10 ARCHAEOLOGY (BURIED HERITAGE)

Introduction

10.1 This chapter of the ES presents an assessment of the potential impacts and associated likely archaeological effects of the proposed development arising from the demolition and construction works and on completion of the proposed development.

10.2 The historic environment comprises archaeological remains, structures, monuments or heritage landscape within or immediately around the development site that are considered to be significant because of their evidential, historic, aesthetic or communal interest. This chapter contains a description of the buried heritage planning policy context and the methods used to assess the potential impacts and effects of the proposed development on likely buried heritage assets at the application site. In turn it describes the archaeological baseline conditions at the application site and in its immediate vicinity; provides a statement of significance of known or possible buried heritage assets at the application site; assesses the potential direct and indirect impacts and associated effects of the proposed development at the application site; identifies the mitigation measures required to prevent, reduce or off-set any significant adverse effects at the application site; and finally reports on the residual effects at the application site (i.e. those that might remain after any relevant mitigation has been implemented).

10.3 The assessment deals solely with the archaeological implications of the proposed development and does not cover built heritage issues except where buried parts of historic fabric are likely to be affected. The effect on above ground assets (designated and undesignated historic structures and conservation areas, and historic character, views and setting) is covered within ES Volume 2: Townscape, Heritage and Visual Impact Assessment.

10.4 An assessment of operational effects has been scoped out on the basis that once the proposed development has been completed, no further ground disturbance would occur and consequently there would be no additional impacts or resulting environmental effects upon buried heritage assets.

10.5 This chapter is accompanied by Technical Appendix 10.1: A Historic Environment Assessment of Charlton Riverside Within ES Volume 3.

Legislation and Policy Context

National Legislation and Policy

National Planning Policy

10.6 The Government issued the National Planning Policy Framework (NPPF) in March 2012[1]. One of the 12 core principles that underpin both plan-making and decision-taking within the framework is to *'conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations'* (Paragraph 17). It recognises that heritage assets are an irreplaceable resource (Paragraph 126), and requires the significance of heritage assets to be considered in the planning process, whether designated or not. In addition, the contribution made by their setting needs to be taken into account (Paragraph 128).

10.7 Local planning authorities are required to identify and assess the particular significance of any heritage asset that may be affected by a proposal (including development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. This assessment should be taken into account when considering the effect of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal (Paragraph 129).

10.8 Local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the associated impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted (Paragraph 141).

10.9 Section 12: Conserving and Enhancing the Historic Environment, of the NPPF is provided in full in Appendix 10.1 of ES Volume 3: Technical Appendices.

National Planning Practice Guidance

10.10 This web-based guidance provides supporting information in respect of planning at the historic environment but no additional policy to that set out in the NPPF.

Regional Planning Policy

The London Plan: Spatial Development Strategy for London Consolidated with Alterations since 2011, 2016

10.11 The overarching strategies and policies for the whole of the Greater London area are contained within the London Plan[2]. Policy '7.8 - Heritage Assets and Archaeology' recognises the significance of London's heritage assets and historic environment and states the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping. Development should *'incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology'* and notes that *'where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset'* (Paragraph E).

10.12 Paragraph 7.31 supporting Policy 7.8 notes that *'substantial harm to or loss of a designated heritage asset should be exceptional…. Where a development proposal will lead to less than substantial harm to the significance of a designated asset, this harm should be weighed against the public benefits of the proposal.'*

10.13 Paragraph 7.32 of the London Plan recognises the value of London's heritage, stating that *'…where new development uncovers an archaeological site or memorial, these should be preserved and managed on-site. Where this is not possible provision should be made for the investigation, understanding, dissemination and archiving of that asset"'*.

[1] Department of Communities and Local Government (March 2012) National Planning Policy Framework.

[2] Greater London Authority, 2016. *The London Plan. Spatial Development Strategy for Greater London. Consolidated with Alterations Since 2011.*

Local Planning Policy

Royal Greenwich Local Plan: Core Strategy, 2014

10.14 The Royal Borough of Greenwich (RBG) adopted its Core Strategy[3] in July 2014, which supersedes the Unitary Development Plan (2006). Policy DH (m) covers archaeology and states: *'The Council will expect applicants to properly assess and plan for the impact of proposed developments on archaeological remains where they fall within 'Areas of High Archaeological Potential (AHAPs)'* and that the RBG *'will seek to secure the cooperation of developers in the excavation, recording and publication of archaeological finds before development takes place by use of planning conditions/legal agreements as appropriate.'*

10.15 The RBG seeks to preserve *'in situ'* remains of national importance (e.g. scheduled monuments). Where preservation *'in situ'* is not possible for undesignated remains, these are to be *'investigated, excavated and removed from the site, or investigated, excavated and recorded before destruction.'*

Consultation Feedback

10.16 As discussed in Chapter 2: EIA Process and Methodology, consideration has been given in this assessment to the informal EIA Scoping feedback comments provided by the RBG and consultees in respect to the proposed development. The key considerations are summarised in Table 10.1.

Table 10.1: Consultation Feedback

Consultee	Comment	Where in the Chapter this issue is addressed
Historic England (Archaeology)	It is recommended that archaeology is scoped in as part of any planned EIA for the site. A key element of the assessment report will be the inclusion of a suitable deposit model of the site and its immediate area. Any planned geotechnical works should therefore be considered by the archaeological desk-based assessment report.	Through further consultation with a GLAAS archaeological advisor it has been agreed that a deposit model can be produced under an archaeological condition rather than at pre-planning stage. There are no planned pre-planning geotechnical works.
Historic England (Development)	No comments.	

Assessment Methodology

Baseline Characterisation

10.17 In order to complete the assessment, the following sources were examined:

- MOLA – in-house Geographical Information System (GIS) with statutory designations, GIS data, prehistoric 'key activity indicators' for London, past investigation locations, projected Roman roads and burial grounds from the Holmes burial ground survey of 1896; georeferenced published historic maps; Defence of Britain survey data, in-house archaeological deposit survival archive; and archaeological publications;
- Historic England – information on statutory designations including scheduled monuments and listed buildings, along with identified Heritage at Risk;
- The London Society Library – published histories and journals;
- Greenwich Heritage Centre, Woolwich – historic maps;
- Groundsure– historic Ordnance Survey maps from the first edition (1860–70s) to the present day;
- British Geological Survey (BGS) – solid and drift geology digital map; online BGS geological borehole record data;
- Leopard Guernsey Anchor Propco Limited – architectural drawings (Simpson Haugh and Partners/ April 2016), existing site survey (Greenhatch Group/23.09.2015);
- Internet – web-published material including the LPA local plan, and information on conservation areas and locally listed buildings.

Method of Assessment

10.18 The methodology and information sources consulted during the baseline characterisation are set out in detail within Appendix 10.1 within ES Volume 3: Technical Appendices. In summary this desk-based study entailed:

- Setting the site into its archaeological and historical context, by collecting information on the known historic environment within a one kilometre (km) radius study area around the application site, as held by the primary repositories of such information within Greater London. These comprise the GLHER, the LAARC and Historic England. The study area was chosen, using professional judgement, as being appropriate to characterise the historic environment of the site. Occasionally there may be reference to assets beyond this study area, where appropriate, e.g., where such assets are particularly significant and/or where they contribute to current understanding of the historic environment.
- Consultation of a broad range of relevant documentary and cartographic sources, including published histories and journals, British Geological Survey data, available geotechnical data, and historic Ordnance Survey maps.
- A site visit was undertaken on the 14th September 2016 in order to determine the topography of the application site and existing land use/the nature of the existing buildings, and to provide further information on areas of possible past ground disturbance and general historic environment potential. The application site is a working industrial estate, and access was limited. Only the entrance located to the west of the application site was considered safe enough to observe.

Evaluating the Potential of Archaeological Assets

10.19 The potential of an archaeological asset denotes the likelihood of its presence. This is achieved by examining the baseline conditions on the application site using the above outlined methodology, and taking into account factors which may have compromised asset survival (e.g. past land use).

Significance Criteria

Evaluating the Significance of Archaeological Assets

10.20 'Significance' lies in the value of a heritage asset to this and future generations. Known and potential heritage assets within the application site and its vicinity have been identified from national and local designations, HER data and expert opinion. The determination of the significance of these assets is based on statutory designation and/or professional judgement against the following values, and has taken into account the likely nature, date, extent, survival, condition, rarity, and group value:

[3] RBG [Royal Borough of Greenwich] (2014); Royal Greenwich Local Plan: Core Strategy with Detailed Policies

- Evidential Value: the potential of the physical remains to yield evidence of past human activity. This may take into account date, rarity, state of preservation, diversity/complexity, contribution to published priorities, supporting documentation, collective value and comparative potential;
- Aesthetic Value: this derives from the ways in which people draw sensory and intellectual stimulation from the heritage asset, taking into account what other people have said or written;
- Historical Value: the ways in which past people, events and aspects of life can be connected through heritage asset to the present, such a connection often being illustrative or associative;
- Communal Value: this derives from the meanings of a heritage asset for the people who know about it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical, particularly associative, and aesthetic values, along with educational, social or economic values.

10.21 There is no single defining criterion that dictates the overall asset significance; each asset has to be evaluated against the range of criteria listed above on a case by case basis. Unless the nature and exact extent of buried archaeological remains within any given area has been determined through prior investigation, significance is often uncertain. Table 10.2 gives examples of the significance of designated and non-designated heritage assets.

Table 10.2: Significance of Archaeological Assets

Buried Heritage Asset Description	Asset Significance
• World Heritage Sites; • Scheduled monuments; • Grade I and II* listed buildings; • Historic England Grade I and II* registered parks and gardens; • Protected Wrecks; and • Heritage assets of national importance.	Very High (International/National)
• Historic England Grade II registered parks and gardens; • Conservation areas; • Designated historic battlefields; • Grade II listed buildings; • Burial grounds; • Protected heritage landscapes (e.g. ancient woodland or historic hedgerows); and • Heritage assets of regional or county importance.	High (National/Regional/County)
• Heritage assets with a district value or interest for education or cultural appreciation; and • Locally listed buildings.	Medium (District)
• Heritage assets with a local (i.e. parish) value or interest for education or cultural appreciation.	Low (Local)
• Historic environment resource with no significant value or interest.	Very Low
• Heritage assets that have a clear potential, but for which current knowledge is insufficient to allow significance to be determined.	Uncertain

10.22 It should be noted that only likely remains are taken forward into the assessment.

Magnitude of Change

10.23 Determination of magnitude of change upon the significance of known or potential heritage assets is based on the severity of the potential physical impact (e.g. any activity that would entail ground disturbance, from piling, ground reduction, etc.). Table 10.3 describes the criteria used in this assessment to determine the magnitude of change.

Table 10.3: Magnitude of Change

Magnitude of Change	Description of Change
High	Complete removal of asset. Change to asset significance resulting in a fundamental change in our ability to understand and appreciate the resource and its historical context, character and setting. The transformation of an asset's setting in a way that fundamentally compromises its ability to be understood or appreciated. The scale of change would be such that it could result in a designated asset being undesignated or having its level of designation lowered.
Medium	Change to asset significance resulting in an appreciable change in our ability to understand and appreciate the asset and its historical context, character and setting. Notable alterations to the setting of an asset that affect our appreciation of it and its significance; or the unrecorded loss of archaeological interest.
Low	Change to asset significance resulting in a small change in our ability to understand and appreciate the asset and its historical context, character and setting.
Negligible	Negligible change or no material change to asset significance. No real change in our ability to understand and appreciate the asset and its historical context, character and setting.
Uncertain	Level of survival/condition of resource in specific locations is not known: magnitude of change is therefore not known.

Significance of Environmental Effect

10.24 The environmental effect is determined by comparing the 'significance of baseline [archaeological] assets' with the 'magnitude of change', as outlined in Table 10.4. Effects may be either adverse (negative) or beneficial (positive) and are defined initially without mitigation. Where information is insufficient to be able to quantify either the asset significance or magnitude of change with any degree of certainty, the effect is given as 'uncertain'. 'Significant' effects are those that are moderate or major. Effects that are 'not significant' are minor or negligible effects.

Table 10.4: Significance of Environmental Effect (Prior to Mitigation)

Magnitude of Change	Archaeological Asset Significance					
	Very High	High	Medium	Low	Very Low	Uncertain
High	Major	Major	Major or Moderate	Moderate or Minor	Minor	Uncertain
Medium	Major	Major or Moderate	Moderate	Minor	Negligible	Uncertain
Low	Moderate	Moderate or Minor	Minor	Minor	Negligible	Uncertain
Negligible	Minor	Minor or Negligible	Negligible	Negligible	Negligible	Uncertain
Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain

Mitigation Measures and Residual Effects

10.25 As archaeological assets are an irreplaceable resource it is generally considered as standard practice within the planning system to implement mitigation measures in order to offset any level of adverse effect on a heritage asset, including minor adverse. This is to ensure that finite and irreplaceable remains are not removed or lost without record. The level of mitigation proposed is, in each case, proportionate to the significance of the asset being affected.

10.26 An appropriate mitigation strategy would aim to reduce or offset any adverse effect. Measures to mitigate effects would normally consist of design adjustments to allow significant archaeological assets to be protected and retained (preservation *'in situ'*) or, where this is not feasible, investigation and recording before and during development, with dissemination at an appropriate level (preservation by record).

10.27 Broadly, the residual effect reflects the success rating for the recommended mitigation strategy. Table 10.5 defines the significance of residual effects.

Table 10.5: Significance of Residual Effect

Significance of Effect	Description
Major Adverse	Substantial harm to, or loss of, an asset's significance as a result of changes to its physical form or setting.
Moderate Adverse	Less than substantial harm to an asset's significance as a result of changes to its physical form or setting.
Minor Adverse	Limited harm to an asset's significance as a result of changes to its physical form or setting.
Negligible	No appreciable change to an asset's significance.
Uncertain	Significance of effect uncertain due to lack of information on buried heritage asset significance.
Minor Beneficial	Limited improvement of an asset's significance as a result of changes to its physical form or setting.
Moderate Beneficial	Notable enhancement of an asset's significance as a result of changes to its physical form or setting.
Major Beneficial	Substantial enhancement of an asset's significance as a result of changes to its physical form or setting.

Assumptions and Limitations

10.28 The assessment relies on publicly available data, and best endeavours have been made to ensure that the data is accurate and up-to-date. It was assumed that information on the Greater London Historic Environment Record (GLHER) database is accurate. However, whilst compiling the baseline, a process of reviewing and validating the GLHER data has been undertaken (e.g. ensuring assets are correctly located and undertaking further research, where appropriate, into GLHER entries with minimal information).

10.29 The main limitation to the assessment is the nature of archaeological assets (buried and not visible) which means it can be difficult to predict accurately the presence and likely significance of buried assets, and consequently the impact upon them based primarily on desk-based sources. The principal sources of archaeological information are the GLHER and the London Archaeological Archive and Research Centre (LAARC), which list all known archaeological sites and findings. The information provides an initial indication of assets present rather than a definitive list as archaeological assets cannot be identified without site-specific archaeological field investigation.

10.30 Current understanding of the nature and extent of past human activity, in particular for periods not present or poorly presented in the historical record (prehistoric, Roman and early medieval periods), is limited due to the lack of past archaeological investigation within the application site and the limited work in the surrounding study area. Therefore, the presence and extent, date, nature, survival and significance of possible, previously unrecorded, buried heritage assets within the application site are largely uncertain.

10.31 In regards to the piling strategy, any archaeological remains within the footprint of each pile would be removed as the pile is driven downwards. A piling layout at 3m intervals is proposed, with piles of 600mm–900mm diameter, leaving any archaeological remains potentially preserved between each pile.

10.32 At the time of writing full details of the proposed piling strategy were unavailable. It has been assumed that the proposed piled foundations would be relatively small in scale and would not extend beyond the footprints of each building.

10.33 Notwithstanding this limitation, the methodology is robust, utilising reasonably available information, and conforms to the requirements of local and national guidance and planning policy. Appropriate standard archaeological prospection and evaluation techniques have been utilised to reduce the uncertainties inherent in any desk-based assessment, as part of an overall EIA mitigation strategy.

Baseline Conditions

Current Baseline

Designated Heritage Assets

10.34 The application site does not contain any nationally designated (protected) heritage assets, such as scheduled monuments, listed buildings or registered parks and gardens. The entire application site lies within the Greenwich Peninsula and Foreshore Area of High Archaeological Potential. This covers the length of the Thames foreshore from the North Greenwich Peninsula to the east of New Charlton, and is characterised by the potential for prehistoric to medieval remains within alluvial deposits.

Site Topography and Geology

10.35 Topography can provide an indication of suitability for past human settlement, and ground levels can indicate whether the ground has been built up or truncated, which can have implications for archaeological survival. Geology can provide an indication of suitability for early settlement, and potential depth of remains.

10.36 The topography of the application site slopes gently from north to south. In the northern projection of the application site towards the river front, ground levels lie at approximately 5.5m above Ordnance Datum (OD). Within Plot A, the ground levels lie at approximately 3.55m OD sloping down to 3.0m above OD in the south-west corner and in the north-east corner ground levels lie higher still at 3.9m above OD, with localised variations. In Plot B, ground levels broadly slope down from the south to north. In the north-east corner of Plot B, ground levels lie at 3.4m above OD, but rise in the south to above 3.7m OD.

10.37 The ground levels on the application site are entirely artificial and reflect substantial made ground deposits introduced in the post-medieval period (possibly earlier) as part of reclamation of the former low-lying marshland. The obscured natural subsurface topography is reflected in the levels of the deeply buried underlying geology.

10.38 The entire application site overlies alluvium associated with the former River Thames floodplain, over Shepperton Gravels. The edge of the floodplain, defined by the underlying Upper Chalk geology, lies just south of Woolwich Road, 400m to the south of the application site.

10.39 At the time of writing no geotechnical surveys had been undertaken within the application site and therefore the levels of natural geology are uncertain, as is the nature of the subsurface topography. The River Thames was originally a braided, rather than single, channel and flowed across a broad floodplain of gravel islands ('eyots') and deeper channels, with intertidal marsh between. The eyots may have been suitable for dry land activities prior to rising water levels in the later prehistoric. This landscape has been buried beneath alluvium and subsequently very thick deposits of made ground used in the reclamation of the marsh.

10.40 The underlying terrace gravels lie at 8.7–9.7m below ground level (mbgl) as identified in three historic British Geological Survey (BGS) boreholes, the depths here presented in a range concurrent with the Preliminary Risk Assessment. Within one borehole, the gravel deposits lie much deeper at 11.0mbgl, likely indicating the presence of a deep palaeochannel. Similar subsurface topography has been identified in other geotechnical surveys 210m and 865m west of the application site, indicating the presence of braided channels within the River Thames floodplain.

10.41 The boreholes indicated that the top of alluvium overlying the gravels is at –1.9 to –4.5m OD (5.5–7.9mbgl). It is not clear why the levels of the surface of the alluvium vary as the floodplain surface would have been flat.

10.42 Between the top of alluvial deposits and current ground level there are very thick undated made ground deposits. These are likely to comprise of redeposited alluvium with other materials forming successive dumping and reclamation layers.

Past Archaeological Investigations

10.43 No archaeological investigations have been carried out within the application site. There is little understanding of the human archaeological potential of the New Charlton area because, other than a number of geoarchaeological and foreshore surveys, only one archaeological evaluation has taken place within the 1km study area to date. This comprised an evaluation 660m south of the application site at Victoria Way, which uncovered post-medieval plough marks along with worked and fire-cracked undated prehistoric flint.

10.44 Conversely the geoarchaeological potential and subsurface topography of the application site is well understood. Five of the past investigations, including those closest to the application site at Lombard Wall (215m to the west), comprised geoarchaeological surveys which have been used to produce subsurface deposit models, which indicate braided channels of the former course of the River Thames. One investigation, 230m north of the application site comprised a foreshore survey, which recorded timbers related to 19th century ships of the line.

Chronological Summary

10.45 The history of the application site has been dominated by its proximity to the River Thames. From the prehistoric to later medieval periods, the application site would have likely lain within the braided channels of the River Thames floodplain, interspersed with gravel eyots. Whilst the more marshy areas would have been exploited for wetland resources such as fish, fowl, and game, the raised eyots would have possibly formed centres of occupation and dryland activity. It is possible that in the prehistoric period, these gravel eyots were connected by timber trackways, such as that found during an investigation at Black Wall Lane. Evidence of alder carr scrubland has also been identified in nearby investigations.

10.46 The focus of Iron Age to Roman activity would have been a considerable distance to the east of the application site in the vicinity of Woolwich Power Station, approximately 2.2km east of the application site. This comprised a possible *'oppidum'* site (a fortified town) identified by two 3m deep ditches, surrounding an area of 15–17 acres with evidence for two roundhouses and a collection of pits. The *oppidum* would have remained the main focus of settlement, and possibly controlled the Roman road which ran to the south, along the gravel embankment towards Greenwich and the temple complex located there.

10.47 During the early medieval period, Charlton was comprised of two manors held by the brothers Godwine and Alweard. The location of the manors is unknown, but the main settlement likely lay in the vicinity of the later medieval settlement, 1.1km south of the application site. To the south-west of the application site, a possible Saxon cemetery was uncovered in the vicinity of Greenwich Park. During the later medieval period it is likely that the marshland began to be drained and reclaimed, initially with the construction of river embankment walls and drainage channels dug around parcels of land. The purpose of reclamation would have been primarily economic, providing good-quality grazing for livestock and fertile land for crops. Reclamation is likely to have taken place in stages, with a number of successive river walls constructed as more of the marshland was reclaimed out from the edge of the higher ground.

10.48 The application site lay within open reclaimed marshland for much of the post-medieval period. It lay adjacent to the east of Manor Way (now Anchor and Hope Lane), which was almost certainly a flood defence embankment which would also have been used as a drove road for transporting livestock down into the marsh. A lane to the east is probably also a river wall. These were typically constructed along the lines of creeks/fleets across the marsh. No such creek is shown on historic maps within the application site, although it is likely that it had silted up and/or was infilled by this period.

10.49 The application site remained in open fields until the early 20th century. The majority of activity in the late-19th century took place along the Thames foreshore to the north of the application site, with the construction of several wharves, at which time the eastern part of the application site was occupied by a small rail route from the Charlton Ballast pits to the south (in the area currently occupied by the Charlton Athletic Football Club stadium). By 1916 the application site was converted into allotment gardens before becoming industrialised in the mid-20th century. The eastern extent of the application site was occupied by a rope manufactory and covered ropewalk which extended south, beyond the application site boundary. An internal track system was constructed to move materials between the manufactories in the vicinity. The application site retained this appearance until around the 1980s when the rope manufactory was replaced by light industrial buildings.

Factors Affecting Archaeological Survival

10.50 Archaeological survival will be high for early remains due to the deep sequence of alluvial deposits and the 5.5–7.9m thick undated dump deposits above, which will have buried (and protected) any early remains within and beneath the alluvium.

10.51 The foundations of the late 20th century industrial units are likely to be slab or pad foundations owing to the design and nature of the buildings, and would have removed the top levels of post-medieval archaeological remains within their footprints.

10.52 Owing to the thick made ground deposits on the application site, any earlier and more deeply buried remains contained within alluvial deposits would be well preserved and intact.

10.53 Any post-medieval archaeological remains relating to the industrial use of the application site would be likely to lie immediately beneath modern ground levels. Earlier remains, including palaeoenvironmental remains, would be expected to lie beneath made ground deposits, 5.5m-7.9mbgl. Prehistoric remains such as fishtraps and hulked boats would be at the base of the alluvium, at a possible depth of 8.7–9.7mbgl (or deeper).

Sensitive Receptors

Existing Sensitive Receptors

Palaeoenvironmental remains

10.54 The application site has a high potential for palaeoenvironmental remains. For much of the application site's history it has lain within open marshland in the River Thames floodplain. BGS boreholes indicate the presence of deep deposits of alluvium with possible peat horizons associated with the former

intertidal marshes on the River Thames floodplain. Such deposits of peat have a high potential to preserve palaeoenvironmental evidence (pollen, plant macro fossils), which if present can be utilised to reconstruct the past palaeoecology of the floodplain and environments within which prehistoric occupation occurred. Any fluvial and estuarine deposits also have the potential to preserve palaeoenvironmental remains (ostracods, foraminifera, diatoms) which can be utilised to reconstruct the past fluvial regimes and indicate the onset of tidal inundations and the transition to an estuarine river environment. Such remains would be considered to be of low or medium significance, derived from the evidential value of the remains.

Prehistoric remains

10.55 The application site has a moderate potential for prehistoric remains. There has been very little archaeological investigation in the area and the potential for this period is uncertain and based largely on assumptions about the floodplain environment. The application site's location at the edge of a palaeochannel of the River Thames would not have been attractive for early human settlement, which is likely to have been located further south on the Chalk terrace. Despite this, the predictable resources of the River Thames floodplain would have been exploited for fish, fowl and game. The landscape at the time would have comprised gravel eyots within deeper marshes and river channels, and efforts to make these accessible, such as the Bronze Age trackway at Blackwall Lane, would have been undertaken. Any evidence of such wetland exploitation would be considered to be of medium significance based on their evidential value, and could include trackways, boats, mooring points, and fishtraps. Such remains would, however, be deeply buried at the base of and within alluvial deposits (5.5–7.9m bgl to 8.7–9.7m bgl).

Roman and medieval remains

10.56 The application site has a low potential for Roman, and medieval remains. Current evidence for the Roman period is very limited within the study area. Although there is evidence in the wider area for Late Iron Age to Roman occupation in the form of a possible temple complex at Greenwich Park, an oppidum at Woolwich, and a fort in Maryon Wilson Park, these sites are all confined to the higher gravel terrace. As previously noted, within the preceding period, the application site would have lain within marshland or the river channel and would not have been attractive for settlement During the early and later medieval periods, the application site would have lain within the manor of Charlton. The principal area of settlement is likely to have been located to the south, in the area of Charlton Village on the gravel terrace; the application site itself would have lain within the floodplain of the River Thames. As in preceding periods, the application site might have been exploited for wetland resources, or used as pastoral land. It is therefore unlikely that the application site would contain roman and medieval remains.

Post-medieval remains

10.57 The application site has a moderate potential for post-medieval remains. Early historic mapping shows the application site was occupied by open field in the 18th century, following successive land reclamation and wetland management schemes. Whilst evidence of post-medieval reclamation dumps would be considered of very low significance, evidence of wetland management, such as timber revetments and drainage channels would be considered of low significance, derived from evidential and historical values.

10.58 The application site has a high potential for post-medieval industrial remains. The application site was developed in the mid-20th century into a rope manufactory (possibly replacing an earlier manufactory along the foreshore to the north-west). This comprised a large building and part of the rope walk in Plot A, and a yard area in Plot B. The manufactory was connected to surrounding industrial processes and a foreshore jetty by an internal railway system. The railway reached the foreshore along the northern projection of the application site. Any such remains would be considered to be of very low or low significance based on their evidence of the industrial history of the Charlton foreshore area.

New Sensitive Receptors

10.59 As archaeology is a buried, historic resource, there will be no new receptors (assets) as a result of the proposed development. Those assets identified as likely to be on the application site and considered further in this assessment are presented in Table 10.6.

Table 10.6: Likely assets present on the application site

Asset	Potential	Asset Significance
Palaeoenvironmental remains within alluvial deposits	High	**Low** or **Medium**
Post-medieval industrial remains	High	**Very Low** or **Low**
Post-medieval wetland management such as timber revetments and reclamation dumps (Moderate potential; high for dumps)	Moderate (High for dumps)	**Low** (very low for reclamation dumps)
Evidence of prehistoric wetland exploitation	Moderate	**Medium**

Potential Effects

Demolition and Construction

10.60 The proposed development entails the demolition of the existing buildings and the erection of nine buildings ranging from two to 28 storeys in height for residential use, employment space and flexible space comprising retail, café/restaurant, community use and leisure at ground floor and first floor level. The application site would have a new basement located within Plot A. This would extend 2.4mbgl (1.15m OD), with an assumed extra 0.5m basement slab, bringing the formation level to 0.65m OD (2.9mbgl).

10.61 The buildings will have piled foundations, and it is anticipated that the piles will be driven using continuous flight auger (CFA), rotary bored piles or 'vibrationless' sheet piling techniques.

10.62 The identification of physical impacts on buried heritage assets within the application site takes into account any activity which would entail ground disturbance, for example site set up works, remediation, landscaping and the construction of new basements and foundations.

Preliminary Site Works

10.63 Works carried out as part of the initial site set up, including preliminary site stripping and demolition, the installation of site fencing and welfare facilities, was assumed for the purposes of this assessment to cause ground disturbance to a maximum depth of 0.5mbgl.

10.64 This would extend the works into undated made ground, which potentially contains remains of archaeological interest, and would entirely remove any remains to this excavation depth. This would include any remains of the mid-20th century industrial buildings that occupied the application site, of low or very low heritage significance. Impacts arising from the initial site works would be considered a medium magnitude of change, resulting in a Minor Adverse effect.

New Basements

10.65 The construction of the new basement level would entirely remove any archaeological remains within its footprint contained within the made ground levels. These would be likely to comprise remains of the mid-20th century industrial buildings, and earlier post-medieval water management features (of low or

very low significance) that might be present. Earlier remains within the underlying alluvial deposits would not be affected.

10.66 The construction of a new basement would be considered a high magnitude of change for post-medieval remains removed from within the footprint of the basement, resulting in a Minor Adverse effect.

New Piled Foundations

10.67 Any archaeological remains within the footprint of each pile would be removed as the pile is driven downwards. A piling layout at 3m intervals is anticipated, with piles of 600mm–900mm diameter, leaving any archaeological remains potentially preserved between each pile.

10.68 The buildings will have piled foundations, and it is anticipated that the piles will be advanced using continuous flight auger (CFA), rotary bored piles or 'vibrationless' sheet piling techniques.

10.69 The insertion of pile caps and connecting ground beams, along with the excavation of a pile guide trench, typically extend no more than 1.0–1.5mbgl and would remove any archaeological remains within the footprint of these works to this depth. The assets affected comprise of the following:

- Palaeoenvironmental remains of low or medium significance (high potential) – Regardless of piling details, this asset is extensive across the River Thames floodplain and the magnitude of change would therefore to be low, resulting in a Minor Adverse effect.
- Prehistoric remains of medium significance (moderate potential) – Without the details of the piling, a medium magnitude of change has been assumed for the pile footprints and deformation of surrounding deposits. Should such remains be present, this would result in a Moderate Adverse effect.

10.70 It should be noted however that the above assets are deeply buried and for the prehistoric assets their presence, nature and extent is uncertain.

Summary of Potential Effects

10.71 Table 10.7 below provides a summary of the predicted environmental potential effects on buried heritage assets prior to mitigation.

Table 10.7: Summary of Potential Effects

Buried Heritage Asset	Asset Significance	Magnitude of Change	Significance of Potential Effect
Palaeoenvironmental remains within alluvial deposits (High potential)	Low or Medium	Low – new piled foundations would locally remove remains within their footprints, for a resource that extends across much of the floodplain	Minor Adverse
Post-medieval industrial remains (High potential)	Very Low or Low	High – preliminary site strip and excavation of new basement level.	Minor Adverse
Post-medieval wetland management such as timber revetments and reclamation dumps (Moderate potential; high for dumps)	Low (very low for reclamation dumps)	High – preliminary site strip and excavation of new basement level. New piled foundations would locally remove any remains within their footprints	Minor Adverse

Table 10.7: Summary of Potential Effects

Buried Heritage Asset	Asset Significance	Magnitude of Change	Significance of Potential Effect
Evidence of prehistoric wetland exploitation (moderate potential)	Medium	Medium – new piled foundations would locally remove remains within their footprints.	Moderate Adverse

Mitigation and Residual Effects

Demolition and Construction

10.72 It is considered that the potential environmental effects of the proposed development could be successfully mitigated by a suitable programme of archaeological investigation before and/or during construction, to achieve preservation by record (through advancing understanding of asset significance).

10.73 Geoarchaeological boreholes, sampling and subsurface deposit modelling would serve as a feasible mitigation strategy for very deeply buried remains affected by piling. This would clarify the nature of the subsurface topography of prehistoric and later landscapes and past environments of the River Thames floodplain.

10.74 This would mitigate the Minor Adverse effect on palaeoenvironmental remains, reducing it to **Negligible**.

10.75 Geoarchaeological boreholes and subsurface deposit modelling would also reduce any adverse effects on deeply buried possible prehistoric remains to **Minor Adverse** residual effect. It would not remove the adverse effect on these assets (if they were found to exist), but considering the localised nature of the impact and the depth of the deposits, it would not be justifiable or indeed feasible to mitigate the effect entirely through archaeological excavation. To reduce the residual effect to negligible would require battering/stepping/or shoring that would result in a much greater area of excavation being needed.

10.76 It is considered that as the Minor Adverse effects arising from post-medieval reclamation dumps and industrial remains are not significant, no mitigation is required owing to the low significance of the assets. Therefore, the effect for both receptors remains as **Minor Adverse** residual effects.

Summary of Mitigation and Residual Effects

10.77 Table 10.8 and Table 10.9 provide a tabulated summary of the outcomes of the Archaeology Impact Assessment of the proposed development.

Table 10.8: Summary of Proposed Mitigation and Enhancement Measures

Receptor	Description of Potential Effect	Proposed Mitigation & Enhancement Measures
Demolition and Construction		
Palaeoenvironmental remains within alluvial deposits	New piled foundations would locally remove remains within their footprints. (Minor Adverse)	Preservation by record – to comprise a geoarchaeological borehole survey and sub- surface deposit model to greater understand the nature of the underlying

Table 10.8: Summary of Proposed Mitigation and Enhancement Measures

(High potential)		geology and topography, and any potential prehistoric landscapes. The significance of post-medieval remains on the application site is not sufficient to warrant recording.
Post-medieval industrial remains (High potential)	Preliminary site strip and excavation of new basement level. (Minor Adverse)	
Post-medieval wetland management such as timber revetments and reclamation dumps (Moderate potential; high for dumps)	Preliminary site strip and excavation of new basement level. New piled foundations would locally remove any remains within their footprints (Minor Adverse)	
Evidence of prehistoric wetland exploitation (Moderate potential)	New piled foundations would locally remove remains within their footprints. (Moderate Adverse)	

Table 10.9: Summary of Residual Effects

Receptor	Description of Residual Effect	Nature of Residual Effect*					
		Significance**	+ -	D I	P T	R IR	St Mt Lt
Demolition and Construction							
Palaeoenviron-mental remains within alluvial deposits (High potential)	Asset locally removed by new piled foundations	Negligible	-	D	P	IR	Lt
Post-medieval industrial re-mains (High potential)	Asset severely truncated by site strip, entirely removed within footprint of proposed basements, and locally removed by new piled foundations.	Minor	-	D	P	IR	Lt
Post-medieval wetland man-agement such as timber revet-ments and rec-lamation dumps (Moderate potential; high for dumps)	Asset severely truncated by site strip, entirely removed within footprint of proposed basements, and locally removed by new piled foundations.	Minor	-	D	P	IR	Lt
Evidence of pre-historic wetland exploitation (moderate potential)	Asset locally removed by new piled foundations	Minor	-	D	P	IR	Lt

Notes:
* - = Adverse/ + = Beneficial; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term.
**Negligible/Minor/Moderate/Major

Likely Significant Environmental Effects

10.78 Following an appropriate mitigation strategy such as that outlined above, there would be no likely significant environmental effects arising from the impacts of piling on buried heritage. If found during construction works, appropriate mitigation measures will be undertaken as outlined above.

Cumulative Effects

10.79 An assessment of cumulative effects has been scoped out based on professional judgement. Cumulative effects are 'elevated' effects which occur where the combined effect of the proposed development with other proposed schemes in the vicinity, on a discrete and significant shared asset/resource, is more severe than that reported at the proposed development site. The reason for the scoping out is that, for intangible and deeply buried heritage assets, it is not feasible to quantify accurately the nature of the resource across the assessment study area and therefore not possible to identify any cumulative impact or potential elevated effect.