

Appendix 1: ES Addendum Appendix Replacement Chapters to the October 2021 ES

Replacement Chapter 11: Archaeology

Replacement Chapter 12: Water Resources, Drainage and Flood Risk

Replacement Chapter 14: Daylight, Sunlight, Overshadowing

Replacement Chapter 15: Effect Interactions

SUMMARY OF CHANGES – APRIL 2022

This chapter (and its associated appendices) has been updated in its entirety following the change to the project team (in terms of the Archaeological Consultant) and therefore has been completely re-written. It takes into account the revised red line (i.e., incorporating Jolly's Green) and other amendments to the Proposed Development as described in the main document of the ES Addendum.

Archaeology (Buried Heritage)	
AUTHOR	MOLA
SUPPORTING APPENDIX	ES Volume 3; Appendix: Archaeology (Buried Heritage): Annex 1: Archaeology Desk Based Assessment Supplement and Geoarchaeological deposit model (MOLA) Annex 2: Correspondence with GLAAS confirming study area.
KEY CONSIDERATIONS	The site is located in a Tier 3 Archaeological Priority Area ('APA'), Lea Valley, which is an extensive area containing potential paleoenvironmental evidence for past wetland and riverine environments. The main potential is for paleoenvironmental remains within the underlying alluvium, prehistoric remains and post-medieval remains of building foundations shown on historic maps from the late 18th century. This chapter has considered the potential effects resulting from the demolition and construction of the Proposed Development on the following potentially sensitive receptors: <ul style="list-style-type: none"> • Paleoenvironmental remains, • Buried prehistoric remains, • Later medieval and post medieval agricultural remains, and • late 19th century onwards structural remains.
CONSULTATION	An EIA Scoping Report was prepared and submitted to the London Borough of Tower Hamlets (LBTH) in August 2021 requesting a formal Scoping Opinion. LBTH's Scoping Opinion was issued on 8 September 2021. This assessment addresses the points raised in LBTH's Scoping Opinion which are of relevance to Archaeology (Built Heritage). As part of the EIA Scoping Process, Historic England, as adviser to LBTH, was consulted and (by email dated 25/08/2012) has indicated that the ES should be informed by submissions as follows: <ul style="list-style-type: none"> • An up to date archaeological desk-based assessment ("DBA"); • A geoarchaeological model of the Site and surroundings using existing data and prepared by a recognised geoarchaeological specialist; • An assessment of the proposed development's impact using the DBA and the geoarchaeological model; • Results of any further pre-submission fieldwork, as agreed with GLAAS, following the completion of the model and impact assessment; and • A mitigation programme that includes appropriate public benefits.

ASSESSMENT METHODOLOGY

Defining the Baseline

Current Baseline Conditions

- 11.1** The methodology and sources consulted for the baseline characterisation of the site, i.e. consideration of the potential for archaeological remains (buried heritage assets) to be present in the site, are set out in detail in the archaeological desk based assessment (DBA) provided in **ES Volume 3, Appendix Archaeology – Annex 1**. In summary, this entailed:
- The collection and assessment of information on known historic environment features within a study area considered through professional judgement to be appropriate to characterise the historic environment of the site. After consultation with Adam Single and Helen Hawkins (email 14/02/2022) from the Greater London Archaeological Advisory Service ('GLAAS'), a 750m-radius study area was considered appropriate. The study area comprises data from the primary repositories of such information including the Greater London Historic Environment Record ('GLHER'), Historic England and the Museum of London Archaeological Archive;
 - Consultation of a broad range of relevant documentary and cartographic sources, including published histories and journals, British Geological Survey ('BGS') data, available geotechnical data and historic maps; and
 - A site visit was conducted on 27 November 2020 by the previous consultant in order to determine the topography of the application site and existing land use, the nature of any existing buildings, and to provide further information on areas of potential past ground disturbance and general historic environment potential.

Photographs taken during the visit have been viewed by the current consultants. Although the site visit did not cover Jolly's Green, which at that time was not included in the site outline, for the purpose of the current assessment this area was viewed through Google Street View, and an additional site visit was not considered necessary.

- 11.2** The National Planning Policy Framework (NPPF)¹ defines a heritage asset as a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Significance (i.e. 'sensitivity') lies in the value of a heritage asset to this and future generations because of its heritage interest, which may be archaeological, architectural, artistic or historic^{2,3}. The determination of the significance of archaeological assets is based on statutory designation and/or professional judgement against four values set out in English Heritage's (now Historic England) Conservation Principles:
- Evidential value: the potential of the physical remains to yield evidence of past human activity. This might 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 assets to the present, such a connection often being illustrative or associative; and
 - 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 and educational, social or economic values.
- 11.3** There is no single defining criterion that dictates the overall asset significance; each asset has to be evaluated using professional judgement against the range of criteria listed above on a case-by-case basis. Evolution of the Baseline
- 11.4** The evolution of the baseline is not relevant to the assessment of archaeology, as there would be no change expected to the below ground conditions on-site prior to the Proposed Development's demolition and construction works commencing, and therefore any archaeological remains would remain as per the existing baseline condition.
- 11.5** In relation to the wider understanding of archaeology in the area, should new information come to light in the course from any archaeological works in the study area, this may enhance the understanding of the baseline conditions at the site.

Impact Assessment Methodology

Demolition and Construction

- 11.6** Impacts on archaeological remains occur during the demolition and construction phase where ground disturbance takes place. They are limited to the area of the physical impact and are permanent. Such impacts and their resulting effects are assessed within this ES chapter, for which the assessment methodology is set out below.

Completed Development

- 11.7** Any potential impacts and effects on buried heritage assets will occur as a result of ground disturbance during enabling, demolition and construction works. No impacts or effects will occur on buried heritage assets on completion of the Proposed Development since no further ground disturbance will occur. There is therefore no need to further consider the completed Proposed Development in respect of buried heritage assets within this ES Chapter.

¹ Ministry of Housing, Communities and Local Government], 2021 National Planning Policy Framework

² Historic England. Conservation Principles, Policy and Guidance for the Sustainable Management of the Historic Environment. 2008

³ Historic England. Conservation Principles for the Sustainable Management of the Historic Environment, Consultation Draft, 10th November 2017. <https://content.historicengland.org.uk/content/docs/guidance/conservation-principles-consultationdraft>

Assumptions and Limitations

- 11.8 The assessment relies on available data, and best endeavours have been made to ensure that these are accurate and up to date. It is assumed that information on the GLHER database is accurate. However, whilst compiling the baseline a process of review and validation of the GLHER data has taken place (for example ensuring assets are correctly located, and undertaking further research, where appropriate, into GLHER entries with little information).
- 11.9 The main limitation to the assessment is the nature of archaeological and palaeoenvironmental remains, i.e. buried and not visible, which means it can be difficult to predict definitively the presence, extent and significance of buried heritage assets, and consequently the impact upon them. Notwithstanding this limitation, the methodology is considered robust, utilising reasonably available information, and conforms to the requirements of local and national guidance and planning policy.
- 11.10 It follows that heritage assets which are considered through professional judgement to be highly unlikely to be present in any part of the site (low potential) are not assigned a level of significance, nor are such assets included in the assessment of impacts and effects, since this would be a disproportionate response to the Proposed Development.

Phasing

- 11.11 Potential impacts on archaeological remains are the same through each of the demolition and construction phases. Once construction is complete there are no further adverse impacts to consider, but potential positive impacts endure (discussed further below).

Methodology for Defining Effects

Identification of Receptors and Receptor Sensitivity

- 11.12 In line with the NPPF, for the purposes of this ES chapter, archaeological ‘receptors’ are referred to as ‘buried heritage assets’, and heritage ‘significance’ is used in place of ‘sensitivity’. The use of heritage ‘significance’ and ‘significance of (environmental) effect’ are clearly differentiated throughout.
- 11.13 **Table 11.1** describes the significance of designated and non-designated buried heritage assets as applied in this assessment.

Table 11.1 Significance (Sensitivity) of Buried Heritage Assets

Asset Significance (Sensitivity)	Buried Heritage Assess
Very High	World Heritage Site Other Assets of recognised international importance Heritage assets that contribute to international research objectives
High	Scheduled Monuments Undesignated heritage assets demonstrably of equivalent significance to a Scheduled Monument Heritage assets that contribute to national research objectives
Medium	Heritage assets that contribute to regional research objectives
Low	Heritage assets of local interest Heritage assets whose value is compromised by poor preservation
Negligible	Assets with little or no archaeological interest

Magnitude of Impact

- 11.14 Determination of magnitude of impact (i.e. 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 11.2** describes the criteria used in this assessment to determine the magnitude of change.

Table 11.2 Defining Magnitude of Impact

Magnitude of impact	Criteria
Major	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.
Moderate	Change to asset significance resulting in a considerable 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.
Minor	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.

Defining the Effect

- 11.15 Adverse effects are those which cause harm to, or loss of, the significance of a heritage asset as a result of changes to its physical form or setting.
- 11.16 Negligible effects cause no material change to the significance of a heritage asset.
- 11.17 Beneficial effects are those which enhance a heritage asset’s significance as a result of changes to its physical form or setting.
- 11.18 Buried heritage assets are finite and non-renewable. Effects arising from their removal are therefore usually adverse. An appropriate mitigation strategy would aim to eliminate, offset, or reduce to an acceptable level, any adverse effect.

Effect Scale

- 11.19 The scale of the potential environmental effect is determined by comparing the significance value of the baseline heritage asset with the magnitude of impact (change) upon that asset as a result of the Proposed Development and are presented without mitigation. The potential effects may be either adverse (negative) or beneficial (positive). The matrix for determining the scale of this effect is presented in **Table 11.3**. Where information is insufficient to quantify the asset significance or magnitude of change, the scale of the effect is given as ‘uncertain’.

Table 11.3 Effect Matrix

Heritage Asset Significance	Magnitude of impact				
	High	Medium	Low	Negligible	Uncertain
Very High	Major	Major	Moderate	Minor	Uncertain
High	Major	Major	Moderate	Minor	Uncertain
Medium	Major	Moderate	Minor	Negligible	Uncertain
Low	Moderate	Minor	Minor	Negligible	Uncertain
Negligible	Minor	Minor	Negligible	Negligible	Uncertain

- 11.20 **Table 11.4** describes each scale of effect.

Table 11.4 Description of Effect

Scale and Nature of Effect	Description
Major adverse	Substantial harm to, or loss of, significance of an asset of very high, high or medium heritage significance, as a result of changes to its physical form or setting.
Moderate adverse	Less than substantial harm to the significance of an asset of very high, high or medium heritage significance, as a result of changes to its physical form or setting.

Minor adverse	Limited harm to the significance of an asset of very high, high or medium heritage significance, as a result of changes to its physical form or setting, or substantial harm to, or the loss of, significance of an asset of low or very low heritage significance.
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 enhancement 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.

- 11.21** If any potential adverse effects are identified, an appropriate mitigation strategy is then considered with the aim of reducing or offsetting the effect. Measures to offset adverse effects on archaeology normally consist of design adjustments, to allow significant resources to be protected and retained (preservation in situ) or, where this is not necessary or feasible, investigation and recording before and during development, with dissemination at an appropriate level (preservation by record).
- 11.22** As heritage 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/lost without record. The level of mitigation/off-setting proposed is, in each case, proportionate to the significance of the asset being affected and based on professional judgement.
- 11.23** Based upon the information presented within **ES Volume 3, Appendix Archaeology – Annex 1**, appropriate mitigation / offsetting measures are identified, and the resulting residual environmental effect is re-assessed using **Table 9.3**.

Geographic Extent of Effect

- 11.24** The geographic extent of the effects is also identified. At a spatial level, 'site' or 'local' effects are those affecting the site and neighbouring assets - effects to archaeological assets are typically limited to the area of the physical impact, i.e. the site area. Depending on the significance of an archaeological asset identified on site, the effects upon archaeological resources could result in a wider geographic extent, i.e. at a 'district / borough' (LBTH) level; at a 'regional/county' (Greater London) level; whilst those which affect different parts of the country, or England, are considered being at a 'national' level.

Effect Duration

- 11.25** Although impacts on archaeological remains only occur during the demolition and construction phases, the resulting effects are permanent.

Direct and Indirect, Reversible or Irreversible Effects

- 11.26** The below assessment also identifies whether the effect is 'direct' (i.e. resulting without any intervening factors) or 'indirect' or 'secondary' (i.e. not directly caused or resulting from something else).
- 11.27** Any effects to archaeological remains will be irreversible.

Categorising Likely Significant Effects

- 11.28** Significant environmental effects are those that are categorised as either moderate or major in scale. Effects that are not significant are minor or negligible in scale.
- 11.29** Where the effect is uncertain, further work may be needed to clarify the anticipated effect.

BASELINE CONDITIONS

Current Baseline Conditions

- 11.30** The site lies within the Tier 3 Archaeological Priority Area (APA), 3.2 River Lea, an extensive area containing potential palaeoenvironmental evidence from past wetland and riverine environments. The main potential for palaeoenvironmental remains within the underlying alluvium and prehistoric remains as the site is on the 'low

terrace' of the River Lea floodplain and would once have been dry ground favourable for settlement and exploitation of the nearby marshes and river. Post-medieval remains of building foundations shown on historic maps from the late 18th century onwards are also expected.

Topography and Geology

- 11.31** In general, the topography slopes down from the north-west to the east and south, down into the River Lea and River Thames. It drops from a high of c 9.2m Ordnance Datum c 670m to the north-west to c 2.4m OD c 760m to the south on Blackwall Way and c 1.8m OD c 50m to the east at the junction of Level Road and Oban Street. Closer to the site, the ground level drops from c 5.5m OD c 10m to the west of the site down to c 1.9m in the south-easter corner and c 3.7m OD c 25m to the east of the site in the north-east.
- 11.32** The site lies at the margins of the River Lea and Thames floodplains, near the confluence of the two rivers. The topography is dominated by sandy gravels of the Shepperton Gravel formation, grading up to Kempton Park river terrace gravels taken to lie at and above approximately 0m OD in this part of the lower Thames valley (Stafford et al 2012). The gravels, sometimes capped with early Holocene sand deposits, lie between 0 and -1m OD across the bulk of the site, although dipping close to -3m OD in the southeast and rising to +3m OD in the northwest and western extreme of the site. No brickearth deposits appear to survive across the site.

Archaeological and Historical Context

- 11.33** The following section provides a summary of the findings of the DBA provided in **ES Volume 3, Appendix Archaeology – Annex 1**.

Palaeoenvironmental

- 11.34** The site would have been a rich river marginal (ecotonal) resource and entirely accessible throughout the bulk of the prehistoric. The site area would have become slowly inundated due to sea level rise by the later Bronze Age although the higher areas of gravel would have remained high and dry into the Historic period, possibly forming foci for human exploitation. Therefore, there would be a low potential palaeoenvironmental remains in the northern part of the site and along the southern part of the arm to the south-east and moderate potential across the rest of the site.

Prehistoric (800,000 BC–AD 43)

- 11.35** There is a low potential for artifacts and waterlogged remains, such as jetties, within northern part of the site and along the southern part of the arm to the south-east but a moderate potential across the rest of the site and moderate potential for evidence of settlement across the whole site. The site is located at the margins of the River Lea and Thames floodplains, near the confluence of the two rivers and as a consequence would have been close to a rich river marginal (ecotonal) resource and entirely accessible throughout the bulk of the Prehistoric. In the early Prehistoric higher areas of gravels would have been dry land suitable for settlement and other activity. In the later Prehistoric rising water levels would have meant that it would not have been a first choice for early settlers, although some of the higher areas would have remained extant well beyond the Prehistoric. Any evidence of such nature would potentially be well preserved due to the waterlogged conditions of the site. The significance of Prehistoric remains would low, for isolated finds, medium for cut features, such as drainage ditches and high for evidence of occupation (including jetties, boats etc) depending on level of survival. This is based on their likely evidential value in providing evidence of past environments and human activity.

Roman

- 11.36** The site has low potential to contain Roman remains. The site would have lain in intertidal marshland and prone to flooding throughout this period, some distance from known settlement and the main Roman road. There is, however, some potential for evidence of economic exploitation of the marshland resources, as recorded elsewhere in the Lower Thames Estuary (e.g. salt manufacture and fish processing sites), although there is currently no evidence to suggest that this was being carried out on the site or in the vicinity.

Early Medieval (Saxon)

11.37 The site has a low potential to contain early medieval (Saxon) remains. Like the Roman period, the site would have lain in intertidal marshland and prone to flooding throughout this period, some distance from known settlement and the main Roman road. It is probable that economic exploitation of the marshland resources, as recorded elsewhere in the Lower Thames Estuary (e.g. salt manufacture and fish processing sites), although there is currently no evidence to suggest that this was being carried out on the site or in the vicinity.

Later Medieval

The site has a moderate potential to contain later medieval remains. Like the two previous periods, the site would have lain in intertidal marshland and some distance from known settlements. However, throughout this period reclamation of the marshes proceeded and there has been evidence of such work being undertaken in the form of drainage ditches. Economic exploitation of the marshland resources developed and the certainly at the end of this period the area was being utilised for agriculture. The significance of later medieval remains is low, based on their likely evidential value in providing evidence of past human agricultural activity.

11.38 The site has a high potential for structural remains dating from the late 19th century. Use of the site varied during the post-medieval period going from agricultural to residential following the growth of Stratford in the late 19th century. The significance of post-medieval remains would be low, based on their likely evidential and historical value in providing evidence of the historic development of the area.

Geoarchaeological Evaluation and Deposit Model Report – A Summary

11.39 A Geoarchaeological deposit model report has been carried out (Spurr G. MOLA, 2022) and is located in **ES Volume 3, Appendix Archaeology – Annex 1⁴**. The deposit model was designed to confirm the depths of natural deposits, the extent and depth of modern disturbance, the palaeoenvironmental potential of the site and the potential for archaeological remains. The results have been used to inform the assessment of the significance of any archaeological assets recorded or of further assets likely to be present, and to inform the assessment of the impact of the proposals upon them. The conclusions of the deposit model are set out below to provide further context on the existing archaeological baseline.

11.40 No geotechnical data was available for the whole site so the geoarchaeological deposit model used nearby data points to infer the geology of the site. Modelling software (RockWorks 17, Surfer 10) has been used to create two-dimensional deposit models of the buried topography and overlying strata on the application site (in cross-section and plan). The modelling software has been used to interrogate geotechnical data provided (Campbell Reith 2015) along with readily available BGS geological information and MOLA data from previous archaeological investigations in the area. These data sources were used to map and characterise sub-surface deposits and former land surfaces within the application site and to provide an assessment of whether they are of potential archaeological/palaeoenvironmental interest.

11.41 Based on the data the resulting model shows that the site can be split into two landscape zones (LZ), i.e. two zones of archaeological potential (refer Figure 11.1). LZ 1 lies in the northern part of the site and along the southern part of the arm to the southeast. LZ 1 has been identified as the area with the lesser (low to moderate) palaeoenvironmental and archaeological potential being defined largely by areas of the gravel topography greater than 0m OD and where no Holocene deposits survive. LZ 2 tends to dominate the southern half of the site and smaller areas to the extreme southeast and north. This zone lies below the 0m OD contour and, coupled with the presence of clays and peats recorded in some of the boreholes within this zone, represents an opportunity for better Holocene deposit survival. Overall LZ 2 is considered to have greater (moderate to high) palaeoenvironmental and archaeological potential.

Palaeoenvironmental Survival

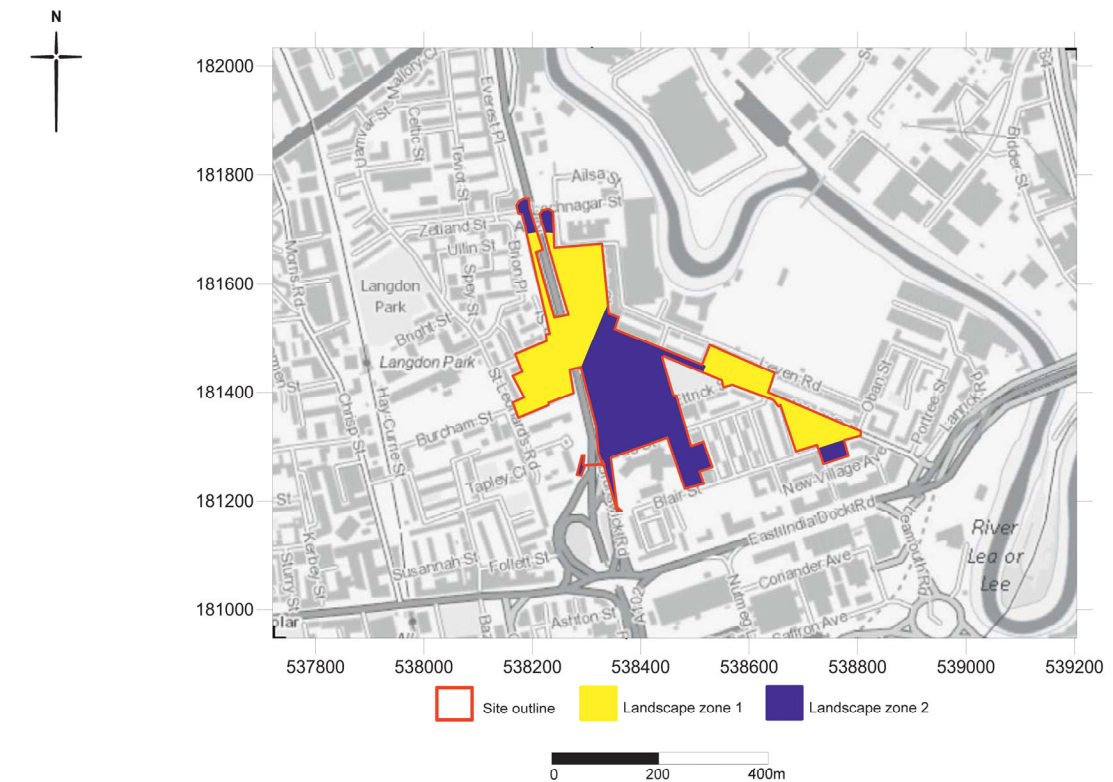
11.42 Based on the results of the geoarchaeological assessment, within LZ 1 there is a low potential for the survival of palaeoenvironmental remains within the alluvium. However, there is a moderate potential within the area of

LZ 2. The significance of general background palaeoenvironmental remains would be low but the significance of extensive layers of peat and other organic remains would be medium, based on their likely evidential value in providing evidence of past environments and human activity.

Archaeological Survival

11.43 Based on the results of the Archaeological Desk-Based Assessment and the 2022 Geoarchaeological Deposit Model, it is considered that the site has a mixed potential for remains from the prehistoric period. In LZ1 there is a moderate potential for evidence of early occupation but a low potential for the survival of artifacts such as timber structures due to the area remaining dry longer. Whereas in LZ2 there is a moderate potential for artifacts given that it became waterlogged earlier potentially having a higher preservation potential. Across both zones there is a moderate potential for isolated artifacts. The site has a low potential for remains from the Roman and Saxon periods, a moderate potential for later medieval and post-medieval agricultural features and high for late 19th century onwards structural remains across the site.

Figure 11.1 Geoarchaeology Landscape Zones



ASSETS (RECEPTORS) AND SIGNIFICANCE (RECEPTOR SENSITIVITY)

Existing

11.44 Table 11.5 lists buried heritage assets that may be affected by the Proposed Development.

Table 11.5 Known and Likely Buried Heritage Receptors⁵

Asset	Asset Potential	Heritage Asset Significance
General background Palaeoenvironmental remains within alluvial deposits	Low within LZ 1 but Moderate within LZ 2	Low significance, based on their likely evidential and historic value in providing information on past environments.

⁴ Spurr, G 2022 Aberfeldy Village, Archaeological Desk Based Assessment Supplement: Geoarchaeological deposit model, London: Museum of London

⁵ Note the potential and significance for each asset has been updated from that which was reported within the EIA Scoping Report in light of further desk based research and geoarchaeological evaluation that has been since undertaken.

Palaeoenvironmental (extensive strata of peat or other organic matter) remains within alluvial deposits	Low within LZ 1 but Moderate within LZ 2.	Medium significance, based on their likely evidential and historic value in providing information on past environments.
Prehistoric remains (isolated, scattered finds)	Low within LZ 1 but Moderate within LZ 2.	Low significance based on their likely evidential and historic value in providing information on past activity within the area.
Prehistoric remains (cut features, revetments etc)	Low within LZ 1 but Moderate within LZ 2.	Medium for cut features such as drainage ditches and high for evidence of occupation (including jetties, boats etc) depending on level of survival and evidential and historic value in providing information on past activity within the area.
Later medieval and post-medieval agricultural features	Moderate across the site.	Low significance depending on their type and extent, based on their likely evidential and historic value in providing information on past activity in the site.
Late 19th century onwards structural remains	High across the site.	Low significance, based on their likely evidential and historic value in providing information on past activity in the site.

Introduced

11.45 No new receptors (archaeological deposits or remains) can be introduced to the Site as part of the Proposed Development, although pre-construction fieldwork might reveal the presence of hitherto undetected remains.

POTENTIAL EFFECTS

Demolition and Construction

11.46 The Proposed Development comprises the following elements that are likely to have an impact upon the above discussed assets:

- Preliminary site works, including demolition of all existing buildings on site, breaking of floor slab, installation of fencing and welfare facilities;
- Pile probing and obstruction removal;
- The insertion of piled foundations, including secant pile wall;
- The construction of a single level basement; and
- The insertion of new services / utilities trenches / drains and landscaping i.e. new planting.

11.47 All impacts on archaeology would occur only during the demolition and construction phase.

Preliminary Site Works Including Demolition and the Breaking Out of the Existing Foundation Slab

11.48 Preliminary site works including, demolition and the breaking out of existing ground floor foundation slabs would likely only affect the upper levels of the made ground and relatively recent remains and therefore have a localised low magnitude of impact on remains of the mid-19th to mid-20th structural remains of low significance resulting in a **Minor Adverse effect (not significant)**.

11.49 The breaking out of basement floor slabs would have a similar impact, i.e. localised low magnitude on remains further down the stratigraphic sequence. Thus, the impact on the remains of high significance (evidence of prehistoric occupation, e.g. fishtraps, jetties etc) would be **Moderate Adverse** (significant); on medium (extensive organic remains, prehistoric cut features) and low (general background palaeoenvironmental remains and isolated prehistoric finds, later medieval and post-medieval agricultural features) significance would be **Minor Adverse (not significant)**.

Pile Probing and Obstruction Removal

11.50 The impact of pile probing and the removal of other buried obstructions such as foundations would depend on the size and density of the existing intrusions, which is currently uncertain, but such work could have a considerable archaeological impact in disturbing adjacent remains.

11.51 Pile probing and obstruction removal would be localised but have a localised Medium magnitude of impact on:

- Palaeoenvironmental remains of low significance resulting in a **Minor Adverse effect (not significant)**;
- Palaeoenvironmental remains (peat or other datable organic remains) of medium significance resulting in a **Moderate Adverse effect (significant)**;
- Isolated prehistoric remains of low significance resulting in a **Minor Adverse effect (not significant)**;
- Later medieval and post-medieval agricultural features of low significance resulting in a **Minor Adverse effect (not significant)**;
- Prehistoric cut features of medium significance resulting in a **Moderate Adverse effect (significant)**;
- Prehistoric timber structures (e.g. fishtraps and jetties) of high significance resulting in a **Major Adverse effect (significant)**.

11.52 Pile probing and obstruction removal would be localised and have a High magnitude of impact on site-specific:

- Remains of the mid-19th to mid-20th structural remains of low significance resulting in a **Moderate Adverse effect (significant)**; and
- Remains of later medieval and post-medieval agriculture, e.g. drainage ditches, of low significance resulting in a **Moderate Adverse effect (significant)**.

Piles, secant pile walls and associated pile caps and ground beams

11.53 Any archaeological remains within the footprint of each pile and the secant pile wall would be removed as the pile is driven downwards. The pile pattern is dense and therefore likely to make any surviving archaeological remains, potentially preserved between each pile, inaccessible in terms of any archaeological investigation in the future.

11.54 Piling, including secant pile walls would have a high magnitude of impact on:

- Palaeoenvironmental remains of low significance resulting in a **Moderate Adverse effect (significant)**;
- Palaeoenvironmental remains (peat or other datable organic remains) of medium significance resulting in a **Major Adverse effect (significant)**;
- Isolated prehistoric remains of low significance resulting in a **Moderate Adverse effect (significant)**;
- Prehistoric cut features of medium significance resulting in a **Major Adverse effect (significant)**;
- Prehistoric timber structures (e.g. fishtraps and jetties) of high significance resulting in a **Major Adverse effect (significant)**;
- Remains of the late 19th to mid-20th century structural features of low significance resulting in a **Moderate Adverse effect (significant)**; and
- Remains of later medieval and post-medieval agriculture, e.g. drainage ditches, of low significance resulting in a **Moderate Adverse effect (significant)**;

11.55 The insertion of pile caps and connecting ground beams would require localised excavation up to 1.5m beneath the ground or basement floor slab. Beneath ground floor slabs they would have a have localised medium magnitude of impact on:

- Remains of the late 19th to mid-20th century structural features of low significance resulting in a **Minor Adverse effect (not significant)** and
- Remains of later medieval and post-medieval agriculture, e.g. drainage ditches, of low significance resulting in a **Minor Adverse effect (not significant)**.

11.56 Their insertion would likely have a localised low magnitude of impact on:

- Palaeoenvironmental remains of low significance resulting in a **Minor Adverse** effect (**not significant**);
- Palaeoenvironmental remains (peat or other datable organic remains) of medium significance resulting in a **Minor Adverse** effect (**not significant**);
- Isolated prehistoric remains of low significance resulting in a **Minor Adverse** effect (**not significant**);
- Prehistoric cut features of medium significance resulting in a **Minor Adverse** effect (**not significant**);
- Prehistoric timber structures (e.g. fishtraps and jetties) of high significance resulting in a **Moderate Adverse** effect (**significant**).

11.57 Beneath the single level basement level they would have a High magnitude impact on:

- Palaeoenvironmental remains of low significance resulting in a **Moderate Adverse** effect (**significant**);
- Palaeoenvironmental remains (peat or other datable organic remains) of medium significance resulting in a **Major Adverse** effect (**significant**);
- Isolated prehistoric remains of low significance resulting in a **Moderate Adverse** effect (**significant**);
- Prehistoric cut features of medium significance resulting in a **Major Adverse** effect (**significant**);
- Prehistoric timber structures (e.g. fishtraps and jetties) of high significance resulting in a **Major Adverse** effect (**significant**).

11.58 The insertion of pile caps, ground beams beneath a basement will have no impact on post-medieval remains.

Basement and Attenuation tanks

11.59 The impact of the insertion of the single level basement beneath Block B3 or attenuation tanks anywhere across the site would have high impact on:

- Mid-19th to mid-20th structural remains of low significance resulting in a **Moderate Adverse** effect (**significant**); and
- Remains of later medieval and post-medieval agriculture, e.g. drainage ditches, of low significance resulting in a **Moderate Adverse** effect (**significant**);

11.60 However, its effect on remains within the alluvial deposits would depend on the depth of made ground and alluvium. In general, and based on the results of archaeological investigations, their insertion would likely have a medium impact on:

- Palaeoenvironmental remains of low significance resulting in a **Minor Adverse** effect (**not significant**);
- Palaeoenvironmental remains (peat or other datable organic remains) of medium significance resulting in a **Moderate Adverse** effect (**significant**);
- Isolated prehistoric remains of low significance resulting in a **Minor Adverse** effect (**not significant**);
- Prehistoric cut features of medium significance resulting in a **Moderate Adverse** effect (**significant**) and
- Prehistoric timber structures (e.g. fishtraps and jetties) of high significance resulting in a **Major Adverse** effect (**significant**).

11.61 If the made ground is shallow then the impact will be higher but if the alluvium is deeper then it is likely that the impact would be less.

Service / Utilities Trenches / Drains

11.62 The excavation of new service trenches, drains and for new planting would extend to a depth of 1.0–1.5mbgl as assumed for the purposes of this assessment. This would have similar impact as to those of pile caps and ground beams beneath ground floor slabs (see paragraph 11.55).

Landscaping

11.63 Landscaping works, including for new planting etc, generally extend to a depth of 1.0–1.5mbgl as assumed for the purposes of this assessment. This would have similar impact as to those of pile caps and ground beams beneath ground floor slabs (see paragraph 11.55).

Changes to Hydrology and Dewatering

11.64 Dewatering (i.e. permanent reduction in moisture levels rather than changes to patterns of hydrology caused by new foundations and basements) may potentially have an impact on any remains left in situ which rely on current water levels for their optimum survival. This could occur through long-term changes to the existing local anaerobic environment in which any waterlogged organic remains not removed by construction groundworks are preserved, resulting in desiccation and decay.

11.65 Any temporary changes to the hydrological regime at the site to facilitate construction are unlikely to have an impact on archaeological or palaeoenvironmental remains.

Phasing

11.66 It is also anticipated that the site will be developed in phases. However, the above impacts have been assumed to be consistent across the site.

Summary

11.67 Table 11.6 summarises the effects on buried heritage assets prior to the implementation of a mitigation strategy.

Table 11.6 Evaluation of Potential Impacts and Effects (Pre-mitigation)

Asset	Heritage Asset Significance	Magnitude of Impact	Direct or Indirect; Duration	Scale of Effect
Palaeoenvironmental remains within alluvial deposits	Low (general background environmental deposits)	Low for preliminary site works, pile caps, ground beams beneath ground floor, services/landscaping	Direct, Permanent	Minor Adverse (not significant)
Palaeoenvironmental remains within alluvial deposits	Low (general background environmental deposits)	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Moderate adverse (significant)
Palaeoenvironmental remains within alluvial deposits	Low (general background environmental deposits)	Medium for pile probing and obstruction removal, single level basement excavation and attenuation tanks	Direct, Permanent	Minor adverse (Not significant)
Palaeoenvironmental remains within alluvial deposits	Medium (extensive strata of peat or other organic matter)	Low for preliminary site works, pile caps, ground beams beneath ground floor, services/landscaping	Direct, Permanent	Minor adverse (not significant)
Palaeoenvironmental remains within alluvial deposits	Medium (extensive strata of peat or other organic matter)	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Major adverse (significant)
Palaeoenvironmental remains within alluvial deposits	Medium (extensive strata of peat or other organic matter)	Medium for pile probing and obstruction removal, single level basement excavation and attenuation tanks	Direct, Permanent	Moderate adverse (significant)
Prehistoric remains (isolated, scattered finds)	Low	Low for preliminary site works, pile caps, ground beams beneath ground	Direct, Permanent	Minor Adverse (not significant)

Asset	Heritage Asset Significance	Magnitude of Impact	Direct or Indirect; Duration	Scale of Effect
		floor, services/landscaping		
Prehistoric remains (isolated, scattered finds)	Low	Medium for pile probing and obstruction removal, single level basement excavation and attenuation tank	Direct, Permanent	Minor adverse (Not significant)
Prehistoric remains (isolated, scattered finds)	Low	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Moderate adverse (significant)
Prehistoric remains (cut features, revetments etc)	Medium	Low for preliminary site works, pile caps, ground beams beneath ground floor, services/landscaping	Direct, Permanent	Minor Adverse (not significant)
Prehistoric remains (cut features, revetments etc)	Medium	Medium for pile probing and obstruction removal, single level basement excavation and attenuation tank	Direct, Permanent	Moderate adverse (Significant)
Prehistoric remains (cut features, revetments etc)	Medium	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Major adverse (significant)
Prehistoric remains (evidence of occupation)	High	Low for preliminary site works, pile caps, ground beams beneath ground floor, services/landscaping	Direct, Permanent	Moderate Adverse (significant)
Prehistoric remains (evidence of occupation)	High	Medium for pile probing and obstruction removal, single level basement excavation and attenuation tanks	Direct, Permanent	Major adverse (Significant)
Prehistoric remains (evidence of occupation)	High	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Major adverse (significant)
Later medieval and post-medieval water management features	Low	Low for preliminary site works, pile caps, ground beams beneath ground floor, services/landscaping	Direct, Permanent	Minor Adverse (not significant)
Later medieval water management and waterfront features	Low	Medium for pile probing and obstruction removal, single level basement excavation and attenuation tanks	Direct, Permanent	Minor adverse (Not significant)
Later medieval water management and waterfront features	Low	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Moderate adverse (significant)
Late 19th century onwards structural remains	Low	Low for preliminary site works, pile caps, ground beams beneath ground floor, services/landscaping	Direct, Permanent	Minor Adverse (not significant)
Late 19th century onwards structural remains	Low	Medium for pile probing and obstruction removal, single level basement	Direct, Permanent	Minor adverse (Not significant)

Asset	Heritage Asset Significance	Magnitude of Impact	Direct or Indirect; Duration	Scale of Effect
		excavation and attenuation tanks		
Late 19th century onwards structural remains	Low	High for piles, secant pile wall (pile caps and ground beams beneath basement floor)	Direct, Permanent	Moderate adverse (significant)

MITIGATION, MONITORING AND RESIDUAL EFFECTS

Demolition and Construction Mitigation

11.68 The site is situated within the Tier 3 Archaeological Priority Area, Lea Valley (APA 3.2) and has a known potential for remains of medium or high significance to be present. Therefore, further investigation will be required prior to any stage of development, to be implemented by way of a planning condition. Given that some remains could be beneath thick alluvial layers, making standard evaluation trenches unfeasible in terms of assessing the potential for archaeology at the base of the alluvial sequence, the most appropriate form of preliminary archaeological evaluation will comprise a geoarchaeological purposive borehole survey followed by targeted archaeological evaluation trenches based on the results of the survey. This will help confirm the extent, nature and significance of archaeological remains within each area of development. The results of the evaluation will enable an informed decision in respect of an appropriate mitigation strategy for any significant archaeological assets. This might comprise targeted excavation for remains of high or medium significance, combined as appropriate with a watching brief during ground works to ensure that archaeological assets of lesser significance are not removed without record. Following the evaluation it is possible that no further work will be necessary.

11.69 A public engagement strategy will most likely comprise one or a combination of the following:

- Presenting the history of the site and area, as well as the results of the archaeological investigation on the demolition and construction hoarding; and/or
- Presenting the history of the site and area, as well as the results of the archaeological investigation on a permanent public display board; and/or
- One or two archaeologists would share information through social media about the archaeological story unfolding from the site in the form of short stories.

11.70 Any archaeological work, including any public engagement, would need to be undertaken in accordance with an approved Written Scheme of Investigation (WSI).

Residual Effects

11.71 All of the residual effects resulting from the Proposed Development, are presented in **Table 11.7**, identifying whether the effect is significant or not.

Table 11.7 Residual Effects

Asset	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D	P	St Mt Lt
Demolition and Construction							
General palaeoenvironmental remains within alluvial deposits	Truncation from pile probing and obstruction removal, site set-up, services/landscaping and pile caps ground beams beneath ground floor slab	Negligible	Not significant	L/B	D	P	Lt
General palaeoenvironmental remains within alluvial deposits	Removal or truncation from piles, secant pile wall (pile caps and ground beams beneath basement floor slab, single	Minor adverse	Not significant	L/B	D	P	Lt

Asset	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D I	P T	St Mt Lt
Demolition and Construction							
	basement level and attenuation tanks						
Extensive strata of peat or other organic matter	Truncation from site set-up, services/landscaping and pile caps ground beams beneath ground floor slab	Negligible	Not significant	L/B	D	P	Lt
Extensive strata of peat or other organic matter	Truncation from pile probing and obstruction removal single basement level and attenuation tanks	Minor adverse	Not significant	L/B	D	P	Lt
Extensive strata of peat or other organic matter	Removal or truncation from piles, secant pile wall (pile caps and ground beams beneath basement floor slab	Moderate adverse	Significant	L/B	D	P	Lt
Prehistoric (isolated remains)	Truncation from pile probing and obstruction removal, site set-up, services/landscaping and pile caps ground beams beneath ground floor slab, single basement level and attenuation tanks	Negligible	Not significant	L/B	D	P	Lt
Prehistoric (isolated remains)	Removal or truncation from piles, secant pile wall (pile caps and ground beams beneath basement floor slab	Minor adverse	Not significant	L/B	D	P	Lt
Prehistoric (cut features, revetments etc)	Truncation from site set-up, services/landscaping and pile caps ground beams beneath ground floor slab	Negligible	Not significant	L/B	D	P	Lt
Prehistoric (cut features, revetments etc)	Truncation from pile probing and obstruction removal, single basement level and attenuation tanks	Minor adverse	Not significant	L/B	D	P	Lt
Prehistoric (cut features, revetments etc)	Removal or truncation from piles, secant pile wall (pile caps and ground beams beneath basement floor slab	Moderate adverse	Significant	L/B	D	P	Lt
Prehistoric remains (evidence of occupation)	Truncation from site set-up, services/landscaping and pile caps ground beams beneath ground floor slab	Minor adverse	Not significant	L/B	D	P	Lt
Prehistoric remains (evidence of occupation)	Truncation from pile probing and obstruction removal, piles, secant pile wall (pile caps and ground beams beneath basement floor slab, single basement level and attenuation tanks	Moderate adverse	Significant	L/B	D	P	Lt
Later medieval water management and waterfront features	Truncation from pile probing and obstruction removal, site set-up, services/landscaping and pile caps ground beams beneath ground floor slab	Negligible	Not significant	L/B	D	P	Lt
Later medieval water management and waterfront features	Removal or truncation from piles, secant pile wall (pile caps and ground beams beneath basement floor slab, single basement level and attenuation tanks	Minor adverse	Not significant	L/B	D	P	Lt

Asset	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D I	P T	St Mt Lt
Demolition and Construction							
Late 19th century onwards structural remains	Truncation from pile probing and obstruction removal, site set-up, services/landscaping and pile caps ground beams beneath ground floor slab	Negligible	Not significant	L/B	D	P	Lt
Late 19th century onwards structural remains	Removal or truncation from piles, secant pile wall (pile caps and ground beams beneath basement floor slab, single basement level and attenuation tanks	Minor adverse	Not significant	L/B	D	P	Lt
Notes: Residual Effect - Scale = Negligible / Minor / Moderate / Major - Nature = Beneficial or Adverse Geo (Geographic Extent) = Local (L), Borough (B), Regional (R), National (N) D = Direct / I = Indirect P = Permanent / T = Temporary St = Short Term / Mt = Medium Term / Lt = Long Term N/A = not applicable / not assessed							

CLIMATE CHANGE

11.72 With regards to archaeology, the only climate variable of relevance would be the groundwater level. The level of the water table has the potential to preserve organic remains if those remains on the Site and any change to the water table, especially its reduction has the potential to negate the preservation of organic remains.

11.73 Based on future climate projection data (**ES Volume 3, Appendix: Climate Change, Annex 1**), London in particular is due to experience drier summers with a reduction in rainfall. If there was an overall reduction in rainfall, there is the potential for the water table to reside at a level lower to its current position. As such any currently preserved organic remains may decay if the water table were reduced for prolonged periods of time.

ASSESSMENT OF THE FUTURE ENVIRONMENT

Evolution of the Baseline Scenario

11.74 There will be no change to the archaeological baseline of the site and the surrounding area in the absence of the Proposed Development. The archaeological baseline would remain as currently understood and as presented within this ES chapter.

11.75 It is however possible that new archaeological investigations in the surrounding area may produce information which enhances understanding of the likely archaeological conditions at the site.

Cumulative Effects Assessment

11.76 There are no anticipated direct or indirect adverse effects from the Proposed Development on the archaeological resource of any of the cumulative schemes identified in **ES Volume 1, Chapter 2: EIA Methodology**, nor should any of these schemes have any direct effect on the archaeological resource within the current Site, nor on the wider area, assuming appropriate mitigation is adopted for them. If significant archaeological remains are recorded during any of those schemes, this may have a minor indirect beneficial effect on any archaeological resource that might be found within this Site, in the sense of allowing it to be interpreted and understood within a better overall context. However, it would have no effect on the archaeological resource itself. This applies during all phases and to all parts of the Proposed Development.

LIKELY SIGNIFICANT EFFECTS

11.77 Following the implementation of a programme of archaeological work approved by the GLAAS, there would remain **significant** residual effects from the proposed piling and basement construction for extensive strata of peat or other organic materials and any evidence of prehistoric occupation, e.g. cut features, fishtraps, jetties, revetments etc. All other effects on the remaining identified assets are anticipated to be **not significant**.

MITIGATION AND MONITORING

Paragraph Reference	Mitigation and Monitoring Measure
11.65	The most appropriate form of archaeological evaluation could comprise a geoarchaeological purposive borehole survey followed by archaeological evaluation trenches based on the results of the survey. This will help confirm the extent, nature and significance of archaeological remains within each area of development. The results of the evaluation will enable an informed decision in respect of an appropriate mitigation strategy for any significant archaeological assets. This might comprise targeted excavation for remains of high or medium significance, a watching brief during ground works to ensure that archaeological assets of lesser significance are not removed without record or no further work.
11.6	A public engagement strategy will most likely comprise one or a combination of the following: Presenting the history of the site and area, as well as the results of the archaeological investigation on the demolition and construction hoarding; and/or presenting the history of the site and area, as well as the results of the archaeological investigation on a permanent public display board; and/or one or two archaeologists would share information through social media about the archaeological story unfolding from the site in the form of short stories.
11.67	Any archaeological work, including any public engagement, would need to be undertaken in accordance with an approved Written Scheme of Investigation (WSI).