

THE LONDON RESORT

The London Resort Development Consent Order

BC080001

Environmental Statement Volume 1: Main Statement

Chapter 14 – Cultural heritage and archaeology

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Regulation 5(2)(a)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Regulation 12(1)

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Chapter Fourteen ◆ Cultural heritage and archaeology

INTRODUCTION

- 14.1 This chapter presents an assessment of the likely significant effects of the Proposed Development on cultural heritage and archaeology. The assessment identifies and evaluates heritage and archaeological assets in and around the Project Site and makes an assessment, based on the information available at the time of writing, of how the Proposed Development may affect these heritage and archaeological assets.
- 14.2 This assessment is informed by baseline assessment and surveys presented in Appendices 14.1-14.11(document reference 6.2.14.1-6.2.14.11), which should be read in conjunction with this chapter.
- 14.3 This chapter identifies and assesses potential direct and indirect effects upon the significance of potential and known archaeological and cultural heritage receptors. The chapter describes the assessment methodology, the baseline conditions at the Project Site (in appendices), the likely significant effects to cultural heritage and archaeology, the mitigation measures required to remove, reduce or offset any significant adverse effects and the residual effects after these measures have been employed.

METHODOLOGY AND DATA SOURCES

Scoping

- 14.4 A Scoping Report was prepared in May-June 2020 and the Secretary of State’s EIA Scoping Opinion was received in July 2020 (document reference 5.1). Scoping comments relevant to this chapter were provided by Historic England, Kent County Council Heritage Team, Dartford Borough Council, Gravesham Borough Council, Thurrock Council and Natural England. Ebbsfleet Development Corporation did not provide any specific comments on the scope of Chapter 14. A summary of the main topics of comment for each stakeholder are summarised in Table 14.1.

Table 14.1: Summary of the Secretary of State’s EIA Scoping Opinion, July 2020, and responses from scoping consultees

Source	ID/Ref	Scoping advice	Response
Secretary of State (SoS)	4.7.5	The assessment of impacts to cultural heritage in the ES should be informed by reference to the Zone of Theoretical Visibility, and both the ZTV and the locations of all designated and undesignated heritage assets need to be shown on detailed maps.	The applicant has prepared a Zone of Theoretical Visibility in Chapter 11 Landscape and Visual Effects, that has also been used for the analysis of setting within this chapter. Plans showing designated and undesignated heritage assets are provided in ES Figures 14.1-14.12
SoS Historic England	4.7.6/13/12	The ES should be informed by reference to Archaeological Character Areas.	The Archaeological Desk-Based Assessment (Appendix 14.1; document reference 6.2.14.1) includes a two stage archaeological characterisation of the Project Sites
SoS	4.7.7	The ES should be based on robust and detailed information and should be used to inform pre-determination fieldwork. This should include an Archaeological Deposit Model informed by a programme of geophysical survey, geotechnical and geoarchaeological coring, and test pitting and trial trenching. The surveys should be agreed with relevant consultation bodies.	Desk-based assessments and field work undertaken to date (for the Project as well as consideration of the results of work undertaken on development in the vicinity in the recent past, in particular for High Speed 1 (HS1)) are considered to provide a robust information base. Surveys for the Proposed Development have included specific geophysical surveys and intrusive survey (such as Archaeological Evaluation at Springhead), as well as a detailed Archaeological Characterisation exercise, and specific assessments of the Palaeolithic interest in and around Baker’s Hole Scheduled Monument and Site of Special Scientific Interest (SSSI). Ground conditions have not permitted specific borehole survey (due to contamination and ground water issues). Nevertheless, the work undertaken to date is

Source	ID/Ref	Scoping advice	Response
			proportionate to the expected impacts and sufficient to allow informed decision making, taking into account the proposed mitigation and predicted residual effects. This detailed evidence base is the results of several years of work and is presented in the Appendices to the chapter.
SoS	4.7.8/ 13.12	The assessment of impacts to archaeology in sub-tidal or inter-tidal areas should be informed by robust information. A comprehensive programme of inter-tidal walkover survey, marine geophysical and geotechnical investigation utilising side scan sonar, multibeam bathymetry, magnetometry surveys and geotechnical core samples should be employed to consider any impacts to archaeological features and deposits below Mean High Water Springs (MWHS) level. The Applicant should make effort to agree suitable surveys with relevant consultation bodies.	The Archaeological Desk-Based Assessment (Appendix 14.1; document reference 6.2.14.1) and Chapter 14 of the Environmental Statement include an assessment of Marine and Inter-tidal areas as well as historic seascape characterisation.
SoS		The ES should describe all designated and non-designated heritage assets in the 1km study area, as well as all relevant heritage assets located in the ZTV. The ES might also have to consider wider viewpoints not focusing on specific assets in order to more readily assess the impact of the proposal on designated assets' significance and setting.	The 1km study area includes 135 Listed Buildings, 9 Scheduled Monuments, 10 Conservation Areas, most of which are not considered to receive a significant effect on their heritage significance. There are also a number of non-designated assets (recorded on Kent County Council and Essex County Council Historic Environment Record) and selected assets from the wider 5km area. The baseline assessment (Appendix 14.2; document reference 6.2.14.2) presents a gazetteer. Where

Source	ID/Ref	Scoping advice	Response
			<p>assets are unlikely to experience a significant effect, this is noted in the gazetteer and a reason given as to why further detailed assessment is not required. Where assets are expected to experience a significant effect, these have been taken forward for detailed assessment. The ES includes the consideration of selected assets (both designated and non-designated) in the wider 5km area and in the ZTV where it is considered that those assets may experience a significant effect or where consultees have requested specific assets be assessed. The ES considers wider viewpoints where appropriate. Consideration of the significance and setting (as it contributes to significance) of assets is not limited to simple intervisibility between a specific asset and the Proposed Development and viewpoints will be selected accordingly. Where relevant, consideration is given to viewpoints produced as part of the Landscape and Visual Impact Assessment (Chapter 11 of the ES), where these inform consideration of significance of heritage assets.</p>
SoS	4.7.11	The ES should collate, synthesise and summarise the results of the baseline investigations, including figures to support the assessment.	The baseline assessments and surveys have been used to inform the assessment of effects presented in this ES. A summary of the results of the archaeological surveys undertaken to date is provided in Appendix 14.1; document reference 6.2.14.1.
SoS		The study area should be	Study Areas have been tailored

Source	ID/Ref	Scoping advice	Response
Dartford Borough Council KCC Heritage Historic England		informed by the extent of the likely impact rather than arbitrary pre-determined distance criteria. A carefully tailored approach that takes into account nuances of geology and topography will be required in the ES.	to the Proposed Development and are appropriate to the likelihood of any significant effect, both direct and indirect.
SoS Dartford Borough Council KCC Heritage		The Scoping Report notes the importance of the area's riverine location, but the connections this facilitated with the English Channel and North Sea also need to be highlighted, as does the significance of its proximity to London.	The assessment is based upon a study area and baseline appropriate to the scale and nature of the Proposed Development and the likely significant effects of the Proposed Development upon the significance of heritage assets. The wider context is described and considered where this is appropriate to the consideration of likely significant effects upon the heritage significance of the assets.
SoS		The Scoping Report fails to address the vulnerability of Baker's Hole to ongoing physical degradation of its surviving deposits. The site is located in the footprint of the Proposed Development, any impacts to its long-term conservation and management should be assessed in the ES where significant effects are likely to occur. Lower and Upper Palaeolithic deposits are likely to extend beyond the currently designated areas.	Consideration of the potential for upper and lower Palaeolithic deposits (as well as other archaeological remains) is considered in the desk-based assessment and likely significant effects upon that resource are assessed in the ES. The implications of any effects physical or otherwise are assessed in the ES and discussed with the consultees as appropriate. Effects on long term conservation and management are considered in the historic environment framework with specific measures by way of mitigation or offset or protection set out in the Outline Construction and Environmental Management Plan (CEMP) (document reference 6.2.3.2)
SoS		The sensitivity and importance of Peat deposits at Tilbury should be	Assessment of effects to geoarchaeological deposits have

Source	ID/Ref	Scoping advice	Response
		addressed in the ES, through assessing impacts with potential to significantly affect such deposits by deforming, desiccating and/or exposing them to aerobic effects. The assessment should be undertaken following appropriate guidelines and informed by detailed geophysical, geotechnical and deposit modelling data	been assessed as part of the ES and are included in Appendix 14.1; document reference 6.2.14.1.
SoS Dartford Borough Council KCC Heritage		The ES should also identify the Milton Blockhouse and New Tavern Fort which were intended to provide interlocking fields of fire with Tilbury Fort.	Tilbury Fort, Milton Blockhouse and New Tavern Fort have been considered as part of the baseline within the ES (paragraphs 14.96-14.98) and within the Built Heritage Statement Appendix 14.2 (document reference 6.2.14.2)
SoS Dartford Borough Council KCC Heritage		The ES should consider the effects of the long-term inaccessibility of sites caused by the Proposed Development. Direct effects should also include any 'sterilisation' of archaeological sites due to long term inaccessibility for research caused by the proposed development	This assessment has taken this into account, but is led by an approach in which preservation in-situ is considered the primary objective, with avoidance and/or minimisation of impacts as the primary design driver, in keeping with current archaeological best practice. The development proposals include the ability to remove parts of the infrastructure (under the proposed People Mover Route) to allow access thus preventing 'sterilisation' occur through affording access to underlying deposits. Specific mitigation is proposed in the Historic Environment Framework (HEF; Appendix 14.9; document reference 6.2.14.9). This consists of taking the opportunity afforded by construction (or pre-construction works) to take a comprehensive suite of samples

Source	ID/Ref	Scoping advice	Response
			at multiple locations in the Scheduled Monument (SM) and Site of Special Scientific Interest (SSSI), and providing for the long-term curation and accessibility of this resource against future research programmes.
SoS		No mention is made of geological evidence, or inter-tidal and marine archaeology in the Scoping. The ES will have to address these in detail too. The ES should also include reference to the National Record of the Historic Environment, Local Historic Environment Records with records below MWHS, UKHO hydrographic data on ship losses and obstructions, and the Rapid Coastal Zone Assessment Surveys for North Kent and Essex as relevant.	Geological information relating to the Project Sites and Marine and Inter-tidal archaeology are presented in Appendix 14.1. An assessment of the effects of the Proposed Development upon marine and inter-tidal assets is presented in this chapter at paragraphs 14.149-14.159.
SoS		The Scoping Report lists a series of possible avoidance and mitigation measures, and notes that scheme assessment and design will be an iterative process, but the measures are generic and there are no details of proposed layout or design. The ES should clearly describe any such measures their likely efficacy and how they would be secured and delivered.	Mitigation measures are outlined in this Chapter and further details on methods are provided in the Historic Environment Framework (Appendix 14.9; document reference 6.2.14.9)
SoS		An appropriate level of field evaluation, including specialist Palaeolithic investigation, will need to be undertaken and reported on prior to submission of the DCO to enable decision-making on the significance of heritage assets and proposed impacts. Consents and licences will be needed for work on the designated sites.	Detailed desk-based assessment and non-intrusive and intrusive fieldwork has been carried out to support the assessment presented here. This has included specific consideration of Palaeolithic potential. This, together with consideration of the results of fieldwork carried out in the immediate vicinity of the development in the recent

Source	ID/Ref	Scoping advice	Response
			<p>past on the same/similar assets and geological features is considered to form an appropriate information base upon which decision making of the impacts of the Proposed Development as presented in the application (especially taking into account the detailed mitigation proposed, and largely negligible residual effects predicted). Details of the supporting work are presented in the appendices (Appendix 14.1-.14.8) to this chapter, and mitigation proposal detailed here and set out in the HEF (Appendix 14.9) / Outline CEMP (document reference 6.2.3.2).</p>
<p>SoS Dartford Borough Council KCC Heritage Historic England</p>		<p>The assessment should also consider any benefits to heritage from the scheme and indicate where enhancement and/or interpretation of heritage assets can bring public benefit.</p>	<p>Benefits of the scheme are explained in this ES chapter and further detailed in the Historic Environment Framework (Appendix 14.9; section 8.4)</p>
<p>Gravesha m Borough council KCC Heritage</p>		<p>Baker’s Hole SSSI is of interest as a geological SSSI and a Scheduled Monument. It is not currently clear how the proposed transport infrastructure can be built in an acceptable manner at this location.</p>	<p>A technical note (Appendix 14.5; document reference 6.2.14.5) has been prepared by the transport consultants who assessed options for the alignment of the people mover route. The options were also assessed by the Palaeolithic specialist to assess the effects of each route. The least harmful of the feasible route options has been chosen. Embedded mitigation in the form of raising the people mover on polystyrene blocks will also minimise below ground impacts.</p>
<p>Gravesha m</p>		<p>The proposed works at Tilbury have potential to impact on the</p>	<p>Assets have been scoped into or out of the assessment (with</p>

Source	ID/Ref	Scoping advice	Response
Borough Council		many listed buildings and conservation areas in Gravesend Town Centre.	justification) in the gazetteer provided as part of the Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2). Selected assets have been included for further detailed assessment in the Built Heritage Statement
Thurrock Council		Grade II* Riverside Station there is not a preclusion at this stage that this will be negative as there are opportunities for enhancement and the exact scope and nature of works is not known. One interesting opportunity for enhancement which may warrant further consideration is the re-establishment of a railway terminus at the Riverside Station.	Beneficial effects to the Grade II* Riverside Station have been identified as part of this chapter, following detailed assessment as presented in paragraph 14.161 of this chapter. No proposals for a railway link are brought forward as part of this application.
Thurrock Council		The decision to consider a further 5km area of search to assess potential indirect effects resulting from changes in the setting of designated heritage assets and built heritage (presumed to refer to non-designated heritage assets) is supported. The use of a Zone of Theoretical Visibility at an early stage will assist in determining which heritage assets in the 5km area of search can be scoped out.	Consideration of designated heritage assets in a 5km Zone of Theoretical Visibility has been used for this chapter and the supporting Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2)
Thurrock Council		The position on the former grazing marsh near to Tilbury Fort means that the setting of the fort will need to be carefully monitored. At present the red line boundary of the development includes the large area of hard standing being used for new car parking. It is unclear what, or if changes are proposed to this area. If further parking is required, any increase in height	The potential for effects to the significance of Tilbury Fort through change to setting (leading to a reduction in the contribution to significance made by that setting) has been assessed in this chapter (paragraph 14.191-194) and in the supporting Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2)

Source	ID/Ref	Scoping advice	Response
		by the creation of structures in this area would potentially impact on the setting of the fort.	
Historic England		Impacts on heritage assets could originate from both construction and operation of the proposed development, and be caused by both direct physical impact and from change in their setting.	Effects arising from direct and indirect effects during the construction and operation of the Proposed Development have been considered in this chapter.
Historic England		The assessment should take account of the potential impacts which associated development activities (such as construction, noise and dust, servicing, maintenance, and associated traffic) might have upon perceptions, understanding, and appreciation of heritage assets.	Effects arising from development activities have been acknowledged in this chapter. However, effects to significance arising from the Proposed Development are assessed as operational effects. This assessment has considered the potential for activities associated with both construction and operation of the Proposed Development to affect the heritage significance (and the ability to appreciate that significance) upon assets in the study area.
Historic England		The assessment should consider the likelihood of alterations to drainage, ground water, scour, and tidal/water flow patterns that might lead to in situ decomposition or destruction of below ground or marine archaeological remains and deposits, and can also lead to subsidence of buildings and monuments.	Effects to marine assets are considered in Appendix 14.1 and in paragraphs 14.149-14.159 of this ES chapter
Historic England		We strongly support the concept of an overarching Historic Environment Framework, which can be used to draw together existing information, and be used as a basis for design decisions. The HEF would be an evolving document but there is already a significant amount of new	The evolving HEF has been provided at Appendix 14.9 (document reference 6.2.14.9) and is based upon assessment and surveys to date

Source	ID/Ref	Scoping advice	Response
		information which could be incorporated in it.	
Historic England		The potential and significance of the information preserved in the natural floodplain and river valley deposits should be investigated appropriately in order to understand the impact that the proposed scheme may have. The existing deposit model prepared for the scheme should be updated with the results of recent investigation as well as new information such as will need to be collected from Tilbury.	Consideration of geoarchaeological deposits is presented in Appendix 14.1 and in paragraphs [14.134 and 14.147] of this ES Chapter
Historic England		We note there is nothing in the DBA baseline regarding archaeology or palaeoenvironmental evidence that might lie in the intertidal area of the river. It will be essential to include assessment of this.	Assessment of the marine and inter-tidal area has been included in Appendix 14.1 (document reference 6.2.14.1) and in this ES chapter (paragraphs 14.149-14.159)
Historic England		Baseline reports should be comprehensively updated. It is noted that very little baseline assessment has been carried out to date for the project site area in Tilbury, Essex and given the scale of the proposals here it will be essential to do so as soon as possible.	Baseline assessments presented in Appendix 14.1-14.3 (document reference 6.2.14.1-3) include a baseline assessment of the Essex Project Site
Historic England		Will also require considerable further input from (field-based) archaeological investigations. Such investigations will need to take the form of an iterative and staged process of archaeological assessment to include: <ul style="list-style-type: none"> • geoarchaeological borehole analysis; • the monitoring of geotechnical works; • geophysical survey; 	A programme for further surveys and investigation is presented in the HEF (Appendix 14.9; document reference 6.2.14.9). Considerable work has already been undertaken on the Kent Project Site, including geophysical survey. This together with detailed desk-based assessment and consideration of work carried out in the recent past in the immediate vicinity of

Source	ID/Ref	Scoping advice	Response
		<ul style="list-style-type: none"> • test pitting, and trial trenching. 	the Kent Project Site has allowed the establishment of a baseline which represents an appropriate basis on which to inform future decision making in relation the parameters set out in the draft Development Consent Order (DCO) and Works Plans, in accordance with the Rochdale Envelope approach. Mitigation proposals allow for detailed investigation (and a staged process) to enhance the record.
Historic England		The Wessex Archaeology geoarchaeology team should have input to the design of further geotechnical works to ensure information suitable for archaeological purposes can additionally be obtained, and which can be used in the creation of an updated deposit model. We strongly recommend that the outputs of the modelling feed directly into the EIA.	The geotechnical works are proposed post-consent. The geoarchaeology team will have input into the design of the investigations and make use of results to enhance the record.
Historic England		Techniques suited to investigating deep areas of archaeology and organic-rich deposits such as peat, should be considered. This may include the use of techniques such as Ground Penetrating Radar (GPR) or Electrical Resistance Tomography (ERT) (Kent and Essex Project Sites).	Electromagnetic Induction (EMI) Survey and Earth Resistivity Tomography (ERT) Survey has been undertaken across the central and northern parts of the peninsula. Results are provided as Appendix 14.7 (document reference 6.2.14.7). Consultation with our in house geophysical specialists has determined that the Essex Project Site would be unsuitable for ERT and EMI survey as the methods require probes to be inserted into the ground, which currently comprises asphalt across the Essex Project Site. Due to the depth of the alluvium at the Essex Project Site GPR survey is also unlikely to be successful.

Source	ID/Ref	Scoping advice	Response
			Further survey is proposed in the form of geoarchaeological boreholes and deposit modelling, outlined in the HEF (Appendix 14.9; document reference 6.2.14.9)
Historic England		Marine geophysical and technical techniques should be included as a part of the investigations to inform both the project design and appropriate mitigation measures for archaeological receptors.	No significant effects are predicted, but measures included in mitigation proposals (to be secured as part of the DCO) as outlined in the HEF (Appendix 14.9; section 14.9)
Historic England		We encourage an inter-disciplinary approach, particularly given the overlap of visual impacts on landscape and cultural heritage.	Inter-disciplinary co-operation has been present throughout the preparation of the ES
Historic England		We would encourage the applicant to consult us regarding significant viewpoints that should be assessed. Regarding the Fort and Barracks, we would need specific heritage viewpoints in relation to the proposed car park development and would want to be involved in agreeing the locations. We would also want to see Essex assets up to 2 km north of the Swanscombe Peninsula picked up in the setting assessment for the main development. We recommend photomontages and rendered Images are produced.	No significant effect on the heritage significance of this asset is predicted, as set out in this chapter and in the supporting Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2). Photographs have been included in the Built Heritage Statement, illustrating the monument in its current setting. Further views from around the Essex Project Site are presented in the LVIA chapter (Chapter 11). The assessment is based on the parameters set out in the draft DCO and Work Plans as part of a Rochdale envelope approach. Rendered images are not considered necessary or useful at this stage.

Consultation

- 14.5 LRCH undertook several rounds of statutory and non-statutory consultation (outlined in the Consultation Report (document reference 5.1) to guide the preparation of the proposals now submitted. Consultation feedback and analysis is presented in the Consultation Report submitted as part of the DCO application (document reference 5.1).

Table 14.2 summarises the feedback received in respect of cultural heritage and archaeology during the statutory consultation that took place between July and September 2020 and sets out LRCH's responses.

Table 14.2: Summary of 2020 Consultation Response

Consultee	ID/Ref	Consultee Comments	Response
Dartford Borough Council KCC Heritage Team	DBC.1.1 16	Nationally important undesignated archaeological assets are known or expected to be present in the site and should be treated as though they are designated.	Noted and agreed.
Dartford Borough Council KCC Heritage Team	DBC.1.1 17 KCC. 154	Baseline assessments will need to be updated and should be sent to statutory consultees and local authorities for comment prior to DCO submission.	Baseline assessments have been updated and are presented in Appendices 14.1-14.3 to this chapter. Additional Baseline information is presented in appendices 14.4-14.9
Dartford Borough Council KCC Heritage Team	DBC KCC 1.55	The Archaeological desk-based assessment should include a detailed historic map regression, a specialist assessment of industrial archaeology (including the cement industry, Bell Wharf and the super pylon) a detailed archaeological impact assessment, which should include temporary construction impacts and landscape and biodiversity mitigation alongside the development proposals.	The Archaeological Desk-Based Assessment includes a detailed historic map regression. Consideration of the cement industry is provided in the Archaeological DBA. Bell Wharf, the Super Pylon and upstanding remains of the cement works are considered in the Built Heritage Statement (as these are standing structures). Effects to these heritage assets are considered in the ES.
Dartford Borough Council KCC Heritage Team	DBC KCC 1.56	Archaeological field evaluation will be required in several areas of the site prior to submission of the DCO. In particular, the areas which require evaluation include Baker's Hole SSSI, Scheduled Monument and adjacent non-designated archaeological remains (transit route, people mover, interchange area); non-designated archaeological remains in the area of Springhead Roman town and religious focus; designated and non-designated	Archaeological evaluation at Springhead Roman Town has been undertaken and results of the evaluation are provided as Appendix 14.8 (document reference 6.2.14.8) Detailed desk-based assessment and specific consideration of the Palaeolithic background has been undertaken (including consideration of work undertaken previous in and adjacent to the development (including for HS1) so that a good

Consultee	ID/Ref	Consultee Comments	Response
		archaeological remains of earlier prehistoric date along the flood plain and adjacent areas of the river Ebbsfleet; and borehole assessment of alluvial areas	level of understanding can be arrived at to inform consideration of the proposals. Further detailed fieldwork is proposed as part of the overall mitigation proposals as set out in the HEF (Appendix 14.9; document reference 6.2.14.9) and Outline CEMP(document reference 6.2.3.2), subject to ongoing studies.
Dartford Borough Council KCC Heritage Team	DBC KCC 1.57	Information in the PEIR is unclear about the proposed location of the people mover. Option 2 of the people mover routes causes least harm to cultural heritage (see Palaeolithic DBA) – this route should therefore be chosen or a full explanation provided in chapter 4 of why it has not and clarity as to which of the other routes is proposed. All of the proposed routes for the people mover, transit route and interchange will have an impact on non-designated archaeological remains of expected national importance; field evaluation is required prior to submission of the DCO	The transport consultants identified options for the alignment of the people mover route. The options were also assessed by the Palaeolithic specialist to assess the effects of each route (ES Appendix 14.4; document reference 6.2.14.4). A technical note was prepared by the transport consultants to justify the selection of the proposed route (ES Appendix 14.5; document reference 6.2.14.5). The least harmful of the feasible route options has been chosen. Embedded mitigation in the form of constructing the route on a lightweight surface structure employing polystyrene blocks would also minimise below ground impacts.
Dartford Borough Council KCC Heritage Team	DBC KCC 1.58	The Historic Environment Framework and strategy should include agreements for management and enhancement of heritage assets in LR land ownership	The HEF is included as ES Appendix 14.9 (document reference 6.2.14.9) and includes provision for management and enhancement of assets.
Dartford Borough Council KCC Heritage Team	DBC KCC 1.59	Opportunities to improve the condition, management, display, and interpretation of the important archaeological remains in and adjacent to the site should be explained in detail in the DCO following further discussion local	Opportunities for management, display and interpretation are included in the mitigation section of the ES and in the HEF (Appendix 14.9; document reference 6.2.14.9).

Consultee	ID/Ref	Consultee Comments	Response
		authorities and statutory consultees, and developer contributions should be agreed to allow these ambitions to be achieved.	
Dartford Borough Council KCC Heritage Team		Temporary rights and access to land – mapping of designated and non-designated heritage assets needs to be undertaken and safeguards put in place to ensure damage is not inadvertently caused.	Details of specific mitigation and protection measures are included in the HEF, and in the Outline CEMP (document reference 6.2.3.2) as appropriate to ensure this risk is avoided.
Dartford Borough Council KCC Heritage Team	DBC KCC 1.73	The Baker's Hole SSSI should also be considered in the Cultural Heritage section in terms of its Palaeolithic archaeology and the need to consider geological evidence to understand Palaeolithic archaeology	Consideration of the Baker's Hole SSSI (effectively as an extension to the Scheduled Monument and its specific interest) is included in this chapter (paragraphs 14.117-14.121).
Dartford Borough Council KCC Heritage Team	DBC KCC1.75	Welcome recognition of 1965 'super pylon' as a local landmark but it also needs to be considered as an industrial heritage asset, in terms of views and setting etc.	The Super Pylon is taken into account in as an industrial heritage asset Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2) and within this ES chapter (paragraph 14.217-218) .
Dartford Borough Council KCC Heritage Team	DBC KCC 1.76 KCC 1.80	Land remediation proposals, landscaping, river transport, flood defence and habitat improvements should be assessed for archaeological impacts.	These have been considered below in the assessment of effects, and mitigation for any direct effects is included in the proposals set out in the HEF and Outline CEMP as appropriate. Specific details (once arrangements, method and locations are known for off-site areas) will be agreed in the form of a Written Scheme of Investigation and secured through the DCO.
Dartford Borough Council KCC Heritage Team		The need for archaeological investigations has been noted but there is also a need for archaeological evaluation, impact assessment and mitigation through design first.	Mitigation through design has taken place with regard to Baker's Hole Scheduled Monument and Neolithic Sites at Ebbsfleet detailed below (paragraphs 14.117-123). This is

Consultee	ID/Ref	Consultee Comments	Response
			based on the detailed assessment work presented in this chapter and the supporting appendices.
Dartford Borough Council KCC Heritage Team	DBC KCC 1.78	Written schemes of investigation and Construction practice codes should also be agreed before consent is granted.	Written Schemes of Investigation are included in the HEF (Appendix 14.9; document reference 6.2.14.9)
Dartford Borough Council KCC Heritage Team		Palaeolithic desk-based assessment - more detailed assessment of impacts including sections, at the southern end of the people mover, transport access and transit interchange is required.	Specific consideration has been given to the potential for survival of Palaeolithic remains in the assessment, and the detailed mitigation proposals reflect this. The level of work to date is considered proportionate, but further opportunities to increase the knowledge base will be identified (as part of mitigation).
Gravesham Borough Council		The impact of the proposals, direct and indirect, on the setting and appreciation of assets at Northfleet, Gravesend and Rosherville needs to be robustly evaluated.	The Conservation Areas at Northfleet, Gravesend and Rosherville have been considered as part of the Built Heritage Statement (ES Appendix 14.2; document reference 6.2.14.2) and scoped into or out of assessment with justification. Selected assets are assessed in this chapter below.
Natural England		Natural England would expect a full and comprehensive investigation of Baker's Hole SSSI to be undertaken to inform the environmental statement, rather than being undertaken at the post consent stage. The assessment should provide an understanding of the potential impacts from the scheme to the notified interest of the SSSI and a robust consideration of ways of achieving the proposed development which avoid, or have a lesser impact to the SSSI.	A Written Scheme of Investigation for Baker's Hole SSSI has been prepared and is provided as an appendix to the HEF (Appendix 14.9). This will be agreed with Statutory Consultees prior to the works taking place. The level of information presented as baseline is considered proportionate in that the interest in the site is clear, and the impacts understood. LRCH's design proposals seek to minimise physical effects and mitigation proposals include measure to address the perceived 'sterilisation' of parts of the SSSI.

Consultee	ID/Ref	Consultee Comments	Response
Historic England	HE 1.1	ES to demonstrate impacts through the use of appropriate photomontages and rendered images. We would be pleased to provide advice on specific views in relation to heritage assets.	Photo-viewpoints have been prepared as part of the Landscape and Visual Impact Assessment (Chapter 11) and where relevant have been used to inform the Built Heritage Statement and assessment of effects below.
Historic England	HE 1.2	We consider the Mol (on the Grade II* listed Riverside Station and floating landing stage) would actually be Major and the RS would be High Adverse. This is due to the scale and close proximity of the car park to the Terminal building. We would therefore expect appropriate recognition of harm in the ES, and an approach to design that reduces this harm.	The assessment at the statutory consultation stage was precautionary and a desk-based exercise. Further assessment has been undertaken since then, including site visits. Following detailed assessment, it is considered that there will be no adverse effect on the heritage significance of this asset, notwithstanding the proposed car park (simple proximity does not equate automatically to 'harm'). The development provides an opportunity to enhance the asset directly (through reroofing of an existing building in the eastern part of the complex which is currently without a roof covering or glazing and retaining the whole in an appropriate and viable use) and indirectly (improved access, ability to use design to enhance and better realise the ability to appreciate the asset's significance). A full assessment is presented in the ES (paragraphs 14.161-162), based on the parameters set out in the DCO and works plans, as part of the Rochdale Envelope approach adopted for this submission.
Historic England	HE 1.3	Agree with the assessment level of 'Medium' Mol and 'Moderate Adverse' effect on significance on Tilbury Fort and Grade II* Barracks block. We would expect	The assessment at the statutory consultation stage was precautionary and a desk-based exercise. Further assessment has been undertaken since PEIR,

Consultee	ID/Ref	Consultee Comments	Response
		harm to be minimised here, firstly through detailed architectural design, and secondly through landscape screening.	including site visits. This assessment considers there is no 'harm' to this asset and there is no significant effect upon its heritage significance. This is explained further in this chapter. Opportunity for screening was considered, but is not considered necessary. Opportunities for enhancement and allowing the significance of the asset to be better realised by visitors using the development (as well as local communities) will be explored.
Historic England	HE 1.5	We need more baseline information about; the deposit sequences and archaeological potential of the Swanscombe Peninsula, the Ebbsfleet Valley and Palaeolithic sites around Baker's Hole.	Assessment of Palaeolithic deposits is presented within the Palaeolithic Desk-Based Assessment prepared for Bakers Hole (Appendix 14.4; document reference 6.2.14.4). Geoarchaeological baseline information has been included in the Archaeological Desk-Based Assessment (Appendix 14.1) and fed into the Historic Environment Framework.
Historic England	HE 1.8	A report for the evaluation work undertaken in the area to the north of Springhead and encompassing the Neolithic scheduled monuments is not included.	This is provided as Appendix 14.8 (document reference 6.2.14.8).
Historic England	HE 1.10	It is important that where consents are required these are applied for and obtained early.	Noted
Historic England	HE 1.11	We would also stress the importance of early/further field evaluation for other aspects of the development. This includes, but is not limited to, anticipated impacts to the Neolithic sites near Ebbsfleet (a scheduled monument); and areas with potential for undesignated archaeology (including nationally	Archaeological surveys undertaken for the Proposed Development are presented in ES Appendices 14.6-14.8 and include geophysical surveys and archaeological evaluation at Springhead which included geoarchaeological test pits of undesignated archaeology either side of the Neolithic Sites near

Consultee	ID/Ref	Consultee Comments	Response
		important and waterlogged, as well as deeply buried remains).	Ebbsfleet (Scheduled Monument).
Historic England	HE 1.12	The need to understand in detail the alterations and additions to the existing A2 Ebbsfleet junction. This should include provision for the continued preservation in-situ of the temple beneath the slip road.	Only minor changes are required to the approved Highways England Scheme of improvements to the A2 Junction. These changes are confined to the areas around the roundabouts themselves and do not include any alterations to the existing A2 (T) eastbound slip road, where the temple is preserved. As such this will continue to be preserved in situ.
Historic England	HE 1.14	Baseline does not adequately reflect the differences in deposit sequence and deposit characteristics for each zone identified, which would be derived from geoarchaeological input and deposit modelling. We would also point out that although some areas have indeed already been excavated during HS1 works (as shown in the characterisation), some of these features are nevertheless still preserved beneath the current road system and should continue to be preserved as such.	The Archaeological Characterisation Zones in the Archaeological Desk-Based Assessment (Appendix 14.1; document reference 6.2.14.1) provides this information.
Historic England	HE 1.15	Baseline assessments should present what is known about the distribution, depth, and potential of the buried deposit sequence of the study area, in the form of text, schematic sections, and maps (such as the zones already produced). It should be based on geotechnical, archaeological and other datasets, which provide information on geology, geomorphology, and sediment character across the study area. This will provide a context for buried archaeology, from which	Geoarchaeological assessment has been incorporated into the Stage 2 Archaeological Characterisation Zones presented in the Archaeological Desk-Based Assessment (Appendix 14.1; document reference 6.2.14.1).

Consultee	ID/Ref	Consultee Comments	Response
		archaeological potential can be assessed.	
Historic England	HE 1.16	The 2015 geotechnical boreholes (Appendix 18.4 / Chapter 18) were monitored by geoarchaeologists. This should have informed the deposit model and helped to ground-truth the geophysical survey. The geoarchaeological deposit modelling, and input to the geophysical survey, is needed to inform the ES.	Geotechnical Boreholes were monitored in 2015 and the data will be fed into the deposit model following the completion of the geophysical and borehole survey on the Swanscombe peninsula
Historic England	HE 1.17	Welcome input to the scope of geoarchaeological and geophysical surveys proposed for the Essex side. These should be deep geophysics, geoarchaeological boreholes, and a deposit model.	Specific proposals have been included in the HEF and CEMP. A staged approach to mitigation is set out, and will be agreed with the statutory consultees in the form of a Written Scheme of Investigation and secured by the DCO.
Historic England	HE 1.18	There is no mention in the 'Baseline Conditions' section of geology or topography.	Geology and Topography of the Site is presented in Section 4.5 of ES Appendix 14.1 as part of the baseline resource.
Historic England	HE 1.19	Contamination because of CKD previously prevented geoarchaeological boreholes being drilled on the peninsula. It would be helpful to understand whether this will still be the case.	Conditions on the development site have not changed since the 2020 PEIR. Opportunities will be sought to tie in with principal contractor's GI works (or use the results of such works) and during construction (where safely possible after removal of contaminated ground) to enhance the geoarchaeological record. This is set out in the CEMP/HEF.
Historic England	HE 1.20	Include provision for the collection and assessment of additional boreholes where necessary as part of mitigation.	This has been added into mitigation section of this chapter and in the HEF (Appendix 14.9; document reference 6.2.14.9).
Historic England	HE 1.21	The potential for indirect archaeological impact should be assessed in the ES in the marine and the terrestrial zone,	Indirect effects to marine remains are considered below. To avoid confusion between indirect effects in relation to setting of

Consultee	ID/Ref	Consultee Comments	Response
		particularly organic remains that have been preserved in waterlogged environments, and organic rich deposits such as peat, as a result of changes to water levels or water chemistry.	heritage assets, indirect effects to Marine assets are referred to as 'indirect physical effects' in this chapter.
Historic England	HE 1.22	Marine baseline presented is a desk-based only, and does not include data from the NRHE and UKHO, so is incomplete. Also recommend the use of data by CITIZAN. We note that none of these assets are considered more than moderately significant. Detail should be provided on how the significance determination was reached	The archaeological desk-based assessment (Appendix 14.1; document reference 6.2.14.1) and this chapter now include the NRHE, UKHO and CITIZAN data. The assessment below outlines the significance of marine assets, none of the known sites are scheduled or protected or demonstrably equivalent, therefore the highest rating is 'medium' (following the scale of sensitivity set out in the methodology for this ES chapter).
Historic England	HE 1.23	We are content that the main potential impacts on marine heritage assets set out are appropriate. However, we wish to see further consideration and discussion regarding during which phases of the development these impacts could occur. We would consider the effects of scour and sediment changes to be an indirect impact that would also be applicable in the operational phases of the development. Due to the shallow nature of the areas to be impacted, it would be applicable for consideration of how boat wash could impact the burial of marine heritage assets.	This chapter provides consideration and discussion regarding the phases of development and the occurrence of impact. Scour has been included as an effect during the operational phase below. The chapter addresses how boat wash from construction and transport vessels could impact the burial of marine heritage assets.
Historic England	HE 1.24	Suggested marine mitigation measures have a preference for preservation by record for intertidal and subtidal features that may be impacted by construction activities. We would like to see greater emphasis on	Where appropriate there is a greater emphasis on primary mitigation strategy of avoidance of heritage assets and reference to the Marine Plan policy SE-HER-1.

Consultee	ID/Ref	Consultee Comments	Response
		the primary mitigation strategy of avoidance of heritage assets, in line with the marine plan policy SE-HER-1.	
Historic England	HE 1.25	The proposed works associated with the piles and jetty construction, could result in increased erosion. This could expose and potentially damage any archaeological remains in the area.	The potential for exposure and damage to archaeological remains through erosion has been considered in the assessment presented in this chapter.
Historic England	HE 1.26	There is no specific mention to the securement of mitigation measures for marine heritage assets with the Deemed Marine Licence. We request that appropriate consideration is given to the securement of such measures in the DCO, whether this is in conjunction with any onshore Written Scheme of Investigations (WSI) produced or as a separate marine WSI.	Mitigation measures will be agreed in the form of a Written Scheme of Investigation and included in the final HEF/ Outline CEMP and secured in the DCO. It is proposed that a separate WSI (or protocol) is produced for marine mitigation.
Historic England	HE 1.28	Mitigation should include a proposal to remove Baker's Hole from Historic England's Heritage at Risk Register. Other opportunities could include contribution to/provision of a centre, for understanding the rich heritage of the area, which would also be a benefit of the proposed scheme.	Opportunities for long-term management are outlined in the mitigation section of this chapter and further detailed in the HEF and may include a management plan for Bakers Hole (section 8.6).
Historic England	HE1.31	We think there must be a particular focus on using landscape and geoarchaeological approaches to analysis, and expect to see the development plans actively respond to historic environment concerns.	The Archaeological Characterisation Zones prepared as part of the Archaeological Desk-Based Assessment (Appendix 14.1) have a landscape and geoarchaeological basis
Port of Tilbury London	POTL.1.5	More detail will be needed as to the proposals for the Riverside Terminal and the proposed Marine Infrastructure to allow for the full assessment of the	This chapter presents an assessment of anticipated direct and indirect effects in relation to the parameters set out in the DCO application, reflecting the

Consultee	ID/Ref	Consultee Comments	Response
		Proposed Development on the heritage asset	Rochdale envelope approach adopted for this application. The HEF has outlined that a Built Heritage Assessment will be required to assess the details of the alterations to the Riverside Terminal when this information is available.
Port of Tilbury London	POTL.1.20	PoTLL will wish to have further detailed discussions with the Applicant to ensure that the proposals for the Riverside Station are brought forward with a detailed appreciation of the value of the asset and a full understanding of the future maintenance regime and responsibilities.	This chapter presents an assessment of anticipated direct and indirect effects in relation to the parameters set out in the DCO application, reflecting the Rochdale envelope approach adopted for this application. This has considered the “value” of the asset in question in respect of its “heritage significance”. The HEF makes provision for detailed recording and assessment in respect of details of the proposed alterations when these are available.
Port of Tilbury London	POTL.1.21	PoTLL agrees that this area of the Port does not make a positive contribution to the setting of the Fort and also agrees broadly that the car park buildings will result in a medium magnitude of effect resulting in a moderate adverse effect.	The assessment of a ‘moderate’ level of effect on the fort at the statutory consultation stage was precautionary and a desk-based exercise. Further detailed assessment has been undertaken since then, supported by site visits. No adverse effect is now considered to occur. The assessment of effects on Tilbury Fort is presented in this chapter of the ES.

Study area

14.6 The archaeological and cultural heritage resource (a term which is synonymous with ‘historic environment resource’) comprises a diverse range of heritage assets comprising archaeological remains, built heritage and historic landscapes. In order to aid the exposition of this chapter of the ES, the archaeological and cultural heritage resource has been split into three sub-sections: archaeology, built heritage and historic landscape. Archaeology has been subdivided further into terrestrial and marine.

- 14.7 The principal study area established for the preliminary assessment of known and potential archaeological and cultural heritage receptors encompasses a 1km radius around the Project Site. The marine study area comprises the mean high watermark (MHW) area of the Thames, from the western-most boundary of the principal study area to the eastern-most boundary.
- 14.8 A wider 5km study area was established for the preliminary identification of heritage assets which might be subject to indirect effects (that is visual or other changes to setting which might reduce the contribution made by that setting to the heritage significance of those assets). Within this area, a Zone of Theoretical Visibility (ZTV) model has been created (see chapter 11: *Landscape and Visual Assessment* and Figure 11.9 'ZTV of Proposed Parameters' of this ES).

Data sources

- 14.9 A number of publicly accessible sources of primary and synthesised information were consulted for the purposes of this assessment and the baseline assessments, as follows.
- Kent Historic Environment Record (KHER) and Essex Historic Environment Record (EHER), comprising a database of all recorded archaeological sites, find spots and archaeological events in the counties (accessed June 2020);
 - The National Record for the Historic Environment for maritime data, including known wrecks, obstructions and recorded losses;
 - The UK Hydrographic Office (UKHO) for maritime data including known wrecks and obstructions;
 - CITIZAN's interactive coastal map (<https://www.citizen.org.uk/interactive-coastal-map/#zoom=1&lat=7000000.42789&lon=-449143.99347&layers=B00000FT>);
 - The North Kent Coast Rapid Coastal Zone Assessment Survey (RCZAS) (Wessex Archaeology 2005);
 - National heritage datasets including the National Heritage List for England (NHLE), Images of England, NMR excavation Index and Parks and Gardens UK;
 - LiDAR data (Environment Agency) and Aerial Photographs;
 - Historic manuscripts, surveyed maps, and Ordnance Survey maps held at the National Archives (Kew) and Kent History and Library Centre. As the baseline assessments for the ES chapter have been prepared during the COVID-19 outbreak, access to the Essex Record Office was not permitted during the preparation of the baseline assessments.
 - Relevant primary and secondary sources held at the National Archives, Kent History and Library Centre and in Wessex Archaeology's own library. Both published and unpublished archaeological reports relating to excavations and observations in area around the Project Site were studied.

Methodology

Assessment of effects

14.10 The following sections describe the methods used to determine the significance of effects during the construction and operational phases associated with the Proposed Development on archaeological and cultural heritage receptors. The assessment considers the following:

- The importance/value of a receptor to an effect;
- Magnitude of effect; and
- The significance of effect upon receptors.

14.11 This chapter identifies and assesses potential direct and indirect effects upon the significance of potential and known archaeological and cultural heritage receptors. Predicted effects to archaeological and cultural heritage receptors due to the Proposed Development can be adverse or beneficial; direct or indirect; temporary or permanent and cumulative.

14.12 The significance of the effects of the Proposed Development on baseline conditions has been assessed through a process of combining an evaluation of the importance of the cultural heritage resource and the scale of the impact (magnitude of change) that would arise due to the construction and operation of the scheme, taking into account mitigation measures incorporated into the design (embedded mitigation) or delivered during the construction and operation phases.

14.13 The heritage significance of cultural heritage and archaeological assets is analogous to importance/value and is considered in relation to statutory designations, and priorities or recommendations set out in national research agenda. The National Planning Policy Framework (NPPF) Section 16: *Conserving and Enhancing the Historic Environment* (2019; paragraphs 184-202) defines significance for heritage policy as *'the value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic'* (NPPF 2019). The NPPF has been mentioned ahead of the Law and Policy section of this chapter below to aid the explanation of the assessment of effects. The NPPF's heritage interests (NPPF Annex 2) definition of Significance (for heritage policy), along with professional judgement, are used to determine the importance/value of the resource. This involves the assessment of the specific heritage value of each heritage asset to be affected by the development. This requires careful analysis of certain aspects of heritage significance of an asset that will be affected in order to appreciate the overall effect of a change to setting.

Direct (physical) effects

14.14 The assessment of physical effects will consider direct effects upon features of cultural heritage interest, where sites or potential sites and any buried archaeological remains are

at risk of being disturbed or destroyed. Physical effects to buried archaeological remains are likely to occur during below-ground works associated with the Proposed Development.

- 14.15 Physical effects to built heritage assets will also occur where changes to the fabric of historic structures are proposed. As cultural heritage is a non-renewable resource, physical effects to heritage assets (either buried or upstanding) are likely to be, dependent on the nature of the proposed works, permanent and irreversible.

Indirect effects

- 14.16 Indirect effects are those which result in potential change to heritage significance but do not give rise to physical damage or disturbance to an asset. The assessment of indirect effects considers whether the significance of a heritage asset is (adversely) affected by a reduction in the contribution to significance made by the asset's setting resulting from changes to that setting caused by the Proposed Development.
- 14.17 *Annex 2: Glossary* of the NPPF states that the setting of a heritage asset consists of 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. While setting is innately boundless, the extents of that setting which makes a meaningful contribution to the significance of a heritage asset is finite, and not all elements of a setting will contribute to an asset's significance. Therefore the importance of 'setting' is in what it contributes to the significance of an asset; simple intervisibility will not always confer significance, nor will it necessarily result in harm where new development is proposed,, and 'setting' itself is not a designation (see paragraph 9 of *'The Setting of Heritage Assets'* (Historic England, 2017).
- 14.18 Setting can therefore be tangible, such as a defined boundary, or intangible, such as an atmosphere or ambience. Setting is not simply identified in a visual envelope, but can include an archaeological or historic context, which may not be visually apparent, or the experience of moving through a space, a kinetic experience, such as moving along an historic thoroughfare. The main concern for visual effects on a cultural heritage setting is the potential for the Proposed Development to fragment the historic landscape, separate visual connectivity between historic sites and impinge on views to and from sites with important landscape settings.
- 14.19 Nevertheless, as noted above, for the purpose of this assessment and reflecting the requirements of the NPPF (to the extent that they are relevant to the Proposed Development), setting is only one attribute contributing to the significance of a specific heritage asset. Whilst a change in setting may occur, the setting may make little or no contribution to the significance of an asset or a change in setting may not be considered to lead to any loss of significance to an asset.
- 14.20 Assessment of setting is associated primarily with designated heritage assets or non-designated heritage assets of equivalent heritage significance (where such assets are

identified). This process of appraisal will follow Steps 1-3 with elements of Step 4 of the five step sequential process set out in the Historic England (2017) guidance, as follows:

- **Step 1:** Identifying the heritage assets affected and their settings;
- **Step 2:** Assessing whether, how and to what degree these settings make a contribution to the significance of heritage asset(s);
- **Step 3:** Assessing the effect of the proposed development on the significance of the asset(s);
- **Step 4:** Maximising enhancement and minimising harm; and
- **Step 5:** Making and documenting the decision and monitoring the outcomes.

14.21 When considering indirect effects in the wider Study Area, a ZTV model has, as noted, been prepared. The ZTV model is based upon height parameters for the Proposed Development which range between 14m and 128m Above Ordnance Datum (AOD). Further details on the methodology used to create the ZTV are included in Chapter 11: *Landscape and visual effects* of this ES. The ZTV has used a digital surface model that takes into account screening afforded by vegetation and buildings. The ZTV does not reflect the degree to which visibility can decrease with distance; the nature of what is visible at 1km will differ considerably from 5km, although both are indicated by the ZTV to have the same level of visibility.

14.22 The Built Heritage Statement prepared for the Proposed Development (ES Appendix 14.2; document reference 6.2.14.2) includes a scoping exercise whereby heritage assets identified as being potentially sensitive receptors to the Proposed Development have been either scoped into or out of further detailed assessment. Justification for the decision on each asset is provided in the Built Heritage Statement.

Indirect physical effects on marine archaeological assets

14.23 For marine archaeological assets, indirect physical effects comprise changes to the marine environment caused by the Proposed Development, such as increases in erosion that exposes assets, possibly leading to their damage or destruction, or increases in sedimentation, which could bury assets, leading to their protection. The assessment of indirect effects will consider whether the significance of a heritage asset is adversely or beneficially affected by the changes to the environment resulting from the Proposed Development.

Assessment criteria and assignment of significance

Methodology for prediction of effects

14.24 To understand the significance of direct effects, baseline data has been reviewed to:

- identify known or suspected archaeological sites in the Project Site boundaries;

- characterise the heritage resource from the Study Areas.

14.25 Comparison of the distribution of known and potential archaeological features with the extent of the proposed construction works allows the potential extent and nature of any direct disturbance to be characterised.

14.26 The assessment of effects arising from change in setting follows the approach set out by Historic England in *The Setting of Heritage Assets* (Historic England, 2017). In this case, the potential for loss of heritage significance is most likely to occur as a result of intervisibility or direct views between a heritage asset and the development. Change to views of an asset from a third viewpoint, even where there is no direct intervisibility between development and asset, might also be relevant as may non-tangible historic or other associations. However, it is important to consider that simple intervisibility between and asset and the Proposed Development, or presence in views, is not in and of itself an adverse effect. There has to be specific 'harm' to the significance of the asset.

Significance evaluation methodology

14.27 The assessment of the significance of any effect on a heritage asset is largely a product of the heritage significance of an asset and the magnitude of the effect that might give rise to harm, qualified by professional judgement. An assessment of effects on a heritage asset involves an understanding of the heritage significance of the asset and in the case of an indirect effect, the contribution of the setting to the heritage significance of the asset. The effect being assessed is whether the asset loses significance due to a reduction in the contribution that its setting makes to that significance, as a result of development in that setting. The National Planning Policy Framework (NPPF, section 16; para. 189) advises that the level of detail should be proportionate to the heritage significance of the heritage asset and no more than is sufficient to understand the potential impact of the proposal.

14.28 Guidance discusses the conservation of the heritage significance of heritage assets, as change is an inevitable process, but one that can be managed. Heritage significance is not necessarily dependent on the preservation of a feature as it can be enhanced through sensitive management (English Heritage/Historic England, 2008).

14.29 Rather than just characterising the potential physical effects of development, any assessment therefore needs to understand the effects on the heritage significance of heritage assets and/ or significant places. This assessment uses the definition of significance provided in the NPPF, *'The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting'* (NPPF Glossary, Annex 2 – Heritage Significance).

14.30 Effectively, the designation of an asset is a recognition of the special interests inherent in that asset that are deemed worthy of statutory protection. These assets are therefore typically regarded as more important than non-designated heritage assets. However, where non-designated heritage assets are deemed to be of equivalent significance to

designated heritage assets they should be treated as such (Department for Culture Media and Sport (DCMS) 2013 and NPPF para. 194b, footnote 63). The significance of identified heritage assets is defined in Table 14.3 below.

Table 14.3: Importance/sensitivity of archaeological and cultural heritage receptors

Importance/ Sensitivity	Criteria
Very High	<ul style="list-style-type: none"> • World Heritage Sites, which are internationally important • Assets of acknowledged international importance • Assets that can contribute significantly to acknowledged international research objectives • Historic landscapes of international value (designated or not)
High	<ul style="list-style-type: none"> • Scheduled Monuments and undesignated assets of schedulable quality and importance. • Listed Buildings • Archaeological assets that can contribute significantly to acknowledged national research objectives • Designated and undesignated historic landscapes of outstanding interest (including Grade I and Grade II* Registered Historic Parks and Gardens) • Non-designated landscapes of high quality and importance and of demonstrable national value • Wrecked ships and aircraft that are protected under the Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979 or Protection of Military Remains Act 1986 with an international dimension to their importance, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value. • Known submerged prehistoric sites and landscapes with the confirmed presence of largely <i>in situ</i> artefactual material. Palaeogeographic features with demonstrable potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.
Medium	<ul style="list-style-type: none"> • Designated or undesignated archaeological assets that contribute to regional research objectives • Conservation Areas • Designated special historic landscapes of special historic interest (including Grade II Registered Historic Parks and Gardens) • Wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation. • Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
Low	<ul style="list-style-type: none"> • Non-designated Heritage assets, including locally listed buildings, other

Importance/ Sensitivity	Criteria
	buildings, and wrecks that are considered to be of local interest <ul style="list-style-type: none"> ● Archaeological assets of limited value, but with potential to contribute to local research objectives
Negligible	<ul style="list-style-type: none"> ● Assets with very little or no surviving archaeological interest/buildings with little or no value at local or other scale ● Landscapes with little or no significant historical interest
Unknown	<ul style="list-style-type: none"> ● The importance of the resource cannot be ascertained due to limited existing information; therefore the value of the resource is classified as ranging from High to Low importance/sensitivity. ● Buildings with some hidden (i.e. inaccessible) potential for heritage significance. ● The importance of the resource cannot be ascertained due to limited existing information; therefore the value of the resource is classified as ranging from High to Low sensitivity.

14.31 In consideration of sensitivity and importance, designation status (and the implicit recognition of the special interests vested in designated heritage assets) is a starting point. However, some assets might be more or less sensitive to the anticipated changes from the Proposed Development, whatever their grading. The assignment of an asset to a particular level of sensitivity or importance is based in part on designation and in part on professional judgement on the degree to which an asset is sensitive to the type of change expected. The assessments in this chapter take this into account.

14.32 Direct effects are qualified by the extent and nature of remains (when considering archaeological heritage assets) or built fabric (when considering built heritage assets) associated with an asset which would be disturbed or lost, and the effect of this loss on the heritage interests (heritage significance) of the asset. In respect of buried archaeological remains with no visible above ground remains, this would normally result in the loss of archaeological interest. As regards built heritage, direct effects may impact upon elements of architectural interest. Historic interest can be affected in all instances, though such impacts are often less owing to the often intangible nature of such interests.

14.33 In this context, the effects of change to the setting of a heritage asset may depend on individual aspects of that setting, and assessments must be, by their nature, specific to the individual assets being considered. Historic England guidance, *The Setting of Heritage Assets* (2017) advises that the following aspects of setting should be considered in addition to any identified key attributes:

- The physical surroundings of the asset, including its relationship with other assets;
- The way the asset is appreciated; and
- The assets associations and patterns of use.

14.34 It should also be noted that not all change necessarily detracts from the heritage significance of an asset. In the assessment of effects on the setting of heritage assets, the nature of the effect, of development is a subjective matter. Change is usually taken to constitute a negative effect where it will introduce new and different elements to the setting of designated features, either to an imagined contemporary setting or to their existing setting. However, this change will only be assessed as generating a significant (adverse) effect where it reduces the contribution made by the setting of an asset to such a degree (magnitude) that the overall significance of the asset is diminished or otherwise harmed. The degree to which this overall significance is affected is what is being assessed and is reflected in the final assessed significance score.

Assessment of magnitude of impact

14.35 The assessment of the magnitude of impact is the identification of the degree of the effect of the scheme upon the heritage resource. The magnitude of impact can be positive or negative and is ranked without regard to the importance/sensitivity of the asset. The table below provides a guide for assessing the magnitude of impact in respect of the cultural heritage resource.

Table 14.4: Assessment criteria for determining the magnitude of impact

Criteria	
Very High	<ul style="list-style-type: none"> • Total loss of or major alteration to a site, building or other feature (e.g., destruction of archaeological feature, demolition of a building). • Fundamental change in setting and/or disassociation of asset from its setting, such as by blocking or severance of key views so as to cause a wholesale reduction in the contribution of that setting to the significance of that asset, and hence a significant loss of the asset's overall significance.
High	<ul style="list-style-type: none"> • Major physical damage to or significant alteration to a site, building or other feature. • Extensive change (e.g., loss of dominance, intrusion on key view or sightline) to the setting of a Scheduled Monument, Listed Building or other feature registered as nationally important, which may lead to a major reduction in the contribution of that setting to the significance of the heritage asset itself, and hence a loss of overall significance for that asset.
Medium	<ul style="list-style-type: none"> • Damage or alteration to a site, building or other feature. Encroachment on an area considered to have a high archaeological potential. • Change in setting (e.g., intrusion on designed sight-lines and vistas) to monuments / buildings and other features, which may lead to a moderate reduction in the contribution of that setting to the significance of the heritage asset, and hence a reduction in the asset's overall significance.

Low	<ul style="list-style-type: none"> Minor damage or alteration to a site, building or other feature. Encroachment on an area where it is considered that low archaeological potential exists. Minor change in setting (e.g., above historic skylines or in designed vistas) of Monuments, Listed Buildings, sites and other features, which may lead to a small reduction in the contribution the setting makes to the significance of the heritage asset, with an appreciable loss in the assets' overall significance.
Negligible	<ul style="list-style-type: none"> No physical effect. Slight or no change in setting, with no or very limited change in the contribution that setting makes to the significance of the asset, and no loss of overall significance.

Determination of significance of effects

14.36 Table 14.5 illustrates how the sensitivity of the asset and the magnitude of the impact are combined to produce an assessment of the significance of effect.

14.37 Effects are considered to be significant or not significant in EIA terms according to the matrix in table 14.5. For this assessment, a Moderate or Major effect would be considered to be significant in EIA terms, depending upon the heritage significance of the asset (above) and the exercise of professional judgement.

Table 14.5: Significance of potential effects

		Magnitude of Impact				
		Very High	High	Medium	Low	Negligible
Importance/ Sensitivity (Heritage Significance)	Very High	Major	Major	Moderate	Minor	Not significant
	High	Major	Major	Moderate	Minor	Not significant
	Medium	Moderate	Moderate	Moderate	Minor	Not significant
	Low	Minor	Minor	Minor	Not significant	Not significant
	Negligible	Minor	Not significant	Not significant	Not significant	Not significant

14.38 In making the final judgement on the significance of an effect, consideration is given not only to the importance of an asset in terms of its designation, but also to the sensitivity of an asset to the type of change or impact anticipated, as well as the magnitude of that change. For example, a highly graded Listed Building might have a high level of importance

by virtue of its designation, but could be less susceptible to a change in setting (and hence potential reduction in significance) arising from the development proposals. This might be due to the asset's form or location or because its heritage interests are not such that its significance relies on a visual contribution from setting, so that its heritage interests and hence overall significance is not harmed. Conversely, if an asset's significance is entirely derived from a visual contribution from its setting, then a higher level of significance may be afforded to the effect on the asset's significance from the anticipated impact, whatever the level of grading of the asset. The final score of the significance of any effect is informed by professional judgement and based on consideration of all of these factors.

- 14.39 The assessment considers the significance of any effects both in terms of the EIA terminology and in respect of the potential for loss of significance ('harm') to occur in terms of the NPPF. Where insufficient information is available in order to establish the potential significance of an effect on a receptor, such as where the sensitivity of archaeological and cultural heritage receptors could not be determined on the basis of the available information, the descriptor 'unknown' has been assigned.

Assessment criteria and assignment of significance

- 14.40 The cumulative impact assessment identifies the significant effects of the Proposed Development that have the potential to overlap with similar effects arising as a result of other projects or activities. Cumulative impacts are defined as those that result from additive impacts caused by other past, present and reasonably foreseeable actions together with the plan, programme and project itself and in-combination effects that arise from the culmination of the environmental effects of the development as a whole when all disciplines are considered together, including proposed mitigation measures.
- 14.41 Cumulative impacts may therefore occur to archaeological and cultural heritage receptors that have the potential to be incrementally affected by other consented and/or proposed development activities. These impacts might be individually minor but collectively assessed as significant.
- 14.42 Potential cumulative effects incorporated into the assessment include direct and indirect effects upon archaeological and cultural heritage receptors. All impacts have been identified and assessed in terms of significance and magnitude using the same methodology outlined above.

Assumptions, limitations and uncertainties

- 14.43 There are two principal areas of uncertainty. The first relates to the nature of the archaeological baseline. The archaeological desk-based studies on which this assessment has been based are predictive and do not provide a definitive understanding of as-yet unrecorded archaeological heritage assets that may be affected by the Proposed Development. The second area of uncertainty relates to detail of the Proposed Development, the EIA for the Proposed Development is applying the Rochdale Envelope approach explained in chapter 3: *Project description* of this ES, and as such the design will

retain a degree of flexibility. Exact details on construction methodology and the final heights and design of buildings and structures are currently unknown and as such broad parameters have been used, with a worst case scenario adopted where information is unavailable. This assessment is based upon the information available as part of the DCO submission, and presented in ES chapter 3: *Project Description*.

- 14.44 This assessment has been based upon the baseline information available at the time of writing (see Appendices 14.1-14.8). Whilst this is considered to form an appropriate and proportionate evidence based to allow informed decision-making, the presence and significance of every archaeological asset which may be affected cannot be certain, where those remains are buried, unrecorded and otherwise unknown. The assessment with respect to the potential for unknown archaeological remains is based on professional judgement and assessment of relevant desk-based resources, fieldwork undertaken as part of this assessment and knowledge of similar archaeological environments and work undertaken in adjacent areas to make an informed appraisal.
- 14.45 The UKHO and NRHE datasets do not provide a record of all surviving marine heritage assets, but a record of known shipwrecks, aircraft crash sites, obstructions and recorded losses. The information held is incomplete and is generally biased towards 19th century to modern shipwrecks, particularly those that pose navigational hazards. Additionally, positional information associated with recorded losses are generally vague and do not, except by chance, correlate to material on the seabed. Therefore the existing data does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown.
- 14.46 The ZTV is based upon height parameters of the proposed development ranging between 14m and 128m AOD in order to gain an understanding of the likely spread of intervisibility across the Project Sites and Study Area (see Chapter 11: *Landscape and Visual Assessment*; Figure 11.9). The ZTV has used a digital surface model that takes into account screening afforded by vegetation and buildings. The ZTV does not reflect the degree to which visibility can decrease with distance; the nature of what is visible at 1km will differ considerably from 5km, although both are indicated by the ZTV to have the same level of visibility, as such the ZTV presents a worst case scenario for actual visibility. The ZTV has largely been used to inform the extent of the study area, and aid in selection of assets to be included (or otherwise) for assessment, both at Scoping and subsequently. As noted in the methodology section, intervisibility (and indeed proximity) is not in and of itself harmful, and this assessment considers the potential effect on the heritage significance of an asset, not the degree to which the Development is visible from an asset.

RELEVANT LAW, POLICY AND GUIDANCE

International agreements

- 14.47 The United Kingdom is a signatory of the following international agreements, each of which is expressly concerned with the protection of the historic environment.

- The World Heritage Convention 1972, ratified by the UK in 1984;
- The European Convention on the Protection of the Archaeological Heritage (revised) 1992 (the Valetta Convention);
- The European Landscape Convention 2000;
- The Convention for the Protection of the Architectural Heritage of Europe 1985.

14.48 Broadly, these agreements recognise that heritage significance has value at a high level and is important and beneficial to the human experience, both for local communities and worldwide. They provide for the appropriate protection of heritage assets in an appropriate legal and regulatory framework at the national and international level, mandating consideration of heritage interests in decision-making, so that heritage becomes a key component in planning future development. Whilst no internationally recognised designations are engaged at the development site, it is recognised that heritage plays an important role in decision-making and place making and has value at the local level and far beyond. This is exemplified in the case of the deposits at Baker's Hole, which although nationally designated have an international value for what they can tell us about the development of the environment and the earliest human exploitation of it in this part of north-western Europe.

National legislation

14.49 There is a significant body of statute law dealing with the historic environment. Heritage assets that are deemed to be of particular importance are given legal protection through the following national legislation:

- Ancient Monuments and Archaeological Areas Act 1979;
- Infrastructure Planning (Decision) Regulations 2010;
- The Planning (Listed Buildings and Conservation Areas) Act 1990;
- National Heritage Act 1983;
- Protection of Wrecks Act 1973;
- Protection of Military Remains Act 1986;
- Burial Act 1997;
- Treasure Act 1996;
- The Hedgerow Regulations 1997 (as amended 2002).

Marine law and policy

- 14.50 Under the Marine and Coastal Areas Act 2009, a marine licence is required for construction (including alteration or improvement of existing structures and assets) and dredging activities. The Marine Management Organisation is responsible for marine licensing. Mitigation measures must be secured for potential impacts to marine heritage assets in a Deemed Marine Licence; this is being sought through the Development Consent Order (DCO).
- 14.51 The Marine and Coastal Areas Act 2009 divided the UK into marine policy regions, with an associated planning authority responsible for preparing a marine plan for that area. The *Marine Policy Statement* (Department for Environment, Food and Rural Affairs, 2011) sets out the framework for preparing Marine Plans and taking decisions affecting the marine environment. Inshore and offshore waters have been divided into eleven plan areas. The intertidal and marine parts of project study area are in the South East Marine Plan, which underwent a statutory public consultation between 14 January and 20 April 2020.
- 14.52 The South East Marine Plan indicates that ‘Proposals that demonstrate they will conserve and enhance elements contributing to the significance of heritage assets will be supported.’ If heritage assets cannot be conserved and enhanced, projects will need to demonstrate that they will, in order of preference: *‘a) avoid; b) minimise; c) mitigate harm to those elements contributing to the significance of heritage assets; and d) if it is not possible to mitigate, then public benefits for proceeding with the proposal must outweigh the harm to the significance of heritage assets.’*

National policy

- 14.53 National Policy Statements (NPS) relevant to this applicant comprise National Policy Statement for National Networks (Department for Transport 2014) and National Policy Statement for Ports (Department for Transport 2012). The National Policy Statement for National Networks sets out the provisions for the assessment of the historic environment in paragraphs 5.120- 5.142 (Department for Transport 2014) and provisions for the historic environment are set out in 5.12.1-5.12.20 (Department for Transport 2012). Both recognise the importance of managing and safeguarding of the historic environment throughout the NSIP process and provide guidance on the assessment of the historic environment, guidance for the decision-maker and recording.
- 14.54 General policy on the importance, management and safeguarding of the historic environment resource is provided by the National Planning Policy Framework (NPPF, February 2019). NPPF section 16: *Conserving and Enhancing the Historic Environment* sets out the national guidance on the importance, management and safeguarding of heritage assets in the planning process. The aims of NPPF Section 16 are to ensure that local planning authorities, developers and owners of heritage assets adopt a consistent and holistic approach to their conservation and to reduce complexity in planning policy relating to proposals that affect those assets.
- 14.55 On 6 March 2014 the Department for Communities and Local Government (DCLG) published the National Planning Practice Guidance (NPPG) web-based resource, which has been updated on a regular basis since then to, amongst other things, reflect the changes

to the NPPF since the guidance was first published. The resource includes a section entitled '*Conserving and enhancing the historic environment*' (ID:18a), which expands upon the corresponding sections of the NPPF.

Port of London Authority

14.56 Under the Port of London Act 1968 the Port of London Authority (PLA) has jurisdiction over the tidal Thames from Teddington to the outer limits of the Thames estuary up to the High Water Mark. The Proposed Development falls in this jurisdiction of the PLA. The Port of London Act denotes the ownership of finds recovered from the seabed.

Local policy

14.57 The Project Site falls partly in three local planning authority areas in north Kent - Dartford Borough Council, Gravesham Borough Council, and Ebbsfleet Development Corporation - and one local planning authority in south Essex, Thurrock Council. Relevant local planning documents from a cultural heritage and archaeology perspective comprise:

- Dartford Local Plan Core Strategy (adopted September 2011; Policy CS6 Thames Waterfront);
- Dartford Development Policies Plan (adopted July 2017; Policy DP12 Historic Environment Strategy; Policy DP13 Designated Heritage Assets);
- Gravesham Local Plan Core Strategy (adopted September 2014; CS20 Heritage and the Historic Environment);
- Gravesham Local Plan First Review Saved and Deleted Policies (2007; TC7 Other Archaeological Sites); and
- Thurrock Local Development Framework, Core Strategy and Policies for Management of Development (as amended) (adopted January 2015; CSTP24 Heritage Assets and the Historic Environment).
- Ebbsfleet Implementation Framework (2017; Part 3.2 no.1 'Celebrate and reflect Ebbsfleet's landscape, people and cultural heritage')

Relevant guidance

14.58 In addition to the relevant planning policy, a number of guidance documents are relevant to the current study:

- Design Manual for Roads and Bridges (DMRB), 'LA 104 Environmental Assessment and Monitoring' and 'LA 106 Cultural Heritage Assessment' (January 2020);
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists 2014; revised 2017);

- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage/Historic England 2008);
- Heritage 2020 Framework, Strategic Priorities for England’s Historic Environment 2015-2020 (Historic Environment Forum 2015);
- The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning Note 3 (Second Edition) (Historic England 2017);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Historic England 2015)
- Deposit Modelling and Archaeology: Guidance for Mapping Buried Deposits (Historic England 2020);
- Preserving Archaeological Remains (Historic England 2016);
- The Assessment and Management of Marine Archaeology in Port and Harbour Development (Historic England 2016);
- Ships and Boats: Prehistory to Present: Designation Selection Guide (English Heritage 2012);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Historic England 2015c).
- Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning Note 2 (Historic England 2015d)
- Statements of Heritage Significance: Analysing Significance in Heritage Assets, Historic England Advice Note 12 (Historic England 2019)
- The Early Palaeolithic in the South-East (Wenban-Smith et al 2019);
- Planarch: Evaluation of Archaeological Decision-making processes and Sampling Strategies (Oxford Archaeology 2001);
- Planarch 2: Review of Cultural Heritage Covering in Environmental Impact Assessments (Oxford Archaeology 2005);
- Kent Farmsteads Guidance (Kent County Council and English Heritage 2014);
- South East Research Framework (Kent County Council 2019);
- The Greater Thames Estuary Historic Environment Research Framework (Heppell 2010);

- Specification for Standard Desk-Based Assessment and Walkover Survey (Kent County Council);
- Specification for A Standard Desk-Based Assessment and Walk-Over Survey for Areas with Known Palaeolithic Potential (Kent County Council);
- Thames Gateway Historic Environment Characterisation Project (Chris Blandford Associates 2005);
- The East of England Research Framework (Medlycott 2011);
- People and the Sea: A Maritime Archaeological Research Agenda for England (Sturt et al 2013);
- North Sea Prehistory Research and Management Framework (Peeters et al. 2009);
- Assessment of Settings, Thurrock Scheduled Ancient Monuments (Place Services 2019);
- Tilbury Fort, Conservation Plan, Draft V1 (Alan Baxter Associates 2018);
- Scheduled Monuments and Nationally Important Non-Scheduled Monuments (DCMS 2013);
- JNAPC Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee and The Crown Estate 2008); and
- Marine Geophysics Data Acquisition, Processing and Interpretation (Plets et al. 2013).

BASELINE CONDITIONS

Introduction

14.59 The assessment of the baseline resource followed a staged approach. The Project Site has been subject to a number of assessments and surveys which formed the baseline information for this assessment.

14.60 A large amount of information relating to the archaeological and historic development of the Project Site has been provided in the appendices to this chapter and as such is not repeated here but references to those appendices are provided below as appropriate. This chapter is supported by the following data and assessments:

- Proposed Development, Archaeological Desk-Based Assessment, August 2020 (Appendix 14.1; document reference 6.2.14.1);

- Proposed Development, Built Heritage Statement, August 2020 (Appendix 14.2; document reference 6.2.14.2);
- Proposed Development, Historic Landscape Characterisation, August 2020 (Appendix 14.3; document reference 6.2.14.3);
- Desk-Based Assessment and Statement of Archaeological Significance (Palaeolithic) for main access road (eastern route), and people mover/cycle route options, 2017 (Appendix 14.4; document reference 6.2.14.4)
- Technical Note 1- People Mover Route- Alignment Options Appraisal (WSP 2020) (Appendix 14.5; document reference 6.2.14.5)
- Detailed Gradiometer Survey Report, South of A2(T), 2017 (Appendix 14.6; document reference 6.2.14.6);
- Earth Resistivity Tomography and Electromagnetic Induction Survey Report, Swanscombe Peninsula, 2017 (Appendix 14.7; document reference 6.2.14.7);
- Proposed Development, Land North of Springhead Nursery, Archaeological Evaluation Report, 2017 (Appendix 14.8; document reference 6.2.14.8);
- Proposed Development, Historic Environment Framework, October 2020 (Appendix 14.9; document reference 6.2.14.9)
- Summary of Impacts, Mitigation and Residual effects (Appendix 14.10; document reference 6.2.14.10)
- Schemes for Cumulative Assessment (Appendix 14.11; document reference 6.2.14.11)

14.61 Assets are discussed below where they have potential to receive a significant effect as a result of the Proposed Development. Further information on the heritage interests of these assets can be found in the Built Heritage Statement in ES Appendix 14.2 (document reference 6.2.14.2). A gazetteer of all designated built heritage assets within the 1km Study Area surrounding the Project Site, is provided within Appendix 1 of the Built Heritage Statement. The gazetteer provides a brief statement of significance and details whether the assets were scoped into or out of further assessment with justification.

Designated heritage assets

14.62 A total of 548 designated heritage assets were identified in the defined Study Areas and are summarised in table 14.6.

Table 14.6: Designated heritage assets in the Project Site and defined study areas (Figure 14.1 - 14.3)

Type of Designated Heritage Asset	Distance			Total
	Within Project Site	0-1km	1-5km	

Scheduled Monuments		3	6	19	28
Listed Buildings	Grade I	0	2	14	16
	Grade II*	1	12	19	32
	Grade II	2	118	326	446
Registered Parks and Gardens	Grade I	0	0	0	0
	Grade II*	0	0	1	1
	Grade II	0	0	1	1
Conservation Areas		0	10	14	24
Registered Battlefields		0	0	0	0
World Heritage Sites		0	0	0	0
Protected Wrecks		0	0	0	0

14.63 Within the Project Site boundary are three Scheduled Monuments (Figure 14.1):

- Palaeolithic sites near Baker's Hole, National Heritage List for England (NHLE) No. 1003557 and Site of Special Scientific Interest (SSSI). The Scheduled Monument consists of two areas in the Kent Project Site. One was subject to partial excavation in 1970-71 and revealed rich deposits and artefacts (dated to c.250,000-150,000 years Before Present (BP)). The second area was excavated in the 1930s and 1970s. The overlapping SSSI designation of Baker's Hole covers a larger area than the Scheduling and has been classified as 'unfavourable declining' by Natural England;
- Neolithic Sites near Ebbsfleet, NHLE no. 1004206. The Scheduled Monument consists of two areas in the Kent Project Site. The Sites near Ebbsfleet were first investigated in the 1930s by Burchell and uncovered artefact bearing horizons and other occupational evidence in the Holocene alluvium at Ebbsfleet. A fine assemblage of Ebbsfleet ware was also recovered. The Site was later reinvestigated by Sieveking, who produced similar artefactual evidence and revealed the presence of waterlogged horizontal timbers of Neolithic date (Neolithic period dates between 4,000-2400 BC);
- Springhead Roman Site, NHLE No. 1005140. Partially in the southern edge of the Site. The initial excavations in this area were thought to have determined the core of the Roman town, including evidence of six temples, a bakery, kilns and corn driers amongst other features. However later investigations determined that the focus of the town and ritual site was actually to the north of the A2(T), outside the scheduled area (Roman period dates between AD 43-410).

14.64 Three Listed Buildings lie in the Project Site:

- *Grade II* listed Riverside Station, including floating landing stage, Tilbury (NHLE 1111547)* which lies in the Essex Project Site. In 1922, a Bill was passed that allowed the construction of the existing riverside station and landing stage at Tilbury, which was opened by Prime Minister Ramsay MacDonald in 1930. The Riverside Station and landing stage are significant for their architectural and historic interest, embodied by

the built form of its component structures and its significant associations with the arrival of the SS Windrush in 1948, which transported 500 migrants from the Caribbean as the first of a wave of 'Windrush' migrants invited to the UK in the post-war years to meet labour shortages. The significance of the asset has been affected by the late 20th-century demolition of the station's former (by then obsolete) railway platforms, tracks, sidings, and association buildings and infrastructure to the north of the terminal. The existing station's north elevation is modern in date; the result of the loss of the former platforms;

- *Grade II listed Swanscombe Cutting Footbridge Crossing A2(T) east of A296 Junction (NHLE No. 1119762)* which lies in the southern part of the Kent Project Site crossing the A2(T). The Swanscombe Cutting Footbridge is a sweeping concrete construction of simple modernist design and was the first of this style of which there are several in Kent. It was built of concrete in 1964 by the county bridge engineer J.S. Bergg. The footbridge derives its significance from its architectural interest as an elegant example of an arch over a dual carriageway road.
- *Grade II listed Boundary Stone, Ingress Park (NHLE No. 1410227)* The boundary stone at Ingress Park lies on the western boundary of the Order Limits on the peninsula, at the edge of the Kent Project Site. The boundary stone at Ingress Park is thought to be the marker of the eastern extent of the Ingress estate owned by Alderman James Harmer in 1833. The estate comprised an historic parkland designed by 'Capability' Brown, which has recently been developed for housing. The structure itself is of only limited interest in and of itself - it is significant primarily for its contribution to the group value of the collection of contemporaneous landscape features in the former parkland which is of most significance.

14.65 There are no World Heritage Sites, Grade I Listed Buildings, Registered Parks and Gardens, Conservation Areas or Registered Battlefields in the Project Site. Designated heritage assets in the Project Site are shown on Figures 14.1 and 14.2. Designated Heritage assets within the wider 5km Study Area that subject to detailed assessment as a result of the scoping exercise undertaken as part of the Built Heritage Statement are outlined as part of the 'scope of indirect effects assessment' below (paragraphs 14.84 and Table 14.12). Designated Heritage Assets within in the wider 5km Study Area (see below are shown on Figure 14.3.

Undesignated archaeological assets

14.66 The desk-based assessments listed above present a summary of the known designated and undesignated heritage assets in the Project Site, based upon the information held by the sources listed above (paragraphs 14.9), and intrusive and other survey works undertaken for the Project Site to date (Appendix 14.6-14.8).

14.67 Tables 14.7 and 14.8 provide a list of undesignated archaeological heritage assets that lie in the Project Site that could be subject to physical impacts as a result of the development, or remains which have been excavated but indicate the potential for further archaeological remains to be discovered in the Project Site. These are illustrated in Figures

14.4-14.9. This list does not include findspots as these are not considered to be 'heritage assets' in themselves, as they indicate the location of artefacts that have been removed.

Table 14.7: Undesignated archaeological assets (terrestrial) in the Kent Project Site (based on current evidence; excluding findspots)

Ref no.	Name	Heritage Significance
WA25	Palaeolithic handaxe and flakes from terrace gravels at Galley Hill Pit (aka Higgins' Pit)	Very High
WA01	Palaeolithic artefacts and molluscan remains from Rickson's Pit, AKA Barracks Pit	Very High
WA43	Levalloisian Palaeolithic flakes, cores and animal remains from pit rail cutting to Bevan's (Baker's Hole) Pit	Very High
WA61	Ebbsfleet Site B (Baker's Hole), with Palaeolithic Levalloisian occupation floors, mammalian fossils and other palaeo-environmental remains	Very High
WA79	Upper Palaeolithic knapping site, Springhead	Very High
WA82	Late Upper Palaeolithic flints, 'Springhead Lower Floor', Ebbsfleet Valley	Very High
WA73	Rich vertebrate and other palaeo-environmental remains from the ZR4 pylon, Baker's Hole, Northfleet	Very High
WA110	Later Prehistoric skeleton 'Galley Hill Man', interred in Pleistocene gravels at Galley Hill, Swanscombe	Medium
WA159	Possible Late Bronze Age/Early Iron Age Boundary Features, Springhead	Low
WA87	Peat/ organic clay exposure by Swanscombe Marshes	Unknown
WA144	Possible Bronze Age Surface, Ebbsfleet Valley	Medium
WA146	Possible Bronze Age Fence or Fish Trap, Ebbsfleet Valley	Low
WA177	Gully Ditch and Cremation Burial, Ebbsfleet Valley	Medium
WA178	Early Prehistoric Site, Ebbsfleet Valley Sports Ground	Low
WA145	Two Bell Barrows with cremation, Springhead	Medium
WA157	Group of Bronze Age Pits, Springhead	Low
WA212	Iron Age Ditch, Springhead Nursery	Low
WA261	Late Iron Age and Roman features at Station Quarter South, Ebbsfleet, Kent	Medium
WA223	Approximate location of springs and ritual pool in early Roman period, Springhead, Northfleet	High
WA224	Late iron age to early/middle Roman activity west of Northfleet Roman villa, Northfleet	Medium
WA225	Late iron age to early/middle Roman activity west of Northfleet Roman villa, Northfleet - Iron Age gully	Medium
WA226	Late iron age to early/middle Roman activity west of Northfleet Roman villa, Northfleet - Iron Age pits	Medium
WA227	Linear Prehistoric Features, Ebbsfleet Valley	Low

Ref no.	Name	Heritage Significance
WA188	Northfleet Roman Villa Site, Ebbsfleet Valley	Medium
WA228	Late iron Age enclosure, Springhead	Medium
WA229	Late iron Age pit group 1, Springhead	Medium
WA230	Late iron Age pit group 2, Springhead	Medium
WA277	Romano-British pottery kiln found AD 1904	Low
WA282	Site of possible Romano-British ritual pit	Medium
WA286	Romano-British kiln (site of)	Low
WA287	Romano-British burial ground	High
WA297	Early Roman Quarry Pits, Springhead	Low
WA303	Probable Romano-British surface observed during cabling works in 1992	Medium
WA307	Large Roman building east of Watling Street, Springhead	High
WA308	Roman building found west of Watling St, Springhead	High
WA309	Two Roman buildings found north of Watling St beneath the A2	High
WA310	Roman shop beneath the A2 at Springhead	High
WA313	Area of probable Romano-British occupation immediately north of Roman Watling St, Springhead	High
WA314	Area of probable Romano-British occupation north of Roman Watling St, Southfleet	High
WA315	Courtyard and well, probably of Romano-British date, at Springhead, Southfleet	High
WA316	Romano-British bath-house found beneath current route of A2 at Springhead	High
WA317	Length of Roman ditch at Springhead, Southfleet	Medium
WA318	Romano-British ditch discovered during the 1960s at Springhead	Medium
WA319	Area of probable Romano-British activity at Springhead, Southfleet	High
WA320	Area of Romano-British activity immediately north of the A2 at Springhead	High
WA364	Two pits containing Romano-British pottery at Branton's Brickfield	Low
WA372	Six early Roman burials, Springhead, Northfleet	High
WA373	Early Roman pits, ovens, trackway and burials, Springhead, Northfleet	High
WA374	Early Roman cenotaph Springhead, Northfleet	High
WA375	Early Roman building Springhead, Northfleet	High
WA376	Roman road-side shrine, Springhead	High
WA378	Romano-British trackway discovered during evaluation in 2001.	Medium
WA383	Roman features at Station Quarter South, Ebbsfleet, Kent	High
WA384	Wall structure at Station Quarter South, Ebbsfleet, Kent	High
WA385	Roman cemetery at Station Quarter South, Ebbsfleet, Kent	High
WA390	Neonatal burials in 2nd century Roman Temple at Springhead	High

Ref no.	Name	Heritage Significance
WA450	Roman road north from Springhead	Medium
WA451	Watling Street Roman Road	Medium
WA452	Roman road, south from Springhead via Pepper Hill cemetery	Medium
WA267	Vagniacis (Springhead), Iron Age and Roman religious centre	High
WA396	2nd century Roman temple preserved beneath slip-road, Springhead	High
WA397	Mid-Roman temple building, Springhead, Northfleet	High
WA398	Early Roman trackway Springhead, Northfleet	High
WA399	Mid-Roman wall and possible building, Springhead, Northfleet	High
WA400	Roman pit alignment, Springhead, Northfleet	High
WA401	Roman structure, Springhead, Northfleet	High
WA402	Enclosing ditch to Roman sanctuary complex, Springhead, Northfleet	High
WA403	Junction in Roman Watling Street, Springhead, Northfleet	Medium
WA404	Roman fence-lines / property boundaries, Springhead	Medium
WA405	Semi-sunken feature Roman building, Springhead	High
WA406	'Property 1' at Roman settlement, Springhead	High
WA407	'Property 2' at Roman settlement, Springhead	High
WA408	'Property 3' at Roman settlement, Springhead	High
WA409	'Property 4' at Roman settlement, Springhead	High
WA410	'Property 5' at Roman settlement, Springhead	High
WA411	'Property 6' at Roman settlement, Springhead	High
WA412	Romano-British building in 'Property 7' at Roman settlement, Springhead	High
WA413	'Property 8' at Roman settlement, Springhead	High
WA414	'Property 9' at Roman settlement, Springhead	High
WA415	'Property 10' at Roman settlement, Springhead	High
WA416	'Property 11' at Roman settlement, Springhead	High
WA417	'Property 12' at Roman settlement, Springhead	High
WA418	'Property 7' at Roman settlement, Springhead	High
WA419	1st/2nd century aisled barn, Springhead	Medium
WA423	East range at Northfleet Roman villa	High
WA421	Roman south 'viewing platform', Springhead, Northfleet	High
WA424	Flint wall and remains of furnace and flue of Ebbsfleet Roman Villa Bath-House	High
WA425	Hot room (caldarium) of Ebbsfleet Roman Villa Bath-House	High
WA426	Warm room (tepidarium) of Ebbsfleet Roman Villa Bath-House	High
WA427	Cold room (frigidarium) of Ebbsfleet Roman Villa Bath-House	High
WA428	Bath of Ebbsfleet Roman Villa Bath-House	High
WA429	Gullies to north of Ebbsfleet Roman Villa Bath-House	High
WA430	Room 10509 in the Ebbsfleet Roman Villa Bath-House	High
WA431	Room 10508 and flue in the Ebbsfleet Roman Villa Bath-House	High
WA432	Room 10697 in the Ebbsfleet Roman Villa Bath-House	High

Ref no.	Name	Heritage Significance
WA433	Room 10624 in the Ebbsfleet Roman Villa Bath-House	High
WA434	Room 10563 in the Ebbsfleet Roman Villa Bath-House	High
WA435	Northfleet Roman villa western range aisled barn - external walls	High
WA436	Northfleet Roman villa western range aisled barn - post holes	High
WA437	Earliest Roman building at Northfleet Roman villa site	High
WA438	Late iron age to early/middle Roman activity west of Northfleet Roman villa, Northfleet - Early Roman pits	Medium
WA439	Early / middle Roman activity west of Northfleet Roman villa, Northfleet	Medium
WA440	Early Roman metalled road west of Northfleet Roman villa, Northfleet - Road	Medium
WA441	Early Roman metalled road west of Northfleet Roman villa, Northfleet - Gullies	Medium
WA442	Early Roman Occupation Site, Ebbsfleet Valley	Low
WA443	Northfleet Roman villa bath-house site	High
WA444	Western Roman Complex, Ebbsfleet Valley Sports Ground	Medium
WA446	Blacksmiths workshop in Property 10 at Roman Settlement, Springhead	High
WA447	Roman fence-lines/ property boundaries at property 10 in the Roman settlement, Springhead	Medium
WA448	Northfleet Roman villa western range aisled barn	High
WA449	Possible bath-house, Springhead, Northfleet	High
WA490	Medieval site at Northfleet East GIS Substation, Springhead	Low
WA457	Early Medieval Corn Dryers, Springhead	Low
WA461	Early medieval sunken-feature building, Springhead - SFB 5809	Medium
WA462	Early medieval sunken-feature building, Springhead -SFB20186	Medium
WA566	Medieval Boundary Ditch, Near Springhead Nursery, Springhead	Low
WA567	Medieval tile kiln west of Springhead	Low
WA487	Early Anglo-Saxon sunken-feature buildings, Northfleet villa site - SFB 16635	Medium
WA488	Early Anglo-Saxon sunken-feature buildings, Northfleet villa site - SFB 16699	Medium
WA489	Three early medieval sunken-feature buildings, Northfleet - SFB30107	Medium
WA283	Early Medieval Settlement, Ebbsfleet Valley	Medium
WA570	Large medieval trackway, Springhead	Low
WA653	Ditch at station Quarter South, Ebbsfleet, Kent	Low
WA664	NORTH KENT RAILWAY	Low
WA665	Post-Medieval Timber Revetment, Ebbsfleet Valley	Low
WA669	Branton's Brickfield	Low
WA713	Brick and flint-built 19th century features relating to Ingress	Low

Ref no.	Name	Heritage Significance
	Park	
WA727	Outfarm north east of Craylands	Low
WA788	FAWKHAM JUNCTION AND GRAVESEND BRANCH RAILWAY	Low
WA789	Gravesend, Rosherville and Northfleet Tramways	Low
WA790	Tramway J. B. White Portland Cement Works, Swanscombe	Medium
WA768	Watercress beds, Springhead evaluation, Gravesend, Kent	Medium
WA770	Britannia Cement Works (Site of)	Negligible
WA771	Chalk Pit (South of Galley Hill Road)	Negligible
WA773	Black Duck barge yard, Swanscombe Marshes	Low
WA774	J. B. White Portland Cement Works, Swanscombe	Medium
WA775	Craylands Lane Pit, Swanscombe	Low
WA776	Northfleet Paper Mills, (Kent Kraft Mills) Site of	Low
WA777	Gravel Pit, East of Stanhope Road	Negligible
WA778	Large Gravel Pit, East of Southfleet Road	Negligible
WA779	Site of Small Clay Pit, West of Southfleet Road	Negligible
WA786	Watercress Beds at Springhead	Medium
WA787	Tram Tunnel, Barnfield Pit/Craylands Gorge	Low
WA802	Air raid shelter (industrial), London Rd, Swanscombe	Low
WA832	Pepper Hill Second World War Battle Headquarters, Northfleet	Low
WA875	Springhead Second World War air raid shelter, Dartford, Kent	Low
WA885	Green's Yard Second World War air raid shelter, Swanscombe, Dartford, Kent.	Low
WA887	Swanscombe Urban District Council offices Second World War communications shelter, Swanscombe Cross, Dartford, Kent	Low
WA888	Whiting Works Second World War air raid siren, Swanscombe Cross, Swanscombe, Dartford, Kent	Low
WA890	Ebbsfleet International Station post-Cold War anti-vehicle bomb obstacles, Ebbsfleet, Dartford, Kent	Negligible
WA891	Ebbsfleet International Station Post-Cold War anti-vehicle bomb obstacles, Dartford, Kent	Negligible
WA893	Johnson's cement works Second World War air raid siren, Swanscombe, Dartford, Kent	Low
WA922	B Company 17th Battalion Kent Home Guard Second World War headquarters, London Road, Swanscombe, Dartford, Kent	Low
WA938	Transmission tower, Swanscombe Marshes	High
WA970	Thames Tar Distillery, (Kent Kraft Estate) Site of	Low
WA976	Tram Tunnels, Barnfield Pit/Craylands Gorge	Low
WA986	Early / middle Roman activity west of Northfleet Roman villa, Northfleet - Pits	Unknown
WA999	Possible denehole	Unknown
WA1026	Former field boundary/drainage pattern	Unknown
WA1027	Rectilinear enclosures	Unknown
WA1035	Animal burrow at station Quarter South, Ebbsfleet, Kent	Unknown

Ref no.	Name	Heritage Significance
WA1037	Cropmark of a possible field system, Springhead	Unknown
WA1038	East range at Northfleet Roman villa - post holes	Unknown
WA1039	Early / middle Roman activity west of Northfleet Roman villa, Northfleet - Ditches	Unknown

14.68 The table above demonstrates the rich archaeological resource in the Kent Project Site. The main archaeological potential of the Kent Project Site can be broadly summarised as follows.

- Palaeolithic potential associated with Baker's Hole and surviving surrounding deposits in the SSSI and surrounding area not previously affected by quarrying activity (very high heritage significance).
- Mesolithic/Neolithic potential associated with one of the two Scheduled areas and surrounding associated deposits/waterlogged deposits in the Ebbsfleet Valley (high significance).
- Roman remains associated with the scheduled Springhead Roman town and ritual site and its predating Late Iron Age phase discovered to the north of the A2(T), and Roman cemeteries discovered to the north of the A2(T) (high and medium significance).
- Northfleet Roman villa, as well as pre-dating Iron Age and post-dating Anglo-Saxon archaeology (high and medium significance).
- Geoarchaeological remains preserved on the peninsula and in the Ebbsfleet Valley (unknown significance).
- Evidence for Bronze Age remains, including funerary monuments and preserved wooden trackway (medium significance).
- Anglo-Saxon watermill and evidence of Anglo-Saxon and Medieval settlement (high to low significance).
- Post-medieval rural development (low significance).
- 19th and 20th century industry including important sites of Portland Cement Works and watercress production (medium significance).
- Potential for as yet undiscovered archaeological remains of unknown and significance (unknown significance).

14.69 Undesignated archaeological assets identified in the Essex Project Site are identified in table 14.8.

Table 14.8: Undesignated Archaeological Assets (terrestrial) in the Essex Project Site (based on current evidence; HER 2020; excluding findspots)

Ref no.	Name	Heritage Significance
WA1086	Tilbury Riverside- Earthworks linear features	Low
WA1088	Site of former buildings near Tilbury junctions	Low
WA1161	WWII anti-aircraft ditches N of Little Thurrock Marshes	Low
WA1158	Six Air-raid shelters (destroyed) between railway and Tilbury Fort	Low

14.70 The heritage assets above are from the post-medieval to modern periods and are considered to be of low heritage significance. The former buildings, anti-aircraft ditches and air-raid shelters are recorded to have been destroyed and it is unlikely that further remains associated with these would be discovered in the Project Site, unless below ground remains survive.

14.71 Previous investigations (in particular Devoy 1979) undertaken surrounding the Essex Project Site have shown that the Project Site has potential for geoarchaeological remains which have provided evidence of the human interaction with the environment during the Mesolithic, Neolithic and Bronze Age periods preserved in peat and alluvial layers. It is likely that these deposits will continue in the Essex Project Site. Finds recovered close to the Essex Project Site date to the Palaeolithic, Neolithic and Roman periods and indicate some level of activity in the area and could indicate potential for further remains to be discovered in the Project Site. Adjacent to the Essex Project Site boundary, was the discovery of an inhumation dating to the Late Mesolithic period found in 1883, at a depth of 10m below ground, thought to have been an intentional human burial. This is of high value due to its age and rarity of deliberate burials of this early date. This is evidence that land in and surrounding the Essex Project Site was occupied during the Late Mesolithic period.

Marine heritage assets

14.72 Data regarding marine and intertidal assets, such as shipwrecks, aircraft crash sites obstructions, and recorded losses, were requested from the HERs, NRHE and UKHO. The data has been assessed for heritage significance, based on professional knowledge and experience, in relation to relevant scheduling selection guidance (such as Historic England 2017, 2018a and 2018b), and in reference to the assessment criteria set out in Table 14.3.

14.73 Table 14.9 provides a list of intertidal undesignated marine heritage assets lying in the Project Site and which might be subject to direct or indirect impacts. The list is based on data from the Kent and Essex HERs and does not include findspots, as they indicate the location of heritage assets that have been removed. These are shown in Figures 14.10 – 14.11.

Table 14.9: Undesignated Heritage Assets (marine) in the Project Sites (based on current evidence)

Ref no.	Name	Heritage Significance	Easting	Northing
WA162	A well-preserved wooden stake and brushwood trackway, dating to the Bronze Age to Iron Age, on foreshore near the mouth of Broadness Creek	Medium	560412	176528
WA647	Wooden stakes and piles in foreshore by Swanscombe Marshes. They probably represent the remains of a previous sea wall.	Low	559613	175616
WA648	Possible wooden vessel, Swanscombe Marshes. Only partial remains of a probably flat bottomed, probably recent wooden vessel.	Medium	559648	175665
WA676	Wooden structure, possibly the remains of a wharf, on foreshore by Swanscombe Marshes	Low	559537	175552
WA677	Large wooden planks on foreshore by Swanscombe Marshes	Low	559566	175579
WA678	Hard, Swanscombe Marshes	Low	559671	175654
WA682	5 concrete pontoons by Swanscombe Marshes	Low	559841	175732
WA744	Hard, Broadness	Low	559486	175570
WA874	Bell Wharf Second World War mine watching post, Swanscombe, Kent. The site probably originated in 1940, built at the end of Bell Wharf, and was decommissioned by 1945. The end of the pier was demolished c. 2000.	Low, site has since been removed, but some evidence may still remain on the seabed.	560046	176235
WA933	Small concrete pier / quay by Broadness saltmarsh	Low	560142	176091
WA934	Abandoned wooden vessel in saltmarsh Broadness Creek. A modern wooden vessel, with rusting metal fittings. The base of wheelhouse and some engine fittings are visible, and the deck hatch cover appears to be in situ. It is almost completely overgrown.	Medium	560449	176479

Ref no.	Name	Heritage Significance	Easting	Northing
	This may be the same as WA2006.			
WA935	Wooden posts in foreshore, by Broadness. The North Kent Coast RCZAS suggested they could be mooring bollards.	Low	560480	176597
WA936	Anti-tank blocks / sea defences Broadness	Medium	560533	176699
WA937	Wooden foundation on foreshore at Botany Salt Marshes. They may be the remains of a 19 th century or later platform.	Low	561062	176371
WA946	Pier at Broadness. This pier was marked on the 2 nd and 3 rd edition OS maps, but by the 4 th edition, it has been replaced by a larger pier to the NE.	Low. This pier has been removed; however some evidence may still remain on the seabed.	560006	176057

14.74 Beyond the Kent and Essex Project Sites but in the marine study area, the NRHE includes sites from the 19th and 20th centuries. These comprise the remains of three to six unidentified barges in Robin's Creek, Gravesend (NRHE 125352, NRHE 1025353, NRHE 1025354, which are possibly the same as NRHE 1527138) and the remains of the Gull Lightship adjacent to Thurrock Yacht Club (NRHE 1474355).

14.75 The UKHO holds 88 records of heritage features in the marine study area (Appendix 14.1) (ES Figures 14.10-14.11). However, the majority of these are beyond the Kent and Essex Project Sites. The tables below assess the sites within a 100 m buffer of the Project Site. The buffer has been added to account for any potential indirect effects that could extend beyond the Order Limits.

Table 14.10: Undesignated heritage assets (marine) within a 100 m buffer of the Kent Project Site (based on UKHO data) Figure 14.10

Ref no.	Name	Heritage Significance	Easting	Northing
WA2001	Wreck. The <i>Magdeburg</i> was a motor vessel measuring 158 m in length by 20 m in beam, with a draught of 8.4 m. It was 6629 gross tons. The vessel was built in 1958. It capsized in 1964	Negligible. Vessel has been refloated. If any material remains it will	176622	69303

Ref no.	Name	Heritage Significance	Easting	Northing
	in thick fog, following a collision with the Japanese MV <i>Yamashiro Maru</i> . The cargo consisted of machinery and equipment, bicycles, diesel motors, electrical equipment, chemicals, etc. Salvage teams refloated the vessel in August 1965 and it was taken to Tilbury Docks for repairs. Record was amended to 'lift'.	likely be isolated		
WA2002	Wreck. The <i>Hart</i> , a 120 gross ton barge sunk in 1976 along with crane barge <i>Margaret Elizabeth</i> at APCM buoy, south side of St. Clement's Reach, River Thames. Owned at time of loss by Thames & General Lighterage Ltd. Record amended to 'dead' 7 September 2004.	Negligible. The record is 'dead' indicating the vessel was likely either lifted or salvaged. Only isolated material may remain	175822	12785
WA2003	Wreck. The <i>Margaret Elizabeth</i> , a barge, sunk along with dumb barge <i>Hart</i> at APCM buoy, south side of St Clement's Reach, River Thames. Owned at time of loss by J. Shelbourne & Co. Ltd. Record amended to 'dead' 7 September 2004.	Negligible. The record is 'dead' indicating vessel was likely lifted or salvaged, and any remaining material will be isolated	175822	12786
WA2004	Wreck. The <i>Folgate</i> was a barge, sunk off the lower end of White's Jetty in 1982, Swanscombe. Owned at time of loss by Blue Circle Industries PLC. Record amended to 'dead' in 2005 when not located by multibeam or echosounder.	Negligible. This wreck was likely lifted as it has not been relocated	176481	13121
WA2005	Wreck. An unknown wreck, measuring approximately 18 m in length by 5 m beam, oriented NNE/SSW, and recorded by the UKHO in a survey in 1989-90. The wreck was surveyed again in 2012 and 2018.	Medium	176392	13251
WA2006	Wreck. Unknown wreck, surveyed by the UKHO in 1990, 2012 and 2018. The wreck site has sonar dimensions 15 m in length by 4 m in width with orientation of 67 degrees. This may	Medium	176470	13250

Ref no.	Name	Heritage Significance	Easting	Northing
	be the same wreck as WA934.			
WA2007	Wreck. An unknown wreck, surveyed by the UKHO in 1990, measuring approximately 7 m in length, and oriented NE/SW. The record indicates that the wreck had been cleared by 1998 and the record was amended to 'lift'.	Negligible. Wreck lifted. Any material remaining will be isolated	176532	13249
WA2008	Foul ground. The foul was located by the UKHO in 2007, along the head of the disused White's Jetty.	Low. Likely debris associated with use of jetty	176191	69149
WA2009	Foul ground. An area of underwater obstructions was surveyed by the UKHO in 2007. It is located on the site of the Empire Paper Mill Jetty.	Low. Likely debris associated with use of jetty	175526	69032
WA2010	Foul ground. The obstruction was located in 2017 by UKHO survey.	Low	559811	175978
WA2011	Foul ground. The obstruction was located in 2017 by UKHO survey.	Low	175950	89347
WA2012	Foul ground. Site comprises cables, chains, mooring, nets, tackle, wires in St. Clement's Reach Anchorage. In 2007 the record was amended to 'dead'.	Negligible. Modern debris	176291	61494
WA2013	Foul ground. The site was surveyed by the UKHO in 1970 but in 1979 the record was amended to 'dead'.	Low. Subsequent survey did not indicate site	176408	13371

Table 14.11: Undesignated heritage assets (marine) within a 100 m buffer of the Essex Project Site (based on UKHO data) Figure 14.11

Ref no.	Name	Heritage Significance	Easting	Northing
WA2014	Wreck. The <i>Southport</i> was a steamship of 572 gross tons, sunk in 1955. It had been built in 1914 by Ardrossan D.D. and S.B. Co Ltd. with a three-cylinder triple expansion engine, single shaft propeller. At the time of loss it was owned by Park Shipping Co. Ltd, and was on passage from Antwerp for London. It sank following a collision at Gravesend Reach. It was later raised and sold for scrap. The record was amended to	Low. Wreck lifted. Any material remaining will be isolated	174991	69991

Ref no.	Name	Heritage Significance	Easting	Northing
	'lift' in 1956.			
WA2016	Foul ground. Surveyed by the UKHO in 2018. The UKHO identified the site as ground tackle remaining after removal of mooring buoy.	Negligible. Modern debris	175049	90304
WA2017	Foul ground. Obstruction identified during a UKHO survey in 1982. However, the record was amended to 'dead' in 1985.	Low. Likely modern debris	175046	13107

14.76 There is potential for further archaeological evidence to be discovered in the marine study area. The terrestrial assessment identified Palaeolithic, Mesolithic and Neolithic sites in the Kent Project Site, and the findspots in the marine study area suggest the potential for further discoveries, particularly within peat and alluvial sediments.

14.77 The Thames has been used as an important waterway for thousands of years. Therefore there is potential for the discovery of boats and coastal infrastructure relating to the local riverside settlements (as evidenced by Roman, Bronze Age, Anglo-Saxon and medieval sites and findspots in the terrestrial zone), as well as vessels lost while en route to central London, or abandoned as derelict on the side of the river (as evidenced by the examples recorded in the HER and NRHE data).

14.78 The NRHE data also provide information about recorded losses, totalling 74 vessels which have been lost but whose location is presently unknown (Appendix 14.15). The recorded losses date from 1636 to 1963. The vast majority (31) were lost due to collision, underlining the difficult navigational conditions and the number of vessels using the waterway. Other losses were due to stranding, loss during a storm and sinking at moorings while at anchor. The Society for Sprintsail Barge Research has indicated the last known locations for sprintsail barges, ten of which became hulks in the marine study area, while another 15 were broken up. It is possible that remains of one of these recorded losses could be present in the Kent or Essex Project Sites.

14.79 There is also the potential for aircraft remains, particularly in relation to the two World Wars.

Built heritage

14.80 The Project Sites contain three designated built heritage assets which have been described above.

Undesignated buildings/structures in the Project Site

14.81 A small number of undesignated buildings and structures are recorded in the KHER or were identified during field assessment which lie within the Kent Project Site, which could be affected directly by the development (ES Figure 14.12). These comprise:

- Milestone on London Road, Dartford (WA674);
- George V pillar box, George and Dragon PH, London Road, Swanscombe (WA866);
- Historic dwelling on London Road, opposite High Street (not on KHER; located at NGR 560520, 174893)
- George and Dragon Public House (not on KHER; located at NGR 560520, 174863)
- Two remnant buildings in the former Portland Cement Works, Swanscombe (WA774)
- Remnant building in former British Vegetable Parchment Mills (not on KHER; located at NGR 560643 175001)
- White's Jetty and Bell Wharf, Broadness (WA741 and WA947)
- Transmission tower, Swanscombe Marshes (WA938)

14.82 The above assets are shown on within the Kent Project Site on ES Figure 14.12. There are no undesignated built heritage assets in the Essex Project Site.

Scope of indirect effects assessment

14.83 Table 14.12 below lists the Designated Heritage Assets that have been included for assessment of indirect effects. A scoping exercise was undertaken as part of the Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2) for all designated built heritage assets within 1km of the Project Site. This provides a brief statement of significance for each asset and justification for scoping into or out of further assessment. Selected assets up to 5km radius that had the potential to be affected were also identified. The selection was made using the zone of theoretical visibility (ZTV), based on height parameters for the Proposed Development which were used to gain an understanding of the likely extent of intervisibility across the area. The height parameters ranged between 14m and 128m AOD and the ZTV model is shown in Figure 11.9 of the ES.

14.84 Indirect effects to archaeological designated heritage assets within and adjacent to the Project Site are assessed in the Archaeological Desk-Based Assessment (Appendix 14.1; document reference 6.2.14.1) and are also included within Table 14.12 below.

Table 14.12: Designated heritage assets scoped in for assessment of indirect effects in the baseline assessments

NHLE Ref	Grade	Name
1003557	SM	Palaeolithic Sites near Baker's Hole
1004206	SM	Neolithic Sites near Ebbsfleet
1005140	SM	Springhead Roman Town
1004226	SM	Enclosure SE of Vagniacis (walled cemetery)
1013378	SM	Medieval Wooded Boundary
1021092	SM/II*	Tilbury Fort (SM) and Officers Barracks (GII*)
1013658/1 261173	SM/II*	New Tavern Fort
1005120	SM	Gravesend Blockhouse
1004227	SM	Aspdin's Kiln
1147660	I	Church of Clement
1054093	I	The Parish Church of St Botolph
1085788	I	Parish Church of St Peter and St Paul, Swanscombe
1085810	I	Church of St Mary
1111547	II*	Riverside Station including floating landing stage
1085781	II*	Church of All Saints
1081094	II*	Church of Our Lady of the Assumption
1111632	II	Worlds End Inn
1085779	II	Ingress Abbey and those associated Grade II Listed features in the former Ingress Park
11011524	II	1 Knockhall Road
1147907	II	The Wharf Public House
N/A	N/A	High Street and Queen Street Conservation Area Gravesend, inclusive of The Town Pier (GII*) and Church of St George (GII*)
N/A	N/A	Gravesend Riverside Conservation Area inclusive of The Royal Terrace Pier (GII) and the Mission House (GII)
N/A	N/A	Lansdowne Square Conservation Area inclusive of Rosherville Quay Walls, steps, drawdock, and WWII Mine Watching Post (GII)
N/A	N/A	Greenhithe Conservation Area
N/A	N/A	The Hill, Northfleet Conservation Area

14.85 A brief summary of the designated heritage assets listed above, is provided below, where they are not already described as existing within the Project Site boundary in paragraphs 14.63-14.65 above. Further description and assessment of heritage significance is provided within Built Heritage Statement, Appendix 14.2 (document reference 6.2.14.2).

Grade II listed Church of All Saints, Swanscombe, Kent (1085781)*

14.86 The Grade II* listed church of All Saints is located at the junction of London Road and High Street adjacent to the Kent Project Site and was built in 1894 as the parish church for Swanscombe. It was designed by Robert Norman Shaw in the Gothic style, and is finished in knapped flint with stone dressings. The church sits upon a high point in the landscape and close to a sheer chalk cliff leading down to the peninsula and was designed for Fredrick A White of JB White and Sons, owner of the Portland Cement Works. The church was designed to sit on this prominent position at a high point in the landscape overlooking the 19th century industrial landscape of the peninsula. The visual and spatial associations stemming from that historic association have been eradicated by the near-complete demolition of the cement works during the 1990s and the cessation of the cement production. The church derives most of its significance from its historic and architectural interest but has been converted into residential units and as such some of its historic and architectural interest has diminished internally.

Grade II Ingress Abbey, Swanscombe, Kent (1101524)

14.87 Ingress Abbey is located to the west of the Swanscombe Peninsula and is of high importance. Its significance is derived from its historic, archaeological and architectural interests. Ingress Abbey was built in 1833 in the Tudor Gothic Style as a grand house. The house has historic connections with the architect Charles Moreing, who designed the house, and the Victorian poet and journalist Eliza Cook who is known to have stayed and written some of her poetry here. It also has archaeological interest as it is thought that this may be the fifth house on this site and as such there is potential for archaeological remains of the former houses to survive. It has some group value with the surviving listed landscape features including a terrace wall to the north of Ingress Abbey, the Monks' Well, Lovers' Arch, stable block, the grange, tunnels and garden arch, flint walled tunnel, brick lined tunnel, Garden Bridge and boundary stone.

Grade II listed Garden Bridge, Swanscombe, Kent (1410227)

14.88 Garden Bridge at Ingress Abbey is located just outside of the Order Limits close to the western edge of Kent Project Site on the peninsula and is of high importance by virtue of its national listing. The Garden Bridge is one of the landscape features which formed the designed landscape of Ingress Abbey (above). The Garden Bridge derives most of its significance from its group value with other undesignated and designated garden structures and features which survive from the former Ingress Abbey Garden. Part of its significance is derived from its intact survival. The structure has little architectural interest.

Grade II no. 1 Knockhall Road, Swanscombe, Kent (1101524)

14.89 1 Knockhall Road is a mid-19th century lodge at the junction of Knockhall Road and London Road in Swanscombe. It was formerly associated with a large 19th century house located to the north known as *Nelson House* and later, *Riversdale*. The main house fell into disrepair by the 1950s and was demolished and redeveloped. The lodge is the only surviving structure from this former small estate. The lodge derives much of its

significance from its architectural interest, being built in a castellated gothic style, although the building has been altered with modern uPVC windows and blocked openings which diminish its significance and historic integrity.

Grade I Parish Church of St Peter and St Paul, Swanscombe, Kent (1085788)

14.90 The Grade I listed Parish Church of St Peter and St Paul located on Swanscombe Street in Swanscombe derives much of its significance from its architectural and historic interest. The church has a long history and it is thought that the lower part of the tower is of Saxon origin. Other parts of the surviving fabric date to the 11th and 12th centuries such as parts of the tower and chancel. Much of the remainder dates to the 13th century with 15th century windows and restorations were undertaken in the 19th century and 20th centuries. It is possible that the church has some potential for archaeological interest due to its early origin and potential for remains of early phases of the church to be discovered below ground.

Medieval Woodland Boundary, Bean, Kent (Scheduled Monument; 1013378)

14.91 The Medieval Woodland Boundary is located at the western extent of the Kent Project Site at Bean and survives as an earthwork relating to the management of the woodland in the medieval period. The woodland boundary consists of a series of earthworks which enclose an area of 35.5ha and were used to manage coppicing in the medieval period. The monument has been securely dated to 1200-1250AD and is important due to its early date and good survival. The earthworks are also comparatively large compared to other examples.

Roman Walled Cemetery, Springhead, Kent (Scheduled Monument; 104226)

14.92 The Roman Walled Cemetery is located to the south of the Kent Project Site and was one of the first discoveries to be made relating to the Roman archaeology in the Springhead area, discovered by Reverend Rashleigh in 1799. The walled cemetery contained eight individuals buried in a central stone buttressed mausoleum and were accompanied by one of the richest collections of grave goods from Roman Britain (Andrews et al 2011). The cemetery dates to the 2nd/3rd century and corresponded with a major new building programme at the roman temple complex. The cemetery contained both urned cremation burials and internments within lead coffins within a stone tomb surrounded by two walled enclosures. Grave goods included a number of gold jewellery items, shoes decorated with gold leaf and large glass urns.

Aspdin's Kiln, Northfleet, Kent (Scheduled Monument; 104227)

14.93 Aspdin's Kiln is the oldest surviving Portland cement kiln in the world. The kiln is a well preserved example of an Aspdin Kiln, illustrative of a particular early form of Portland cement production. The structure's archaeological interest relates to its potential for below-ground remains relating to its construction and deposits of material it produced.

Grade I Church of St Botolph, Northfleet, Kent (1054093)

14.94 The Church of St Botolph is located at Vicarage Drive, Northfleet and derives much of its significance from its historic, archaeological, architectural interests and its setting. The church is known to have had an Anglo-Saxon predecessor on this site on top of 'The Hill', Northfleet, overlooking the river, and as such has archaeological interest for remains of the earlier Saxon Church. The present church dates to the early 14th century but exhibits some 13th century and earlier fabric. However the current tower was built after an earlier structure collapsed in 1717. The historic and architectural interests are derived from the age of the building and the ecclesiastical architecture. The extent of the church's setting is largely limited to its surrounding churchyard, mature planting and later development to the edge of the churchyard to screen the surrounding landscape, resulting in an insular experience with narrow views to High Street and the tower of the Church of Our Lady of the Assumption.

Grade II Church of Our Lady of the Assumption, Northfleet, Kent (1081094)*

14.95 The Church of Our Lady of the Assumption is located approximately 500m to the east of the Kent Project Site at Northfleet. The church is significant for its architectural interest, being constructed between 1913 and 1916 to a design by Sir Giles Gilbert Scott, employing experimental use of reinforced concrete and brick. The buildings significance is vested in its built form and monumentality, being visible from a wide area.

New Tavern Fort (1013658) including Milton Chantry, Gravesend, Kent (1261173/1089047)

14.96 New Tavern Fort derives its significance from its historic, architectural and archaeological interests and its setting. New Tavern Fort is an unusually complete example of an 18th century fortification which was of strategic importance to the Thames Estuary. In the north west corner of the fort is Milton Chantry, a 14th century building representing the chapel of a medieval hospital which is well preserved and has many surviving architectural features from the 14th-19th centuries (historic and architectural interests). Archaeological remains relating to the medieval hospital and development of the fort are expected to survive below ground (archaeological interest).

Gravesend Blockhouse, Kent (1005120)

14.97 Gravesend Blockhouse derives its significance from its historic and archaeological interests and its setting. The blockhouse was built in 1539 for Henry VIII as part of a chain of coastal defences along the Thames to protect London and the dockyards at Deptford and Woolwich (historic interest). The blockhouse has been partially demolished and there remains potential for archaeological investigation to reveal more information about the structure and its use.

14.98 The asset has a relationship with the River Thames and the other coastal defences in the area; Tilbury, Higham, Milton and East Tilbury. The Gravesend Blockhouse crossed fire with the Tilbury Blockhouse and also guarded the ferry crossing between Gravesend and Tilbury. The original location of the ferry crossing is thought to have been slightly further

east of the modern ferry terminal closer to Worlds End Public House (formerly known as Ferry House) as this was a shorter crossing distance.

High Street and Queen Street Conservation Area, Gravesend, Kent

14.99 The High Street and Queen Street Conservation Area in central Gravesend derives much of its significance from its architectural and historic interests and focusses on the historic core of Gravesend. Queen Street was a back lane to the medieval high street and had a connection to the riverside via Crooked Lane. Queen Street became the market place in the 16th century and but the later 18th and 19th century town grew away from the river. Modern developments in the Conservation Area have altered its appearance but it still retains its 19th century character. The river and panoramic views across the river also contribute to its heritage significance.

Gravesend Riverside Conservation Area, Kent

14.100 The Gravesend Riverside Conservation Area derives its significance from its historical, architectural interests and from its setting. The Thames is considered to be part of the immediate setting of the Conservation Area and makes a positive contribution to its significance. Wide open spaces, panoramic views and historic uses of the river contribute positively and define the character of the Conservation Area. Principal positive views have been identified looking towards Tilbury and along the river in both directions.

Lansdowne Square Conservation Area, Gravesend, Kent

14.101 The Lansdowne Square Conservation Area, Gravesend derives much of its significance from its architectural interest and historic interest as a planned prestigious suburb of Gravesend, built by local wealthy landowner Jeremiah Roshier. The Conservation Area is significant for the group value of its component historic buildings, including the Rosherville Quay Walls, and the architectural and historic interest of those buildings as part of the Rosherville New Town planned settlement. The riverside plays a role in the layout and design of the settlement, with views across the River forming a positive element of its setting.

Grade I Church of St Mary, Stone, Dartford, Kent (1085810)

14.102 Church of St Mary is located almost 2km west of the Kent Project Site at Stone Dartford. The building comprises an historic church with a 13th century interior and later alterations. The building's significance is vested in its architectural and historic interest: primarily embodied by its 13th century interior, with internal spandrels identical in form to contemporaneous arcading in Westminster Abbey's Choir Chapel.

Greenhithe Conservation Area, Kent

14.103 Greenhithe is a residential neighbourhood set on the waterfront east of Dartford which has consistently had a historical relationship with the Thames, firstly as a shipping village, later associated with ship repair and a naval college and finally as a ferry link from both

Essex and Gravesend with connections to the Pilgrims Way. Views from in the Conservation Area towards the river are relatively restricted, resulting in quite a closed setting in terms of its relationship to the wider area. The introverted nature of the Conservation Area is a key element of its character and appearance and contributes actively to the group value and significance of its component historic buildings.

Tilbury Fort (Scheduled Monument 1021092) and Officers Barracks, Tilbury, Essex (Grade II 1375568)*

14.104 Tilbury Fort is situated on low lying ground on the north bank of the River Thames. The scheduled monument includes the buried remains of a Tudor blockhouse constructed in 1539, a large and complex fort and battery dating to the 17th century, late 19th and early 20th century alterations and a WWII pillbox. The officers' barracks comprises a terrace of 22 officers' houses dating to 1772 in the Fort's interior. The Scheduled monument is significant for its architectural, historic and archaeological interest vested in the built form of the fort and below ground remains of earlier fortifications. The Barracks building is significant for its architectural and historic interest, enhanced by its group value with the fort.

Grade II World's End Inn, Tilbury, Essex (1111632)

14.105 The World's End Inn is located on the north bank of the Thames, close to the Essex Project Site, and derives its significance from its architectural interest and its setting. The Inn was constructed in the late 17th or early 18th century as a timber framed house which was altered in the 19th century into an Inn. On early historic maps of the 18th century it is marked as 'Ferry House' at the edge of West Tilbury Marsh. The Inn is likely to have provided facilities and a stopping place for passengers using the ferry crossing. Worlds End Inn is of high value by virtue of its national listing.

Grade II Wharf Public House, Grays, Essex (1147907)

14.106 Wharf Public House lies on the Essex side of the Thames opposite the peninsula at Grays and is of high importance. It derives its significance from its historic and architectural interest with some significance derived from its setting. The Wharf was constructed as a public house in the 18th century on the banks of the River Thames. Its historic and architectural interests are derived from its age and its surviving original features.

Grade I Church of St Clement, West Thurrock, Essex (1147660)

14.107 The Church of St Clement lies upon the Essex side of the River Thames opposite the peninsula at West Thurrock and is Grade I listed and of high importance. The building's significance is vested in its architectural and historic interest, primarily embodied by its 13th century interior with 14th and 15th century alterations. Historic mapping from the 19th century shows that the Church was in an isolated position at the edge of the marshland, with the Thames beyond.

Historic landscape character

- 14.108 The Historic Landscape Characterisation baseline study covers the Kent and Essex Project Sites and a 1km Study Area surrounding it. It shows that the overriding historic character of the Kent Project Site and Study Area is one of extensive settlement with industrial and former extractive areas which, although containing nationally significant archaeological remains and historic buildings of various dates, show only partial or fragmentary historic legibility of previous characters and limited time depth.
- 14.109 The large-scale settlement, industrial and extractive areas of the landscape are generally confined to the area north of the A2(T). The active industrial landscape, as it exists today, has contracted significantly from that which existed at its peak in the mid-20th century. Present-day industry is concentrated along Manor Way on Swanscombe Peninsula and along the banks of the Thames at Northfleet and consists largely of modern shed units. Although an industrial character remains in these areas, the historic legibility of the nationally significant industrial processes and industry that thrived here are limited to scattered evidence such as the remains of tramlines and building platforms on the Swanscombe Peninsula, along with the potential for below ground remains beneath the existing industrial units and yards. The importance of the historic industries on a local level to the surrounding communities of Swanscombe, Northfleet and Gravesham and, on a national level, to the development of the important cement industry, is undoubted. However, the significance of the present-day industrial historic landscape (remembering that the historic landscape is characterised as it survives and can be recognised in the present day landscape) is considered to be Low owing to the large-scale and widespread changes that occurred in the later 20th century and the limited historic legibility which can be seen.
- 14.110 The Tilbury area is predominantly characterised by substantial residential areas, large scale dockyards and some areas of marshland. Historic mapping from the 1860s shows the area was almost entirely covered by marshland aside from a small number of scattered settlements, the railway, which included a delta junction, Tilbury and Tilbury Fort. Aside from the historic core of the settlements, these elements remain legible in the current landscape character, albeit significantly distilled.

Historic seascape character

- 14.111 The Kent Historic Landscape Characterisation (Croft *et al.* 2001) covers the marine study area. The study area has been divided into three areas to facilitate description: the Kent Project Site, the Essex Project Site and the general Thames Area.
- 14.112 The area around the existing Bell Wharf at the Kent Project Site is characterised as coastal land with mudflats and enclosed land reclaimed from tidal marsh. Previous development is also recorded, such as the Aggregates Quay in Swanscombe Marshes. There are also flood and erosion defences, sea defences, an anchorage, communication cables, a hydrocarbon pipeline, a submarine power cable, and the HS1 Channel Tunnel Rail Link.

Palaeochannels (remnants of former streams or channels) have also been recorded. Further along the coast to the north-east is an area of shingle foreshore.

14.113 At the Essex Project Site there is an existing jetty system associated with Tilbury station rail pier and Tilbury Cruise and Ro-Ro Terminal and Jetty, with Tilbury docks immediately to the west, and Tilbury Fort immediately to the east. Evidence in the wider area includes oil and gas pipelines, and a submarine power cable; there are also flood and coastal defences. There is also evidence for palaeochannels.

14.114 In the wider area of the Thames there are examples of industry, aggregates yards, jetties, wharves, piers and a freight terminal, indicating the high volume of vessels collecting materials and passengers. There are also anchorages, beacons and lighthouse, and known wreck sites, obstructions, and areas of foul ground. There has been dredging associated with navigational channel maintenance, and with berthing pockets. There is further evidence of seabed development, including pipelines and power cables. Along the mudflat shores there are sea and erosion defences. There is further evidence of palaeochannels. On the surface, in addition to vessel traffic related to industry and the commercial shipping route, there is also leisure sailing, a yacht club, and pleasure piers.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Introduction

14.115 The following section presents an assessment of the environmental effects of the construction and operation of the Proposed Development, as set out in the project description in Chapter 3 (document reference 6.1.3) of the ES.

14.116 It is likely that unknown archaeological remains will exist in the area of the Proposed Development in both the Kent and Essex Project Sites. The significance of these archaeological remains is currently unknown. A high magnitude of the effect would be caused by the construction works (particularly where these involve excavation or any earth-moving activities). As the significance of these assets is currently unknown the significance of the effect remains unknown. Proposed mitigation is set out in detail in paragraphs 14.246-265 and within the HEF (Appendix 14.9; document reference 6.2.14.9)

Direct effects during construction phase

Archaeological remains-direct effects: Kent Project Site

14.117 The construction phase of the Proposed Development has the potential to result in direct, permanent adverse impacts on archaeological remains across the Project Sites. As the DCO is being sought for development parameters under the Rochdale Envelope, details of the development proposals have not yet been finalised, as such a reasonable worst case scenario has been used for the assessment below.

14.118 The position of the Resort Access Road will be outside of the area of the Palaeolithic Sites near Baker's Hole (1003557) Scheduled Monument located to the east but within the SSSI,

which has Palaeolithic deposits of equal importance (Very High). The construction of the Resort Access Road, the construction of a retaining wall, and a 5m working area on the western side of the retaining wall would require excavation into these deposits, which could also extend in the Scheduled area. This will result in an effect of high magnitude of effect to deposits of very high importance resulting in a major adverse effect prior to mitigation.

- 14.119 As a result of statutory consultation, route options for the people mover were assessed as part of a Palaeolithic Desk-based assessment (Desk-Based Assessment and Statement of Archaeological Significance (Palaeolithic) for main access road (eastern route), and people-mover tram/cycle route options – ES Appendix 14.4; document reference 6.2.14.4) which identified the levels of harm of each option upon the scheduled monument and the SSSI. A route for the people mover was chosen which was the least harmful of the feasible options. Justification for the selection of this alignment is provided in Appendix 14.5, Technical Note 1, People Mover Route-Alignment Options Appraisal (document reference 6.2.14.5), a technical note on the route selection for the people mover, prepared by WSP, for the London Resort Proposed Development. The People Mover Route is aligned over the Palaeolithic Scheduled Monument and in the SSSI. However, it is proposed that the people mover route would be constructed on a shallow embankment utilising *Jablite* or similar polystyrene blocks across the Scheduled Monument and SSSI in order to minimise physical effects. Limited ground removal will take place for the embankment which will involve the removal of topsoil up to 300mm for the sand foundation layer and that Palaeolithic remains will be preserved *in situ* beneath the route. At present this is considered to have no physical impact to the Palaeolithic deposits as part of the Scheduled Monument but will restrict access to this part of the SSSI for future investigation. However, the lightweight construction of the polystyrene blocks mean that it will be relatively easy to move the People Mover Route foundations and realign the carriageway if required in the future.
- 14.120 The northern part of the People Mover Route over the SSSI and Scheduled Monument would require a retaining wall. The retaining wall will be placed on top of the monument, although there will be an element of ground breaking for the foundation of the wall, the detail of which is yet to be designed. Overall (i.e. to the Scheduled Monument, the SSSI and associated deposits of demonstrably equivalent importance), but taking into account this embedded mitigation the People Mover Route would result in a medium magnitude of effect to deposits of very high importance resulting in a moderate adverse effect prior to mitigation.
- 14.121 The southern extent of the People Mover Route and the proposed roundabout for the transport interchange also lie partially in the SSSI. This section of the people mover and roundabout will also adopt the same construction method using the polystyrene blocks to preserve the deposits *in situ*. This will restrict the future access to the SSSI although as described above the route will be able to be moved and the route realigned relatively easily. The People Mover Route will result in a medium magnitude of effect to deposits of very high importance resulting in a moderate adverse effect prior to mitigation.

- 14.122 The Palaeolithic Desk-Based Assessment (Appendix 14.4; document reference 6.2.14.4) identified other areas in the Kent Project Site as being of equivalent Palaeolithic potential and importance (very high) which also lie within the area for the southern part of the Resort Access Road, in particular the alterations to the eastern proposed roundabout at the A2 junction and the southern section of the access road. The construction of the new junction will result in a high magnitude of effect, which will result in a major adverse effect prior to mitigation. The section of the Resort Access Road between the new junction and the A2260 will be built on an embankment of polystyrene blocks which will only require topsoil removal to a depth of approximately 300mm. As Palaeolithic deposits are likely to be deeply buried, these deposits would be persevered *in situ* under this section of the access road.
- 14.123 Design proposals indicate that the Resort Access Road is aligned across one of the two parts of the Scheduled Monument, Neolithic Sites at Ebbsfleet (western section; NHLE 1004206). This monument is of high importance and as such embedded mitigation is currently proposed which will involve raising this section of the road over the monument on a lightweight polystyrene embankment (as described above). This will reduce physical impacts to the monument during construction. This will require topsoil stripping to lay the sand foundation of up to 300mm. Two geoarchaeological test pits were excavated either side of the monument (northern and southern sides) to evaluate the deposits in this area. Deposits of high geoarchaeological significance were discovered within the test pits including peat deposits within test pit 19 and sand and gravel deposits within test pit 20. The sands and gravels were interpreted as Late Devensian/ Early Holocene deposits. However the archaeological deposits were overlaid by made ground layers to a depth of 1.5m below ground level and 1.65m below ground level in test pit 20 (Wessex Archaeology 2020). As the People Mover Route will only require foundations of up to 30mm depth, these important deposits will be preserved *in situ* beneath the People Mover Route, resulting in no physical impact as a result of the Proposed Development.
- 14.124 The Springhead Roman Site is a Scheduled Monument (NHLE 1005140) of high importance located partially in the southern boundary of the Kent Project Site; however based on the illustrative masterplan (document reference 2.21) there will be no direct physical impacts to this monument as a result of the Proposed Development.
- 14.125 The area around Ebbsfleet International Station has previously yielded evidence of for archaeological features and it is possible that additional remains could exist along the route for the Resort Access Road, the transport interchange and proposed multi-storey car park to the east of the Station. However, survival of archaeological remains beneath the existing car park surface is currently unclear. Should associated remains exist these would be expected to be of low to medium value. The damage or removal of these deposits would result in a high magnitude of effect resulting in a moderate adverse effect, prior to mitigation.
- 14.126 The buried remains of the J.B White Portland Cement Works and the associated tramway (WA774 and WA790) are recorded as being located at Swanscombe in the proposed Leisure Core and car parking area and considered to be of medium importance. The Portland Cement Works at Swanscombe opened in the early 19th century was one of the

early producers of Portland Cement and which became known around the world. One of the early types of cement was patented at the Swanscombe cement works. Some evidence of the former tramway and possible foundation pads exist at ground level and it is suspected that only foundation courses may survive below ground (but there is some potential that other structural remains relating to processes undertaken at the site may also survive). The construction of the Leisure Core is planned to take place in the area of the cement works which is expected to result in the destruction/removal of below ground remains associated with the cement works, which would result in a moderate adverse effect prior to mitigation.

- 14.127 Craylands Lane Pit (WA775) is a former chalk quarry located to the south of London Road, which was formerly one of the quarry pits used by the Portland Cement Works and was later used for the expansion of the main processing plant, housing kilns and washmills from the end of the 19th century. Aerial photographs from 1990 show extant buildings within Craylands Lane Pit however by 1999 these had been demolished and the site cleared. Development proposals in the pit involve the construction of 500 dwellings. The likelihood that sub-surface remains of these buildings will exist within the Site is low, and these would be considered to be of low significance. Removal of potential remains of the foundations would be an effect of high magnitude resulting in a minor adverse effect prior to mitigation.
- 14.128 Within the area proposed for the Leisure Core a 19th century outfarm east of Craylands Lane is recorded (WA727). An outfarm is a separate farm or holding managed by a manager or tenant and remote from the main farm or owner's establishment. These are considered to be of low importance. The magnitude of impact is expected to be high, upon a heritage asset of low importance, resulting in a minor adverse significant effect prior to mitigation.
- 14.129 Modern remains are also recorded in the area proposed for the Leisure Core upon the peninsula, which include air raid sirens, a communications shelter, an air raid shelter and the Thames Tar distillery works. The majority of these heritage assets have been demolished and as such there is unlikely to be any below-ground survival, and these are considered to be of negligible importance. Should below-ground remains survive these would be subject to a high magnitude of effect. However, due to their negligible heritage value, the effect to heritage significance is considered to be 'not significant'. The remnant upstanding remains associated with the Thames Tar Distillery Works are considered as effects to built heritage (see paragraph 14.166 below).
- 14.130 Partial remains of a derelict 20th century sewage works lie above the north-eastern shore of the peninsula (WA940), which are considered to be of negligible heritage value. Construction activities would have a high magnitude of effect. However, due to the negligible importance of the sewage works the predicted effect to heritage significance is considered to be 'not significant'.
- 14.131 Other 19th century remains are recorded in the area proposed for the back of house area in the south-eastern part of the peninsula, such as Northfleet Papermills (WA776) and Britannia Cement Works (WA770). These are considered to be of low importance. The

construction of the Resort's back of house area would result in a high magnitude of effect to assets of low heritage significance, resulting in a minor adverse effect prior to mitigation.

14.132 A rectilinear enclosure of unknown date is recorded on the peninsula in the area for the Leisure Core. The cropmark has not been verified by any intrusive investigation and is currently of an unknown date and importance (WA1027). Should this feature exist as an archaeological feature the construction of the leisure core would have been a high magnitude of impact. However, as the importance of the asset is unknown the significance of the effect is also unknown.

14.133 Ecological mitigation measures are proposed upon the northern part of the peninsula, at Botany Marsh and Black Duck Marsh. Activities such as the creation of new wetland habitats, watercourses, bare ground scrapes and shallow pools could result in adverse effects on buried archaeological remains. As details of the depths required for the mitigation and the depth of potential archaeological remains are currently unknown, a worst case scenario has been assumed. This would result in a high magnitude of impact to buried archaeological remains, although this would be localised. As the heritage significance of the potential archaeological remains is currently unknown the significance of the effect is also unknown, but it is likely that any effects can be mitigated through the implementation of an appropriate programme of archaeological recording prior to or during excavation of scrapes and other ecological habitat creation activities.

14.134 The peninsula holds potential for geoarchaeological remains, waterlogged remains and/or other archaeological remains that are presently undiscovered, the extent and significance of which are currently unknown. These deposits/remains are predicted to be subject to a high magnitude impact as a result of the development of the Leisure Core, Water Treatment Works and more widely across the peninsula as a result of ecological mitigation works. As the importance of these remains is unknown the significance of effect also unknown. Although it is considered that the baseline established represents a proportionate evidence base to inform decision making on the outline proposals, specific impacts remain uncertain. Mitigation and further investigation consisting of completion of the geophysical survey and a borehole survey are proposed to be undertaken upon the peninsula as part of the phased approach to mitigation outlined in the HEF (Appendix 14.9; document reference 6.2.14.9) and the specific Written Scheme of Investigation (WSI) annexed to Appendix 14.9. The results of these initial phases of mitigation can inform subsequent detailed design; where possible this work will be brought forward to inform the examination of the DCO application. It is considered that the mitigation proposed in the HEF will appropriately address this issue (through preservation in-situ and/or preservation by record).

14.135 The remaining heritage assets on the peninsula lie at the edge of the Kent Project Site in the inter-tidal and marine area, so are considered as marine assets below (paragraphs 14.149-14.159).

14.136 A ditch of post-medieval date was recorded during excavations at Station Quarter South (WA653) at the Kent Project Site. It is possible that additional associated remains or a

continuation of this or similar features of a similar date and importance could be found in the area for the Resort Access Road. The continuation of similar post-medieval remains would be expected to be of low importance. The construction activity is expected to have a high magnitude of impact upon a heritage asset of low value, which would result in a minor adverse effect prior to mitigation.

14.137 A medieval ditch (WA566) was discovered at Springhead Nursery adjacent to the area for the A2(T) junction and was excavated and recorded at the time of discovery during the works for High Speed 1 (HS1). It is possible that continuation of this features or associated features could be found in the area for the A2(T) junction, which would be subject to a high magnitude of impact as a result of the development. As this heritage asset is of low importance this would result in a minor adverse effect prior to mitigation.

14.138 The Proposed Development involves changes to the approved Highways England Scheme for the A2(T) junction, as part of the Bean to Ebbsfleet Junction Works. This will involve changes to the junction itself and a connection to the Resort Access Road. The area for the proposed A2(T) junction alterations lies partially in and adjacent to the expected extent of the Springhead Roman Town and a wealth of archaeological finds, features and structures of high value have been discovered in this area which were excavated for the construction of HS1 and preserved by record. This includes Roman roads and a roadside settlement as well as a ritual site. Archaeological evaluation undertaken for the Proposed Development (see Appendix 14.8; document reference 6.2.14.8) in the area of the eastern roundabout at the junction and the southern part of the access road revealed Romano-British features including a possible walled cremation and inhumation cemetery (in addition to other burials identified in separate previous investigations undertaken for HS1 (URL 1997) and for Station Quarter South, Springhead (Wessex Archaeology 2005)), pits, postholes and a potential roadside ditch. These remains are of high significance and are known to continue in the area for the proposed A2(T) junction alterations and as such would be subject to a high magnitude of impact as a result of the construction of the alterations to the A2(T) junction. This would result in a major adverse effect prior to mitigation.

14.139 Adjacent to the exit from the proposed junction towards the A2(T) (eastbound) is a Roman temple which was previously investigated as part of the HS1 works, recorded and preserved *in situ* beneath the existing road (shown on ES Figure 14.7). The junction alterations from the approved Highways England Scheme are not anticipated to require any adjustments to the existing slip roads which serve the existing junction and as such the Roman temple will continue to be preserved *in situ* and there will be no impact to the Roman temple as a result of the Proposed Development.

14.140 To the north of Springhead Roman town the postulated route of a Roman road (WA450) extends to the north in the area for alterations to the approved Highways England A2(T) junction. Due to the association with the Roman town this is considered to be of high importance. This would be subject to a high magnitude of effect as a result of the development, which would result in a major adverse significant effect prior to mitigation.

14.141 Roman settlement at Springhead was predated by late-Iron Age activity, which is thought to have been the origins of the Roman ritual site established later. This included a

processional way, viewing platform, ritual pits and large enclosures in the area surrounding the Ebbsfleet river, which were excavated and recorded during the archaeological works associated with HS1 and were considered to be of medium value/importance. It is possible that associated remains of medium importance could continue in the area for the A2(T) junction alterations and Resort Access Road. This would be subject to a high magnitude of impact where below ground activities take place, as a result of the development resulting in a moderate adverse significant effect prior to mitigation.

14.142 A cropmark of unknown date is recorded in the area for the proposed alterations to the A2(T) junction (WA1037). The cropmark has not been verified by any intrusive investigation and is currently of an unknown date and importance. Should this feature exist as an archaeological feature the magnitude of impact from construction would be high. However, as the importance of the asset is currently unknown the significance of the effect is also unknown.

14.143 Three Tramway Tunnels are located in the Kent Project Site (WA917, WA918, WA919) which extend beneath London Road in the northern part of the Kent Project Site, considered to be of low importance. To the south of London Road the current proposals are for housing in this area. Tramway Tunnels WA917 and WA918 will remain unaffected by the Proposed Development. Tunnel WA919 will be used as part of the Proposed Development to connect the staff accommodation to the resort and is proposed to be widened to allow vehicles to circulate in both directions and have pedestrians and cycle paths on either side. This will result in a physical impact to the tunnel which would be of high magnitude upon an asset of low importance. This would result in a minor adverse effect prior to mitigation.

14.144 Springhead is considered to be the birthplace of the cultivated watercress industry which later developed into a tourist attraction (WA786). Remains associated with watercress production were discovered as part of the HS1 works and are considered to be of medium importance. Below ground activities as a result the proposed development would result in a high magnitude of impact upon a receptor of medium importance resulting in a moderate adverse effect prior to mitigation.

14.145 As the locations and form of off-site habitat creation is currently unknown, the significance of any archaeological remains that may be impacted is currently unknown. Any impacts will be mitigated by the implementation of an appropriate programme of archaeological work in accordance with the methods etc. detailed in the HEF (Appendix 14.9; document reference 6.2.14.9) to be agreed with the consultees, dependant on the nature of the impacts at each location.

Archaeological remains-direct effects: Essex Project Site

14.146 The Essex Project Site holds potential for geoarchaeological deposits to exist beneath the area for the proposed multi storey car park. These remains are of unknown importance

as this has not yet been investigated or verified by any intrusive investigation. The magnitude of the effect is dependent upon the depth of deposits and the depth of the proposals in this area, which are both currently unknown, although the Development Proposals allow for a basement level. As a worst case scenario (allowing for excavation for a basement level) a high magnitude of impact is assumed but as the significance and presence of the deposits is unknown the significance of effect is also unknown.

14.147 Post-medieval records including earthworks of linear features and the site of former buildings are recorded for the Essex Project Site (WA1086 and WA1088). These are within the area that will be used for a surface level car park. As this part of the Essex Project Site is already used for car storage the development proposals are not expected to involve below ground activities in this area.

14.148 The Asda roundabout that forms a discrete northern section of the Essex Project Site may require minor improvement to support the Proposed Development. This could involve some below ground works of unknown nature and depth. The significance of the potential archaeological resource in this area is also unknown. As such the significance of the effect remains unknown.

Marine heritage - direct effects

14.149 The site preparation and main construction phases on both sides of the Thames have the potential to result in direct, permanent adverse impacts on marine archaeological remains in the footprint of these works. This assessment has been based on the Outline Construction Method Statement (document reference 6.2.3.1). Significant effects (that is moderate adverse or above) to heritage assets within the Marine and Inter-tidal zone have been identified for six heritage assets based on their heritage value and the magnitude of the impact. For the heritage assets listed below a moderate adverse effect prior to mitigation has been identified. These assets these comprise;

- A well preserved wooden stake and brushwood trackway on the foreshore close to broadness Creek (WA162);
- Possible wooden vessel, Swanscombe marshes (WA648);
- Abandoned wooden vessel in saltmarsh at Broadness Creek (WA934);
- An unknown wreck (WA2005);
- An unknown wreck (WA2006); and
- Potential Palaeographic receptors, should such deposits exist within the Project Site.

14.150 For all other assets identified within the marine and intertidal zone a minor adverse prior to mitigation or a 'not significant' effect has been identified. A summary of the impact to

each heritage asset is presented within Appendix 14.10 *Summary of Impacts, Mitigation and Residual Effects* (document reference 6.2.14.10).

Site preparation phase

14.151 The site preparation phase will require marine works, as the construction and/or upgrade of facilities both on the Swanscombe Peninsula and at the Port of Tilbury will support the movement of construction materials and construction waste.

14.152 At the Kent Project Site, three proposed design options are still being progressed in addition to the refurbishment of Bell Wharf and the construction of a new floating pontoon, through discussions with the PLA and MMO. These comprise of the refurbishment of Bell Wharf, construction of a ferry pontoon with linkspan and either:

- Option A construction of a new floating roll-on/roll-off platform and linkspan;
- Option B refurbishment/replacement of the existing White's Jetty (currently in an uncertain state of repair);
- Option C dredging to deepen access to Bell Wharf.

14.153 Options A and B could require piles driven or bored using an anchored or 'spud' barge, and/or use of anchors or spud legs for additional marine infrastructure emplacement (such as for a crane barge to place the linkspan). There is potential for effects on known archaeological assets, such as an unknown foul ground (WA2008) of low archaeological sensitivity, as well as potential buried archaeological assets of unknown value. This could result in an effect of high magnitude resulting in a minor adverse effect for the foul ground prior to mitigation and an unknown effect for potential remains of unknown value.

14.154 Open piled structures might require new casting, and this would need to be undertaken in the dry, so the structures and their immediate environment would need to be dewatered. This could be undertaken through temporary sheet piling or the installation of a bund with a diaphragm wall. The sheet piling or installation of a bund could impact potential archaeological assets of unknown sensitivity. This could result in an effect of high magnitude, however due to the unknown value of potential assets the significance of effect remains unknown. In addition, depending on the size of the area dewatered, presently stable, buried, wet archaeological features could dry out, leading to degradation and damage, which could also have a high magnitude of effect on remains of unknown value prior to mitigation.

14.155 For Option C, the type of dredging works could be undertaken by floating vessels, either anchored barges with mounted excavators or by specialised dredging vessels, or by dewatering the area through use of a bund or sheet piling, and excavation undertaken using standard land-based equipment. The dredging, sheet piling and dewatering could lead to direct negative impacts. Dredging could impact known areas of foul ground (WA2010 and WA2011), but more importantly dredging and sheet piling could impact previously unknown assets of unknown value. This would result in an effect of high

magnitude upon assets of unknown value, as such the significance of the effect is unknown. The foul ground is of low value and subject to a high magnitude of effect resulting in a minor adverse effect prior to mitigation.

14.156 At the Port of Tilbury, an extension to the ferry pontoon with a linkspan has been proposed. For the construction of floating pontoons, piles will be driven or bored using an anchored or 'spud' barge. The installation of the linkspan could be done from shore or by a vessel, and if by vessel it would require anchors or spud legs. There is potential for direct impacts from the piles, anchors or spud legs. There are no known marine heritage assets in the immediate vicinity of the proposed piling and the existing records are both 'dead' indicating material has not been seen on the seabed. Additionally, there is already a marine structure in the area (that is, the existing pier). However, there could be potential for impact to unknown, buried archaeological assets in locations that have not been affected by previous structures. This could result in an effect of high magnitude to deposits of unknown importance, as such the significance of the effect remains unknown.

14.157 In addition, the Essex Project Site holds potential for geoarchaeological deposits to exist beneath the seabed. Previous geoarchaeological assessments undertaken as part of other developments in the wider area have indicated the presence of peat in the terrestrial and intertidal zones, and if they continue into the marine zone, as these could date from the Mesolithic to the Iron Age, they are likely to be of high significance. As a worst-case scenario, a high magnitude of effect is assumed resulting in a major adverse effect prior to mitigation.

Main construction phase

14.158 During the main construction phase, other works will be undertaken. These include enhanced flood defences and drainage works around the coast of the Kent Project Site. These works have the potential to impact undesignated intertidal sites.

14.159 Intertidal sites identified through the Historic Environment Records, including derelict vessels and a prehistoric trackway, are considered to be of Medium to Low importance. Any impact to these would be permanent and non-reversible, and therefore it would be of medium to high magnitude, leading to minor to moderate significance of effect prior to mitigation.

14.160 Temporary navigational aids may need to be installed during construction works, and if they include anchors or other infrastructure on the seabed, they could impact known or potential archaeological sites. Assuming a worst-case scenario, the impact would be of high magnitude, upon assets of unknown value and as such the significance of the effect is unknown.

Built heritage-direct effects

14.161 The Grade II* Riverside Station and Landing Stage at the Essex Project Site are described in paragraph 14.64 above. The Proposed Development offers the opportunity to re-use and ensure the long term use and upkeep of this heritage asset of high importance. The

proposals are to refurbish and restore the Riverside Station building, reusing the building as a point of arrival and departure, fitting with its historic function. The scheme will likely repair the, at present, dilapidated structure at the eastern end of the station restoring its missing roof covering and glazing. The magnitude of impact would be minor beneficial on an asset of high importance resulting in a minor beneficial significance of effect.

14.162 Two built heritage assets lie along London Road in the Kent Project Site and have been considered here as part of the direct effects of the Proposed Development, predominantly associated with the Leisure Core. The milestone beside London Road (WA674) is to be retained as part of the development proposals and as such no effects will occur as a result of the development. A George V pillar box on London Road is of negligible heritage importance. This would also be unaffected by the development proposals.

14.163 The historic dwelling identified on London Road, opposite High Street dates to the later 19th century and may have been associated with the Portland Cement Works. The dwelling is considered to be of low importance (ES Figure 14.12), and has limited value in terms of its architectural or historic interest. The building is proposed for demolition as part of the development proposals to make way for the Visitor Centre which will be an effect of high magnitude on an asset of low importance. This will result in a minor adverse significance of effect prior to mitigation.

14.164 Two remnant buildings are extant in the former Portland Cement Works, and these are thought to comprise a warehouse and substation (ES Figure 14.12). The loss through demolition of the remainder of the works in the 1990s has significantly diminished the heritage interest in these structures and as such are considered to have low heritage importance. These structures are proposed for demolition as part of the development proposals which will be an effect of high magnitude to heritage assets of low importance. This will result in a minor adverse significance of effect prior to mitigation.

14.165 Remnant buildings associated with the former British Vegetable Parchment Mills located to the south of Manor Way on the Swanscombe peninsula have low heritage importance (ES Figure 14.12). These buildings are proposed for demolition as part of the development proposals which would be an effect of high magnitude upon an asset of low importance, resulting in a minor adverse significance of effect.

14.166 Remnant buildings associated with the former Thames Tar Distillery (WA970) have low heritage importance. These buildings are proposed for demolition as part of the development proposals which would comprise an effect of high magnitude upon an asset of low importance, resulting in a minor adverse significance of effect.

14.167 It is proposed that White's Jetty and Bell Wharf (WA741 & WA947) on the western side of Swanscombe peninsula will be repaired, restored and put to new use as part of the development proposals. This is considered to be a low beneficial impact affecting assets of low to moderate importance, which would be minor beneficial overall.

14.168 Two anti-vehicle bomb obstacles are recorded in the Kent HER as located at Ebbsfleet International Station (WA890 & WA964). These are recent in date (contemporary with the

HS1 rail -link the creation of the station). It is anticipated that the obstacles at WA964 may have to be removed or relocated to facilitate the transport interchange. This would constitute a high magnitude of impact upon an asset of negligible value resulting in a 'not significant' effect in EIA terms. The obstacles at WA890 are to be retained and will be unaffected.

14.169 The transmission tower (WA938) is to be retained and does not form part of the development proposals. As such there would be no direct effects to this heritage asset of high significance.

Indirect effects during construction phase

14.170 Indirect effects during the construction phase could arise from activities involving the presence of cranes, flashing lights on moving vehicles, construction traffic, and noise and dust created by construction activities. These would be localised, short term, temporary effects to the appreciation of the setting of heritage assets that would be fully reversible and are not considered to harm the significance of designated or undesignated assets. The full assessment of indirect effects is provided in relation to the operational development (paragraphs 14.188-14.245), as this is where the maximum effects are predicted.

14.171 The assets included below are those that derive some of their significance from associated deposits/assets that would be subject to physical effects during the construction phase, which could indirectly affect the significance of those heritage assets. An assessment is made of the effect of the loss of these associated deposits/assets on the significance of the designated heritage assets through change to setting.

Archaeological remains - indirect effects

Springhead Roman Site (1005140) and Roman Enclosure SE of Vagniacis (1004226)

14.172 The scheduled remains of the Springhead Roman Site are located to the south of the A2(T) and the Roman walled cemetery lies to the south-east of the Site. These monuments derive their significance from their archaeological interest. Excavations in the mid-20th century identified structures relating to both the domestic occupation of the town (shops, bakery, a road surface) and evidence relating to its religious focus (temples). The initial excavations were undertaken on the southern side of the A2(T) and as such the scheduled area just covers this part of the Roman town. During excavations for HS1 extensive remains relating to the Roman town and religious centre were discovered outside of the scheduled area of equivalent significance. The monument is not considered to have any architectural/artistic or historic interest.

14.173 The monuments derive a very small part of their significance from their setting. Their setting is comprised of its position in the landscape and extensive surviving associated

remains that have been discovered from outside of the scheduled areas. The route of the Roman road is reflected through the route of the modern A2(T) and whilst the course of the River Ebbsfleet has been modified since the Roman times the remainder of the river is still present in the landscape. The presence of the additional remains associated with the town and of a contrasting rural Roman villa to the north help to build a picture of the scheduled monument in its contemporary landscape, and it is the archaeological context of its setting which makes a contribution to significance.

14.174 The alterations to the approved Highways England junction arrangement of the A2(T) junction and the Resort access road in the setting of the monuments will result in a very minor change in the setting of the monument as there is an existing junction at this location. As the monuments derive their significance primarily from their archaeological interest and not from setting, this is considered to have a negligible magnitude of impact to the significance of the assets and is considered to be 'not significant' in EIA terms.

Aspdin's Kiln (1004227)

14.175 Aspdin's Kiln is located at Northfleet and derives most of its significance from its inherent architectural, historic and archaeological interest. The monument's historic interest stems from being the oldest Portland cement kiln in the world. The kiln is a well preserved example of an Aspdin Kiln, illustrative of a particular early form of Portland cement production. The structure's archaeological interest relates to its potential for below-ground remains relating to its construction and deposits of material it produced.

14.176 The Kent Project Site contains some areas of former quarries and is also the site of the Portland Cement Works, which has some surface expression through foundation pads, structures and tramlines embedded in hardstanding and two remaining upstanding structures. It is anticipated that the physical impacts during the construction phase to the Portland Cement Works at Swanscombe will not result in any meaningful impact to the significance of Aspdin's Kiln, this would be considered to be 'not significant' in EIA terms.

Palaeolithic Sites near Baker's Hole (1003557)

14.177 As described above, the monument derives a small part of its significance from its setting, as it does have some connection to the surrounding landscape to sites of other similar preserved deposits. The Proposed Development is expected to result in the preservation of the deposits in the Scheduled Monument but will result in the destruction of some of the deposits in the SSSI and the associated deposits of similar value which lie in the surrounding area. It is the archaeological context of its setting that contributes to its significance and as this relates to deposits that are buried its setting cannot be appreciated or experienced on the ground. The loss of similar associated deposits is expected to have a negligible effect to significance through change in setting, and this would be considered to be 'not significant' in EIA terms.

Marine heritage - indirect physical effects

14.178 There is potential for indirect physical effects on marine archaeological sites due to changes to erosion and siltation regimes, for example if there is increased scour adjacent to proposed jetty piles or on the edges of proposed dredging, or due to wash from construction and transport vessels. Increased erosion could result in exposing currently buried features, and their resulting damage or destruction, whereas increased siltation could lead to their protection. The areas proposed for new or refurbished pilings are relatively small and adjacent to areas where there are already existing standing features associated with jetties, and therefore the effects are likely to be minor, however this should be reviewed prior to construction.

Historic seascape character

14.179 The Historic Seascape Character assessment indicates an area of industrial, commercial and leisure use, with jetties, piers and other transport infrastructure already present. Therefore, the development of a new floating jetty or repair or replacement of White's Jetty will have a negligible impact upon historic seascape character. Additionally, there is already considerable vessel traffic on this section of the Thames, for a wide variety of purposes, and construction traffic will have a short term temporary increase in numbers of vessels/movements. There is no change in the character of the historic seascape (a busy riverside) from this activity.

Direct effects during operational phase

Archaeological remains - direct effects

14.180 It is not anticipated that the operational phase will have any direct physical impacts on any of the Scheduled Monuments or undesignated archaeological remains in the Project Sites. The effects on archaeological sites identified as sensitive receptors during the construction phase will have been mitigated prior to and during that phase and no further impacts during the operational phase are envisaged.

Marine heritage - direct effects

14.181 Impacts during the operation of the Proposed Development could include maintenance work on jetties. If these are in areas of previous impact, any impact will be of negligible magnitude. In addition, impacts to archaeological sites identified as sensitive receptors during the construction phase will have been mitigated prior to and during that phase, and mitigation for those impacts as set out in the HEF (Appendix 14.9; document reference 6.2.14.9) and agreed in the form of WSI would remain in place. Any impact to potential buried archaeological assets of unknown significance, could result in an effect of high magnitude however the significance of the effect would remain unknown.

Built heritage- direct effects

14.182 It is not anticipated that the operational phase will have any direct physical impacts on any of the identified built heritage assets.

Indirect effects during operational phase

Archaeological remains-indirect effects

14.183 During the operational phase it is possible that effects to heritage significance could arise through change to the setting of designated archaeological assets, leading to a reduction in the contribution made by that setting to the assets' heritage significance. These effects have the potential to occur through the permanent presence of the Leisure Core, landscaping planting, car parks, the Resort Access Road, Related Housing, Back of House Area and the changes to the A2(T) junction. Additional effects could occur through changes to lighting, maintenance, traffic and noise associated with the operation of the Resort. Chapter 15 of the ES provides details on the Noise and Vibration effects of the development (document reference 6.1.15), the Lighting Statement (document reference 7.10) provides details of the proposed lighting and Chapters 9 and 10 provide an assessment of the Land Transport (document reference 6.1.9) and River Transport (document reference 6.1.10).

Palaeolithic Sites near Baker's Hole (1003557)

14.184 The setting of the monument is comprised of its immediate surroundings and its relationship with other similar surviving deposits in the SSSI and the immediate area beyond. The monument derives a minimal amount of significance from this setting, although it does have some connection to the surrounding landscape and sites of other similar preserved deposits (albeit this is no longer perceivable in the current environment). The contribution that the setting makes to the significance of the monument is not considered to be reduced by additional noise or lighting as a result of the Leisure Core located to the north, the adjacent people mover and Resort Access Road or the A2(T) junction alterations to the south. Consequently, there is not expected to be an effect to heritage significance and the way that significance is appreciated, through change to setting. This effect would be 'not significant' in EIA terms.

Springhead Roman Site (1005140) and Roman Enclosure SE of Vagniacis (1004226)

14.185 As mentioned above (paragraph 14.173) the monuments derive a small part of their significance from their setting. Their setting is comprised of their position in the landscape and extensive surviving associated remains that have been discovered from outside of the scheduled areas. The presence of the additional remains associated with the town and a contrasting rural Roman villa to the north, help to build a picture of the scheduled monument in its contemporary landscape and it is the archaeological context of its setting that makes a contribution to significance. The modern A2(T) passes through the centre of the Roman town and has severed any physical connection. The existing A2(T) junction also sits where previous archaeological remains relating to the Roman town were found.

14.186 It is the archaeological context of the surrounding landscape which contributes to the setting of the asset. The physical surroundings of the monuments are not considered to contribute to the setting of the monuments. These monuments derive their significance from their archaeological interest and a small part of its significance from setting. The Proposed Development would involve the construction of the Resort Access Road and minor alterations to the approved A2(T) junction in the setting of the monument. However, the introduction of new highway infrastructure in the setting of the monument is not expected to reduce the very limited contribution made by that setting to the heritage significance of the monument, and the interests which comprise that significance would be unaffected. The asset is of high value and the predicted magnitude of impact is expected to be negligible. This assessment concludes that the effect to heritage significance is 'not significant' in EIA terms.

Marine archaeological remains - indirect physical effects

14.187 There is potential for indirect physical effects on marine archaeological features during the operational phase, for example relating to changes to erosion and sedimentation regimes. These may relate to scour around marine infrastructure, such as the proposed pontoons or bell wharf, or from wash from vessel traffic. Increased erosion could result in exposing currently buried features, and their resulting damage or destruction, whereas increased siltation could lead to their protection. Potential marine assets on or under the seabed are of unknown sensitivity, and any impacts could result in an effect of high magnitude. As the value of the asset is unknown the significance of the effect is unknown.

Built heritage - indirect effects

14.188 Indirect effects to built heritage during the operational phase of the Proposed Development may arise through the permanent and continual presence of new buildings in the setting of built heritage assets. Other effects during the operational phase could arise from an increase in noise and lighting in the surroundings of heritage assets. The effects of the development as a result of noise and vibration are presented within Chapter 15 (document reference 6.1.15) and lighting for the Proposed Development is presented within the Lighting Statement (document reference 7.10).

14.189 All of the assets that were subject to detailed assessment in the Built Heritage Statement (Appendix 14.2; document reference 6.2.14.2) are set out in Table 14.12 above and a wider scoping exercise is detailed in the Built Heritage Statement. Key assets that were considered likely to experience significant effects upon their heritage significance as a result of the Proposed Development or which were otherwise considered particularly sensitive and have been specifically requested by the statutory consultees for inclusion in the assessment are included below. Designated Heritage Assets within the 1km and wider 5km areas are shown on Figures 14.1-14.3.

Tilbury Fort (1021092) and Officers Barracks (1375568)

14.190 Tilbury Fort is situated on low lying ground on the north bank of the River Thames. The Scheduled Monument is significant for its architectural, historic and archaeological

interest vested in the built form of the fort and below ground remains of earlier fortifications. The Barracks building is significant for its architectural and historic interest, enhanced by its group value with the fort.

14.191 The setting of the monument comprises its immediate surroundings as well as its visual relationship with the river and surrounding associated fortifications. The setting of the monument makes an important contribution to the significance of the asset. Its setting comprises the River Thames and the bordering historic grazing marshes, but these include all the riverside development along both sides of the Thames, and visible in the hinterland on either side of the river. The monument has important views to Gravesend, to Kent and east and west along the river and forms a defensive triangle with New Tavern Fort and Shornmead Fort, both located at Gravesend. The line of sight between these assets makes an important contribution to the fort's significance, and is a key to understanding its function and location. Another important connection is with Coalhouse Fort located 5km to the east of Tilbury Fort on the Essex side of the River, as part of the wider defences along the Thames. During the use of the fort it was a requirement that land between Tilbury and Coalhouse fort was kept free of vegetation.

14.192 The proposed multi-storey car park on the Essex Project Site will be introduced 400m from the Fort. The Fort's westward outlook, looking towards the Essex Project Site, is largely unsympathetic, being dominated by modern offices and a large modern warehouse and makes no contribution to the Fort's significance. The Proposed Development, in particular the proposed car park building, would be largely concealed by the existing office and warehouse buildings to the west of the Fort, thus constituting only a minor change in its current setting (which makes no contribution to the Fort's significance as noted above). The proposed extension to the landing stage is also unlikely to be particularly prominent in views and even so will have no effect on the interests that contribute to the heritage significance of the Fort. The Proposed Development will result in only a very limited change in setting for the Fort and the Officers' Block, and would not adversely affect the heritage significance of either asset, nor the ability to understand or appreciate that significance, this would be 'not significant' in EIA terms.

14.193 Whilst the riverside setting of the monument is considered to make an important contribution to the significance of the asset the Essex Project Site is not currently considered to make a positive contribution to its setting and does not impair the ability to understand the defensive value of the fort in its riverside location. A negligible magnitude of effect has been identified to a heritage asset of high significance resulting in an effect assessed as 'not significant'.

New Tavern Fort (1013658) including Milton Chantry (1261173/1089047)

14.194 Positive elements of the New Tavern Fort's setting are primarily confined to the extent of its fortifications and its outlook over the River Thames towards Tilbury Fort, with which it forms a grouping. Later development has encroached on New Tavern Fort and generally does not contribute to its significance, though nor is it necessarily detrimental. The Fort lies in an area of parkland known as Fort Gardens. The Project Site is only visible from the

north-easternmost edge of the defensive fortifications and has no bearing on the significance of New Tavern Fort as part of its setting.

14.195 The main purpose of the New Tavern Fort was to provide a strategic view and defensive position on the southern side of the Thames opposite Tilbury Fort, to be able to provide cross fire with Tilbury Fort during a time of threat from French invasion. Views across the River to Tilbury Fort and in both directions up and down the river are an important aspect of the significance of the monument and it is possible to view a large expanse of the Thames from New Tavern Fort, allowing its significance to be appreciated and understood. Development in the Essex Project Site will result in the construction of multi-storey building in the peripheral view looking towards Tilbury Fort, and is not considered to interrupt or affect the appreciation of the view between Tilbury Fort and New Tavern Fort, as they are directly opposite. The building will be introduced into the view looking west along the river. However, this view already features an industrial building to the east of the Essex Project Site and the industrial buildings located at Tilbury Docks. As such the assessment of the introduction of the new car parking structure in this view is expected to have an effect of negligible magnitude upon the overall significance of New Tavern Fort. This effect would be 'not significant' in EIA terms.

14.196 Milton Chantry is Grade II* listed building inside New Tavern Fort, representing the chapel of a medieval hospital. The chantry is significant as a rare survival with a well-documented history and potential for below ground archaeological remains. The setting of the Chantry is largely defined by the grounds of the fort. The Project Site does not contribute to its significance as part of its setting and as such no effect is predicted to the significance of the asset which is considered 'not significant' in EIA terms.

14.197 The lighting strategy (document reference 7.10) has been designed to combine the illumination of the public space of the resort with the sensitivities of the natural environment which will surround it. Light levels will taper to lower levels of illumination immediately surrounding the perimeter of the Principle Development to provide a transition into areas of the natural environment. Due to the distance from the core of the Resort, there are not expected to be any operational effects associated with lighting during the operational phase upon the heritage significance of New Tavern Fort or Milton Chantry.

Gravesend Blockhouse (1005120)

14.198 The Blockhouse's setting is defined by its riverside location, set in a later urban streetscape. While the riverside location and views across the river contribute to the monument's significance and an understating of its historic function, its modern urban setting has no bearing on an understating of its schedulable interests.

14.199 The construction of the car park building at the Essex Project Site will introduce an additional structure in the peripheral view looking west from Gravesend Blockhouse along the river. The proposed car park would not restrict the more important view towards Tilbury blockhouse or the river and the Essex Project Site makes no contribution to the significance of the Blockhouse as part of its setting. It will introduce a new building into

this view. However, as noted there already exists large industrial buildings in this view associated with Tilbury Docks and large building located adjacent to the Essex Project Site. The Proposed Development has no bearing on any of the Blockhouse's special interests and as such the assessment expects this to have a negligible magnitude of effect to the significance of the asset overall, and the significance of any impact is assessed as 'not significant' in EIA terms.

Grade II listed Boundary Stone, Ingress Park, Lovers Lane (1410237)

14.200 The Boundary Stone is located just in the western boundary of the Kent Project Site on the peninsula and a description of the asset is provided in paragraph 14.64. The boundary stone is of high importance by virtue of its national listing. The boundary stone derives the majority of its significance from its historic interest as a marker of the Ingress Estate in 1830 when substantial works were taking place to the estate. The structure is of limited architectural interest - it is the group value of the collection of landscape features in the former parkland which is of most significance, and the spatial and visual relationship between them (where such still remains). Its survival as the only remaining of three boundary stones also contributes to its significance.

14.201 The boundary stone derives very little of its significance from its setting. Formerly its setting would have made a much greater contribution due to its relationship with the other structures and gardens of Ingress Abbey. However, recent development has diminished its former setting and severed this connection through the introduction of a modern residential estate over what would have been the Ingress Abbey Gardens. This former connection is no longer perceptible on the ground. The Project Site does not contribute to the significance of the asset or the ability to appreciate or understand that significance. Consequently the Proposed Development is expected to have a negligible magnitude of effect upon a heritage asset of high value. This assessment concludes that the effect upon heritage significance is considered to be 'not significant' in EIA terms.

14.202 The additional lighting and noise as a result of the Leisure Core is predicted to have a negligible magnitude of effect to heritage significance which is 'not significant' in EIA terms, as the boundary stone derives very little of its significance from its setting.

Grade II listed Garden Bridge (1410227)

14.203 The Garden Bridge derives very little of its significance from its modern setting. Formerly its setting would have made a greater contribution to significance, due to its relationship with the other structures and gardens however this former setting has been destroyed by the recent modern development on the Ingress Abbey Estate. The former relationships between Ingress Abbey and its associated landscape and garden features are no longer appreciable on the ground. The Project Site does not contribute to the significance of the asset as part of its setting and as such the introduction of the Proposed Development and any associated lighting or noise is not expected to harm the significance of the asset or the ability to appreciate or understand that significance. This will have a negligible magnitude of effect to a heritage asset of high value, which is 'not significant' in EIA terms.

Swanscombe Cutting Footbridge Crossing A2(T) East of A296 (1119762)

14.204 The Swanscombe Cutting Footbridge derives its significance predominantly from its architectural interest as a footbridge constructed from concrete in the 1960s with a post-tensioned arch. This was the first of several similar bridges built in Kent and is recognised for its elegant arched design. The setting of the bridge is comprised of the road that it spans and the areas that it connects on either side and this makes a minor contribution to its significance as the reason for its purpose and function. The western arm of the Kent Project Site which covers the A2(T) and the footbridge is in the setting of the footbridge. There are not anticipated to be any works to the A2(T) in the western arm of the Kent Project Site. As such the bridge will be retained in an appropriate setting and its significance as an exemplar of concrete architecture will not be affected. The proposals do not change the setting of the asset as it is retained in its urban, roadside environment in which its form and function are readily appreciable, so no potential effect upon heritage significance is assessed.

Grade II listed Church of All Saints (1085781)*

14.205 The Grade II* listed church of All Saints is located at the junction of London Road and High Street and was built in 1894 as the parish church for Swanscombe and is of high importance by virtue of its national listing. The church derives most of its significance from its historic and architectural interest but has been converted into residential units and as such some of its historic and architectural interest has diminished internally.

14.206 Setting makes little contribution to the significance of the church, which is encroached upon by 20th century development to the south, with an outlook to the busy London Road. Views over the peninsula are partly restricted at ground level. Where these views exist they overlook an evolved landscape until recently dominated by the industrial developments of the last 200 years. The prominent hilltop location of the church has some importance and relates to its intended design.

14.207 The Proposed Development will include the construction of 500 dwellings located in Craylands Lane pit to the west, the construction of a visitor centre to the north-west and the construction of the London Resort Academy for staff training to the west, and Sports Ground back of house area to the east, associated principally with provision of electricity and energy for the Resort. Much of the height of the residential blocks will sit within the former quarry and will be only partially visible from London Road. Much of the development for the Sports Ground back of house in the quarry pit to the east is expected to sit in the quarry. These developments would present a marked change in the setting of the church. However, as the majority of the Project Site as existing does not contribute to the church's listable interests (its architectural and historic interests, which are vested in its built form and associations with the former cement works), these activities are expected to have a low adverse effect on an asset of high significance, resulting in a minor adverse effect, which is 'not significant' in EIA terms.

14.208 The Leisure Core will be on lower ground to the north of the church. As mentioned above the loss of the cement works and the cessation of cement production has diminished the contribution that this part of the Project Site makes to the setting of the asset.

14.209 The Lighting Statement (document reference 7.10) details that the Leisure Core would be lit at night and Chapter 15 (document reference 6.1.15) details that there will be new sources of noise such as additional traffic and ride/guest noise in the setting of the church in the absence of mitigation. Whilst the church already sits in an urban environment the introduction of additional lighting and noise from the associated development will result in a slight change to setting, however this is not expected to affect the heritage significance of the asset (given the existing conditions). The assessment predicts that this will result in a negligible magnitude of effect, to an asset of high importance, resulting in a 'not significant' effect.

Grade II no. 1 Knockhall Road (1101524)

14.210 1 Knockhall Road is a mid-19th century lodge at the junction of Knockhall Road and London Road in Swanscombe.

14.211 The setting of the asset has changed over time. Formerly its setting would have comprised the land and gardens of the main estate. However, its setting has been diminished through the loss of its associated house and grounds and the lodge is now isolated in terms of its location, design and former associations.

14.212 The Project Site makes no contribution to the significance of the Listed Building as part of its setting. Views to and from the Listed Building are screened by mature vegetation and intervening built form as well as the natural variation in topography between the Listed Building and the Project Site. In addition, there are no meaningful historic functional associations between the building and the Project Site. The lighting strategy has been designed to provide light to the Resort Core which will taper to lower levels of illumination towards the natural environment which will surround it. Due to the lack of intervisibility between 1 Knockhall Road and the Resort Core, no effects from additional lighting are anticipated. Similarly, the noise assessment (document reference 6.1.15) has established that the higher noise levels will be confined to the Resort Core and is not expected to affect the heritage significance of 1 Knockhall Road.

14.213 The Proposed Development is not expected to cause any reduction in the contribution of setting to significance of the asset or the way in which the asset is appreciated and understood. As such a negligible magnitude of effect is expected, which would result in a 'not significant' in EIA terms.

Grade II Ingress Abbey (1101524)

14.214 Ingress Abbey is located to the west of the Swanscombe Peninsula and is of high importance.

14.215 The former parkland setting of the Ingress Abbey has been lost through the redevelopment of its associated grounds. This was formerly a designed and landscaped garden with follies, bridges, mound, walkways, tunnels, and a well. Some of these features survive and are listed in their own right, although the area of the former gardens has been redeveloped as a residential estate and the relationship between the assets is no longer perceptible on the ground. As such the contribution that the setting makes to the significance of the asset has been very much reduced.

14.216 The Proposed Development will result in a change in the wider landscape surrounding Ingress Abbey (including the presence of the Resort within the landscape, additional lighting and noise) but the Project Site is not considered to contribute to the significance of the asset. This is not expected to harm the appreciation or understanding of the significance of the asset and as such a negligible magnitude of effect to heritage significance is expected, which would result in a 'not significant' effect in EIA terms.

Transmission Tower, Swanscombe Marshes (WA938)

14.217 The electricity transmission tower on Swanscombe Marshes is an undesignated industrial heritage asset, considered to be of medium importance and would be retained as part of the development proposals. The Transmission Tower derives its significance from its historic value and from its setting. The tower is a local landmark at 193m tall and links with another on the northern bank of the river. These are reportedly the tallest electricity pylons in the UK.

14.218 The setting of the asset comprises its relationship with the river that it spans, the opposing pylon and the wider electricity generation and transmission infrastructure that it connects to. The introduction of the Proposed Development is not considered to harm the setting of the asset in these terms. Whilst the Proposed Development will introduce tall structures in the setting of the asset, at the tallest this is expected to be 128m so will not compete in height with the 193m tall tower. Effects to the significance of the asset are expected to be a negligible magnitude of effect resulting in a 'not significant' effect in EIA terms. As this is an industrial heritage asset the lighting and noise associated with the Proposed Development are not expected to affect the heritage significance of the asset.

Grade I Church of St Botolph (1054093)

14.219 The Church of St Botolph is located at Vicarage Drive, Northfleet and derives much of its significance from its historic, archaeological, architectural interests and its setting.

14.220 The Kent Project Site is well removed from the Church and has no intervisibility or meaningful historic functional associations with it. Consequently, the Kent Project Site makes no contribution to the significance of the church as part of its setting. Whilst the development at the transport interchange and the Resort Access Road will be in the wider surroundings of the St Botolph's Church, this will be located almost 1km from the church. As such there is considered to be a negligible magnitude of effect, which would result in a 'not significant' effect in EIA terms.

14.221 Other taller elements of the Proposed Development such as the hotels and attractions will be located on the peninsula and are beyond the setting of the Church. As such no effect to significance is expected as a result of this. Due to the distance of almost 1km between the resort road and St Botolph's church there is not expected to be any additional effects relating to noise or lighting during the operational phase.

Grade I Parish Church of St Peter and St Paul, Swanscombe (1085788)

14.222 The Grade I listed Parish Church of St Peter and St Paul is located on Swanscombe Street in Swanscombe.

14.223 The church derives significance from its churchyard and associated cemetery to the north. Otherwise the church's setting is one defined by modern suburban residences of limited interest and does not contribute to significance. No part of the Kent Project Site is visible or otherwise experienced from the church and there are no meaningful historic associations between the Kent Project Site and the Church; the Kent Project Site makes no contribution to the church's significance. The introduction of the Resort Access Road and the transport interchange hub in the wider surroundings of the church is not considered to result in an effect to the significance of the asset, as such no effect is anticipated.

Grade II Riverside Station and Landing Stage (1111547)*

14.224 The Grade II* Riverside Station and Landing Stage is located in the Essex Project Site and a description of the asset is provided earlier in this chapter (paragraph 14.64). The Proposed Development would involve the construction of the four storey car park, adjacent to and in the immediate setting of the Riverside Station. Historically this is where passengers would have disembarked from the train to connect to ship or ferry services. Presently this area is occupied by a surface-level car park and a single industrial building, which make a negative contribution to significance. The creation of this area of car parking is the result of the clearance and destruction during the later 20th century of the Riverside Station's associated platforms, railway tracks, and various associated ancillary buildings in this area. This modern setting no longer makes any contribution to the significance of the Station and Landing Stage.

14.225 The Proposed Development would result in beneficial change to the Riverside Station which will look to reuse the building as a point of arrival and departure, fitting with its historic function. The addition of the proposed extended landing stage would not prevent the appreciation or understanding of this asset as a point of entry and historic gateway to London, and the riverside setting of the landing stage is retained. The proposals would result in the repair and restoration of the station buildings so that they can continue to serve a use for which they were intended. The poor quality palisade fencing and streetscape to the north of the Listed Building would be removed and replaced with a new open forecourt that will reopen views across the north of the Listed Building, restoring the historic sense of arrival to the landward side of the building.

14.226 The siting of the proposed car park and its linear north-south orientation will reconnect the Listed Building with land that formerly comprised platforms and tracks associated with

the station, and will provide a marked improvement on the existing expanse of car storage, palisade fencing and warehouses. Notwithstanding the relative proximity of the proposed new car parking, and taking into account the improvements of the environment (and physical enhancement of the buildings through roofing etc.) these proposals are considered to constitute a minor beneficial impact to the significance of an asset of high value resulting in a minor beneficial effect to significance overall.

Greenhithe Conservation Area

14.227 Greenhithe is a residential neighbourhood set on the waterfront east of Dartford. The introverted nature of the Conservation Area is a key element of its character and appearance and contributes actively to the group value and significance of its component historic buildings. The Conservation Area is of medium heritage importance/sensitivity.

14.228 The Conservation Area derives its significance from its architectural and historic interest derived predominantly from its Grade II and locally listed buildings. The Project Site makes a minor contribution to the character and appearance of the Conservation Area providing amenity value to views along the foreshore. The Proposed Development and its lighting design (which will be tapered to lower levels towards the natural environment at the edges of the Resort) are not expected to harm the character or appearance of the Conservation Area. As such the assessment expects a negligible magnitude of effect, which would result in a 'not significant' effect in EIA terms.

High Street and Queen Street Conservation Area, Gravesend

14.229 The High Street and Queen Street Conservation Area in central Gravesend derives much of its significance from its architectural and historic interests.

14.230 The Conservation Area has a wider setting through its connections with the development of the town. The Conservation Area does have some historic connection to the riverside but this became less important over time. However views across to Tilbury are considered to contribute positively to the Conservation Area and from the riverside at Tilbury, the built form of the Conservation Area can be appreciated. The tradition of the ferry service between Gravesend Pier and Tilbury contributes to the significance of the Conservation Area and pier. However, this is one of function rather than a visual relationship. The introduction of the multi-storey car parking building on the Essex Project Site on the northern side of the river will introduce an additional large scale building into an already predominantly industrial area and as such this not expected to affect the significance of the Conservation Area and as such a negligible magnitude of effect is predicted, which would result in 'not significant' effect in EIA terms. The ferry service which has been identified as contributing to significance will remain unaffected by the development proposals. As the Essex Project Site is to be used for parking and ferry crossing, there are not expected to be any additional impacts from lighting or noise during the operational phase; this is a negligible effect, and not significant in EIA terms.

Gravesend Riverside Conservation Area

14.231 The Gravesend Riverside Conservation Area derives its significance from its historical, architectural interests and from its setting. The Thames is considered to be part of the immediate setting of the Conservation Area and makes a positive contribution to its setting. Principal positive views have been identified looking towards Tilbury and along the river in both directions. The Conservation Area is intervisible with the Essex Project Site. However, such intervisibility does not contribute to its significance, nor the significance of the Listed Buildings in the Conservation Area. The Proposed Development will result in no meaningful change in the setting of the Conservation Area and Listed Building and as such no effect to significance. As the Essex Project Site is to be used for parking and ferry crossing, there are not expected to be any additional impacts from lighting or noise during the operational phase; any effect on the significance of the Conservation Area is considered to be negligible in magnitude, the result of which is not significant in EIA terms resulting in a continuing neutral effect.

Lansdowne Square Conservation Area, Northfleet

14.232 The Lansdowne Square Conservation Area, Gravesend derives much of its significance from its architectural interest and historic interest as a planned prestigious suburb of Gravesend, built by local wealthy landowner Jeremiah Roshier. The Conservation Area is significant for the group value of its component historic buildings, including the Rosherville Quay Walls, and the architectural and historic interest of those buildings as part of the Rosherville New Town planned settlement. The riverside plays a role in the layout and design of the settlement, with views across the River forming a positive element of its setting.

14.233 Whilst the River Thames contributes to the setting is it not considered that the Essex Project Site makes a contribution to the setting of the asset. As the Essex Project Site is to be used for parking and ferry crossing, there are not expected to be any additional impacts from lighting or noise during the operational phase. Consequently, there is expected to be a negligible magnitude of effect upon the Conservation Area of medium value, which is a 'not significant' effect in EIA terms.

Grade I Church of St Clement (1147660)

14.234 The Church of St Clement lies upon the Essex side of the River Thames opposite the Swanscombe peninsula at West Thurrock and is Grade I listed and of high importance. The building's significance is vested in its architectural and historic interest, primarily embodied by its 13th century interior with 14th and 15th century alterations. Historic mapping from the 19th century shows that the Church was in an isolated position at the edge of the marshland, with the Thames beyond.

14.235 Historically the church would have derived some of its significance from its setting, however this has changed greatly over time. The church is now situated in an industrial estate with large industrial buildings surrounding it on its northern and eastern side which, together with an electricity sub-station to the west and a car park to the south, have eroded its historical setting.

14.236 The Kent Project Site is not considered to contribute to the significance of the Listed Building, and visibility between the Kent Project Site and the church is very limited. Due to distance from the Kent Project Site and lack of intervisibility or other meaningful association the Proposed Development is expected to have a negligible effect to heritage significance which is 'not significant' in EIA terms. The lighting strategy (document reference 7.10) has been designed to provide light to the Resort Core which will taper to lower levels of illumination towards the natural environment which will surround it. Due to the distance and limited intervisibility between the church and the Resort Core, no effects from additional lighting are anticipated. Similarly, the noise assessment (document reference 6.1.15) has established that the higher noise levels will be confined to the Resort Core and is not expected to affect the heritage significance of the church of St Clement. There is not expected to be any effect to heritage significance as a result of the development of the multi-storey car park within the Essex Project Site. The Essex Project Site does not contribute to the significance St Clements Church.

Grade II Wharf Public House (1147907)

14.237 Wharf Public House lies on the Essex side of the Thames opposite the peninsula at Grays and is of high importance. It derives its significance from its historic and architectural interest with some significance derived from its setting. Its historic and architectural interests are derived from its age and its surviving original features.

14.238 The public house was constructed with views across the River Thames with its primary façade facing south. Today, a flood defence exists on the banks of the Thames consisting of a bank and wall that restrict views across the river. However, its former relationship with the river can still be appreciated and understood. The northern and western parts of the Swanscombe peninsula closest to the Wharf Public House are to be retained as marshland and as such there will be a buffer between the Leisure Core and the listed building. The taller elements of the Proposed Development such as rides and hotels will be introduced into the sight line looking south from the public house. The lighting strategy (document 7.10) has been designed to provide light to the Resort Core which will taper to lower levels of illumination towards the natural environment which will surround it. Due to the distance and limited intervisibility between the public house and the Resort Core, no effects from additional lighting are anticipated. Similarly, the noise assessment (document reference 6.1.15) has established that the higher noise levels will be confined to the Resort Core and is not expected to affect the heritage significance of the public house.

14.239 The assessment expects a low magnitude of effect, upon a heritage asset of high value, resulting in a minor adverse effect, which is not significant in EIA terms.

Grade II World's End Inn (1111632)

14.240 The World's End Inn is located on the north bank of the Thames, close to the Essex Project Site.

14.241 The World's End Inn's setting is primarily confined to its immediate environs; its built form, adjacent parking, and Tilbury Fort to the east and north. The modern sea wall to the south terminates views southwards which would have historically looked south across the river. The modern offices and warehouses to the west make no contribution to significance. The public houses associations with the Riverside Station in the Essex Project Site make a minor contribution to significance, which helps explain the historic development and changing roles of the public house and of the Tilbury area. The Proposed Development would result in change in the setting of the listed building however this is not expected to harm the significance of the asset. The lighting strategy (document reference 7.10) has been designed to provide light to the Resort Core which will taper to lower levels of illumination towards the natural environment which will surround it. Due to the distance from the Resort Core and presence of the natural environment on the eastern side of the peninsula, no effects from additional lighting are anticipated. Similarly, the noise assessment (document reference 6.1.15) has established that the higher noise levels will be confined to the Resort Core and is not expected to affect the heritage significance of World's End Inn.

14.242 The assessment expects a low magnitude of effect resulting in a minor adverse effect, which is not considered significant for purposes of the EIA regulations.

14.243 Enhancements to the westerly approach to the public house and an increase in footfall and available parking is likely to result in an increase in visitor numbers which will facilitate the long term viability of the public house.

Historic landscape character

14.244 The Proposed Development will be in the geographical area of Swanscombe Peninsula, Darenth and Bean (A2(T) Highway works) Swanscombe (A2(T) junction) and Tilbury as defined in the Historic Landscape Characterisation assessment (Appendix 14.3; document reference 6.2.14.3). The importance of the historic landscape of this area was considered to be low (Swanscombe and Darenth and Bean) and negligible (Swanscombe Peninsula and Tilbury). The Proposed Development would change the historic landscape character of the peninsula from broadly marshland and industrial to a developed site. This change is expected to have high magnitude of impact resulting in a minor adverse effect. The development proposals in the Project Site in the Swanscombe and Tilbury characterisation areas will result in minor adverse and negligible effects respectively, neither of which are significant in EIA terms. There is not expected to be any change to the historic landscape character of the area of Darenth and Bean.

Historic seascape character

14.245 The Kent Historic Seascape Character assessment (Croft et al 2001) indicates an area of industrial and leisure use along both banks of the Thames, with jetties, piers and other transport infrastructure already present. Therefore, the presence of the Proposed Development's jetty and ferry terminals would be viewed in context and would have negligible impact. Additionally, there is already considerable vessel traffic on this section

of the Thames, for a wide variety of purposes, and additional transport of visitors will have a negligible impact.

PROPOSED MITIGATION

Site preparation and main construction phases

14.246 As identified above physical effects to buried archaeological remains is likely to occur as a result of the development during the construction phase, for which mitigation, both embedded and specific, is proposed.

Embedded Mitigation

14.247 The design of the Proposed Development, as set out in the DCO works plans (document reference 2.5) and illustrative masterplan (document reference 2.21) and Design and Access Statement (document reference 7.1) has sought to avoid or minimise impacts to subsurface archaeological remains where possible.

14.248 An identified effect on the significance of the Baker's Hole Scheduled Monument has been taken into account in design of the access arrangements for the Kent Project Site. The proposed people-mover has been designed to run on embankment where it crosses the monument. The route takes the minimum of the area of the monument required for delivering the people-mover, and is informed by consultation responses from Historic England and Natural England. The route proposed is considered to be the least harmful of the options, to the monument.

14.249 It is designed to be built on a light embankment made of light, removable blocks of a polystyrene type material. This will sit on a thin layer of sand, which will be placed on the ground surface after removal and vegetation and topsoil, with an anticipated depth of around 300mm. This will minimise the potential for disturbance of the underlying archaeological, palaeo-environmental and geological deposits from which the Monument derives its heritage significance, with the bulk of this material preserved in situ.

14.250 The same technique will be applied to the Resort Access Road as it crosses the *Neolithic Sites at Ebbsfleet* Scheduled Monument located further south. Test pit investigations either side of the monument showed made ground to depths of at least 1.5m below ground level, demonstrating that important deposits will be preserved in situ beneath the impact of the Resort Access Road.

Archaeological mitigation

14.251 A HEF (Appendix 14.9; document reference 6.2.14.9) has been prepared to inform an appropriate strategy for further evaluation, mitigation and publication for any archaeological resource identified. This is intended to be a 'live' document that will be updated and amended in response to the results of the initial phases of evaluation. The following mitigation measures are included in the HEF:

- preservation in situ where possible;
- excavation and recording of archaeological remains and built heritage;
- a programme of strip, map and record;
- watching brief during construction;
- Outline Construction Environmental Management Plan (CEMP; document reference 6.2.3.2);
- consideration of the works areas of large plant and machinery;
- consideration of the works hours of large plant and machinery;

14.252 Mitigation will take place as part of a staged programme. This will include an initial suite of surveys, the scope and extent of which is set out in a series of Written Schemes of Investigation appended to the HEF (see Appendix 14.9; document reference 6.2.14.9). These surveys include:

- test pit/ borehole evaluation of Baker's Hole Scheduled Monument and SSSI to evaluate deposits to be affected by the Resort Access Road and People Mover Route, to inform a mitigation strategy;
- completion of geophysical survey (partially completed in 2017), electrical resistivity tomography (ERT) and electromagnetic induction (EMI) survey at Swanscombe peninsula, to investigate the type, depth and distribution of sediments across the peninsula in order to map the topography of the former ground surface upon which human activity may have taken place;
- geoarchaeological borehole survey, Swanscombe Peninsula, to map and characterise the superficial geological deposits across the peninsula, identifying areas of geoarchaeological and archaeological potential, to ground truth the ERT and EMI surveys, to inform a deposit model and to inform a mitigation strategy;
- Archaeological Evaluation and Historic Landscape Survey of the industrial remains of the former Portland Cement Works, to identify, excavate, record and analyse any surviving remains of industrial processes, buildings or activities and to inform a mitigation strategy.

14.253 Other assessment and mitigation works proposed as part of this staged approach to mitigation comprise:

- marine geophysical survey;
- marine geotechnical survey;

- Strip, map, sample excavation, Springhead;
- Historic Building Recording of Grade II* Riverside Station at Tilbury, and Historic Building Recording of non-designated assets to be demolished as appropriate and proportionate to their significance;
- Evaluation of Palaeolithic Deposits at the Kent Project Site;
- Evaluation of geoarchaeological deposits at the Kent Project Site;
- Geoarchaeological borehole survey of palaeoenvironmental remains at Essex Project Site.
- Preparation of a Deposit Model including results from geophysical, geoarchaeological and geotechnical surveys within both the Kent and Essex Project Sites;
- Targeted and General Watching Brief as required.

14.254 Further detailed or specific works might be identified as a result of this first stage. The scope and extent of these would be agreed in the form of additional WSI's and implemented in accordance with those and in line with the provisions of the HEF.

14.255 A specific issue has been raised by Natural England with regard to the Baker's Hole SSSI. This concerns the sterilisation of parts of the SSSI with respect to the ability to use the site for future research, as substantial areas will no longer be accessible under embankment, or behind retaining walls or with areas of protection either side of carriageways etc. Standard preferred archaeological mitigation by avoidance (preservation in situ) is not regarded by Natural England as appropriate (and indeed conflicts with their stated desire that this material be accessible).

14.256 This perceived sterilisation effect is addressed in two ways. First, the embankment for the people mover route would be a lightweight surface-level construction incorporating Jablite or similar polystyrene blocks. Lifting and shifting of the route and removal of the blocks is possible, and could afford access to the underlying material.

14.257 Second, it is proposed to take advantage of the proposed first stage of mitigation (surveys and evaluations referred to above) pre-construction to implement a comprehensive sampling strategy across both the Scheduled Area as well as the rest of the SSSI (at least where the 'sterilisation' effect would occur). The objective is to generate a 'library' of samples of different types, from across the site both in terms of depth and area, and which would be amendable to the application of different investigation techniques (including scientific dating techniques). Provision would be made for the curation of this suite of material in appropriate conditions at an appropriate repository, with access to researchers facilitated. Details of samples/locations/types and arrangements for curation and access etc will be agreed in the form of WSI with the relevant consultees.

14.258 The mitigation for marine heritage assets will be secured in the Order and should either be captured in the HEF with onshore mitigation, or in a separate marine WSI. For any

further survey work, for example to confirm design options, there should be archaeological input at the planning stages, to maximise results and to ensure that data gathered is suitable for archaeological assessment. Proposed marine mitigation is as follows:

- avoidance of marine heritage assets as the primary mitigation strategy, in accordance with the draft South East Inshore Marine Plan SE-HER-1 (Marine Management Organisation 2020);
- pre-construction archaeological assessment of any marine geophysical and geotechnical data, interpreted following standard guidance and conducted by an experienced and suitably qualified marine archaeologist;
- marine archaeological assessment (for example by diver or ROV survey) of any sites identified that could be adversely affected. This will comprise archaeological assessment of data gathered for other purposes, for example as part of a UXO survey, or could be an archaeologist-led survey;
- watching brief during construction;
- implementation of a protocol for unexpected archaeological discoveries in the marine zone during site preparation, construction and operational activities.

Other

14.259 It is proposed that the Grade II* listed Riverside Station at Tilbury be surveyed and recorded as part of a formal appraisal of this structure (in the form of the Built Heritage Assessment proposed in the HEF). The purpose would be to identify those aspects of its current form and fabric that contribute to its significance, to inform on conservation and restoration proposals (such as reroofing parts of the structure which are currently in a derelict state) and to inform detailed arrangements for bringing the building back into full use.

Operational phase

14.260 No significant effects are predicted to occur to any built heritage assets during the operational phase of the Proposed Development.

14.261 The proposals will have a beneficial effect with regard to on the Grade II* listed Riverside Station at Tilbury. Unroofed parts of the structure will likely be restored and the building will be retained in optimum viable use (that is, it will continue in its historic use as a port of entry and riverside landing stage and terminal). The design of the building as required for purposes of the Proposed Development will respond to its historic interest, and that interest will be more appreciable be visitors and users of the facility.

14.262 Mitigation for marine archaeological remains will be required if maintenance work is required for the jetties or dredging which would include the continued implementation of

a programme of archaeological work specific to the marine and intertidal environment. As set out in the HEF, this will be agreed in the form of a WSI and secured through the Order.

14.263 Opportunities will be sought to mitigate effects on the historic environment through improving public understanding and engagement with, and protection of, the historic environment. Opportunities for use, display and interpretation of the archaeological and built heritage evidence, as well as marine mitigation during the operational phase include:

- enhancement of the historic environment through improved access to archaeological sites and built heritage assets;
- enhancement of public understanding through the display of artefacts and the results of archaeological excavations;
- use of the historic background and archaeological knowledge of the site and its environs, in combination with a less tangible cultural heritage such as association with historic activities, events and people, whether artists, musicians or otherwise celebrated for achievement, could be used to promote a wider understanding of the diverse and changing nature of the local communities in and around the peninsula as well as the Essex Project site;
- enhancement of public understanding through open days and events (such as guided walks, digital interaction via apps linked to the historic and archaeological archives resulting from the works undertaken in and around the Proposed Development);
- archaeological review of any data relating to changes to marine conditions, for example increased erosion or scour around marine infrastructure; and
- continued implementation of marine archaeological protocol, if maintenance work is required for jetties or dredging.

14.264 These opportunities could include a management plan for Site B of Palaeolithic Sites near Baker's Hole and off Site heritage interpretation at Swanscombe Heritage Park. With respect to Baker's Hole, a management plan will consider how the Proposed Development can assist the Statutory Consultees conserve the heritage interest in the Scheduled Monument and SSSI, the former currently being on the 'at risk' register and the latter being 'declining' in status. The proposal above to make accessible deposits under the proposed people-mover as well as the comprehensive sample library are specific project commitments in making the value in these assets more realisable. Management plans could also include management of planting and vegetation etc across the designated area as these lie in the Order limits.

14.265 Elements of the historic landscape have also been included in the design such as the use of the Pilgrims' Way historic route as a principal pedestrian route and a celebration of local heritage through engagement with key landscape features such as the chalk cliffs and super pylon, public art installations and an interactive visitor display.

RESIDUAL ENVIRONMENTAL EFFECTS

14.266 Residual effects are those effects on the heritage significance of the assets considered in this assessment, after the application of proposed mitigation.

Construction

14.267 The assessment predicted an effect of ‘major’ significance upon the heritage significance of the Baker’s Hole Scheduled Monument and SSSI (and associated but non-designated Palaeolithic deposits) as a result of damage or destruction of deposits from construction. However, proposed mitigation, both by design and in the application of specific measures, in the form of archaeological recording prior to construction will substantially reduce the assessed significance of effect.

14.268 Primary mitigation for Baker’s Hole Scheduled Monument (as set out above and detailed in the HEF) consists of mitigation by design to limit the physical impact of the proposed people mover route. As this would be a lightweight and largely surface-level construction with a shallow depth, only the deposits at or in c. 300mm of the surface will be affected. The footprint of the people mover is limited in respect of the monument area taking the minimum amount consistent with the ability to construct the proposed route. As a result, the majority of the monument area will be unaffected, and the deposits of archaeological and quaternary geological interest will be largely untouched (other than at the current ground surface, which is already subject to disturbance from bio-turbation and weathering). The significance of this monument as inherent in its archaeological interest will be large unaffected as the evidence contained in these deposits will be largely unharmed.

14.269 Specific mitigation is in any case proposed. This will consist of a programme of archaeological work to record deposits under the people mover route, ensuring that those areas of disturbance caused by construction of the route at or near the current surface can be appropriately investigated and recorded. The opportunity would be taken to sample the full depth of the underlying deposits (as part of a comprehensive sampling programme) to generate additional data to inform further management plans for the monument. This work would lead to preservation by record, with the benefit of informing in the formation of a management plan seeking to help long-term preservation of the monument and its archaeological significance.

14.270 It is considered that, taking into account the proposals for mitigation by design and after the implementation of an appropriate programme of archaeological recording, the residual effect of the Proposed Development upon the Monument would be reduced to ‘minor’ (and not significant for purposes of the EIA Regulations).

14.271 This assessment recognises that some unavoidable physical loss would have occurred as a result of construction, but that the proposed programme of archaeological works would lead to preservation by record in this respect. Additional benefit would be generated by the opportunity to further sample the deposits of interest to depth, and as part of a

comprehensive programme, providing knowledge gain, and informing the production of management plan for the long-term conservation of the monument.

- 14.272 Related to the issues at the Baker's Hole Scheduled Monument is the effect on the SSSI designation (this being larger). A significant effect is predicted on the heritage significance of the asset, which resides in its archaeological and geological evidential interest. The proposed people mover will have a small effect, but the construction of the proposed Resort Access Road will have a greater physical effect. As noted above mitigation for the direct impact is proposed in the form of preservation by record, after the implementation of an appropriate programme of recording.
- 14.273 One of the effects being mitigated in the perceived sterilisation of the asset (even where it is not directly affected) by making it inaccessible to future researchers (either under the people-mover, or behind retaining walls, or in stand-off/protection areas associated with these routes). Natural England has indicated that the standard archaeological approach of preservation *in situ* is not adequate for their purposes.
- 14.274 This effect is mitigated in two ways. Firstly, the design of the people mover has been made so that the blocks it lies on can be removed, allowing access to the underlying deposits. Secondly, as noted above, a comprehensive programme of sampling of the deposits to depth, taking advantage of the opportunity afforded by pre-construction investigations to mitigate direct impacts, is proposed. The suite of samples thus generated can be 'banked', with provision made to hold them in suitable storage conditions in an appropriate facility, and made available for future researchers. Study of material collected during the recording work will aid in the development of a management plan (as with the monument) seeking to secure long-term conservation and enhancement of the SSSI (with the ultimate goals of helping to improve its currently 'declining' status).
- 14.275 Taking the above measures into account, it is considered that the residual effect upon the heritage significance of the SSSI is 'minor' (and not significant for purposes of the EIA Regulations). This recognises that physical impacts and loss will have occurred to part of the designated area, but that appropriate recording will lead to preservation by record and the creation of a 'bank' of samples will further enable that record to be interrogated by further researchers. Such researchers will in any case have access to the deposits under the people mover, as it is designed to be removable in sections for this purpose.
- 14.276 Mitigation is proposed in the form of a programme of archaeological investigation and recording on groundworks in the area defined in Order limits. This mitigation is set out in the Written Scheme of Investigation in the HEF and will be secured as part of the Order. This will ensure that archaeological remains associated with the former cement works can be appropriately investigated and that physical impacts predicted elsewhere are addressed. Loss of or damage to the heritage significance of such archaeological remains will have been addressed through a programme of works leading to preservation by record. Residual effects after the implementation of such as scheme are therefore assessed as no more than 'minor' in significance, and are not considered significant for purposes of the EIA Regulations.

14.277 Mitigation is proposed in the form of a programme of archaeological investigation and recording for any areas where ground works are planned at off-site locations required for habitat off-set. Details are set out in the HEF and will be agreed in the form of a WSI with the relevant consultees. This would lead to preservation by record, and would reduce any other predicted effects to 'minor' or 'not significant', and no residual effects resulting from construction are considered significant for purposes of the EIA Regulations.

14.278 Where effects to marine and intertidal heritage assets have been identified in paragraphs 14.149-60 this will be mitigated in accordance with the provisions made in para 14.258 and within Appendix 14.9, section 7.9 (document reference 6.2.14.9). In each case where the predicted adverse effect of moderate significance was identified (wooden trackway at Broadness WA162, possible wooden vessel WA648, abandoned wooden vessel WA934, and unknown wrecks WA2005 and WA2006) with the implementation of the mitigation measures outlined above this has been reduced to minor adverse or not significant residual effect.

Operation

14.279 No significant residual effects (that is, effects assessed as 'major' or 'moderate' in significance) have been identified as occurring to the significance of any heritage assets with regard to operation of the Proposed Development. Direct effects will have been mitigated as part of the measures proposed for (or prior to) construction. No indirect effects on the heritage significance of built heritage assets have been assessed as leading to any significant effect and no mitigation is proposed in this respect, with no adverse residual effects predicted.

14.280 Planned works at the Tilbury landing stage and railway terminus site will have a beneficial effect in restoring the condition of part of the building (especially the unroofed part) and retaining the structure in an appropriate viable use (that is, enabling it to continue to be used as a ferry terminal and port of entry, echoing its current and historic use). Proposals to enhance the visitor and user experience through making the historic interest in the building apparent (in design and through information boards etc.) will have added benefit in making the heritage significance of this building more appreciable. The residual effect of the proposals upon this structure can be seen as beneficial in this regard.

14.281 A full tabulation of the residual effects of the Proposed Development on archaeology and cultural heritage is presented in ES Appendix 14.10 (document reference 6.2.14.10) *Summary of Impacts, Mitigation and Residual Effects*.

CUMULATIVE AND IN-COMBINATION EFFECTS

14.282 The cumulative effects assessment identifies the significant effects of the Proposed Development that have the potential to overlap with similar effects arising as a result of other projects or activities. Cumulative effects are defined as those which result from additive impacts caused by other past, present and reasonably foreseeable actions. In-combination effects arise from the reaction between effects of the development plan and programme of the project on different aspects of the environment.

14.283 Cumulative effects might therefore occur to archaeological and cultural heritage receptors that have the potential to be incrementally affected by other existing, consented and/or proposed developments or activities. These impacts may be seen individually as minor but collectively as significant.

14.284 Potential cumulative effects incorporated into the assessment include direct effects upon archaeological and cultural heritage receptors and indirect effects. In cases where there is spatial or temporal overlap with the Proposed Development and other such developments, cumulative direct effects may occur with respect to the setting of archaeological and cultural heritage receptors. In-combination effects will be assessed as part of the ES in conjunction with the other technical disciplines.

14.285 A shortlist of schemes identified as having potential for cumulative effects to occur is presented at Appendix 14.11 (document reference 6.2.14.11). Table 14.12 below lists those from the shortlist where it was felt assessment was needed, based on distance, location and development type. A zone of influence (ZOI) was established for indirect effects of up to 5km from the Project Site and for direct effects up to 500m from the Project Site. The below schemes were selected from a long list of schemes surrounding the Project Site, primarily based on ZOI but also using professional judgement to scope the schemes into or out of further detailed assessment.

14.286 In assessing the potential cumulative impacts for the Proposed Development, it is important to bear in mind that for some projects, predominantly those 'proposed' or 'awaiting determination' might or might not actually be taken forward. Thus there is a need to build in some consideration of certainty (or uncertainty) with respect to the potential impacts which might arise from the proposals. For example, relevant projects which are already under construction are likely to contribute to cumulative impact whereas projects which are not yet approved, are less certain to contribute to such impacts, some may not achieve approval or may ultimately not be built due to other factors.

Table 14.12 Schemes for Cumulative Assessment

Application Reference	Name and description	Distance from Project Site	Project Status
https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2	Tilbury2 Port Expansion by Port of London Limited	c. 4.3km east of Kent Project Site c. 820m east of Essex Project Site	Secretary of State for Transport granted development consent for this application on 20/04/19
https://infrastructure.planninginspectorate.gov.uk/projects/south-east/thurrock-	Thurrock Flexible Generation Plant by Thurrock Plant Ltd	c. 4.0km east of Kent Project Site c. 400m east of Essex Project Site	This application was accepted for examination

flexible-generation-plant/			
https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing/	Lower Thames Crossing by Highways England	c.5.4km east of Kent Project Site c. 2.6km east of Essex Project Site	Pre-application stage. The application was expected to be submitted to the Planning Inspectorate in Summer 2020
16/00201/EDCCON https://publicaccess.Dartford.gov.uk/online-applications/	Eastern Quarry Swanscombe Mixed Use Development of up to 6250 dwellings	c.14km south of Kent Project Site c. 4.6km south west of Essex Project Site	Permission Granted 23/01/13
https://highwaysengland.co.uk/projects/a2-bean-and-ebbsfleet-junction-improvements/	A2 Bean and Ebbsfleet Junction Improvements by Highways England	c.2.5km south west of Kent Project Site c.6.0km south west of Essex Project Site	On 2nd June 2020 Highways England received confirmation from the Secretary of State for Transport that the scheme can proceed to construction
17/01814/FUL	The Pier, by Crest Nicholson Mixed Use Development including 151 residential, riverside walk, boat trailer park development platform and slipway, permanent diversion of Public Right of Way	Directly adjacent to western boundary of Kent Site c. 4.9km west of Essex Project Site	Awaiting Decision
17/01814/FUL https://publicaccess.dartford.gov.uk/online-applications/	Land West of Springhead Road, by Countryside Properties (UK) Ltd Outline application for mixed use development	Adjacent to southern boundary of Kent Project Site c.3.0km south west of Essex Project Site	Permission granted in February 2016
EDC/18/0009	Land West of Springhead Road, by Countryside	Adjacent to southern boundary of Kent Site	Permission granted June 2018

	Properties (UK) Ltd Reserved matters application pursuant to application 20150155/ EDC relating to the erection of 172 residential dwellings in Phase 3 of Springhead Quarter	c. 3.00km south west of Essex Project Site	
EDC/16/0004 https://applications.ebbsfleetdc.org.uk/online-applications/	Outline application for mixed development comprising 532 new homes, employment space and mixed use neighbourhood centre	c.600m east of Kent Project Site c.1.9km south west of Essex Project Site	Approved subject to 106 08/06/18
EDC/17/0110 http://applications.Ebbsfleetdc.org.uk/online-applications/	Outline planning application for residential development of up to 220 dwellings including new vehicular access to Tiltman Avenue	Adjacent to southern Site boundary of Kent Project Site c.4.4km west of Essex Project Site	Approved subject to 106 18/12/18

Table 14.14 Cumulative Rochdale Envelope

Impact	Scenario	Justification
Direct Effects to heritage assets	Assess committed development that would impact heritage assets or groups of heritage assets that would also be affected during the construction phase of Proposed Development	Disturbance of heritage assets or groups of heritage assets by other development would present an increased magnitude of impact.
Indirect effects on setting and views to/of designated heritage assets, causing a reduction in the contribution of setting to significance of an asset, and hence loss of	Assess committed development that would impact on the settings and views to/from selected designated and non-designated heritage assets during the construction and operational phases of the Proposed Development	Construction and operation of other development alongside Proposed Development may result in cumulative effects on the settings of heritage assets and in a worst-case scenario could cause loss of significance

Impact	Scenario	Justification
overall significance		

Direct effects

Archaeological remains

14.287 Other development proposals in the vicinity of the Project Site have the potential to result in harm to buried archaeological remains within the footprints of these developments where below-ground removal is required. Cumulative effects could occur as a result of development at other development sites that have similar archaeological interests to those of the Proposed Development.

14.288 None of the other proposed development schemes outlined above has been identified to have the potential to give rise to a cumulative adverse direct effect to any of the individual assets or discrete archaeological features which have been identified in the Project Site. The following asset groups have the potential to be affected where these assets or associated deposits extend beyond the Order limits or are predicted to do so.

Table 14.15 Cumulative direct effects

Heritage asset group	Schemes with potential cumulative direct effect
Archaeological remains associated with Springhead Roman Town and Ritual Site	A2 Bean and Ebbsfleet Junction Improvements by Highways England. Land West of Springhead Road, by Countryside Properties (UK) Ltd (EDC/18/0009) Land West of Springhead Road, by Countryside Properties (UK) Ltd (20150155/EDC)
Palaeolithic deposits similar to those at Baker's Hole and associated deposits	Eastern Quarry, Swanscombe (16/00201/EDCCON) Outline planning application for residential development of up to 220 dwellings including new vehicular access to Tiltman Avenue, creation of a development platform and associated works. (EDC/17/0110)
Geoarchaeological Deposits upon Swanscombe Peninsula	Outline planning application for residential development of up to 220 dwellings including new vehicular access to Tiltman Avenue, creation of a development platform and associated works. (EDC/17/0110) The Pier, by Crest Nicolson (c/o Barton Wilmore) (17/01814/FUL)

Heritage asset group	Schemes with potential cumulative direct effect
Portland Cement Works	Outline application for a mixed development and comprising up to 532 Homes, up to 46,000 sq. m Employment Floorspace and a Mixed Use Neighbourhood Centre (EDC/16/0004)

14.289 The above schemes are expected to involve below ground effects which have the potential to damage or remove archaeological deposits within the footprint of the proposals which have potential to damage or remove archaeological remains of the same or similar archaeological interest to the Proposed Development. Where a decision has been made on the above applications, archaeological conditions have been placed upon those which have the potential to affect below ground remains. Assuming appropriate preservation by record, or where possible preservation *in situ* is achieved then this potential cumulative loss of these archaeological remains/deposits will be mitigated. If the mitigation measures are adhered to the overall cumulative effect is likely to be a minor adverse effect.

Marine archaeological remains

14.290 Development proposals with marine components in the vicinity of the Project Site have the potential to result in harm to marine archaeological remains within the footprints of these developments where the seabed is impacted. Cumulative effects could occur as a result of development in other development sites.

14.291 However, the above schemes will all have undergone or will undergo EIA. As with the London Gateway project, the EIAs will identify mitigation measures, such as the avoidance of known sites, archaeological assessment of geophysical and geotechnical survey data, further assessment of sites that cannot be avoided, and protocols for reporting unexpected discoveries. Therefore, any cumulative impacts from the projects would be negligible.

14.292 The archaeological assessments of geophysical and geotechnical data, and further archaeological assessments of sites have the potential to contribute to wider understanding of the palaeogeography of the area, as well as any shipwrecks or aircraft crash sites, and therefore work undertaken as part of the EIA process, and during pre-construction surveys, can be considered to be of beneficial significance, particularly when the data gained through archaeological assessment is disseminated to the wider public.

Built heritage

14.293 Development proposals in the vicinity of the Project Site have the potential for result in on-going damage, alteration to and potential destruction of built heritage in their respective sites. The Built Heritage identified as lying within the Project Site will not be directly affected by any of the above schemes as such there are not expected to be any cumulative direct effects to built heritage assets in the Project Site as a result of development of the cumulative schemes.

Indirect effects

Archaeological remains

14.294 Cumulative indirect effects to archaeological remains could result from the potential increased degradation to the significance of buried archaeological remains through change in setting which could lead to a reduction in the contribution that setting makes to the significance of heritage assets. Archaeological assets which have the potential to be affected in this way comprise;

- Palaeolithic Sites near Baker's Hole (1003557); and
- Springhead Roman Site (1005140).

14.295 Effects as a result of the Proposed Development upon the significance of the above assets through change in setting is identified above as 'not significant' for both Palaeolithic Sites near Baker's Hole and Springhead Roman Site. The addition of the implementation of the cumulative schemes is not expected to increase this from a 'not significant' effect.

Marine archaeological remains

14.296 Cumulative indirect effects to marine archaeological remains could result from changes to sedimentary or erosion regimes. However, any indirect impacts, such as scour or increased sedimentation will likely be very localised, and therefore even the nearest developments are unlikely to cause any indirect impacts for marine assets in the Project Site.

Built heritage

14.297 Cumulative indirect effects to built heritage assets could arise as a result of an increased degradation to the significance of built heritage assets through a reduction in the contribution made by their settings to their heritage significance. Of the above schemes, those in the table below have been identified as having the potential to affect the significance of the same heritage assets as those considered in this assessment.

Table 14.16 Cumulative indirect effects

Heritage Asset	Schemes with Potential to cause Cumulative Indirect Effect
Tilbury Fort & Officers Barracks	Tilbury2 Port Expansion by Port of Tilbury London Limited (TR030003) Thurrock Flexible Regeneration Plant Tilbury Energy Centre Lower Thames Crossing
New Tavern Fort	Tilbury Energy Centre

- 14.298 The riverside location and defensive arrangements of these assets are not considered to be in any way changed by the Proposed Development in combination with the developments identified above. Whilst the (current) visual setting is altered in that new structures may be visible, the linkage between the forts is unchanged, and the ability to appreciate and understand their defensive function individually and as part of larger defensive system (from which their heritage significance is primarily derived) is unharmed.
- 14.299 The cumulative indirect effects of the schemes in Table 14.16 alongside the delivery of the Proposed Development are not anticipated to increase the effect to heritage significance to either Tilbury Fort or New Tavern Fort. No significant cumulative effect is identified, and the heritage significance of these assets is not changed.

SUMMARY AND CONCLUSIONS

- 14.300 The baseline assessments together with the consultations with statutory authorities indicate that the Kent Project Site contains archaeological remains of Very High sensitivity that can be considered to be of international importance, specifically those relating to the Palaeolithic period. The Kent Project Site also contains a wide variety of medium and high sensitivity heritage assets and sites dating to the prehistoric, Romano-British and Industrial periods, all of which are expected to be adversely affected by the Proposed Development. Mitigation is embedded into design and is also proposed in the HEF.
- 14.301 As mentioned above, there is a very high potential for potential buried archaeological remains dating from the Palaeolithic period to be encountered at Baker's Hole Scheduled Monument and SSSI and the surrounding area. Embedded mitigation will minimise physical impacts in the Scheduled Area and specific measures leading to preservation by record are proposed, including the creation of a bank of samples to be held against future research programmes.
- 14.302 The Essex Project Site holds potential for important geoarchaeological deposits comprising Holocene alluvial deposits, including peat and elevated areas of gravel which may have been dry in the Mesolithic and Neolithic periods. A single phase of evaluation was undertaken adjacent to the northern part of the Essex Project Site as part of the Tilbury2 DCO but this did not reveal any archaeological remains in the trenches located adjacent to the Essex Project Site.
- 14.303 Potential adverse effects to heritage assets within the marine and inter-tidal zone were identified to be of minor and moderate adverse effect prior to mitigation. With the implementation of mitigation as outlined above these adverse effects were reduced to minor adverse or a not significant effect in EIA terms.
- 14.304 Potential adverse indirect effects to the heritage significance of a number of designated heritage assets have also been assessed, specifically a number of listed buildings in the area, through change to the setting of heritage assets that could lead to a reduction in the contribution that setting makes to heritage significance. None of these effects are considered to be a significant effect in EIA terms, and the development proposals in

respect of the Grade II Riverside Station at Tilbury would have a beneficial effect on the fabric of this buildings and securing it in a viable use reflecting its historic function.

14.305 This assessment of effects indicates that the greatest scope for significant effects on the archaeological resource and built heritage in the Project Site would be as a result of direct effects during the construction phase of the Proposed Development. With the exclusion of the assets of highest significance (Scheduled Monuments and SSSI), mitigation measures would reduce these effects to minor adverse or lower which are not considered to be significant in EIA terms.

14.306 Indirect effects to the significance of designated built heritage assets are expected to result from predominantly the operational phase of the development. Effects during the construction phase, generally arise from the presence of flashing lights on moving vehicles, dust, and the presence of cranes and would be temporary and reversible after the construction phase has ended. These effects are not considered to affect the significance of heritage assets.

14.307 It has also been recognised that there exists in the Proposed Development opportunities for the furthering of archaeological and cultural heritage knowledge and appreciation through dedicated programmes of community engagement, display and interpretation. The nature of the use, display and interpretation of the archaeological and built heritage evidence is outlined in the HEF (Appendix 14.9; document reference 6.2.14.9).

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