 7.8.3 All archaeological remains assets are illustrated on Figure 7.1 and built heritage assets and historic landscapes on Figure 7.2 [TR010060/APP/6.2]. Each cultural heritage asset has been given an individual number for ease of reference. A gazetteer of all assets within the baseline is included in Appendix 7.1 of the Environmental Statement [TR010060/APP/6.3], and additional detail is available in the DBA within Appendix 7.2 [TR010060/APP/6.3]. The cultural heritage baseline is summarised in more detail in the following paragraphs.
- 7.8.4 The East of England is recognized as an internationally important area for the study of the Palaeolithic (up to 10,000BC) (O'Connor, 2015, p. 72). The proposed scheme passes through a part of Essex where geological conditions are considered suitable for the preservation of in situ remains and palaeoenvironmental evidence from this period, as demonstrated by the geoarchaeological evaluation carried out at Colemans Farm, Rivenhall (Asset 362) and Hoxnian lake deposits recorded at Marks Tey (Asset 906). A detailed DBA of the potential for the presence of Palaeolithic archaeological remains was carried out to inform this chapter and can be found in Appendix 7.3 [TR010060/APP/6.3]. The early prehistoric period (up to 2,500BC) is largely represented by isolated finds such as hand axes dating from the Palaeolithic (Assets 150, 362, 378, 388, 393, 685 and 813).
- 7.8.5 The Palaeolithic and Palaeoenvironmental Evaluation Report (presented as Appendix 7.8 of the Environmental Statement [TR010060/APP/6.3]) breaks the proposed scheme down into five Quaternary Landscape Evaluation Areas (QLEA), each of which includes areas of high potential for the presence of interglacial lake and lake-edge deposits, where *in situ* palaeolithic archaeological remains could be found (Appendix 7.8, Part 2, Illustration 31): QLEA1 – south of Junction 19 (UPQ-29A); QLEA2 – between the A12 and Maldon Road, south of Witham (UPQ-26A); QLEA3 – between Junction 22 and Junction 23, including the known Palaeolithic site at Colemans Farm Quarry (UPQ-5A, UPQ-5C, UPQ-8B and UPQ-9); QLEA4 – between Ewell Hall Chase and Highfields Lane, Kelvedon (UPQ-13B); and QLEA5 – north of Queensbury Avenue, Copford (UPQ-23). From these areas, four areas of high Palaeolithic potential have been identified (Assets 978 to 981).
- 7.8.6 The Mesolithic (10,000–4,000BC) and Neolithic (4,000–25,000BC) periods are also mostly represented by chance finds of flint implements and evidence of their manufacturing (Assets 335, 342, 391 and 395), although more substantial evidence such as the scheduled long mortuary enclosures at Rivenhall (Asset 399) and Frame Farm Feering (Asset 737), and a non-designated possible long barrow at Colemans Farm, Rivenhall (Asset 391), are also known.
- 7.8.7 There is an increase in evidence from the Bronze Age (2,500–800BC). Many of the recorded sites are structural in nature or linked to potential areas of activity, such as ring ditches, pit alignments and enclosures (Assets 19, 122, 688, 863, 954, 960 and 964), as well as finds of pottery and other artefacts (Assets 37, 76, 390, 449, 664 and 820). Evidence gathered during trial trenching also suggests that there may be long continuity of occupation at some sites, meaning that Bronze Age occupation may have been obscured by later and more extensive activity in the Iron Age and Roman periods.



- 7.8.8 The progression into the Iron Age (800BC–AD43) is illustrated in the increase in assets providing clear evidence of settlement activity. The unenclosed settlements of the late Bronze Age progressed to a more enclosed form towards the middle of the period. As with earlier periods, evidence at many locations comes from stray finds of pottery and flint, of which there are many in the study area (Assets 84, 316, 409, 422, 454, 459, 469, 639, 653, 659, 660, 704, 714, 722, 809 and 873). Settlement evidence includes enclosures, roundhouses, ditches, post-holes and pits. Sixteen such sites are known within the study area for the proposed scheme, of which five have been newly identified during archaeological evaluations conducted to inform this chapter (Assets 951, 963, 968, 969 and 971).
- 7.8.9 There are few overtly ceremonial Iron Age monuments within the baseline, although the findspot of the Kelvedon Iron Age Warrior (Asset 657) is of particular note as a high status individual, buried with arms and armour including a sword which appeared to have been deliberately broken. At Church Road and Plantation Road, Boreham, an Iron Age cremation cemetery (Asset 855) depicting more typical burials was discovered during construction of a housing development.
- 7.8.10 The Roman period (AD43–410) is well represented in the HERs. Archaeological evaluation and aerial photography analysis, undertaken mainly as part of the National Mapping Programme and recorded in the HER, has identified a significant number of assets dating to the period and range from settlement evidence to individual finds, which reflects the extent of movement and trade that was common at this time. The route of the existing A12 follows a Roman precursor for much of its length east of Chelmsford (Roman *Caesaromagus*) (Assets 1, 111, 112 and 780) except where it deviates south of the towns of Witham and Kelvedon. Although it is likely that evidence of the Roman road would have been removed by construction of the existing A12, it is possible that it could be preserved in places. Seven other sections of Roman road are also recorded in the baseline (Assets 376, 736, 761, 772, 774, 926 and 927), indicating the potential for it to have influenced the development of settlements and farming.
- 7.8.11 A single high status site of the Roman period has been identified. The scheduled monument of a Roman villa, Anglo-Saxon hall, cemetery and church site, around and to the north and east of St Mary and All Saints Church, Rivenhall (Asset 976), is located a little over 1km north-west of the proposed scheme.
- 7.8.12 As with the preceding periods, much evidence for the location and extent of Roman activity within the baseline is derived in the first instance from stray finds of artefacts, of which 55 are known. Seventeen sites of Roman date have been recorded within the study area (Assets 177, 348, 354, 411, 530, 673, 729, 949, 950, 956, 958, 965, 966, 967, 970, 975 and 976), which range in scale from a cemetery at Kelvedon (Asset 530); industrial sites and a pottery kiln (Assets 729 and 966); agricultural field systems (Assets 967 and 675); and enclosures potentially associated with domestic activity (Assets 177, 354, 411, 673, 949, 950, 956, 958, 965 and 970). Of these assets, nine were identified during

evaluations carried out to inform this chapter (Assets 949, 950, 956, 958, 965, 966, 967, 970 and 975).

- 7.8.13 The earliest changes within the Early Medieval period (AD410–1066) are often difficult to identify due to the continuation of Roman influence in the area. There are 20 sites dated to the Early Medieval period within the baseline, of which 13 are stray finds of artefacts from the ploughsoil. Among the more substantial archaeological remains are funerary sites, including the scheduled monument of an Anglo-Saxon cemetery 150m east of Easterford Mill (Asset 646), as well as non-designated Anglo Saxon Cemeteries at Witham, Little Braxted and Kelvedon (Assets 187, 348 and 648). There are also field systems at White Hart Lane, Springfield (Asset 2); the site of a demolished house dated from documentary sources (Asset 135); and the site of Burgate Field Enclosure (Asset 354). The latter was, however, shown to potentially be the continuation of an extensive Roman domestic site as a result of evaluation carried out to inform this chapter.
- 7.8.14 It is during the Early Medieval period that buildings as well as archaeological remains are encountered. Within the study area, four churches contain fabric from, or can trace their origins to, this period: Church of St Andrew, Boreham (Asset 89); Church of St Peter, Wickham Bishops (Asset 304); Parish Church of All Saints, Inworth (Asset 708); and Church of St Mary, Copford (Asset 801). The relative rarity of these assets is recognised in their designation as listed buildings.
- 7.8.15 As well as 52 findspots of pottery, metalwork and other materials, there are a further 20 archaeological sites of Medieval date (AD1066–1540).
- 7.8.16 Among some of the high-status Medieval sites within the study area were hunting or deer parks, of which two are known: New or Little Park, New Hall, Boreham (Asset 5); and Red Deer Park, New Hall, Boreham (Asset 45). Neither are designated heritage assets, and their existence can be traced mainly through documentary sources and the survival of some elements of their boundaries in the modern field pattern. New or Little Park was considered to be the highest status parkland site in Essex based on its size alone.
- 7.8.17 Moated sites consist of wide ditches, often water-filled, and partly or completely enclosing one or more islands on which stood domestic or religious buildings. The majority served as high status residences, with the moat intended to function as a status symbol rather than a practical means of defence. Typically constructed between the mid-13<sup>th</sup> and mid-14<sup>th</sup> centuries AD, they are particularly common in eastern England. Many examples provide conditions favourable to the survival of organic remains and their enclosing ditches are often the only extant part of the site. Five moated sites have been identified within the study area (Assets 105, 706, 818, 862 and 932), including the recently designated scheduled monument at Marks Tey Hall Moated Site (Asset 818).
- 7.8.18 Deserted settlements like Church Hills (Asset 134) are a common site type dating from the Medieval period, although earlier and later examples also exist. They are often preserved in the landscape as earthworks or cropmarks. There is a variety of reasons for their desertion, although reduction of populations through illness during events like the Black Death in the 14<sup>th</sup> century, and

migration of their inhabitants to larger settlements and cities during the Post-Medieval and later periods, are often cited.

- 7.8.19 Potts Green, Marks Tey (Asset 909) is an example of a village green, many of which were of Medieval origin when they were created to provide communal grazing as protection from animal predators and theft. They also functioned as a location for recreation.
- 7.8.20 Many of the towns and villages in the study area have their origins in the Medieval period, and this is reflected in the designation of the Witham (Chipping Hill) (Asset 195), Witham Town Centre (Newland Street) (Asset 251), Kelvedon (Asset 566) and Feering (Asset 666) Conservation Areas, which all have Medieval buildings in the cores.
- 7.8.21 Significant Medieval historic buildings in the baseline include:
- One scheduled monument: Hatfield Priory (Asset 165)
  - Six grade I listed buildings, comprising New Hall, Boreham (Asset 10); 1-5, High Street, Kelvedon (Asset 499); and the parish churches of St Nicholas, Little Braxted (Asset 358), St Mary, Kelvedon (Asset 477), All Saints, Feering (Asset 746) and St Andrew, Marks Tey (Asset 796)
  - 22 grade II\* listed buildings, comprising the churches of St Andrew, Hatfield Peverel (Asset 163) and St Albright, Stanway (Asset 941); sixteen houses or cottages (Assets 88, 151, 209, 272, 420, 486, 512, 525, 582, 587, 601, 619, 623, 662, 822 and 942); the barn south of Marks Tey Hall (Asset 816); Kitchen/Dovecote, approximately 100 metres north of Little Braxted Hall (Asset 356); and two public houses (Assets 140 and 618)
  - 58 grade II listed buildings, including six farmsteads and individual agricultural buildings (Assets 50, 126, 191, 448, 472 and 479); 44 houses or cottages including Prested Hall (Asset 730); two public houses (Assets 262 and 654); and a smithy (Asset 201)
- 7.8.22 Four historic landscape assets contain elements of Medieval date. Although its designation as a grade II\* registered park and garden is based on its 18<sup>th</sup> century designed landscape, Little Braxted Park (Asset 480) traces its origins back to a Medieval hunting park. The Ancient Woodland (HLT 8), Unenclosed Heath (HLT 10) and Enclosed Meadow Pasture (HLT 11) types also include field morphologies established in the Medieval period.
- 7.8.23 Assets from the Post-Medieval (AD1540–1901) period are the most numerous, with 97 archaeological sites, 359 historic buildings and structures, and 10 HLTs. This reflects both the growth of settlements, agriculture and infrastructure like canals and railways in this period, and the longevity of the structures and their reuse into the modern era. Examples include the Chelmer and Backwater Navigation (Asset 152), constructed in the late 18<sup>th</sup> century to transport goods and people between Chelmsford and Maldon. There are 18 individual assets associated with the canal within the study area, and a measure of its value can be seen in the five grade II listed locks and bridges (Assets 20, 35, 36, 51 and 78), and its designation as a Conservation Area (Asset 68). The Wickham Bishops timber trestle railway viaduct (Asset 290) is a unique example of this

type of structure in Britain, and the importance of industrial heritage is demonstrated by the circular brick kilns, W H Collier Brick and Tile Works, Church Lane (Asset 804). Both the railway viaduct and circular brick kilns are designated as scheduled monuments.

- 7.8.24 As with the preceding periods, there are numerous stray finds of artefacts from this period with 41 recorded within the study area.
- 7.8.25 As well as country houses like the grade I listed Boreham House (Asset 69) and its grade II registered landscape park (Asset 67), and grade II registered parks at New Hall, Boreham (Asset 7), there are numerous farmsteads and agricultural buildings as well as cottages and village houses reflecting the rural landscape through which much of the proposed scheme passes.
- 7.8.26 Seven non-designated HLTs reflect the field patterns, settlements and infrastructure: Settlement (HLT 1), Industry (HLT 3), Mineral Extraction (HLT 4), Post-Medieval designed landscape (HLT 7), Post-Medieval Plantation (HLT 9), Pre-18<sup>th</sup> Century Enclosure (HLT 12) and 18<sup>th</sup> and 19<sup>th</sup> Century Enclosure (HLT 13).
- 7.8.27 Relatively few assets of modern (AD1901–Present) date have been identified, comprising 23 archaeological sites, 10 built heritage assets, and five HLTs. The strategic importance of the industrial and military sites in this part of Essex is reflected in the number of military assets within the study area. As well as the site of a night-landing ground established by the Royal Flying Corps at Easthorpe during WWI (Asset 778), there are 14 sites of demolished pillboxes and other defensive sites (Assets 22, 38, 39, 41, 46, 49, 108, 294, 299, 311, 315, 331, 343 and 858) and four extant similar assets (Assets 44, 53, 310 and 312). The most recent military asset is a Cold War Royal Observer Corps monitoring post at Hatfield Peverel (Asset 172). Military commemorative assets include the grade II listed war memorials at Witham (Asset 279) and Marks Tey (Asset 913).
- 7.8.28 Other modern assets include the early 20<sup>th</sup> century Kelvedon-Tiptree-Tollesbury Light Railway (Crab and Winkle) (Asset 735); Inworth Pumping Station (Asset 693); K6 Telephone Kiosk, Feering (Asset 745); and a former Methodist Church, London Road, Marks Tey (Asset 928).
- 7.8.29 Five HLTs reflect settlement growth and field boundary changes from the 20<sup>th</sup> century: Communications (HLT 2), comprising the existing A12; Horticulture (HLT 5); Recreation (HLT 6); Modern Agriculture (HLT 14); and Artificial Water Bodies (HLT 15).

#### **Summary of designated heritage assets within 1km**

- 7.8.30 Detailed descriptions of all designated cultural heritage assets are presented in Appendix 7.1 of the Environmental Statement [TR010060/APP/6.3].
- 7.8.31 There are no world heritage sites, registered battlefields or protected military remains, or protected wrecks within the 1km study area.
- 7.8.32 There are eight scheduled monuments within the 1km study area: Hatfield Priory (Asset 165); Wickham Bishops timber trestle railway viaduct (Asset 290); Rivenhall long mortuary enclosure (Asset 399); Anglo-Saxon cemetery 150m east of Easterford Mill (Asset 646); Long mortuary enclosure and round barrow

160m south-west of Frame Farm (Asset 737); circular brick kilns, W H Collier Brick and Tile Works, Church Lane (Asset 804); Marks Tey Hall Moated Site (Asset 818); and Roman villa, Anglo-Saxon hall, cemetery and church site, around and to the north and east of St Mary and All Saints Church (Asset 976).

7.8.33 There are 10 grade I listed buildings within the 1km study area: New Hall, Boreham (Asset 10); Boreham House, Boreham (Asset 69); Church Of St Andrew, Boreham (Asset 89); Church of St Nicholas, Little Braxted (Asset 358); Parish Church of St Mary, Kelvedon (Asset 477); 1-5, High Street, Kelvedon (Asset 499); Parish Church of All Saints, Inworth (Asset 708); Parish Church of All Saints, Feering (Asset 746); Church Of St Andrew, Marks Tey (Asset 796); and Church of St Mary, Copford (Asset 801). There are also 40 grade II\* listed buildings and 375 grade II listed buildings within the 1km study area.

7.8.34 There are four registered parks and gardens within the 1km study area: Braxted Park (Asset 480) is grade II\* registered; and New Hall, Boreham (Asset 7), Boreham House (Asset 67), and Hatfield Priory (Asset 162) are all grade II registered.

#### **Aerial mapping and interpretation**

7.8.35 The AIM Report in Appendix 7.4 of the Environmental Statement [TR010060/APP/6.3] comprises a desk-based review of aerial photographs, and specialist interpretation to identify potential new archaeological sites. This process identified one previously unknown site (Asset 955, Cropmarks south-east of Hole farm), and provided additional detail for two sites identified by the geophysical survey (Asset 954, Geophysical Anomalies west of Inworth Hall; and Asset 958, Enclosures west of Sniveller's Lane), as well as enhancing the understanding of a further 18 known assets recorded in the HER (Assets 121, 130, 182, 194, 277, 383, 411, 439, 458, 495, 600, 657, 673, 688, 696, 771, 775 and 776).

#### **Geophysical survey**

7.8.36 Archaeological evaluation of the route through geophysical survey was conducted in two phases between December 2019 and March 2020, and comprised a magnetometer survey of approximately 635 hectares. The results of the geophysical surveys are presented in Appendices 7.5 and 7.6 of the Environmental Statement [TR010060/APP/6.3]. Anomalies detected by the geophysical survey resulted in the identification of 10 previously unrecorded archaeological sites (Assets 407, 430, 949, 950, 951, 953, 954, 956, 957 and 958), mostly interpreted as being of prehistoric or Roman date, and ranging in value between negligible and medium depending on their apparent complexity. All have been taken into account when assessing the impact of the proposed scheme, and details are included in the Cultural Heritage Gazetteer (Appendix 7.1 of the Environmental Statement [TR010060/APP/6.3]).

#### **Archaeological trial trenching**

7.8.37 Archaeological evaluation by trial trenching was conducted throughout the Order Limits to test the interpretation of assets identified from desk-based sources, as well as those identified by the geophysical survey and AIM, and also to identify archaeological remains which may not be responsive to any of

the non-invasive means previously employed. A total of 2,117 linear trenches were used to target known HER assets, specific geophysical survey anomalies and cropmarks, and to test blank areas. A full report on the results of the trial trenching is presented in Appendix 7.7 of the Environmental Statement [TR010060/APP/6.3].

- 7.8.38 Eighteen previously unknown archaeological sites have been identified by the trial trenching (Assets 952, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974 and 975), mostly comprising field boundaries, enclosures and associated pits and post holes of late prehistoric or Roman date, with some sites of Post-Medieval date also being identified. All have been taken into account when assessing the impact of the proposed scheme, and full details are included in the Cultural Heritage Gazetteer (Appendix 7.1 of the Environmental Statement [TR010060/APP/6.3]).

### **Palaeolithic evaluation**

- 7.8.39 The results of evaluations to characterise the palaeolithic potential of the proposed scheme are presented in Appendix 7.8: Palaeolithic and Palaeoenvironmental Stage Evaluation Report [TR010060/APP/6.3].
- 7.8.40 Specialist geophysical techniques were employed to see if it was possible to characterise the relationship between deposits using non-intrusive methods and to supplement the results of test pit and borehole surveys. A single electrical resistivity imaging technique transect was conducted at the location of proposed borrow pit I, and electromagnetic conductivity transects were conducted at eight locations within the Order Limits.
- 7.8.41 Machine-dug test pits were excavated to a depth of 3m below ground level in a sample of trial trench locations to test for the presence of Palaeolithic deposits. Test pits were arranged in transects where possible to aid in the creation of a deposit model of the proposed scheme. A total of 88 test pits were excavated, distributed between the five QLEAs. Soil samples from each test pit were carefully hand sieved to identify worked flint and animal bone, and samples were also taken for palaeoenvironmental assessment and potential dating using amino acid racemisation.
- 7.8.42 A total of 113 boreholes, a mixture of window samples, cable-percussive, and rotary drilled samples, were sunk to characterise the nature of the sedimentary sequence throughout the proposed scheme. They were arranged as part of 18 transects to enable the creation of a deposit model to aid understanding of the palaeolithic stratigraphy of the proposed scheme, and reached depths of between 5m and 10m metres below ground level depending on the methodology used and ground conditions. Six of the transects were used to characterise the Holocene deposits associated with the river valleys crossed by the proposed scheme.
- 7.8.43 The investigations improved understanding of the location and extent of Palaeolithic archaeological remains with potential to be affected by the proposed scheme. Areas of potential defined as updated Palaeolithic and Quaternary zones (UPQ) are shown in Appendix 7.8 of the Environmental Statement [TR010060/APP/6.3] (Illustration 31). Rather than a single lake with an easily defined margin, the central area lake deposits identified east of

Witham proved to be a more complex infilled lake with marginal wetland at its edges. These deposits contained several areas considered to be of high potential for the presence of *in situ* palaeolithic remains (UPQ-5A, UPQ-5C, UPQ-8B and UPQ-9) (Asset 979). These areas of high potential are located approximately between junction 22 (Colemans interchange) and borrow pit I, east of Rivenhall End and including the known Palaeolithic site at Coleman’s Farm (Asset 362). Further areas of high potential were identified south of the A12 close to Howbridge Hall Road (UPQ-26A) (Asset 978), partially within borrow pit J between Highfields Lane and Ewell Hall Chase, Kelvedon (UPQ-13B) (Asset 980), and between the railway and Queensbury Avenue, north of Copford (UPQ-23) (Asset 981). Areas assessed by the same study to be of very high or high palaeoenvironmental potential coincide with the same areas, with the exception of an area south of junction 19 (Boreham interchange), close to the River Blackwater (UPQ-29A) (Asset 977).

**Review of the proposed scheme’s contribution to the archaeological record**

7.8.44 Table 7.9 lists the archaeological sites, deposits and features that have been identified through evaluation, either where none were previously recorded, or where the evaluation has significantly expanded the understanding of individual archaeological sites. This demonstrates the effectiveness of the archaeological evaluation in locating additional sites and features. These sites contribute to the understanding of the archaeological potential of the study area and beyond. The location and extent of these assets is shown on Figure 7.1 [TR010060/APP/6.2], and chainage distances can be cross-referenced with the General Arrangement Plans within Volume 2 of the DCO application [TR010060/APP/2.9]. Locations of areas of high potential for the presence of Palaeolithic and palaeoenvironmental remains are shown on Illustration 13 of Appendix 7.8: Palaeolithic and Palaeoenvironmental Evaluation Report [TR010060/APP/6.3].

**Table 7.9 Archaeological sites contributing to the understanding of the study area**

Asset	HER ref.	Chainage	Features found during evaluation
65: Boreham Hall cropmarks	MEX19562	9,750–10,100	A number of linear cropmarks and possible pits were identified from aerial photographs and recorded in the HER. The geophysical survey confirmed and refined the location, alignment and extent of some of the linear features, and trial trenching confirmed their archaeological origin, although no dating evidence was recovered.

Asset	HER ref.	Chainage	Features found during evaluation
<p>72: Lionfield Cottages cropmarks</p> <p>952: Lionfield Cottages area of palaeoenvironmental potential</p>	MEX1031236	11,500–11,800	<p>The geophysical survey identified a number of curvilinear anomalies that corresponded with field boundaries shown on early Ordnance Survey (OS) maps, as well as areas of magnetic disturbance.</p> <p>The trial trenching confirmed the presence of the field boundaries, although no dating evidence was recovered. A number of pits recorded in the same area were dated to between the late Bronze Age and Early Iron Age, suggesting an earlier origin than was previously thought to be the case. One feature was also thought to represent an Early Medieval sunken floored building.</p> <p>Environmental samples from alluvial deposits in a group of trenches in a small area close to Main Road revealed a diverse assemblage of wetland taxa and semi- or true-aquatic plants, suggesting they had been deposited in waterlogged conditions.</p>
121: Crix Farm Cropmark	MEX20775	14,500–14,800	<p>The AIM Report confirmed the presence of a pattern of linear features. They are not indicated on historic maps, and this was interpreted as evidence for a potential prehistoric origin.</p>
130: North of Brewhouse Wood	MEX28634	14,900–15,550	<p>Cropmarks including an enclosure marking a former circular wood block recorded on early OS maps but believed to have an earlier origin were recorded in the HER. The geophysical survey confirmed the location and extent of this enclosure and identified linear anomalies interpreted as part of a previously unknown enclosure.</p> <p>This location is outside the proposed scheme Order Limits and was not included in the trial trenching.</p>



Asset	HER ref.	Chainage	Features found during evaluation
133: Church Field, Hatfield Peverel	MEX20640	15,100– 15,400	<p>Recorded in the HER as a 'probable site' of the pre-Dissolution parish church based on the field name and documentary sources including a record of demolition debris in the area reported to the OS in the 1970s.</p> <p>The geophysical survey results were inconclusive, although strong ferrous anomalies appeared to support the HER interpretation.</p> <p>Trial trenching found no evidence of a demolished building in this area and appeared instead to support an alternative location for the church north of the railway.</p>
174: Cropmarks north of Sandfords Farm	MEX27194	17,700– 18,300	<p>Cropmarks of a rectangular enclosure and double-ditched trackway as well as Post-Medieval field boundaries were recorded in the HER.</p> <p>The geophysical survey confirmed the presence of linear features conforming to the field boundaries, but evidence for quarrying and other disturbance prevented identification of other features.</p> <p>Trial trenching confirmed limited evidence for 'pre-modern' features within the Order Limits.</p>
182: Cropmark NE of Knowle's Farm	MEX28421	18,600– 18,800	<p>The HER recorded cropmarks of a linear feature and pits, and the AIM Report added a large but incomplete enclosure with internal divisions, numerous pits and other features. There was also a trackway and possible round barrow. The report also noted that geological conditions could be masking other features from observation from the air.</p> <p>The features were located outside the Order Limits, preventing further investigation by trial trenching.</p>
194: Cropmarks near Dengie Farm	MEX27190	19,100– 19,450	<p>Cropmarks representing a possible double-ditched trackway were recorded in the HER, and the AIM Report added further linear cropmarks believed to represent a Medieval or earlier field system on a different alignment to the existing Post-Medieval field pattern.</p> <p>Trial trenching confirmed the presence of these features as well as a pit with in situ burning, suggesting some sort of short-term occupation, although no dating evidence was recovered to confirm their age.</p>

Asset	HER ref.	Chainage	Features found during evaluation
228: Olivers Farm cropmarks	MEX1031756	19,500– 20,150	<p>The HER recorded simply 'cropmarks showing linear features' in this area.</p> <p>Trial trenching confirmed the presence of a Post-Medieval field system depicted on early OS maps as well as a north to south aligned trackway which may possibly be a predecessor of nearby Howbridge Hall Road to the west.</p>
277: East of Olivers Farm, cropmarks 1	MEX27025	20,150– 20,400	<p>The HER recorded a number of linear cropmarks and pits at this location, and this was confirmed by the AIM Report.</p> <p>The geophysical survey confirmed the presence of these features, and trial trenching recorded linear ditches consistent with Post-Medieval field boundaries and evidence of what was interpreted as Post-Medieval waste dumping. Two linear features, the morphology of which was notably different from the Post-Medieval ditches, were recorded, although no dating evidence was found in either.</p>
354: Burgate field enclosure, Rivenhall End	MEX38628	23,500– 23,700	<p>The HER recorded this site as an embanked enclosure recorded on an 18<sup>th</sup> century estate map and believed to be potentially of late Roman or Early Medieval date. It is one of three potential candidates to be the site of Witham Burh founded by Edward the Elder in 912 AD.</p> <p>Trial trenching recorded numerous sections of linear ditches and gullies interpreted as an agricultural field system and irrigation features. Numerous isolated pits were also encountered. Dating evidence from these features in the form of pottery spanned the Bronze Age, Iron Age and Roman periods. Notably, no evidence for Early Medieval activity was recorded.</p>
368: South-east of Hoo Hall	MEX38768	24,100– 25,200	<p>Cropmarks of possible field boundaries and a sinuous double-ditched feature were recorded in the HER.</p> <p>The geophysical survey did not identify these features but did record a number of isolated anomalies interpreted as being pits of possible archaeological origin.</p> <p>The known extent of this asset is mostly located outside the Order Limits.</p>

Asset	HER ref.	Chainage	Features found during evaluation
383: North of Appleford Farm, prehistoric and Roman funerary site	MEX27089; MEX28353	24,000– 24,800	<p>Cropmarks of an enclosure and double-ditched ring ditch, as well as finds of burnt and struck flint of possible Neolithic or Bronze Age date and Roman pottery were recorded at this location in the HER.</p> <p>Isolated anomalies interpreted as being of potential archaeological origin were identified in this area, but the enclosure and other features were not confirmed.</p> <p>The known extent of this asset is mostly located outside the Order Limits.</p>
407: Circular enclosure and field system	N/A	25,400– 25,500	<p>The geophysical survey identified a small circular enclosure as well as a selection of discrete anomalies which were interpreted as being archaeological in origin and possibly associated with other nearby sites.</p>
411: Hole Farm 439: Cropmarks along Crane's Lane	MEX27069; MEX42758	25,400– 26,100	<p>The HER recorded two apparently complex adjacent cropmark sites comprising a series of rectilinear enclosures and/or field boundaries enclosing a ring ditch near the west of the site. It was dated to the Roman period based on surface finds of pottery and tile.</p> <p>The geophysical survey confirmed the presence of all elements of these sites including the ring ditch.</p> <p>Trial trenching confirmed the presence of these features and suggested a long history of occupation with multiple enclosures overlaid on one another. Finds recovered dated from the Mesolithic, Neolithic, Bronze Age and Roman periods.</p>
430: Square Enclosure	N/A	25,300– 25,400	<p>A limited number of anomalies were detected at this location by the geophysical survey, including two possible ring-ditches and a small number of discrete anomalies. They were interpreted as being of likely prehistoric date and related to other finds and features in the area around Hole Farm.</p>

Asset	HER ref.	Chainage	Features found during evaluation
439: Cropmarks along Crane's Lane	MEX42758	25,700– 26,100	<p>The HER recorded the cropmarks of linear features at this location and these were confirmed by the geophysical survey.</p> <p>The AIM Report noted extensive cropmarks including a square enclosure and incomplete annex of possible Roman date. A ring-ditch, with internal pits, that may represent a Bronze Age round barrow and a possible trackway as well as widespread linear features which may represent a field system associated with the enclosure.</p> <p>Trial trenching confirmed the presence of a multi-phase settlement enclosure complex and associated boundary ditches. Bronze and Iron Age pottery was recovered as well as worked flint of possible Mesolithic date.</p>
458: Crabb's Farm Cropmarks 1	MEX26270	26,100– 26,300	<p>Although the AIM Report confirmed the presence of cropmarks at this location, they were interpreted as being of likely post-medieval origin.</p>
495: Ashman's Farm cropmarks 2	MEX27174	26,200– 26,900	<p>The HER recorded cropmarks including a possible large ring ditch at this location, although the latter was not confirmed by the AIM Report.</p> <p>Trial trenching identified a number of linear ditches aligned at odds to the modern field pattern as well as individual pits. Finds of worked flint and pottery ranged from the Neolithic to Medieval periods, including late Iron Age and Roman finds. The site was interpreted as being an agricultural landscape of enclosures and field boundaries possibly associated with some of the nearby prehistoric and Roman sites.</p>
600: South of Ewell Hall	MEX27196	30,100– 30,400	<p>The HER recorded a rectilinear enclosure containing a possible building in the northern half of this site, and the AIM Report added a trackway, field boundaries and a possible ring ditch.</p> <p>The presence of overhead and underground utilities prevented trial trenching of this site.</p>

Asset	HER ref.	Chainage	Features found during evaluation
647: Kelvedon Enclosure	MEX1039971	31,000– 31,300	<p>The HER recoded two rectilinear enclosure in this area.</p> <p>Trial trenching confirmed the presence of these features as well as numerous linear ditches representing an associated field system and isolated pits. Although a small quantity of Mesolithic to Bronze Age flints were recovered, the finds assemblage was dominated by Roman pottery and tile suggesting the presence of a settlement. Preserved plant remains, including hulled wheat, bread wheat, barley, oats, legumes and hazelnut shells are suggestive of a mixture of arable and grassland and imply that crop processing was taking place at the site.</p>
657: Kelvedon Iron Age Warrior	MEX26911	30,500– 30,700	<p>The findspot of the 1<sup>st</sup> century BC warrior grave was recorded at this location in the HER.</p> <p>The AIM Report identified a number of linear cropmarks in this area, some of which were identified as being part of a Post-Medieval field system recorded on early OS maps, others as a possible enclosure south-east of, and associated with, the burial site.</p> <p>Trial trenching identified numerous features in this area including a number of discontinuous ditches, one of which with a strong V-shaped profile was too deep to excavate fully. Trenching also recorded many pits and post holes, and recovered dating evidence in the form of Iron Age and Roman pottery and Roman brick and tile suggesting the presence of a complex settlement in the area. There was also evidence for earlier prehistoric activity in the form of finds of worked flint.</p> <p>The evidence from this area points towards a potential settlement contemporary with the Kelvedon Iron Age warrior.</p>

Asset	HER ref.	Chainage	Features found during evaluation
673: West of Inworth Hall, cropmarks and geophysical anomalies	MEX26908	30,700– 30,850	<p>Located immediately east of the site of the Kelvedon Iron Age Warrior (Asset 657), this site was originally noted in the HER as a distinctive area of black earth coinciding with finds of Roman brick and tile fragments and interpreted as the location for a possible kiln.</p> <p>The AIM Report noted cropmarks of short linear features, pits and a possible incomplete curved enclosure possibly associated with the nearby Kelvedon Iron Age Warrior (Asset 657) and Roman settlement site (Asset 954).</p> <p>The geophysical survey was somewhat inconclusive, identifying only strong magnetic disturbance associated with extant and infilled Post-Medieval field boundaries.</p> <p>Trial trenching recorded sections of two linear ditches and a small number of shallow pits, the former being dated to the Roman period by finds of pottery.</p>
688: West of Brick Kiln Farm	MEX26253	31,400– 31,500	<p>The AIM Report confirmed the presence of a cropmark trackway recorded in the HER and added the traces of a possible Bronze Age barrow.</p>
696: Brickfield within Parish of Inworth	MEX1037246	31,750– 32,100	<p>The HER recorded the presence of a brickworks at this location which was still operational in the late 19th century. The Geophysical survey and AIM Report confirmed the presence of features interpreted as being related to this site.</p>
771: Cropmarks east of Prested Hall	MEX39032	33,400– 34,500	<p>A large area defined in the HER and containing cropmarks of infilled field boundaries, some of which were recorded on early OS maps.</p> <p>The AIM Report added more detail in the form of the site of a demolished farmstead and trackway.</p> <p>The geophysical survey identified further linear anomalies interpreted as potentially part of an enclosure.</p> <p>Sections of ditches corresponding with the supposed enclosure were recorded in two trenches close to the north edge of Asset 771, although no dating evidence was recovered.</p>

Asset	HER ref.	Chainage	Features found during evaluation
775: Cropmarks east of Hill House Farm	MEX28260	33,600– 34,100	<p>The HER records and AIM Report recorded two ring ditches, a possible enclosure and field boundaries in this location, some of which appeared to pre-date field boundaries shown on early OS maps.</p> <p>The geophysical survey confirmed the presence of one ring ditch and some possibly contemporary field boundaries.</p> <p>Trial trenching of this site confirmed an archaeological origin for the linear features and recovered dating evidence for occupation between the late Bronze Age and late Roman periods including worked flint, pottery, tile and animal bones. Environmental evidence believed to represent brewing among other activities was also noted. The trial trenching report concluded that this site represented a late prehistoric and/or Roman rural domestic settlement of some complexity and time depth.</p>
776: Cropmarks at Little Domsey	MEX39036	34,300– 34,950	<p>The cropmarks of infilled Post-Medieval field boundaries and the site of a demolished contemporary farmstead were recorded by the HER, and these were supplemented by the AIM Report which added the traces of a sinuous double-ditched trackway.</p> <p>The geophysical survey added a 22.5m diameter ring ditch as well as further linear anomalies believed to represent field boundaries.</p> <p>The trial trenching confirmed the archaeological origin of most of these features, and was able to differentiate between Post-Medieval field boundaries and earlier features including a rectangular enclosure, post holes and other features dated to the late Bronze Age and early Iron Age. This was interpreted as a potential domestic settlement.</p>

Asset	HER ref.	Chainage	Features found during evaluation
778: WWI landing ground at Easthorpe	MEX1032821	34,900– 35,300	<p>The site of a WWI night-landing ground that was returned to agriculture in 1919, and of which no surface trace was visible, was recorded in the HER.</p> <p>The geophysical survey identified only modern disturbance associated with buried modern services and recent use of the site as an off-road driving circuit.</p> <p>Trial trenching identified Post-Medieval field boundaries and other features recorded on early OS maps, as well as a small, ditched enclosure in the south-western corner of the site interpreted as a stock corral of Medieval date. Ephemeral evidence for Roman activity in the form of a small amount of residual pottery was also noted.</p>
779: Cropmarks west of Domsey Brook	MEX39040	34,600– 35,500	<p>The HER recorded cropmarks associated with field boundaries and an area of woodland named 'Domsey Grove' on early OS maps, and the geophysical survey confirmed the presence of these features.</p> <p>Trial trenching of this site confirmed the presence of a number of these features and additional ditches, suggesting that historically this area had been sub-divided into smaller fields than present or the layout recorded by the OS in the late 19<sup>th</sup> century. No dating evidence was recovered, but these features are presumed to be of Medieval or Post-Medieval date.</p>
888: Cropmarks west of Brick Kiln Farm	MCC6951	31,100– 31,800	<p>Initially recorded in the HER as cropmarks of a broad double-ditched trackway and what were interpreted as recently removed field boundaries.</p> <p>Geophysical survey confirmed these features and added a possible ring ditch.</p> <p>Trial trenching revealed what were interpreted as a series of small enclosures possibly defined by ditches which contained pottery and other finds from the Bronze Age, Iron Age, Roman and Medieval periods. These features extended into an area where no features had been identified from aerial photography or geophysical survey.</p>



Asset	HER ref.	Chainage	Features found during evaluation
949: Geophysical anomalies south-east of junction 21	N/A	18,500– 18,950	<p>A series of linear and isolated anomalies were detected in the geophysical survey and interpreted as being of potential archaeological origin.</p> <p>Trial trenching confirmed the presence of a small Roman domestic settlement with potential late prehistoric origins. The majority of the finds were of Roman date and included a sestertius coin of between the 1<sup>st</sup> and mid-3<sup>rd</sup> century AD, a hobnail, animal bone, as well as tile and pottery. There were also contemporary layers of what was interpreted as domestic refuse. Evidence for earlier activity in the form of a late Bronze Age shouldered jar was also found.</p>
950: Circular enclosure north-west of Prested Hall	N/A	33,050– 33,300	<p>The geophysical survey detected a curvilinear anomaly in the south-west corner of this area which was interpreted as being of archaeological origin.</p> <p>Trial trenching confirmed the archaeological origin of this site and identified it as a 'banjo' enclosure of potential late Bronze Age or Early Iron Age date. Trial trenching also identified a single ring ditch, and finds suggested that this location may have been in use for a considerable length of time with pottery from the Roman and Medieval periods also being recovered.</p>
951: Geophysical anomalies west of Prested Hall	N/A	32,050– 32,550	<p>The geophysical survey detected a number of linear and discrete anomalies interpreted as being of potential archaeological origin, as well as confirming the presence of Medieval or Post-Medieval field boundaries depicted on early OS maps.</p> <p>Trial trenching confirmed the presence of a large rectilinear enclosure containing a high density of pits. Finds were sparse, although they pointed towards a late Iron Age to early Roman period of occupation and the site was interpreted as being a small domestic settlement.</p>

Asset	HER ref.	Chainage	Features found during evaluation
953: Geophysical anomalies south and east of Potts Green	N/A	36,950– 37,900	<p>The geophysical survey in this area identified a number of isolated anomalies described as pit-like and tentatively interpreted as being of archaeological origin because of the presence of surface finds of Iron Age and Roman date 250m to the west.</p> <p>Trial trenching in this area identified an extensive area of activity, including a curvilinear enclosure, or partial enclosure of late Iron Age to Roman date which contained evidence for iron working; ditches, pits and spreads of material containing abundant finds of Roman material; pits used for 19<sup>th</sup> century clay extraction as well as Post-Medieval field boundaries and stock enclosures. Small quantities of material of Bronze Age date were also recovered.</p>
954: Geophysical anomalies west of Inworth Hall	N/A	30,400– 31,300	<p>The geophysical survey supported by the AIM Report identified a site comprising a series of linear field boundaries and isolated pits.</p> <p>Trial trenching identified an extensive site which included a series of land divisions formed from discontinuous ditches and pits as well as at least one enclosure. Different alignments of ditches suggested a multi period occupation of the site, and this is supported by a range of finds from the Bronze and Iron Age to the Roman period. Although no further burials similar to the nearby Kelvedon Warrior (Asset 657) were recorded, a single un-urned human cremation was found. Finds included pottery and tile, butchered animal bone including cattle and goat as well as examples indicative of sheep leatherworking. Also of note was an assemblage of 87 pieces of flint knapping debris identified as being of Mesolithic or Neolithic date and of a style considered rare in Essex, and an Early Medieval loom weight.</p>

Asset	HER ref.	Chainage	Features found during evaluation
955: Cropmarks south-east of Hole Farm	N/A	25,550–26,350	<p>The AIM Report identified the cropmarks of post-medieval field boundaries and geological disturbance, as well as an incomplete rectangular enclosure and round barrow both of which were outside of the Order Limits.</p> <p>Trial trenching confirmed the interpretation of the post-medieval field boundaries as well as identifying a number of possible quarry pits or artificial ponds. A number of small pits which produced finds ranging from prehistory to the present suggested the presence of sparse occupation activity over a lengthy period of time.</p>
956: Geophysical anomalies south of the Railway, Hatfield Peverel	N/A	16,700–16,900	<p>Geophysical survey identified a possible enclosure and ring ditch as well as linear anomalies of possible field boundaries.</p> <p>Trial trenching confirmed the presence and interpretation of the enclosure and also identified further linear ditches interpreted as part of a possible field system. The base of a late Iron Age or Roman period oven was also recorded. The site produced a large assemblage of Roman pottery, as well as hobnails and iron slag, the latter hinting at metalworking being carried out at the site.</p>
957: Geophysical anomalies north of Hare Lodge	N/A	25,100–25,200	<p>A group of linear and isolated anomalies of potential archaeological origin was detected by the geophysical survey.</p> <p>Trial trenching confirmed the presence of ditches and pits and recovered pottery of Iron Age and Roman date, as well as Mesolithic or early Neolithic worked flints. This site was interpreted as a continuation of Asset 958 to the east.</p>
958: Enclosures west of Sniveller's Lane	N/A	25,200–25,450	<p>Geophysical survey and the AIM Report identified what appeared to be a partial rectilinear enclosure in this location. This was confirmed by trial trenching, and a small quantity of prehistoric pottery was recovered. This site was interpreted as being peripheral to and potentially associated with Assets 411 and 439 to the east.</p>
959: Possible Prehistoric features south-west of Little Braxted Lane	N/A	22,600–22,850	<p>Trial trenching at this location identified a linear ditch and other features believed to be of prehistoric date, as well as evidence for post-medieval agricultural activity.</p>

Asset	HER ref.	Chainage	Features found during evaluation
960: Possible prehistoric features south-west of Little Braxted Lane	N/A	24,400– 24,700	A number of ditches, pits, post and stake holes were recorded during the trial trenching, and interpreted to be part of a prehistoric settlement based on a small quantity of Bronze Age pottery. The site was noted to be close to a palaeochannel and although no archaeological features coinciding with it were noted, two pieces of preserved, roughly worked wood were found, suggesting the potential for more organic material to be preserved at this location. The site was interpreted as being part of a late prehistoric settlement.
961: Prehistoric features north of Highfields Lane	N/A	26,500– 26,700	Trial trenching recorded several sections of ditches forming no clear pattern in plan, as well as discrete pits. These features were dated to between the Neolithic, Bronze Age and Iron Age from finds of pottery and worked flint. This site was considered to be related to Assets 962 and 968 to the north and east respectively.
962: Prehistoric field boundaries west of Maldon Road	N/A	26,650– 26,900	Trial trenching recorded sections of a number of ditches on different alignments which were interpreted as being part of a later prehistoric or Roman field system. It was dated by means of finds of Neolithic worked flint, as well as Bronze Age and Roman pottery. This site was considered to be related to Assets 961 and 968 to the south and south-east respectively.
963: Prehistoric pit and ditch east of Maldon Road	N/A	26,950– 27,000	A single trial trench at this location recorded a section through a ditch and a discrete pit with evidence of in situ burning. No finds were recovered from the ditch, but the pit was dated by a single sherd of Iron Age pottery. This site was interpreted as most likely forming part of a wider pattern of prehistoric fields, although the pit could point towards settlement activity nearby.
964: Possible late prehistoric enclosure south of Ewell Hall Chase	N/A	30,050– 30,200	A number of sections of linear ditches and a possible corner of an enclosure or field were identified in the trial trenching. Dating was achieved by means of finds of pottery, most of which was of Roman date apart from a single sherd dating from the Bronze Age. This site was interpreted as an extension of a late prehistoric or Roman field system identified at other nearby sites.

Asset	HER ref.	Chainage	Features found during evaluation
965: Possible Roman enclosure west of Park Farm	N/A	31,350– 31,600	Trial trenching at this site identified boundary ditches, discrete pits, and post holes which were interpreted as being part of an enclosure tentatively dated to the Roman period by means of a small amount of Roman pottery. This site was interpreted as potentially representing settlement activity at the periphery of an agricultural field system.
966: Roman industrial activity west of Park Farm	N/A	31,600– 31,800	Trial trenching at this site identified a series of discrete pits, many of which exhibited evidence of in situ burning, as well as a possible pond. Dating evidence was limited to a single sherd of Roman pottery. Its proximity to Assets 954 and 965 suggested that it formed part of a wider late prehistoric or Roman landscape of fields, enclosures and small-scale settlement.
967: Prehistoric field system west of Prested Hall Farm	N/A	33,500– 33,600	A small number of linear ditches were recorded during trial trenching at this site and interpreted as a continuation of features seen at Asset 775 to the east. These features were dated to between the Bronze Age and Roman period by means of finds of pottery, and a small quantity of worked flint of Mesolithic and Neolithic date was also found.
968: Possible Iron Age settlement south of Highfields Lane	N/A	26,900– 30,100	Trial trenching of an area not previously identified as being of archaeological potential identified a number of linear ditches interpreted as a field system of late Iron Age or early Roman date. A single worked flint blade of Neolithic date was also recovered. This site was considered to be related to Assets 961 and 962 to the west and north-west respectively.
969: Prehistoric features east of Koorbaes	N/A	30,200– 30,500	Trial trenching in an area not previously identified as being of archaeological potential identified several linear ditches and isolated pits interpreted as being part of a field system, as well as a trackway which appears to link this site with Asset 954 to the east. Pottery from these features gave dates ranging from the late prehistoric, Roman, Medieval and Post-Medieval periods. Of particular note was an un-urned human cremation of Roman date which suggests the presence of settlement activity in the area.

Asset	HER ref.	Chainage	Features found during evaluation
970: Roman features south-east of Kelvedon	N/A	31,000–31,200	Trial trenching at this location identified a series of linear ditches interpreted as being part of a field system of possible late prehistoric or Roman date as well as a number of quarry pits. Finds of Roman pottery, brick and tile, and part of a lavastone quern suggest that these features may be peripheral to a contemporary settlement.
971: Possible late prehistoric field system west of Easthorpe Road	N/A	34,150–34,350	Ditches identified during the trial trenching were noted to be on a similar scale and alignment to those in Asset 775 to the west. No dating evidence was recovered, but due to this similarity the site was tentatively dated to the late prehistoric or Roman periods.
972: Undated features north of Inworth Hall	N/A	31,000–31,450	Trial trenching identified evidence for industrial activity dating to the Roman period. This was based on large quantities of animal bone interpreted as being indicative of large-scale butchery or skinning for leatherworking. This site is adjacent to Assets 954, 965 and 966 and is considered to be potentially associated with them by proximity.
973: Possible Iron Age enclosure north of Easthorpe Road	N/A	34,800–34,950	Originally identified in the geophysical survey as a series of short, linear anomalies surrounding isolated pit-like anomalies and interpreted as a small enclosure possibly associated with a demolished Post-Medieval building recorded on an early OS map.  Trial trenching confirmed this to be a small prehistoric rectilinear enclosure defined by ditches, as well as a post hole and pit. The site was dated to the late Bronze Age or Early Iron Age by pottery recovered from some of the features. A small quantity of Mesolithic to Neolithic worked flint was also found, suggesting a long period of occupation at or near this site.
974: Multi-period field system west of Wishingwell Farm	N/A	36,500–36,750	Trial trenching recorded a regular arrangement of parallel, shallow linear ditches which were interpreted as potential bedding trenches for vines or asparagus. Although it is possible they could belong to a later period, they were identified to be of Roman date based on a single sherd of Roman pottery. If these features are confirmed to belong to the Roman period, that would make them a very unusual survival.

Asset	HER ref.	Chainage	Features found during evaluation
975: Roman field system east of Hall Chase	N/A	38,000–38,100	Sections of linear ditches and a truncated trackway at this site were dated to the Roman period by means of finds of pottery, and were interpreted as being part of a wider pattern of Roman field boundaries present throughout much of the undeveloped sections of the footprint of the proposed scheme.
977: River Blackwater area of palaeoenvironmental potential	N/A	9,200–10,800	Areas assessed to be of high palaeoenvironmental potential south of junction 19 (Boreham interchange), close to the River Blackwater (UPQ-29A).
978: Area of Palaeolithic potential 1	N/A	19,000–20,000	Areas assessed to be of high palaeoenvironmental potential south of the A12 close to Howbridge Hall Road (UPQ-26A).
979: Area of Palaeolithic potential 2	MEX1049149	22,700–25,200	Areas of high Palaeolithic potential (UPQ-5A, UPQ-5C, UPQ-8B, UPQ-9) between junction 22 (Colemans interchange) and borrow pit I east of Rivenhall End, including the known Palaeolithic site at Coleman's Farm.
980: Area of Palaeolithic potential 3	N/A	30,100–30,700	Areas assessed to be of high palaeoenvironmental potential partially within borrow pit J between Highfields Lane and Ewell Hall Chase, Kelvedon (UPQ-13B).
981: Area of Palaeolithic potential 4	N/A	39,200–39,950	Areas assessed to be of high palaeoenvironmental potential between the A12 and Queensbury Avenue, Copford (UPQ-23).

### Future baseline

- 7.8.45 Future development, such as proposed additional phases of the Beaulieu Park Development, may lead to changes to the baseline environment due to removal of cultural heritage assets, severance of historical associations between them, or changes to their settings (Chapter 16: Cumulative effects assessment, of the Environmental Statement [TR010060/APP/6.1], describes future committed developments).
- 7.8.46 The proposed A120 Braintree to A12 road scheme has recently been confirmed as a 'pipeline project' in the Government's Road Investment Strategy 2: 2020–2025 (Department for Transport, 2020), to be delivered in Road Investment Strategy 3, and would potentially lead to changes to the baseline environment close to its proposed tie in with the A12 at junction 23 south of Kelvedon.
- 7.8.47 Ongoing operation of Colemans Farm Quarry, south-west of Rivenhall End and near junction 22 (Colemans interchange), may also lead to changes to the baseline environment.

7.8.48 The built heritage is a constantly evolving dataset in which historic structures can be added to or removed. These additions and subtractions are due to periodic re-surveys of listed buildings by Historic England as well as due to changes as a result of ongoing development.

7.8.49 Local authorities also designate new conservation areas and locally listed buildings on a periodic basis.

### **Value and sensitivity of receptors**

7.8.50 All receptors within the baseline have been assigned a value based on professional judgement together with guidance in DMRB LA 104 (Highways England, 2020d), as described in Section 7.5 of this chapter. The values of cultural heritage assets in the baseline are summarised in Table 7.8. Full details of all cultural heritage assets including assessments of value are presented in the Gazetteer (Appendix 7.1 of the Environmental Statement [TR010060/APP/6.3]).

## **7.9 Potential impacts**

### **Construction**

#### **Archaeological remains**

7.9.1 Construction of the proposed scheme would result in adverse impacts on archaeological remains.

7.9.2 Impacts during construction may result from the partial or complete removal of archaeological remains during excavation and other ground-breaking activity. This would include widening of the existing highway boundary or the creation of new offline sections, new junctions and utility diversions, in addition to new drainage features, topsoil stripping for compounds, the excavation of attenuation ponds and borrow pits, and creation of landscaping features.

7.9.3 The following permanent impacts may also arise from construction activities:

- Compression of archaeological remains from the movement of machinery or weight of stockpiled materials
- Changes to groundwater levels caused by engineering activities associated with the proposed scheme adversely affecting the preservation of buried archaeological remains

7.9.4 Construction of the proposed gas main diversion would result in removal of archaeological remains associated with non-designated archaeological sites.

7.9.5 Impacts may also result from changes to the setting of an archaeological site (if its setting is relevant to understanding and appreciating its heritage value) during construction, including the following:

- Damage to, or severance from, buried archaeological remains or other heritage assets which form part of its setting, including severance of identifiable interrelationships (for offline sections) causing physical divisions between previously related cultural heritage assets



- Alterations to the setting of archaeological remains where new infrastructure is present in key views towards, through and across an asset
- Alterations to the setting of archaeological remains through the removal of vegetation or associated above-ground elements
- Temporary changes in the way in which sound and noise currently contribute to the heritage value of assets and changes to the setting of archaeological remains, where that setting is relevant to understanding and appreciating its heritage value, during construction activities such as, but not limited to, earthworks, placement of site compounds, and from increased construction traffic

### **Built heritage**

- 7.9.6 The potential construction impacts which have been identified on built heritage receptors would result from alterations to the settings of heritage assets. The construction activities which would affect built heritage assets would include landscaping; the removal of landscape features, trees, vegetation or field boundaries; the construction of new earthworks, compounds, borrow pits or soil storage sites; and other associated above-ground works including utility diversions, de-trunking, de-watering and the demolition of existing infrastructure.
- 7.9.7 The identified potential construction impacts would primarily result in temporary visual effects on the settings of heritage assets which could affect views to, or from, the heritage assets, or remove part of an historic or functionally related element of their setting which contributes to the heritage asset's legibility and thereby harm its value. Where relevant, this assessment makes reference to the results of the LVIA (Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1]) including the ZTV, viewpoint analysis and photomontages.
- 7.9.8 Temporary construction impacts may also result from increased construction traffic causing noise and dust or from the visual effects of construction infrastructure such as heavy vehicles or cranes. Reference to vibration resulting from construction activities is not included, as this is not predictable until the detailed design stage when information on specific construction methods would be available. This assessment does not include reference to absolute noise levels, or the impact of noise on the health and quality of life of people who live in, or visit, the area, as this is assessed separately in Chapter 12: Noise and vibration, of the Environmental Statement [TR010060/APP/6.1]. However, where applicable, a summary of the results of the noise and vibration assessment is incorporated into the results of the built heritage assessment for individual receptors.
- 7.9.9 Construction impacts could also result from changes to groundwater conditions that could cause a potential differential settlement risk to historic buildings (see Appendix 14.4 of the Environmental Statement [TR010060/APP/6.3]). These potential changes to groundwater conditions could result from the construction of new highway cuttings, road widening, construction of borrow pits and construction of attenuation ponds. Whilst this potential impact has been

identified, this risk to built heritage assets cannot yet be fully quantified. Further assessment will be carried out during the detailed design phase based on data from additional ground investigations (see additional mitigation in Section 7.10 of this chapter); only broad numbers of potential historic buildings can currently be identified.

### **Historic landscape**

- 7.9.10 Impacts during construction may result from the severance of land parcels making up HLTs and the removal or partial removal of the boundaries that define them. This would occur during widening of the existing highway boundary or the creation of new offline sections, new junctions and utility diversions, in addition to drainage features, compounds, attenuation ponds and borrow pits, and creation of landscaping features.
- 7.9.11 Impacts may also result from changes to the setting of an HLT (if the setting is relevant to understanding and appreciating its heritage value) during construction, including the following:
- Damage to, or severance of, associated field boundaries and landforms which form the setting of an HLT
  - Alterations to the setting of HLTs through the removal of vegetation
  - Temporary changes in the way in which sound and noise currently contribute to the heritage value of HLTs and changes to their setting, where that setting is relevant to understanding and appreciating its heritage value, during construction activities such as, but not limited to, earthworks, placement of site compounds, and from increased construction traffic

## **Operation**

### **Archaeological remains**

- 7.9.12 Potential physical impacts on archaeological remains which may occur during operation of the proposed scheme comprise the following:
- Removal of, or damage to, archaeological remains during maintenance works
  - Damage to archaeological remains through release of pollutants
- 7.9.13 Potential impacts on the value of archaeological remains where the proposed scheme would alter the setting and its contribution to the value of an asset (if the setting is relevant to understanding and appreciating its heritage value) during operation comprise the following:
- Alterations to the setting of an asset due to changes in the way in which sound, noise and light currently contribute to its heritage value
- 7.9.14 These effects would be permanent.

### **Built heritage**

- 7.9.15 Operational impacts are assessed as permanent changes that would result during the functioning of the proposed scheme, from the presence of new infrastructure in the landscape and from the maintenance and use of the new infrastructure.
- 7.9.16 Examples of potential operational impacts from the proposed scheme include the presence in the landscape of new roads, bridges and roundabouts as well as new signage and lighting, leading to alterations to the settings of built heritage assets or interruptions to views to, or from, those built heritage assets. Operational impacts may also result from increased noise associated with increased traffic flows using the new infrastructure. This assessment does not include a reference to absolute operational noise levels, which are assessed separately in Chapter 12: Noise and vibration, of the Environmental Statement [TR010060/APP/6.1]. Where relevant, this assessment makes reference to the results of the LVIA (Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1]) including the viewpoint analysis, ZTV and photomontages.

### **Historic landscape**

- 7.9.17 Operational impacts on HLTs may result from the presence of new infrastructure, including noise, lighting and signage where it would affect the setting of HLTs and where that setting contributes to their heritage value. Such effects are more likely to occur to HLTs which include elements of designed landscape.
- 7.9.18 The Planning Inspectorate agreed that this matter could be scoped out of the assessment; however, following feedback from Historic England in the Planning Inspectorate's (2021) Scoping Opinion, operational effects have been scoped in as a precautionary approach.

## **7.10 Design, mitigation and enhancement measures**

### **Embedded (design) mitigation**

- 7.10.1 The environment team has worked in close collaboration with the infrastructure design team to avoid or reduce environmental impacts through the proposed scheme design. This is referred to as embedded (or design) mitigation.
- 7.10.2 The details of the design alternatives that have been considered, including the environmental factors which have influenced the decision making, are provided in Chapter 3: Assessment of alternatives, of the Environmental Statement [TR010060/APP/6.1].
- 7.10.3 Embedded mitigation relevant to this aspect includes the following:
- Realigning the proposed bypass between junctions 22 (Colemans interchange) and 23 (Kelvedon South interchange) has reduced the impact on the setting of the Rivenhall Long Mortuary Enclosure Scheduled Monument (Asset 399).

- Construction of new infrastructure has been avoided in locations with sensitive built heritage assets as far as practicable. Examples include realigning the offline section of road between junctions 22 and 23 which has reduced the impact on the setting of the grade II\* listed Hole Farm at Rivenhall End (Asset 420) and aligning the road between junctions 24 (Kelvedon North interchange) and 25 (Marks Tey interchange) in order to avoid the grade II listed Doggets Hammer Farm at Marks Tey (Asset 795).
- The location and extent of borrow pits has been designed to avoid areas of Palaeolithic archaeological potential wherever practicable.
- Junction locations have been revised to reduce impacts on the setting of heritage assets; for example, the proposed new junction 24 was moved from a position just south of the existing junction 24 to a new location to the west of Inworth Road, thereby reducing potential impacts on the grade II listed Prested Hall (Asset 730).
- Inclusion of acoustic bunds and low noise road surfaces to reduce the effects of traffic noise on the settings of sensitive built heritage receptors during the operational phase. Details of these measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].
- Alignment of the proposed scheme and location of junctions and borrow pits designed to reduce landscape and visual effects.
- Lighting limited to junctions and side roads and designed to best practice to reduce light spill. Use of light-emitting diode luminaires which use less energy than conventional luminaires, while reducing light spill into adjacent areas.
- Planting to reduce adverse landscape and visual effects, including native hedgerows, shrubs and trees (as described in Chapter 8: Landscape and visual [TR010060/APP/6.1], and shown on Figure 2.1: Environmental Masterplan [TR010060/APP/6.2]. Consideration of the species, pattern and distribution of proposed hedgerows, shrubs and trees along the proposed scheme to reflect the distinctive local character of vegetation within the adjacent landscape and provide screening for visual receptors.
- Native tree and shrub planting on and adjacent to highway earthworks to create woodlands, copses and shelterbelts in order to break up the scale of the road, screen structures, traffic, and lighting and help integrate the proposed scheme into the existing landscape pattern.

### Standard mitigation

- 7.10.4 In the first instance, archaeological evaluation has been undertaken across the route of the proposed scheme to determine the presence or absence of archaeological assets site by site, their character, age and the significance of the resource.

- 7.10.5 Based on these results, further mitigation is required where significant and substantial archaeological evidence has been encountered. This would be followed by a further phase of post-excavation assessment, analysis, reporting and, where appropriate, publication.
- 7.10.6 Standard mitigation would occur as a matter of course due to legislative requirements or standard sector practices. Examples of standard mitigation for archaeology include the following:
- Archaeological earthwork survey and photography in advance of construction to record upstanding earthwork features.
  - Archaeological excavation or strip, map and sample excavation as appropriate and targeted on sites identified in the DBA, non-intrusive and intrusive evaluations, to record archaeological remains before their removal during construction, followed by a programme of assessment, analysis and publication. The requirement for such mitigation would be based on the nature and significance of the archaeological remains encountered and the outcome of consultation with the relevant stakeholders.
  - A programme of archaeological excavation and investigation of Palaeolithic and Quaternary Deposits would be developed and implemented, subject to the outcome of ongoing consultation with the stakeholders. Full details of the scope and extent of the required work are contained in the Archaeological Mitigation Strategy in Appendix 7.10 of the Environmental Statement [TR010060/APP/6.3].
  - Boreholes to record the depth and depositional sequence of Holocene palaeoenvironmental deposits at sites identified in Appendix 7.8 of the Environmental Statement [TR010060/APP/6.3].
  - Visual impacts have been reduced through retaining as much of the existing vegetation as practicable within the proposed scheme boundary and within temporary works areas. Particular attention has been given to the retention of mature vegetation including specimen trees and woodlands as shown on the Retained and Removed Vegetation Plans [TR010060/APP/2.14].
  - Consideration would be given during detailed design stage to the type of site security fencing near large construction compounds, proposed structures, listed buildings and residential properties to provide an additional temporary screening function.
  - Temporary lighting would be provided to ensure safe working conditions and to maintain security within construction compounds and working areas. Best practice measures would be implemented where practicable to ensure temporary lighting is avoided or directed away from heritage assets.
- 7.10.7 Examples of standard mitigation measures for built heritage include the following:

- Inclusion of measures where practicable to reduce noise and vibration during construction such as programming of works to minimise work outside normal working hours, specifying the use of low noise equipment and, where practicable, measures to avoid dust or construction traffic through sensitive areas such as conservation areas. Details of noise measures are provided in Section 12.10 of Chapter 12: Noise and vibration, and dust measures are in Chapter 6: Air quality [TR010060/APP/6.1].
- Use of sympathetic designs or materials, where practicable, to respect the settings of sensitive built heritage receptors during the construction or operational phases.
- Sympathetic hard and soft landscaping, landscaping bunds or planting to provide screening and reduce visual impacts within the settings of sensitive built heritage receptors during the operational phase. Details of these measures are provided in Section 8.10 of Chapter 8: Landscape and visual [TR010060/APP/6.1].
- Implementation of good construction working principles and considerate working practices during the utility works within the Kelvedon Conservation Area (Asset 566) and works affecting the adjacent listed buildings in order to avoid, as far as practicable, the effects of noise, vibration, dust and construction traffic. No trees would be removed and historic street furniture would also be protected during construction. The works would be 'made good' with appropriate materials and quality hard surfaces finishes to match the character and appearance of the conservation area.

7.10.8 Examples of standard mitigation measures for historic landscape assets include:

- Inclusion of measures, where practicable, to reduce noise and vibration during construction such as programming of works to minimise work outside normal working hours, specifying the use of low noise equipment and, where practicable, measures to avoid dust or construction traffic through sensitive areas such as conservation areas. Details of noise measures are provided in Section 12.10 of Chapter 12: Noise and vibration, and dust measures are in Chapter 6: Air quality [TR010060/APP/6.1].
- A programme of historic landscape recording to Historic England (2017b) Level 2 for affected assets.

7.10.9 Standard mitigation is included in the Archaeological Mitigation Strategy in Appendix 7.10 of the Environmental Statement [TR010060/APP/6.3].

7.10.10 Standard mitigation is also included in the Register of Environmental Actions and Commitments (REAC), within the first iteration of the EMP [TR010060/APP/6.5], which forms part of the DCO submission (refer to Chapter 5: Environmental assessment methodology, of the Environmental Statement [TR010060/APP/6.1]).

## Additional mitigation

- 7.10.11 For those heritage assets that are at risk of potential differential settlement, a detailed differential settlement risk assessment would be carried out during the detailed design phase (see Appendix 14.4: Groundwater Assessment, of the Environmental Statement [TR010060/APP/6.3]). This may require additional ground investigations to be undertaken to gather groundwater parameters near the analysed locations as well as to determine the *in situ* hydrogeological characteristics and to refine the expected drawdown effects. As part of this exercise, should the presence of thick Alluvium be encountered, owing to potentially greater settlement effects in this material, a detailed settlement risk assessment would also be performed at these locations. Should some of the heritage assets be confirmed to be at risk of differential settlement, additional assessment would be required such as condition surveys to determine the differential settlement risk, leading to the specification of mitigation such as asset protection measures. This is included as an additional mitigation measure in the road drainage and water environment assessment (Chapter 14 of the Environmental Statement [TR010060/APP/6.3]).
- 7.10.12 Additional mitigation from the noise assessment is also relevant to the cultural heritage assessment. This includes use of purpose-built noise barriers and road surfacing with better noise reducing properties than convention low noise road surfacing to reduce the effects of traffic noise on the settings of sensitive built heritage receptors during the operational phase. Details of these measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].

## Enhancement

- 7.10.13 The proposed scheme is likely to generate considerable new archaeological information and provide an opportunity for communicating such finds to the wider public. Interpretation of archaeological information will be informed by the reported fieldwork results. Appropriate outreach and engagement opportunities for the proposed scheme would be identified throughout the construction and operational phases of the proposed scheme and could include activities such as presentations, scientific outreach activities at local schools, volunteering programmes, media coverage, web-based initiatives, information and progress signage at appropriate locations, and permanent heritage interpretation at relevant sites, such as the Kelvedon Warrior (Asset 657), Rivenhall Long Mortuary Enclosure Scheduled Monument (Asset 399) and Prested Hall (Asset 730).

## 7.11 Assessment of likely significant effects

- 7.11.1 The assessment of likely significant effects is based on the current design and has a high confidence level based on the detailed construction information available.
- 7.11.2 No significant effects have been identified from the gas main diversion. Non-significant effects associated with these works are included in the Impact Assessment Summary Tables in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].

## Construction

### Archaeological remains

- 7.11.3 Only impacts resulting in significant effects as set out in the methodology in Section 7.5 of this chapter are described below and summarised in Table 7.10. Significant effects during construction have been assessed for 31 out of the total of 462 archaeological remains assets in the baseline. A summary of all impacts on archaeological remains is included in the Impact Assessment Summary Tables in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].
- 7.11.4 No impacts have been predicted for the eight scheduled monuments identified in the archaeological remains baseline, all of which are located outside the Order Limits (Assets 165, 290, 399, 646, 737, 804, 818 and 976). The two scheduled monuments located within 300m of the Order Limits (Assets 399 and 646) are funerary sites of prehistoric or Early Medieval date with no surface remains. Their value is derived principally from their evidential and historical value. Their setting within the modern arable landscape contributes little to their value and would not be significantly affected by construction of the proposed scheme.
- 7.11.5 The Groundwater Assessment, Appendix 14.4 of the Environmental Statement [TR010060/APP/6.3] has been evaluated. It is considered that there are a number of locations close to some proposed cuttings and borrow pits where groundwater drawdown could affect the preservation of buried deposits and artefacts. The majority of sites considered that would be susceptible to this type of impact would also be subject to physical impacts from construction of the proposed scheme, and appropriate mitigation has been proposed. Non-significant effects are itemised in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3]. No likely significant effects on known archaeological sites outside the Order Limits have been identified.
- 7.11.6 Construction of proposed attenuation ponds, outfalls, an access track, and the junction 19 satellite compound, as well as creation of woodland planting, would remove archaeological remains associated with the known extent of Lionfield Cottages Cropmarks (Asset 72) within the Order Limits, resulting in an impact of major magnitude and of large adverse significance on an asset assessed to be of medium value. Mitigation through archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, to define the extent and layout of features, and clarify their function and date. The residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.7 Construction of the junction 22 north main compound would remove archaeological remains associated with the known extent of Burgate field enclosure, Rivenhall End (Asset 354) resulting in an impact of major magnitude and of large adverse significance on an asset of medium value. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function and date. The residual significance of this effect has been assessed to be **moderate adverse** and significant.



- 7.11.8 Construction works near to the existing junction 23, including construction of a laydown area and haul road, and the creation of an attenuation pond and drainage outfall would remove archaeological remains associated with the entire extent of cropmarks at Hole Farm (Asset 411) within the Order Limits, resulting in an impact of major magnitude and of large adverse significance on an asset of high value. Mitigation through archaeological excavation to ensure a full record of the site is made is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of such a large proportion of the archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.9 Construction of the proposed scheme including a haul road north of the A12, an attenuation pond and outfall would remove archaeological remains associated with the extent of cropmarks along Crane's Lane (Asset 439) within the Order Limits, resulting in an impact of major magnitude and of large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.10 Construction of an attenuation pond and outfall and creation of a temporary soil storage area north of the proposed junction 24 would remove archaeological remains associated with the whole of Kelvedon Enclosure (Asset 647). This would result in an impact of major magnitude and of large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.11 Construction of an offline section of proposed highway, temporary soil storage area, a temporary site compound and an attenuation pond and outfall would remove archaeological remains associated with the whole of cropmarks east of Hill House Farm (Asset 775). This would result in an impact of major magnitude and of large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed for the more complex eastern part of this asset and strip map and sample for the west, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.12 Archaeological remains associated with the known extent of geophysical anomalies south-east of the existing junction 21 (Witham South interchange) (Asset 949) would be removed by the excavation of borrow pit F. This would result in an impact of major magnitude and of very large adverse significance on an asset of high value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.13 Construction of a realigned section of highway, an embankment and culvert, as well as ecological ponds and tree planting, would remove archaeological remains associated with the known extent of circular enclosure north-west of Prested Hall (Asset 950). This would result in an impact of major magnitude and large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.14 Construction of the realigned highway and a soil storage area, as well as an attenuation pond, outfall and access track, would remove archaeological remains associated with approximately 75% of the known extent of geophysical anomalies west of Prested Hall (Asset 951) within the Orders Limits. This would result in an impact of major magnitude and large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function and date. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.15 Construction of an offline section of highway and Marks Tey roundabout, Potts Green Bridge, two attenuation ponds and their associated outfalls, a flood defence bund, as well as two ecological ponds, would remove archaeological remains associated with the known extent of geophysical anomalies south and east of Potts Green (Asset 953). This would result in an impact of major magnitude and very large adverse significance on an asset of high value. A programme of archaeological excavation and strip, map and sample is proposed at three areas of this asset, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in

this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.16 Excavation of borrow pit J would remove archaeological remains associated with the whole of geophysical anomalies west of Inworth Hall (Asset 954). This would result in an impact of major magnitude and of large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.17 Topsoil stripping for construction of a temporary site compound would remove archaeological remains associated with the known extent of geophysical anomalies south of the Railway, Hatfield Peverel (Asset 956), and would result in an impact of major magnitude and large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.18 Excavation of borrow pit I would remove archaeological remains associated with the known extent of geophysical anomalies north of Hare Lodge (Asset 957). The magnitude of this impact has been assessed to be major, and the significance of effect moderate, on an asset of medium value. Because of its relatively low complexity, strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.19 Excavation of borrow pit I and the creation of an attenuation pond and associated outfall and access track would remove archaeological remains associated with the known extent of enclosures west of Sniveller's Lane (Asset 958). This would result in an impact of major magnitude and very large adverse significance on a high value asset. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.20 Excavation of borrow pit I and woodland planting would remove archaeological remains associated with the known extent of prehistoric settlement north-east of Henry Dixon Road (Asset 960). This would result in an impact of major magnitude and large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a full record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. Palaeoenvironmental assessment and analysis is also proposed because of its palaeoenvironmental potential. The impact of removal of archaeological remains and deposits associated with the asset cannot be totally mitigated, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.21 Construction of a laydown area, soil storage area and a haul road, as well as creation of an attenuation pond, outfall and access track, would remove archaeological remains associated with the known extent of prehistoric field boundaries west of Maldon Road (Asset 962), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.22 Construction of an attenuation pond, outfall and access track south of Ewell Hall Cottages would remove archaeological remains associated with the known extent of possible late prehistoric enclosure south of Ewell Hall Chase (Asset 964), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. Because of the relative low complexity of this asset, strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.23 Construction of the new junction 24 and the connection with Inworth Road would remove archaeological remains associated with the known extent of a possible Roman enclosure west of Park Farm (Asset 965), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.24 Construction of the connection to Inworth Road and a drainage culvert would remove archaeological remains associated with approximately 75% of the known extent of Roman industrial activity west of Park Farm (Asset 966), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.25 Construction of an offline section of highway as well as an attenuation pond, outfall and access track would remove archaeological remains associated with the known extent of the prehistoric field system west of Prested Hall Farm (Asset 967), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to define the extent and layout of features, and clarify their function. The impact of removal of archaeological remains associated with this asset would be reduced but not totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.26 Creation of an attenuation pond and outfall, topsoil stripping associated with a temporary soil storage area, and the creation of a flood compensation area would remove archaeological remains associated with the known extent of a possible Iron Age settlement south of Highfields Lane (Asset 968). This would result in an impact of major magnitude and of large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a detailed record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.27 Construction of the northern part of junction 24 and a laydown area, and topsoil stripping to create a temporary soil storage area, would remove archaeological remains associated with the known extent of Roman features south-east of Kelvedon (Asset 970). This would result in an impact of major magnitude and of large adverse significance on an asset of low value. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a detailed record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with Asset 970 cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.28 Construction of an offline section of highway and a soil storage area would remove archaeological remains associated with approximately 75% of the known extent of possible late prehistoric field system west of Easthorpe Road (Asset 971), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a detailed record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with Asset 971 cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.29 Construction of an offline section of highway, two attenuation ponds and their associated outfalls, and topsoil stripping associated with the creation of a temporary site compound and soil storage area would remove archaeological remains associated with the known extent of possible Iron Age enclosure north of Easthorpe Road (Asset 973). This would result in an impact of major magnitude and of large adverse significance on an asset of medium value. A programme of archaeological excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a detailed record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.30 Construction of an offline section of highway as well as an attenuation pond, outfall and access track would remove archaeological remains associated with approximately 60% of the known extent of the multi-period field system west of Wishingwell Farm (Asset 974), which was assessed to be of medium value. This would result in an impact of major magnitude and large adverse significance. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a detailed record of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with Asset 974 cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.31 Construction of the junction 25 satellite compound, realigned section of Hall Chase, and an attenuation pond, outfall and access track would remove archaeological remains associated with the known extent of the Roman field system east of Hall Chase (Asset 975), which was assessed to be of medium value. This would result in an impact of major magnitude and of large adverse significance. Strip, map and sample excavation is proposed, subject to the outcome of ongoing consultation with the relevant stakeholders, to ensure a detailed record of Asset 975 is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with the asset

cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.32 Construction of junction 19 (Boreham interchange), two attenuation ponds, outfalls and access roads, temporary haul roads and soil storage areas would remove archaeological remains associated with the River Blackwater area of palaeoenvironmental potential (Asset 977), which was assessed to be of medium value. This would result in an impact of moderate magnitude and of moderate adverse significance. A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders. This would be followed, if necessary, by a programme of either archaeological excavation or strip, map and sample excavation to ensure a full record of the affected area of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. Palaeoenvironmental assessment and analysis is also proposed because of its palaeoenvironmental potential. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.33 Construction of an attenuation pond, access road and outfall, as well as a haul road, temporary site compound and soil storage area south of the A12 and west of Maldon Road, would remove archaeological remains associated with approximately 30% of the known extent of Palaeolithic potential 1 (Asset 978), which was assessed to be of medium value. This would result in an impact of major magnitude and of large adverse significance. A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders. This would be followed, if necessary, by a programme of either archaeological excavation or strip, map and sample excavation to ensure a full record of the affected area of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.34 Construction of junction 22 (Colemans interchange), Rivenhall West Roundabout, Braxted Road realignment, six attenuation ponds, access roads and outfalls, as well as haul roads, site compounds, soil storage areas, and borrow pit I would remove archaeological remains associated with the whole of the known extent of Palaeolithic potential 2 (Asset 979), which was assessed to be of medium value. This would result in an impact of major magnitude and of large adverse significance. A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders. This would be followed, if necessary, by a programme of either archaeological excavation or strip, map and sample excavation to ensure a full record of the affected area of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

- 7.11.35 Construction of an attenuation pond, access roads and an outfall, as well as two soil storage areas and borrow pit J would remove archaeological remains associated with the whole extent of Palaeolithic potential 3 (Asset 980), which was assessed to be of medium value. This would result in an impact of major magnitude and of large adverse significance. A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders. This would be followed, if necessary, by a programme of either archaeological excavation or strip, map and sample excavation to ensure a full record of the affected area of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.
- 7.11.36 Construction of an attenuation pond, access road and outfall, and realignment of Roman River culvert would remove archaeological remains associated with up to half of the known extent of Palaeolithic potential 4 (Asset 981), which was assessed to be of medium value. This would result in an impact of major magnitude and of large adverse significance. A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders. This would be followed, if necessary, by a programme of either archaeological excavation or strip, map and sample excavation to ensure a full record of the affected area of the site is made, the findings of which will be made available to improve the understanding of this type of site at a regional scale. The impact of removal of archaeological remains associated with this asset cannot be totally mitigated in this way, and the residual significance of this effect has been assessed to be **moderate adverse** and significant.

**Table 7.10 Significant effects on archaeological remains assets during construction**

Asset no.	Asset name	Designation	Value	Magnitude of impact	Significance of effect
72	Lionfield Cottages cropmarks	Non-designated	Medium	Major	Moderate adverse
354	Burgate field enclosure, Rivenhall End	Non-designated	Medium	Major	Moderate adverse
411	Hole Farm cropmarks	Non-designated	High	Major	Moderate adverse
439	Cropmarks along Crane's Lane	Non-designated	Medium	Major	Moderate adverse
647	Kelvedon Enclosure	Non-designated	Medium	Major	Moderate adverse
775	Cropmarks east of Hill House Farm	Non-designated	Medium	Major	Moderate adverse
949	Geophysical anomalies south-east of junction 21	Non-designated	High	Major	Moderate adverse



<b>Asset no.</b>	<b>Asset name</b>	<b>Designation</b>	<b>Value</b>	<b>Magnitude of impact</b>	<b>Significance of effect</b>
950	Circular enclosure north-west of Prested Hall	Non-designated	Medium	Major	Moderate adverse
951	Geophysical anomalies west of Prested Hall	Non-designated	Medium	Major	Moderate adverse
953	Geophysical anomalies south and east of Potts Green	Non-designated	High	Major	Moderate adverse
954	Geophysical anomalies west of Inworth Hall	Non-designated	Medium	Major	Moderate adverse
956	Geophysical anomalies south of the Railway, Hatfield Peverel	Non-designated	Medium	Major	Moderate adverse
957	Geophysical anomalies north of Hare Lodge	Non-designated	Medium	Major	Moderate adverse
958	Enclosures west of Sniveller's Lane	Non-designated	High	Major	Moderate adverse
960	Prehistoric settlement north-east of Henry Dixon Road	Non-designated	Medium	Major	Moderate adverse
962	Prehistoric field boundaries west of Maldon Road	Non-designated	Medium	Major	Moderate adverse
964	Possible late prehistoric enclosure south of Ewell Hall Chase	Non-designated	Medium	Major	Moderate adverse
965	Possible Roman enclosure west of Park Farm	Non-designated	Medium	Major	Moderate adverse
966	Roman industrial activity west of Park Farm	Non-designated	Medium	Major	Moderate adverse
967	Prehistoric field system west of Prested Hall Farm	Non-designated	Medium	Major	Moderate adverse
968	Possible Iron Age settlement south of Highfields Lane	Non-designated	Medium	Major	Moderate adverse
970	Roman features south-east of Kelvedon	Non-designated	Low	Major	Moderate adverse
971	Possible late prehistoric field system west of Easthorpe Road	Non-designated	Medium	Major	Moderate adverse
973	possible Iron Age enclosure north of Easthorpe Road	Non-designated	Medium	Major	Moderate adverse

Asset no.	Asset name	Designation	Value	Magnitude of impact	Significance of effect
974	Multi-period field system west of Wishingwell Farm	Non-designated	Medium	Major	Moderate adverse
975	Roman field system east of Hall Chase	Non-designated	Medium	Major	Moderate adverse
977	River Blackwater of palaeoenvironmental potential	Non-designated	Medium	Moderate	Moderate adverse
978	Area of Palaeolithic potential 1	Non-designated	Medium	Major	Moderate adverse
979	Area of Palaeolithic potential 2	Non-designated	Medium	Major	Moderate adverse
980	Area of Palaeolithic potential 3	Non-designated	Medium	Major	Moderate adverse
981	Area of Palaeolithic potential 4	Non-designated	Medium	Major	Moderate adverse

### Built heritage

- 7.11.37 Wherever practicable, mitigation has been proposed for all significant construction effects (see Table 7.14 in Section 7.13 of this chapter for details). In each case, the overall significance of effect provided in this section represents the residual effect following the application of mitigation. However, although the proposed mitigation measures for the significant construction effects have been considered to be appropriate, they would not be sufficient to reduce the residual effects to a not significant level. Nevertheless, these mitigation proposals would still ameliorate some of the effects of the proposed scheme, and are therefore considered to be in accordance with professional guidance and best practice.
- 7.11.38 During the construction phase there are predicted to be significant effects on 13 built heritage assets out of a total of 465 built heritage assets located within 1km of the proposed scheme. Only those built heritage impacts with the potential to result in significant effects are described in the section below and summarised in Table 7.12. All the identified effects are adverse, unless otherwise stated. A full list of built heritage impacts, including non-significant construction effects, is provided in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].
- 7.11.39 The Groundwater Assessment (see Appendix 14.4 of the Environmental Statement [TR010060/APP/6.3]) has identified the potential for changes to groundwater conditions during the construction phase that could cause differential settlement risk to historic buildings. These potential changes to groundwater conditions could result from the construction of new highway cuttings, road widening, construction of borrow pits and construction of attenuation ponds. Whilst this potential impact has been identified, the risk cannot be fully quantified until further assessment has been carried out during

the detailed design phase based on data from additional ground investigations, and only broad numbers of potentially affected historic buildings can be identified at this stage. The likelihood of the groundwater drawdown resulting in significant effects is therefore currently unknown as further hydrogeological assessment work will be required.

- 7.11.40 Where further hydrogeological assessment identifies significant potential effects on a listed building from differential settlement, a detailed settlement risk assessment of the building would be undertaken. Should the detailed risk assessment identify a listed building as 'at risk' of differential settlement, a condition survey would be undertaken of the building prior to the relevant works commencing. The appropriate asset protection measures identified in the condition survey would then be implemented as mitigation, in agreement with any relevant landowner, prior to relevant works commencing.
- 7.11.41 The numbers of historic buildings currently potentially affected by changes in groundwater conditions (see Appendix 14.4 of the Environmental Statement [TR010060/APP/6.3]) are shown below in Table 7.11.

**Table 7.11 Built heritage assets potentially affected by groundwater conditions**

Cutting ID*	Number of listed buildings potentially impacted	Distance of closest listed building (m)
W2	12 x grade II, 1 x grade II* listed buildings	35
W5	1 x grade I, 5 x grade II, 1 x grade II* listed buildings (in Little Braxted)	384
W5	14 x grade II, 4 x grade II* listed buildings (in Witham and Industrial Estate)	472
W6	>30 listed buildings in Kelvedon (concentrated on Church Street and High Street)	415
W6	5 x grade II, 1 x grade II* listed buildings (on Ewell Hall Chase)	226
W6	7 x grade II listed buildings (on London Road)	395
W6	2 x grade II listed buildings (on Braxted Road)	380
W7	1 x grade II listed buildings	119
W7	3 x grade II, 1 x grade II* listed buildings	220
C10	1 x grade II listed buildings	38
CJ11	1 x grade II listed buildings	168
WJ4	1 x grade II listed buildings	70
BP-J	11 x grade II, 1 x grade I listed buildings (in Inworth)	307
BP-J	1 x grade II listed buildings (south of borrow pit)	98
BP-J	5 x grade II listed buildings (south-west of borrow pit)	866

Cutting ID*	Number of listed buildings potentially impacted	Distance of closest listed building (m)
BP-J	5 x grade II, 1 x grade II* listed buildings (on Ewell Hall Chase)	205
BP-J	>75 x grade II, 2 x grade I, 11 x grade II* listed buildings (in Kelvedon)	495

\* Cutting IDs are shown on Figure 14.3 [TR010060/APP6.2], which supports Chapter 14: Road drainage and the water environment, of the Environmental Statement.

- 7.11.42 Boreham House (Asset 69) is a grade I listed 18<sup>th</sup> century country house, which was designed by the nationally renowned architect James Gibbs. The house is located approximately 350m south-west of junction 19 (Boreham interchange) on the A12. The setting of the house would potentially be impacted by the construction of the new junction 19 layout including the widening of Boreham Bridge and alterations to the B1137 Main Road. The main house is set in its own landscaped grounds, which are accessed via the northern entrance from the B1137 Main Road, and which encompasses a formal coach road with a clear view extending approximately 370m southwards to the principal elevation of the listed building. The gardens surrounding the house form part of an 18<sup>th</sup> century grade II registered park and garden (Asset 67), which was designed by Henry Flitcroft. The gardens contribute significantly to the legibility and understanding of the house as well as its aesthetic, historic and communal values (further information is provided in the 'historic landscape' sub-section below).
- 7.11.43 The grounds around the house are generally level, but it is partly screened from its wider surroundings by planting along the boundaries of the main gardens. The formal approach to Boreham House is from the B1137 Main Road, through gates which lead to twin parallel carriage drives flanking a 250m long, formal canal. The driveways, which were laid out when the house was first built in the early 18<sup>th</sup> century, lead directly to the entrance forecourt below the north-west entrance front of the house. The rows of elm trees which originally lined the driveways were lost to Dutch elm disease in the 1960s and have since been replaced by a collection of flowering cherry trees, shrubs and roses along the banks of the canal. Along the south-west side of the lawn is a larger concentration of trees, many of them later 20<sup>th</sup> century additions to the pleasure-ground shrubbery. These setting elements contribute strongly to the aesthetic value of the house as well as having a functional relationship with it, which contributes to its historic and communal values.
- 7.11.44 Within the setting of the main house, to the immediate south-west of it, is a truck repair business and there are large industrial sheds located to the west which are visually intrusive and detract from the aesthetic value of the listed building.
- 7.11.45 The construction works within the setting of the house would include large-scale changes to the arrangement of the roundabout at junction 19, including the widening of Boreham Bridge. There would be some minor land-take along Main Road, plus construction of associated earthworks and landscaping which would affect the entrance to Boreham House, but only within the existing highways

land, where the northern end of the associated registered park and garden (Asset 67) abuts it. Sympathetic hard landscaping would be used at the area of the entrance to provide an appropriate setting and mitigation.

- 7.11.46 The impacts from construction activities within the setting of the house would include noise and dust plus visual intrusion from construction traffic and demolition machinery. This construction activity would be visible in the context of the existing highway infrastructure including the existing A12 junction 19. The magnitude of impact from visual effects of construction traffic and demolition works would be moderate on a high value asset resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures would be applied during construction through the EMP (see Chapter 12: Noise and vibration, of the Environmental Statement [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.47 The grade II listed 'Generals' (Asset 57) was formerly known as the General's Head Inn, a 17<sup>th</sup> century timber-framed and plastered house with cross-wings which is now once again a private residence. The house is situated approximately 40m east of the existing A12 junction 19 and its setting is affected by the existing infrastructure and traffic on the road as well as the adjacent Premier Inn, with its associated large guest accommodation block and car parking. The modern setting, therefore, makes a limited contribution to the aesthetic value, communal value or legibility of the Generals but does maintain a minor functional relationship with it, which contributes to its historic value. A stand of trees along the Main Road, in front of the Generals, provides some screening and contributes to the listed building's aesthetic value.
- 7.11.48 There would be large-scale construction works to the north, west and south of the Generals, especially around the existing junction layout. These construction activities would include changes to the roundabout and junction 19 arrangement, the widening of Boreham Bridge, plus some minor land-take along the pavement and verge near the entrance from Main Road. However, the existing stand of trees along the Main Road, in front of the Generals, would be protected and retained as mitigation.
- 7.11.49 The proposed construction works within the setting are predicted to result in noise and dust plus visual intrusion from construction machinery and traffic. This construction activity would be visible in the context of the existing highway infrastructure including the existing junction 19. The magnitude of impact is predicted to be moderate on a high value asset, resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures will be applied through the EMP during construction (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.50 The grade II listed properties of Nos. 12 and 14, 'The Street' (B1137) (Asset 141), in Hatfield Peverel, are adjacent to the existing Bury Lane Bridge and approximately 40m south of the existing A12 which is in a cutting at this point. The setting of the listed building is currently formed by the historic ribbon development of Hatfield Peverel along 'The Street' (B1137) which contributes to the aesthetic, communal and historic value of the buildings. The main predicted

construction impacts on these building's settings would result from the demolition and replacement of the Bury Lane Bridge together with the earthworks associated with the cutting and landscaping for the road widening. These construction works would be associated with noise and dust plus visual intrusion from construction traffic and machinery during construction. The magnitude of impact is predicted to be moderate on a high value asset resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures will be applied construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.

- 7.11.51 The grade II listed former Post Office Stores (Asset 146), in Hatfield Peverel, are also located on 'The Street', adjacent to the existing Bury Lane Bridge and approximately 55m south of the existing A12. The setting of the listed building is also formed by the historic ribbon development of Hatfield Peverel along 'The Street' (B1137) which contributes to the aesthetic, communal and historic value of the building. The main predicted construction impact would result from the demolition and replacement of the Bury Lane Bridge together with earthworks associated with the cutting and landscaping for the road widening. The construction phase would result in associated traffic and noise plus visual intrusion from construction traffic and machinery. The magnitude of impact would be moderate on a high value asset resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures will be applied during construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.52 The grade II\* listed Hole Farmhouse (Asset 420) at Rivenhall End is a two-bay hall house dating from the 15<sup>th</sup> century and built-in timber framing with roughcast render. The house is located approximately 55m south of the existing A12 with an entrance directly onto the A12. To the south, the farmhouse has interrupted views over farmland, screened by existing farm buildings, with views to the north partly screened by vegetation along the A12. Although affected by the existing road noise and visual intrusion from the A12, the setting, particularly the southern aspect, contributes to the aesthetic, communal and historic value of the farmhouse.
- 7.11.53 The setting of Hole Farmhouse would be affected by construction of a new offline section of road at Rivenhall End, which would be slightly to the north of the existing A12. Although the road at this point would be moving further away from the listed building, there would also be impacts from the conversion of part of the existing A12 into a new local access road for the adjacent Essex County Fire and Rescue Service headquarters. The predicted impacts on the listed building's setting would result from the visual intrusion associated with the construction of earthworks and landscaping plus noise from construction traffic and machinery. The construction of a pond approximately 140m to the east and borrow pits approximately 290m to the north together with a soil storage area and a compound would also contribute to the construction impacts, although these would be lessened by the greater distance from the house. The magnitude of impact on Hole Farmhouse is predicted to be moderate on a high value asset resulting in a moderate adverse significance of effect. Whilst

standard noise mitigation measures will be applied during construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.

- 7.11.54 The grade I listed All Saints Parish Church in Inworth (Asset 708) is an early 11<sup>th</sup> century church in origin, built primarily of carved flint-rubble with brick and limestone dressings under a red plain tile. The church sits prominently on raised ground around 60m from a bend in the B1023 Inworth Road. The parish church is set within its own churchyard with a tree-lined pathway to the east entrance onto Inworth Road, around 60m away. In front of the church is a stand of trees adjacent to a small lay-by.
- 7.11.55 As part of the construction activities to upgrade Inworth Road, the road in front of the church would need to be widened, requiring the enlargement of the lay-by and removal of trees in front of the church. In addition, vegetation would be removed along the roadside hedgerow to the field to the south of the church where a new flood compensation area would be excavated. A further attenuation pond would be built across Inworth Road, to the south-east of the church. The construction activities for the associated earthworks and landscaping within the setting of the listed building would result in noise and dust plus visual intrusion from construction machinery and traffic. The magnitude of impact would be moderate on a high value asset resulting in a moderate adverse significance of effect. Following the construction phase, the church boundary and adjacent field boundary would be reinstated through replanting. Whilst standard considerate contractor measures and noise mitigation measures would be applied during construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.56 The grade II listed Easthorpe Green Farmhouse (Asset 785) is a 17<sup>th</sup> century timber-frame and brick house, located approximately 230m to the south of the existing A12. It has some mature trees surrounding it to the south and north, but with largely open fields to the east. The house is associated with the historic landscape features of Easthorpe Green (Asset 902), which is shown as a roughly square area on the 1777 Chapman and Andre historic map. The green forms part of the setting of the house, contributing to its aesthetic value and historic legibility.
- 7.11.57 The potential construction works which would affect Easthorpe Green Farmhouse (Asset 785) consist of the construction of an offline section of raised road, located approximately 100m to the north and north-east of the house, together with a new side road and the construction of the Wishingwell Overbridge to the east. The construction activities within the setting of the listed building for the associated earthworks and landscaping would result in noise and dust plus visual intrusion from construction machinery and traffic. The magnitude of impact would be moderate on a high value asset resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures would be applied during construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.

- 7.11.58 Approximately 100m south-west of Easthorpe Green Farmhouse (Asset 785) is Church View House (Asset 784), a grade II listed building, formerly known as Flispes. The house is a late 16<sup>th</sup> century three-bay, cross-passage house, located approximately 330m to the south of the existing A12. The house is screened from the A12 by mature trees to the north but with views over open fields to the south and east. Part of its setting is formed by the historic Easthorpe Green (Asset 902) which contributes to its aesthetic value and historic legibility. The construction works near the house would consist of an offline section of raised road, located approximately 230m to the north and north-east of the house, plus a new side road, attenuation pond and construction of the Wishingwell Overbridge.
- 7.11.59 The construction activities within the setting of the listed building for the associated earthworks and landscaping would result in noise and dust plus visual intrusion from construction machinery and traffic. The magnitude of impact would be moderate on a high value asset resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures will be applied to noise impacts during construction (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.60 The grade II listed Doggets Hammer Farm (Asset 795), near Marks Tey, is located approximately 250m to the south of the existing A12, with open fields to the south and east which contribute to the aesthetic value of the building as well as having an historic functional relationship. The house is a 16<sup>th</sup> century timber-frame building with jettied north and south bays and a cross-wing which is accessed from the A12 by Doggets Lane. The farm is built on the edge of Potts Green (Asset 909) which is a surviving green shown on the 1777 Chapman and Andre historic map and located to the west of the farmhouse. The green, which incorporates part of Doggets Lane, contributes to the aesthetic value and historic legibility of the historic building. Construction of the offline section of new road at Marks Tey, located approximately 50m to the south and south-east of the farm, would lead to partial truncation of the associated Potts Green (Asset 909).
- 7.11.61 In addition, the predicted impacts from construction activities close by, including earthworks and landscaping, would result in visual intrusion from construction machinery plus associated noise and dust within the setting of Doggets Hammer Farm (Asset 795). These activities would result in a moderate adverse magnitude of impact on a high value asset resulting in a direct moderate adverse significance of effect. Whilst standard noise mitigation measures would be applied to impacts during construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.62 The grade II listed No. 172 London Road (Asset 805), within Marks Tey, is located on the old London Road, which is directly north of the existing A12 and parallel to it. The existing setting of the house is compromised by the visual intrusiveness of the A12, but it retains some views of open fields beyond. The construction activities for the proposed upgraded junction 25 at Marks Tey and new offline section of road to the south would include construction of a



roundabout and the reconfiguration of the existing interchange to the north-east at Marks Tey, plus demolition of the Marks Tey Footbridge and construction of the Marks Tey Bridge Replacement.

- 7.11.63 The potential impacts from the above construction activities within the setting of the listed building would include visual intrusion, noise and dust from construction machinery and traffic. This is assessed as resulting in a moderate magnitude of impact on a high value asset, resulting in a moderate adverse significance of effect. Whilst standard noise mitigation measures would be applied to impacts during construction (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effect would remain **moderate adverse** and significant.
- 7.11.64 The grade II listed Marks Tey Hall (Asset 819) is a 16<sup>th</sup> century timber-framed house, located approximately 350m to the south of the existing A12. The hall has group value with an associated grade II\* listed barn (Asset 816), which has 15<sup>th</sup> century origins, a grade II listed 17<sup>th</sup> century barn (Asset 817) and the scheduled monument at Marks Tey Hall Moated Site (Asset 818) which dates from the Medieval period.
- 7.11.65 Marks Tey Hall (Asset 819) has largely uninterrupted views to the south and west over agricultural land with some mature trees and vegetation surrounding it, giving the setting a semi-rural character. It has inter-visibility with the two listed barns and the Marks Tey Moated Site (Asset 818). The moat is a relatively undisturbed and well-defined archaeological feature which includes three water-filled sections and forms part of the settings of the listed buildings and contributes to their legibility, historic and communal value (see 'archaeological remains' sub-section above).
- 7.11.66 The existing historic character of this building group is somewhat compromised by the visual intrusion from the location of a caravan sales lot approximately 120m to the north-east as well as from outbuildings, used as industrial units, approximately 90m to their west. These elements have eroded some of the contribution of the settings to the aesthetic value of the hall (Asset 819) and two barns (Assets 816 and 817).
- 7.11.67 This historic farm group is accessed from the A12 by Hall Chase Lane. It is surrounded by mature trees and vegetation and would be subject to impacts from construction activities within its setting. The impacts would result from the construction of the new offline section of A12 road at junction 25, to the west of the building group. The new access road, to the south of the A12, would be located within approximately 250m of Marks Tey Hall. Further construction activities would consist of the satellite compound near junction 25, reconfiguration of the existing interchange at Marks Tey (junction 25) and the demolition of the Marks Tey Footbridge and construction of the Marks Tey Bridge Replacement.
- 7.11.68 The proposed construction activities are predicted to result in setting impacts from the earthwork and landscaping activities with associated visual intrusion from construction machinery and traffic together with associated noise and dust. This is assessed as a moderate magnitude of impact on each of these three high value assets and would result in three direct effects of moderate adverse significance. Whilst standard noise mitigation measures would be applied to

impacts during construction through the EMP (see Chapter 12: Noise and vibration [TR010060/APP/6.1]), the residual effects would remain **moderate adverse** and significant.

**Table 7.12 Significant effects on built heritage assets during construction**

Asset no.	Asset name	Designation	Value	Magnitude of impact	Significance of effect
57	The 'Generals'	Grade II listed	High	Moderate	Moderate adverse
69	Boreham House	Grade I listed	High	Moderate	Moderate adverse
141	Nos. 12 and 14, 'The Street'	Grade II listed	High	Moderate	Moderate adverse
146	Post Office Stores	Grade II listed	High	Moderate	Moderate adverse
420	Hole Farmhouse	Grade II* listed	High	Moderate	Moderate adverse
708	Parish Church of All Saints, Inworth	Grade I listed	High	Moderate	Moderate adverse
784	Church View House (Flispes)	Grade II listed	High	Moderate	Moderate adverse
785	Easthorpe Green Farmhouse	Grade II listed	High	Moderate	Moderate adverse
795	Doggets Hammer Farm	Grade II listed	High	Moderate	Moderate adverse
805	No. 172 London Road, Marks Tey	Grade II listed	High	Moderate	Moderate adverse
816	Barn south of Marks Tey Hall	Grade II* listed	High	Moderate	Moderate adverse
817	Barn to north-west of Marks Tey Hall	Grade II listed	High	Moderate	Moderate adverse
819	Marks Tey Hall	Grade II listed	High	Moderate	Moderate adverse

### Historic landscape

- 7.11.69 One significant temporary residual effect on historic landscapes has been identified on Boreham House (Asset 67) during construction. The following paragraphs set out how potential impacts on designated historic landscape assets were assessed. A full list of impacts on historic landscapes, including non-significant construction effects, is provided in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].
- 7.11.70 HLT 7 reflects four occurrences of Post-Medieval designed landscapes within the study area, all four of which coincide with registered parks and gardens: New Hall, Boreham (Asset 7); Boreham House (Asset 67); Hatfield Priory (Asset 162) (all grade II); and Braxted Park (Asset 480) (grade II\*).

- 7.11.71 Boreham House grade II registered park and garden (Asset 67) was created in the early 18<sup>th</sup> century as the setting for grade I listed Boreham House (Asset 69). The house and earliest elements of the park, the canal flanked by its twin parallel driveways linking the estate to the B1137 Main Road at its north-west boundary, were designed by Henry Flitcroft for the owner Benjamin Hoare. After Benjamin's death in 1750, his elder brother Richard commissioned Richard Woods to create pleasure grounds and a lake south of the house, while retaining the original canal and approaches. An engraving from 1771 shows the canal and driveways unaltered as part of the new scheme, and these elements have survived largely intact to the present day. The land surrounding Boreham House was gradually sold off during the 20<sup>th</sup> century, leaving the house and pleasure grounds in private ownership, surrounded by farmland to the south and east, but with the A12 and industrial units beyond to the west and north, as well as modern roadside development in Boreham to the north and east, all of which are prominent in its setting. A broad avenue of trees flanks the access drives and frames views along the canal, and the north-west boundary is open to the B1137. Historically, this view would have taken in distant glimpses towards New Hall and the countryside beyond, but now traffic movement is a prominent component of views from the house.
- 7.11.72 Boreham House (Asset 67) is of aesthetic value as an example of an early 18<sup>th</sup> century landscape park designed to complement a contemporary mansion, and of historical value for its connections with landscape gardeners Henry Flitcroft and Richard Woods, and the architect of Boreham House (Asset 69), James Gibbs. Taking this and its designation as a grade II registered park and garden into account, the value of Asset 67 has been assessed to be high.
- 7.11.73 Although the quality of the view north over the canal has been eroded by residential and commercial development in the 20<sup>th</sup> century, the operation of construction plant at this location would create a prominent temporary visual impact affecting the understanding of the design and intended function of this part of the park to frame the view from the mansion. This would result in a temporary impact of minor magnitude and of moderate adverse significance. A programme of historic landscape recording to Historic England Level 2 (2017b) would be undertaken of the affected area of the asset before construction to ensure a record of its existing condition and setting is made. Whilst standard noise mitigation measures would be applied during construction through the EMP (see Chapter 12: Noise and vibration, of the Environmental Statement [TR010060/APP/6.1]), the residual effect would remain **moderate adverse**. This impact would be temporary and would cease at the end of construction at this location.
- 7.11.74 New Hall, Boreham (Asset 7) is a grade II registered park and garden, which can trace its origins to one of six Medieval manors of Boreham. In the 16<sup>th</sup> century, the estate was in the possession of the Boleyn family who relinquished it to Henry VIII in 1517. Henry improved the house and grounds, employing John Ryman to create what became known as the Great Garden of Beaulieu. One of the most prominent elements of the garden today is the 800m long double avenue and drive that links it with New Hall Road, east of the modern edge of Chelmsford. Asset 7 is of historical value because of its long history and connections with Henry VIII, and of aesthetic value because of its surviving

elements of 16<sup>th</sup> century garden design including the long avenue. Taking its designation into account, the value of New Hall, Boreham, has been assessed to be high.

- 7.11.75 Construction of junction 19 (Boreham interchange) would be within approximately 50m of the southern end of the double avenue which marks the approach to Asset 7. Dense mature plantation and shelter belts screen views from the house within. Distant glimpses of moving machinery during construction of the proposed scheme would not affect the understanding of the HLT at this location, and a temporary impact of negligible magnitude has been predicted, resulting in a **slight adverse** significance of effect. No mitigation is proposed for this impact.
- 7.11.76 Hatfield Priory (Asset 162) and Braxted Park (Asset 480) are a grade II and II\* registered park and garden respectively, both of which have been assessed to be of high value. They are located respectively 700m and 800m south-west of the proposed scheme and are screened from it by existing settlements and woodland. No impact is predicted for either asset during construction and therefore the effect would be **neutral** for both assets.

## Operation

### Archaeological remains

- 7.11.77 No significant operational effects upon the recorded or unrecorded archaeological remains are envisaged. During the operation of the proposed scheme, no further earthworks are anticipated. As such, there would be no further physical impacts on archaeological remains arising from the operation of the proposed scheme. Non-significant effects on archaeological remains during operation of the proposed scheme are presented in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].

### Built heritage

- 7.11.78 Wherever practicable, mitigation has been proposed for all significant operational effects (see Table 7.14 in Section 7.13 of this chapter for details). In each case, the overall significance of effect provided in this section represents the residual effect following the application of mitigation. However, although the proposed mitigation measures for the significant operational effects have been considered to be appropriate, they would not be sufficient to reduce the residual effects to a not significant level. Nevertheless, these mitigation proposals would still ameliorate some of the effects of the proposed scheme, and are therefore considered to be in accordance with professional guidance and best practice.
- 7.11.79 Whilst cross-referencing is provided in this section to the LVIA (Chapter 8: Landscape and visual, of the Environmental Statement [TR010060/APP/6.1]), and in particular to relevant viewpoints, these are provided only for further information as the methodological approach used in the LVIA does not directly apply to that used in the built heritage assessment. The visual impacts of the proposed scheme are only relevant to the built heritage assessment where they are considered to impact the value of a heritage asset through intrusion or erosion of its setting, leading to harm to either its aesthetic, historic, communal or evidential value.

- 7.11.80 Significant effects have been identified for six built heritage assets during the operational phase out of a total of 465 built heritage assets located within 1km of the proposed scheme. Only those built heritage impacts with the potential to result in significant effects are described in the section below and summarised in Table 7.13. The identified effects are adverse, unless otherwise stated. The full list of built heritage impacts, including non-significant operational effects, is provided in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].
- 7.11.81 The grade II listed Easthorpe Green Farmhouse in Copford (Asset 785), which is a 17<sup>th</sup> century timber-frame and brick house, is located approximately 250m to the south of the existing A12. The house would be impacted by the operation of the new offline section of road to the south of the existing A12 (Viewpoint No. 20, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]).
- 7.11.82 Whilst there are mature trees surrounding the farmhouse, providing some screening, there are open fields to the east and south which contribute to the building's aesthetic value; the existing vegetation around the house would all be retained. The farmhouse is associated with the nearby Church View (Asset 784), and the Easthorpe Village Green (Asset 902). These heritage assets both form part of the setting of Easthorpe Green Farmhouse and contribute to its historic legibility and aesthetic value.
- 7.11.83 The proposed new offline section of road would be located approximately 120m to the north of Easthorpe Green Farmhouse. In addition, the new infrastructure would include the Wishingwell Overbridge and a new side road to the south-east. This new infrastructure would result in visual intrusion within the setting of the house from the presence of the new raised road section, including associated traffic, lighting and signage (Viewpoint 20, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]). The new road would result in noise from additional road traffic closer to the house. This noise has been assessed as being minimal at the front of the house, due to existing road noise, and more prevalent to the rear, which is currently more tranquil. The predicted increase in noise would be reduced by the proposed road surfacing with better noise reducing properties than a conventional low noise road surface and an acoustic barrier. A landscape bund, along with woodland and tall screen planting, would also provide some screening of the properties from the new access road to mitigate the visual impacts.
- 7.11.84 The operation of the new road would partly impact the aesthetic value of Easthorpe Green Farmhouse (Asset 785), a high value asset, and erode what remains of its historic setting. The visual impacts (Viewpoint 20, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]) are predicted to result in a moderate magnitude of impact on a high value asset, resulting in a moderate adverse significance of effect. The residual effect would remain **moderate adverse** and significant.
- 7.11.85 The nearby grade II listed Church View House (Asset 784), formerly known as Flispes, is a late 16<sup>th</sup> century three-bay, cross-passage house, located approximately 330m to the south of the existing A12. The house is also surrounded by mature trees, which would be retained, but with open fields to the south, and part of its setting is formed by the historic Easthorpe Village Green (Asset 902).

- 7.11.86 The operation of the proposed new offline section of raised road, which would be located approximately 230m to the north and north-east of the house, plus the new side road and Wishingwell Overbridge, would affect long-range views from the house. The visual impact from the road's presence within the setting of the house, including lighting and signage, is predicted to result in harm to the aesthetic value of the listed building (Viewpoint 20, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]). There would also be noise impacts from additional road traffic. The predicted increase in noise would be reduced by the proposed road surfacing with better noise reducing properties than a conventional low noise road surface and an acoustic barrier. A landscape bund, along with woodland and tall screen planting, would also provide some screening of the properties from the new access road to mitigate the visual impacts.
- 7.11.87 The impact on Church View House (Asset 784) is assessed as resulting in a moderate magnitude of impact on a high value asset, which would result in a moderate adverse significance of effect. The residual effect would remain **moderate adverse** and significant.
- 7.11.88 Doggets Hammer Farm (Asset 795), a grade II listed building near Marks Tey, is located approximately 260m to the south of the existing A12, currently with views over open fields to the south and east. The house is a 16<sup>th</sup> century timber-frame building which would be affected by the presence in the landscape of the new offline section of road at Marks Tey located approximately 35m to the south and south-east of the farm together with a new Potts Green Bridge over the road.
- 7.11.89 The proposed new road would isolate the farm between the existing A12 and the new offline section of road, leading to a visual intrusion from the presence of the new road within its setting, including the Potts Green Bridge, new lighting and signage (Viewpoint 22 and photomontage, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]). Although a road surfacing with better noise reducing properties than a conventional low noise road surface is proposed in this area, plus an acoustic bund and woodland planting to the south, there is predicted to be an increase in noise from road traffic, affecting its tranquillity, due to traffic being closer to the house plus the dominant noise source now impacting upon a different side of the house (see Section 12.11 of Chapter 12: Noise and vibration [TR010060/APP/6.1]).
- 7.11.90 Overall, the new offline section of road would result in visual intrusion and erosion of the setting plus harm to the aesthetic value and historic legibility of Asset 795. This is assessed as a moderate magnitude of impact on a high value asset, resulting in a moderate adverse significance of effect. The residual effect would remain **moderate adverse** and significant.
- 7.11.91 The Marks Tey Hall (Asset 819) farm group of listed buildings is centred around the grade II listed 16<sup>th</sup> century timber-framed hall house, located approximately 330m to the south of the A12. The main hall has a group value together with two nearby barns to the south and north-west of it (Assets 816 and 817 respectively). Asset 816 is a grade II\* listed 15<sup>th</sup> century barn which is built of timber framing with exposed brick noggings and has a crown-post roof and jowled main-posts. Asset 817 is a grade II listed 17<sup>th</sup> century barn, built of red

brick with blue-glazed headers, a peg-tiled roof with two later diagonal chimney shafts and casement windows. The hall also has associated value with the Marks Tey Hall Moated Site (Asset 818), a scheduled monument, which forms part of the listed buildings' settings and contributes to their historic legibility and communal values.

- 7.11.92 Marks Tey Hall (Asset 819) has partial views to the south and west over agricultural land. Although these views are screened by mature trees and vegetation surrounding it, the setting retains a semi-rural character. However, this character has been partly compromised by the existing A12 and also by the visual intrusion of the adjacent caravan sales lot to the north-east and outbuildings, now used as industrial units, to the west which have eroded some of the contribution of the setting to the aesthetic value of the Marks Tey Hall group. The two listed barns are subject more directly to the intrusion of the caravan sales lot and also the industrial units, but also from the visual intrusion of the existing A12 to the north.
- 7.11.93 This historic farm group of three listed buildings (Assets 816, 817 and 819) would be subject to impacts from the visual intrusion of the new offline section of A12 road within their settings, including lighting and signage. There would also be additional noise impacts from road traffic using the new road in closer proximity to them.
- 7.11.94 However, the listed buildings would also benefit from some reductions in traffic noise from the proposed road surfacing with better noise reducing properties than a conventional low noise road surface. A new roundabout south-west of junction 25 joined to a new offline access road would provide access from the A12 to the existing Hall Chase Road within approximately 200m of Marks Tey Hall (Asset 819) (Viewpoint 24 and photomontage, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]). Tree planting is proposed as mitigation to the north of the access road to reduce the visual intrusion from the new offline road in this location by year 15, when the planting would have become established.
- 7.11.95 The operation of the proposed scheme is predicted to result in an impact from the presence of the earthworks and structures within settings of the Marks Tey Hall group of listed buildings (Assets 816, 817 and 819), which is assessed as resulting in harm to the aesthetic value and historic legibility of the three listed buildings. This would result in moderate magnitude of impacts on three high value heritage assets, resulting in three effects of moderate adverse significance. The residual effects would remain of **moderate adverse** significance.

**Table 7.13 Significant effects on built heritage assets during operation**

Asset no.	Asset name	Designation	Value	Magnitude of impact	Significance of effect
784	Church View House (Flispes)	Grade II listed	High	Moderate	Moderate adverse
785	Easthorpe Green Farmhouse	Grade II listed	High	Moderate	Moderate adverse

Asset no.	Asset name	Designation	Value	Magnitude of impact	Significance of effect
795	Doggets Hammer Farm	Grade II listed	High	Moderate	Moderate adverse
816	Barn south of Marks Tey Hall	Grade II* listed	High	Moderate	Moderate adverse
817	Barn to north-west of Marks Tey Hall	Grade II listed	High	Moderate	Moderate adverse
819	Marks Tey Hall	Grade II listed	High	Moderate	Moderate adverse

### Historic landscape

- 7.11.96 The preliminary assessment of historic landscape has not identified any significant residual effects on historic landscapes during operation. All impacts on the historic landscape are presented in Appendix 7.9 of the Environmental Statement [TR010060/APP/6.3].
- 7.11.97 Retained mature vegetation and buildings north-west of Boreham House (Asset 67), a grade II registered park and garden of medium value, would continue to screen views from the entrance driveway and canal towards the A12 north of junction 19. Once mature, the proposed tree planting east of junction 19 would screen more oblique views towards it from Asset 67. The magnitude of impact from operation of the proposed scheme on Asset 67 has been assessed to be minor, resulting in a **slight adverse** significance of effect.

## 7.12 Monitoring

### Construction effects

- 7.12.1 The measures identified to mitigate significant effects on heritage assets arising from construction of the proposed scheme would be monitored to ensure their successful delivery.
- 7.12.2 Monitoring may also be required for listed buildings and non-designated built heritage assets in conservation areas identified as being potentially subject to settlement effects, as described in Appendix 14.4: Groundwater Assessment, of the Environmental Statement [TR010060/APP/6.3].
- 7.12.3 The archaeological mitigation works (including protection measures for heritage assets and preservation in situ of archaeological remains) would be undertaken during the advanced works (the majority of the archaeological fieldwork and recording) and construction works stages.
- 7.12.4 Details of the monitoring required during the construction phase are presented in the Archaeological Mitigation Strategy (Appendix 7.10 of the Environmental Statement [TR010060/APP/6.3]), the parameters and duration of which are proportionate to the nature, location and size of the proposed scheme and the significance of its effects on identified heritage assets.



7.12.5 Monitoring by an archaeological clerk of works (to be employed by the Principal Contractor) would include, but not be limited to, the following:

- Monitoring of fencing to ensure its condition and that it is appropriately signed
- Monitoring of the archaeological mitigation works to ensure they are in line with the requirements of the mitigation strategy and Written Scheme of Investigation to be prepared by the Principal Contractor's archaeological contractor.

### Operational effects

7.12.6 As the assessment has concluded that there would be no significant adverse or beneficial effects on archaeological remains arising from operation of the proposed scheme, no monitoring of operational effects is required.

## 7.13 Summary

7.13.1 A total of 45 residual significant effects during construction, and six during operation, on designated and non-designated cultural heritage assets would remain after all forms of mitigation have been applied (Table 7.14).

7.13.2 Of the residual significant effects identified in this chapter, none have been assessed to meet the test equating to substantial harm.

**Table 7.14 Summary of significant residual cultural heritage effects**

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<b>Construction</b>			
Lionfield Cottages cropmarks (Asset 72) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Burgate field enclosure, Rivenhall End (Asset 354) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Hole Farm cropmarks (Asset 411) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Cropmarks along Crane's Lane (Asset 439) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Kelvedon Enclosure (Asset 647) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Cropmarks east of Hill House Farm (Asset 775) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation. Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Geophysical anomalies south-east of junction 21 (Asset 949) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Circular enclosure north-west of Prested Hall (Asset 950) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Geophysical anomalies west of Prested Hall (Asset 951) – Removal of archaeological remains affecting approximately 75% of the known extent of the asset.	Archaeological Excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Geophysical anomalies south and east of Potts Green (Asset 953) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation. Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Geophysical anomalies west of Inworth Hall (Asset 954) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Geophysical anomalies south of the Railway, Hatfield Peverel (Asset 956) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Geophysical Anomalies north of Hare Lodge (Asset 957) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Enclosures west of Sniveller's Lane (Asset 958) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Prehistoric settlement north-east of Henry Dixon Road (Asset 960) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation. Palaeoenvironmental assessment, analysis and reporting.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Prehistoric field boundaries west of Maldon Road (Asset 962) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Possible late prehistoric enclosure south of Ewell Hall Chase (Asset 964) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Possible Roman enclosure west of Park Farm (Asset 965) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Roman industrial activity west of Park Farm (Asset 966) – Removal of archaeological remains affecting approximately 75% of the known extent of the asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Prehistoric field system west of Prested Hall Farm (Asset 967) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Possible Iron Age settlement south of Highfields Lane (Asset 968) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Roman features south-east of Kelvedon (Asset 970) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Possible late prehistoric field system west of Easthorpe Road (Asset 971) – Removal of archaeological remains affecting approximately 75% of the known extent of the asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Possible Iron Age enclosure north of Easthorpe Road (Asset 973) – Removal of archaeological remains affecting the whole asset.	Archaeological excavation.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Multi-period field system west of Wishingwell Farm (Asset 974) – Removal of archaeological remains affecting approximately 60% of the known extent of the asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)
Roman field system east of Hall Chase (Asset 975) – Removal of archaeological remains affecting the whole asset.	Strip, map and sample.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>River Blackwater area of palaeoenvironmental potential (Asset 977) – Removal of archaeological remains affecting the whole asset.</p>	<p>A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders.</p> <p>Archaeological Excavation or Strip Map and Sample, the extent of which will be subject to the outcome of ongoing consultation with the relevant stakeholders.</p> <p>Palaeoenvironmental assessment, analysis and reporting.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]</p>	<p>Moderate adverse (significant)</p>
<p>Area of high Palaeolithic potential 1 (Asset 978) – Removal of archaeological remains affecting approximately 30% of the known extent of the asset.</p>	<p>A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders.</p> <p>Archaeological Excavation or Strip Map and Sample, the extent of which will be subject to the outcome of ongoing consultation with the relevant stakeholders.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]</p>	<p>Moderate adverse (significant)</p>
<p>Area of high Palaeolithic potential 2 (Asset 979) – Removal of archaeological remains affecting the whole asset.</p>	<p>A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders.</p> <p>Archaeological Excavation or Strip Map and Sample, the extent of which will be subject to the outcome of ongoing consultation with the relevant stakeholders.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]</p>	<p>Moderate adverse (significant)</p>

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>Area of high Palaeolithic potential 3 (Asset 980) – Removal of archaeological remains affecting the whole asset.</p>	<p>A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders.</p> <p>Archaeological Excavation or Strip Map and Sample, the extent of which will be subject to the outcome of ongoing consultation with the relevant stakeholders.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]</p>	<p>Moderate adverse (significant)</p>
<p>Area of high Palaeolithic potential 4 (Asset 981) – Removal of archaeological remains affecting the whole asset.</p>	<p>A further stage of evaluation may be required subject to the outcome of ongoing consultation with the relevant stakeholders.</p> <p>Archaeological Excavation or Strip Map and Sample, the extent of which will be subject to the outcome of ongoing consultation with the relevant stakeholders.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Archaeological Mitigation Strategy (Appendix 7.10) [TR010060/APP/6.3]</p>	<p>Moderate adverse (significant)</p>
<p>Grade II listed 'The Generals' (Asset 57) – Impact on setting from construction works to the existing junction 19. Some minor land-take along the pavement and verge near the entrance from Main Road. Impact from noise and dust plus visual intrusion from construction machinery and traffic.</p>	<p>Retain and protect existing stand of trees in front of The Generals, along the Main Road. This would maintain screening and retain trees which contribute to aesthetic value.</p> <p>Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Retained and Removed Vegetation Plans [TR010060/APP/2.14]</p>	<p>Moderate adverse (significant)</p>

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>Grade I listed Boreham House (Asset 69) – Affected by construction works associated with junction 19 within the setting. Minor land-take along Main Road, plus construction of associated earthworks and landscaping which would affect the entrance to Boreham House within the existing highways land. Impacts would include noise and dust plus visual intrusion from construction traffic and demolition machinery.</p>	<p>Landscape mitigation would be used in the area of the entrance.</p> <p>Standard mitigation measures to reduce noise during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p>	<p>Moderate adverse (significant)</p>
<p>Grade II listed Nos. 12 and 14 (Asset 141) – Impacts on the setting from the demolition and replacement of the Bury Lane Bridge together with the earthworks associated with the cutting and landscaping for the road widening. Impacts from noise and dust plus visual intrusion from construction traffic and machinery during construction.</p>	<p>Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p>	<p>Moderate adverse (significant)</p>
<p>Grade II listed Post Office Stores (Asset 146) – Impacts on the setting from the demolition and replacement of the Bury Lane Bridge together with the earthworks associated with the cutting and landscaping for the road widening. Impacts from noise and dust plus visual intrusion from construction traffic and machinery during construction.</p>	<p>Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p>	<p>Moderate adverse (significant)</p>



Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>Grade II* listed Hole Farmhouse (Asset 420) – Setting impacted by construction of a new offline section of road at Rivenhall End. Impacts from construction traffic and conversion of part of the existing A12 into a new local access road, construction of a pond, borrow pit to the north and soil storage area with compound. Impacts would result from the visual intrusion associated with the construction of earthworks and landscaping plus noise and dust from construction traffic and machinery.</p>	<p>Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p>	<p>Moderate adverse (significant)</p>
<p>Grade I listed Parish Church of All Saints, Inworth (Asset 708) – Setting impacted during construction from enlargement of roadside lay-by at pinch-point and removal of trees and hedge along roadside to church. Construction of flood compensation area to the south of church and new attenuation pond to the south-east, plus soil storage areas to the north-east would result in impacts on the aesthetic and communal values of the church from construction traffic, dust, noise and visual intrusion.</p>	<p>Reinstatement of church boundary and adjacent field through replanting after construction phase.</p> <p>Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p>	<p>Moderate adverse (significant)</p>

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Grade II listed Church View House (Flispes) (Asset 784) – Impact on the setting from construction of an offline section of raised A12, together with a new side road and the construction of the Wishingwell Overbridge. The construction activities for the associated earthworks and landscaping would result in noise and dust plus visual intrusion from construction machinery and traffic.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)
Grade II listed Easthorpe Green Farmhouse (Asset 785) – Impact on the setting from construction of an offline section of raised A12, together with a new side road and the construction of the Wishingwell Overbridge. The construction activities for the associated earthworks and landscaping would result in noise and dust plus visual intrusion from construction machinery and traffic.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)
Grade II listed Doggets Hammer Farm (Asset 795) – Impact on the setting from construction of the offline section of new road. Impacts from visual intrusion from construction machinery plus associated noise and dust within the setting of the listed building.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Grade II listed No. 172 London Road, Marks Tey (Asset 805) – Impacts on the setting from construction of upgraded junction 25 at Marks Tey, new roundabout plus demolition and replacement of a footbridge. The impacts would include visual intrusion, noise and dust from construction machinery and traffic.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)
Grade II* listed barn south of Marks Tey Hall (Asset 816) – Impacts on the setting from a new offline section of A12 road at junction 25, a new access road and reconfiguration of junction 25, satellite compound, and the demolition and replacement of the existing footbridge. Impacts would result in visual intrusion from construction machinery and traffic together with associated noise and dust.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)
Grade II listed barn to north-west of Marks Tey Hall (Asset 817) – Impacts on the setting from a new offline section of A12 road at junction 25, a new access road and reconfiguration of junction 25, satellite compound, and the demolition and replacement of the existing footbridge. Impacts would result in visual intrusion from construction machinery and traffic together with associated noise and dust.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
Grade II listed Marks Tey Hall (Asset 819) – Impacts on the setting from a new offline section of A12 road at junction 25, a new access road and reconfiguration of junction 25, satellite compound, and the demolition and replacement of the existing footbridge. Impacts would result in visual intrusion from construction machinery and traffic together with associated noise and dust.	Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)
Grade II registered park and garden Boreham House (Asset 67) – The presence and operation of construction plant nearby would create a temporary visual impact in a key view from the interior of the park, affecting the ability to understand the relationship between the park, house and wider landscape.	Level 2 historic landscape recording. Standard mitigation measures to reduce noise and vibration during construction. Details of these standard measures are provided in Section 12.10 of Chapter 12: Noise and vibration [TR010060/APP/6.1].	REAC, within the first iteration of the EMP [TR010060/APP/6.5]	Moderate adverse (significant)
<b>Operation</b>			
Church View House (Flispes) (Asset 784) – Impact on the setting from new offline section of road including new Wishingwell Overbridge and a new side road to the south-east. This new infrastructure would result in visual intrusion within the setting of the house from the presence of the new raised road section, including associated traffic noise, lighting and signage (Viewpoint 20, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]).	The noise impacts would be reduced by the proposed road surfacing with better noise reducing properties than conventional low noise road surfacing, and acoustic barrier. Visual impacts would be reduced by a landscape bund, along with woodland and tall screen planting, to screen the asset from the new access road.	REAC, within the first iteration of the EMP [TR010060/APP/6.5] Environmental Masterplan [TR010060/APP/6.2]	Moderate adverse (significant)

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>Easthorpe Green Farmhouse (Asset 785) – Impact on the setting from new offline section of road including new Wishingwell Overbridge and a new side road to the south-east. This new infrastructure would result in visual intrusion within the setting of the house from the presence of the new raised road section, including associated traffic noise, lighting and signage (Viewpoint 20, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]).</p>	<p>The noise impacts would be reduced by the proposed road surfacing with better noise reducing properties than conventional low noise road surfacing, and acoustic barrier. Visual impacts would be reduced by a landscape bund, along with woodland and tall screen planting, to screen the asset from the new access road.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Environmental Masterplan [TR010060/APP/6.2]</p>	<p>Moderate adverse (significant)</p>
<p>Doggets Hammer Farm (Asset 795) – Impact on the setting from a new offline section of A12 together with the proposed Potts Green Bridge. Impacts would include visual intrusion from the presence of the new road, the new bridge, new lighting and signage (Viewpoint 22 and photomontage, LVIA, see Chapter 8: Landscape and visual [TR010060/APP/6.1]) within its setting, resulting in visual intrusion and erosion of the setting affecting its tranquillity, and harm to the aesthetic value and historic legibility of the listed building.</p>	<p>A road surfacing with better noise reducing properties than a conventional low noise road surface is proposed in this area, plus an acoustic bund and woodland planting to the south.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]</p> <p>Environmental Masterplan [TR010060/APP/6.2]</p>	<p>Moderate adverse (significant)</p>

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>Barn south of Marks Tey Hall (Asset 816) – Impact from the new offline section of A12 road within its setting, including a new roundabout south-west of junction 25 and a new offline access road to provide access from the A12 to the listed building along Chase Road. The impacts would result from visual intrusion of the new infrastructure including lighting and signage and associated traffic noise, harming the aesthetic value and historic legibility of the listed building.</p>	<p>Tree planting is proposed as mitigation to the north of the access road to reduce the visual intrusion from the new offline road. The proposed road surface with better noise reducing properties than conventional low noise road surfacing would reduce noise from road traffic.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5] Environmental Masterplan [TR010060/APP/6.2]</p>	<p>Moderate adverse (significant)</p>
<p>Barn to north-west of Marks Tey Hall (Asset 817) – Impact from the new offline section of A12 road within its setting, including a new roundabout south-west of junction 25 and a new offline access road to provide access from the A12 to the listed building along Chase Road. The impacts would result from visual intrusion of the new infrastructure including lighting and signage and associated traffic noise, harming the aesthetic value and historic legibility of the listed building.</p>	<p>Tree planting is proposed as mitigation to the north of the access road to reduce the visual intrusion from the new offline road. The proposed road surface with better noise reducing properties than conventional low noise road surfacing would reduce noise from road traffic.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5] Environmental Masterplan [TR010060/APP/6.2]</p>	<p>Moderate adverse (significant)</p>

Description of effect	Mitigation measures	Mitigation mechanism	Significance of residual effect
<p>Marks Tey Hall (Asset 819)                      – Impact from the new offline section of A12 road within its setting, including a new roundabout south-west of junction 25 and a new offline access road to provide access from the A12 to the listed building along Chase Road. The impacts would result from visual intrusion of the new infrastructure including lighting and signage and associated traffic noise, harming the aesthetic value and historic legibility of the listed building.</p>	<p>Tree planting is proposed as mitigation to the north of the access road to reduce the visual intrusion from the new offline road. The proposed road surface with better noise reducing properties than conventional low noise road surfacing would reduce noise from road traffic.</p>	<p>REAC, within the first iteration of the EMP [TR010060/APP/6.5]                       Environmental Masterplan [TR010060/APP/6.2]</p>	<p>Moderate adverse (significant)</p>

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