

11 Archaeology

11.1 Introduction

- 11.1.1 This chapter presents an assessment of the potential effects of the Bank Station Capacity Upgrade (BSCU) on archaeological (buried heritage) assets.
- 11.1.2 The assessment focusses on the BSCU Work Sites but draws on a wider study area defined as a 100m radius from the centre of the Whole Block Site, Arthur Street Work Site, potential Walbrook Grout Shaft Site and Low Level 2 Sewer works (National Grid References TQ 32787 80911; TQ 32838 80780; TQ 32654; 81090 and TQ 32602; 80983 respectively) to provide an understanding of the context for the archaeological resource. Within this study area all known designated and non-designated archaeological assets have been identified and mapped.
- 11.1.3 This chapter is supported by a comprehensive desk-based baseline assessment which is presented at Appendix A11.1, a gazetteer of archaeological assets (at Appendix A of Appendix A11.1) and Figures 11.1, 11.2 and 11.3 within the ES Figures Volume which illustrate respectively the identified archaeological resource, extent of modern disturbance and archaeological survival within the BSCU Work Sites.

11.2 Legislative and Policy Context

- 11.2.1 The legislative and policy context for the BSCU is presented in full at Section 3 of the desk-based baseline assessment included as Appendix A11.1.

Legislation and National Policy

Ancient Monuments and Archaeological Areas Act 1979

- 11.2.2 The *Ancient Monuments and Archaeological Areas Act 1979* sets out the requirement for Scheduled Monument Consent for any works of demolition, repair, and alteration that might affect a Scheduled Ancient Monument. For archaeological sites that are not covered by the above Act, protection is afforded through development control, the *Town and Country Planning Act 1990* and the *National Planning Policy Framework (2012)*.
- 11.2.3 The *Ancient Monuments and Archaeological Areas Act 1979 (Part II)* allows for the designation of Areas of Archaeological Importance. The designation of such an area is a material consideration in the planning process. The area covered by the City of London including all of the BSCU Work Sites is considered to be equivalent to an Archaeological Priority Area.

National Planning Policy Framework (Department of Communities and Local Government, 2012)

- 11.2.4 *Section 12 of the National Planning Policy Framework (NPPF) sets out the importance of being able to assess the significance of heritage assets that may be affected by a development. Significance is defined in Annex 2 as being the value of an asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic interest.*
- 11.2.5 This definition also clearly states that significance is not only derived from an asset's physical presence, but also from its setting, which is defined as *the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve.*
- 11.2.6 *Paragraphs 128 and 129 state that when determining applications, local authorities require an applicant to describe the significance of assets that may be affected by a development, to a level of detail that is proportionate to their importance and that is no more than sufficient to understand the potential impact on their significance; this should also include assets where their setting may be affected by a proposal.*
- 11.2.7 *Paragraph 128 of the NPPF directs local planning authorities to require developers to submit an appropriate desk-based assessment and, where necessary, with regard to development sites where there are known or there is potential for heritage assets with archaeological interest, to undertake field evaluation.*
- 11.2.8 *Paragraph 132 recognises that heritage assets are irreplaceable and that where proposed development may impact on the significance of a designated heritage asset great weight should be placed on its conservation. A clear link is drawn between the significance of the asset and the weight that should be placed on its conservation. The NPPF notes that alteration or destruction of a heritage asset or development within its setting can harm its significance.*
- 11.2.9 *Paragraph 133 sets out considerations to be taken into account when determining a planning application which would result in substantial harm or total loss of significance of a heritage asset. It states that the local planning authority should weigh the public benefits of the proposed development against any harm. Paragraph 135 sets out the need for a balanced judgement between the significance of non-designated heritage assets and the scale of any harm or loss, when considering assets directly or indirectly affected by proposed development.*
- 11.2.10 *Paragraph 137 understands the role new development has to play in the setting of heritage assets in enhancing or better revealing their significance. It encourages local planning authorities to look for such opportunities and to treat such proposals favourably.*

- 11.2.11 At *Paragraph 139*, the *NPPF* recognises that non-designated heritage assets of archaeological interest may be of equivalent significance to a Scheduled Monument. In such cases the *NPPF* directs that such assets are to be considered subject to the policies for designated assets.

Planning Practice Guidance (Department of Communities and Local Government, 2014)

- 11.2.12 The national *Planning Practice Guidance (PPG)* was launched in March 2014 and provides a web-based resource in support of the *NPPF*.
- 11.2.13 The *PPG* provides guidance and explanatory advice regarding Conserving and Enhancing the Historic Environment in support of *NPPF* policies and other published heritage guidance. The *PPG* provides advice on designated assets, world heritage sites, assessing substantial harm to heritage assets and with regard to archaeology, non-designated heritage assets of archaeological interest.

Regional Policy

The London Plan (Greater London Authority, 2011)

- 11.2.14 Regional policy is defined by *The London Plan* and *Revised Early Minor Alterations* published in October 2013. *Policy 7.8* of *The London Plan* deals with heritage assets and archaeology and establishes the contribution that designated and non-designated heritage assets make to London's world class city status. The policy seeks to ensure the sensitive management and promotion of London's heritage assets and highlights the importance of identifying and recording London's heritage through character appraisals, conservation plans, local lists, and the *Greater London Historic Environmental Record (GLHER)*.
- 11.2.15 *Policy 7.8* establishes the following clauses regarding archaeology and buried heritage remains:

Strategic:

- B. Development should incorporate measures that identify record, interpret, protect and, where appropriate, present the site's archaeology.*

Planning Decisions:

- C. Development should identify value, conserve, restore, re-use and incorporate heritage assets, where appropriate.*
- D. Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.*
- E. New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-*

site. 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.

- 11.2.16 The *Revised Early Minor Alterations to the London Plan (2013)* sets out minor alterations in relation to *The London Plan* and changes to UK legislation including the *Localism Act (2011)* and the *NPPF*. The revisions amend and split *Paragraph 7.31* supporting *Policy 7.8 Heritage Assets and Archaeology* with regard to developments affecting the setting of heritage assets, the need to weigh developments causing less than substantial harm on heritage assets against the public benefit and the reuse or refurbishment of heritage assets to secure sustainable development.

Local Policy

Core Strategy (City of London Corporation, 2011)

- 11.2.17 *Strategic Objective 3* of the *Core Strategy* states that it is a strategic objective to *promote a high quality of architecture and street scene appropriate to the City's position at the historic core of London, complementing and integrating the City's heritage assets and supporting the continued development of the City as a cultural destination for its own communities and visitors.*
- 11.2.18 *Policy CS12, Historic Environment*, outlines City of London Corporation's commitment to *conserve or enhance the significance of the City's heritage assets and their settings ... by [inter alia] ... protecting and promoting the evaluation and assessment of the City's ancient monuments and archaeological remains and their settings, including the interpretation and publication of results of archaeological investigations.*

Unitary Development Plan (City of London Corporation, 2002)

- 11.2.19 Chapter 11: Archaeology of the *Unitary Development Plan (UDP)* sets out the saved policies relevant to archaeology within the City of London. *Saved Policy ARC1* sets out the City of London Corporation's requirements for planning applications which involve excavation or groundworks on sites of archaeological potential, stating:

All of the City is considered to have archaeological potential unless it can be demonstrated that archaeological remains have been lost, due to basement construction or other groundworks. The Corporation will indicate the potential of a site, its relative importance, and the likely impact to a developer at an early stage so that the appropriate assessment and design development can be undertaken.

- 11.2.20 *Saved Policy ARC2* requires development proposals to *preserve in situ, protect and safeguard important ancient monuments and important archaeological*

remains and their settings, and may, where appropriate, require the permanent public display and/or interpretation of the monument or remains.

- 11.2.21 Where a development incorporates archaeological remains or where it is considered that preservation in situ is not appropriate, *Policy ARC3 considers proper investigation, recording of sites, and publication of the results by an approved organisation* to be an integral part of a development programme. *Paragraph 11.16* clarifies this by saying that a programme for such archaeological works should be *submitted to and approved by the Corporation, prior to development*, thereby ensuring the *preservation of those remains by record*.

Draft Local Plan (City of London Corporation, 2013)

- 11.2.22 A consultation draft of the emerging *Local Plan* was published in December 2013 which sets out updated Strategic and Development Management policies for the historic environment, ancient monuments and archaeology. It is anticipated that the *Local Plan* will be adopted in late 2014, when it will supersede the *Core Strategy* and *UDP*.
- 11.2.23 The *Draft Local Plan* includes a series of *Draft Development Management Policies*, including *DM12.1 Managing change affecting all heritage assets and spaces*.

11.3 Assessment Methodology

- 11.3.1 The EIA for the BSCU considers the historic environment under two separate topics: Archaeology (buried heritage assets) and Built Heritage (historic buildings, structures and streetscapes). Built Heritage assets are assessed in Chapter 10: Built Heritage.
- 11.3.2 This archaeological impact assessment has been prepared using current best practice and drawing on relevant legislation, policy and industry standards and guidance documents including *Planning Advice Note 3: Archaeology in the City of London* (City of London Corporation, 2003); English Heritage, *Greater London Archaeology Advisory Service: Standards for Archaeological Work London Region* (2009), the published *Standard and Guidance for desk-based assessment* (Institute for Archaeologists (IfA) 2012) and the *Code of Conduct of the Institute for Archaeologists* (IfA 2014).

Baseline Study

- 11.3.3 This EIA is supported by a comprehensive desk-based assessment of baseline conditions (Appendix A11.1). The purpose of the archaeological baseline study is to identify designated and non-designated archaeological assets that will be impacted by the BSCU and their significance.

- 11.3.4 The assessment has focussed on the BSCU Work Sites where impacts on archaeological remains may occur namely the Whole Block Site, Arthur Street Shaft, potential Walbrook Grout Shaft, Low Level 2 Sewer and London Bridge Sewer works shaft sites. A study area extending 100m from the work sites provides an understanding of the archaeological potential of these work sites and the wider archaeological context of any archaeological assets that may be affected.
- 11.3.5 The Taplow Terrace Gravels and underlying London Clay are archaeologically sterile. Consequently the construction of the running tunnels, platform tunnels and cross passages within these geological strata will have no impact on archaeological remains and therefore require no further assessment.
- 11.3.6 Designated and non-designated assets have been identified through interrogation of core historic environment records, enhanced by research of previous archaeological reports, historic documents, maps, photographs and geotechnical data. Principal sources consulted to inform the archaeological baseline assessment included:
- Greater London Historic Environment Record;
 - English Heritage National Monuments List;
 - English Heritage National Monuments Record;
 - London Metropolitan Archive;
 - Guildhall Library;
 - London Archaeological Archive and Resource Centre (for previous archaeological investigation reports);
 - historic Ordnance Survey and pre-Ordnance Survey mapping;
 - previous archaeological studies undertaken for the BSCU;
 - available ground investigation reports or borehole data;
 - detailed survey drawings prepared for the existing basements of the Whole Block Site; and
 - information regarding archaeological priority areas obtained from the City of London Corporation.
- 11.3.7 The baseline study was informed by site visits which assessed the current conditions within the BSCU Work Sites including a consideration of setting and the extent of previous development impacts on the archaeological resource.
- 11.3.8 The baseline study has also determined the heritage significance of archaeological assets identified.

- 11.3.9 The assessment of these previous impacts has used a four-point scale of High, Medium, Low and Negligible, the definitions of which are set out in Table 11.1.

Table 11.1: Assessment of Previous Ground Disturbance

Extent of Previous Ground Disturbance	Description
High	Extensive and deep disturbance resulting in the removal of all subsurface archaeological deposits for example within known basements, deep foundations and large utilities.
Medium	Moderate previous disturbance which may extend to some depth, but where there remains the potential for archaeological remains to survive either between or beneath existing impact levels such as building foundations and utility trenches, for example developed areas without basements.
Low	Shallow previous disturbance such as areas of car parking and surfacing where archaeological remains may survive with limited truncation beneath the level of impact.
Negligible	No known historic development impacts to subsurface archaeological remains. Potential for the survival of archaeological horizons from Prehistory to the Post-medieval period.

Consultation

- 11.3.10 In addition to the assessment of baseline conditions, consultation with Historic Environment advisors at the City of London Corporation regarding archaeological remains is on-going.
- 11.3.11 A scoping opinion response was received from the Transport and Works Act Orders Unit of the Department for Transport in November 2013 following issue of the BSCU EIA Scoping Report. The scoping opinion included a response from the City of London Corporation stating that *the EIA should include an archaeological desk based assessment*. A desk based assessment of baseline archaeological conditions for the BSCU has been undertaken and is included at Appendix A11.1.

Evaluation of the Archaeological Resource

- 11.3.12 Once the baseline conditions were established, the potential impacts from the BSCU on archaeological assets were identified and assessed.
- 11.3.13 The potential impacts of the BSCU on the archaeological resource could include the damage or loss of potentially important archaeological remains surviving as below ground deposit sequences currently sealed beneath the existing ground surface and extant buildings.

Sensitivity of Archaeological Assets

- 11.3.14 For the purpose of this impact assessment the term sensitivity is used instead of [heritage] significance described in *NPPF* policy. This change in terminology is intended to avoid any confusion between the terms *significance* (when applied to the importance or value of an archaeological asset) and the *significance of effects* stated in the impact assessment.
- 11.3.15 The sensitivity of identified archaeological assets has been determined by professional judgement guided by statutory and non-statutory designations, the criteria for heritage significance as set out in Annex 2 of the *NPPF*, national, regional and local policies, archaeological research frameworks and the modified criteria for Scheduled Monuments used in England by the Secretary of State for Culture, Media and Sport (DCLG, 2012).
- 11.3.16 The criteria used to determine the sensitivity of archaeological assets are presented in accordance with a four point scale as shown in Table 11.2.

Table 11.2: Factors Determining the Sensitivity of Archaeological Assets

Sensitivity (Heritage Significance)	Asset Categories
High	Remains of inscribed international/universal importance, such as World Heritage Sites. Scheduled Monuments. Registered battlefields. Non-designated archaeological assets demonstrably of schedulable quality and significance.
Medium	Sites of moderate archaeological resource value as identified through consultation. Non-designated assets not of schedulable quality but with good survival and rarity within the region.
Low	Locally important historic or archaeological sites, sites with a local value for research, education or cultural appreciation. Assets compromised by poor preservation and/or survival or contextual associations.
Not Significant	Assets identified as being of no historic, evidential, aesthetic or communal interest. Assets with no significant research potential. This may include heavily truncated archaeological remains, chance finds of isolated artefacts that have no archaeological context or remains/structures which are identified as archaeological assets by Local Authority Historic Environment Records but which have been previously destroyed.

Magnitude of Impact

- 11.3.17 Potential impacts are defined as a change resulting from the proposed BSCU that affect the archaeological resource. These impacts are considered in terms of being either negative or positive.
- 11.3.18 Professional judgement has been used to apply the scale shown in Table 11.3 in consideration of the magnitude of any impact the BSCU may have on the archaeological resource or its setting.
- 11.3.19 The magnitude of an impact is considered on a five-point scale.

Table 11.3: Factors Determining the Magnitude of Archaeological Impacts

Magnitude of Impact	Description of Change
High	Change such that the heritage significance of the asset is totally altered or destroyed. Comprehensive change to setting affecting heritage significance, resulting in changes in our ability to understand and appreciate the resource and its historical context and setting.
Medium	Change such that the heritage significance of the asset is affected. Changes such that the setting of the asset is noticeably different, affecting heritage significance resulting in changes in our ability to understand and appreciate the resource and its historical context and setting.
Low	Change such that the heritage significance of the asset is slightly affected. Changes to the setting that have a slight impact on heritage significance resulting in changes in our ability to understand and appreciate the resource and its historical context and setting.
Very Low	Changes to the asset that hardly affect heritage significance. Changes to the setting of an asset that have little effect on heritage significance and no real change in our ability to understand and appreciate the resource and its historical context and setting.
No Change	The development does not affect the heritage significance of the asset. Changes to setting that do not affect the heritage significance of the asset or our appreciation of it.

Assessment of Effects

- 11.3.20 The assessment of effects is undertaken in two stages. The magnitude of impact is first assessed without reference to the sensitivity of the receptor. The findings of this assessment are then cross-referenced with the sensitivity of the receptor (heritage significance or value of the asset) to categorise the effect that is likely to result from the BSCU (Table 11.4).

Table 11.4: Classification of Archaeological Effects

Sensitivity of Receptor	Magnitude of Impact				
	High	Medium	Low	Very Low	No Change
High	Major	Major	Moderate	Minor	Negligible
Medium	Major	Moderate	Minor	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible	Negligible
Not Significant	Minor	Minor	Negligible	Negligible	Negligible

- 11.3.21 For this EIA major and moderate effects are generally considered to be significant. However, following the categorisation of effects using this methodology, further consideration of whether an effect is significant and requires mitigation is carried out using professional judgement, taking account of whether effects are considered to be beneficial or adverse, permanent or temporary, direct or indirect, the duration/frequency of the effect and whether any secondary effects are caused.
- 11.3.22 Mitigation may be proposed to reduce or compensate for any significant adverse effects or to enhance positive effects. This assessment re-assesses impacts after mitigation to determine the residual effect. The scope of archaeological mitigation potentially required has been determined by considering the known or expected extent and sensitivity of surviving archaeological remains. It may include detailed excavation, geoarchaeological or palaeoenvironmental sampling or monitoring and recording of archaeological remains (archaeological watching brief) during demolition and construction activities.
- ## 11.4 Baseline Conditions
- 11.4.1 A full and detailed description of the baseline conditions within the BSCU Work Sites and surrounding study area is provided at Appendix A11.1. The baseline assessment considered:
- the geology and topography of the study area (Section 1.4);
 - previously recorded archaeological remains and the historic development of the study area, and of the BSCU Work Sites, (Sections 4.1 and 4.2); and
 - the extent of previous ground disturbance (Section 4.3).
- 11.4.2 The topography of the City of London is dominated by the River Thames to the south and two hills: Ludgate Hill in the west and Cornhill in the east. These hills were divided by the multi-branching stream of the Walbrook River. The Whole Block Site is located on the western flank of Cornhill and the gentle upper slope of the Walbrook valley at a height of approximately 115m ATD, with the land rising to the north and east and sloping downhill to the west in to

the Walbrook valley and south towards the River Thames. The Arthur Street Work Site is located on a steeper section of the Thames terrace where the underlying gravels lie at approximately 106m ATD before dropping away to foreshore of the River Thames.

- 11.4.3 The contours of the Lower Walbrook valley have been mapped during a number of archaeological and geotechnical investigations. The eastern edge of the valley has been recorded at Mansion House where the terrace gravels lay at a height of 108.86m ATD sloping gently to 106.10m ATD within Walbrook before dropping away westwards to the base of the former Walbrook Channel recorded at between a height of c.100.98m ATD to c.100.00m ATD beneath Bucklersbury House (Wilmot 1991).
- 11.4.4 The first significant occupation of the area dates to the Roman period when it would have been located within the heart of the Roman town of *Londinium* which was established around AD 47. From its origins the Roman town was laid out in an ordered grid of roads, including one along modern day Cannon Street. The Whole Block Site would have likely included a number of Roman buildings.
- 11.4.5 From c. AD 50 early Roman river embankments were constructed along the northern bank of the River Thames consisting mainly of lines of piles or post-and-plank revetments. By AD 70 the shoreline of the River Thames had been extensively developed (Milne 1985). Immediately south of the Arthur Street Shaft lay the line of two Roman quays dating to the mid-1st and late 1st century AD, the northern bank of the River Thames was also modified into a series of artificial terraces occupied by masonry warehouses and domestic or commercial buildings.
- 11.4.6 To the west of the Whole Block Site numerous archaeological investigations have provided extensive evidence for Roman settlement within the Lower Walbrook valley, which was certainly occupied by AD 60. From this early date the course of the Walbrook stream through the study area would have been managed or canalised between timber revetments with the low lying land on either side of the stream the subject of reclamation and ground raising using timber revetments, piles and dumping to create terraces on which early Roman timber buildings were constructed.
- 11.4.7 The Lower Walbrook valley would have been tidal during the Roman period and boats carrying goods into and out of the city would have been able to travel up the Walbrook as far as the bridges which carried the Roman roads across the stream, alongside which would have stood domestic residences, workshops, warehouses and at least one water-powered mill.

- 11.4.8 In the later Roman period the banks of the Walbrook became a more desirable place to live with substantial masonry buildings including the Temple of Mithras replacing earlier timber buildings.
- 11.4.9 After the end of Roman rule the City was abandoned for some 460 years until the Late Saxon period when it was reoccupied in the mid-9th century. Throughout the Late Saxon and medieval periods London developed into a thriving port and trading centre and the Whole Block Site would have been occupied by densely packed wooden townhouses between Abchurch and Nicholas Lane. Excavations at Miles Lane revealed the Late Saxon origins of St Michael's Lane (later medieval *Saynte Mighelles Lane* and post-medieval Miles Lane) the line of which may have passed through the location of the Arthur Street Shaft. Evidence of houses established on either side of the lane with yards to the rear, as well as later Saxon pits were also recorded to the south of the Arthur Street Shaft (Miller, 1980).
- 11.4.10 Within the Lower Walbrook valley ground raising and consolidation of the area continued into the medieval period. Late Saxon resettlement of the city extended across the study area by the 11th century with the principal roads such as Poultry, Bucklersbury and Walbrook being laid out by this time. The pattern of densely packed housing alongside numerous churches was consolidated between the road network and Walbrook stream which had by 1598 been completely culverted (Weinreb and Hibbert). During the medieval period the western side of the Walbrook stream would have been dominated by *Bucklersbury* the private residence of the Buckerel family and its gatehouse *The Barge*. At the north end of Walbrook lay the Stocks Market and churches of St Mary Woolchurch and St Stephen Walbrook.
- 11.4.11 Following the Great Fire of London in 1666 housing within the Whole Block Site was rebuilt fronting onto the surrounding roads and lanes with a number of small yards set back from the street. Blocks of new housing with a few small courtyards to the rear were also constructed along St Michael's Lane (near Arthur Street) and along Walbrook Street. At the north end of Walbrook the site of the Stocks Market and St Mary Woolchurch was cleared to create the Woolchurch Market, which was itself demolished in 1739 to make way for the construction of Mansion House, the Lords Mayor of London's residence.
- 11.4.12 The rebuilding of London Bridge on its present site by John Rennie between 1831 and 1835 was to have a profound impact on the local area. A number of early lanes and alleys were demolished to create the street pattern seen today. King William Street was laid out under a number of Acts of Parliament beginning in 1823 (Lambert, 1921), but primarily between 1829 and 1835 to connect Mansion House, Cornhill and London Bridge. Arthur Street was laid out in 1830 and the site of the Arthur Street Shaft has since then remained within the roadway. The construction of Queen Victoria Street through the

western side of the study area in 1869 completed the modern road layout seen today.

Designated Archaeological Assets

- 11.4.13 Only one Scheduled Monument within the study area is designated solely for its archaeological significance. This Scheduled Monument, comprising the buried archaeological remains of the Roman Provincial Governor's Palace [**A36**], is located within the study area some 20m southwest of the Whole Block Site on the southern side of Cannon Street (English Heritage National Monuments List No. 1001997; numbers in bold refer to archaeological assets identified on Figure 11.1 and Appendix B of Appendix A11.1). The Scheduled Monument lies beyond the limits of the BSCU and will not be impacted by the scheme.
- 11.4.14 There are no World Heritage Sites, Registered Parks and Gardens or Registered Battlefields within the study area.

Non-Designated Archaeological Assets

- 11.4.15 The whole of the City of London is considered to be equivalent to an Archaeological Priority Area. In addition, the Cannon Street and Nicholas Lane frontages of the Whole Block Site and Arthur Street are located within an Area of Archaeological Potential as defined by the *City of London Unitary Development Plan 2002* (City of London Corporation, 2002).
- 11.4.16 A total of 205 non-designated archaeological and historical assets have been identified within the study area (Figure 11.1). Six of these assets are recorded within the boundary of the Whole Block Site, although most are known to have been removed by the construction of modern basements. No known assets are recorded within the footprint of the Arthur Street Shaft, although the results of previous archaeological investigations in the vicinity of the Arthur Street Work Site indicate that the line of a Roman road and the Anglo-Saxon and medieval St Michael's Lane may pass through the footprint of the shaft. No known assets are recorded within the footprint of the potential Walbrook Grout Shaft, or the Low Level 2 and London Bridge Sewer works shafts. There is however potential for archaeological remains of Roman to post-medieval date to survive at each of these locations.
- 11.4.17 Within the Whole Block Site Roman remains have been recorded, namely:
- a layer of Roman fire debris overlying mixed gravel and Brickearth containing burnt fragments of amphora, wood, mortaria and Samian pottery dating to the 1st and 2nd centuries AD [**A31**];
 - the remains of a mosaic floor laid on clay containing fragments of brick, pottery, plaster, sand and gravel of probable Roman date [**A53**];

- two deep undated features identified in geotechnical boreholes sunk in 1974 [**A55**];
- several substantial Roman walls and a mortar floor indicating the remains of least one or possibly two Roman buildings were recorded truncated by several medieval and post-medieval wells/cess pits [**A33**];
- the northern edge of the Roman road which runs east-west below Cannon Street [**A51**]; and
- a fire/destruction deposit dating from the Flavian period (AD 69 to 96) and a section of ragstone wall [**A38**].

11.4.18 The first three assets are known to have been entirely removed; and the last three partially removed by the construction of modern basements.

11.4.19 Evidence for later Roman domestic buildings in the form of mosaics, walls, floor surfaces and building materials have been recorded adjacent to the Whole Block Site ([**A37**, **A29**, **A34**, **A35**, **A45** and **A209**]).

11.4.20 With the possible exception of a continuation of the Roman road [**A52**; **A66**] leading to the Roman waterfront no known archaeological assets are recorded within the footprint of the Arthur Street Shaft.

11.4.21 Immediately to the south of and extending between c.7m and 40m from the Arthur Street Shaft, archaeological investigations at Miles Lane/33-37 King William Street [**A81**, **A82** and **A83**] have revealed the line of two Roman quays dating to the mid-1st and late 1st century AD. The hillside above the quays had been landscaped to create two terraces separated by a substantial mortared chalk and flint wall founded on timber piles. On the lower terrace lay a group of Roman domestic buildings. A substantial masonry and tile building (Building A) occupied the eastern side of the site flanked by a timber lined drain and a gravel path/road that may represent the southern end of the road [**A52**]. The Late Saxon origins of St Michael's Lane (later Miles Lane) and evidence of houses established on either side were also recorded (Miller, 1980).

11.4.22 The timber quay and terracing recorded at Miles Lane/33-37 King William Street extended westwards and was also recorded at the 12 Arthur Street site where excavations recorded the remains of two successive Roman buildings on the upper terrace [**A79**]. Evidence was also found for three phases of Roman waterfront, a number of high status masonry buildings on the lower terrace, and a later timber-framed well with the remains of a timber water-lifting mechanism (Swift, 2008).

11.4.23 To the northwest of the Whole Block Site, at the northern end of King William Street in the area of the London Bridge Sewer works a large 1st century Roman quarry pit was found to be overlain by dump deposits which suggested the area was open land until the 2nd century when a Roman masonry building

- was constructed [A150]. Remains associated with several other later Roman buildings have also been recorded in the vicinity including a tessellated pavement [A148], and walls and flues for a hypocaust underfloor heating system [A151]. Immediately to the north of the Access Shaft, Roman remains were truncated by 18th and 19th century cellars which may extend across the location of the shaft.
- 11.4.24 To the west of the Whole Block Site numerous archaeological investigations have provided extensive evidence for Roman settlement within the Lower Walbrook valley. Chief amongst these investigations was the work of Professor W F Grimes and Ivor Noel-Hume during the post-War regeneration of the late 1940s and 1950s on the site of the former Bucklersbury House. This included the course of the Walbrook stream, layers of dumping, timber revetments, lines of piles, timber platforms, sections of Roman road, wells drains and the remains of buildings and the discovery of the Temple of Mithras on the east bank of the Walbrook [A164-A168].
- 11.4.25 Alongside the Walbrook channel numerous sites have provided evidence for the low lying marshy ground which was subject to long term and extensive attempts to reclaim and raise the ground level [A103; A104; A110; A105; A121; A169; A173; A174 and A194].
- 11.4.26 In the vicinity of the potential Walbrook Grout Shaft archaeological investigations beneath Mansion House have recorded the remains of reclamation deposits, Roman domestic buildings and yard deposits including a tessellated pavement [A147]; the partial remains of a substantial masonry building which would have stood near the corner formed by the *Via Decumana* and the eastern bank of the Walbrook stream [A144]; external gravel yard surfaces; and a sequence of three early Roman buildings one of which had been destroyed by fire. These early Roman buildings were replaced by a Roman masonry structure; possibly the same building found in 1917 [A146].
- 11.4.27 A trial pit against the western external wall of Mansion House recorded extensive Roman remains including a north-south aligned wooden fence; dump deposits cut by rubbish pits, gravel surfaces possibly representing a yard and evidence for four phases of Roman buildings [A156].
- 11.4.28 Immediately to the southwest of the potential Walbrook Grout Shaft the full profile of the Roman Walbrook channel, alluvial deposits and associated timber piles, dump deposits, timber floor/platform and gravel path that may be associated with a Roman landing stage or bridge has been recorded [A138] (Wilmot 1991).
- 11.4.29 The proposed Low Level 2 Sewer works are also situated on what would have been the eastern slope of the Lower Walbrook valley. Evidence from three trial

trenches excavated as part of the Walbrook Place/Bucklersbury House development between 2011 and 2012 revealed early Roman remains:

- a complex sequence of Walbrook alluvium, Roman demolition dumps and levelling layers and redeposited fire debris and a timber lined drain [A206];
- c.4.0m to the southwest of the proposed Low Level 2 Access Shaft Roman deposits had again been truncated by a Victorian cellar. Nevertheless Roman dump layers and general domestic refuse were recorded overlying a complex series of internal clay floors and remains of a timber building [A207]; and
- c.12.0m to the southwest of the Low Level 2 Sewer further Roman remains were recorded truncated to varying depth by Victorian cellars. Here Roman demolition deposits and redeposited fire debris sealed the remains of a late 1st century Roman building [A207]. An auger sample recorded a pale grey clay with wood fragments and peat at a 103.0m ATD (MoLA 2014 in prep).

- 11.4.30 The proposed Low Level 2 Sewer works are located just to the southeast of the *in situ* buried remains of the nationally significant Temple of Mithras [A164]. A trial trench excavated in 2010 revealed the remains of the temple's narthex entrance structure [A205] which extends eastwards from the temple beneath Walbrook. The Roman remains were sealed by 'dark earth' deposits containing a large amount of Roman building material including Roman tile and brick (MOLA 2011).
- 11.4.31 To the east of the Low Level 2 Sewer works and further up the slope of the Walbrook valley archaeological excavations at St Swithin's House and Walbrook House in 1949-50 revealed evidence for the reclamation of waterlogged land alongside the Walbrook; the remains of 1st to 2nd century buildings constructed on this raised terrace including the remains of a wattle and daub hut destroyed by fire [A185]; the remains of a stone building [A189] apparently destroyed by the Hadrianic fire; and the remains of a mid- to late 2nd century Roman stone building were also recorded [A184] (MoLA 2010).
- 11.4.32 More recent excavations prior to the redevelopment of the same site recorded further Roman occupation features [A186], the earliest of which may form part of a military enclosure created just after the Roman invasion of AD43. Other early activity recorded comprised a quarry pit possibly used in treating leather goods, a north-south aligned road flanked by buildings built shortly after the Boudiccan revolt and subsequently replaced in the late 1st century by buildings with stone foundations and masonry walls.

Archaeological Survival

11.4.33 An assessment of the extent of previous ground disturbance affecting archaeological survival within the BSCU Work Sites has been undertaken within Section 4.3 of the baseline Appendix A11.1. The results of the assessment and potential archaeological remains that survive are summarised below and in Tables 11.5 to 11.9.

Whole Block Site

11.4.34 The archaeological investigations undertaken within the Whole Block Site are discussed in full at Section 4.3 of the Baseline Assessment at Appendix A11.1. The results of these investigations are summarised in Table 11.5 and confirm that:

- the underlying topography of the natural Brickearth and Taplow terrace gravels slopes downhill from c.111m ATD beneath 10 King William Street, falling to an estimated height of c.110m ATD at Cannon Street;
- Roman tessellated pavements or floor surfaces recorded at 10 King William Street and in Nicholas Lane suggest the presence of domestic buildings;
- a number of substantial ragstone and tile walls which suggest the presence of at least two buildings with mortared floor surfaces at 12 Nicholas Lane;
- fire debris possibly correlating with the destruction layers of the Boudiccan revolt of AD 60 and Hadrianic fire between c. AD 120 and AD 125 have been recorded;
- a Roman road surface and fire horizons were observed beneath 143-149 Cannon Street in 1963 and may continue west into 135-141 Cannon Street;
- the construction of existing basement levels within the Whole Block Site has truncated the archaeological sequence, removing post-medieval and medieval horizons; and
- where medieval or post-medieval remains do survive they are limited to truncated deep features such as wells and brick lined coal cellars or cess pits, three of which were recorded at 12 Nicholas Lane and one beneath 10 King William Street.

11.4.35 Table 11.5 summarises the extent, depth, archaeological survival and magnitude of previous ground disturbance within the Whole Block Site. The areas of modern disturbance are shown on Figure 11.2.

Table 11.5: Archaeological Remains Recorded Within the Whole Block Site

Location	10 King William Street Borehole 2	10 King William Street (formerly 8-13 King William Street)	12 Nicholas Lane (NIC80)	143-149 Cannon Street (GM33)
Deposits	Height in metres above Tunnel Datum (m ATD) at Surface of Deposit and Thickness (m)			
Existing Ground Level	Not recorded	Assumed 115.0m ATD	Not recorded	Not recorded
Modern Basement	113.10m ATD (0.30m)	111.77m ATD (base of slab)	Not recorded	Not recorded
Made Ground	112.80m ATD (0.35m) Brick Rubble	Not present	Not present	Not present
Post-medieval Deposits	Not present	Not present	Not present	Not present
Medieval Horizons	Not present	Not present	Not present	Not present
Post-Roman Dark Earth	Not present	Not present	Not present	Not present
Roman Horizons	112.45m ATD 'Mosaic floor' (0,25m) 112.20m ATD (1.00m) soft brown clay with fragments of brick, pottery, plaster, sand and gravel.	111.77m ATD (0.66m) burnt clay and tile 111.11m ATD (0.68m) mixed gravel, Brickearth burnt wood, amphora and mortaria 1st-2nd Centuries AD.	111.76m ATD Top of Roman wall in Tr. B (2.06m)base of foundation at 109.70m ATD 110.56m ATD Roman floor Tr. B 110.36m ATD (0.42m) Top of Roman wall Tr. C 109.94m ATD Roman floor surface Tr. C 110.82m ATD Top of Roman wall Tr. D All Roman structural remains sealed by burnt	c. 110.50 to 111.00m ATD* 1st Century AD Burnt deposit cut by Roman wall 110.53m ATD Roman gravel road surface (0.23m thick) recorded overlying gravel *No levels or height information were recorded during 1961 monitoring.

Location	10 King William Street Borehole 2	10 King William Street (formerly 8-13 King William Street)	12 Nicholas Lane (NIC80)	143-149 Cannon Street (GM33)
			horizons and redeposited Brickearth	
Natural Brickearth	Not present	110.43m ATD (0.31m)	Not present	c.110.30m based on assumed thickness of 0.30m
Taplow Terrace Gravels	111.10m ATD (5.35m)	110.12m ATD	110.69m ATD (northern side Tr. A) 110.82m (southern side Tr. B)	Assumed at c. 110.0m ATD
London Clay	105.75m ATD	Not reached	Not reached	Not reached

- 11.4.36 The review of previous development impacts has revealed extensive truncation of archaeological deposits resulting from construction of the extant buildings and their basements. It is therefore almost certain that all archaeological horizons post-dating the Roman period have been removed and that across much of the site archaeological remains have been removed altogether. The extent of basement impact is summarised in Table 6 of the baseline Appendix A11.1.
- 11.4.37 The general archaeological potential of the Whole Block Site by chronological period can therefore be assessed as:
- negligible-low for prehistoric remains including isolated find of flint tools;
 - moderate for the recovery of Roman remains;
 - negligible-low for the discovery of archaeological remains of Anglo-Saxon and medieval date; and
 - low for the recovery of post-medieval remains.
- 11.4.38 At ground and basement levels the new Station Entrance Hall will only occupy the eastern half of the Whole Block Site as shown on Figure 11.2. Within this footprint 10 King William Street and 12 Nicholas Lane have negligible archaeological potential; 14 Nicholas Lane has a moderate to high potential for up to 1.4m of stratified Roman and possibly later deposits and 143-149 Cannon Street has a low potential for the survival of Roman remains including further evidence for fire debris and deposits associated with the Roman road [A38; A51] within its single level basement, reducing to negligible within the sub-basement area.

Arthur Street Shaft

- 11.4.39 A number of investigations have been completed in the surrounding area of which 28-32 King William Street, approximately 10m north and Miles Lane/33 King William Street immediately to the south of the Arthur Street Shaft provide the closest and most useful information regarding the potential archaeological sequence within the Arthur Street Shaft. Previous investigations reported the following:
- at 28-32 King William Street probable gravel surfacing of the Roman road leading south from the Forum to the Roman waterfront [A66] was recorded;
 - terrace gravels were recorded at a height of 106m ATD approximately 8m south of the Arthur Street Shaft;
 - Roman deposits c.1.2m thick and including the remains of a substantial building (Building A) of masonry and tile construction and *opus signinum* floors, timber lined drain and the gravel surface of a road or path (possibly Roman road [A52; A66]) were recorded;
 - a post-Roman layer of dark earth sealed the Roman remains;
 - medieval deposits were also recorded including part of a masonry building. Medieval deposits were sealed by the pre-Fire of London surface of St Michael's Lane (later Miles Lane) suggesting that depth of the medieval horizons was between 0.61m and 0.95m thick; and
 - overlying the pre-Fire of London surface of St Michael's Lane was a layer of post-fire dumping.
- 11.4.40 By using the excavated evidence the potential archaeological sequence and depths of archaeological survival within the Arthur Street Shaft can be predicted as summarised in 11.6 and Figure 24 of Appendix A11.1.
- 11.4.41 Numerous modern services and utilities are known to be located within the footprint of the Arthur Street Shaft. Disturbance caused by these services and utilities is likely to be limited to the recent made ground deposits which overlie the archaeological horizons.
- 11.4.42 The former King William Street Station is known to have been tunnelled through the London Clay geology. Consequently it will not have removed archaeological remains within the footprint of the Arthur Street Shaft.

Table 11.6: Predicted Deposit Sequence within the Arthur Street Shaft

Deposit	Potential Archaeological Remains	Estimated Surface Height of Deposit (m ATD)	Estimated Thickness of Deposit (m)
Made Ground	None	111.50m (existing street level)	2.50m
Post-medieval	Surfaces of Miles Lane (ILA79*), possible evidence of roadside buildings or occupation.	109.0m	0.25m
Medieval	Building remains associated with Building O (ILA79*), surface of pre-fire Miles Lane (ILA79*).	108.75m	0.95m
Anglo-Saxon	Post-Roman 'dark earth', surfacing of a road or pathway (ILA79*), pits, post-holes and occupation activity.	107.80m	0.10m
Roman	Northern extent of Building A wooden drain (ILA79*), surface of Roman path/road associated with [A52; A66].	107.70m	1.20m
Terrace Gravels	None	106.50m	1.50m
London Clay	None	105.0m	N/A

*As recorded extending north from Miles Lane excavation (Site Code ILA79) towards the Arthur Street Shaft.

11.4.43 On the assumption that archaeological horizons recorded immediately to the south at Miles Lane/33 King William Street will extend into the area of the Arthur Street Shaft, the archaeological potential is assessed as being:

- negligible-low for prehistoric remains including isolated find of flint tools;
- moderate–high for the recovery of Roman remains including the north end of 'Building A' and the road/pathway associated with [A52; A66];
- moderate for the discovery of archaeological remains of Anglo-Saxon date;
- moderate-high for the recovery of medieval remains including the surfacing of St Michael's/Miles Lane and possible building remains 'Building O'; and
- low-moderate for the recovery of truncated post-medieval remains including the surfacing of Miles Lane.

Potential Walbrook Grout Shaft

Previous Archaeological Investigations

- 11.4.44 Five archaeological investigations have been undertaken in the immediate vicinity of the potential Walbrook Grout Shaft and these provide insight into the archaeological sequence likely to survive within the shaft. The results of these five archaeological investigations are summarised in Table 8 of Appendix 11.1.
- 11.4.45 The investigations recorded the following:
- natural terrace gravels at a height of 106.40m to 107m ATD;
 - the natural topography and Roman land surfaces slope downhill towards the Walbrook stream located c.30m further west. Beneath the adjacent Magistrates Court in 1873 [A138] Roman road surfaces flanked by timber flooring were recorded at a height of 104.06m ATD and supported by oak piles driven through flood deposits;
 - a complex sequence of Roman deposits comprising dump deposits cut by rubbish pits; gravel surfaces possibly representing ground raising/consolidation and external yard surfaces and the remains for up to four phases of clay and timber buildings with brickearth and sand internal floors between 106.40m ATD and 108.81m ATD at the western external wall of Mansion House [A156] and 107.10m and 110.10m ATD further west beneath Mansion House itself [A146];
 - evidence for at least one substantial later Roman masonry building was recorded beneath Mansion House [A144; A146] at c.108.86m to 109.66m ATD;
 - a tessellated pavement /mosaic was discovered in Walbrook in 1869 suggesting the presence of a later Roman building to the south of the shaft [A147];
 - two of the archaeological investigations recorded medieval remains directly overlying the Roman remains, with Saxon remains absent. Outside Mansion House the remains of a medieval building were recorded [A156] at c.108.82m to 108.97m ATD and a chalky-mortar floor make-up associated with the Church of St Mary Woolchurch Haw was recorded beneath Mansion House [A146] at 109.80m ATD;
 - the basements of, and post-medieval features associated with, Mansion House had truncated the archaeological sequence above 109m/110m ATD. Within the roadway of Walbrook a full sequence of medieval deposits including former street surfaces dating back to the 12th century may survive.
- 11.4.46 The predicted depths of archaeological survival within the Walbrook Grout Shaft are summarised in Table 11.7 below.

Table 11.7: Predicted Deposit Sequence within the Potential Walbrook Grout Shaft

Deposit	Potential Archaeological Remains	Estimated Surface Height of Deposit (m ATD)	Estimated Thickness of Deposit (m)
Made Ground	None	112.60m (existing street level)	2.50m
Post-medieval	Former road surfaces of Walbrook, possibly drains associated with Mansion House	110.10m	c.0.30 – 1.10m
Medieval	Former road surfaces of <i>Walbrooke Street</i> and possibly features associated with Stocks Market or St Mary Woolchurch	c.109 – 109.80m	c.0.20m
Anglo-Saxon	None recorded but dark earth or Late Saxon road surfaces may survive	Unknown	Unknown
Roman	Dump and reclamation layers, quarry pits, make-up layers and external yard surfaces, the remains of clay and timber early Roman buildings superseded by later Roman masonry building, demolition layers and fire debris. Timber piles may survive.	c.108.80-109.60m	c.2.30-2.60m
Terrace Gravels	None	106.50 - 107m	2.50-3.0m
London Clay	None	c. 104m	N/A

- 11.4.47 *Walbrooke Street* is certainly medieval in date and was probably in existence by the 12th century. Historic maps appear to confirm that the site of the shaft has remained free from major development for at least the last 500 years.
- 11.4.48 Previous development impacts within the roadway are likely to comprise post-medieval culverts or drains associated with the construction of Mansion House, which have been recorded to a depth of 109.0m ATD. More recent services and utilities are also known to be present but are likely to be limited to the predicted 2.5m depth of made ground.
- 11.4.49 Although no archaeological assets are recorded within the site of the Walbrook Grout Shaft, its archaeological potential is assessed as being:
- negligible-low for prehistoric remains including isolated find of flint tools;

- moderate-high for the recovery of Roman remains including dump deposits and reclamation/ground raising within the Walbrook valley, rubbish pits, the remains of clay and timber buildings and floor/yard surfaces and later Roman masonry buildings overlooking the Walbrook as seen immediately to the east at Mansion House [A144], [A146] and [A156];
- low-moderate for the discovery of archaeological remains of Late Anglo-Saxon date;
- moderate for the recovery of medieval remains including former road surfaces of *Walbrooke Street* and possibly features associated with Stocks Market or St Mary Woolchurch; and
- moderate for the recovery of truncated post-medieval remains including the surfacing of Walbrook.

Low Level 2 Sewer works

- 11.4.50 The Low Level 2 Sewer works are also located with an area of significant archaeological potential on the eastern side of the Walbrook valley and just to the south of the nationally significant *in situ* remains of the Temple of Mithras [A164].
- 11.4.51 Extensive archaeological excavations within the Lower Walbrook valley provide extensive evidence for the settlement and development of the area; however, four archaeological trenches excavated in the immediate vicinity of the shaft provide the best evidence for archaeological survival within the area around the Low Level 2 Sewer works.
- 11.4.52 Based on the results of an auger sample recovered to the north of the shaft and sections recorded and modelled across the Walbrook valley (Wilmot 1991, MOLA 2011) the natural geology within the shaft are predicted to lie between 103.00m and 104.00m ATD sloping east to west.
- 11.4.53 The results of the previous archaeological investigations are summarised in Table 10 in Appendix 11.1.
- 11.4.54 The adjacent archaeological investigations recorded:
- possible Walbrook alluvium and organic layers recorded between 103.00m and 104.00m ATD in auger samples;
 - a complex sequence of Roman demolition dumps, levelling layers and redeposited fire debris between 105.00m and 105.80m ATD, overlying a large north-south timber lined drain the base which lay at 104.76m ATD [A206] (MOLA 2014 in prep.);
 - Roman dump layers and general domestic refuse overlying a complex series of internal clay floors and remains of a 1st century timber building

[A207] overlain by demolition dumps and redeposited fire debris between 105.00m and 105.90m ATD (MOLA 2014 in prep);

- *in situ* remains of the narthex entrance structure [A205] for the nationally significant Temple of Mithras [A164]. These remains do not extend south towards the proposed Low Level 2 Shaft as evidenced in BZY10 Trench 21, but do provide a clear indication of the level at which the remains of later Roman structures survive i.e. between c.104.59m and 105.94m ATD (MOLA 2011);
- the Roman remains in Trench 17 were sealed by two layers of 'dark earth' totalling 0.86m deep which extended to 106.70m ATD (MOLA 2011);
- medieval remains recorded in Trench 17 comprised ground raising and consolidation deposits between 106.70m and 107.42m ATD and a chalk and stone wall foundation preserved in the core of 19th century cellar wall;
- due to truncation caused by Victorian cellars the only evidence for post-medieval remains was limited to a 17th century brick lined well truncated at 107.80m ATD.

11.4.55 The predicted archaeological sequence within the Low Level 2 Sewer works is summarised in Table 11.8.

11.4.56 Historic maps show that until the 1950s the site of the Low Level 2 Sewer works lay partially within the frontage of buildings situated on the western side of Walbrook. This was confirmed by the adjacent archaeological trenches which recorded Victorian cellars extending to a consistent depth of c.105.80m to 105.90m ATD.

11.4.57 The Low Level 2 Sewer over which the shaft will be located was itself constructed by tunnelling through the archaeologically sterile London Clay rather than by an open cut method. As a result the overlying sequence of archaeological deposits was not disturbed by its construction.

Table 11.8: Predicted Deposit Sequence within the Low Level 2 Sewer Works

Deposit	Potential Archaeological Remains	Estimated Surface Height of Deposit (m ATD)	Estimated Thickness of Deposit (m)
Made Ground	None	110.76m (existing street level)	2.50m
Post-medieval	Victorian cellars and possibly former road surfaces of Walbrook	c.108.26m	c.0.30 – 1.10m
Medieval	Ground raising deposits and former road surfaces of <i>Walbrooke Street</i>	Unknown due to possible truncation	Unknown
Anglo-Saxon	None recorded but dark earth or Late Saxon road surfaces may survive	Unknown due to possible truncation	Unknown
Roman	Dump deposits and the remains of clay and timber buildings, timber lined drain, overlying reclamation/dump layers and Walbrook alluvium. Timber piles may survive.	c.105.80m	c.2.80m
Terrace Gravels	None	Unknown	Unknown
London Clay	None	c. 103 - 104m	N/A

11.4.58 Modern buried services and utilities within the roadway of Walbrook are likely to be limited to the predicted 2.5m depth of made ground.

11.4.59 The archaeological potential of the Low Level 2 Sewer works is therefore assessed as being:

- negligible to low for prehistoric remains including isolated find of flint tools;
- high for the recovery of Roman remains including dump deposits and reclamation/ground raising within the Walbrook valley, possible timber lined drains and the remains of clay and timber buildings [A206; A207];
- low to moderate for the discovery of archaeological remains of Anglo-Saxon date such as dark earth deposits;
- low for the recovery of medieval remains within areas of Victorian basement impact, raising to moderate outside former basements for remains including ground raising deposits and former road surfaces of *Walbrooke Street*, and
- low to moderate for the recovery of truncated or deep cut post-medieval remains within areas of Victorian basement impact and possibly surfacing deposits for Walbrook.

London Bridge Sewer Works

- 11.4.60 Access to the London Bridge Sewer will be achieved by the breaking out of a manhole cover slab (approximately 2-4m depth) to an existing shaft. The construction of this existing structure will have removed any surviving archaeological remains within the footprint and consequently there is no potential for the survival of archaeological remains and therefore no further assessment is required.

Low Level 2 and London Bridge Sewer Works Emergency Access/Egress

- 11.4.61 The Low Level 2 and London Bridge Sewer works will use existing blind shafts for emergency access/egress. The construction of these existing structures will have removed any surviving archaeological remains within their footprint and consequently they have no potential for the survival of archaeological remains and therefore no further assessment is required.

Other Utilities Works

- 11.4.62 It is anticipated that the general utility works will be undertaken within the depth of existing made ground identified across the BSCU area and as such they will not impact on buried archaeology and therefore no further assessment is required.

Sensitivity of Archaeological Assets

- 11.4.63 The sensitivity of the baseline archaeological resource within or extending into the BSCU Work Sites has been assessed using the criteria set out in Table 11.2.
- 11.4.64 The sensitivity of the archaeological remains will primarily be derived from their potential to provide evidence of past human activity (their *evidential value*; EH 2008, 7) and from their ability to contribute to the established research themes for Greater London set out in *A Research Framework for London Archaeology* (EH/MOLAS, 2002).
- 11.4.65 Additional factors such as their level of preservation and whether the remains are already well documented and understood will also affect the sensitivity of archaeological remains.
- 11.4.66 The sensitivity of known archaeological assets or potential archaeological remains identified within the BSCU Work Sites is summarised in Table 11.9.

Table 11.9: Sensitivity of Archaeological Assets

BSCU Work Site	Archaeological Asset or Potential Archaeological Remains	Sensitivity
Whole Block Site - 14 Nicholas Lane	Truncated and poorly preserved remains associated with Roman buildings and fire debris deposits [A33]	Low
Whole Block Site - 14 Nicholas Lane	Well preserved, stratified remains associated with Roman buildings and fire debris deposits [A33]	Medium
Whole Block Site - 143-149 Cannon Street	Remains of the Roman road which runs below modern day Cannon Street [A51]	Low
Whole Block Site - 143-149 Cannon Street	Roman fire debris deposits and ragstone walls [A38]	Low
Arthur Street Shaft	Archaeological remains of Roman to post-medieval date which contribute to local research themes or which are poorly preserved,	Low
Arthur Street Shaft	Well preserved, stratified archaeological remains of Roman to post-medieval date	Medium
Potential Walbrook Grout Shaft	Archaeological remains of Roman to post-medieval date which contribute to local research themes or which are poorly preserved,	Low
Potential Walbrook Grout Shaft	Well preserved, stratified archaeological remains of Roman to post-medieval date, such as the building remains, timber structures recorded beneath Mansion House and the National Safe Deposit Company building.	Medium
Low Level 2 Sewer works	Archaeological remains of Roman to post-medieval date which contribute to local research themes or which are poorly preserved such as dump deposits, domestic refuse, fire debris and truncated demolition layers recorded adjacent [A206; A207].	Low
Low Level 2 Sewer works	Well preserved, stratified archaeological remains of Roman to post-medieval date including floor layers, building remains and timber lined drains recorded adjacent [A206; A207]	Medium

11.5 Incorporated Mitigation

- 11.5.1 Within the Whole Block Site a single level basement for the new Station Entrance Hall will in part make use of existing basement areas with a new raft slab laid over the extant basement slabs of the existing buildings without the need for piling. This design not only minimises the risk to existing London Underground Limited (LUL) infrastructure located beneath the Whole Block

Site, but also largely removes the impact on any archaeological remains which survive beneath the current basement slabs.

- 11.5.2 It is possible that the single level basement of 143-149 Cannon Street is found to be too shallow to accommodate a new raft slab and still provide the required plant space for the new Station Entrance Hall. In that event excavation will be required to increase the depth of the basement level. The potential effects of increasing the depth of the basement at 143-149 Cannon Street are assessed below.

Archaeological Mitigation

- 11.5.3 The results of the Archaeological Baseline Assessment (Appendix A11.1) have been used to inform the mitigation strategy for the BSCU. The mitigation strategy will be further refined once the TWAO has been made in consultation with the City of London Corporation's Historic Environment Advisor. A staged programme of archaeological investigation and mitigation will be undertaken after consent and prior to construction.
- 11.5.4 Archaeological assessment is unlike most other EIA topics insofar as the presence of an asset is frequently not known with certainty. Unless records are extensive or archaeological investigation undertaken as part of the EIA, it remains the function of pre-construction investigation to ascertain any more detailed mitigation measures that might be needed.
- 11.5.5 The first stage of this programme of investigation will be the confirmation of the extent and depth of previous ground disturbance within the footprint of the new Station Entrance Hall at the Whole Block Site and at the location of the Arthur Street Shaft, the potential Walbrook Grout Shaft and the Low Level 2 Sewer works shaft.
- 11.5.6 In the first instance this will be achieved through the archaeological monitoring of geotechnical boreholes programmed for 2016 and a review of the results by a suitably qualified archaeologist. If appropriate, site specific archaeological deposit models will also be prepared.
- 11.5.7 Archaeological evaluation may also be undertaken within the basements of the Whole Block Site once vacant possession of the existing buildings has been gained. This would comprise either the archaeological monitoring of geotechnical trial pits or targeted archaeological trial trenches. The evaluation would verify the presence or absence of archaeological remains and enable the nature of the made ground and magnitude of previous ground disturbance to be confirmed. The results would also inform the design of appropriate archaeological mitigation measures.
- 11.5.8 The trial trench or pit evaluation would confirm the presence or absence, extent, depth, condition and significance of any archaeological remains that

may survive. The results of intrusive evaluation would inform the final design of mitigation measures in the form of conservation by record.

- 11.5.9 If significant archaeological remains are found to survive; for example, beneath the extant basement slabs of 14 Nicholas Lane and 143-149 Cannon Street, it may be necessary to undertake a detailed archaeological excavation following demolition and prior to construction of the new shaft and basement level.
- 11.5.10 Trial trench evaluation of the Arthur Street Shaft and the potential Walbrook Grout Shaft following service and utility diversions would confirm the sequence, extent, depth and significance of archaeological remains at these locations. This would inform the design and programme of mitigation in the form of detailed archaeological excavation and recording prior to or during the construction of the shafts. The design and sequencing of these archaeological investigations within the BSCU programme under consideration will continue to be developed during the detailed design stage.
- 11.5.11 The access shaft for the Low Level 2 Sewer works at Walbrook is of a smaller diameter which may make evaluation prior to construction impractical. At this location it may be necessary for the controlled archaeological excavation of the shaft to be undertaken in advance of shaft construction or incorporated into the construction methodology for the shaft.
- 11.5.12 Any appropriate archaeological investigation or mitigation measures will be undertaken in accordance with an Archaeological Project Design and Written Scheme of Investigation prepared and approved in advance with the City of London Corporation's Historic Environment Advisor. The requirements for any archaeological mitigation measures will also be enshrined within the CoCP for the BSCU construction works. All archaeological investigations will be undertaken by suitably qualified archaeologists who will be monitored as necessary by the Project's Archaeologist on behalf of Dragados and LUL and by the City of London Corporation's Historic Environment Advisor to ensure compliance with both the agreed project design and professional standards.

11.6 Assessment of Effects

- 11.6.1 The baseline assessment has identified that buried archaeological remains may survive between the base of made ground deposits and the surface of the underlying Taplow Terrace Gravels.
- 11.6.2 The BSCU has the potential to cause direct physical impacts on the buried archaeological resource (both known and unknown).
- 11.6.3 Construction at the Whole Block Site will include the following activities which have the potential to impact on the archaeological resource:

- groundworks associated with enabling activities such as the diversion of existing and provision of new services and utilities;
 - construction of a compensation grout shaft within 10 King William Street;
 - construction of the secant pile walls for the structural escalator box and passenger lift core;
 - the breaking out of existing basement slabs;
 - breaking out of existing ground bearing slabs; and
 - removal/grubbing out of the existing 143-149 Cannon Street basement slabs and bulk ground reduction.
- 11.6.4 Construction of the Arthur Street Shaft includes the following activities which have the potential to impact on the archaeological resource:
- the diversion of existing services and utilities as enabling works;
 - excavation of the sheet piled shaft; and
 - excavation through the tunnel crown and structure of the former King William Street Station and remaining depth of the shaft.
- 11.6.5 The impact of shaft construction on the fabric of the King William Street Station is considered in Chapter 10: Built Heritage.
- 11.6.6 Excavation of a 3.5m diameter and 19m deep shaft on Walbrook for the Low Level 2 Sewer works has the potential to impact on the archaeological resource.
- 11.6.7 Excavation of a 6m diameter and up to 14m deep shaft on Walbrook outside Mansion House for the Walbrook Grout Shaft (if required) has the potential to impact on the archaeological resource.
- 11.6.8 As set out in the impact assessment methodology of this chapter the magnitude of impact resulting from the BSCU has been assessed in isolation from the assessment of asset sensitivity. The criteria which define the assessed magnitude of impact are set out in Table 11.3. The significance of effect prior to the application of mitigation measures is established using the assessment matrix established in Table 11.4 which balances the sensitivity of the asset against the magnitude of impact.
- Demolition of the Whole Block Site**
- 11.6.9 Demolition of the buildings that currently occupy the Whole Block Site will be undertaken within the basement footprints of the existing buildings and will retain the extant basement slabs. No impact on archaeology will be caused by demolition resulting in no change to the archaeological resource.

Construction

Utilities Works (Arthur Street)

- 11.6.10 General utilities works and the diversions required within Arthur Street are likely to be undertaken entirely in previously disturbed made ground with no impact to any archaeological remains. In the event that utility trenches of manholes/chambers extending below the depth of made ground are required, the impact on any surviving archaeology can be successfully mitigated by archaeological monitoring during the works.

Utilities Works (Sewers)

- 11.6.11 Construction of the Low Level 2 Sewer works will result in the total loss of surviving archaeological remains between the made ground and Taplow Terrace Gravels. The potential sequence of deposits comprises Roman dump and demolitions layers, building remains and timber lined drain as recorded adjacent to the shaft [A206; A207]. Possible Anglo-Saxon dark earths and medieval road surfacing layers may also survive in areas not truncated by Victorian cellars. This would constitute a high magnitude of impact on assets of low to medium sensitivity, however, the resulting adverse effects can be appropriately mitigated by ensuring a programme of archaeological excavation and recording is implemented either prior to or during shaft construction as stated in the Written Scheme of Investigation that will be proposed for the BSCU.

Potential Compensation Grout Shafts

- 11.6.12 One of the shafts would be located at the northwest corner of the Whole Block Site. The existing double basement of 10 King William Street will have removed any surviving archaeological remains at this location resulting in no impact to buried archaeology.
- 11.6.13 The potential Walbrook Grout Shaft would be located at the north end of Walbrook in an area of known archaeological potential often with a good level of preservation as demonstrated at the Magistrates Court to the west and beneath Mansion House to the east where respectively Roman timber structures and building remains have been discovered. Shaft construction would result in the total loss of any surviving archaeological remains within its footprint. This would constitute a high magnitude of impact on predicted non-designated remains of a low to medium sensitivity; moderate and major adverse effect respectively. However, the adverse effects could be appropriately mitigated by ensuring a programme of archaeological excavation and recording is implemented either prior to or during shaft construction as stated in the Written Scheme of Investigation that will be prepared for the BSCU.

BSCU Demolition and Construction Works

Whole Block Site

- 11.6.14 Enabling works comprising the capping off of redundant services and utilities will also be required. The design of these utilities works is still evolving at the time of writing; however, excavations to disconnect existing services and for new utilities trenches are likely to be limited to previously disturbed or made ground.
- 11.6.15 The areas that will be affected directly by piling are almost entirely without archaeological remains owing to their removal by the basements of 10 King William Street and 12 Nicholas Lane. The one exception to this is beneath what is currently 14 Nicholas Lane, where piles would remove any surviving archaeological remains within their footprint. This high magnitude of impact on remains of low to medium sensitivity would result in a moderate to major adverse effects, but given the mitigation measures that will be in place the effects will be minor to moderate adverse.
- 11.6.16 Excavation for the escalator box and passenger lift core will be required beneath the existing basement slab of 12 Nicholas Lane where only the base of deep cut features such as Roman, medieval or post-medieval wells may survive. This high magnitude of impact on remains of low sensitivity would result in a moderate adverse effect. Archaeological investigation and recording undertaken as mitigation will reduce this to a minor adverse effect.
- 11.6.17 Similarly, excavation beneath 14 Nicholas Lane will have a high magnitude of impact on surviving Roman or later archaeology. These remains would be of low to medium sensitivity. This would result in moderate to major adverse effects, which mitigation in the form of archaeological investigation and recording will reduce to minor to moderate adverse.
- 11.6.18 Excavation of a deeper basement at 143-149 Cannon Street will cause the total removal of surviving archaeological remains, an impact of high magnitude on the Roman wall [A38] and road [A51]. Any previously unknown Roman remains would be similarly affected. These assets are of low to medium sensitivity, and adverse effects would be moderate or major, but given the mitigation measures that will be in place these effects will be minor or moderate adverse.

Arthur Street Shaft

- 11.6.19 Excavation of guide-wall trenches and gantry crane foundations are typically between 0.5 and 1.2m in depth and would not penetrate the made ground deposits resulting in no change to the archaeological resource.

11.6.20 Construction and bulk excavation of the sheet piled section of the Arthur Street Shaft will cause the total removal of surviving archaeological remains between the made ground and Taplow Terrace Gravels. The potential sequence of deposits will comprise Roman, Anglo-Saxon, medieval and post-medieval remains and may include Roman and medieval building remains, road surfaces and occupation layers. This high magnitude of impact on remains of low to medium sensitivity respectively would result in a moderate to major adverse effect. The implementation of a programme of archaeological excavation and recording will mitigate this to a minor to moderate adverse effect.

Blockade

11.6.21 No intrusive works are anticipated as a result of the blockade, therefore no significant archaeological effects are considered likely to occur as a result of the blockade.

Operation

11.6.22 The operation of the completed BSCU will not have any impact on archaeological assets.

11.7 Mitigation Measures

11.7.1 As described in Section 11.5 a programme of archaeological investigation and recording will be incorporated into the BSCU. An Archaeological Project Design and Written Scheme of Investigation will be developed during detailed design.

11.7.2 In this way the impact of construction on buried archaeology can be managed, and remains appropriately recorded prior to their loss.

11.7.3 In the event that unexpected archaeological discoveries are made during construction the Archaeological Project Design will include details of the process and measures that would be implemented.

11.7.4 Typical appropriate mitigation measures for conservation by record are summarised in Table 11.10 below.

Table 11.10: Archaeological Mitigation Measures

Mitigation Method	Description
Detailed Excavation	Detailed Excavation would be undertaken where significant archaeological remains are either known previously or discovered during the course of the works. This may be targeted at specific area locations such as the sites of archaeological interest identified during the baseline assessment or identified as the result of a programme of trial trench evaluation or watching brief monitoring.
Targeted Watching Brief	A programme of observation, investigation and recording of archaeological remains during or alongside construction activities in which the contractor's preferred method of working would be controlled as necessary to allow archaeological recording to take place to the required standard. Targeted watching briefs would be undertaken in specific cases where the presence of moderate potential remains has been demonstrated, but where detailed investigation prior to the main construction programme is unjustified, unfeasible due to safety or logistical considerations, or undesirable due to environmental or engineering constraints.
General Watching Brief	A programme of observation, investigation and recording during construction activities. This method of observation differs from a targeted watching brief in that the contractor's preferred method of working would not be controlled for archaeological purposes but access for recording any discovered archaeology would be provided. General watching briefs would be employed in areas where remains have not been identified by assessment and evaluation studies but where there remains a residual risk of archaeological discoveries. Includes monitoring of geotechnical site investigations.

11.8 Residual Effects

11.8.1 Archaeological investigation and recording incorporated into the BSCU will appropriately manage and reduce adverse effects arising from construction on buried archaeological remains. The residual effects of the BSCU are therefore assessed as:

- a minor adverse residual effect on the low sensitivity truncated remains of deep cut Roman, medieval and post-medieval features beneath 12 Nicholas Lane;
- a minor adverse residual effect on archaeological remains of low sensitivity comprising potential Roman fire debris and possibly deep cut medieval and post-medieval features beneath the basement slab of 14 Nicholas Lane;
- a minor to moderate adverse residual effect on archaeological remains of medium sensitivity comprising potential well preserved and stratified Roman building remains and occupation layers beneath the basement slab of 14 Nicholas Lane;
- a minor adverse residual effect on any surviving archaeological remains of low sensitivity associated with fire debris and a ragstone wall [A38] and the Roman road [A51] at 143-149 Cannon Street;
- a minor to moderate adverse residual effect on archaeological remains of low to medium sensitivity respectively comprising Roman and medieval building remains, road or path surfacing and occupation layers of Roman to post-medieval within the footprint of the Arthur Street Shaft;
- a minor to moderate adverse residual effect on low to medium sensitivity archaeological remains respectively. These remains may include Roman dump deposits and reclamation/ground raising within the Walbrook valley, rubbish pits and the remains of Roman timber buildings and masonry buildings, Anglo-Saxon dark earth and medieval to post-medieval road surfaces of *Walbrooke Street* with the footprint of the Walbrook Grout Shaft; and
- a minor to moderate adverse residual effect on Roman and later remains of low to medium sensitivity respectively. This may include Roman dump and demolitions layers, building remains and timber lined drain, possible Anglo-Saxon dark earths and medieval road surfacing layers surviving within the footprint of the Low Level 2 Sewer works on Walbrook.

11.8.2 Table 11.11 summarises the residual effects of the BSCU following the implementation of mitigation measures.

Table 11.11: Summary of Residual Effects

Asset or Potential Archaeological Remains	Assessed Sensitivity	Description of Impact	Magnitude of Impact prior to Mitigation (including incorporated)	Significance of Effect prior to Mitigation	Mitigation	Residual Effect
No.12 Nicholas Lane Previously unknown truncated archaeological remains of Roman, medieval or post-medieval date	Low	Direct impacts comprising construction of a secant piled structural box	High Negative	Moderate	Archaeological evaluation and investigation, where appropriate, followed by conservation by record comprising an appropriate programme of archaeological investigation and recording.	Minor Adverse
No.14 Nicholas Lane Previously unknown archaeological remains of Roman, medieval or post-medieval date	Low to Medium	Direct impacts comprising construction of a secant piled structural box	High Negative	Moderate to Major Adverse	Archaeological evaluation and investigation, where appropriate, followed by conservation by record comprising an appropriate programme of archaeological investigation and recording.	Minor to Moderate Adverse
[A38] Roman fire debris and wall	Low	Direct construction impacts comprising ground reduction, site clearance, and excavation to new basement level.	High Negative	Moderate Adverse		Minor Adverse
[A51] Roman Road	Low		High Negative	Moderate Adverse		Minor Adverse
Arthur Street Shaft Sequence of potential Roman, Anglo-Saxon, medieval and post-medieval horizons. Possibly including Roman and medieval building remains and road/path surfaces.	Low to Medium	Direct impacts comprising construction of a 40m deep access shaft	High Negative	Moderate to Major Adverse	Archaeological evaluation and investigation, where appropriate, followed by conservation by record comprising an appropriate programme of archaeological investigation and recording.	Minor to Moderate Adverse

Asset or Potential Archaeological Remains	Assessed Sensitivity	Description of Impact	Magnitude of Impact prior to Mitigation (including incorporated)	Significance of Effect prior to Mitigation	Mitigation	Residual Effect
Walbrook Grout Shaft Sequence of Roman to post-medieval deposits, which may include dump deposits, yard surfaces, building remains, timber structures and the former road surfaces of <i>Walbrooke Street</i>	Low to Medium	Direct impacts comprising construction of a 14m deep compensation grout shaft	High Negative	Moderate to Major Adverse	Archaeological evaluation and investigation, where appropriate, followed by conservation by record comprising an appropriate programme of archaeological investigation and recording.	Minor to Moderate Adverse
Low Level 2 Sewer works Sequence of possible Roman to post-medieval date, including dump deposits, fire debris and truncated demolition layers, building remains, timber lined drains, dark earth and the former road surfaces of <i>Walbrooke Street</i> .	Low to Medium	Direct impacts comprising construction of a 19m deep access shaft	High Negative	Moderate to Major Adverse	Archaeological evaluation and investigation, where appropriate, followed by conservation by record comprising an appropriate programme of archaeological investigation and recording.	Minor to Moderate Adverse

11.9 Inter-relationships and Cumulative Effects

- 11.9.1 Further potential effects may be caused to any archaeological assets within the Whole Block Site due to construction of both the BSCU and an over site development. This is likely to affect the same general assets, including the fire debris and walls [A38] and remains of the Roman road [A51] recorded beneath 143-149 Cannon Street may extend across the southern frontage of the Whole Block Site.
- 11.9.2 Where possible, integrated programmes of archaeological investigation and recording can be achieved to mitigate individual and cumulative scheme impacts. All archaeological works will be designed in consultation with the City of London Corporation's Historic Environment Advisor to ensure that there are no significant cumulative impacts arising from these works.
- 11.9.3 The wider archaeological resource of the study area comprises buried archaeological remains which have accumulated as a result of human activity since the Roman period and dense urban occupation of the City of London during the subsequent centuries. The individual developments identified in Chapter 17: Inter-relationships and Cumulative Effects, have the potential to result in localised impacts to the wider archaeological resource of the area surrounding the BSCU Works.
- 11.9.4 The grant of planning permission for each of the cumulative schemes would be made in accordance with national, regional and local planning policy and guidance within which archaeological assets are a material consideration and will have included the provision of appropriate archaeological investigation and recording as mitigation measures specific to each scheme.
- 11.9.5 As a result, the cumulative impacts of the identified schemes in conjunction with the BSCU are considered to be of negligible significance.

11.10 Assumptions and Limitations

- 11.10.1 This assessment has been undertaken using up to date information for archaeological assets supplied by the GLHER and English Heritage National Monuments Record.
- 11.10.2 Archaeological records dating from the 19th century, 1920s and 1960s used in the assessment of archaeological survival within the Whole Block Site contain height information that is either limited or missing altogether. In these instances estimates regarding the depths of archaeological horizons have been made using the nearest verifiable data. Such instances are clearly noted within the text.

- 11.10.3 Information regarding the depth of existing basement slabs is at the time of writing limited and assumptions have had to be made as to the likely thickness of the existing basement slabs. For the purpose of this assessment thickness of existing basement slabs has been assumed to be of a minimum thickness of 0.2m over a further 0.2m sub-based material.
- 11.10.4 The limitations of the historic archaeological records and existing basement information have not prevented a comprehensive archaeological baseline from being assessed. The limitations and assumptions do however highlight areas where the baseline data can be enhanced or verified and the detailed archaeological design informed by future archaeological surveys. Consequently these limitations do not reduce the validity of the assessment of effects made in this ES or the resulting conclusions that are made.

11.11 Conclusions

- 11.11.1 The BSCU is located in the historic heart of the City of London, an Archaeological Priority Area within which there is an established potential for the survival of deeply stratified Roman, Anglo-Saxon, medieval and post-medieval remains deposited over approximately 2000 years of urban settlement.
- 11.11.2 Despite covering a relatively large area, construction impacts arising from the BSCU will be limited to work sites where intrusive shaft works have the potential to remove archaeological remains that may survive between the current ground level and the surface of the Taplow Terrace Gravels; namely the Whole Block Site and Arthur Street shaft and the grout shaft sites on King William Street and potentially Walbrook. The new station platforms and running tunnels will be constructed in the archaeologically sterile London Clay without impact to buried remains.
- 11.11.3 This ES chapter has established the baseline conditions for the archaeological resource for the BSCU Work Sites and has identified the extent of existing ground disturbance. Archaeological investigations previously undertaken within these sites or their immediate vicinity provide a clear indication of the character and sensitivity of the archaeological resource. This has enabled the potential archaeological remains within each work site to be predicted and assessed with a good degree of confidence.
- 11.11.4 Construction of the new Station Entrance Hall within the Whole Block Site will have minor or moderate adverse residual effect on surviving Roman or later remains of low to medium sensitivity. The exception to this is 10 King William Street where the existing double basement has removed all but the deepest potential archaeological features such as base of well shafts.

- 11.11.5 Construction of the Arthur Street Shaft will remove all surviving archaeological remains of Roman to post-medieval date within its footprint resulting in a minor or moderate adverse residual effect on remains of low or medium sensitivity.
- 11.11.6 In Walbrook the construction of the Walbrook Grout Shaft (potentially) and Low Level 2 Sewer works will remove all surviving archaeological remains of Roman to post-medieval date within their footprints resulting in a minor or moderate adverse residual effect on remains of low or medium sensitivity at each location.
- 11.11.7 Construction impacts will have a minor adverse residual effect on assets of low sensitivity or a moderate adverse residual effect on assets of medium sensitivity. The implementation of an appropriate programme of archaeological investigation, recording, analysis and publication, would mitigate the loss of any surviving archaeological remains. Consequently the residual effects are not considered likely to be significant.

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