HERITAGE STATEMENT

BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

OCTOBER 2023

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1.0
INTRODUCTION
BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

INTRODUCTION

1.1 This Heritage Statement is prepared on behalf of the British Museum in support of applications for planning permission and listed building consent for sites within the south-eastern and south-western corners of the Museum Estate.

1.2 The project forms part of the Museum's Energy Centre Programme for its Bloomsbury estate and is designed to address matters of energy efficiency, sustainability and staff welfare accommodation. It forms the first phase of the wider Estate Masterplan, which will transition the Museum to low-carbon sustainable systems, replace critical life-safety infrastructure, and provide appropriate facilities for the maintenance and upkeep of the Museum. The works will likewise support the future upgrade of M&E and distribution and services to each of the galleries and collections storage.

1.3 The development sites that form the subject of the applications accommodate back-of-house servicing functions and are not accessible to the public. The development may be described as:

"Demolition of existing Energy Centre to internal West Road. Removal of temporary buildings to the south of the existing energy centre on the internal West Road and to the north and east of the White Wing facing Montague Street. Erection of new energy centre incorporating maintenance support accommodation to internal West Road, new substation off Montague Street, all together with associated internal and external works, service runs, erection of plant, landscaping, and temporary works associated with construction."

1.4 The site lies within the administrative authority of the London Borough of Camden.

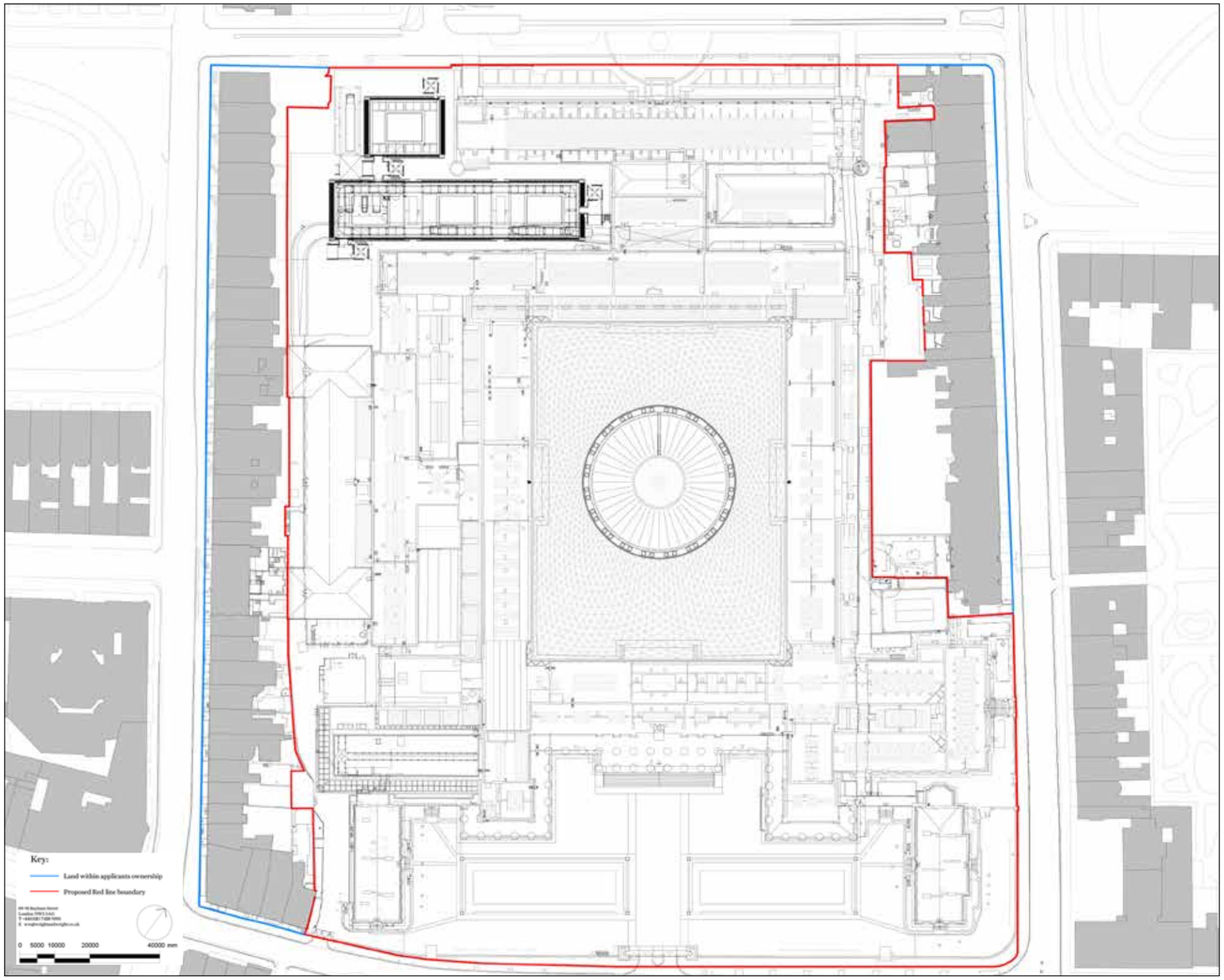


Figure 1.1 Site Plan

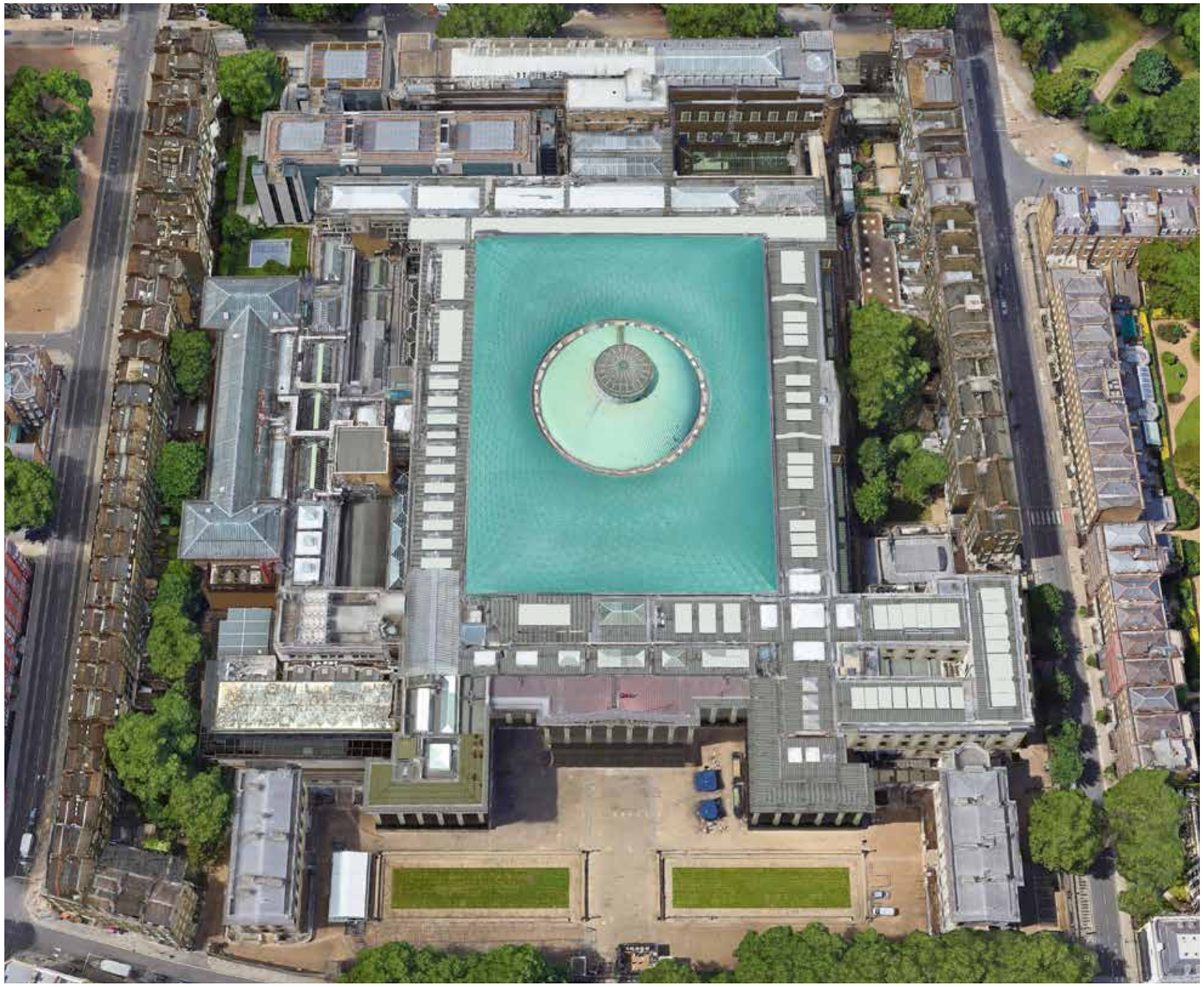


Figure 1.2 Aerial View

DESCRIPTION OF THE SITE

SWEC SITE

1.5 The British Museum comprises a collection of Grade I listed buildings within the Bloomsbury Conservation Area ('CA'). The existing SWEC, which dates from the 1990s, is located within the southwest portion of the Museum estate and adjoins the southern range of the Duveen Gallery.

1.6 Section 1(5a) of the Planning (Listed Buildings and Conservation Areas) Act 1990 states that for the purposes of the Act 'listed building' means a building which is for the time being included in a list compiled or approved by the Secretary of State and any object or structure fixed to the building. The existing SWEC is Grade I listed by virtue of its attachment to the Duveen Gallery. However, the building itself does not contribute to the significance (architectural or historic special interest) of the main listed complex.

1.7 To the east are the museum galleries collectively known as the Western Range; to the west are the rear gardens of terraced properties on Bloomsbury Street. To the south of the SWEC is a block of portacabins, currently used to provide welfare facilities for contractors. For ease within this report, we refer to the portacabin block and existing energy centre as 'the SWEC site'.

1.8 The SWEC itself dates from 1997. It is a three-storey brick building with a lower ground floor, with access provided from ground level to the service road to the south and plant enclosed within a screen at roof level (**Figure 1.3**). The building was designed by Arnold and Boston and has an expedient character reflecting its back of house use.

1.9 Adjacent to the west – but not adjoining – are galleries forming part of the Western Range designed by Sydney Smirke, the fabric of which dates from 1845–1885 and are of high significance. Their external expression to west is limited: they are now absorbed within later ranges and back of house functions (**Figure 1.4**).

1.10 The Duveen Gallery itself, presents blank elevations to the south, lacking any elaboration of windows, where it adjoins the energy centre. That range is top lit.

Figure 1.3 The existing SWEC

Figure 1.4 The energy centre in context with the Western Range galleries

1.11 The portacabins comprise a three-storey block occupying the space between the existing energy centre, the New Wing and the Lycian Gallery. The portacabins are a temporary and expedient solution to the need for welfare accommodation and are of no architectural or historic merit (**Figure 1.5**). To their immediate east the Lycian Gallery rises to six storeys (plus lower ground) and is of considerable historic and architectural interest by reason of its age and association with Robert Smirke; to the west it presents a stock brick faced elevation with stone string courses, deep window reveals and parapet concealing rooftop plant (**Figure 1.6**).

1.12 Significant servicing pipework attaches to the west elevation.

1.13 The 1975–78 New Wing to the south by Sir Colin St John Wilson & Partners presents its secondary, northern elevation to the SWEC site. Whilst St John Wilson is, clearly, a designer of historic interest, the New Wing is not admired as a leading example of his work. Whilst characteristic of its time, it has a simple character, lacking any real architectural refinement. It clearly demonstrates a particular phase in the history of the museum, but then so would any extension of any substance and in our opinion more definite historic interest is needed for the building to have greater than low significance.

1.14 Overall, the character of this part of the Museum's estate is simple and expedient, with a back of house quality, albeit accepting that some of the fabric is of intrinsic interest because of its greater age. Essentially, the use of this area as a service area, the presence of the service road and the constrained nature of the Museum's estate has influenced the form of the buildings and the way they address their surroundings. The elevations facing the SWEC site are secondary and have been subject to accretive change over time as the result of plant and service requirements. This part of the estate is not visible or accessible from public areas.

1.15 The area is bounded to the west by Grade II listed terraced properties on Bloomsbury Terrace, attractive late Georgian properties whose gardens have been truncated by the Museum's development historically. The boundary walls between those properties and the Museum estate are not, therefore, original to the houses. Mature trees within the gardens of these properties provide a filtering effect.

Figure 1.5 The existing portacabin block

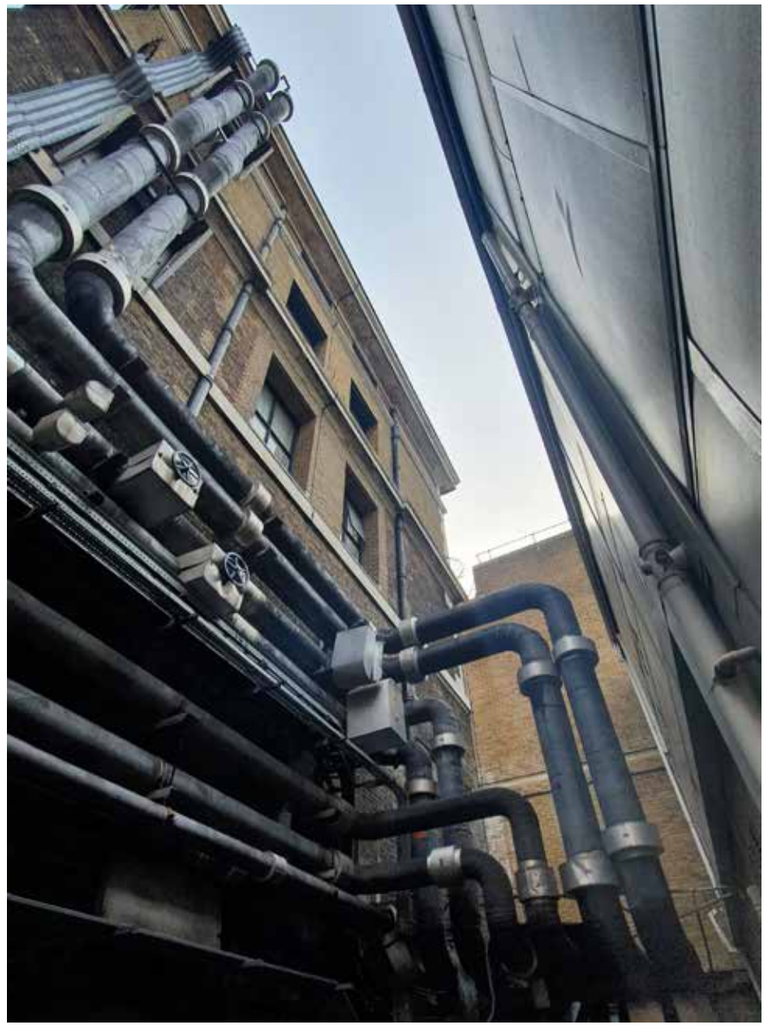


Figure 1.6 The west elevation of the Lycian gallery

ISS SITE

1.16 The Incoming Substation ('ISS') Site is located to the southeast of the Estate, adjacent to the part of the Museum known as the White Wing (Grade I listed), which presents its principal elevation to Montague Street.

Figure 1.7 ISS site

1.17 The site is currently occupied by three portacabins, of expedient character and placed in proximity to the railings where they are visible in public views of the Museum from Montague Street. The portacabins extend to occupy the small area of forecourt immediately in front of the White Wing (to each side of the entrance steps) where they detract materially from an appreciation of the Museum fabric as well as surrounding listed buildings, and are detrimental to the appreciation of the White Wing.

1.18 The surface treatment of the forecourt – comprising areas of tarmac and gravel – is likewise expedient and of no particular quality. The area also accommodates ad-hoc plant and servicing infrastructure, including a tunnel and railing adjacent to the Hirayama Conservation Studio to the western part of the site.

Figure 1.8 Portacabin to the east elevation of the White Wing, ISS site

STRUCTURE OF THIS REPORT

1.19 This Heritage Statement examines the heritage considerations material to the Proposed Development. It should be read in conjunction with the Design and Access Statement, prepared by Wright and Wright Architects, and the Planning Statement, prepared by Montagu Evans, submitted as part of this application.

1.20 This statement draws on our site inspections and analyses the effect of the proposals on listed buildings comprising the Museum Estate, the Bloomsbury Conservation Area and listed buildings within it. We note and have considered the highly sensitive assets on Bedford Square (the Grade I listed terraces and the RPG), which have limited visual interaction with SWEC.

1.21 In combination with all other supporting material, this report assess the proposals against statutory provision, relevant local and regional planning policy, as well as national guidance.

1.22 As described within this report and in detail in the Design and Access Statement, the design of the proposals has evolved in close consultation with the Local Authority and Historic England.

1.23 By virtue of paragraph 194 of the NPPF, applications for development proposals which affect the historic environment are required to describe the significance of the identified assets so that the impact of the proposals may be understood. This report fulfils this requirement by assessing the significance of relevant heritage assets and the contribution made by the site to their significance.

1.24 **Section 2.0** of this report provides a summary of statutory provision and applicable planning policies. **Section 3.0** provides a brief summary of the relevant heritage assets and their significance and **Section 4.0** provides an assessment of the proposals' effect on that significance. **Section 5.0** sets out our conclusion that the proposals comply with national and local planning policies as they relate to heritage.

1.25 This report has been prepared and overseen by qualified heritage professionals, Rosie Adamson and Dr Chris Miele.

2.0
STATUTORY PROVISION, POLICY AND GUIDANCE
BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

STATUTORY PROVISION, POLICY AND GUIDANCE

2.1 The heritage designations affecting the Museum comprise very sensitive and weighty considerations in planning terms, engaging statutory provision under the Planning (Listed Buildings and Conservation Areas) Act 1990:

- S16(2), which requires a decision maker considering whether to grant listed building consent for any works, to have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.
- S66(1), which requires the decision maker, in considering whether to grant planning permission or listed building consent for any works, to have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses; and
- s72(1), which requires special attention to be paid to the desirability of preserving or enhancing the character or appearance of a conservation area.

2.2 As noted, SWEC itself is attached to the Duveen Gallery which forms part of the Grade I listed British Museum Estate, and so is listed under Section 1(5a) of the Planning (Listed Buildings and Conservation Areas) Act 1990. The SWEC and ISS sites lie within the setting of listed buildings (both Museum buildings and listed buildings in the wider area – the terraces on Bedford Square, Bloomsbury Street, Montague Street and Great Russell Street) and within the Bloomsbury CA.

NATIONAL PLANNING POLICY FRAMEWORK

2.3 National policy on the historic environment imports the statutory duty and may be expressed as a series of principles:

- The significance of the heritage assets affected should be identified and assessed (para. 194, NPPF). Heritage interest may be archaeological, architectural, artistic or historic (Glossary, NPPF);
- The impact of the proposed development on the significance of the identified heritage assets is then to be considered (para. 199, NPPF);
- If the proposed development is considered to cause harm to the significance of a designated heritage asset, such harm should be categorised as either less than substantial or substantial, and in either category, the extent of harm should be clearly articulated (PPG paragraph 18). It is important to calibrate the extent of harm as this informs the balancing exercise required by para. 202 (see below);
- If a proposal would result in harm to the significance of a designated heritage asset, great weight should be given to the asset's conservation (irrespective of whether the harm would be substantial or less than substantial) (paragraph 199 NPPF);
- Any harm to the significance of a designated heritage asset should require 'clear and convincing justification': para. 200, NPPF. This does not mean that the proposal must be tested against possible alternative designs to identify a design that would cause the least harm. Where the harm would be less than substantial, there must be countervailing public benefits which would outweigh the harm: para. 202, NPPF; and
- For this purpose, there is no further definition of "public benefits". The term is broad enough to encompass enhancements to heritage assets, benefits to the way an area appears or functions, improvements to the townscape setting of heritage asserts, or more general land use planning benefits, such as sustainability enhancements.

THE DEVELOPMENT PLAN

2.4 The Development Plan comprises the London Plan (2021) and the Camden Local Plan (2017).

2.5 The London Plan treats heritage at Policy HC1, Heritage Conservation and Growth and requires that development proposals affecting heritage assets should conserve their significance, avoid harm and identify enhancement opportunities by integrating heritage considerations early on in the design process.

2.6 Camden Local Plan Policy D2 Heritage supports national policy and in respect of harm states that the Council:

> *'... will not permit loss of or substantial harm to a designated heritage asset, including conservation areas and Listed Buildings, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss...'. And 'will not permit less than substantial to the significance of a designated heritage asset unless the public benefits of the proposal convincingly outweigh that harm.'*

2.7 In respect of Conservation Areas, the Council requires that 'development within conservation areas preserves or, where possible, enhances the character or appearance of the area' (Policy D2).

2.8 In respect of archaeology, the Council will require acceptable measures to be taken proportionate to the significance of a heritage asset to preserve it and its setting, including physical preservation, where appropriate. There is a separate archaeological desk-based assessment accompanying the application.

OTHER MATERIAL CONSIDERATIONS

2.9 Other relevant planning guidance and material considerations include:

- National Planning Practice Guidance (online);
- Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment (Historic England, 2015);
- Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (Historic England, 2017); and
- Bloomsbury Conservation Area Appraisal and Management Strategy (April 2011, London Borough of Camden).

3.0
SIGNIFICANCE OF SURROUNDING HERITAGE ASSETS AND SETTING

BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

SIGNIFICANCE OF SURROUNDING HERITAGE ASSETS AND SETTING

SOUTH WEST ENERGY CENTRE SITE

THE BRITISH MUSEUM (GRADE I)

3.1 The Bloomsbury Conservation Area Appraisal and Management Strategy (2011) describes the British Museum at paragraph 5.46 as 'occupying a major ensemble of outstanding grade I listed buildings which make a significant contribution to the character and appearance of this the Conservation Area as a whole'. The Museum is identified as a landmark building with notable views towards it east and west along Great Russell Street and glimpsed views along adjacent streets (p.8).

3.2 In this section we summarise the significance of the component parts of the Museum, and assess the contribution made by the SWEC and ISS sites to that significance.

LYCIAN BUILDING

3.3 The Lycian building forms part of Robert Smirke's early development plans for the Museum and opened to the public in 1847. The block as seen today is the result of many phases of development over the 19th and 20th centuries.

3.4 Originally, it comprised a triple-height space with pitched roof and coffered plaster ceiling to the gallery space below. In 1892 the pitched roof was removed, and the walls heightened to match the height of the adjacent West Wing upper floor galleries to provide a new gallery and offices for the Department of Coins and Medals (now known as Level 6). The new floor was lit by triple windows echoing those of the Lycian Gallery below and it is likely that it was also top lit by a rooflight.

3.5 The upper storey was gutted by WWII bombing, although the external envelope broadly survived (**Figures 3.1 and 3.2**). The gallery underwent reconstruction in the 1950s, with a mezzanine floor added (Level 6A) and two additional windows formed at the west end of the block to light the new mezzanine.

3.6 The ground floor gallery was itself comprehensively refurbished between 1961–81, and another mezzanine was inserted in the 1980s to create the Level 5 spaces.

3.7 Overall, therefore, the character of the interior spaces is materially altered from the 19th century intention of a triple-height gallery. The spaces are now artificially lit and have a character which reflects their 20th century remodelling. The significance of the wing accordingly lies predominately in its historic value and plan form as part of the Smirke masterplan. The external fabric likewise has architectural interest that reflects its historic development.

3.8 The primary elevation to the south is marked by its ashlar facing, which formerly would have been seen above the southern forecourt and Great Russell Street prior to the construction of the New Wing in the 1970s. That part of the Lycian building closest to the SWEC site is its western elevation, which as noted is a stock-brick faced façade with stone string courses denoting storey heights and a simpler form fenestration than those used to the longer northern and southern elevations. Whilst of considerable historic interest, therefore, the west elevation was a secondary frontage that was not public-facing and its architectural expression reflects that status.

3.9 The west elevation is also marked by the quantity of later servicing comprising pipework and ducting attached to it (see **Figures 3.7 and 3.7**). These obscure – to a significant degree – the lower storeys and extends to cover the northern bay, rising from ground to roof level. The pipework, which is accretive and unsightly, materially detracts from an appreciation of the architectural qualities of the elevation.

3.10 The setting of the Lycian building to the west has been described above as comprising back of house and servicing areas. The buildings that are the subject of these proposals – the energy centre and portacabin block – make no contribution to the way the interest of this part of the Museum is appreciated.

Figure 3.1 Photograph showing bomb damage to the south-west corner of the Museum

Figure 3.2 Post-war photograph showing damage to the Lycian Building

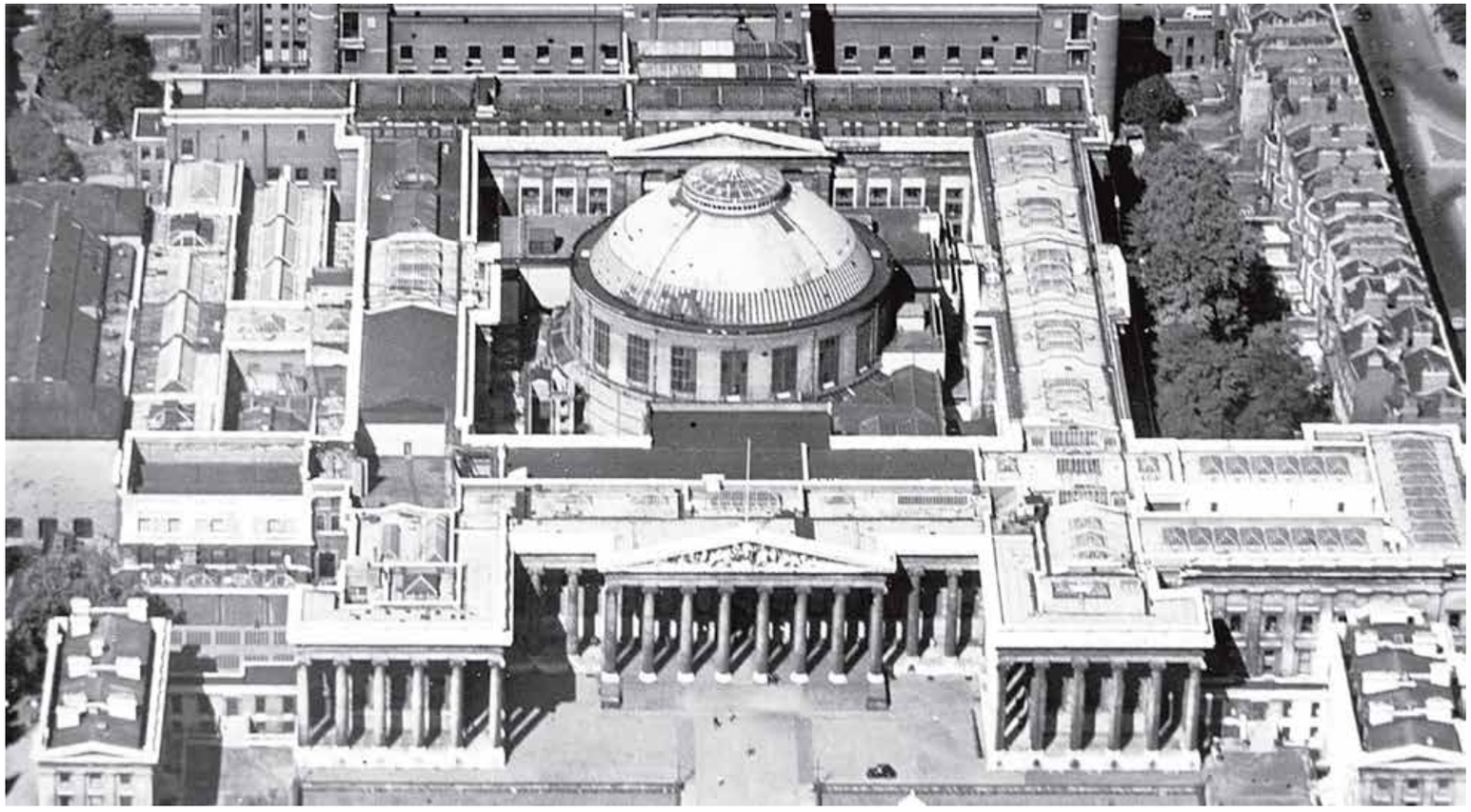


Figure 3.3 Aerial photograph showing bomb damage to the Lycian building (see far left of photograph)

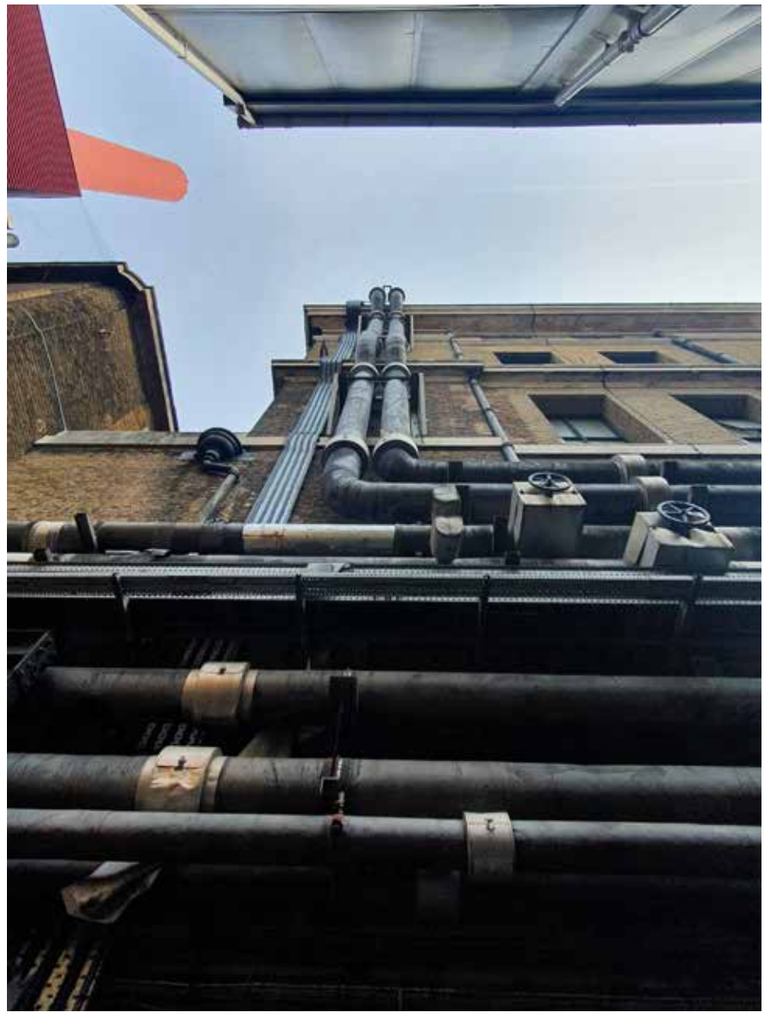


Figure 3.4 View looking up the west elevation of the Lycian building, showing the extent of ducting to the façade

Figure 3.5 View of the ground storey of the Lycian building where it meets the existing portacabin block

WEST WING

3.11 To the east of the existing energy centre is Room 15 within the Western Range, part of the Sydney Smirke galleries and dating from 1850–51. It is four storeys above a lower ground level and is lit by three square hipped rooflights, which are original. The northern part of the western elevation of this gallery is abutted by the Duveen Gallery; the existing energy centre lies against the southern part. As a result, the gallery is almost wholly subsumed within later buildings and has no material external expression (**Figure 3.6**). Its significance lies within its plan form and historic fabric, visible within the internal gallery space in the rooflights, plaster decorative ceiling and broad pilasters supporting a frieze and cornice.

3.12 The buildings that are the subject of this application likewise make no contribution to its interest or appreciation.

Figure 3.6 View towards the West Wing as it relates to SWEC

DUVEEN GALLERY

3.13 The Duveen Gallery, designed by John Russell Pope to house the Parthenon Sculptures, comprises a long top-lit gallery on a north-south axis with raised transepts at each end. The existing energy centre is attached to the southern wall of the gallery.

3.14 The style of the interiors is sober and stately, intended as a fitting background and display space for the display of the marbles in a pattern that replicates what is understood to be their original position.

3.15 The plan form and architectural quality of the gallery are best appreciated from its interior spaces: the space was designed for the display of a specific collection and so the focus is internal. The gallery was built in the constrained space between the 19th century Western Ranges and the terrace on Bloomsbury Street: the rear gardens of the latter were curtailed to accommodate the Duveen footprint. Accordingly, the gallery does not have any public facing façade, and its external architectural expression reflects that. The elevations to west, north and south, which are faced in stock brick, are largely blind, and address the service areas of the estate.

3.16 The existing energy centre is built against the southern elevation of the southern raised gallery, and there is no awareness of it from within the gallery (**Figure 3.7**). It makes no contribution to an appreciation of the gallery's significance.

NEW WING

3.17 The northern elevation of the New Wing, facing the SWEC site, is a secondary façade of little architectural interest. It consists of large expanses of stock brick with a low parapet enclosing plant at roof level. The functional areas and offices (which occupy this northern portion of the wing) are not considered to be significant.

3.18 **Figure 3.8** shows the relationship of the portacabin block to the New Wing on its northern elevation.

CONTRIBUTION OF THE SWEC SITE TO THE SIGNIFICANCE OF THE GRADE I LISTED MUSEUM

3.19 Overall, therefore, the areas of the Museum's estate under consideration comprise back of house and servicing areas. The existing SWEC site makes no contribution to the way these component parts of the Museum are appreciated or their interest; indeed, the low architectural quality of the portacabin block and the existing energy centre are detracting elements in the setting of the listed buildings within proximity such as the Lycian, the Western Range and the Duveen Galleries.

Figure 3.7 The existing SWEC, built against the southern façade of Duveen Gallery

Figure 3.8 The portacabin block which adjoins the northern elevation of the New Wing

MAIN ENTRANCE GATEWAY, RAILINGS AND ATTACHED LODGES TO THE BRITISH MUSEUM (GRADE II*)

3.20 The main entrance gateway to the Museum, railings and attached porters lodges are separately listed at Grade II*. They date from 1849 to the designs of Sydney Smirke and are of historic and architectural value for their age, quality of detailing and architectural composition. The ensemble is likewise of significance for its association with the Museum and comprises an important setting component, as a set-piece with the south forecourt, providing a grand entrance and sense of status and enclosure to the Museum. The railings continue to the south and east boundaries of the Museum estate.

THE BLOOMSBURY CONSERVATION AREA AS IT RELATES TO SWEC AND LISTED BUILDINGSWITHIN IT

LISTED PROPERTIES ON BLOOMSBURY STREET

3.21 The properties on Bloomsbury Street to the west of the SWEC site are listed at grade II as part of a terrace – Nos. 24–60 and attached railings (Nos 1–10 Bedford Square, which adjoin the terrace to the north, and are listed at grade I are discussed below under *'Properties on Bedford Square'*). The terrace dates from the mid-18th century and comprises properties of yellow stock brick with slate mansards and dormers (**Figure 3.9**). The Bloomsbury Conservation Area Appraisal and Management Strategy notes that the majority of buildings along Bloomsbury Street pre-date Bedford Square, and architecturally, they share many of the characteristics of their later counterparts in Gower Street (vertically proportioned fenestration and long blocks of consistent height and building line); however, they are of slightly smaller scale and finer detailing.

3.22 The significance of the terrace lies in its historic and architectural interest as part of the 18th century development of Bloomsbury and for the quality and coherence of its composition in the street scene.

3.23 Those properties closest to the SWEC site are nos. 32–44, occupied in a range of uses – commercial, hotel and educational. No. 40 is in residential use, reflecting its original function. The properties' setting to the rear has undergone considerable change through the multi-phased development of the Museum, which, over time, has curtailed the extent of the rear gardens through the expansion of the western galleries. The map regression at **Figure 3.10** – 3.11 and the aerial photograph at **Figure 3.12** show the extent of change.

3.24 The Museum developments of the 20th century – the Duveen Gallery and the New Wing as well as the existing energy centre – have introduced large scale buildings which, due to the topography of the site, are comparable to the terrace in height, albeit visually separated by the filtering effect of the mature trees within the rear gardens of nos. 32–44, which provide a dense screen, particularly in the summer months.

3.25 The blind elevations to Duveen and the New Wing on this side make no contribution to an appreciation of the significance of the terrace, and the utilitarian character created by the extensive service pipework, plant, and portacabins to this part of the Museum estate are detracting features.

Figure 3.9 Grade II listed properties on Bloomsbury Street

3.26 The SWEC site, therefore, is an undistinguished element in the setting of the listed buildings which is obscured within the back of house facilities within the Museum Estate and often screened by mature vegetation.

HERITAGE ASSETS ON BEDFORD SQUARE

3.27 The designated heritage assets within and immediately around Bedford Square comprise the following:

- Nos. 12 –27 Bedford Square – North (Grade I);
- Nos. 28–38 Bedford Square – West (Grade I);
- No. 39 Bedford Square – West (Grade II);
- Nos. 1–10 Bedford Square – South (Grade II);
- Railings and gates to garden in the middle of Bedford Square (Grade II);
- The Garden House within garden in the middle of Bedford Square (Grade II);
- Nos. 37 lamp standards around Bedford Square (Grade II); and
- Bedford Square (Grade II* Registered Park and Garden –'RPG').

3.28 Bedford Square is a very important example of a later 18th century planned London square, of architectural and historic significance as part of the development of this part of Bloomsbury and for the quality and coherence of its composition in the street scene.

3.29 The properties and plan of Bedford Square date from 1776 and were designed to form part of the wider Bedford Estate, following the demolition of Bedford House. The CAA describes it as one of the most significant and complete examples of a Georgian Square in London, which despite the impact of traffic along Gower Street remains a relatively intimate space.

3.30 We note that notwithstanding the completeness of the square, its setting has fundamentally changed and today comprises the wider urban environment, including the large-scale buildings of Tottenham Court Road, with development visible above the Georgian terraces, particularly in views from the south and west. The roof of the Museum's Round Reading Room is also visible in views eastwards.

3.31 The Grade I terraces fronting the square comprise grand townhouses of stock brick, with the central properties distinguished by their larger scale and central stuccoed pediment. As noted by the CAA, the terraces were designed as a whole in a neo-classical style to give a sense of architectural unity and harmony to the square. The overall effect of each is therefore of a single composition, distinct from the adjoining Grade II properties to surrounding streets – such as those at 24–60 Bloomsbury Street – which have a smaller scale and plainer character.

3.32 In our view, the roofscape of the listed buildings is secondary to the overall composition. The enclosing and filtering effect of the mature vegetation within the semi-private Bedford Square Gardens themselves means that the symmetrical composition of the terraces is best appreciated (especially in summer months) from the generous public realm outside the garden railings, beyond the RPG.

Figure 3.10 1870 OS Map

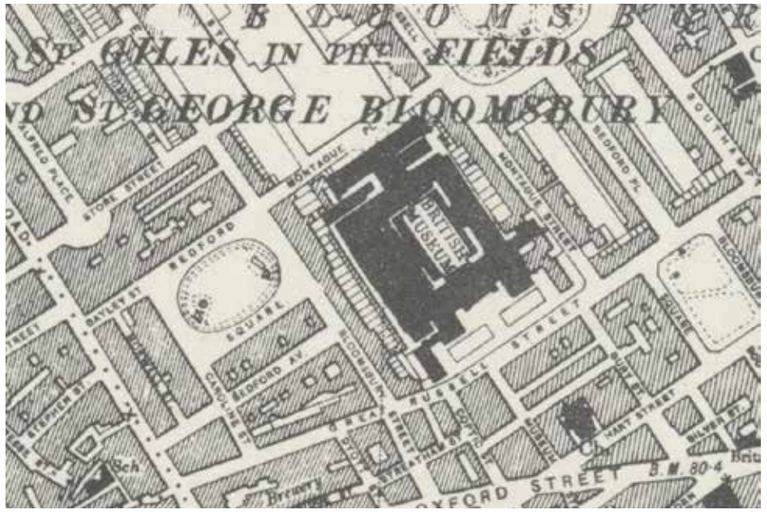


Figure 3.11 1938 OS Map

Figure 3.12 1948 aerial view

3.33 The properties' setting to the east has undergone transformative change over time due to multi-phased development of the Museum. The map regression shown at **Figures 3.10–3.11** and the aerial photography at **Figure 3.12** show the extent of change as a result of Museum redevelopment and expansion.

3.34 The visual relationship the listed terraces and the Museum is limited to the generous public realm to the southwest corner of the square, from which the dome of the Round Reading Room is a prominent element rising above the roofline of Nos. 1–10 Bedford Square.

3.35 There are also views of the Round Reading Room roof from the west end of Bedford Avenue, to which the mews properties to the rear of Nos. 1–10 Bedford Square face. These properties, which are curtilage listed, are Edwardian in date and display a robust, architecturally consistent frontage of red brick and terracotta detailing to the street.

3.36 The SWEC site as existing has no visual relationship to Bedford Square since development interposes, preventing any visual interaction. The SWEC buildings make no contribution to significance or an appreciation thereof. Likewise, the SWEC site has no visual relationship to Bedford Avenue due to the interposing Bloomsbury Street terraces.

Figure 3.13 View across Bedford Square gardens, a private space (see https://www.bedfordestates.com/about-us/garden-squares/ accessed 18/09/2023).

Figure 3.14 The mews to Bedford Avenue. Views to the Round Reading Room roof can be obtained from the southern pavement to the west end of this street.

LISTED PROPERTIES ON GREAT RUSSELL STREET

3.37 The listed properties on Great Russell Street closest to the SWEC site entail nos. 89, 90 and 91 Great Russell Street, listed as a group at grade II. No. 89 dates from the early 19th century, while nos. 90 and 91 date from the late 18th century and have been subject to significant alterations.

3.38 The significance of the terrace is derived from the architectural and historic interest of the elevations and composition of the buildings.

3.39 The existing SWEC site has no visual relationship with the listed buildings through occlusion by interposing development.

ISS SITE

COMPONENT PARTS OF THE MUSEUM ESTATE

3.40 The ISS site adjacent to the Museum's White Wing, which was constructed in the 1880s and was intended to provide exhibition space for the Prints and Drawings department and the British Medieval Antiquities, as well as storage for newspapers and manuscripts. The site was formerly the garden of the Principal Librarian's residence. Its significance lies in its historic and architectural interest as one of the Museum's earliest major extension schemes – evidencing its historical need for expansion, for its association with the library collection, and for the quality and presence of its architecture in the street scene. It forms an outward facing wing, giving the Museum significant presence on Montague Street.

3.41 To the east are the Museum's Grade II* listed railings and gates which form a continuous boundary to the Estate, surrounding it on three sides. The railings to the White Wing are of a smaller scale than those to the east but stylistically match those to the southern frontage.

3.42 As described, the ISS site is currently characterised by unattractive portacabins in close proximity to the railings and are visible in views of the Museum from the street, partially occluding views towards the ground floor of the White Wing. The expedient quality of these structures and their poor condition materially detract from an appreciation of this part of the Museum Estate.

Figure 3.15 View into the service areas of the Museum Estate to the rear of nos. 89–91 Great Russell Street. The SWEC site lies beyond the New Wing.

Figure 3.16 Portacabins within the ISS site, occluding views towards the White Wing at low level

Figure 3.17 Portacabins within the ISS site

LISTED BUILDINGS TO MONTAGUE STREET

3.43 The same observations apply in respect of the site's relationship with the listed buildings on Montague Street, comprising No. 30 and attached railings (Grade II) and the adjoining terrace (Nos. 1–11 and attached railings including White Hall Hotel and Montague House, Grade II). The listed buildings have special interest for their architectural and historic value as part of the development of this part of Bloomsbury, and for their quality and coherence in the streetscene. The ISS site in its existing condition is currently a detracting element in views towards those listed buildings closest to it.

3.44 Two Grade II listed telephone kiosks flank the gate piers to the White Wing.

4.0
HERITAGE ASSESSMENT
BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

HERITAGE ASSESSMENT

4.1 This assessment should be read in conjunction with the DAS prepared by Wright and Wright Architects. In summary, the proposals may be described as:

- The demolition of the existing SWEC and portacabin block and their replacement with a new, carefully considered Energy Centre, including the removal of the existing ducts and pipework to the west elevation of the Lycian building and the replacement of the existing plant to the west portion of the roof with new ASHP
- The demolition of the existing portacabins to the southeast corner of the estate adjacent to the White Wing and their replacement with a new incoming switchroom in the south (Incoming Substation or 'ISS')
- Infrastructure distribution which connects the new plant systems to secondary plant rooms / systems across the Estate
- Enabling works comprising:
  - The careful dismantling, storage and re-erection in situ of the Grade II* listed southwest gate piers and railings to enable construction traffic access
  - The careful dismantling, storage and re-erection in situ of the Grade II* listed southeast railings to facilitate access to the ISS to enable its connection to UKPN
  - The removal of a section of walling to the west lawn within the entrance forecourt to allow for temporary security arrangements for the period of construction
  - Works to facilitate the erection of a crane within the entrance forecourt, comprising excavation and works to stabilise the crane

4.2 In this section, we consider these four components of the proposals and their specific impacts on relevant heritage interests in turn. In relation to the Museum itself, we consider specific impacts arising from the different parts of the proposals before providing an overall assessment of effect on the heritage asset as a whole.

SOUTH WEST ENERGY CENTRE

4.3 The SWEC site is effectively landlocked. It is contained by the existing Museum development, much of which is of considerable sensitivity, and by the need for service roads and access. These considerations have dictated the space and location available for a new energy centre, along with the location of the existing service feeds. The design therefore seeks to optimise the site.

4.4 We first make an overall observation, which is that the new SWEC will not affect any principal public view of the Museum from Great Russell Street or the South Forecourt. The proposals have evolved through rigorous visual testing, and the applications are now supported by a series of verified views that demonstrate the changes to visibility in the surrounding townscape that will arise as a result of the new SWEC. Those views are presented at **Appendix 1.0**, and we refer to them where relevant in the following assessment.

4.5 The scale and mass of the proposals has been carefully considered with reference to the way the Museum is experienced and understood, and there will be no effect on either the intrinsic historic and architectural significance of the Museum Estate or the way that it is appreciated in these key views from the south.

4.6 A Zone of Theoretical Visibility ('ZTV'), also known as a Zone of Visual Influence ('ZVI') prepared by independent visualisation consultants Cityscape Digital demonstrates the limited visual interaction with the wider Museum Estate (**Appendix 2.0**). The analysis shows areas from which the proposed development could theoretically be seen, based on terrain modelling. It is important to note that actual visibility is dependent on a number of factors, including the occluding effect of interposing vegetation and the nature of the viewing experience.

4.7 For this reason we use the term 'ZTV' and we note here that a ZTV has limitations. Accordingly, verified wireline views have been prepared to assist in understanding the nature of effects from the environs of Bedford Square (refer to **Appendix 1.0**). The viewpoint locations have been agreed with Council Officers.

IMPACT ON THE SIGNIFICANCE OF CONSTITUENT PARTS OF THE MUSEUM

WEST WING

4.8 The SWEC site lies in the setting of the Museum's western galleries described above. In respect of the West Wing, we note that the building is almost wholly subsumed within later building ranges and so its form and architectural quality is now experienced almost exclusively from its internal spaces. The proposed development will have no effect on the intrinsic interest of the galley's footprint or built fabric as part of Sydney Smirke's design; nor will the building's function as a vehicle for the display of collections be affected.

LYCIAN BUILDING

4.9 The same observations apply in respect of the Lycian Building. The affected area is a secondary façade and altered, as described, with prominent service pipework to the elevation. The character of the galleries themselves reflects their 20th century remodelling and they are now artificially lit.

4.10 Notwithstanding, the proposals have developed with careful consideration given to the sensitivity of the built fabric and the character of the internal spaces through the placement of a lightwell between the new building and the historic elevation, providing separation between the buildings. The historic cornices are retained, and connections to the historic fabric are designed to be lightweight and reversible.

4.11 The service pipework will be removed, a material benefit, and the elevation made good. The elevation will be repaired where necessary and cleaned – including replacement on a like-for-like basis of defective brick and stone masonry and pointing, and refurbishment of existing windows and leadwork.

4.12 The new lightwell will enable views towards the refurbished façade from within the new welfare accommodation.

4.13 The existing plant to the roofscape will likewise be rationalised, and the new AHSP will replace existing plant to the non-historic roof.

DUVEEN GALLERY AND NEW WING

4.14 In respect of the Duveen Gallery, the increased massing will likewise not affect the internal character of the gallery space, which is the source of its architectural interest. The positioning of the massing relation to the south transept, Gallery 18, means that additional height of the new plant enclosure will not be visible from the gallery floor, which is top lit by means of a lightwell.

4.15 The New Wing has no distinguishing feature to its northern elevation that would be affected by the proposals, and we do not identify any harm from the new building to its significance.

4.16 We note that there may be some, limited visibility from the service entrance to the Museum on Great Russell Street, where the entrance gateway offers glimpsed views to the north taking in the flank walls of the New Wing, albeit heavily filtered by the presence of mature trees in the gardens of nos. 89–90 Great Russell Street (refer to View 01, **Appendix 1.0**). The views are glimpsed and transitory, and are dominated in any event by the West Residence, the distinguished western elevation of which holds the attention.

MATERIALITY AND DETAILED DESIGN

4.17 The design of SWEC has developed with careful regard to sensitive museum fabric. The selection of yellow-toned London stock brickwork is designed to reflect the rear elevations of the Museum's Lycian and Duveen Galleries and the New Wing, whilst also responding to the wider context of the Bloomsbury Street perimeter properties (see below). The louvres and reveals to the fenestration will be of charcoal-coloured metalwork. CGIs of the proposed SWEC are included at **Figure 4.1** and **Figure 4.2**.

VISIBILITY FROM THE SOUTH

4.18 The ZTV (refer to **Appendix 2.0**) demonstrates that there may be some, glimpsed visibility of the uppermost parts of the new ASHP on the Lycian building from a small portion of Museum Street. Any effect would be transient and of very short duration, experienced only from a short stretch of the eastern pavement, peripheral to the focus of the view and at some distance (c.125m). The potential visibility occurs at a point where views towards the Museum are characterised by the filtering effect of the trees and railings bounding the Museum forecourt, and influenced by activity at street level on the approach to Great Russell Street.

4.19 If perceptible, therefore, the proposals would appear obliquely and above a small portion of the modern New Wing. The effect would, we consider, be so small as to be unnoticeable to the ordinary observer and not harmful to an appreciation of the Museum, the distinguished southern elevation of which holds the attention in these views. From the northern portion of Museum Street as it joins Great Russell Street, where one can appreciate the scale of the principal façade of the Museum, there is no visibility.

4.20 The ASHP would also be visible in some views from West Central Street / Coptic Street to the south, from which a portion of the West Residence can be seen. These views are obtained over a considerable distance (c.250m–175m) and form part of a kinetic sequence. The activity at street level (the effect occurs around the New Oxford Street junction) influences the character of the townscape and visual amenity here, and it is not a point from which the significance of the Museum is best appreciated.

4.21 The ZTV and modelling work undertaken by Cityscape indicates that parts of the ASHP will be visible as part of the Museum roofscape in these views (existing plant is currently visible beyond the West Residence). The visibility diminishes rapidly as one progresses north, and is occluded altogether along Coptic Street. The nature of the effect in our view, is limited and transient, and does not materially alter the character of these views or the way the Museum is experienced, resulting in an effect that is neutral. We conclude that there will be no harm to the significance of the Museum or the way it is appreciated.

4.22 We note the presence in these longer views of the Bloomsbury Public House (Grade II), which is experienced in an urban setting heavily influenced by the New Oxford Street junction and street activity. The historic and architectural interest of this listed building and the appreciation thereof would not be affected by the glimpsed visibility described above, which would be peripheral and at some considerable distance. We conclude that significance would be preserved.

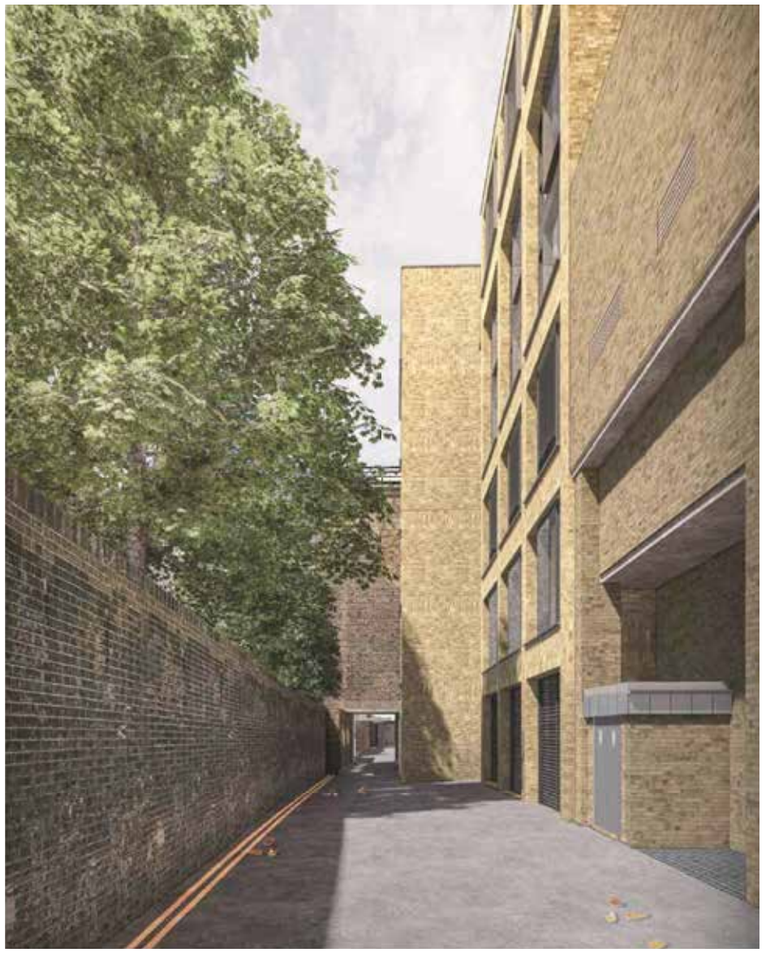


Figure 4.1 CGI of the proposed SWEC

Figure 4.2 CGI of the proposed SWEC

Figure 4.3 CGI of the proposed SWEC

SUMMARY

4.23 Overall, therefore, the new SWEC optimises the space available, and the increase in massing is achieved without harm to an appreciation of the significance of Museum fabric. The proposals replace undistinguished buildings of no architectural or historic merit (and in the case of the existing portacabins, a temporary and expedient solution to the need for welfare accommodation which are detracting) – with one of higher quality that responds, in its materiality and carefully considered design, to its immediate context.

4.24 The rationalisation of existing plant and services in this location removes unsightly ducting from the west elevation of the Lycian building, which is carefully considered in the proposals through the placement of a lightwell to provide separation between the historic fabric and the new building. Critically, the sustainable infrastructure delivered through the SWEC project constitutes a major benefit for the Museum in heritage terms through improvements to its operation and enabling the future delivery of improved environmental conditions for the collections.

4.25 Overall and in conclusion, we identify a significant enhancement to the operation of the Museum through the proposals achieved without harm to an appreciation of its historic and architectural significance, and improvement to the appearance of this part of the estate.

IMPACT ON THE LISTED BLOOMSBURY STREET TERRACE

4.26 Institutional Museum buildings have formed part of the immediate setting of Bloomsbury Terrace to the rear since the mid-20th century. As described, the rear gardens of the properties along the terrace were curtailed to facilitate the building of the Duveen Gallery and are now experienced additionally in proximity to the New Wing, the existing SWEC building and the associated plant which characterises the Museum roofscape in this location.

4.27 The introduction of the new SWEC building is therefore consistent – in both character and scale terms – with the building types that already characterise this part of the setting. The new building, which is set back from the rear gardens and does not extend beyond the current building line established by the existing energy centre or the New Wing, will be filtered by the existing mature trees within the gardens of 36–40 Bloomsbury Street, the canopies of which will not be affected. Overall, as noted, the proposal will rationalise and reduce the plant and service pipework which is a conspicuous and detracting element in this part of the Museum estate, instead presenting a coherent façade to the west addressing the terrace.

4.28 Views analysis demonstrates that there would be some visibility of the new SWEC above the roofline of the terrace from Bedford Avenue, which lies perpendicular to the site on an east west axis. The existing flue on the roof of the energy centre is currently visible in these views, noticeable from the western portion of the road and over a distance of c.150–200m behind the chimney stacks at no. 42 Bloomsbury Street. The views here are glimpsed, albeit over some distance, and obtained only from the north pavement when one is moving east. The north pavement is characterised by mature trees which have a heavily filtering effect, even in winter months, and our analysis concludes that the nature of the effect would accordingly be limited and transitory, diminishing as one moves eastwards.

4.29 We refer the reader to the views in **Appendix 1.0** (Views 04 and 05) which demonstrate the nature of the effect along Bedford Avenue.

CONCLUSION

4.30 For these reasons, we conclude that the intrinsic architectural and historic significance of the listed terrace will be unaffected, and the ability to appreciate that significance – best appreciated in closer views and those from along Bloomsbury Street itself – will not be harmed.

IMPACT ON BEDFORD SQUARE

4.31 The ZTV presented at **Appendix 2.0** illustrates that part of the proposed SWEC building will be seen from one area of the gardens. The wireline views prepared by Cityscape Digital (**Appendix 1.0**, Views 02 and 03) demonstrate the nature of the effect. The visible portion of the new building will appear in the southeast corner of the square, where it will be seen above the roofline of the Grade II listed terraces to Bloomsbury Street. It is removed, visually, from the roofline of Nos. 1–10 (the square's eastern terrace) and will be subservient – by virtue of its relative scale and separating distance – to Nos. 40–54 (southern terrace).

4.32 The area and duration of the effect is limited: as one moves into the view visibility will reduce, and from the public realm beyond the gardens will be occluded altogether.

4.33 The materiality of the new building has been carefully considered with reference to this view: the use of stock brick around the discreetly placed louvres reflecting the prevalent building materials of this part of the Museum Estate and the surrounding area will reduce the nature of the effect.

4.34 For these reasons we do not consider that the composition or architectural prominence of the listed buildings will be challenged, or that the proposals will materially affect the way in which the architectural or historic value of the listed buildings – or those of the RPG – are experienced or appreciated. The qualities which make up Bedford Square's particular special interest – as the first garden square with an imposed architectural uniformity which set the style for garden squares in London in the late 18th and early 19th century – will be preserved.

CONCLUSION

4.35 For the reasons set out above, therefore, we do not identify any harm either to the listed terraces comprising Bedford Square, or to the special interest of the RPG. Likewise, we consider the character and appearance of the Bloomsbury Conservation Area to be unaffected. Should the decision maker reach a different view, and find some harm to arise from the effects described, then we consider that harm must be limited and less than substantial in the terms of the NPPF. Against that impact are the benefits to the Museum estate described above. Effects on heritage assets, as described, attract great weight in the planning balance.

IMPACT ON THE LISTED GREAT RUSSELL STREET TERRACE

4.36 We note and have considered the presence within the study area of the Grade II listed buildings forming a terrace comprising nos. 80–91 Great Russell Street. As a result of their orientation which is to the rear of the SWEC, and interposing development and vegetation, which limits the SWEC's visibility to a view through a single British Museum service entrance; these sensitive assets will not experience a perceptible change to their setting in the operational condition, and will not experience any harmful impact to their significance.

4.37 We refer the reader to View 01 in **Appendix 1.0**.

INCOMING SUBSTATION

4.38 As described, the demolition of the existing, poor quality portacabins on the ISS site will materially enhance the immediate setting of the White Wing and No. 1A Montagu Place through the removal of unsightly structures placed prominently in public views into the Estate and their replacement with a building and landscape scheme carefully conceived relative to the sensitivity of their surroundings.

4.39 The proposed building will be one-storey and placed between the White Wing and Montague Place. It is located away from the White Wing elevation and from the listed railings, although is positioned to screen views to the service areas of the Estate behind it. Its scale and design is the product of careful consideration relative to the surrounding listed buildings: it is designed to read as a subservient element which will form a stepped back transition between the existing building lines of the neighbouring buildings. In its materiality and detailing it responds to the existing portico that terminates the 1/1A Montague Street frontage (**Figure 4.4**).

4.40 The proposals also include the removal of the existing redundant tunnel between Level 01 of the White Wing and 1A Montague Street and the associated metal railing and gate, all of which have a character reflecting their service function and are detracting. Their removal comprises a material benefit to this part of the Museum and its setting.

4.41 Importantly, the reduced built footprint enables the re-landscaping of the external area, materially improving the appreciation of the White Wing from Montague Street and de-cluttering this part of the Museum Estate in views from the Conservation Area.

4.42 The landscaping proposals comprise the use of natural stone paving and stone benches positioned to reflect the articulation of the White Wing elevation through pilasters. The existing trees will be retained and new low-level shrubs planted inside the railings to provide a sense of enclosure whilst enabling views to the White Wing from public areas. The existing ornamental lampposts (curtilage listed structures) will be retained in the proposed scheme, and the northernmost repositioned so as to provide symmetry to the White Wing elevation.

4.43 Overall, therefore, the setting of the surrounding listed buildings – comprising the Museum itself and the listed terraces to Montague Street – is improved. We do not identify any harm arising from the ISS in its operational state, either to the Museum Estate, surrounding listed buildings or the character and appearance of the Conservation Area. Indeed, we consider the proposals to materially enhance this part of the Museum's setting and accordingly, this part of the CA. Visual amenity is likewise improved.

4.44 Construction impacts and enabling works are discussed separately below.

Figure 4.4 Sketch of the proposed ISS and new landscaped forecourt to the White Wing

DISTRIBUTION

4.45 The site-wide services distribution strategy is explained in detail in Chapter 6 of the DAS. In summary, the approach is to re-use wherever possible external service routes for new HV and LTHW distribution. In below-ground external distribution areas, new cables will typically be laid within ducts within the perimeter road and will not affect the built historic environment. Where new routes are required, these will avoid existing building foundations such as those to the Duveen Gallery, where the new route skirts the corners of the building (see DAS 6.3.5).

4.46 As explained in the DAS, the majority of the existing LTHW heating system pipework will need to be replaced. New external LTHW pipework will run either buried under the road as above or exposed at high level, using existing service routes. The internal distribution routes have been carefully considered to avoid or minimise impact on historic fabric. Where possible, the pipework will run in existing trenches retained at their current size, although there are some areas where an increase in trench size will be required to receive new pipework, and areas too where new trenching will be required to accommodate the new service routes.

4.47 At the western end of the South Wing at Level 01, the internal trench requires widening (although its depth will be unaffected). On-site survey combined with analysis of the record drawings have led Steensen Varming to conclude that the historic foundation depths and corbelling in the south basement corridor fall predominately outside the location of the widened trench; accordingly, no major foundation works are likely to be required (see DAS 6.3.1).

4.48 To the eastern end, a new internal electrical trench will be required, with high level distribution through the stair B/1/S02. The DAS includes a photograph of the required location at 6.3.1. The existing trench at the eastern end of the South Basement will likewise require widening and deepening to accommodate the new distribution. Again the proposed width is not proposed to interact with foundation corbelling.

4.49 Alterations are also proposed to the north corridor central trench where it connects to the North Road, to increase its depth to enable the accommodation of the new LTHW pipework. To the eastern end of the corridor the trench will be both widened and deepened beyond the existing trench provision.

CONCLUSION

4.50 We conclude that the widened trenching will avoid any material impact on the historic footings within the vaults. The trenches will be made good, and so the character and appearance of the vaults will likewise be conserved in the operational state. Floor finishes are generally concrete or asphalt and so no historic floor finishes would be affected, with the exception of a small area within the north basement corridor where existing flagstones are required to be cut out and raised to enable the trenching works, resulting in some limited loss of historic fabric.

4.51 Where trenches pass through existing walls, allowance has been made for the cutting down of existing foundations (using non-percussive tools) and making good to reveals. Accordingly, there may be some limited loss of historic fabric through cutting down existing footings. There is a very low level of harm associated with the limited loss of historic fabric; however, this would not affect the character of historic spaces and is necessary for the delivery of the requisite infrastructure to support the upgrade of M&E. Any such harm, in our view, is limited and less than substantial in the terms of the NPPF. Against that harm are the benefits of the scheme identified above to the Museum and its setting.

ENABLING WORKS

4.52 Enabling works to facilitate the construction of SWEC and ISS are required to other existing buildings / structures around the Estate, some of which affect listed fabric on either a temporary or permanent basis. The delivery of the proposals is a significant project undertaken in the context of an operational museum, and critical to the approach is minimising the impact on the collections and / or the ability for the collections to be appreciated by the public.

LYCIAN BUILDING

4.53 It is proposed to re-open currently blocked historic window openings to the Lycian building at level 01, Ground. This will enable the careful through-routing through the window openings (on a temporary basis, for the construction period) of pipework, cable trays and ductwork through the basement of the Lycian building to plant room C/1/030 (refer to **Figure 4.5**). The re-routed services would be removed in the operational phase of SWEC and the existing situation reinstated. The affected fabric (the blockwork) is 20th century: no fabric of significance is affected.

WORKS TO THE PERIMETER RAILINGS, GATES AND GATE PIERS

4.54 Two areas of temporary alteration are proposed to the Grade II* listed railings surrounding the perimeter of the Museum Estate. These comprise, firstly, the demounting and storage on site of two bays of the railings (plus masonry plinths) enabling the construction of the ISS. The removal of the railings will allow for the excavation of the UKPN trench connection to Montagu Street.

4.55 Secondly, to the southwest of the estate, the gate piers, plinths and railings comprising the existing vehicular entrance to Great Russell Street will be likewise carefully dismantled and stored for the construction period prior to their reinstatement in situ. As explained by the Construction Management Plan, their dismantling is required to facilitate safe construction access and road safety for the construction of SWEC.

4.56 We understand that in addition, the need for maintenance and refurbishment to the gate and gate piers has been identified as part of the day-to-day operational management of the Estate. The construction period would provide the opportunity for these essential works to be undertaken.

4.57 The works for both operations (the dismantling of sections of the railings to Great Russell Street and Montague Place) will be subject to comprehensive method statements detailing the approach to recording, demounting, storage on site and re-erection, prepared by independent specialists in historic fabric. The affected areas comprise a small portion only of the entrance railings: the majority of the asset will continue to be appreciated in association with the Museum for the duration of the construction phase.

CONCLUSION

4.58 In the operational condition, the character and appearance of the railings and gate piers will be restored to the existing condition, and consequently (subject to their appropriate dismounting and re-erection as controlled through method-statements) we do not identify any harm to the historic or architectural value of the asset as a result of the works. Heritage values, being enduring, are capable of withstanding temporary intervention without loss of intrinsic significance.

4.59 The architectural value of the railings, their function relative to the Museum and their contribution to the way its significance is appreciated will be unaffected in the end condition. For this reason, we consider that the intrinsic significance of the asset comprising the main entrance gateway, railings and lodges will be preserved; so too is the contribution made by this separately listed asset to the significance of the Museum as a setting component.

4.60 We accordingly conclude that the character and appearance of the Conservation Area will likewise be preserved.

SOUTH FORECOURT

SOUTH FORECOURT CRANE BASE

4.61 To deliver the new SWEC on a constrained site and continue to maintain business-as-usual operational requirements for the Estate during the construction period, a tower crane will need to be erected in the north-western corner of the south forecourt. It will be located between the South Colonnade and West Residence. Due to its (significant) size, the crane will require a reinforced concrete foundation, requiring excavation.

4.62 Affected paving slabs will be carefully removed and stored on site, prior to the excavation of a 5m x 5m footprint for the reinforced concrete base. Following construction, the top part of the crane base will be demolished and made good, to facilitate reinstatement of the South Forecourt paving. The diagram included within the DAS at 7.2.2 (and **Figure 4.5**) demonstrates that the location will not affect the Smirke vaults beneath the South Forecourt, and so the Museum fabric will be unaffected.

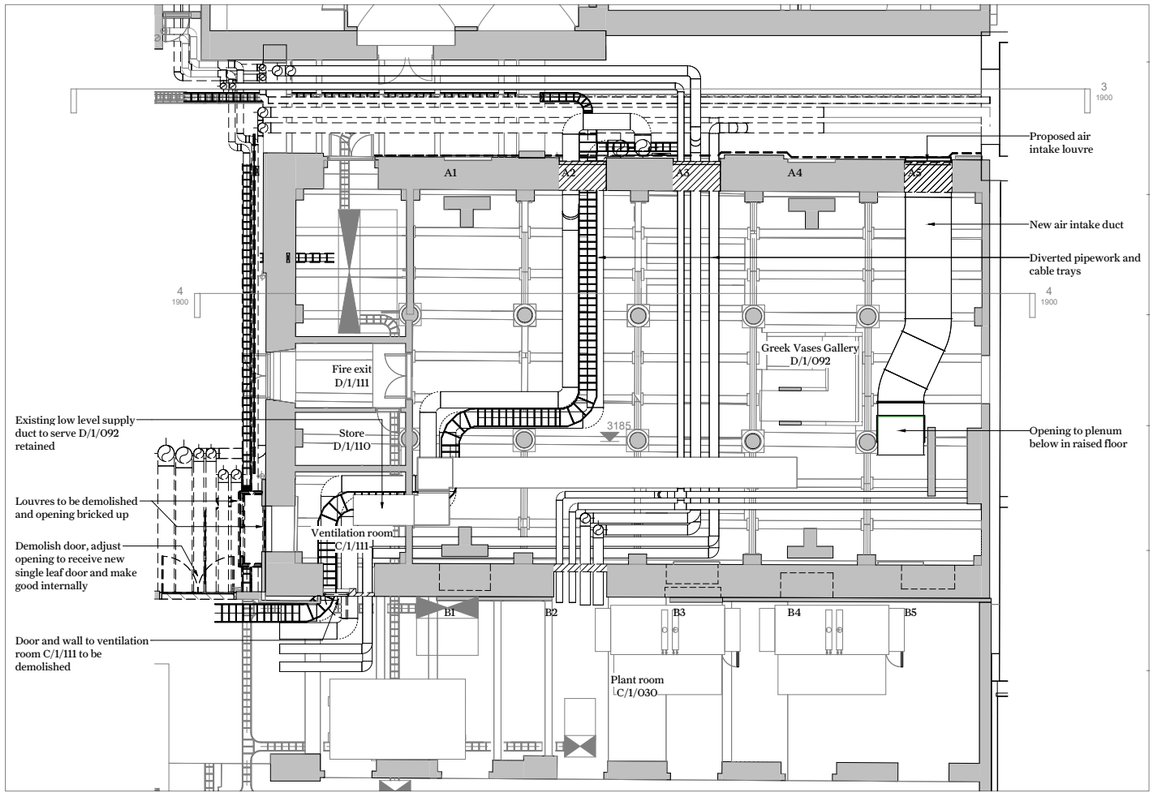
LOW LEVEL WALLS TO WEST OF SOUTH FORECOURT

4.63 Operational requirements for the construction of SWEC will require alterations to the security arrangements within the entrance forecourt. As part of the enabling works it is proposed to remove a section of the low wall defining the west lawn and associated lampposts, to enable level pedestrian access as part of temporary security arrangements for the period of construction. The removal is also required to facilitate access for the crane itself. The extent of removal, we anticipate, will be subject to condition. The reinstatement of the walling at the end of that period will reinstate the symmetry of the forecourt, which will be restored to its existing condition.

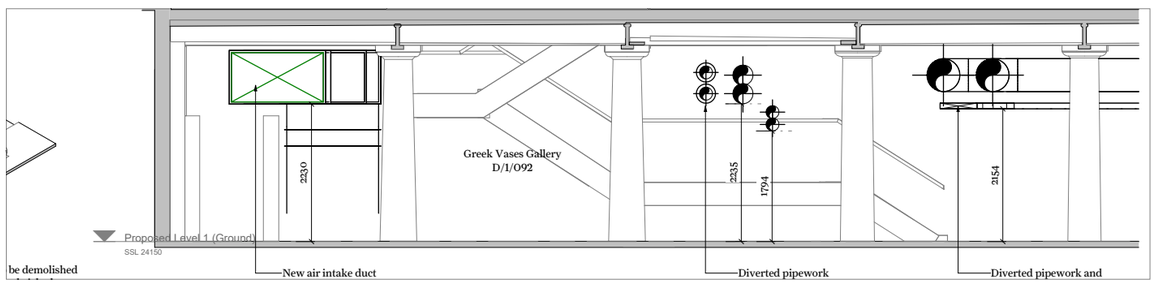
4.64 Affected fabric will be carefully dismantled and stored on site, in accordance with a methodology prepared by specialist historic fabric consultants.

CONCLUSION

4.65 In the operational condition, the character and appearance of the South Forecourt will be as existing. Accordingly, we identify no harm from this element of the works.

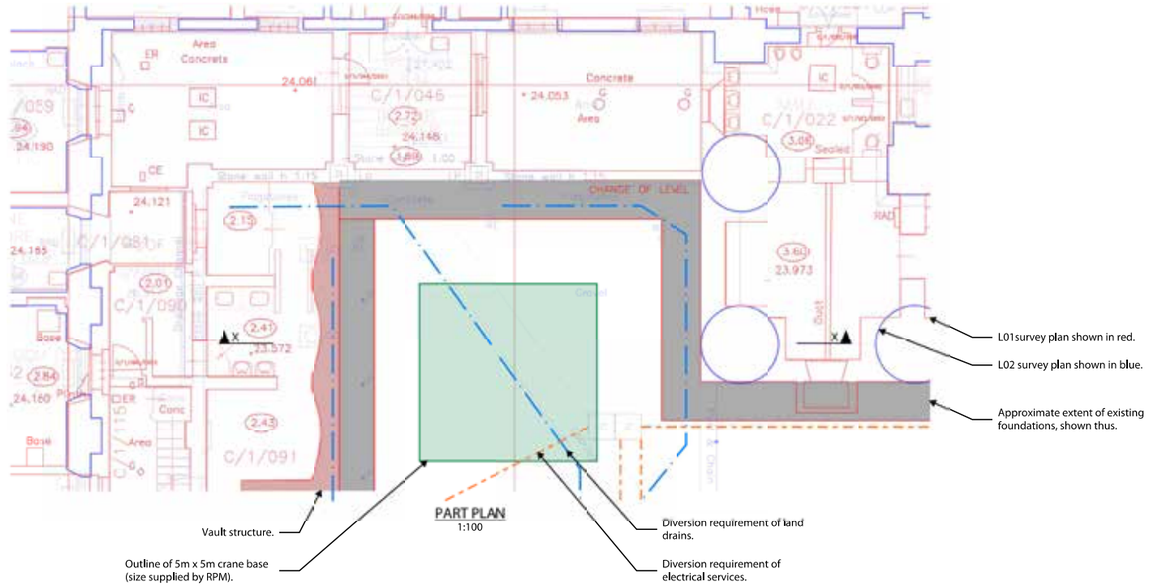


Proposed & Demolition Level 01 Plan



Proposed Lycian Room D/1/092 Section

Figure 4.5 Enabling works to the Lycian building, comprising the temporary rerouting of pipework and reopening of blocked windows (to be reinstated in the operational phase).



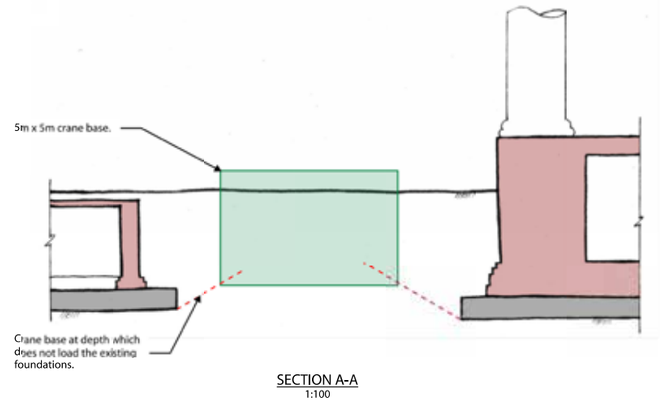


Figure 4.6 Plan showing crane base location relative to the vaults.

OVERALL ASSESSMENT OF IMPACT ON THE MUSEUM

4.66 The proposals remove undistinguished buildings in the immediate setting of (and attached to) the Grade I listed Museum. The buildings to be demolished – the existing SWEC and the portacabins to the southwest and southeast portions of the Estate – are of no historic interest or architectural merit in themselves, and indeed, the portacabins, particularly those visible in public views of the Museum from the east, are unsightly and detract from an appreciation of the Museum's significance. For this reason we consider the proposed demolition to be acceptable in principle, and the removal of the latter to comprise a material enhancement to the appreciation of the listed building and its immediate setting.

4.67 The replacement buildings are carefully considered with regard to the sensitivities of surrounding Museum fabric. For the reasons set out within this section, the proposed SWEC will not affect the intrinsic interest of the historic galleries or their function, and has been designed to preserve (through careful placement) and enhance (through the removal of detracting ducting and service runs) the historic west elevation of the Lycian building. The proposed ISS, through the provision of complementary landscaping and carefully considered new substation subservient in character to surrounding historic buildings, will likewise provide an enhanced setting for the Museum to the east.

4.68 Key views of the Museum from the south forecourt and Great Russell Street, from which its scale, status and architectural quality are best appreciated, are entirely unaffected. Visibility of parts of the new ASHP from limited areas in the wider townscape to the south is glimpsed, transient, and will not materially alter the character of the views or the way the Museum is appreciated.

4.69 Considered together, the SWEC and ISS comprise a significant investment in the Museum to deliver essential infrastructure vital to its ongoing operation. There are not only environmental benefits that arise from that investment, but social benefits too, derived from the future benefit to the collection. The collection is a key part of the Museum's significance, and the Energy Centre Programme will provide an essential component underpinning and enabling future proposals for improved environmental conditioning for collections display, conservation and management.

4.70 We accordingly identify a major benefit to heritage interests, from the delivery of the infrastructure required to support the Museum's operational requirements and the necessary maintenance of its fabric, and the betterment of its estate, including areas visible from the public realm.

4.71 Enabling works required to facilitate the construction of SWEC and ISS are temporary and reversible in respect of historic fabric, and we identify no harm overall to the significance of the Grade II* main entrance, railings and lodges (which are also an important setting element contributing to significance) through the careful dismantling and reinstatement of some parts.

4.72 The distribution works have been devised to minimise impacts on historic fabric through re-using wherever possible existing service runs and trenching, although there are inevitably some areas where widened / deeper trenching is required. To the lower-ground vaults, widened trenches will be made good, preserving the character and appearance of the historic spaces. There will however be some loss of historic fabric in instances where widened trenches interact with foundation corbelling, and where existing flagstones are required to be removed for access, albeit limited in extent and necessary to facilitate the improvements to M&E.

4.73 There is nevertheless a very low level of harm associated with this limited loss of fabric, and harm to heritage interests attracts great weight in the planning balance. We consider that any such harm would be limited in its nature and extent, and less than substantial in terms of the NPPF. Set against that harm are the numerous benefits to Museum fabric and its setting identified in this report, as well as future benefit to collections display, conservation and management. Benefits to heritage assets likewise attract great weight.

OTHER HERITAGE ASSETS

4.74 In respect of all other heritage assets considered, we find that significance is preserved. The intrinsic architectural and historic interest of the listed buildings to Bedford Square, Bloomsbury Terrace, Montague Street and Great Russell Street will unaffected, and an appreciation of their significance will not be harmed by the proposals which are carefully considered in respect of each. The special interest of the Bedford Square RPG will likewise be unaffected.

4.75 The Grade II* listed entrance, railings and lodges to the Museum – a separately designated asset – will be restored and reinstated, and accordingly significance will not be harmed.

4.76 In respect of the Bloomsbury Conservation Area, we find that the benefits identified in respect of the Museum's setting likewise comprise enhancements to the character and appearance of the Conservation Area.

4.77 Accordingly, and in respect of all assets considered, we conclude that significance is preserved, satisfying the statutory duties. It follows that the cognate development plan and national policies cited earlier in this report are likewise complied with.

5.0
CONCLUSION

BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

CONCLUSION

5.1 The proposals have developed with regard to the constraints of the site and careful consideration of the heritage sensitivities of both the historic Museum fabric and the surrounding townscape, including Bedford Square.

5.2 In respect of each heritage asset considered, significance is preserved in line with the three statutory provisions cited in Section 2. In respect of the Museum itself, we identify a major benefit from the delivery of the infrastructure required to support the Museum's operational requirements and the necessary maintenance of its fabric, and the betterment of its estate, including areas visible from the public realm. The enhancement of elements of its setting likewise comprise enhancements to the character and appearance of the Bloomsbury Conservation Area. In relation to all other assets potentially affected by the proposals – listed buildings in the surrounding streets, the listed entrance gates, railings and lodges to the Museum and the Bedford Square RPG, we find that significance, and the contribution made by setting to significance, is preserved.

5.3 For these reasons and as set out within this report, we conclude that the proposed development satisfies the statutory tests (S16(2), S66(1) and 72(1)) and the requirements of the cognate national and development plan policy as identified in this report.

APPENDIX 1: AVRS PREPARED BY CITYSCAPE DIGITAL

BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

British Museum
London

Accurate Visual Representation Document
October 2023

CITYSCAPE DIGITAL

View Table

01	Great Russell St	14:46	15/04/23	24mm	D28268

Existing view

01	Great Russell St	14:46	15/04/23	24mm	D28268

Proposed view

02	Bedford Square 1	15:50	15/04/23	24mm	D28269

Existing view

02	Bedford Square 1	15:50	15/04/23	24mm	D28269

Proposed view

03 Bedford Square 2 15:56 15/04/23 24mm D28270

Existing view

03	Bedford Square 2	15:56	15/04/23	24mm	D28270

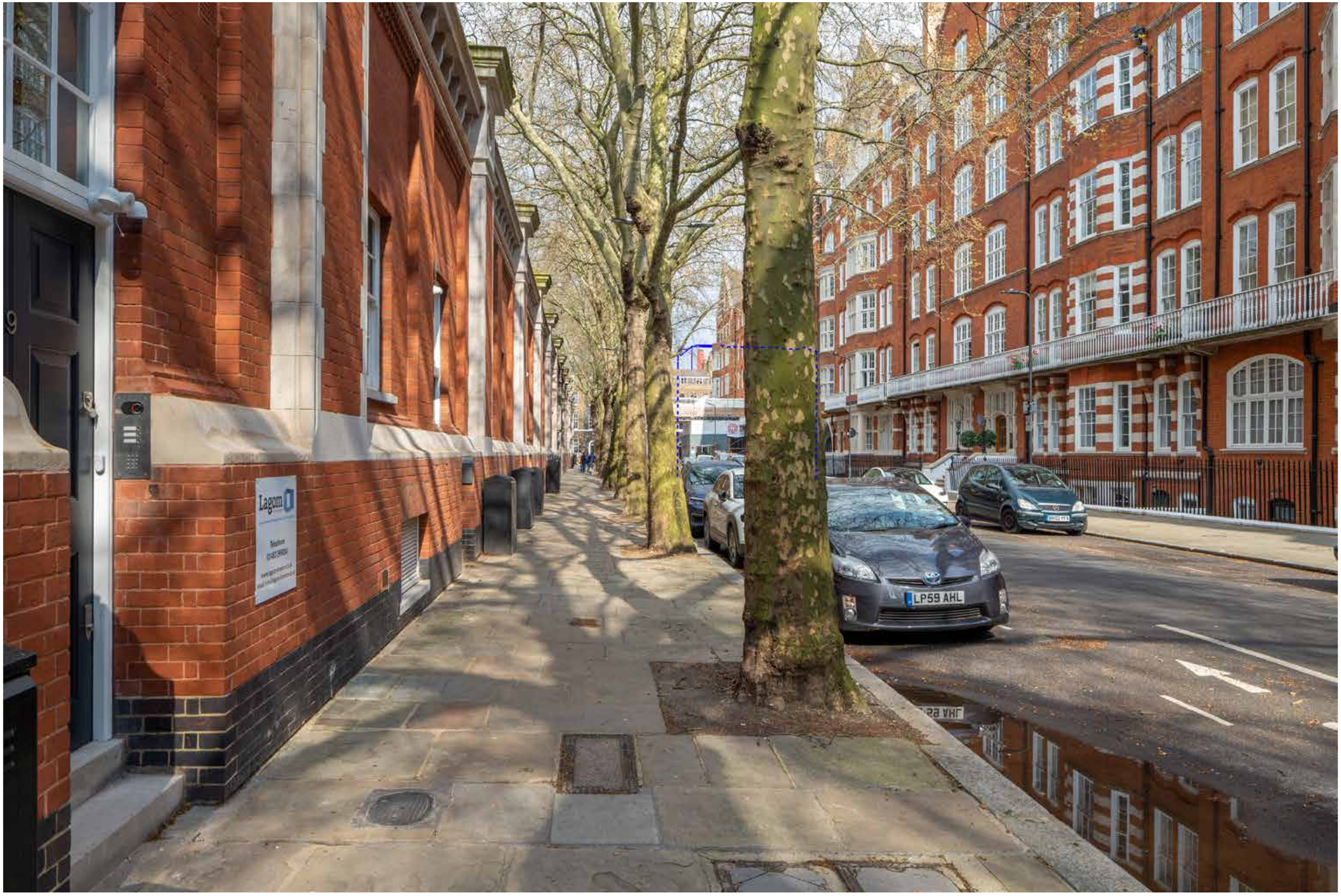
Proposed view

04 Bedford Avenue 1 15:21 15/04/23 24mm D28272

Existing view

04 Bedford Avenue 1 15:21 15/04/23 24mm D28272

Proposed view



05	Bedford Avenue 2	15:40	15/04/23	24mm	D28274

Existing view

05	Bedford Avenue 2	15:40	15/04/23	24mm	D28274

Proposed view

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APPENDIX 2: ZTV

BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

British Museum
London

Zone of Visual Influence Study (ZVI)
October 2023

CITYSCAPE DIGITAL

Introduction

A ZVI (Zone of Visual Influence) or ZTV (Zone of Theoretical Visibility) provides a visual representation of potential scheme visibility at 1.6m from the ground.

It is classed as “theoretical” due to the unreliable nature and limited accuracy of the commercially available context models provided to us by external sources.

While due care has been taken to use relevant information as available to us, we cannot guarantee its accuracy.

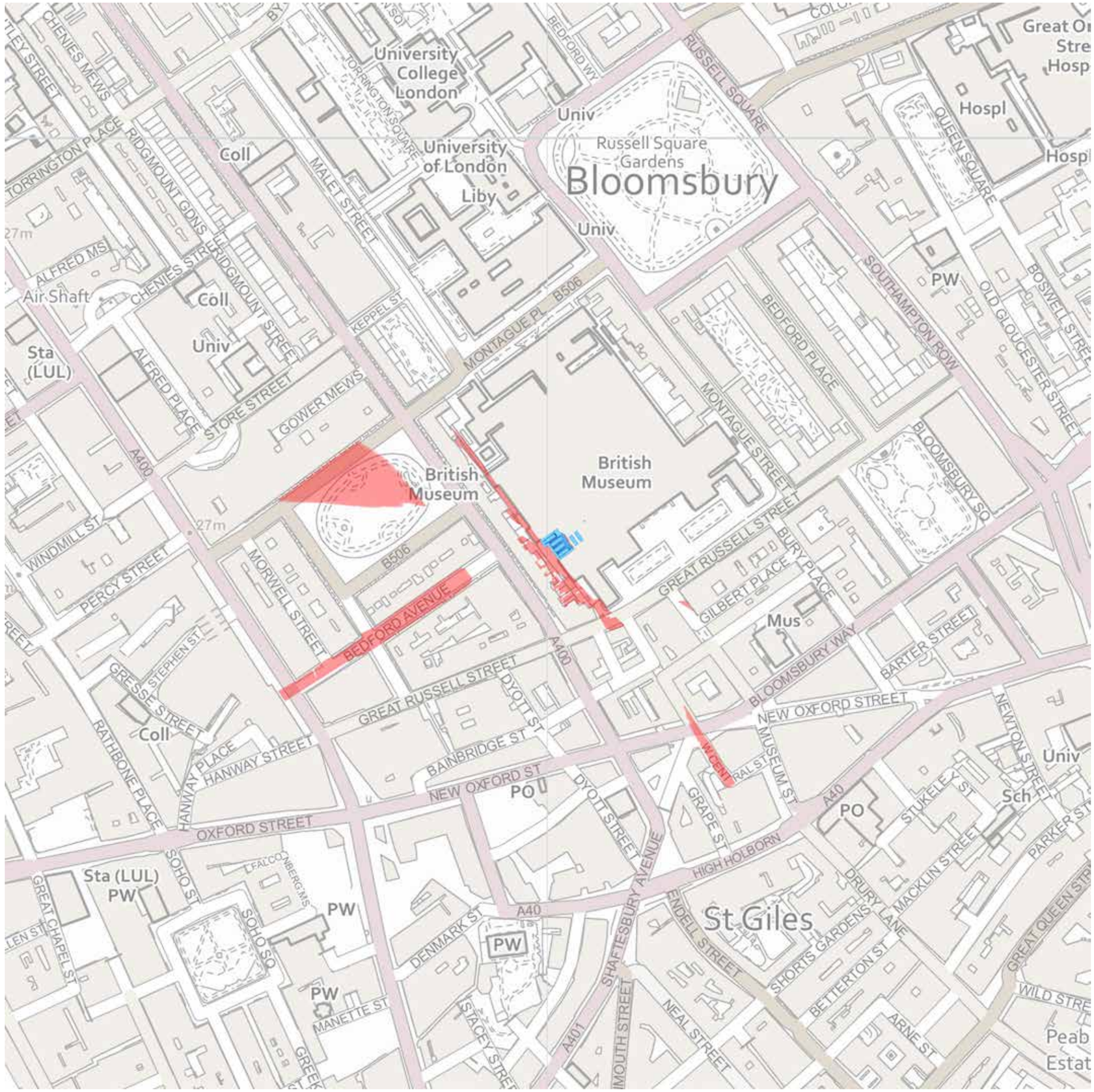
This report has been produced by Cityscape Digital using Zmapping and the model received on the 2nd of October 2023.

The ZVI study on the Zmapping area was produced without trees and consented developments taken into consideration.

Zone of visual influence

Analysis has been based on 3D ZMap data.

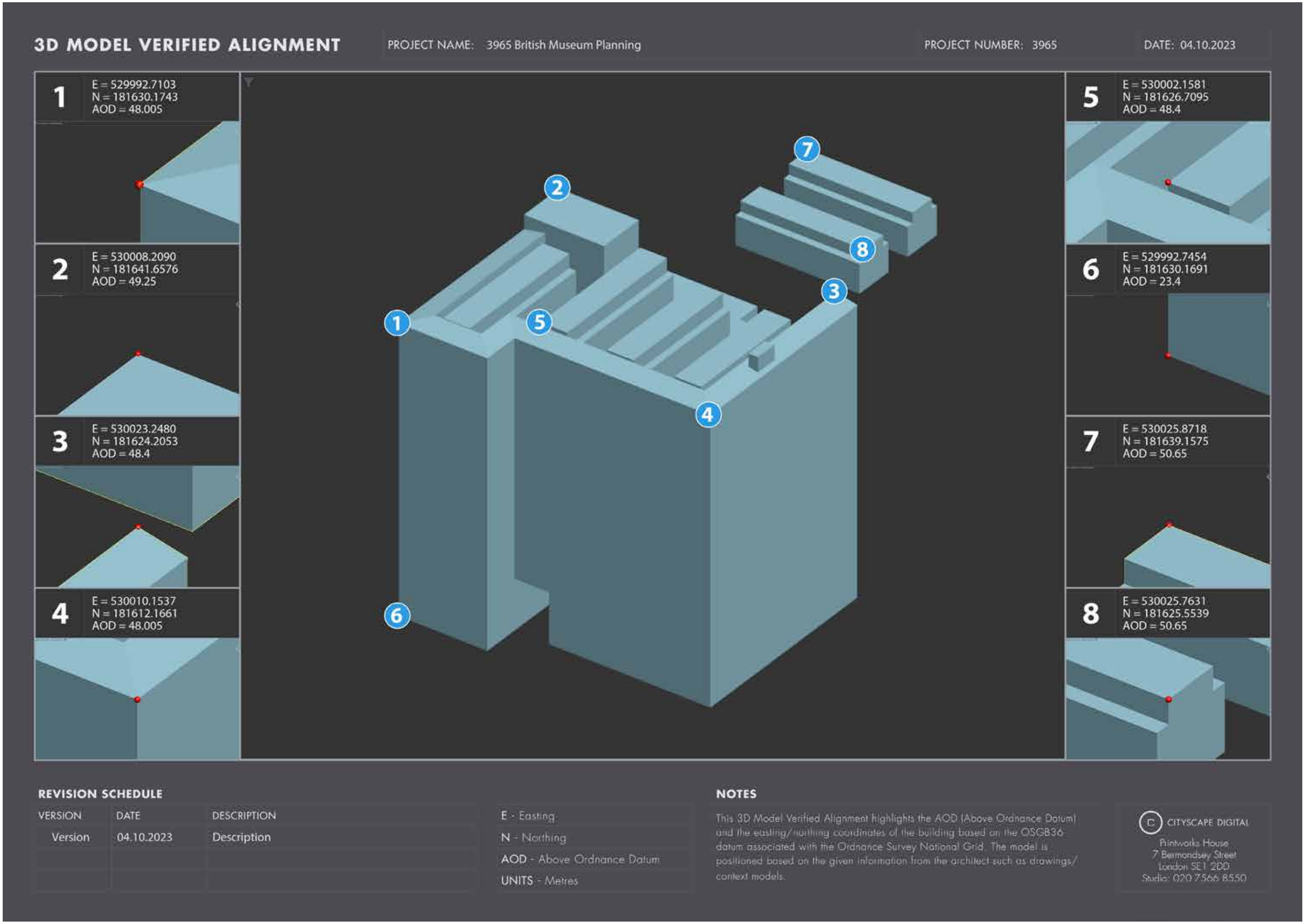
Preliminary, model-based work is only as accurate as the 3D information provided and so we recommend all decisions based on massing are checked using Accurate Visual Representations.



Zone of theoretical visibility

Proposed

Position sign-off image.



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APPENDIX 3: AVR METHODOLOGY

BRITISH MUSEUM, ENERGY CENTRE PROGRAMME

British Museum
London

Accurate Visual Representation Methodology
October 2023

CITYSCAPE DIGITAL

Contents

Table of views

View	Visualisation type	Level of accuracy of location	Render / wireline	Ref	OS-E	OS-N	Height (AOD)	Height (AGL)	Heading	Lens	Lens choice	Field of view	Date	Time
1	Type 4	Better than 0.05m	Wireline	D28268	530056.123	181549.993	25.41 M	1.60 M	335°	24mm	Inclusion of relevant context	73°	15/4/23	14:46
2	Type 4	Better than 0.05m	Wireline	D28269	529821.567	181690.278	27.11 M	1.60 M	109°	24mm	Inclusion of relevant context	73°	15/4/23	15:50
3	Type 4	Better than 0.05m	Wireline	D28270	529829.558	181678.15	26.95 M	1.60 M	102°	24mm	Inclusion of relevant context	73°	15/4/23	15:56
5	Type 4	Better than 0.05m	Wireline	D28272	529845.424	181552.691	26.71 M	1.60 M	61°	24mm	Inclusion of relevant context	73°	15/4/23	15:21
7	Type 4	Better than 0.05m	Wireline	D28274	529923.480	181606.079	26.72 M	1.60 M	71°	24mm	Inclusion of relevant context	73°	15/4/23	15:40

0.0 Introduction

0.1 Methodology overview

The methodology applied by Cityscape Digital Limited to produce the *'Type 4 Photomontages survey / scale verifiable'*[1] or views contained in this document are described below. In the drafting of this methodology and the production and presentation of the images, guidance has been taken from the 'TGN 06/19 Visual Representation of development proposals' (TGN06/19) from the Landscape Institute published on 17 September 2019 in support of GLVIA3.

The disciplines employed are of the highest possible levels of accuracy and photo-realism which are achievable with today's standards of architectural photography and computer-generated models.

0.2 View selection

The viewpoints are being selected through a process of consultation with relevant statutory consultees by townscape/heritage consultants and having regard to relevant planning policy and guidance.

1.0 Photography

1.1 Digital photography

High quality digital full frame sensor cameras are being utilised.

1.2 Lenses

In accordance with TGN 06/19, Cityscape balances the need to include the extent of the site and sufficient context with the stated preference for 50mm lenses. For local urban views a wide angle lens of 24mm or 35mm is generally used. For more open spaces the default is 50mm, intermediate distance views are photographed with a lens between 35mm to 70mm and occasionally long range views may be required with lens options ranging from 70mm to 1200mm.

As a guide, the following approach is used:

View	Lens options
Relevant foreground, urban context or large site	24mm – 35mm
Open spaces, where proposed development can be included	50mm
800 to 5000 metres – intermediate	35mm – 70mm
5000+ metres – long	70mm – 1200mm

Examples of these views are shown in Figures 1 and 2.

1.3 TGN 06/19

States that:

"2.2 Baseline photography should: [...] include the extent of the site and sufficient context;"[2]

"1.1.7 If a 50mm FL lens cannot capture the view in landscape or portrait orientation (for example, if the highest point of the development is approaching 18° above horizontal) the use of wider-angled prime lenses should be considered, working through the following sequence of fixed lenses in this order: 35mm FL > 28mm FL > 24mm FL > 24mm FL Tilt-Shift. Tilt-Shift Lenses are considered at Appendix 13. In these unusual situations, the reasoning for the choice and the approach used should be documented, and the agreement of the competent authority should be sought (see Appendix 10 Technical Methodology)."[3] and "Views should include the full context of the site / development and show the effect it has upon the receptor location.[...]"[4]

1.4 Digital camera

Cityscape uses high quality professional DSLR (digital single lens reflex) and DSLM (digital single lens mirrorless) cameras. The cameras utilise FFS (full frame sensors) so declared focal lengths require no conversion to be understood in line with TGN 06/19 guidelines.

Cityscape use high quality lenses that are matched to the resolution of the cameras to ensure high contrast and sharp rendition of the images.

1.5 Position, time and date recording

The photographer is provided with (i) an Ordnance Survey map or equivalent indicating the position of each viewpoint from which the required photographs are to be taken, and (ii) a digital mockup rendered with a context model of the desired view. For each viewpoint the camera is positioned at a height of 1.60 metres above the ground level which closely approximates the human eye altitude, and falls into the 1.5-1.65m range provided by TGN 06/19[5].

If local conditions required a deviation to capture the view, the exact height can be found in the Table of Views. A point vertically beneath the entrance pupil of the lens is marked on the ground as a survey reference point and two digital reference photographs are taken of (i) the camera/ tripod location and (ii) the survey reference point (as shown in Figures 3 and 4). The date and time of the photograph are recorded by the camera.

1 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 21-2

2 TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 5, Paragraph 2.2

3 TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 28, Paragraph 1.1.7

4 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 35, Paragraph 4.1.5

5 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp. 50

1: Local view

2: Intermediate view

3: Camera location

4: Survey reference point

2.0 Digital image correction

2.1 Raw file conversion

Professional digital cameras produce a raw file format, which is then processed for both high detail and colour accuracy. The final image is saved as an 8 bit tiff[6] file.

2.2 Digital image correction

The digital photographs were prepared for the next stage of camera matching (see Sections 6 and 7).

All lenses exhibit a degree of geometric distortion. The most common types are radially symmetrical along the principal axis of the lens, and tend to grow in size towards the perimeter of the image. The outer edges of the images are therefore not taken into consideration to reduce inaccuracies. Figure 5 illustrates the 'safe' or non-distortive area of an image which is marked by a red overlay.

The adjusted or corrected digital image, known as the 'background plate', is then saved ready for the camera matching process (see Sections 6 and 7). In preparation for the survey (see Section 3.2) Cityscape indicates on each background plate the safe area and priority survey points, such as corners of buildings, retained elements and party walls for survey (see Figure 6).

5: Area of interest to be surveyed

6: Background plate highlighting critical survey points in green and secondary survey strings in red

6 TIFF is the name given to a specific format of image file stored digitally on a computer.

3.0 Type 4 visualisations

3.1 Type 4 visualisation

Unless otherwise specified visualisations are completed to TGN 06/19[7] Type 4 Photomontage / Photowire (survey / scale verifiable) standards.

3.2 Survey

An independent surveyor is contracted to undertake the survey of (i) each viewpoint as marked on the ground beneath the entrance pupil of the lens at the time the photograph is taken (and recorded by way of digital photograph (see Section 1 above) and (ii) all the required points on buildings, hard landscape features or immobile permanent objects within the safe zone. The survey is coordinated onto the Ordnance Survey National Grid (OSGB36) by using GNSS (global navigation satellite system such as GPS[8]) equipment (see, for example, Figure 7) and processing software. The Ordnance Survey National Grid (OSGB36) is chosen as it is the most widely used and because it also allows the captured data to be incorporated into other available digital products (such as Ordnance Survey maps). The height datum used is Ordnance Survey Newlyn Datum and is also derived using the GNSS.

Improvements to the real-time position of GNSS data is achieved by RTK (real time kinematic) compensation, which utilises a comparison between known base stations positions and their current position fix to produce correction data to the measurements. The required points on each building are surveyed using conventional survey techniques utilising an electronic theodolite and reflectorless laser technology (shown in Figure 8). In certain circumstances, a viewpoint may need to be surveyed using conventional survey techniques as opposed to RTK, if, for example, the viewpoint is in a position where GNSS information cannot be received.

3.3 False origin

3D modelling programs, unlike CAD/BIM programs, have inherent inaccuracies the further an object is away from the origin. Cityscape decide on and record a local, ‘false origin’ that is used to move the model closer to the origin. This alleviates the inaccuracies. The 3D model of the proposed development, consented scheme models, and survey data are all moved uniformly to this new false origin. When performing positioning checks (see Section 5.2) the offset between false origin and OS are added back to the coordinates.

7: Field survey being carried out, GNSS receiver

8: Field survey being carried out, total station

7 ‘TGN 06/19 Visual Representation of development proposals.’ Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp.11, Table2, pp 21-24.

8 https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/land/guidelines-for-the-use-of-gnss-in-surveying-and-mapping-2nd-edition-rics.pdf

4.0 Type 3 visualisations

4.1 Type 3 visualisation

These visualisations are as described in TGN 06/19[9] Type 3 Photomontage / Photowire (not survey / scale verifiable) standards. In contrast to Type 4, Type 3 visualisations rely on good quality data for camera matching, but are not relying on surveys as described in Section 3.2. Data sources such as GPS, OS Maps, 3D City models, geo-referenced aerial photography, LiDAR or 3D models can be used.

The individual data source used is declared in an accompanying table. The possible angular shift of a 1m lateral displacement of the camera against its actual coordinate depends on the distance of the object from the camera[10]:

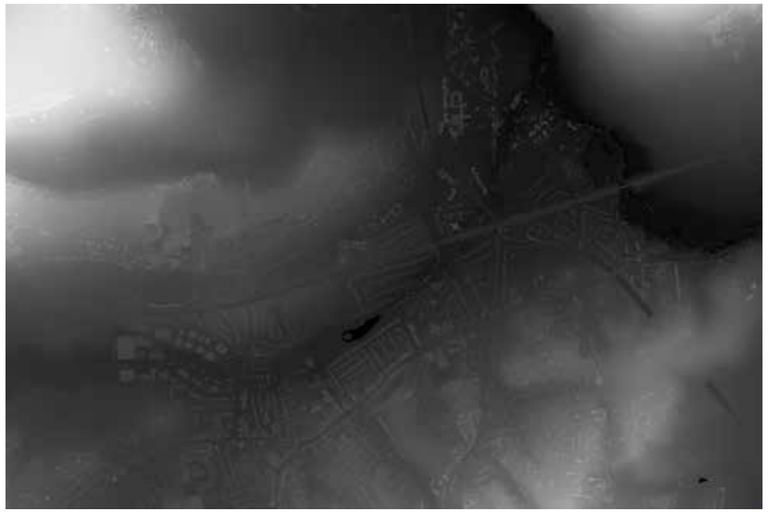
Distance from camera	Apparent shift
10m	5.7°
100m	0.57°
1,000m	0.057°
10,000m	0.006°

Cityscape also create 3D DSM (Digital Surface Model) models from publicly available data sources, such as Defra LiDAR scans from the Defra Data Services Platform. We always choose the newest data available at the highest possible resolution, typically at 1m resolution. The data is processed to coordinate onto Ordnance Survey National Grid (OSGB36), and converted to a Square Grid DSM. The square grid is then optimised into a TIN (Triangulated Irregular Network). The optimisation has been validated to produce no loss in usable information of the geometric mesh. This process follows the guidelines set out in 'Guidance - Visual representation of wind farms - Feb 2017'[11].

DSM source is typically the Defra LiDAR Composite DSM, 2020, resolution 1m.

4.2 False origin

3D modelling programs, unlike CAD/BIM programs, have inherent inaccuracies the further an object is away from the origin. Cityscape decide on and record a local, 'false origin' that is used to move the model closer to the origin. This alleviates the inaccuracies. The 3D model of the proposed development, consented scheme models, and survey data are all moved uniformly to this new false origin. When performing positioning checks (see Section 5.2) the offset between false origin and OS are added back to the coordinates.



11: 1m resolution LiDAR GeoTIFF

12: Resulting 3D TIN mesh

9 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp.11, Table2, pp 19-20.

10 'TGN 06/19 Visual Representation of development proposals.' Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed: March 2022).pp 56-57

11 'Guidance - Visual representation of wind farms - Feb 2017' Available at: https://www.nature.scot/sites/default/files/2019-09/Guidance%20-%20Visual%20representation%20of%20wind%20farms%20-%20Feb%202017.pdf (Accessed at March 2022). pp 8-9

5.0 Model positioning

Applies to Type 3 and Type 4 visualisation.

5.1 Model source

A wireframe 3D model of the proposed scheme if not provided is created by Cityscape from plans and elevations provided by the architects and from survey information of the ground levels on site and various other points on and around the site, such as the edge of adjacent roads and pavements etc. provided by the surveyor.

5.2 Proposed model position check

The architect supplies a 3D model in OS coordinates that can be used 'as is' for position checks as described below (utilising the false origin as described in Section 3.3). Alternatively, a non OS located model can be provided together with a floor plan that is positioned in an OS map. The model can then be positioned by way of setting it on the floor plan. Heights are either preserved from the original model if supplied in AOD, or taken from supplied elevations.

Once the model is positioned, confirmation of height and Easting/ Northing Coordinates is requested from the architect.

At least two clear reference points are agreed and used to confirm the placement of the model.

13: Proposed model position check

6.0 Camera matching – Type 4 visualisations

6.1 Cityscape's database

Cityscape has built up a comprehensive database of survey information on buildings and locations in central London; the database contains both GNSS survey information and information regarding the dimensions and elevations of buildings gathered from architects and other sources.

The outlines of buildings are created by connecting the surveyed points or from the information obtained from architects' drawings of particular buildings. By way of example of the high level of detail and accuracy, approximately 300 points have been GNSS surveyed on the dome of St. Paul's.

The database 'view' (as shown in Figure 14) is 'verified' as each building is positioned using coordinates acquired from GNSS surveys. In many instances, the various coordinates of a particular building featured in one of the background plates are already held by Cityscape as part of their database of London. In such cases the survey information of buildings and locations provided by the surveyor (see Section 3.2 above) is used to cross-check and confirm the accuracy of these buildings. Where such information is not held by Cityscape, it is, where appropriate, used to add detail to Cityscape's database.

The survey information provided by the surveyor is in all cases used in the verification process of camera matching.

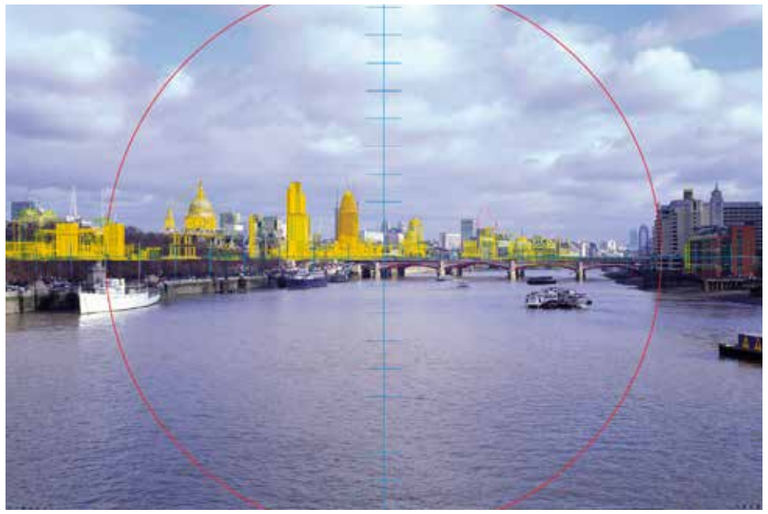
14: Selected GPS located models (yellow) from Cityscape's database, situated on Cityscape's London digital terrain model

6.2 Camera matching process

The following information is required for the camera matching process:

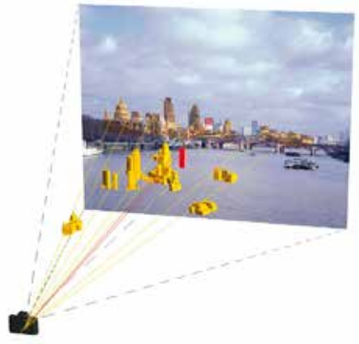
- Specific details of the camera and lens used to take the photograph and therefore the field of view (see Section 1);
- The adjusted or corrected digital image i.e. the 'background plate' (see Section 2);
- The GNSS surveyed viewpoint coordinates (see Section 3.2);
- The GNSS surveyed coordinates of points within the the background plate (see Section 3.2);
- Selected models from Cityscape's database (see Section 6.1);
- The GNSS surveyed coordinates of the site of the proposed scheme (see Section 3.2);

The data is combined in a 3D software package and is then used to situate Cityscape's virtual camera such that the 3D model aligns exactly over the background plate (as shown in Figures 15, 16 and 17) (i.e. a 'virtual viewer' within the 3D model would therefore be standing exactly on the same viewpoint from which the original photograph was taken (Figure 3). This is the camera matching process.



15: The background plate matched in the 3D GPS located models

16: Background plate matched to the 3D GPS located models



17: The camera matched background plate with an example of a proposed scheme included in red

7.0 Camera matching – Type 3 visualisations

7.1 Cityscape's context models

Cityscape have purchased available 3D city models of large parts of London and other parts of the UK that are modelled to within 25cm accuracy. Where available this data is used to create camera matches for Type 3 visualisations, or additional data is purchased.

In addition, or where 3D city models are not available, DSM data is used for camera matching (see Section 4).

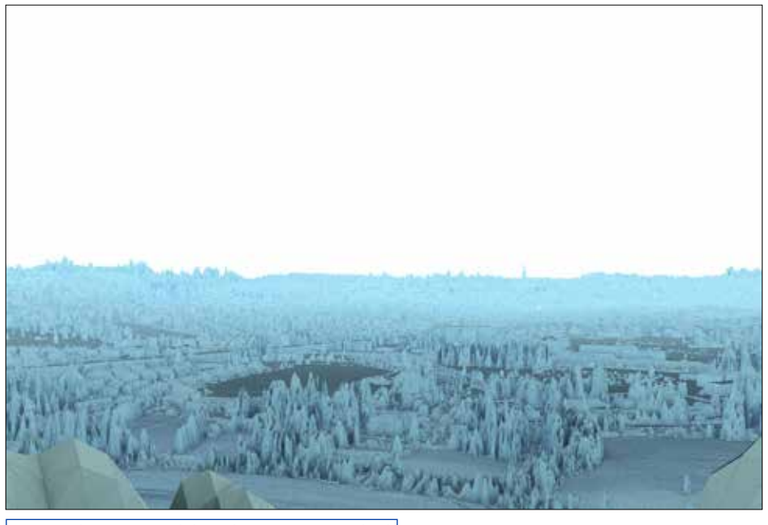
7.2 Camera matching process

The following information is required for the camera matching process:

- Specific details of the camera and lens used to take the photograph and therefore the field of view (see Section 1);
- The adjusted or corrected digital image i.e. the 'background plate' (see Section 2);
- 3D city model and/or DSM context model (see Section 4);
- Selected models from Cityscape's database (see Section 6.1);
- A 3D model of the proposed scheme (see Section 5)

The data is combined in a 3D software package and is then used to situate Cityscape's virtual camera such that the 3D model/DSM aligns exactly over the background plate (as shown in Figure 20) (i.e. a 'virtual viewer' within the 3D model would therefore be standing very close to the same viewpoint from which the original photograph was taken (Figure 3). This is the camera matching process.

18: Background plate: digital photograph, size and bank corrected as described in Section 2



19: Render: DSM model render, camera matched

20: Camera matching: the background plate matched in DSM TIN mesh

8.0 Rendering

8.1 Wireline image (AVR 0/1)

The proposed developments are shown using a constant thickness wireline. The line is generated from a computer rendering of the 3D model and follows an 'inside stroke' principle.

Rendering is a technical term referring to the process of creating a two dimensional output image from the 3D model. The 'inside stroke' principle is followed so that the outer edge of the line touches the outline of the render from the inside, fairly representing the maximum visibility.

The camera matching process is repeated for each view and a wireline image of the proposal from each viewpoint is then produced. The wireline image enables a quantitative analysis of the impact of the proposed scheme on views.

8.2 Rendered image (AVR 3)

In order to assist a more qualitative assessment of the proposals, the output image needs to be a photo-realistic reflection of what the proposed scheme would look like once constructed. This is called an AVR3.

8.3 Texturing

The process of transforming the wireframe 3D scheme model into one that can be used to create a photorealistic image is called texturing[12].

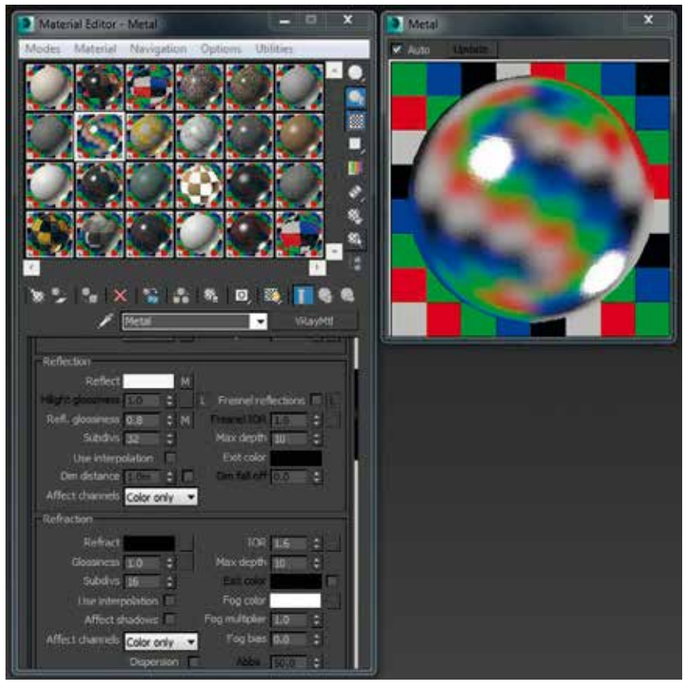
Prior to rendering, Cityscape requires details from the architect regarding the proposed materials (e.g. type of glass, steel, aluminium etc.) to be utilised.

Cityscape also use high resolution photographic imagery of real world material samples, supplied by the client or the manufacturer, to create accurate photorealistic textures for use in all our images. This information is used to produce the appearance and qualities in the image that most closely relates to the real materials to be used (as shown in Figure 21).

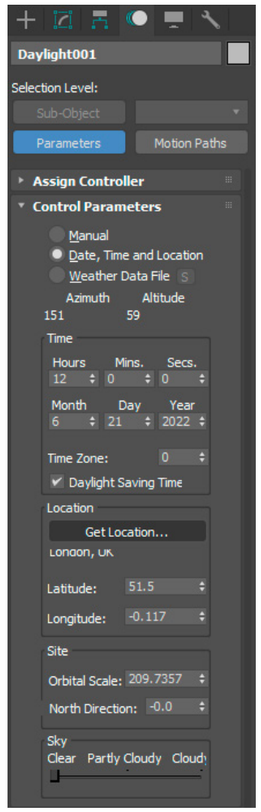
8.4 Lighting and sun direction

The next stage is to light the 3D model to match the photographic environment. The date, time of the photograph and the latitude and longitude of the city are input (see Figure 22) into the unbiased physically accurate render engine. Cityscape selects a 'sky' (e.g. clear blue, grey, overcast, varying cloud density, varying weather conditions) from the hundreds of 'skies' held within its database to resemble as closely as possible the sky in the background plate.

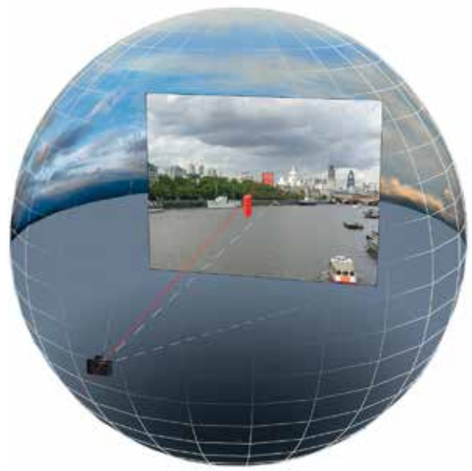
The 3D model of the proposed scheme is placed within the selected sky (see Figure 23) and using the material properties also entered, the computer calculates the effects of the sky conditions (including the sun) on the appearance of the proposed scheme.



21: Screenshot of some materials in the 3D rendering package.



22: Screenshot of environment information (time, date and year) entered to locate the sun correctly (see Section 7.



23: Example of a proposed scheme highlighted in red within the selected sky and rendered onto the background plate

12 Texturing is often referred to as part of the rendering process, however, in the industry, it is a process that occurs prior to the rendering process.

9.0 Post production

9.1 Post production

Finally, the rendered image of the scheme model is inserted and positioned against the camera matched background plate.

Once in position, the rendered images are edited using Adobe Photoshop®. Masks are created in Photoshop where the line of sight to the rendered image of the proposed scheme is interrupted by foreground buildings (as shown in Figure 24).

The result is a verified image or view of the proposed scheme (as shown in Figure 25).

A similar process is followed for wireline (AVR1) images. The outline of the rendered model is traced with a constant thickness stroke which stays inside the massing of the rendered model. Additional lines are added using a narrower stroke to delineate significant stepping in the model's topography, and to aid with the understanding of the wirelines in respect to the overall arrangement of massing of the proposed development.

24: Process red area highlights the Photoshop mask that hides the unseen portion of the render

25: Accurate Visual Representation

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