

# A47/A11 Thickthorn Junction

**Scheme Number: TR010037**

## **Volume 6**

### **6.1 Environmental Statement**

#### **Chapter 6 – Cultural Heritage**

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**The Infrastructure Planning  
(Applications: Prescribed Forms and  
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The A47/A11 Thickthorn Junction  
Development Consent Order 202[x]

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**CHAPTER 6  
CULTURAL HERITAGE**

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## 6. Cultural heritage

### 6.1. Introduction

- 6.1.1. Highways England (the Applicant) has submitted an application for an order to grant a development consent order (DCO) for the A47/A11 Thickthorn Junction (hereafter referred to as ‘the Proposed Scheme’). The Proposed Scheme will create one new connector road between the A11 and A47 and provide a new link road between Cantley Lane South and the B1172 Norwich Road for continued access to the Thickthorn Junction. Two new underpasses and two new overbridges will also be constructed along with improvements to the Thickthorn roundabout. The Proposed Scheme will reroute traffic away from the existing Thickthorn Junction, which currently experiences delays and high levels of congestion during peak hours.
- 6.1.2. As part of the Environmental Impact Assessment (EIA) process, this Environmental Statement (ES) chapter reports the potential significant effects on cultural heritage as a result of the Proposed Scheme. This assessment includes a review of the existing baseline conditions, consideration of the potential impacts, identification of proportionate measures for mitigation and enhancement and summarises predicted significant residual effects.
- 6.1.3. The approach to this assessment follows that set out in the EIA Scoping Report (February 2018) (**TR010037/APP/6.5**) and subsequent Scoping Opinion (Planning Inspectorate, March 2018) (**TR010037/APP/6.6**) for the EIA of the Proposed Scheme. The assessment has been undertaken in accordance with the most up to date guidance in the Design Manual for Roads and Bridges (DMRB): LA 104 Environmental assessment and monitoring (Highways England 2019), and LA 106 Cultural heritage assessment (Highways England 2020).
- 6.1.4. The main chapter text is supported by the following appendices:
- ES Appendix 6.1 (**TR010037/APP/6.3**) – Cultural heritage information. A detailed discussion of baseline information gathered to date, including assessment of archaeological potential, heritage value/sensitivity and the contribution of setting and significance of all identified heritage assets
  - ES Appendix 6.2 (**TR010037/APP/6.3**) – A47/A11 Thickthorn Junction Geophysical Survey Reports: *An archaeological geophysical survey (magnetic gradiometry) report* (ENF 143424) (WYAS, 2018) and *Geophysical survey report* (Magnitude Surveys, 2020)(ENF150634)
  - ES Appendix 6.3 (**TR010037/APP/6.3**) – Archaeological trial trenching evaluation report (ENF149240) (Cotswold Archaeology, September 2020) *A11/A47 Thickthorn Junction Hethersett and Ketteringham, Norwich Norfolk Archaeological Evaluation*

## 6.2. Competent expert evidence

- 6.2.1. The competent expert is a Principal Consultant with a BSc in Archaeological Science and holds full corporate membership with the Chartered Institute for Archaeologists (MCIfA) and the Institute of Historic Building Conservation (IHBC). The Principal Consultant has over 13 years of experience undertaking heritage assessments throughout the UK. A technical review of this assessment was undertaken by a Technical Director with 30 years of professional heritage experience.

## 6.3. Legislation and policy framework

### National legislation and policy

#### *Legislation*

- 6.3.1. The overarching legislation relating to the historic environment in England and relevant to this heritage assessment of the Proposed Scheme is:
- The Ancient Monuments and Archaeological Areas Act 1979  
It is a criminal offence to carry out any works on or near to a Scheduled Monument without Scheduled Monument Consent. Development must preserve in-situ protected archaeological remains and landscapes of acknowledged significance and protect their settings.
  - The Planning (Listed Buildings and Conservation Areas) Act 1990  
The 1990 Act is amended by the Enterprise and Regulatory Reform Act 2013 to introduce additional controls for works to listed buildings.  
Section 1 of the Act requires the Secretary of State to compile and maintain lists of buildings of special architectural or historic interest. The principal statutory duty under the Act is to preserve the special character of these heritage assets, including their setting.
  - The Burial Act (1857)  
Under Section 25 of the 1857 Act, it is generally a criminal offence to remove human remains from any place of burial without an appropriate licence issued by the Ministry of Justice (MoJ), although recent legislative changes indicate that some cases are exempt from this requirement.
  - The Treasure Act (1996 and 2003 amendments)  
The 1996 Act defines 'Treasure' as any object that is at least 10% gold or silver, associated with coins or groups of coins which are over 300 years old, objects formerly classed as 'treasure trove' (i.e. deliberately deposited items with a high content of gold or silver) and any objects found in association with the above. Any find of 'Treasure' must be reported to the local Coroner.

### *National Policy Statement for National Networks*

- 6.3.2. The National Policy Statement for National Networks (NPS NN, 2014) sets out guidance concerning infrastructure projects. Of relevance to this assessment is Section 5: The historic environment, which addresses impacts to heritage assets and the conservation and enhancement of the historic environment.
- 6.3.3. Paragraph 5.131 states *“Given that heritage assets are irreplaceable, harm or loss affecting any designated heritage asset should require clear and convincing justification. Substantial harm to or loss of a grade II Listed Building or a grade II Registered Park or Garden should be exceptional. Substantial harm to or loss of designated assets of the highest significance, including World Heritage Sites, Scheduled Monuments, grade I and II\* Listed Buildings, Registered Battlefields, and grade I and II\* Registered Parks and Gardens should be wholly exceptional”*.

### *National Planning Policy Framework (NPPF, 2019)*

- 6.3.4. The NPPF addresses the conservation and enhancement of the historic environment. Of relevance to the Proposed Scheme are paragraphs 184, 189, 192 to 197, and 199. These set out the local planning authority’s responsibilities when dealing with planning proposals which have the potential to impact on cultural heritage assets. The NPPF emphasises the importance of balancing the need for the conservation of heritage assets with the desirability of new development.
- 6.3.5. Although the Proposed Scheme will not be subject to the local authority planning process, the approach outlined in the NPPF represents best practice when dealing with the cultural heritage resource.
- 6.3.6. The NPPF introduced the term ‘harm’ into national planning policy regarding the historic environment. The term ‘harm’ is also used in the NPSNN (2014). Harm is now the policy test against which the impact of development on heritage assets is judged. Paragraph 194 of the NPPF states that *‘Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification’*.
- 6.3.7. The policy framework goes on to state that *‘where proposed development will lead to substantial harm to or total loss of significance of a designated asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss’*.
- 6.3.8. The level of impact on an asset which could constitute substantial harm is set out in the National Planning Practice Guidance (NPPG) (2014) which states that

*'in general terms, substantial harm is a high test, so it may not arise in many cases... is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed'. It goes on to say that 'while the impact of total destruction is obvious, partial destruction is likely to have a considerable impact but, depending on the circumstances, it may still be less than substantial harm or conceivably not harmful at all... However even minor works have the potential to cause substantial harm'.*

- 6.3.9. It should be noted that less than substantial harm can still be significant, and any harm should be taken into consideration when assessing whether the Proposed Scheme should be allowed. The NPPF states: *'where a development proposal will lead to less than substantial harm to the significance of the designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use'.*

#### *Local planning policy*

#### **Joint Core Strategy for Broadland, Norwich and South Norfolk (Greater Norwich Development Partnership 2014)**

- 6.3.10. The Joint Core Strategy for Broadland, Norwich and South Norfolk contains the following policies relevant to cultural heritage:

- Policy 1 - Addressing climate change and protecting environmental assets: *"The built environment, heritage assets, and the wider historic environment will be conserved and enhanced through the protection of buildings and structures which contribute to their surroundings, the protection of their settings, the encouragement of high-quality maintenance and repair and enhancement of public spaces"*
- Policy 2 - Promoting good design: *"Development proposals will respect local distinctiveness including landscape character and historic environment, taking account of conservation area appraisals and including the wider countryside and the Broads area"*
- Policy 8 addresses culture, leisure and entertainment, and states *"Cultural heritage will be enriched through use of innovative design and in the public realm."*

## **6.4. Methodology**

### **Introduction**

- 6.4.1. The assessment has been undertaken in accordance with DMRB LA106 and has considered effects on designated and undesignated heritage assets as described above. These assets include scheduled monuments, conservation areas, registered parks and gardens, listed buildings, undesignated locally recorded historically important buildings and landscapes, locally important buildings and



structures identified during survey work, and undesignated below ground archaeological remains.

6.4.2. In addition to LA106, the following guidance has been used to inform this assessment:

- Chartered Institute for Archaeologists (CIfA) *Standard and guidance for historic environment desk based assessment* (CIfA 2017)
- Statements of Heritage Significance: Analysing Significance in Heritage Assets Historic England Advice Note 12 (Historic England 2019)
- Design Manual for Roads and Bridges (DMRB), LA 104 Environmental assessment and monitoring (Highways England 2019)
- Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision Taking (Historic England 2015)
- Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (Historic England 2017)
- Standards for Development-led Archaeological Projects in Norfolk (NCCES 2018)

6.4.3. Temporary and permanent construction and operational impacts on heritage assets have been considered in this assessment. Temporary impacts relate to those upon the setting of heritage assets arising from construction-related activities. Permanent impacts can be either direct, physical effects on heritage assets or impacts on their setting.

6.4.4. All heritage assets are listed in ES Appendix 6.1, Annex A, **(TR010037/APP/6.3)** with an assessment of their heritage value/sensitivity. This appendix also provides the historic background necessary to place the assessments in context

6.4.5. An assessment of magnitude of impact and significance of effect without application of proposed mitigation measures upon all baseline heritage assets that may be affected is presented in ES Appendix 6.1 **(TR010037/APP/6.3)** Tables 8 (construction phase impacts) and 9 (operation impacts).

6.4.6. Within this chapter an assessment of residual effects following application of proposed site-specific mitigation measures is presented for heritage assets identified where an effect significance of Slight or higher is predicted in ES Appendix 6.1 **(TR010037/APP/6.3)**, Tables 8 and 9.

6.4.7. The results of site visits, geophysical survey and trial trenching have been used to inform the assessment of archaeological potential.

6.4.8. The methodology was presented within Chapter 6 of the EIA Scoping Report for the Proposed Scheme (2018). A schedule of responses detailing how each of the



Scoping Opinion comments has been considered as part of this chapter is contained within ES Appendix 6.1, Table 1 (TR010037/APP/6.3).

6.4.9. Changes to DMRB standards in 2019 since the date of scoping did not significantly affect the methodology as presented within the EIA Scoping Report (2018).

### Update to guidance and scope of assessment

6.4.10. Following preparation of the EIA Scoping Report for the Proposed Scheme in 2018, an update to DMRB standard was published in 2019. The scope of this assessment has been reviewed and updated to reflect the current guidance contained in DMRB LA 106 Cultural heritage (Highways England 2020).

6.4.11. Table 6-1 sets out the method for assessment in the ES which was originally used in the scoping assessment to determine the proposed scope of the heritage assessment. Where the response to one or more of the scoping assessment questions is 'yes', further assessment has been undertaken.

Table 6-1 Summary of proposed scope

Scoping question	Comment	Scope in?
Is any designated or other cultural heritage resource in the DCO boundary of the Proposed Scheme or outside that DCO boundary but still potentially physically affected by it?	Designated and undesignated heritage assets are recorded within the DCO boundary of the Proposed Scheme.	Yes
Is the setting of any designated or other cultural heritage resource in the DCO boundary of the Proposed Scheme, within the zone of visual influence or potentially affected by noise?	Designated and undesignated assets have settings that include or partially include the DCO boundary of the Proposed Scheme, ZTV and / or are potentially affected by noise.	Yes
Is there new land take associated with the Proposed Scheme?	The Proposed Scheme DCO boundary has altered and has new land take to the north west.	Yes
Could potential hitherto unknown archaeological remains be concealed?	Potential archaeological remains are indicated in the Proposed Scheme DCO boundary from findspots and cropmarks visible on aerial photos.	Yes

### Consultation

6.4.12. Non-statutory public consultation on the Proposed Scheme was undertaken in March and April 2017. Where relevant, key points arising have been carried forward in the development of mitigation measures for the Proposed Scheme and reported in the ES.

- 6.4.13. An EIA Scoping Report has been prepared for the scheme and was submitted to the Planning Inspectorate in March 2018 (**TR010037/APP/6.5**). In June 2018, on-site consultations were undertaken at the scheduled monument in Cantley Wood, attended by Highways England, Historic England and Norfolk County Council Environmental Services (NCC ES).
- 6.4.14. In June 2020 further consultation regarding EIA methodology was undertaken by email with Historic England and NCC ES.
- 6.4.15. Norfolk County Council have also been consulted to agree the design of intrusive archaeological evaluations of the Proposed Scheme DCO boundary by trial trenching, which informs the assessment of archaeological potential in this chapter.
- 6.4.16. A detailed description of the consultation which has taken place can be found in ES Appendix 6.1 (**TR010037/APP/6.3**), Table1.

## Data sources

- 6.4.17. The following baseline research has been undertaken for this assessment:
- An examination of the local, regional and national planning policies in relation to the historic environment.
  - A search of the National Heritage List for England (NHLE), maintained by Historic England, for the location and status of designated heritage assets (in the case of the Proposed Scheme these are scheduled monuments, registered parks and gardens, and listed buildings).
  - A search of the Norfolk Historic Environment Record (HER) database for details of known undesignated heritage assets: archaeological sites and find spots, locally listed buildings and archaeological event location.
  - A walkover survey of the land within the Proposed Scheme DCO boundary to examine the ground conditions and potential for previously unrecorded heritage assets.
  - Norfolk County Council web pages for details of Conservation Areas and Historic Landscape Characterisation data.
  - An examination of relevant published and unpublished archaeological and historic documentary sources for example journals and historic records
  - An examination of topographical and geological data
  - A map regression exercise using historic maps to determine previous land use within the DCO boundary of the Proposed Scheme
  - The results of an aerial photograph and LiDAR review
  - An examination of the geophysical survey interpretive data completed for this project (ES Appendix 6.2 (**TR010037/APP/6.3**), A47/A11 Thickthorn Junction

Geophysical Survey Reports (ENF 143424, WYAS, 2018) and Magnitude Surveys, 2020 (ENF150634 )

- Results of a programme of archaeological trial trenching (ES Appendix 6.3 (**TR010037/APP/6.3**), *A11/A47 Thickthorn Junction Hethersett and Ketteringham, Norwich Norfolk Archaeological Evaluation* (ENF149240, Cotswold Archaeology, September 2020)) in accordance with the Written Scheme of Investigation (WSI).

- 6.4.18. The archaeological potential of the Proposed Scheme DCO boundary has been determined through consideration of the available HER data, documentary evidence geophysical survey and intrusive evaluation through trial trenching.
- 6.4.19. Figures showing the location of all heritage assets in relation to the Proposed Scheme DCO boundary have been provided (**TR010037/APP/6.2**). Results of the geophysical survey can be found in ES Appendix 6.2 (**TR010037/APP/6.3**). Results of the trial trench evaluation can be found in ES Appendix 6.3 (**TR010037/APP/6.3**). LVIA visualisations used in assisting the Cultural Heritage assessments can be found in ES Figures 7.6.1 – 7.6.12 (**TR010037/APP/6.2**).

### Assessment criteria

- 6.4.20. The assessment of heritage value/sensitivity of heritage assets and the magnitude of any impacts and the assessment of significance of effects follows the requirements of LA106 Cultural heritage which refers to the criteria outlined in in tables 3.2N, 3.4N, 3.7 and 3.8.1 of DMRB LA 104 Environmental assessment methodology.
- 6.4.21. Each heritage asset is graded for value/sensitivity on a scale of Negligible, Low, Medium, High and Very High. This accords with the criteria outlined in Table 3.2N of DMRB LA 104 and with reference to other appropriate criteria such as those used to designate scheduled monuments or listed buildings (that is, the value/sensitivity of a heritage asset will derive from factors including fabric, rarity, completeness, historic and cultural associations, community, research and place-making potential) which is assessed through professional judgement.
- 6.4.22. An assessment of the sensitivity of a heritage asset to change within its setting is also a professional judgement, based on consideration of the asset's value/sensitivity and the contribution its current and historical setting makes to that value/sensitivity.
- 6.4.23. The value/sensitivity of heritage assets is based on the criteria outlined in Table 6-2.

Table 6-2. Criteria for establishing value/sensitivity of archaeological assets and historic buildings

Value/Sensitivity	Typical criteria
Very High	World Heritage sites, assets of acknowledged international importance, assets that can contribute significantly to acknowledged international research objectives.
High	Scheduled monuments, listed buildings, registered parks and gardens, registered battlefields, undesignated assets of schedulable quality, undesignated monuments, sites or landscapes that can be shown to have specific nationally important qualities and assets that can contribute significantly to national research objectives.
Medium	Conservation areas, undesignated sites of high importance identified through research or survey, monuments or sites that can be shown to have important qualities in their fabric or historical association.
Low	Non-designated assets - buildings, structures, monuments or archaeological sites with a local importance for education or cultural appreciation, and which add to local archaeological and historical research. Very badly damaged assets that are of such poor quality that they cannot be classed as high or medium, parks and gardens of local interest.
Negligible	Heritage resources identified as being of little historic, evidential, aesthetic or communal interest, resources whose importance is compromised by poor preservation or survival or by contextual associations to justify inclusion into a higher grade.

Source: Based on DMRB (LA104 Environmental Impact Assessment, Table 3.2N), 2019

6.4.24. The magnitude of impact is assessed on a scale of no change, negligible, minor, moderate or major. This is based on consideration of each of the parts of or the extent to which each asset is likely to be affected. These parts could be physical elements of the asset or its setting, and how important those elements are to the value/sensitivity of the asset. Impacts can be beneficial or adverse and there can be both beneficial and adverse impacts on the same asset. Beneficial and adverse impacts do not “balance out” and where appropriate each type of impact has been carried forward to assessment of the significance of impact.

6.4.25. Magnitude of impact is based on the criteria outlined in Table 6-3.

Table 6-3. Factors in the assessment of the magnitude of impacts

Magnitude	Criteria
Major adverse	Total loss or fundamental alteration to heritage asset's significance or setting. Addition of new features that substantially alter the setting of a heritage asset.
Moderate adverse	Partial loss or alteration to a heritage asset's significance or its setting. Addition of new features that partially alter setting of a heritage asset to the extent where the significance is impacted.
Minor adverse	Minor loss of an element of a heritage asset or its setting. Addition of new features that form largely inconspicuous elements in the setting of a heritage asset to the extent that its significance is slightly impacted.

Magnitude	Criteria
Negligible adverse	Very minor loss of elements of a heritage asset or its setting. Addition of new features that do not alter the setting of a heritage asset.
No change	No change to the heritage asset.
Negligible beneficial	Very minor enhancements to the heritage asset or its setting that help slightly better reveal the assets heritage value.
Minor beneficial	Changes that have a limited benefit to the heritage value of the asset. Changes to the setting of the asset which have a slight beneficial impact on heritage value and enhance the ability to understand the asset its historic context and setting.
Moderate beneficial	Changes that are beneficial to the heritage value of the asset. Changes that result in the setting of the asset being noticeably enhanced and improving the ability to understand the asset and its historic context and setting.
Major beneficial	Changes that are extremely beneficial to the value of the asset. Comprehensive changes to the setting of the asset which greatly reveal and enhance its heritage value.

Source: Based on DMRB (LA104 Environmental Impact Assessment, Table 3.4N), 2019

6.4.26. The significance of identified effects are established by combining the assessment of both the heritage value/sensitivity of an asset with the magnitude of the impact as described in DMRB LA104, Table 3.8.1. This informs the prediction of the significance of the effect on a scale ranging from Neutral to Slight, Moderate, Large, or Very Large as shown in the matrix at Table 6-4.

6.4.27. In accordance with DMRB LA104, Table 3.7 note 3, predicted residual effects of moderate to very large are considered to be significant.

Table 6-4. Criteria for assessing significance of effect

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Heritage Value/sensitivity	Very High	Neutral	Slight	Moderate/Large	Large/Very Large	Very large
	High	Neutral	Slight	Moderate/Slight	Moderate/Large	Large/Very Large
	Medium	Neutral	Neutral/Slight	Slight	Moderate	Moderate/Large
	Low	Neutral	Neutral/Slight	Neutral/Slight	Slight	Slight/Moderate
	Negligible	Neutral	Neutral	Neutral/Slight	Neutral/Slight	Slight

Source: Based on DMRB (LA104 Environmental Impact Assessment, Table 3.8.1), 2019

6.4.28. Further detail of how criteria in this assessment applies to cultural heritage is provided in ES Appendix 6.1, Sections 6.8 – 6.10 (**TR010037/APP/6.3**).

## 6.5. Assessment assumptions and limitations

- 6.5.1. Some heritage assets are designated (Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Registered Parks and Gardens, or Registered Battlefields) and protected through legislation, or locally designated through policies in the Local Plan. Undesignated assets may be recorded in Historic Environment Records (HER), while many other assets are currently unrecorded.
- 6.5.2. Heritage assets are referred to in this chapter by their National Heritage List for England (NHLE) (designated heritage assets) or Norfolk Historic Environment Record (NHER) reference number, prefixed 'MNF' (undesignated heritage assets). Assets recorded by both sources are referred to by their NHLE reference. Where assets have been identified by fieldwork as a part of this assessment of the Proposed Scheme, they are prefixed 'THK'.
- 6.5.3. Information provided by the HER can be limited due to its dependence on the nature of previous opportunities for historic and archaeological research, fieldwork, and discovery. Where nothing of historic interest is shown in a particular area, this can be down to a lack of research or investigation carried out in the area to date, rather than proof that no heritage assets are present at that location.
- 6.5.4. A walkover survey was undertaken of the Proposed Scheme DCO boundary in 2017 for a previous scheme assessment. The site was not revisited for the current assessment as the landscape and archaeological potential inferred from the visit was assessed as unlikely to have changed. These limitations are largely mitigated by undertaking archaeological field survey in the form of geophysical survey and trenching as well as the availability of digital images online and records from other discipline's surveys.
- 6.5.5. Documentary sources are rare before the medieval period. Whilst it is accepted that historic documents may be biased depending on the author, wherever such documentary sources are used in assessing archaeological potential, professional judgment is used in their interpretation.
- 6.5.6. Older primary sources referenced by the NHER often fail to accurately locate heritage assets and interpretation can be subjective.
- 6.5.7. Where archaeological sites have been identified solely from aerial imagery without confirmation from archaeological excavation or supporting evidence in the form of find-spots for example, it is possible the interpretation may be revised in the light of further investigation. It should be noted that the absence of



indications of archaeological features on aerial imagery does not confirm an absence of sub-surface archaeological deposits.

- 6.5.8. A gazetteer of all heritage assets can be found in ES Appendix 6.1, Annex A (TR010037/APP/6.3).

## 6.6. Study area

- 6.6.1. The study area is shown on ES Figures 6.1 and 6.2 (TR010037/APP/6.2) and has been defined in accordance with Sections 3.6 – 3.7 of DMRB LA106 to include:

- The Proposed Scheme footprint that may be physically affected
- The zone of visual influence (ZVI) defined by the procedurally generated Zone of Theoretical Visibility (ZTV, see ES Figure 6.1 TR010037/APP/6.2) which is modified based on site observations to account for vegetation or other factors not procedurally accounted for. The ZVI does not have a mappable output, as it is based partly on professional judgement and will change with season and weather.
- Any heritage assets which may potentially be affected by noise as identified in paragraph 6.10.14 of this chapter.

- 6.6.2. As is standard methodology, to establish the archaeological potential and provide historic context to the land within the Proposed Scheme DCO boundary, NHLE and NHER baseline information has been gathered for a wider baseline area of search (1km area of search from the Proposed Scheme scoping boundary).

- 6.6.3. It should be noted that where the ZTV clearly indicates visibility only from the rooftops of buildings represented in the baseline topographical data, these have been discounted from detailed assessment in the historic environment screening exercise (as it is considered there would be no appreciable intervisibility between the heritage asset and the Proposed Scheme).

## 6.7. Baseline conditions

- 6.7.1. The archaeological and historic baseline is described in detail in ES Appendix 6.1, Sections 6.5 – 6.7 (TR010037/APP/6.3). A summary of the baseline conditions and descriptions of the heritage assets that may be affected by the Proposed Scheme is set out in this section.

- 6.7.2. There are no Registered Parks and Gardens, Registered Battlefields or Conservation Areas within the study area (defined as the DCO boundary of the Proposed Scheme, within the ZTV or potentially affected by noise).



- 6.7.3. A total of 37 heritage assets as recorded by the NHER and evaluation undertaken for this assessment have been identified within the study area. These assets are made up of:
- One Scheduled Monument (comprising two barrows)
  - Six Listed Buildings (all Grade II)
  - 13 undesignated assets
  - 17 findspots<sup>1</sup>, which are considered by the assessment of archaeological potential, but excluded from direct impact assessment)
- 6.7.4. In addition, 16 historic landscape character types are considered in the impact assessment.
- 6.7.5. One unknown heritage asset has been considered in the impact assessment, identified through trial trench evaluation carried out for the proposed scheme ('THK02') (ES Appendix 6.3 (**TR010037/APP/6.3**)).
- 6.7.6. The archaeological potential of areas within the DCO boundary that are programmed for trial trenching in Spring 2021 have been evaluated through geophysical surveys (ES Appendix 6.2 (**TR010037/APP/6.3**)). The archaeological trial trenching proposed is supplementary to that already completed in 2020.
- 6.7.7. Each of the assets that have been identified as being located within the study area are described in detail below.
- 6.7.8. Heritage assets are shown on ES Figures 6.1, 6.2 and 6.3 (**TR010037/APP/6.2**) and are listed in the gazetteer in ES Appendix 6.1, Annex A (**TR010037/APP/6.3**).
- 6.7.9. Heritage assets were screened for potential impacts following reviews of all available information. Heritage assets excluded from impact assessment include:
- Upstanding remains within the ZTV where the Proposed Scheme would only be visible from an inaccessible location such as; roof lines, the tops of trees, boundary walls or hedges.
  - Archaeological remains outside the footprint of the road, as these could not be affected by the Proposed Scheme. (These were nevertheless considered to inform the assessment of potential for the presence of previously unknown archaeological remains within the Proposed Scheme footprint.)
  - Findspots of artefacts that have been removed from their original location. These cannot be affected as they are no longer present however, as

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<sup>1</sup> A findspot is one single find or artefact that has been removed from its location of discovery.

above, these may indicate other remains nearby and so were used to inform the assessment of archaeological potential.

- 6.7.10. A screening exercise has been undertaken ((see Tables 8 (Temporary and permanent construction impacts of the Proposed Scheme) and 9 (operational impacts of the Proposed Scheme), ES Appendix 6.1 (**TR010037/APP/6.3**)) to identify environmental impacts of the final design fix (including design measures) without site-specific detailed mitigation recommendations. For an assessment of all cultural heritage assets, including those where no likely significant effects have been reported, refer to ES Appendix 6.1 (**TR010037/APP/6.3**). This exercise identified 20 assets, referred to below as the 'key assets' which may experience significant effects. They comprise of one scheduled monument, six listed buildings and 13 non-designated assets, which are described further below.

### Key designated heritage assets

#### *Two Tumuli in Big Wood, scheduled monument 1003977*

- 6.7.11. There is one scheduled monument (comprising a pair of monuments) within the ZTV for the Proposed Scheme, located outside, directly to the east of, but also surrounded by the Proposed Scheme DCO boundary as shown on ES Figure 6.1 (**TR010037/APP/6.2**). Visualisations of the setting surrounding the scheduled monument have been produced to aid the assessment (ES Figures 7.6.1 - 7.6.12 (**TR010037/APP/6.2**)).
- 6.7.12. Following consultation with Historic England during early stages of the Proposed Scheme it was agreed that detailed analysis by remote sensing would be implemented in order to better understand the extent, significance and setting of the barrows (this is presented in ES Appendix 6.1, Section 6.5 (**TR010037/APP/6.3**) and summarised below).
- 6.7.13. This scheduled monument is a pair of Bronze Age burial mounds ('round barrows' or 'tumuli'). Nationally important, the asset is of **High** heritage value/sensitivity. Evidence of Bronze Age funerary practice is an extremely rare resource and can contribute significantly to acknowledged national research objectives. The barrows are heavily screened by large trees and, with the exception of animal burrows, both are undisturbed. The NHER records them as two of the largest and best preserved barrows in Norfolk.
- 6.7.14. In the 20<sup>th</sup> century, gravel extraction was carried out in the immediate vicinity of the scheduled monuments. The gravel pit was also then utilised as a landfill site accepting household waste during the 1960s and the landfill completely surrounds the westernmost barrow. The extent of mapped extraction is illustrated in Figure 6.1.6, ES Appendix 6.1 (**TR010037/APP/6.3**).

- 6.7.15. Assessment of LiDAR data and aerial imagery has indicated that the western barrow, measuring approximately 35m in diameter and approximately 4m in height, is situated a minimum of 5m from the Proposed Scheme DCO boundary. The eastern barrow, measuring approximately 31m in diameter and approximately 3m in height, is situated a minimum of 18m from the Proposed Scheme DCO boundary.
- 6.7.16. Proposed trial trenching within the Proposed Scheme DCO boundary in close proximity to the scheduled monument to provide data on any associated archaeological activity, requested by Historic England to accompany the ES submission, has not been possible due to the presence of existing tree cover. However, trial trenches that were excavated to the north (Trench 57, 65m away from the western barrow) and south (Trench 48, 80m from the western barrow) contained no archaeological remains.

*Milestone No.4, grade II listed building 1050573*

- 6.7.17. This late 18th century milestone for Norwich and Thetford Turnpike Trust, is a Grade II listed building, located within the Proposed Scheme DCO boundary and ZTV. The Proposed Scheme design avoids the asset.
- 6.7.18. The limestone milestone is wedge shaped, around 60cm high with a rounded cap, tapering from 14cm to 31cm. There are recessed full width panels inscribed NORWICH / 4 / MILES and THETFORD / 25 / MILES. The asset is of **High** value/sensitivity.
- 6.7.19. There are five further listed buildings located outside the Proposed Scheme DCO boundary but within the ZTV, which have been considered due to the potential for their settings to be affected.

*The Round House, grade II listed building 1050567*

- 6.7.20. Cottage constructed in approximately 1805 for the estate of Sir Roger Kerrison. Octagonal in shape with a red brick dentil cornice and black glazed pantiles. The asset is of **High** value/sensitivity, located 280m east of the Proposed Scheme DCO boundary at Thickthorn junction.

*Kitchen garden walls and attached octagonal building c.60m north-east of Thickthorn Hall, grade II listed building 1050575*

- 6.7.21. Early 19th century walls, constructed with red brick in Flemish bond with some ramped walls at angles. This has been included for group value with Thickthorn Hall. The asset is of **High** value/sensitivity and is located 62m west of the Proposed Scheme DCO boundary.

### *North House / The Farmhouse, grade II listed building 1169110*

- 6.7.22. Late 18th and early 19th century farmhouse, now two dwellings with colourwashed brick and black glazed pantiles. The farm was originally the Hall Farm of Cringleford Hall. The asset is of **High** value/sensitivity, located 20m east of the Proposed Scheme DCO boundary.

### *Thickthorn Hall, grade II Listed Building 1169537*

- 6.7.23. An early 19<sup>th</sup> century mansion, with an early 19<sup>th</sup> century walled kitchen garden and a late 18<sup>th</sup> century octagonal barn. The principal façade of Thickthorn Hall is to the south and has Tuscan pilasters and a recessed doorway with Tuscan columns. The asset is of **High** value/sensitivity, located 190m south of the Proposed Scheme DCO boundary at the A11.

### *Cantley House, grade II listed building 1306560*

- 6.7.24. A 16<sup>th</sup> and 17<sup>th</sup> century house (formerly a farmhouse), much of the timber frame now replaced with colourwashed brick and pantile roof. The main block of the house dates from the 17<sup>th</sup> century, and the interior of the house contains elaborately carved timbers with ovolo mouldings and other decorative details. The house and farmstead are the only-remaining settlement of the former parish of Cantelose. The asset is of **High** value/sensitivity, located 200m south of the Proposed Scheme DCO boundary.

## **Key undesignated heritage assets**

- 6.7.25. Thirteen undesignated assets located within the Proposed Scheme DCO boundary have been identified as potentially affected by the Proposed Scheme.

### *MNF11805 Lodge House*

- 6.7.26. Constructed in the late 18<sup>th</sup> or early 19<sup>th</sup> century, Lodge House was the original lodge of Thickthorn Hall (NHLE1169537). The lodge is Georgian in style, compared to the neo-classical style of the hall. It has been suggested that the lodge was a deliberate device to make the park seem larger than it was.
- 6.7.27. An occupied residential house. The asset is of **Low** cultural heritage value/sensitivity.

### *MNF18186 cropmarks of linear ditches and possible enclosures of unknown date*

- 6.7.28. Cropmarks of linear ditches perhaps relating to the medieval parish boundary of Thickthorn, together with several possible fragmentary enclosures of unknown date are visible on aerial photographs on land that is now Hethersett Racecourse.

- 6.7.29. With the exception of slight agricultural disturbance, the remains may be well preserved. Recorded by NHER as an area, roughly half of which is located within the south west of Proposed Scheme DCO boundary, although the majority will already have been destroyed by the existing A11. The asset is of **Low** value/sensitivity.

*MNF9409 bank (earthwork), linear feature, hollow way*

- 6.7.30. Undated low bank, may have been part of a hollow way that led to a moated house to its east and potentially therefore of Medieval date.
- 6.7.31. Recorded by NHER as a linear feature crossing the A47 to the immediate north of the Norfolk Railway, 120m of which is located within the Proposed Scheme DCO boundary, although some of this length will already have been destroyed by the existing A47. The asset is of **Low** value/sensitivity.

*MNF70857 ring ditch and 2 linear features identified through aerial photography, geophysical survey and unstratified finds*

- 6.7.32. Excavated remains and unstratified multi-period finds across the site of Cringleford residential development to the east of the existing A47 (south of the Thickthorn Junction), in which the NHER records seven previous archaeological investigations.
- 6.7.33. A comprehensive intrusive evaluation of the Cringleford residential development area by trial trenching, which included a proportion of the current Proposed Scheme DCO boundary, recorded multi-phase prehistoric activity, limited Roman activity and late Saxon activity across much of the development area (Suffolk Archaeology, March 2019). This was at a generally low level across the majority of the site with some small concentrations. In particular a focused area of activity was seen in excavation 'Area 3' which contained Late Bronze Age to early Iron Age period pits and ditches, activity which is likely to continue to the south western edge of the field, and possibly beyond the A47 (see Figure 6.1.8, ES Appendix 6.1) (**TR010037/APP/6.3**).
- 6.7.34. This area of proven archaeological potential is located within pasture and is therefore likely well-preserved due to the absence of modern ploughing. The majority of the area of archaeological potential recorded by NHER is located within the Proposed Scheme DCO boundary to the east of the A47. Asset investigation through trial trenching for the Proposed Scheme (Trenches 79-81) identified prehistoric, Roman, Late Anglo Saxon and undated features. The asset is of **Low** value/sensitivity.

### *MNF59885 possible prehistoric field boundaries*

- 6.7.35. Possible field boundaries are visible as cropmarks on aerial photographs on land to the south of Norwich Road, Hethersett, which were also identified in the geophysical survey for the Proposed Scheme.
- 6.7.36. The features consist of several ditches at right angles to each other, as well as at least two banks which appear to surround a possible pit. At least one of the ditches, towards the south west of the site, appears to be on the same orientation as the possible prehistoric field boundaries 824m to the north east.
- 6.7.37. With the exception of slight agricultural disturbance, the remains should be well preserved. Recorded by NHER as a defined area of archaeological potential, the majority of which is located within the Proposed Scheme DCO boundary. Asset investigation through trial trenching for the Proposed Scheme (Trenches 31-44) identified Medieval and undated features ('Area B'). The asset is of **Low** value/sensitivity.

### *MNF43554 prehistoric features identified during construction of Thickthorn Park and Ride*

- 6.7.38. In 2004 two scatters of prehistoric flint artefacts were found during fieldwalking, along with burnt flints, a piece of possible Roman pottery and medieval and post medieval pottery and metalwork. Bronze Age and Iron Age features and prehistoric finds were discovered during the subsequent evaluation excavation.
- 6.7.39. Recorded by NHER as an area, a very small part of which is located within the north west of the Proposed Scheme DCO boundary, within which survival of the asset is not proven. The asset is of **Low** value/sensitivity.

### *MNF45126 prehistoric flint artefacts and undated features*

- 6.7.40. In 2004 prehistoric flint artefacts and undated ditches, pits and post holes were found during trial trenching on the site of a proposed new school. The flints included a later Neolithic or Bronze Age polished flint axe and the features could be prehistoric.
- 6.7.41. Geophysical survey of this area and two additional fields to the west did not record any magnetic anomalies of possible archaeological origin. Compositional changes in the soils may have prevented any archaeological features from being detected.
- 6.7.42. Recorded by NHER as an area, a small part of which is located within the north east of the Proposed Scheme DCO boundary, within which survival of the asset is not proven. The asset is of **Low** value/sensitivity.



### *MNF9396 undated enclosure or field system and multi-period finds*

- 6.7.43. An undated enclosure or field system is visible as cropmarks on aerial photographs taken in 1973. Prehistoric flint artefacts, an Iron Age coin, a Roman coin, medieval pottery sherds and a post medieval seal have also been found on the site.
- 6.7.44. Recorded by NHER as an area, the majority of which is located within the north of the Proposed Scheme DCO boundary. Area likely to be largely disturbed through construction of the adjacent Thickthorn roundabout, although an area to the south of the junction remains undisturbed. The asset is of **Low** value/sensitivity.

### *MNF65378 possible ditches and pits and Prehistoric, medieval and post medieval finds*

- 6.7.45. A systematic fieldwalking survey identified a wide range of finds dating to the Prehistoric, medieval, and post medieval periods. The worked flint assemblage has been broadly dated to the Neolithic to Early Bronze Age and includes flakes, blades, and cores.
- 6.7.46. A small quantity of medieval pottery and ceramic building material was recovered from the northern portion of the field, and a moderate quantity post medieval finds including pottery, pantile, brick, and clay pipe fragments was recovered throughout.
- 6.7.47. The medieval and post medieval objects were likely re-deposited during arable farming activities, and an unusually high proportion of 17<sup>th</sup> to early 19<sup>th</sup> century high-status wares within the assemblage likely indicates night-soiling from Norwich or a nearby inn. Geophysical survey in the northern portion of this area identified several possible ditches and pits of unknown date.
- 6.7.48. Recorded by NHER as an area, the majority of which is located within the north west of the Proposed Scheme DCO boundary. Located within agricultural land, with the exception of slight disturbance the remains should be well preserved. Asset investigation through trial trenching for the Proposed Scheme (Trenches 17-31) identified late prehistoric, Roman, Medieval, and undated features ('Area B'). The asset is of **Low** value/sensitivity.

### *MNF33732 Thickthorn Park*

- 6.7.49. An early 19<sup>th</sup> century landscape park surrounding Thickthorn Hall. The park includes a medieval moat that was turned into an ornamental lake, a late 19<sup>th</sup> century kitchen garden, early 19<sup>th</sup> century lodges and concrete greenhouses from the 1930s.



- 6.7.50. Recorded by NHER as an area, roughly half of which is located within the north west of the Proposed Scheme DCO boundary, within which little of the landscaped surface features survive, it having been converted to arable land in the 20<sup>th</sup> century. Investigation through trial trenching for the Proposed Scheme identified archaeological features relating to the parkland only outside the DCO boundary. The asset is of **Medium** value/sensitivity.

#### *MNF16685 site of lime kilns and tramway*

- 6.7.51. Modern lime kilns (in use during the 1930s and 1940s) and associated tramway. A tipping wagon survives as a drinking trough.
- 6.7.52. Recorded by NHER as an area, a very small part of which is located within the Proposed Scheme DCO boundary. The setting of the preserved surface remains has the potential to be affected by the scheme due to the close proximity of the Cantley Lane link road southern embankment. The asset is of **Low** value/sensitivity.

#### *MNF9469 deserted medieval village of Cantley*

- 6.7.53. Deserted medieval village (DMV) of Cantley, mentioned in the Domesday Book. Cropmarks of a possible double ditched enclosure are visible on aerial photographs to the north east of the main settlement.
- 6.7.54. The heritage asset is located outside the Proposed Scheme DCO boundary, however, works involved in the construction of the Cantley Lane link road may result in the loss or damage of archaeological remains which contribute to the significance of the DMV, such as field boundaries defining its contemporary hinterland. The asset is of **Medium** value/sensitivity.

#### *THK02 'Area C' Early Iron Age remains identified through trial trenching*

- 6.7.55. Settlement identified during the programme of trial trenching (Cotswold Archaeology, September 2020: ES Appendix 6.3: Archaeological Evaluation (**TR010037/APP/6.3**)), where flint and stone tools dating to the Neolithic and Bronze Age were collected. Settlement activity dating to the Early Iron Age was also demonstrated by the presence of a group of pits which showed either in situ burning or produced heat-altered flint, and which may show either cooking or small scale industrial activity, close to Bronze Age barrows.
- 6.7.56. 'Area C' is located entirely within the DCO boundary and corresponds to no known heritage assets recorded on the NHER. The asset is of **Low** value/sensitivity.

### *Undesignated assets that contribute to the significance of designated assets*

- 6.7.57. Six undesignated heritage assets have been identified whose setting may be affected by the Proposed Scheme as they contribute to the significance of designated heritage assets.
- 6.7.58. Undesignated heritage assets have the potential to contribute to the significance of designated heritage assets through group and/or historical value within their setting.
- 6.7.59. The screening exercise has identified that within the ZTV for the Proposed Scheme there are five undesignated heritage assets that contribute to the significance of Thickthorn Hall (NHLE1169537) and its kitchen garden (NHLE1050575). Due to their association with these Grade II listed buildings, the following undesignated assets are considered to be of **High** value/sensitivity:
- Thickthorn Park (MNF33732) which was an early 19th century landscape park surrounding Thickthorn Hall.
  - Constructed in the late 18th or early 19th century, Lodge House (MNF11805) was the original lodge of Thickthorn Hall (NHLE1169537).
  - Thickthorn Lodge (MNF47810), a late 19th century red brick lodge with a thatched roof. The lodge stands at the entrance to the landscape park surrounding Thickthorn Hall
  - Hollow way (MNF65395) visible as an earthwork on aerial photographs and on the ground. The hollow way may be a former approach to Thickthorn Hall.
  - Medieval moat (MNF9352) in the grounds of Thickthorn Hall. Medieval documents record that this was the site of the manor house of Alan de Thickthorn in the mid-13th century.

### *Unknown archaeological remains*

- 6.7.60. The archaeological potential of the Proposed Scheme DCO boundary is determined through analysis of the available HER data, documentary records and archaeological investigations, indicating a high potential for unknown buried remains of prehistoric date and a moderate potential for unknown buried remains of a late medieval and post medieval date within the Proposed Scheme DCO boundary, which have the potential to be adversely impacted by the scheme.
- 6.7.61. Further evaluation trial trenching is programmed to take place in Spring 2021. The results will not be received in time to assimilate into this cultural heritage assessment but will inform the development and implementation of a mitigation strategy at the next stage of Scheme design.

## 6.8. Potential impacts

6.8.1. This section provides an overview of potential significant impacts as a result of the Proposed Scheme during construction and operation.

### Construction impacts

#### *Temporary construction impacts*

6.8.2. Temporary construction impacts would last for all or part of the construction period.

6.8.3. Temporary impacts are short term and reversible, including:

- noise generated by construction work which could impact the quiet, rural setting of heritage assets
- movement of construction plant in the setting of heritage assets
- siting of construction compounds, including the introduction of noise and lighting and potential impact on the setting of heritage assets
- siting of haul routes and traffic diversions introducing traffic and plant movement deeper into the rural setting of heritage assets

6.8.4. The screening exercise reported in Table 8 in ES Appendix 6.1 (**TR010037/APP/6.3**) identified temporary construction phase impacts of the final design fix (including design measures) for one scheduled monument, and six grade II listed buildings (Table 6-5 below).

Table 6-5. Temporary construction phase impacts

NHLE/ HER no.	Name	Type	Description of impact	Value/ sensitivity
<b>Designated heritage assets located within Proposed Scheme DCO boundary</b>				
1050573	Milestone no. 4	Grade II listed building	Asset will be protected with fencing throughout construction which will restrict access and alter appreciation of setting.	High
<b>Designated heritage assets located outside Proposed Scheme DCO boundary, within ZTV</b>				
1003977, MNF9463, MNF9464	Two tumuli in Big Wood	Scheduled monument	Activities during construction would have a major adverse impact on the setting of the asset through visual, noise and light intrusion.	High
1050575, 1169537 (and undesignated assets MNF11805, MNF65395, MNF33732, MNF9352, MNF47810)	Thickthorn Hall with its kitchen garden walls and attached octagonal building northeast of Thickthorn Hall and associated undesignated heritage assets within its setting	Grade II listed building / undesignated assets (group value)	Activities during construction would have no effect on the relationship between the listed buildings or the significance contributed through association with medieval assets within its historical parkland setting.  The Noise and Vibration assessment (ES Chapter 11 (TR010037/APP/6.1)) concludes no significant effects. Two belts of intervening trees would limit any visual change and is not considered likely to be significant.	High
1169110, 1050567, 1306560	The Round House, North House & The Farm House, Cantley House	Grade II listed buildings	Activities during construction could have a slight adverse impact on the setting of each asset through noise intrusion.	High

### *Permanent construction impacts*

- 6.8.5. Permanent impacts may arise as a result of works carried out during the construction phase which would result in a direct or indirect permanent impact.
- 6.8.6. Permanent impacts are likely to include:
- Excavation required for the construction of the Proposed Scheme, site compounds, utility diversions and haul routes, which have the potential to permanently remove archaeological remains.
  - Earthworks required for construction of the Proposed Scheme which have the potential to permanently impact the setting of heritage assets.
  - Structural damage to historic buildings due to proximity of works (vibration or other ground movement).
- 6.8.7. The screening exercise undertaken in Table 8 in ES Appendix 6.1 (TR010037/APP/6.3) identified permanent construction phase impacts of the final design fix (i.e. including design measures) for 11 undesignated heritage assets (Table 6-6 below).
- 6.8.8. In addition, an assessment of the potential impact of the Proposed Scheme on unknown archaeological remains is presented for areas of the proposed DCO boundary that has been subject to geophysical survey but for which intrusive evaluation through trial trenching has not been carried out at the time of submission (programmed for Spring 2021). Following review of the geophysical survey for these areas and based on the extensive archaeological evaluation works in the vicinity, it is considered that impacts to any archaeological remains that may be preserved in areas not subject to investigation to date are unlikely to result in significant effects.
- 6.8.9. A geoarchaeological watching brief is to be maintained during the geotechnical ground investigation programmed for Spring 2021. Depending on the findings, pre-construction mitigation works may be specified in the area of the Cantley Stream diversion.

Table 6-6. Permanent construction phase impacts

NHLE/ HER no.	Name	Type	Description of impact	Value/ sensitivity
<b>Undesignated heritage assets within Proposed Scheme DCO boundary</b>				
MNF33732	Thickthorn Park	Archaeological remains of historic park	Direct impacts to the former parkland (MNF33732) comprise the construction of the Cantley Lane Link (N) and A11-A47 Connector Road and a proposed detention basin (drainage pond) to the west of the Cantley Lane Link. No known physical remains of the parkland features will be impacted, however there is a potential for associated archaeological deposits associated with the park to be exposed across a relatively small part of the overall parkland area. The impacted area has already been subsequently disturbed by modern agricultural practices.	Medium
MNF43554	Prehistoric features identified through trial trenching	Archaeological remains	Construction groundworks associated with cutting for the A11-A47 Connector Road (W) have the potential to result in the loss or damage of archaeological remains preserved in a very small area to the south of the previously investigated Thickthorn Park and Ride SMS.	Low
MNF59885	Possible prehistoric field boundaries	Cropmarks	Construction groundworks associated with the Cantley Lane Link (N), cutting for the A11-A47 Connector Road (W) and the detention basin (drainage pond) have the potential to result in the loss or damage of archaeological remains over a significant area.	Low
MNF18186	Linear ditches perhaps relating to a medieval parish boundary and possible fragmentary enclosures of unknown date	Cropmarks	Construction groundworks associated with cutting for the A11-A47 Connector Road (W) and access track realignment have the potential to result in the loss or damage of archaeological remains over a substantial portion of the area.	Low
MNF65378	Several possible ditches and pits of an unknown date identified through geophysical survey	Archaeological remains	Construction groundworks associated with the Cantley Lane Link (N) have the potential to result in the loss or damage of archaeological remains over a substantial portion of the area.	Low
MNF45126	Prehistoric (?) ditches, pits and post holes identified through trial trenching	Archaeological remains	Construction groundworks associated with embankment for the A11-A47 Connector Road (E) and utility diversions have the potential to result in the loss or damage of archaeological remains over small part of the area.	Low
MNF70857	Ring ditch and 2 linear features identified through aerial photography and geophysical survey	Cropmarks	Construction groundworks associated with cutting for the A11-A47 Connector Road (E) have the potential to result in the loss or damage of archaeological remains over a relatively small part of the area.	Low
MNF9409	Bank (earthwork), linear feature, hollow way	Earthwork	Construction groundworks associated with cutting for the A11-A47 Connector Road (E) have the potential to result in the loss or damage of archaeological remains over a relatively small part of the area.	Low

NHLE/ HER no.	Name	Type	Description of impact	Value/ sensitivity
MNF9396	Undated enclosure or field system and multi-period finds	Cropmark & findspot	Construction groundworks associated with junction island reconfiguration, including the segregated left turn lane and bund have the potential to result in the loss or damage of archaeological remains over a relatively small part of the area.	Low
MNF9469	Deserted medieval village (DMV) of Cantley	Archaeological remains	Construction groundworks associated with an access track realignment have the potential to result in the loss or damage of archaeological remains over a very small part of the area. Groundworks involved in the construction of the Cantley Lane Link (S) may result in the permanent loss or damage of archaeological remains that are located outside of the HER-defined area but are associated with the deserted medieval village of Cantley, such as field boundaries or features that extend within the Proposed Scheme DCO boundary which provide context to the known DMV.	Low
THK02	'Area C' Early Iron Age remains identified through trial trenching for the Proposed Scheme	Archaeological remains	Construction groundworks associated with proposed A11-A47 connector road, Cantley Lane footbridge (Cringleford), proposed detention basin, and earthwork bunds have the potential to result in the loss or damage of archaeological remains over a substantial portion of the area.	Low
ARCHAEO-LOGICAL POTENTIAL	Areas of final DCO boundary not subject to previous geophysical survey or intrusive evaluation through trial trenching (programmed post ES-submission)	Archaeological remains	Construction groundworks have the potential to result in the loss or damage of archaeological remains over a substantial portion of the area.	Low



## Operational impacts

- 6.8.10. Operational impacts have the potential to occur in relation to heritage assets arising from the use of the Proposed Scheme.
- 6.8.11. Operational impacts are likely to include:
- The appearance of the Proposed Scheme, including landscaping works and presence of structures and signage with the potential to permanently alter the setting of heritage assets
  - Changes to traffic movements with the potential to alter the setting of heritage assets as a result of noise, pollution, light and movement
  - New road lighting with the potential to alter the setting of heritage assets
- 6.8.12. The screening exercise undertaken in Table 9 in ES Appendix 6.1 (**TR010037/APP/6.3**) identified operational phase impacts of the preliminary design (including design measures) for one scheduled monument, two Grade II listed buildings (and an associated group of undesignated heritage assets), and two further undesignated heritage assets detailed in Table 6-7.
- 6.8.13. In addition, the physical alteration of parts of historic landscape character (HLC) areas and the changes in setting arising from increasingly 'urban' elements are predicted to have minor magnitude of impact on the historic landscape. As the historic landscape types are of generally **Low** value/sensitivity, the impact significance is predicted to be slight.

Table 6-7. Operational phase impacts

NHLE/ HER no.	Name	Type	Description of impact	Value/ sensitivity
<b>Designated heritage assets located outside Proposed Scheme DCO boundary, within ZTV</b>				
1003977, MNF9463, MNF9464	Two tumuli in Big Wood	Scheduled monument	Visualisations of the setting surrounding the scheduled monument are shown within ES Figures 7.6.1 – 7.6.12 <b>(TR010037/APP/6.2)</b> The setting to the west, north and east of the barrow group is already permanently altered by the existing road network and as such the monument draws little significance from its setting currently. However, construction of the embanked proposed Cantley Lane Link Road (S) immediately adjacent to the western barrow would cause severance from the monument's associated landscape to the south, from where the barrows are currently viewed prominently. Long-sections (ES Figure 6.4) demonstrate that the top of the new embankment will be taller than the AOD of the western barrow. The cumulative effect would be to block this view and to remove the last remaining preserved part of the setting permanently. The effects will be of reduced magnitude for the eastern barrow due to the thicker vegetation. Group value will remain unaffected. The Noise and vibration assessment (ES Chapter 11) <b>(TR010037/PP/6.1)</b> predicts a minor to moderate reduction in noise in the short-term (although this does not lead a significant beneficial noise effect). Night time lighting levels will remain the same as current levels with no adverse effects predicted.	High
1050575, 1169537 (and undesignated assets MNF11805, MNF65395, MNF33732, MNF9352, MNF47810)	Thickthorn Hall with its kitchen garden walls and attached octagonal building NE of Thickthorn Hall and associated undesignated heritage assets within its setting	Grade II listed buildings / undesignated assets (group value)	The construction of the Cantley Lane Link (N) and A11-A47 Connector Road will permanently bisect the historical parkland setting of these two listed buildings (MNF33732). This former essential part of Thickthorn Hall's parkland setting is not preserved, now under the plough as C20th fields, however, the Cantley Lane Link (N) would sever the relationship of Thickthorn Hall with its original Lodge House (MNF11805) and eastern approach. The two veteran trees identified for removal as part of the Proposed Scheme are part of a field boundary and not remnants of the designed parkland setting of Thickthorn Hall. The Noise and Vibration assessment (ES Chapter 11) <b>(TR010037/PP/6.1)</b> concludes no significant effects. Night time lighting levels will remain the same as current levels with no adverse effects predicted.	High
<b>Undesignated heritage assets within Proposed Scheme DCO boundary</b>				
MNF16685	Site of lime kilns and tramway	Structure	Setting of preserved surface remains adjacent to the Proposed Scheme DCO boundary would be permanently altered.	Low
MNF11805	Lodge House	Building	Roadside setting and contribution to significance largely preserved, although the ability to interpret the Lodge's relationship with Thickthorn Hall would be reduced through severance by the Cantley Lane link road (N)	Low

NHLE/ HER no.	Name	Type	Description of impact	Value/ sensitivity
HNF48794, HNF48795 HNF48806, HNF48796, HNF48799 HNF48767 HNF48759 HNF48761 HNF48758 HNF48773 HNF48770 HNF48780 HNF48772 HNF53198 HNF53203 HNF53226 HNF48741	Historic Landscape Character	Historic Landscape	<p>There will be some truncation of landscape character areas, particularly in the area of the Cantley Lane Link Road. In terms of landscape character, the 'inland managed wetlands' will be most affected by the realignment of the watercourse.</p> <p>Construction of the scheme would require partial loss of field boundaries. However, this will not represent a major change in light of previous works to the Thickthorn Junction. The dominant 20th century agricultural landscape will remain. Historic Landscape Character of the former medieval manors are each now 'C20th agriculture'. The original access tracks are preserved / not severed.</p>	Low

## 6.9. Design, mitigation and enhancement measures

### Design measures

- 6.9.1. Design intervention is mitigation embedded into the design of the Proposed Scheme and is achieved through an iterative process.
- 6.9.2. The location of drainage and road infrastructure has been placed as far as possible (19.75m) from the scheduled monument 'Two Tumuli in Big Wood' (NHLE1003977) which is located alongside the Proposed Scheme DCO boundary in order to minimise direct impacts on any associated remains that may be preserved.
- 6.9.3. It is proposed to use low noise surfacing on the Cantley Lane link road (with hot rolled asphalt on the overbridges) and the A11 to A47 connector road.
- 6.9.4. Impacts upon historic landscape character have been minimised by restricting the DCO boundary of the Proposed Scheme, with no loss for temporary purposes such as haul routes and compounds.
- 6.9.5. Impacts upon buried archaeological features across the Proposed Scheme DCO boundary have been minimised by avoiding ground disturbance in areas of temporary use, such as haul routes and compounds.
- 6.9.6. Veteran trees within the areas of Proposed Scheme compounds either side of the Cantley Lane Link (S) will be retained in order to avoid permanent impacts to the historic Thickthorn Park (MNF33732) for temporary uses.
- 6.9.7. Lighting levels will be reduced as far as possible from the baseline case, or else remain the same, in order to avoid any impact on the nearby designated assets and the historic landscape as a result of the proposed scheme.
- 6.9.8. Screening planting to be established on the embanked Cantley Lane link road as part of the Proposed Scheme Environmental Masterplan (**TR010037/APP/6.8**) would assist in reducing the predicted impact of the Proposed Scheme on the setting of nearby heritage assets including 'Two Tumuli in Big Wood' (scheduled monument NHLE1003977), Thickthorn Hall (grade II listed building NHLE1050575) and the associated group of undesignated assets in its setting (Grade II listed building kitchen garden walls and attached octagonal building NHLE1169537 and undesignated heritage assets Thickthorn Park (MNF33732), Lodge House (MNF11805), Thickthorn Lodge (MNF47810), Hollow way (MNF65395), Medieval moat (MNF9352)).
- 6.9.9. An opportunity for enhancement or public benefit through the provision of an information board has been identified on the proposed all user pathway on the

Cantley Lane link road, particularly should a line of sight be possible to the barrows (Two Tumuli in Big Wood, NHLE1003977). This is recognised as an enhancement as the barrows are not currently publicly accessible.

- 6.9.10. A heritage information board would provide an explanation of the history and significance of the barrows, set in the context of the wider contemporary prehistoric landscape from this vantage point, to bring public value back to a historic landscape that has been almost entirely permanently altered in character by the road network and modern developments.

### Construction mitigation measures

- 6.9.11. Construction would be carried out using industry best practice and in accordance with the implementation of an Environmental Management Plan (EMP) **(TR010037/APP/7.4)** to minimise potential adverse effects from noise and vibration as well as dust and accidental damage. No specific measures outside these best-practice measures are recommended for temporary effects on heritage assets.
- 6.9.12. In addition to the identified Proposed Scheme design mitigation measures, Milestone No.4 (Grade II listed building NHLE1050573), located within the Proposed Scheme DCO boundary on the B1172 Norwich Road will be demarcated with HERAS fencing to provide protection throughout construction works to ensure its safety.
- 6.9.13. The heritage value of the known and potential archaeological resource within the footprint of the Proposed Scheme lies in its potential to contribute to the regional research framework objectives. Preservation by record would be an appropriate method to mitigate adverse effects. Identified remains are not of such complexity or value/sensitivity that preservation in situ would be necessary. However, good practice dictates that where remains need not be disturbed, they should be protected to ensure they are preserved for the future. Throughout detailed design, proposals for temporary structures, services, haul routes, storage methods etc should have regard to this and preserve remains where reasonably practicable by excluding open areas from works with appropriate fencing.
- 6.9.14. During the construction phase archaeological mitigation excavations, should it be desirable and achievable to preserve any archaeological remains in situ in areas of temporary use (compounds or haul roads), this could be achieved through protective methods such as geotextile, track matting or bog mats.
- 6.9.15. A strategy for appropriate mitigation will be developed in consultation with Historic England and NCC ES. This strategy will include:

- Archaeological excavation in advance of construction in specific areas where remains are identified, and in areas of high potential for remains of greater than low value/sensitivity. This may also be expanded to lesser value remains should it prove expedient for the construction programme.
- Archaeological recording during construction ('construction integrated') would consist of an archaeologist monitoring specific works areas of lesser potential or for low value remains. In the event that archaeological remains are identified the archaeologist would halt works and implement appropriate levels of recording, sampling and assessment. The methodology may be modified to adapt to higher value remains.

6.9.16. Archaeological excavation in advance of construction will be undertaken for:

- any groundworks required within Thickthorn Park (MNF33732), and the known multi-period archaeological assets in it (MNF65378, MNF11820, MNF59885, MNF18186)
- any groundworks required to the south of Thickthorn Junction (THK02 'Area C')
- any groundworks required in the vicinity of the 'Two Tumuli in Big Wood' (scheduled monument NHLE1003977)

6.9.17. Construction integrated recording is recommended for all remaining areas of known archaeological potential within the Proposed Scheme DCO boundary.

6.9.18. Depending on the results of geoarchaeological monitoring, programmed for Spring 2021, in the area of the proposed Cantley Stream diversion, a programme of palaeoenvironmental mitigation may be required. The aims of palaeoenvironmental mitigation will be to (a) analyse stratigraphy and retrieve samples for laboratory analyses and dating, and (b) assess the potential for/location and age and significance of any buried land surfaces preserved within the DCO boundary. The scope of palaeoenvironmental evaluation works will be specified in a written in a Written Scheme of Investigation (WSI) which will be discussed with Historic England and NCC ES.

6.9.19. During construction, a protocol for unexpected archaeological discoveries will be developed as part of the EMP (**TR010037/APP/7.4**). This protocol will be discussed with with Historic England and NCC ES and may include:

- Toolbox talks or other instruction methods to allow operatives to identify potential archaeological remains
- Protocols for protection, recording, and archiving of relevant finds
- Protocols and communications plans for halting works and consulting with the relevant stakeholders in the event of unexpected remains of potential high or very high value/sensitivity

## 6.10. Assessment of likely significant effects

- 6.10.1. Section 6.9 above presents a strategy for mitigation. In line with the methodology section and in LA106 and LA 104, Tables 6-8 – 6-10 below details these mitigation recommendations for each heritage asset that is predicted to be affected, following the application of site-specific mitigation measures, is presented in this section for the effects identified in Section 6.8.
- 6.10.2. Design measures have been incorporated into the Proposed Scheme to reduce adverse effects on the setting of heritage assets and the historic environment, and further site-specific historic environment appropriate mitigation measures have been recommended.

### *Temporary construction phase residual effects*

- 6.10.3. Significant residual construction phase effects have been identified for one scheduled monument (Two Tumuli in Big Wood, NHLE 1003977). The magnitude of this impact would be major, giving a **Large adverse** significance of effect (see Table 6-8 below).
- 6.10.4. **Slight adverse** residual construction phase effects have been identified in respect of a further six grade II listed buildings (Thickthorn Hall NHLE1050575 and its Kitchen Garden Walls NHLE1169537, The Round House NHLE 1169110, North House and The Farmhouse NHLE1050567, Cantley House NHLE1306560, and Milestone No. 4 NHLE 1050573) for which minor magnitude effects are predicted.
- 6.10.5. Slight residual effects on historic environment receptors are not significant.

### *Permanent construction phase residual effects*

- 6.10.6. No significant effects have been identified as a result of permanent construction phase impacts (see Table 6-9 below). All identified effects can effectively be mitigated through preservation by record (archaeological recording).

### *Operational phase residual effects*

- 6.10.7. The impact assessment has identified one significant residual adverse effect in respect of the scheduled monument 'Two Tumuli in Big Wood' (NHLE1003977) as a result of operation of the Proposed Scheme. The magnitude of this impact would be moderate, giving a **Moderate adverse** significance of effect (see Table 6-10 below). This would arise as a result of permanent alteration of its setting from construction of the Cantley Lane link road, including potential noise and visual intrusion. The permanent effect relates to the severance of a significant



aspect of the asset's setting, in which the barrows historically could be viewed prominently from downslope to the south.

- 6.10.8. **Slight adverse** residual effects on setting have been identified as a result of operation of the Proposed Scheme upon which minor or moderate magnitude impacts are predicted for two grade II listed buildings (Thickthorn Hall NHLE1050575 and its Kitchen Garden Walls NHLE1169110) and associated undesignated heritage assets within the setting of Thickthorn Hall (MNF11805, MNF65395, MNF33732, MNF9352, MNF47810), two undesignated heritage assets (MNF16885 site of limekilns and tramway, and MNF11805 Lodge House), and Historic Landscape Character within and adjacent to the Proposed Scheme DCO boundary (see Table 6-10 below).
- 6.10.9. Slight residual effects on historic environment receptors are not significant.

### Temporary construction phase residual effects

- 6.10.10. The EMP will ensure implementation of standard construction-phase environmental mitigation to reduce noise and dust which will ensure that any temporary construction phase effects are minimised. No other site-specific mitigation is recommended for temporary historic environment effects.

Table 6-8. Assessment of temporary construction phase residual effects

NHLE/ HER no.	Name	Type	Value/ sensitivity	Magnitude of Impact	Residual Significance of Effect
<b>Designated heritage assets located within Proposed Scheme DCO boundary</b>					
1050573	Milestone no. 4	Grade II listed building	High	Minor adverse	Slight adverse
<b>Designated heritage assets located outside Proposed Scheme DCO boundary, within ZTV</b>					
1003977, MNF9463, MNF9464	Two tumuli in Big Wood	Scheduled monument	High	Major adverse	Large adverse
1050575, 1169537 (and undesignated assets MNF11805, MNF65395, MNF33732, MNF9352, MNF47810)	Thickthorn Hall with its Kitchen Garden Walls and attached Octagonal Building NE of Thickthorn Hall and associated undesignated heritage assets within its setting	Grade II listed buildings / undesignated assets (group value)	High	Minor adverse	Slight adverse
1169110, 1050567, 1306560	The Round House, North House & The Farm House, Cantley House	Grade II listed buildings	High	Minor adverse	Slight adverse

- 6.10.11. The identified impacts are considered to be short term (less than two years) and reversible and therefore are not considered to be significant.

## **Permanent construction phase effects**

6.10.12. The predicted significant effects upon the historic environment as a result of permanent construction phase effects, and the residual effects following the implementation of mitigation measures, are presented in Table 6-9 below.

Table 6-9. Assessment of permanent construction phase residual effects

NHLE/ HER no.	Name	Value/ sensitivity	Recommended Mitigation	Magnitude of impact (post-mitigation)	Significance of effect (post-mitigation)
<b>Undesignated heritage assets within Proposed Scheme DCO boundary</b>					
MNF33732	Thickthorn Park	Medium	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
MNF43554	Prehistoric features identified through trial trenching	Low	Preservation by Record (Construction integrated archaeological recording)	Negligible adverse	Neutral
MNF59885	Possible prehistoric field boundaries	Low	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
MNF18186	Linear ditches perhaps relating to a medieval parish boundary and possible fragmentary enclosures of unknown date	Low	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
MNF65378	Several possible ditches and pits of an unknown date identified through geophysical survey	Low	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
MNF45126	Prehistoric (?) ditches, pits and post holes identified through trial trenching	Low	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
MNF70857	Ring ditch and 2 linear features identified through aerial photography and geophysical survey	Low	Preservation by Record (Construction integrated archaeological recording)	Negligible adverse	Neutral
MNF9409	Bank (earthwork), linear feature, hollow way	Low	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
MNF9396	Undated enclosure or field system and multi-period finds	Low	Preservation by Record (Construction integrated archaeological recording)	Negligible adverse	Neutral
MNF16685	Site of lime kilns and tramway	Low	Preservation by Record (Construction integrated archaeological recording)	Negligible adverse	Neutral

NHLE/ HER no.	Name	Value/ sensitivity	Recommended Mitigation	Magnitude of impact (post-mitigation)	Significance of effect (post-mitigation)
MNF9469	Deserted medieval village (DMV) of Cantley	Low	Preservation by Record (Construction integrated archaeological recording)	Negligible adverse	Neutral
THK02	'Area C' Early Iron Age remains identified through trial trenching for the Proposed Scheme	Low	Preservation by Record (Advance archaeological excavation)	Negligible adverse	Neutral
ARCHAEO-LOGICAL POTENTIAL	Areas of final DCO boundary not subject to previous geophysical survey or intrusive evaluation through trial trenching (programmed post ES-submission)	Low	Preservation by Record (Advance archaeological excavation or Construction integrated archaeological recording as appropriate, following further evaluation)	Negligible adverse	Neutral

## Operational effects

6.10.13. The predicted significant effects upon the historic environment as a result of operational phase effects, and the residual effects following the implementation of mitigation measures, are presented in Table 6-10 below.

### *Noise effects non-technical summary*

6.10.14. The following cultural heritage noise sensitive receptors have been identified within the noise and vibration study areas (ES Chapter 11 (TR010037/APP/6.1)):

- Two Tumuli in Big Wood (NHLE 1003977)
- Thickthorn Hall (NHLE 1050575)
- The Round House (NHLE 169110)
- North House/Farmhouse (NHLE 1050567)
- Cantley House (NHLE 1306560)

6.10.15. The noise and vibration impact assessment identifies that significant adverse noise or vibration effects are not predicted at any of these receptors as a result of construction or operation of the Proposed Scheme.

6.10.16. At the scheduled monument (Two Tumuli in Big Wood) effects of the Proposed Scheme are predicted to be a minor to moderate reduction in noise change (although this does not lead a significant beneficial noise effect). At the rest of the receptors, there is only predicted to be a negligible reduction in noise levels during operation of the Proposed Scheme.

### *Night time lighting non-technical summary*

6.10.17. Night time lighting levels will remain the same as current levels with no adverse effects predicted during operation of the Proposed Scheme.

Table 6-10. Assessment of operational phase residual effects

NHLE/ HER no.	Name	Value/ sensitivity	Recommended mitigation	Magnitude of impact (post- mitigation)	Significance of effect (post- mitigation)
<b>Designated heritage assets located outside Proposed Scheme DCO boundary, within ZTV</b>					
1003977, MNF9463, MNF9464	Two tumuli in Big Wood  Scheduled monument	High	Planting design: focused planting and screening of new infrastructure.  Evaluation: increased understanding of the context of the barrows.  Enhancement: introduction of heritage information board.	Moderate adverse	Moderate adverse
1050575, 1169537 (and undesignated assets MNF11805, MNF65395, MNF33732, MNF9352, MNF47810)	Thickthorn Hall with its Kitchen Garden Walls and attached Octagonal Building NE of Thickthorn Hall and associated undesignated heritage assets within its setting (Thickthorn Park, Lodge House, Thickthorn Lodge, Hollow Way and Medieval moat)  Grade II listed buildings / undesignated assets (group value)	High	Planting design: focused planting and screening of new infrastructure.	Minor adverse	Slight adverse
<b>Undesignated heritage assets within Proposed Scheme DCO boundary</b>					
MNF16685	Site of lime kilns and tramway Undesignated heritage asset	Low	None proposed	Minor adverse	Slight adverse
MNF11805	Lodge House	Low	None proposed	Moderate adverse	Slight adverse

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NHLE/ HER no.	Name	Value/ sensitivity	Recommended mitigation	Magnitude of impact (post- mitigation)	Significance of effect (post- mitigation)
HNF48794, HNF48795 HNF48806, HNF48796, HNF48799 HNF48767 HNF48759 HNF48761 HNF48758 HNF48773 HNF48770 HNF48780 HNF48772 HNF53198 HNF53203 HNF53226 HNF48741	Historic Landscape Character	Low	The landscape and planting design has been developed to provide texture screening and avoid block planting. This is in keeping with the current character of the immediate setting of the existing A47 and surrounding area with open fields bordered by dispersed tree lines.	Minor adverse	Slight adverse



## 6.11. Monitoring

- 6.11.1. Due to the potential for significant adverse effects upon archaeological remains and heritage assets, the monitoring of any mitigation measures would be put in place during construction to ensure that they remain effective. It is anticipated that monitoring would include regular inspections of temporary fencing.
- 6.11.2. Monitoring measures and protocols for managing any disturbance or removal of archaeological remains and heritage assets would be detailed within the EMP (**TR010037/APP/7.4**) and compliance will be secured by a requirement to the DCO.

## 6.12. Summary

- 6.12.1. The Proposed Scheme has the potential for beneficial and adverse effects on cultural heritage assets. Adverse effects have been reduced or eliminated through a combination of sensitive design and targeted mitigation.
- 6.12.2. There is one designated heritage asset located within the DCO boundary, Milestone No.4, grade II listed building 1050573, for which protection with fencing throughout construction is recommended and therefore no impact is predicted.
- 6.12.3. The area within the DCO boundary has been evaluated through desk-based assessment, walkover survey, geophysical survey and trial trenching and the archaeological potential of the site is well understood. A programme of archaeological recording is proposed to mitigate identified impacts on known archaeological remains. No likely significant construction phase residual effects have been identified as a result of the Proposed Scheme.
- 6.12.4. Design intervention and mitigation has been included in the impact assessments for the heritage assets. A planting plan incorporated into the Environmental Masterplan (**TR010037/APP/6.8**) for the Proposed Scheme reduces adverse effects on the setting of several cultural heritage sites.
- 6.12.5. Temporary construction phase impacts upon four designated heritage assets ranging from Slight – Large effects are considered to be short term (less than four years) and reversible and therefore are not considered to be significant.
- 6.12.6. Slight (not significant) residual operational effects have also been identified upon two Grade II listed buildings and six undesignated heritage assets:
- Thickthorn Hall (NHLE1169537)
  - Kitchen garden walls and attached octagonal building c.60m north-east of Thickthorn Hall (NHLE1050575)
  - Thickthorn Park (MNF33732)

- Lodge House (MNF11805), the original lodge of Thickthorn Hall
  - Thickthorn Lodge (MNF47810)
  - Hollow way (MNF65395)
  - Medieval moat (MNF9352)
  - Site of lime kilns and tramway (MNF16685)
- 6.12.7. Slight (not significant) effects are predicted upon historic landscape character within the DCO boundary.
- 6.12.8. In accordance with the DMRB, effects of Moderate to Very Large are considered to be significant. The impact assessment has identified one significant residual adverse effect (that is, after application of proposed mitigation measures) upon one heritage asset as a result of the operation phase of the Proposed Scheme: a scheduled monument consisting of two Prehistoric burial mounds known as 'barrows', located outside the site boundary, named 'Two Tumuli in Big Wood' (NHLE1003977).
- 6.12.9. Construction of the proposed embanked Cantley Lane link road immediately adjacent to the western barrow would cause severance from the monument's associated landscape to the south, from where the barrows are currently viewed prominently. The effect would be to remove the last remaining preserved part of the setting permanently. The same effects will occur but be of reduced magnitude for the eastern barrow due to the thicker vegetation present providing improved screening.
- 6.12.10. Without mitigation the effect on the western barrow is assessed as Large. Following application of mitigation proposals including focused planting and screening of new infrastructure, an improved understanding of the context of the barrows through excavation, and introduction of a heritage information board, the residual effect on the scheduled monument is assessed as Moderate.
- 6.12.11. Whilst there are no mitigation measures available to fully ameliorate the permanent impact upon the scheduled monument, opportunities to enhance appreciation of cultural heritage in the area have been proposed in the form of a new viewpoint and information board. These measures will enhance everyday public awareness and appreciation of a scheduled monument which is inaccessible to the public.

## 6.13. References

- 6.13.1. For a full list of references and a glossary of terms, refer to, ES Appendix 6.1, Annex B (**TR010037/APP/6.3**).