

Crystal Palace Park

Environmental Statement - Non-Technical Summary

London Borough of Bromley

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Prepared for:

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1. Introduction

1.1 Overview

- 1.1.1 This document is the Non-Technical Summary of the Environmental Statement (ES) that accompanies the outline planning application for the regeneration of Crystal Palace Park (hereafter referred to as 'the Proposed Development'). The site of the Proposed Development (hereby referred to as 'the Park') is located within the boundary of the London Borough of Bromley (LBB) but lies on the border of several other boroughs, including the London Boroughs of Southwark, Lambeth, Croydon and Lewisham.
- 1.1.2 LBB (hereafter referred to as 'the Applicant') submitted an outline planning application in January 2020 seeking permission for the regeneration of the Park from LBB in their role as the local planning authority (hereafter referred to as 'the Authority'). The outline planning application comprised the following elements:
- Landscaping works within the Park (hereafter referred to as 'the landscaping works');
 - The construction of up to 210 residential dwellings around the edges of the Park (hereafter referred to as 'the residential development'); and
 - The redevelopment and extension of the Capel Manor College campus in the Park (hereafter referred to as 'the Capel Manor College redevelopment').
- 1.1.3 Some of the chapters of the ES were amended and resubmitted in May 2020 (including *ES Volume I Chapter 6: Cultural Heritage*, and *ES Volume I Chapter 14: Residual Effects and Conclusions*, as well as a single visualisation included in an appendix of *ES Volume I Chapter 11: Townscape and Visual*). Where relevant, this NTS makes reference to the conclusions of those amended ES chapters.
- 1.1.4 Since the submission of the outline planning application and ES in January 2020, the Applicant has proposed the following minor amendments to the application, which includes:
- Removal of Anerley Hill element of Capel Manor College;
 - Reduction in maximum floorspace for residential development to 15,985 sqm GEA reduced from 18,847 sqm GEA. The change has been made to ensure it is consistent with the maximum floorspace quoted in the Enabling Development Financial Viability Assessment. There has been no change in the number of residential units and the maximum or minimum parameters;
 - Reduction in proposed non-residential car parking within the planning application boundary from 136 spaces to 124 spaces in response to concerns raised by the Greater London Authority (GLA); and
 - Modest changes to some of the hard/soft landscape percentages on the hard/soft landscape parameter plans to slightly reduce the maximum % of hard landscape in certain areas of the Park.
- 1.1.5 Whether the above minor amendments alter the conclusions of the January 2020 ES has been assessed in an EIA Statement of Conformity. Where relevant, this NTS makes references to minor amendments as summarised in the EIA Statement of Conformity.
- 1.1.6 In this case, LBB are acting as both the Applicant applying for planning permission and as the Authority determining whether planning permission should be granted. Measures have been implemented by LBB to ensure that these two roles are separate to eliminate bias. This is a requirement of Regulation 64 of the Town and Country Planning (EIA) Regulations 2017. This has included LBB as the Applicant employing external independent advisors to prepare the outline planning application and LBB as the Authority employing external independent advisors to review the Environmental Statement.

1.2 What is an Environmental Impact Assessment?

- 1.2.1 An Environmental Impact Assessment (EIA) is a process to ensure that planning decisions are made, in this case by LBB as the Authority, with full knowledge of the likely significant environmental effects of a Proposed Development. The outcome of the EIA process is reported within the ES.
- 1.2.2 The objective of the EIA is to identify any likely significant effects that may arise from the Proposed Development and to identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects. During the EIA process for the Proposed Development, opportunities and management measures have been identified and incorporated within the development proposals to prevent or reduce any adverse effects and to enable for sustainable design and construction principles to be embedded within the Proposed Development.
- 1.2.3 The EIA informs the decision of whether to give consent for the Proposed Development to proceed and helps frame any planning conditions.
- 1.2.4 The ES comprises the following documents:
- *ES Non-Technical Summary (NTS)* – This document, which provides a summary of the Proposed Development and the findings of the ES in non-technical language;
 - *ES Volume I: Main Document* – This presents the findings of the EIA and is divided into a number of background and technical chapters supported with figures and tabular information for clarity of reading; and
 - *ES Volume II: Technical Appendices* – Additional reports and survey data which provide further detail on the technical assessments undertaken and information used to inform *ES Volume I*.
- 1.2.5 This ES complies with the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended 2018) (the ‘EIA Regulations’) (Ref 1-1) and forms part of a suite of documents submitted as part of the planning application for the Proposed Development.

1.3 Planning Background

- 1.3.1 In 2007, an outline planning application was submitted for the Crystal Palace Park Masterplan, which comprised of the demolition of a number of buildings and structures; the removal of areas of hardstanding and trees; remodelling of ground levels; construction of a range of sports and park related buildings; improvements to the entrances; creation of new vehicular and pedestrian routes; reconfiguration and relocation of car parking; and the creation of landscape features (hereafter referred to as ‘the 2007 Scheme’). The proposals also identified two sites for housing, the Rockhills and Sydenham Villas, as well as substantial landscaping, tree planting and other improvements.
- 1.3.2 An EIA was undertaken for the 2007 Scheme. The ES (Ref 1-2), including a suite of technical reports, was submitted with the planning application. The 2007 Scheme was granted planning permission in 2010. However, the funds to deliver the £67 million scheme were not identified at this point and this prevented the 2007 Scheme being implemented.
- 1.3.3 Since the 2007 Scheme, the Crystal Palace Park Regeneration Plan has been developed (Ref 1-3), and the Proposed Development represents the aims of the Regeneration Plan. It should be noted however, that the 2007 Scheme is considerably different to the Proposed Development, particularly in relation to the removal of the National Sports Centre (NSC) from the Application Site and fewer landscaping proposals.

2. Existing Site and Surroundings

- 2.1.1 The Site makes up the majority of Crystal Palace Park, which is designated as a Historic England Grade II* Registered Park and Garden and located in the LBB. Crystal Palace Park is interchangeably referred

to as 'the Park' in this report. The Park is approximately 80ha in size and is centred on National Grid Reference TQ342709. The Registered Park and Garden designation includes most areas of the Park but does not cover areas of residential properties around the northern and eastern edges of the Park.

- 2.1.2 The red line boundary of the Site and the extent of the Registered Park and Garden designation is shown in Figure 1.
- 2.1.3 The Park is enclosed by walls and fencing and is bounded to the north by Westwood Hill (A212); to the north-east round to the south-east by Crystal Palace Park Road (A234); to the south-west by Anerley Hill; and to the west and north-west by Crystal Palace Parade (A212). Thicket Road provides the boundary to the south-east, while the railway line which runs between London and Beckenham forms the boundary to the south. The Crystal Palace campus of Capel Manor College is also located along the southern edge of Crystal Palace Park.
- 2.1.4 The Site is owned and managed by LBB, who are the local planning authority for the entire Park, including the NSC. The Mayor of London, through the Greater London Authority (GLA), are the long-term lease owners of the NSC, which occupies approximately 10.1 hectares inside the Park. The lease for the NSC runs for 125 years from 2006. The Proposed Development will not include any development of the NSC.
- 2.1.5 The majority of the Site comprises open green space which is open to the public, with the Upper and Lower Italian Terraces in the west and two small lakes in the north and south-eastern parts of the Site. The gardens and pleasure grounds are situated on the lower slopes to the east and along the north side of the Park. From the Penge entrance in Thicket Road, a tarmac road leads northwest up through the centre of the Park. Amongst the green space, there are several notable developments within the Park. The Crystal Palace Caravan Club is present at the northwest corner of the Park, and is located next to the iconic transmitter tower, which is owned and operated by Arqiva. On the southwestern border of the Park is the Crystal Palace Museum and Brunel designed South Water Tower. The Museum details the history of the Crystal Palace with photos, documents and ceramics. The Lower Lake at the southern side of the Park contains the Crystal Palace Dinosaurs, which were built in the 1850s as an attraction and are now designated as Grade I listed structures. Crystal Palace Park Café and the Crystal Palace Park Information Centre are situated on the eastern side of the Park. Throughout the Park there are various recreational areas including, a playground, a skate park, a maze and open lawns for the public to enjoy. The NSC is located in the centre of the Park and contains a variety of sports facilities. The immediate surroundings of the Site are predominantly densely populated residential use with other mixed uses, such as retail and transport.
- 2.1.6 Water bodies within the Site include the 'Tidal Lake' (also referred to as the 'Lower Lake') in the southeast part of the Park; the 'Intermediate Lake' in the northeast part of the Park; a pond in front of the concert bowl; a small circular, steep concrete walled pond opposite the car park in the centre of the Park; and a rectangular pond beside Capel Manor College along the southern edge of the Park.
- 2.1.7 The locations of existing key features within the Park are shown in Figure 2.

3. Alternatives and Design Evolution

- 3.1.1 Alternatives analysis is a key part of the EIA process and serves to ensure that environmental considerations are built into the project design at the earliest possible stage. The alternatives to the Proposed Development that have been considered by the Applicant include:
- The 'No Development' / 'Do Nothing' Alternative;
 - Alternative Sites; and
 - Alternative Designs.

The 'No Development' Alternative

- 3.1.2 The 'No Development' Alternative refers to the option of leaving the Site in its current state.
- 3.1.3 For the Park, this assumes the continuation of the current management. This would result in several negative effects, including the loss of opportunity to improve the following:
- Amount and quality of public spaces;
 - Historic landscape and listed buildings;
 - Pedestrian permeability; and
 - Safety within the Park.
- 3.1.4 For Capel Manor College, this would involve leaving Capel Manor College in its current state. Capel Manor College is the only specialist Further Education (FE) College providing high quality land-based education and training in London. Sufficient space is required for storage of equipment, materials, animal feeds and space for processing green and animal waste. Leaving Capel Manor College in its current state would leave it unable to deliver its education function at Crystal Palace. Although the Anerley Hill Site has since been removed from the Proposed Development, existing containers on site and a partially derelict maintenance building will be removed, with the area still used thereafter for maintenance and as a storage area. Capel Manor College will continue to use the Jubilee Stand, which is part of the NSC, as they do presently.
- 3.1.5 Proceeding with the 'No Development' Alternative was therefore considered an unviable position.

Alternative Sites

- 3.1.6 As the vision and aims of the Proposed Development are intrinsically linked to the regeneration of Crystal Palace Park, an assessment of alternative sites is not possible. However, alternative locations for the residential developments within the Park have been investigated.
- 3.1.7 Nine alternative sites for the residential developments within the Park were identified. Some of these alternative sites were originally considered in the 2007, with further alternative sites considered from 2016 to 2018. All nine alternative sites were located on the periphery of the Park, with easy access from adjacent roads and potential capacity to integrate with existing residential developments.
- 3.1.8 The two locations selected are Rockhills and Sydenham Villas. The justification for this being that both locations have been previously developed and provide an opportunity to restore the line of villas that enclosed the Park from the 1870s to the 1950s. These locations are also deemed to have fewer development concerns, as the ground surface is relatively level at these locations, there are surrounding mature trees and shrubs to integrate them into the Park, and there are existing vehicle access points.
- 3.1.9 Alternative sites for Capel Manor College within Crystal Palace Park, the wider Crystal Palace area and the south of London were also investigated, however, the existing Farm and Anerley Hill sites were considered to be the most suitable for a range of factors, including greater chance of securing planning permission, more secure long-term tenure, safe and easy public transport access and sufficient outdoor space.

Alternative Designs

- 3.1.10 A number of alternative designs have been considered during the evolution of the Proposed Development, which has included the development of a masterplan in 2007 and an option appraisal of six options as part of the development of the regeneration plan in 2016 to 2017. Throughout this design process, there has been frequent consultation with the LBB and other statutory and non-statutory stakeholders, including a comprehensive community engagement programme.
- 3.1.11 The consultation process has resulted in amendments to the design of the Proposed Development. Within this process, there were six main alternative designs which were based on those used in the

2007 masterplan. Those alternative designs provided a wide variety of options for the Park, which allowed stakeholders to comment on what they felt best achieved the aims of the regeneration project. Those aims included re-establish the national and international significance of the Park through repairing infrastructure, conserving and restoring the historical assets, reconnecting the central walk and Paxton Axis through the Park, and restoring the architectural presence and grandeur of the Italian Terraces.

3.1.12 This process concluded in the following key principles that would be incorporated into the Proposed Development:

- A formal garden to be laid out on the Upper Palace Terrace to represent the footprint of the former Palace, restore the focus of the Park and provide an opportunity to showcase horticulture in the Park. Lines of trees to be planted to provide enclosure and to represent the former Palace structure;
- A Cultural Venue to be constructed, comprising of approximately 3000m² three storey building connected to the Grade II* listed subway under Crystal Palace Parade. The Cultural Venue to provide access to the subway and visitor facilities;
- A renovation of the Lower Palace Terrace to create a serviced area for temporary facilities to service events on the Italian Terraces;
- The Lower Italian Terrace is to be refurbished to form a large open event space with service points at key locations to facilitate event staging;
- A removal of hard-surfaced car and coach parking within the Transitional Landscape and restoration to parkland to restore historic views;
- A restoration of all heritage assets, including those on the Heritage at Risk register including the Park itself to facilitate their removal from the register. Works to include renovation of the terrace walls, the North and South walls and railings, Rockhills gatepiers, bust of Sir Joseph Paxton and continued restoration of the Grade I listed pre-historic animal sculptures (dinosaurs); and
- A replacement of the caravan site with a new public entrance into the park from the northwest and new accessible public park including a new natural play area.

3.1.13 It is considered that these elements incorporated into the Proposed Development provides many benefits to the Park, most notably conservation of heritage assets, an enhanced visitor offer and community facilities, an increase in accessibility and opportunity for income generation from events and a cultural offer in the form of the Cultural Venue..

4. The Proposed Development

Overview

4.1.1 As a result of the design evolution discussed above, the key components of the Proposed Development include the following elements:

- Landscaping works within the Park (hereafter referred to as 'the landscaping works');
- The construction of up to 210 residential dwellings (hereafter referred to as 'the residential development'); and
- The redevelopment and extension of the Capel Manor College campus in the Park (hereafter referred to as 'the Capel Manor College redevelopment').

4.1.2 Figure 3 illustrates the key aspects, built features and repairs proposed as part of the Proposed Development. Further information on the Proposed Development is included within *ES Volume 1 Chapter 4: The Proposed Development*.

Landscaping works

4.1.3 The landscaping works within the Park will include the following elements:

- Conservation and repair of heritage assets including:
 - A section of the Crystal Palace basement wall (Paxton Tunnel Wall);
 - The Upper and Lower Italian Terrace walls
 - The Bust of Sir Joseph Paxton;
 - The Gatepiers to Rockhills;
 - The North and South Railings and Walls, Crystal Palace Parade;
 - The Prehistoric Animal Structures; and
 - The Colonnade wall.
- Landscape improvements including: removal of clutter, redundant fencing, etc.; improvements to pedestrian routes; enhancement of habitat diversity; restoration of historic views and the central park axis; re-establishment of parkland and associated landscape;
- Earthworks to re-profile the landscape on the Upper and Lower Palace Terraces, to create gardens on the Upper Palace Terrace and install utilities infrastructure (for temporary use) on the Lower Palace Terrace to support events on the Italian Terraces; landscaping to the Italian Terraces and installation of utilities infrastructure to create large open event space and earthworks to re-profile landscape in the Transitional Landscape area;
- Full and partial removal of hard surfaces including: car/coach parking areas within the Transitional Landscape area, comprising a net removal of 339 car and coach parking spaces; removal of existing playground within the Cricket Ground area to be replaced by three new playgrounds within Tidal Lakes area, the Cricket Ground area and English Landscape area;
- Installation of wayfinding signs and low energy lighting on footpaths; surface water drainage systems and benches;
- Change of use of Caravan Site to part public open space and part residential;
- Dismantling and reconstruction of Crystal Palace Park Road maintenance depot up to 530 sqm to be located beside Sydenham Gate;
- Alteration to highways access at Anerley Hill Gate entrance, Penge Gate car park, Old Cople Lane (Rockhills Gate), Sydenham Gate car park; and
- Creation of 3 additional accesses for the residential elements at Rockhills and Sydenham.;
- Improvements to highway, pedestrian and cycle access points at Penge Gate, Sydenham Gate Norwood Gate and Anerley Hill;
- Modification of public car and coach parking areas to provide 124 car parking spaces and 10 coach spaces, including:
 - The provision of 42 new car parking spaces at Rockhills Gate, including 4 accessible;
 - The re-provision of 10 coach parking spaces at Rockhills Gate;
 - The removal of 20 car parking spaces at Sydenham Gate to provide 50 car parking spaces, including 4 accessible;
 - The removal of 12 car parking spaces at Penge Gate to provide 21 car parking spaces, including 2 accessible;
 - The removal of 47 car parking spaces at Sports Centre Road to provide 6 car parking spaces;
 - The retention of 4 car parking spaces at Crystal Palace Museum;
 - The provision of one new accessible car parking space at the Cultural Venue.
- Demolition of the following structures / features within the Park:
 - Nursery near Sydenham Gate;
 - Rangers' Lodge near Sydenham Gate;
 - St Johns Ambulance building on Crystal Palace Park Road;
 - St Johns Ambulance facility and associated storage buildings in Transitional Landscape area;

- Buildings at Caravan Club;
 - Maintenance shed and containers east of Crystal Palace Museum;
 - Park Depot near NSC;
 - Information Centre;
 - Existing Capel Manor College buildings and hard surfacing; and
 - Four substations (2 adjacent to Penge Gate, one in the Transitional Landscape, and one on the Lower Palace Terrace)
- Breaking up of surface car parking/areas of hardstanding.

The Residential Developments

4.1.4 The residential development includes the following two sites:

- 'Rockhills' – 140 permanent residential dwellings (Use Class C3) in 2 blocks of up to 10,672 sq. m with a maximum of 5 storeys together with 84 car parking spaces inclusive of 10 disabled spaces, 252 long stay bicycle parking spaces and 18 short stay bicycle parking spaces. Rockhills is located in the northwest corner of the Park and is within the boundary of the Grade II* Registered Park and Garden designation. The blocks will be set back from the pavement and will be arranged around two courtyards to allow residents to benefit from a degree of privacy. Existing trees will be retained to maintain a parkland setting for the buildings. The highest point of Rockhills will be five storeys and approximately 21m above ground level to the west. This is intended to help mark the new entrance into the Park. The buildings will step down towards the east following the slope of the road and relative to the scale of the villas along Crystal Palace Park Road with the lowest part of the building being two storeys and approximately 13.5m above ground level in the southeast corner. And;
- 'Sydenham Villas' – 70 permanent residential dwellings (Use Class C3) in 6 blocks of up to 5,680 sq. m with a maximum of 4 storeys together with 43 car parking spaces inclusive of 4 disabled spaces, 128 long stay bicycle parking spaces and 2 short stay bicycle parking spaces. Sydenham Villas is located in the northeast corner of the Park and is outside of the boundary of the Grade II* Registered Park and Garden designation. Sydenham Villas will be comprised of six separate villas laid out in two groups. The western group will have two villas, with vehicular access from Crystal Palace Park Road between these two villas where parking facilities will be located, as well as undercroft parking available in Villa 2. The eastern group comprising the remaining four villas are separated from the two western villas by an existing two storey villa. There will be two points of vehicle access to the eastern villas from Crystal Palace Park Road. The eastern villas are set back from Crystal Palace Park Road, leaving space for parking facilities in front of the villas. There will be additional undercroft parking in Villa 5. All six villas will be four storeys in height and in proportion to the existing villa that separates the two groups. The villas will be spaced apart to allow views of the Park. There will be low walls, hedges and trees to front gardens will reinforce the green character of Crystal Palace Park Road.

4.1.5 The residential development will also involve the construction of the following new buildings:

- A three-storey Cultural Venue (Use Class D1) with viewing platform comprising up to 791sqm, together with the change of use of the eastern end of the Crystal Palace subway to museum / interpretation centre (Use Class D1). The building will sit on the Park side of the subway at ground level. It will be integrated into the historic structure through connection with the staircases. Entry to the subway will be managed as visitors will have to enter through the staffed cultural venue at ground level to access the historic subway site. The first and second floor of the Cultural Venue will comprise flexible exhibition space and on the ground floor kitchen and toilet facilities. The toilets will be accessible from the Park. The Cultural Venue has a lift and stairwell on the northern side of the building as well as staircases on the ground floor connected to the subway.
- A two-storey Community Centre (Use Class D1) of up to 670sqm at 'Rockhills'. The building will have a differentiated design than the proposed residential development. The Community Centre will be located on the east side of the parking area and will be on the Park side of the proposed residential development. The first and ground floor will comprise community space and on the first floor an outdoor balcony will face the Park allowing views over the Park. The Community Centre

has a lift and stairwell on the northern side of the building as well as a staircase on the east side of the building.

- A single-storey Information Centre (Use Class D1) of up to 150qm. The building will be located on the site of the existing Information Centre. It will have a smaller footprint and will comprise an office for a community group and a meeting room with associated toilets and small kitchen.

Capel Manor College Redevelopment

4.1.6 An educational institution (Use Class D1) building up to a total of 3,779sqm comprising:

- Farm Site – erection of a teaching and animal care building comprising 3,399sqm over part 2/part 4 storeys together with 380sqm of ancillary shelters and outbuildings.
 - Demolition of existing buildings in the southeast of the Farm Site, including the laboratory and classrooms, bin store, stables, greenhouses and animal pens;
 - Construction of new buildings in the southeast of the Farm Site in a reconfigured layout to make better use of space, including a learning resource centre, dining hall, teaching block and animal enclosures;
 - Installation of lightweight structures for animal shelter in the northwest of the Farm Site;
 - Creation of a new public entrance at the northwest of the Farm Site with signage to make clear the public are allowed to visit; and
 - Removal of 9 trees.

Demolition and Construction

4.1.7 Provisional phasing for implementation of the landscaping works has considered five key factors;

- Requirement for further Reserved Matters Applications;
- Funding availability;
- Capacity of the Park to maintain public access whilst securing construction areas;
- Heritage and community benefits of each phase; and
- Increasing opportunities for income generation during the implementation period.

4.1.8 Two principle phases are therefore proposed. These are then split into sub-phases:

4.1.9 Phase 1 will focus on the western half of the Park: Anerley Hill Edge, the Palace Terraces and the Italian Terraces. The western half of the Park is currently underused and relatively uninviting. Regeneration works will open-up these areas and greatly improve their appearance and appeal. Access to these areas will be restricted during the works but in general these areas are currently less popular than other areas which will remain open to the public. In addition, works to the dinosaurs and their setting in the Tidal Lakes will restrict access but the nature of the works will allow some use by the public. The new dinosaur-themed play area will be constructed before removal of the existing play area.

4.1.10 Phase 1 will be split into two sub-phases: Phase 1A will focus on the Italian Terrace and the Tidal Lakes, including the Information Centre; and Phase 1B will focus on the Palace Terrace and Anerley Hill Edge. Phase 1 therefore revolves around the restoration of the most significant heritage assets in the Park, including two on the Heritage at Risk register. The assets are the dinosaurs and their setting, the terrace walls and the North and South railings and walls on Crystal Palace Parade. The setting and access for the newly restored Crystal Palace Subway, another Heritage at Risk feature is also enhanced.

4.1.11 Phase 2 will focus on the centre of the Park and its northern edge: English Landscape, Transitional Landscape, Cricket Ground and Paxton Axis. The second phase is expected to start on site after

completion of Phase 1. The works associated with Phase 2 are more discreet compared to the Phase 1 works, enabling parts of these areas to remain publicly accessible during construction. By placing the delivery of the Transitional Landscape and the Paxton Axis into the Phase 2 it also enables the adjacent NSC regeneration scheme to be sufficiently developed to be co-ordinated with the Park regeneration scheme. This may provide some economies, including the potential to re-use materials and minimise issues along the interface between the two schemes.

- 4.1.12 Phase 2 will be split into two sub-phases: Phase 2A will be focussed on the English Landscape and Transitional Landscape including the upper section of the Paxton Axis which runs through the Transitional Landscape. Phase 2B will be focussed on the Cricket Ground and associated lower section of the Paxton Axis. Phase 2 restores the central axis through the Park and improves key views, which together with Phase 1 and the NSC project will facilitate the removal of the registered park from the Heritage at Risk register.

5. EIA Methodology

- 5.1.1 The environmental effects of the Proposed Development have been assessed both during construction and once the Proposed Development is complete and occupied. There is some uncertainty over the exact construction phasing as a contractor has not yet been appointed, however, it has been assumed that the construction programme for the Proposed Development will run from 2021 to 2026, with the peak year of construction activity in 2022.
- 5.1.2 EIA assesses environmental effects on resources (such as archaeology) and receptors (such as human beings). The effects are described in terms of changes to the existing situation (the baseline). The significance of the environmental effects has been assessed by judging the sensitivity (that is, the importance) of a resource or receptor against the magnitude (that is, the scale or extent) of the predicted impact. The duration and geographic scale of the effects have also been taken into account.
- 5.1.3 The EIA has assumed certain aspects of the design, such as landscaping proposals and drainage design that will help to limit the extent of potential environmental effects. It also assumes mandatory application of a Construction Environmental Management Plan (CEMP), which the Applicant will require contractors to prepare, based upon the measures set out in the ES, before they start any construction work.
- 5.1.4 Where significant effects are still likely to occur, additional measures are proposed to reduce effects where practicable. Any effects that remain, once these measures are taken into account, are reported as 'residual effects'.
- 5.1.5 The content or 'scope' of the EIA was agreed through the production of an EIA Scoping Report. Following the provision of a 'Scoping Opinion' by London Borough of Bromley (LBB), the following environmental topics are addressed in detail in the EIA:
- Air Quality;
 - Cultural Heritage;
 - Ecology and Biodiversity;
 - Ground Conditions and Contaminated Land;
 - Noise and Vibration;
 - Socio Economics;
 - Townscape and Visual Impact; and
 - Transport and Access.
- 5.1.6 Topics are scoped out of the EIA where it is considered that the effects to arise from the Proposed Development on these topics are not likely to be significant and as such do not require further assessment within the EIA. The topics scoped out include:
- Arboriculture;

- Climate Change;
 - Daylight, Sunlight, Overshadowing and Solar Glare;
 - Flood Risk;
 - Human Health;
 - Lighting;
 - Major Accidents and Disasters; and
 - Water Resources.
- 5.1.7 A development of this nature is certain to have some effects on the environment, both beneficial and adverse. Sufficient information in relation to the Proposed Development has been provided as part of the outline planning application to allow for a robust assessment of the likely significant environmental effects, whilst building flexibility into the design to allow for detailed designs to come forward as part of a reserved matter application(s).
- 5.1.8 What is important is that 'significant' adverse effects are identified and reduced through the design process, or through other mitigation measures. 'Significant' effects are considered to be those effects which represent key factors or material influences in the decision-making process. The beneficial effects are also reported in the ES to ensure the benefits arising from the proposed development are realised and the balance of issues is understood.
- 5.1.9 If, at the stage of reserved matters applications, there are changes to the Proposed Development, consideration will be given as to whether there would be any materially new or materially different significant environmental effects, as compared with those reported in this ES in support of the outline planning application. Where these are identified, then the reserved matters application will contain additional assessment material. The form and detail of this will be agreed with the Authority.
- 5.1.10 The remainder of this Non-Technical Summary sets out the findings of the ES, on a topic by topic basis.

6. Findings of the Environmental Statement

6.1 Air Quality

- 6.1.1 *ES Volume I Chapter 5: Air Quality* presents the findings of an assessment of the likely significant effects of the Proposed Development on air quality.
- 6.1.2 The air quality assessment considers the potential for the Proposed Development to generate dust during the demolition and construction phase, as well as the potential air quality impacts of additional road traffic generated by the Proposed Development once complete and operational. Where necessary, mitigation measures are proposed to reduce air quality impacts.

Effects during Construction

- 6.1.3 The air quality assessment for the construction phase considered the impact of dust generated by demolition, earthworks, construction and trackout. The effect of construction road traffic on pollutants other than dust is scoped out due to the low construction traffic volumes and the temporary nature of the emissions. Emissions from Non-Road Mobile Machinery (NRMM) are considered to be not significant. A summary of the risk magnitudes for the activities during the construction phase are listed in Table 1.

Table 1 - Summary of Potential Dust Emission Magnitudes for Construction Phase Activities

Activity	Risk Magnitude	Justification
Demolition	Medium	Assumed to be below 20,000m ² and 50,000m ²

Activity	Risk Magnitude	Justification
Earthworks	Large	Indicated that the total earthworks area will be at least 38,000m ²
Construction	Large	Due to potential piling works, construction will be classed as large.
Trackout	Medium	The number of construction-related heavy-duty vehicle (HDV) movements generated by the proposed development estimated to be maximum 40 vehicles per day.

6.1.4 The sensitivity of the receptors identified within the vicinity of the site has been assessed as shown in Table 2.

Table 2 - Sensitivity of Receptors

Area Affected	Sensitivity	Justification
Dust Soiling	High	Given that there are residential properties within the surrounding area, the receptors were conservatively considered to have a "high" degree of sensitivity.
Human Health	High	Given that there are residential properties within the surrounding area, the receptors were conservatively considered to have a "high" degree of sensitivity.
Ecological	Low	Given that there is only 1 Local natural reserve within 50m of major roads which will likely be used by construction traffic, the area is considered to have a low risk

6.1.5 The sensitivity of the surrounding area is set out in Table 3.

Table 3 - Sensitivity of the Surrounding Area

Receptor Sensitivity	Sensitivity of the Surrounding Area			
	Demolition	Construction	Earthworks	Track out
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low
Ecology	Low	Low	Low	Low

6.1.6 Information contained within Table 2 and Table 3 was combined to determine the risk of dust impacts, as shown in Table 4. These risk levels were used to determine the appropriate level of mitigation required at the site. Overall, the Dust Risk Assessment conservatively identified the Site as having a 'high risk' of causing dust impacts.

Table 4 - Sensitivity of the Surrounding Area

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Track out
Dust Soiling	Medium	High	High	Medium
Human Health	Low	Low	Low	Low
Ecology	Low	Low	Low	Low

6.1.7 Mitigation measures will include a dust management plan and good practice measures specific to site management, air quality monitoring, preparing and maintaining the site, operating vehicle machinery

and sustainable travel, operations and waste management. Following application of these measures, it is considered that the residual dust effects are not significant to local air quality.

- 6.1.8 With effective mitigation measures and management in place, the effects of dust are not considered to be significant.

Effects during Operation

- 6.1.9 When combining the future baseline with predicted transport emissions generated by the Proposed Development, the predicted nitrogen dioxide (NO₂) concentrations remain below air quality objectives for the area at all nearby sensitive receptors. The maximum change in annual concentrations of NO₂ is predicted to be 0.5 µg/m³ at A234/Sydenham Avenue, which is not significant.
- 6.1.10 Another key air quality indicator is particulate matter that is 10 micrometres or less in diameter (PM₁₀). The predicted PM₁₀ concentrations are below air quality objectives for the area at all nearby sensitive receptors. The maximum change in annual concentrations of PM₁₀ is shown to be 0.1 µg/m³, which is not significant.
- 6.1.11 There are no anticipated building operational plant emissions associated with the Proposed Development.
- 6.1.12 The predicted total emissions generated by additional car trips to and from the Proposed Development are well below the assessment guidance benchmarks for this type of development. Consequently, the Proposed Development is considered to be 'air quality neutral' with respect to transport emissions.

6.2 Cultural Heritage

- 6.2.1 *ES Volume I Chapter 6: Cultural Heritage* of the ES presents the findings of an assessment of the likely significant effects of the Proposed Development on archaeological assets and built heritage assets within the Site and the surrounding area. The assessment considers impacts on archaeology and built heritage during enabling works, demolition, construction and once the Proposed Development is complete and occupied.

Built Heritage

- 6.2.2 The Site itself is designated as a grade II* Registered Park and Garden and as a Conservation Area. Within the Site boundary, there are eight listed buildings: one grade I listed building, one grade II* listed building, and six grade II listed buildings. A further grade II* listed building and 19 grade II listed buildings are located outside the Site boundary but within 1km of the Site.
- 6.2.3 The landscaping works within the Park have been designed to bring about beneficial effects on the Park and the built heritage assets within it. In particular these improvements will include:
- Renovation of the Grade I listed prehistoric animal sculptures and their setting;
 - Restoration of the Grade II listed Upper and Lower Terraces (Italian Terraces);
 - Removal of car parking to restore the Transitional Landscape; and
 - Reinstatement of the Paxton Axis to restore the symmetry of the Park.
- 6.2.4 Under a separate project linked to the creation of the Cultural Venue, the grade II* listed Subway, Vestibule, Terrace and Stairs to the Crystal Palace will be restored.

Effects during Construction

- 6.2.5 During construction, it has been assessed that all but one built heritage assets within the Park will experience temporary adverse effects ranging from negligible to minor adverse. The grade II* listed Pedestrian Subway under Crystal Palace Parade is considered to experience a temporary moderate

adverse (significant) effect. These effects are due to nearby construction activity causing a temporary and localised impacts on the setting of the affected built heritage asset.

- 6.2.6 Where possible, the effects on built heritage assets due to nearby construction activity will be managed by mitigation measures included in a Construction Environmental Management Plan (CEMP) (e.g. to limit dust and noise).

Effects during Operation

- 6.2.7 Once completed, it has been assessed that the Proposed Development will have a significant permanent beneficial effect on eight built heritage assets within the Park, predominately due to the enhancement to their setting and fulfilment of their intended role. This includes four major beneficial effects on the Crystal Palace Park Registered Park and Garden, the grade I listed Prehistoric Animal Sculptures, the grade II* listed Pedestrian Subway under Crystal Palace Parade and the grade II listed Bust of Sir Joseph Paxton. There are five moderate beneficial effects on the Crystal Palace Park Conservation Area, the grade II listed Upper and Lower Italian Terraces, the grade II listed Gatepiers to Rockhills and the grade II listed North and South Railings, Walls and Boundary Marker.
- 6.2.8 Two built heritage assets were assessed as experiencing a permanent adverse effect. These are due to the introduction of new built form near to the built heritage asset. Minor adverse effects were assessed for the grade II listed Sunnyside due to the introduction of the Rockhills residential development and the grade II* listed Crystal Palace National Recreation Centre due to the introduction of the Sydenham Villas. These effects, however, are not considered significant. With the removal of the Anerley Hill Site from the Proposed Development, the effect on the setting of the grade II listed Harefield is now considered to be negligible.

Buried archaeology

Effects during Construction

- 6.2.9 There are three archaeological assets within the Site, which includes the site of the former Crystal Palace.
- 6.2.10 One of the objectives of the Proposed Development is to reinstate the Palace site and Upper and Lower Italian Terraces, making these the focus of the Park. To achieve this, earthworks would be required to reveal the two levels of the Palace Terrace.
- 6.2.11 A comparison of the ground levels indicated on historic maps reproduced in the Crystal Palace Park Conservation Plan and the Crystal Palace Park Regeneration Plan indicates that the proposed ground levels will closely replicate the terraced ground levels of the historic parkland design. As such the proposed earthworks will encounter the remains of terrace features such as fountain bases. The impact on features is therefore likely to be variable with some removed by the works due to poor survival, while others could be retained.
- 6.2.12 During the earthworks around the Upper and Lower Italian Terraces, it has been assessed there would be a moderate adverse effect on buried archaeology. Therefore, archaeological monitoring will be carried out to enable the identification of buried historic terraces features. When features from the historic terraces are encountered, a decision will be made to either remove or retain the feature within the renovated landscape, following the principles set out in the design principles and in consultation with Greater London Archaeology Advise Service (GLAAS). A record of all historic terrace features will also be made. Following implementation of this mitigation, it has been assessed that there would be a residual minor adverse effect. This is not considered significant.
- 6.2.13 In other areas of the Park where there are no proposed changes in topography, and for the proposed residential developments, there is considered to be a negligible effect on buried archaeology.
- 6.2.14 Further archaeological mitigation could be provided to offset any necessary loss of archaeological features through the provision of tours and other interpretation on the development of the Park and its subsequent renovation. By highlighting how the landscape has been reinstated and clearly articulating

any necessary loss of archaeological features in this process it would embed archaeological assets removed during renovation within the history of the Park and its continued historic narrative.

6.3 Ecology and Biodiversity

6.3.1 *ES Volume 1 Chapter 7: Ecology and Biodiversity* presents the findings of an assessment of the likely significant effects of the Proposed Development on the ecology of the Site and surrounding area. The assessment considers effects on designated sites, habitats and protected species.

Baseline

6.3.2 The Site itself is designated as the Crystal Palace Park Site of Importance for Nature Conservation (SINC). Dulwich Upper Wood SINC and Local Nature Reserve (LNR) is located approximately 0.2km from the Site. These designations reflect the local importance of the site and surrounding area for ecology and biodiversity. There are, however, no nationally or internationally designated sites within 2km of the Site.

6.3.3 The Site is characterised by areas of amenity grassland separated by scattered trees and broadleaved woodland and punctuated by artificial water bodies which increase the level of biodiversity within the Site. Overall, the habitats offer suitable habitat native mammals, birds, invertebrates, reptiles, amphibians and plants.

Sensitive receptors

6.3.4 The ecological baseline of the Site was identified through the following desk-based studies and field surveys:

- Desk-based studies of designated sites, habitats and protected species;
- Review of existing survey data which was completed to inform the ES for the 2007 Scheme; and
- Field surveys carried out during June, September and October 2017; April and May 2018; and July, August and September 2019.

6.3.5 Based on the results of field surveys, the protected species likely to be affected by the Proposed Development are listed below:

- Roosting bats – no confirmed roosts identified during surveys undertaken to date;
- Foraging and commuting bats – activity recorded within the Park, including common pipistrelle (*Pipistrellus pipistrellus*), brown long-eared bats (*Plecotus auritus*), Leisler's bat (*Nyctalus leisleri*) and *Myotis* species;
- Reptile assemblages – no reptiles found during surveys in the Park, however, records of common lizards and slow worms within 2km of the Site, therefore are assumed to be present within the wider zone of influence of the Site; and
- Breeding birds – suitable habitat for nesting birds exists within the Park and further breeding bird surveys will be conducted pre-construction to provide further information on the assemblage of bird species present.

Effects during Construction

6.3.6 During construction, a CEMP will be implemented, which will include mitigation measures to minimise impacts on ecological receptors, including reducing dust emissions, appropriate management of waste, secure storage of fuels, sensitive temporary lighting and appropriate contractor training on protected species awareness and spill response.

6.3.7 Where buildings or trees with potential for roosting bats require removal, further surveys will be carried out to confirm whether or not those features are actively used by roosting bats. If this is confirmed, a European Protected Species Mitigation Licence will be applied for from Natural England in order to remove the roost assuming no alternatives are possible.

- 6.3.8 The implementation of this CEMP, together with precautionary methods of working in areas suitable for protected species and if necessary an ecological watching brief, is assessed to mitigate effects on protected species during construction to negligible or minor adverse levels. These effects are not considered significant.

Effects during Operation

- 6.3.9 Once complete and operational, although the Proposed Development will result in a net reduction in the total vegetated area of the Site, there will be an increase in the habitat diversity of the Site, including habitats of better value to wildlife, new tree planting, swales and attenuation basins. In addition, the landscaping works will incorporate more floristically diverse grasslands. No significant environmental effects are therefore predicted.

6.4 Ground Conditions and Land Contamination

- 6.4.1 *ES Volume 1 Chapter 8: Ground Conditions and Land Contamination* presents the findings of an assessment of the likely significant effects of the Proposed Development on ground conditions and land contamination.

Baseline

- 6.4.2 The site is directly underlain by made ground overlying London Clay. Beneath the clay are the Lambeth Group, Thanet Sands and Chalk. There are no licensed groundwater abstractions within 1km of the site and it is not located within a Source Protection Zone.
- 6.4.3 The Site itself contains five surface water bodies and lies within a Flood Zone 1.
- 6.4.4 A review of historic mapping indicates that there are potential sources of contamination within the Site, including engine houses and a fire station present on-site in the late 1800s and early 1900s; rubble from properties damaged during the Second World War that was used to infill the foundations of the former Crystal Palace; and the use of the former Crystal Palace as a depot in the 1950s, with vehicles and equipment stored on the Palace Terrace and Upper and Lower Italian Terraces. The Site currently includes several electrical substations and parking areas.
- 6.4.5 The above activities could potentially have led to contamination with a wide range of substances, including fuels, oils, volatile organic compounds, metal compounds, polychlorinated biphenyls (PCBs), and asbestos. This was confirmed by historical intrusive investigation at the Site, which identified elevated concentration of metals and hydrocarbon and the presence of asbestos containing material (ACM) in the western part of the Site.
- 6.4.6 Potential sources of contamination and hazards identified within the Site include:
- Potential hotspots of soil and groundwater contamination (including ACM) within made ground and the underlying deposits;
 - Several electrical substations; and
 - Unexploded ordnance (UXO).

Potential sensitive receptors

- 6.4.7 Based on the proposed end use of the Proposed Development, sensitive human health and controlled waters receptors were identified, which included the below:
- Contractors carrying out construction works;
 - Neighbouring uses, occupiers and the general public immediately adjacent to the Site;
 - Users of the Proposed Development once complete and operational;
 - Controlled waters, including surface water features such as the lakes and ponds, and the underlying groundwater; and

- Existing and proposed new utilities and infrastructure both on-site and in close proximity.

Effects during Construction

- 6.4.8 During construction, a number of standard environmental mitigation measures will be carried out as industry best practice demolition and construction techniques. The standard mitigation measures are protective of both human health and controlled waters will be based on Environment Agency pollution prevention guidance, and on waste management and construction related regulations. These measures will be set out in a Construction Environmental Management Plan.
- 6.4.9 Further intrusive site investigations will be completed to analyse ground and stability conditions. The results of these investigations will inform any additional mitigation measures that may be required for the Proposed Development. This will likely include seepage analysis and groundwater level monitoring to assess deformation and stability of surrounding structures. Remediation of contaminated hotspots and the importation and placement of clean fill within the green areas will create an effective barrier to any residual contamination.
- 6.4.10 The results and recommendations from any further site investigations will be consulted and agreed with LBB and the EA.
- 6.4.11 With the recommended standard and additional mitigation measures in place during construction, it is considered that there will be no likely significant residual ground contamination effects.

Effects during Operation

- 6.4.12 Once complete and operational there is considered to be no further risk of significant effects on ground conditions and land contamination as a result of the mitigation measures implemented during the construction phase.

6.5 Noise and Vibration

- 6.5.1 *ES Volume 1 Chapter 9: Noise and Vibration* presents the findings of an assessment of the likely significant effects of the Proposed Development on noise and vibration. In addition, an assessment of the suitability of the site has been undertaken and outline mitigation requirements recommended to achieve good acoustic conditions in residential buildings associated with the Proposed Development.
- 6.5.2 The study area that was considered for the noise and vibration assessment includes the Proposed Development and nearby sensitive receptors (e.g. residential properties), that may be affected by noise and vibration during the construction and operation of the Proposed Development. In order to inform the assessment, baseline monitoring surveys were undertaken to establish the existing noise and vibration conditions around the Site, with measurements taken at the locations of existing and future receptors sensitive to noise and vibration.

Assessment of Site Suitability

- 6.5.3 The assessment of Site suitability has identified the need for a suitable glazing and ventilation strategy to achieve suitable internal noise conditions in the Proposed Development. Example glazing specifications that would perform to the required standard have been provided in the ES; however specifications for glazing and ventilation will be finalised at the detailed design stage of the Proposed Development.
- 6.5.4 The detailed design of the residential development should be undertaken with consideration of how noise could be minimised in outdoor amenity areas. Recommendations have been provided on how good acoustic design can be implemented to provide the best practicable acoustic conditions in outdoor amenity space. Any residual exceedances of outdoor amenity noise thresholds can be partially offset through provision alternative outdoor amenity space in line with national policy guidance. The alternative outdoor amenity space is provided by the proximity of new residential development to Crystal Palace Park.

Effects during Construction

6.5.5 It is considered that the greatest noise generation by the Proposed Development will be during the demolition phase, including when existing hard-standing surfaces within the Park are broken up and removed. The noise generated during the construction phase of the Proposed Development is likely to vary across different construction phases and activities. After the implementation of appropriate mitigation measures, including regular communication with any affected residents, the effects of construction noise across most of the Site has been assessed as not significant. Examples of these mitigation measures include:

- Good industry standards, guidance and practice procedures detailed within a Construction Environment Management Plan (CEMP);
- Reducing source levels where possible, but with due regard to practicality through ensuring that noisy plant is located as far from receptors as practicable and screened using temporary barriers;
- Limiting the daily time that noisy equipment is operated;
- Good communication strategy prior to works being undertaken, liaison with occupiers of sensitive receptors that may be adversely affected by construction noise and vibration;
- Best Practicable Means (BPM) construction activities; and
- A risk assessment identifying the probability of vibration from any activities will also be carried out.

6.5.6 Further details of mitigation are provided in *ES Volume 1 Chapter 9: Noise and Vibration*.

6.5.7 With this mitigation in place, however, there will remain temporary moderate adverse effects as a result of construction noise at monitoring locations R23 and R28. R23 is located around 25-27 Crystal Palace Park Road, where the Sydenham Villas residential development is proposed around the edge of the Park. R28 is located at the location of the National Sports Centre, which the Site surrounds. However, these significant adverse effects will be temporary and limited to the construction phase.

6.5.8 Regarding vibration, a risk assessment identifying the probability of vibration from any activities will be carried out prior to commencement of construction activities, to determine the need for periodic or continuous vibration monitoring. The contractor will use techniques least likely to cause vibration or effect damage to the surrounding residential and commercial properties. Should the need arise, additional means of mitigating potential effects will be considered as the construction arrangements are developed further. It is likely that the magnitude of the potential vibration effects can be reduced, if not avoided altogether, as a result of these further considerations. With mitigation measures in place, there are minor adverse vibration effects reported at receptors R1 to R22, R23 and R24 to 28 during the construction phase.

6.5.9 The effects of construction road traffic noise on sensitive receptors has also been assessed. Two modelling scenarios were generated – both representing the year when construction of the Proposed Development is due to take place, but one with the Proposed Development and the other without the Proposed Development. The difference between the two scenarios is used to assess the effects of construction road traffic noise. The assessment concluded there will be an increase in construction road traffic noise of 0.1 dB or less and is therefore considered to be a negligible (not significant) effect.

Effects during Operation

6.5.10 The Proposed Development is not expected to lead to a significant increase in noise as a result of increased road traffic during operation. Any building services plant will be designed to achieve the recommended noise emission limits. There are no likely significant noise and vibration effects during the operational phase.

6.6 Socio-Economics

6.6.1 *ES Volume 1 Chapter 10: Socio-Economics* presents the findings of an assessment of the likely significant effects of the Proposed Development on socio-economics at the Site and within the surrounding area. The assessment considers the social impacts (housing provision, access to

education, healthcare, play space and open space) and economic impacts (employment and local spending) of the Proposed Development.

- 6.6.2 The Proposed Development was assessed against the existing socio-economic baseline conditions. Different socio-economic baseline conditions were considered to assess effects at a local, borough and regional level. The socio-economic baseline conditions were established using nationally recognised data and research, including (but not limited to) the 2011 Census, Office for National Statistics employment data, and statistics released by the Department for Education and National Health Service.

Effects during Construction

- 6.6.3 The construction phase of the Proposed Development is expected to last 56 months from February 2022 to October 2026. The construction phase is expected to create a total of 82 construction-related jobs per annum, with 65 of these sourced from Greater London. Given the large labour pool of construction workers in London (over 189,000 workers), this small increase is considered to be beneficial but not significant.

Effects during Operation

- 6.6.4 Once complete and occupied, the Proposed Development will generate 46 net jobs in the Greater London area through a variety of means. This level of job generation is not considered significant given the large labour pool available in Greater London.
- 6.6.5 The future occupants of the new residential developments within the Proposed Development are estimated to spend approximately £3.6 million per annum in the Greater London each year. This additional spending is considered a minor beneficial effect, but it is not considered significant given the size of the Greater London economy. The 210 additional dwellings will account for 3.3% of the total housing target set for Bromley in the London Plan between 2015 and 2025. These deliveries are assessed as a minor beneficial effect on housing supply at a district level, but it is not considered significant.
- 6.6.6 Local primary and secondary schools in the relevant catchment areas to the Proposed Development have surpluses of 663 and 4,434 places respectively above the desired occupancy rate for schools. These surpluses are far greater than the additional demand generated by the new dwellings and therefore, the Proposed Development is assessed to have a negligible effect on education provision.
- 6.6.7 Primary healthcare facilities within 1km of the Site currently have an average of 1,863 patients per GP, which is broadly in line with the standard of one GP per 1,800 registered patients. The residential elements of the Proposed Development will increase this ratio to 1,875 patients per GP, but this is still considered broadly in line with the set target for the UK. A negligible effect is therefore assessed.
- 6.6.8 The landscaping works within the Proposed Development will improve and expand open space across the Site, which is identified as a Metropolitan Park according to the London Plan. The Park will be expanded by around 2.7ha and the quality of the open space will be greatly enhanced through new character areas, improved infrastructure and better accessibility. The works aim to re-establish the Park's cultural significance and identity. These works will have a major beneficial effect upon the provision of open space locally.
- 6.6.9 The Proposed Development will provide 2,730m² of publicly accessible play space across three separate areas. This space will be accessible from the residential units within the Proposed Development and will cater for the needs of children of all ages within these units. In addition, the over-provision provided by the Proposed Development will improve the provision of local play space and will be accessible to visitors and the community, considered a moderate beneficial effect locally.
- 6.6.10 This assessment has identified no potential significant adverse effects relating to socio-economics within either the construction/demolition or operational phase hence there is no requirement for mitigation. Significant beneficial effects are anticipated during operation as a result of the provision of open space in the local area (major beneficial) and the provision of play space locally (moderate beneficial).

6.7 Townscape and Visual Impact

6.7.1 *ES Volume I Chapter 11: Townscape and Visual* presents the findings of an assessment of the likely effects on townscape and visual receptors as a result of the Proposed Development.

6.7.2 In this assessment, 'townscape receptors' includes consideration of local and published landscape or townscape character areas. Townscape effects relate to the potential for there to be changes to the features or character of an area, including through changes to aesthetic and perceptual qualities.

6.7.3 Visual receptors relate to 'people' and their existing views. Visual effects relate to the potential for there to be changes to the composition of existing views, from the addition or loss of elements within the view.

6.7.4 Following the desk-based reviews and fieldwork, the townscape receptors included in the TVIA are:

- Natural England's National Character Area (NCA) 114: Thames Basin Lowlands, which covers the majority of the Site. As this NCA includes high quality distinctive features, in the assessment the value of the NCA is considered to be High and the overall sensitivity as Medium. NCA 112 Inner London covers the western and northern edges of the Site and the value of this NCA was also considered to be High and the overall sensitivity as Medium.
- Eight local townscape character areas (TCAs) have been identified within the study area.
- The Crystal Palace Park Site itself was also considered a sensitive receptor, along with individual parts of the Park, which have their own unique character. These individual areas within the Park are identified in the townscape assessment as Site Character Area (SCA).

6.7.5 Sixteen visual receptors, with corresponding viewpoints (VP) have been identified from within the zone of theoretical visibility (ZTV) and fieldwork, to represent a range of different types of people's views and are used to assess the visual impacts and effects of the Proposed Development. The viewpoints and visual receptors are as follows:

- VP1: Visitors to Palace Terrace (listed as a view of local importance in the Local Plan);
- VP2: Recreational receptors walking from the railway station into the Park;
- VP3: Recreational receptors on Paxton Axis;
- VP4: Recreational receptors on the Green Chain Walk, within the Park;
- VP5: Recreational receptors within the Park;
- VP6: Recreational receptors along Paxton Axis;
- VP7: Residents and road users in Penge;
- VP8: Residents at Anerley Hill;
- VP9: Residents at Norwood Triangle;
- VP10: Residents in Upper Sydenham;
- VP11: Residents adjacent to Crystal Palace Park Road
- VP12: Residents and road users along Crystal Palace Parade;
- VP13: Residents at Anerley Hill;
- VP14: Recreational users on Lower Italian Terrace;
- VP15: Recreational users on footpaths within the Park; and
- VP16: Recreational users at Tidal Lakes.

Methodology

Assessment Methodology

6.7.6 *ES Volume I Chapter 11: Townscape and Visual* has been undertaken in accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition, 2013. The assessment methodology is set out in Section 11.3 of *ES Volume I Chapter 11*.

6.7.7 In summary, the methodology assesses the sensitivity of townscape and visual receptors, via an assessment of their value and susceptibility. The magnitude of impacts (or change) from the Proposed Development is then assessed, in relation to matters including scale, extent and duration. The combination of the sensitivity of the townscape and visual receptors and the magnitude of impact is used to determine the significance of effects, i.e. whether the effects are significant or not. A guide to this relationship between the sensitivity of the receptor, the magnitude of impact and the significance of effect is set out in Table 11-9 of *ES Volume I Chapter 11*.

Zone of Theoretical Visibility Methodology

6.7.8 As set out above, the visual assessment has been informed by the use of ZTVs. In summary, the ZTV models the maximum height and mass of the proposed buildings, in relation to the existing landform, buildings and vegetation across the study area. The ZTV provides a theoretical indication of where the proposed buildings may be visible from, which is then used to inform the fieldwork.

Photomontage Methodology

6.7.9 *ES Volume I Chapter 11: Townscape and Visual* includes several visualisations of the Proposed Development, which superimpose the proposed building massing on an existing photograph (view) of the Site. In summary, the methodology is based on surveyed photography to enable the Proposed Development to be accurately located within the existing photographs, via computer rendering software.

Effects during Construction

6.7.10 During the construction phase, significant adverse effects are predicted for a small number of the identified townscape receptors. These significant effects are as a result of demolition and construction activity introducing new features in the form of construction machinery and activity that are not in keeping with the local character of the area. The townscape receptors which are predicted to experience a significant adverse effect are:

- Local TCA 8: Crystal Palace Park (the Site), predicted to experience a temporary major adverse effect (significant); and
- Anerley Hill Edge SCA, English Landscape SCA, Palace Terrace SCA, Tidal Lakes SCA, Italian Terrace SCA and the Cricket Ground SCA, predicted to experience temporary moderate adverse (significant) effects.

6.7.11 Visual effects on receptors within and on the edge of the Site would result from the removal of features within the Site, the restoration works for heritage features, the construction of new landscape improvements, and the construction of the new residential, college and cultural buildings. Since most of the identified receptors are at close range to the Site, changes to views would typically be extensive, albeit temporary.

6.7.12 All 16 of the above identified visual receptors are predicted to experience temporary significant effects ranging from moderate adverse to major adverse during the construction phase. These effects are considered inevitable at a local scale due to the presence of construction activity and earthworks.

6.7.13 However, the assessment of the demolition and construction phase assumes a worst-case scenario, with a precautionary assumption that peak construction and demolition activity occurs consistently throughout the construction and demolition phase, when in reality the activity would be phased and therefore of a lesser overall visibility.

Effects during Year 1 of Operation

- 6.7.14 At year 1 of operation, there would be a beneficial townscape impacts at the Site level, due to the enhancement to the character of the Park. Significant major beneficial effects are predicted to Local TCA 8: Crystal Palace Park. The changes are due to an enhancement of the existing character and improvement to the quality and condition of the Site.
- 6.7.15 Both beneficial and adverse significant effects identified after year 1 of operation to visual receptors.
- The significant beneficial effects relate to the improvements to the character of the Park on receptors VP1, VP3, VP8 and VP14. The effects to these receptors are predicted to be moderate beneficial.
 - The significant adverse effects relate to the introduction of new built elements resulting from the residential development and the Capel Manor College redevelopment. The receptors that are predicted to experience significant adverse effects are VP10, VP11 and VP15. The effects to these receptors would be moderate adverse.
- 6.7.16 The year 1 assessment is based on the Proposed Development as set out in the parameter plans which includes the embedded mitigation of a new layout and structure of the Site and siting of new building massing. In this respect, there is no additional mitigation required for the purposes of the assessment. In reality, the architectural design of the new buildings would differ from the massing on the parameter plans, and planning conditions should ensure that the detailed design achieves high-quality buildings through articulation and detailing.
- 6.7.17 Therefore, there would be a reduction in the adverse impact associated with the massing shown on the parameter plans and predicted at year 1, from the detailed design process.

Effects during Year 15 of Operation

- 6.7.18 After 15 years of operation, major beneficial significant beneficial townscape effects are predicted to remain for Local TCA 8. As well as this, Palace Terrace SCA and Italian Terrace SCA are also predicted to experience permanent moderate beneficial effects, which are significant. This is as a result of the proposed planting within the SCAs becoming established and being taller in height than in comparison to the year 1 assessment.
- 6.7.19 At year 15 of operation the Proposed Development will have:
- Major beneficial (significant) effects on VP1, VP3 and VP14. This is due to the of the proposed planting within the SCAs becoming established and being taller in height than in comparison to the year 1 assessment.
 - Moderate beneficial (significant) effects on VP2 and VP8. This is due to the proposed planting within the SCAs becoming established and being taller in height than in comparison to the year 1 assessment.
 - Moderate adverse (significant) effect on VP15 due to the position of the proposed building within the Farm Site, which would retain views of the massing, reflecting the year 1 assessment.

6.8 Transport and Access

- 6.8.1 *ES Volume 1 Chapter 12: Traffic and Access* presents the findings of an assessment of the likely significant effects of the Proposed Development on traffic and transport.
- 6.8.2 The existing baseline traffic and transport conditions and sensitive receptors were identified during the preparation of this assessment. The effects on traffic and transport during the construction phase and the operational phase of the Proposed Development was compared against the future baseline without the Proposed Development to assess effects of the Proposed Development.

Effects during Construction

- 6.8.3 Based on the traffic data available, it has been forecast that the peak level of construction activity will occur in 2022. The peak activity is associated with the coinciding of the construction of the Sydenham and Rockhills residential developments, the construction of the Cultural Venue and some of the landscaping works. This work involves the demolition, site clearance, earthworks, landscape, highway drainage, utilities and landscaping associated with the Italian Terrace, Tidal Lakes and Information Centre.
- 6.8.4 In line with the assessment methodology derived from the Institute of Environmental Assessment (IEA) guidance, road links with an increase in two-way flow (either total vehicles or Heavy Goods Vehicles (HGVs)) of 10% or more in either the peak hours have been identified. While it is anticipated that delivery activity will be spread across the day, therefore minimising the impacts of HGVs, both Old Cople Lane and A212 Westwood Hill (East of A234) are identified to have increases in activity of at least 30 HGVs in either or both the average weekday (Monday to Friday) or average day (Monday to Sunday). These have been considered further for analysis. The two links identified were assessed in terms of the magnitude of their effect, the following criteria were assessed:
- Severance
 - Driver Delay
 - Pedestrian Delay
 - Pedestrian and Cycle Amenity
 - Fear and Intimidation
 - Accidents and Safety
- 6.8.5 All the above criteria were assessed and the effects of the construction phase on Old Cople Lane and A212 Westwood Hill were deemed negligible.
- 6.8.6 Overall effects of the Proposed Development construction phase on public transport and parking facilities are also considered to be negligible based on the existing provision of public transport surrounding the Site and the continued provision of parking facilities whilst the construction takes place.

Effects during Operation

- 6.8.7 Based on the traffic data provided, additional trips are generated by the Rockhills and Sydenham Villas residential developments, the Cultural Venue and the Capel Manor College redevelopment.
- 6.8.8 The Proposed Development is not forecast to breach a 10% threshold for further assessment on any external highway links in the vicinity of the Park, with changes in peak hour flows of between 0% and 2%. The only link which is forecast to witness increases in flow above this threshold is Old Cople Lane which will provide vehicular to coach parking and car parking associated with the Park and car parking for the Rockhills residential development. It will also provide an alternative cycle access point to the Park and a separate pedestrian access point will also be provided to the east of Old Cople Lane. It is not considered that the increase in traffic flow using the Old Cople Lane link results in a significant adverse effect to severance and overall, severance is assessed to have a negligible (not significant) effect.
- 6.8.9 The Proposed Development was assessed to have a minor beneficial (but not significant) effect on pedestrian and cycle amenity due to the number of new or improved pedestrian and cycle accesses to the Park, with improved segregation of pedestrian / cyclist and vehicle activity at the Penge Gate Access and improved pedestrian crossing facilities at the Anerley Hill access. Routes through the Park will be capable of accommodating all modes and will feature segregated pedestrian footways with cycle provision either provided on carriageway or as part of a shared pedestrian facility.
- 6.8.10 The Proposed Development is assessed to have negligible (not significant) effects on Severance, Driver Delay, Pedestrian Delay, Fear and Intimidation and Accidents and Safety.

- 6.8.11 The effect of the Proposed Development on public transport provision is considered to be negligible as current services can accommodate the small increase that will arise from the Proposed Development. With regard to car parking, the Proposed Development creates a significant reduction in day-to-day parking provision within the Park, with the Proposed Development identifying a reduction from 707 spaces to 368 spaces. Having said this the significance of effect on parking will be negligible. This is because the parking surveys show that on a non-event day, the demand for parking peaked at 312 vehicles on a weekday, including that associated with the NSC.

7. Cumulative Effects and Effect Interactions

- 7.1.1 The EIA Regulations require that the EIA considers cumulative effects and effect interactions, these two types of effect have been described below:

- The in-combination effect interactions (referred to as 'Type 1' effects), being the combined effects of individual impacts of the Proposed Development, for example noise, airborne dust or traffic effects on a single receptor; and
- The cumulative effects (referred to as 'Type 2' effects), assess the effects of other development projects which may, on an individual basis not be significant but, cumulatively, have a significant effect on a receptor.

- 7.1.2 These are further discussed in the sections below.

Effect Interactions (Type 1 Effects)

- 7.1.3 A review of the residual effects presented in this ES has been undertaken in order to identify the potential for interactions and so, combined effects of individual impacts.

Demolition and Construction Phase Effects

- 7.1.4 During the demolition and construction phase of the Proposed Development, local residents within the vicinity of the Site may experience adverse effects due to emissions from road traffic and dust, impacting on human health, noise from construction activities and visual effects on close distance receptors. Due to the temporary nature of the demolition and construction period, and the construction environmental management measures set out within the CEMP, the combined effects on the local residents are not considered to be any more significant than the moderate to major adverse visual effects on close distance receptors already reported in *ES Volume 1 Chapter 11: Townscape and Visual Impact*.

Complete and Occupied Phase Effects

- 7.1.5 There is the potential for a series of effect interactions to take place once the Proposed Development is complete and occupied. Local residents can be expected to see minor beneficial (not significant) effects due to a combination of effects from socio-economic and visual benefits including increases in open space and renovation of cultural heritage assets as well as small increases in local employment.
- 7.1.6 The ability for adverse effects to interact is limited due to the design of the Proposed Development being able to remove environmental impacts.
- 7.1.7 No significant in-combination effects during the operational phase are predicted.

Cumulative Effects (Type 2 Effects)

- 7.1.8 Other known nearby developments that are of a sufficient scale to have the potential to combine their effects with the Proposed Development were identified and agreed through pre-application consultations with the LBB.

Demolition and Construction Phase Effects

- 7.1.9 During the construction phase, given the relatively small-scale nature of the cumulative developments, combined with their distance from the Site, it has been assessed that there are no significant cumulative effects.

Complete and Occupied Phase Effects

- 7.1.10 Once the Proposed Development is complete and occupied, given the relatively small-scale nature of the cumulative developments, combined with their distance from the Site, it has been assessed that there are no significant cumulative effects on the following disciplines:

- Air Quality;
- Cultural Heritage;
- Ecology and Biodiversity;
- Ground Conditions;
- Noise and Vibration;
- Townscape and Visual; and
- Transport and Access.

- 7.1.11 In terms of socio-economics, the following significant cumulative effects have been identified:

- A permanent moderate beneficial (significant) cumulative effect on housing provision;
- A permanent major beneficial (significant) cumulative effect on provision of open space locally; and
- A moderate beneficial (significant) cumulative effect on the provision of play space locally.

8. Conclusion

- 8.1.1 The Proposed Development is overall considered to have beneficial effects, primarily by regenerating and enhancing the Park.
- 8.1.2 There are adverse effects predicted during the construction phase, however, these impacts will be temporary in nature. Mitigation measures have been recommended and will be managed on site through the implementation of a CEMP and appropriate management. There is potential for significant adverse visual effects as a result of the proposed residential development and the Capel Manor College redevelopment.
- 8.1.3 The design of the Proposed Development has evolved through continuous consultation with LBB and other key consultees. Considerable care has been given to ensuring an appropriate design outcome through extensive environmental testing and consultation.
- 8.1.4 Overall, the Proposed Development accords with the objectives of planning policies at national, regional and local levels, and is considered to be in accordance with the Government's objectives for sustainable development.

9. Environmental Statement Availability

- 9.1.1 Copies of this ES can be viewed at the offices of the Local Planning Authority from 8:30am to 5pm, Monday to Friday by appointment only. Please phone 020 8313 4956 to make an appointment.
- 9.1.2 Copies of this ES can be found on the Local Planning Authority website as follows: <http://www.bromley.gov.uk/info/200074/planning>

- 9.1.3 Hard copies of this ES can be purchased from the LBB. Requests to purchase a hard or DVD copy of the ES or obtain a copy of the NTS should be made in writing to the following address, or by emailing planning@bromley.gov.uk:

Civic Centre,
Stockwell Close,
Bromley,
BR1 3UH

10. References

Ref 1-1 Her Majesty's Stationery Office (HMSO), (2017); The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

Ref 1-2 Waterman Environmental, (2007); Crystal Palace Park Masterplan – Environmental Statement.

Ref 1-3 AECOM (2019); Crystal Palace Park, Regeneration Plan.

the \mathbb{R}^n is a linear space over \mathbb{R} with the usual addition and scalar multiplication. The inner product is defined by

$$(x, y) = x_1 y_1 + x_2 y_2 + \dots + x_n y_n \quad (1)$$

where $x = (x_1, x_2, \dots, x_n)$ and $y = (y_1, y_2, \dots, y_n)$ are vectors in \mathbb{R}^n . The norm of a vector x is defined by

$$\|x\| = \sqrt{(x, x)} = \sqrt{x_1^2 + x_2^2 + \dots + x_n^2} \quad (2)$$

The distance between two vectors x and y is defined by

$$d(x, y) = \|x - y\| = \sqrt{(x - y, x - y)} \quad (3)$$

The angle between two vectors x and y is defined by

$$\cos \theta = \frac{(x, y)}{\|x\| \|y\|} \quad (4)$$

The orthogonal projection of a vector x onto a vector y is defined by

$$\text{proj}_y x = \frac{(x, y)}{(y, y)} y \quad (5)$$

The orthogonal distance from a vector x to a vector y is defined by

$$d(x, y) = \|x - \text{proj}_y x\| \quad (6)$$

The orthogonal distance from a vector x to a subspace S is defined by

$$d(x, S) = \inf_{y \in S} \|x - y\| \quad (7)$$

The orthogonal distance from a point x to a line L is defined by

$$d(x, L) = \inf_{y \in L} \|x - y\| \quad (8)$$

The orthogonal distance from a point x to a plane P is defined by

$$d(x, P) = \inf_{y \in P} \|x - y\| \quad (9)$$

The orthogonal distance from a point x to a hyperplane H is defined by

$$d(x, H) = \inf_{y \in H} \|x - y\| \quad (10)$$