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Crystal Palace Park

EIA Scoping Report

Prepared for: London Borough of Bromley

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Quality information

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1. Introduction

1.1 Background

1.1.1 This Environmental Impact Assessment (EIA) Scoping Report has been prepared by AECOM on behalf of the London Borough of Bromley (LBB) (the 'Applicant'). It sets out the proposed scope of the EIA and associated Environmental Statement (ES) to support an outline application for the comprehensive phased scheme for landscaping including planting of new trees and improvements to the Crystal Palace Park comprising the dismantling and refurbishment of, alterations to, and demolition of existing buildings and structures known as 'Crystal Palace Park' (the 'Proposed Development').

1.1.2 This Scoping Report brings together the results of early consultations, and desk-based assessments already undertaken, which have enabled the scope and methodology of the EIA to be established. The Crystal Palace Park site (the 'Site') falls within the jurisdiction of the LBB (referred to as the 'Local Planning Authority') and the Scoping Opinion, and future planning application, will be determined by the LBB Planning Development Control team.

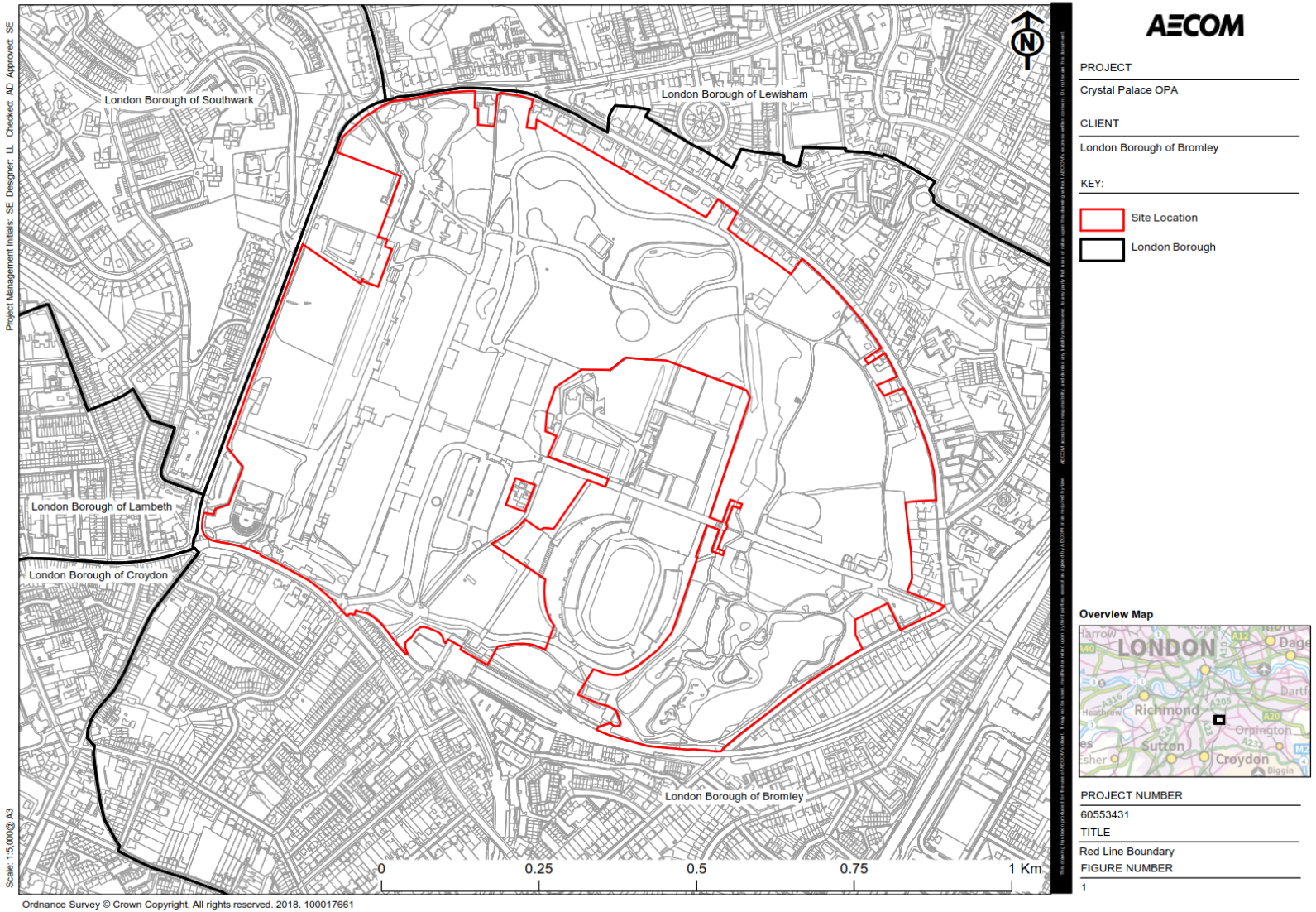
1.1.3 The Site is approximately 80 hectares (ha) and is centred on National Grid Reference TQ342709. The Site is enclosed within iron railings and fencing and is bounded to the north by Westwood Hill (A212); to the north-east round to the south-east by Crystal Palace Park Road; to the south-west by Anerley Hill; and to the west and north-west by Crystal Palace Parade. 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 Site is owned and managed by the LBB and excludes the existing National Sports Centre (NSC) in the centre of the Park, which is leased and managed by the Greater London Authority (GLA).

1.1.4 Figure 1 illustrates the application boundary (the 'red line boundary').

1.1.5 The Applicant requested a formal Screening Opinion from the Local Planning Authority in early November 2017 (planning ref: 17/04985/EIA) who subsequently deemed the Proposed Development as an "EIA development" on 20th November 2017 due to its potential for significant effects to arise from the development's associated works and thus requires an Environmental Statement (ES) to be submitted in support of the planning application.

1.1.6 AECOM has been commissioned to undertake the Environmental Impact Assessment (EIA) on behalf of the Applicant in line with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') (Ref. 1).

Figure 1: Indicative Red Line Boundary for the Application Site



1.2 Purpose of Scoping in the EIA Process

1.2.1 EIA 'Scoping' forms one of the early stages of the EIA process and refers to the activity of identifying the environmental 'topics' that should be considered within the EIA. In addition, EIA Scoping allows for the early identification of the receptors that may be affected or impacted by a new development. Through consideration of environmental 'topics' and potential receptors (both existing and introduced as a result of a new development), EIA Scoping initiates the process of defining the potential for significant effects, which in turn results in the identification of the issues to be addressed in the EIA.

1.2.2 Regulation 15 of the EIA Regulations allows for an applicant to ask the Local Planning Authority (who in turn would seek the opinion of other relevant Statutory Consultees – see indicative list later in this report) to state in writing their opinion as to the scope of the EIA.

1.2.3 This report constitutes a formal request for a Scoping Opinion under Regulation 15 of the EIA Regulations.

1.2.4 The objectives of this report are to:

- Set out the proposed scope of the EIA (i.e. identifying which environmental topics are to be 'scoped in' or 'out'), taking into account what is currently known about the Site and the development proposals;
- Set out what additional information needs to be collected (i.e. through desk-based studies or field survey work) to characterise the baseline environment of the Site;
- Define the assessment methods to be used to determine the likely significant environmental effects of the Proposed Development;
- Identify potential effects and opportunities for mitigation, and set out the structure of the ES;
- Act as a 'vehicle' for further consultation with the Local Planning Authority and other relevant statutory bodies on the environmental issues to be addressed as part of the EIA and design development process; and
- Support a request for a Scoping Opinion from the Local Planning Authority under Regulation 15 of the EIA Regulations.

1.3 Structure of the Scoping Report

1.3.1 The remainder of the Scoping Report presents the following:

- An overview of the existing Site and potential sensitive receptors;
- An overview of the Proposed Development;
- Key legislative and planning policy documents;
- A preliminary list of EIA consultees;
- The environmental topics to be addressed ('scoped in') within the EIA;
- The environmental topics to be 'scoped out' of the EIA;
- The proposed structure of the ES; and
- Summary and conclusions to the EIA Scoping Report.

2. Overview of the Existing Site and Sensitive Receptors

2.1 Site Description and Context

2.1.1 The Site makes up the majority of Crystal Palace Park (a Historic England Grade II* Registered Park and Garden (Ref. 2)) (also referred to the 'Park' in this Report) in the London Borough of Bromley (LBB) and is approximately 80ha in size. The Site is enclosed within iron railings 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; to the south-west by Anerley Hill; and to the west and north-west by Crystal Palace Parade. 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.

2.1.2 The Site is owned and managed by the LBB and excludes the existing National Sports Centre (NSC) in the centre of the Park, which is leased and managed by the Greater London Authority (GLA).

2.1.3 The majority of the Site comprises open green space which is open to the public, with two small lakes in the north and south-eastern parts of the Site. The immediate surroundings of the Site are predominantly densely populated residential use with other mixed uses, such as retail and transport.

2.1.4 Water bodies within the Site include the 'Tidal Lake' (also referred to as the 'Lower Lake') in the south-eastern part of the Park, the 'Intermediate Lake' in the north-eastern part of the Park, a pond in front of the concert bowl and a small circular, steep concrete walled pond opposite the car park in the centre of the Park.

2.1.5 Figure 2 shows the surrounding context of the Site.

2.2 Planning Background

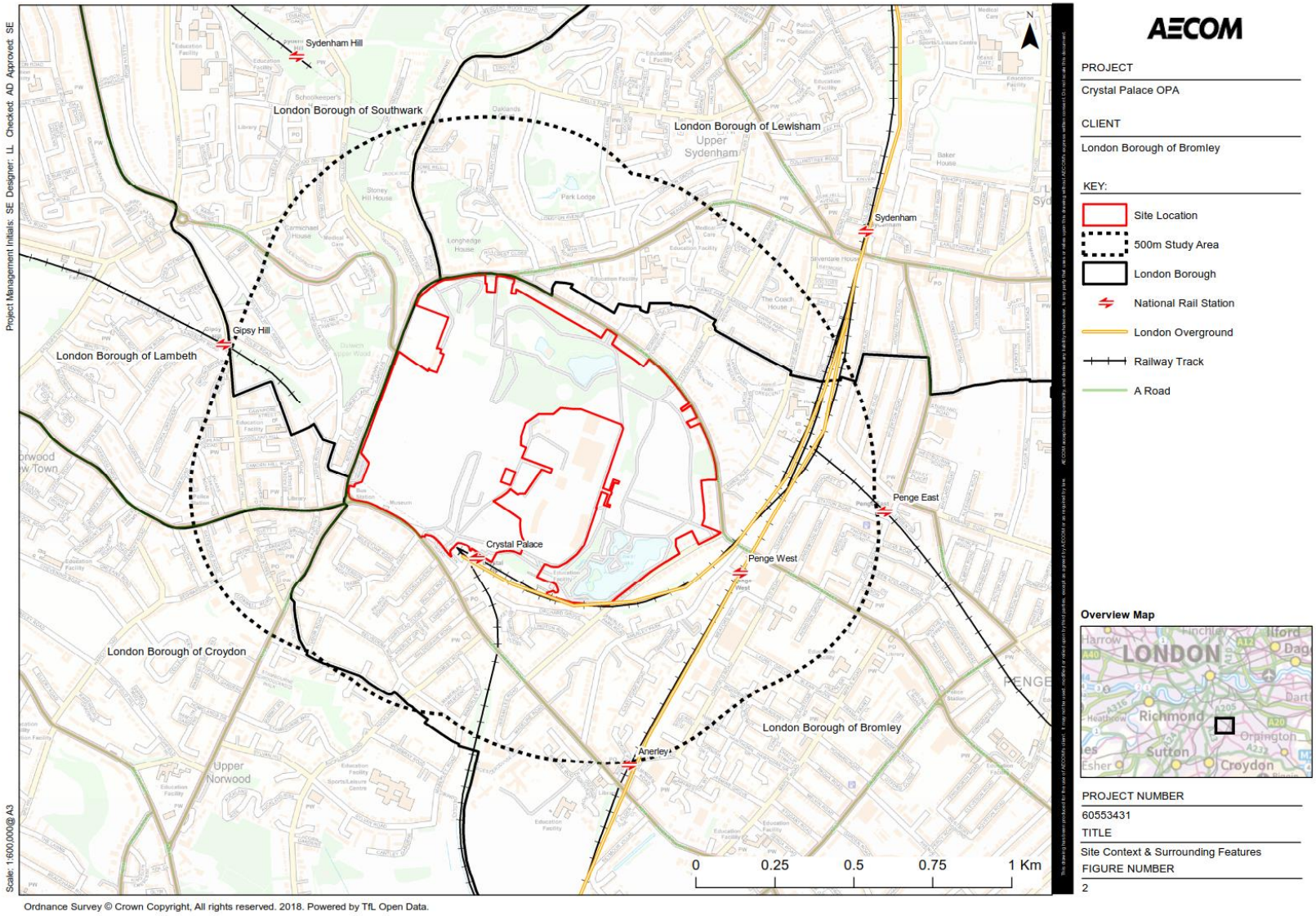
Existing Policies and Permission for the Site

2.2.1 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. The proposals also identify two sites for housing, the Rockhills and Sydenham Residential sites as well as substantial landscaping, tree planting and other improvements.

2.2.2 An ES (Ref. 3), along with a suite of technical reports was submitted in conjunction with the planning application in 2007. The scheme was granted permission in 2010.

2.2.3 The 2007 ES has been used as a reference document to inform the baseline and potential impacts during both construction and operation in the screening assessments that follow. It should be noted however, that the scheme that was assessed in the 2007 ES is considerably different to the current masterplan, particularly in relation to the removal of the NSC from the red line boundary and significantly fewer landscaping proposals.

Figure 2: Surrounding Context of the Application Site



2.3 Environmental Considerations

2.3.1 Figure 3 illustrates the environmental designations of the Site and surrounding area.

Air Quality

2.3.2 In 2007, the London Borough of Bromley declared an Air Quality Management Area (AQMA) due to exceedances of the National Air Quality Strategy (NAQS) objective values for nitrogen dioxide (NO_2). This area encompasses the whole of the north-west corner of the borough including Bromley, Beckenham and Penge. The Proposed Development in Crystal Palace Park is therefore wholly located within this AQMA.

Arboriculture

2.3.3 The LBB online mapping was checked on 2nd October 2017 and concluded that the majority of the Site is within the Crystal Palace Conservation Area with the exception of the extreme western extent adjacent to Crystal Palace Parade. Individual Tree Preservation Orders (TPOs) are located just outside the Site boundary within the residential gardens of properties along Crystal Palace Park Road to the north and east of the Site and Thicket Road to the south-east.

2.3.4 All trees within a Conservation Area (with a stem diameter greater than 75mm, measured at a height of 1.5m) are subject to equivalent protection to that of a TPO. No works which could impact on protected trees (including development activity, pruning and felling) is to take place without the prior consent of the LBB.

Cultural Heritage (incl. Archaeology) and Townscape

2.3.5 The Site consists of the extent of Crystal Palace Park which has been listed as a Grade II* Registered Park by Historic England and incorporates several Grade II and Grade II* Listed Buildings are situated within the Site boundary. There are also three Grade II listed buildings immediately outside the boundary of the Site, comprising Sunnydene to the north and Harefield and Crystal Palace Lower Level Station to the south. The majority of the Site is within the Crystal Palace Conservation Area with the exception of the extreme western extent adjacent to Crystal Palace Parade.

2.3.6 An archaeological evaluation of the western end of the Site was conducted in 2007 (Ref. 4) to clarify the key buried structural remains of the palace and its grounds. It was concluded that the overall value of the archaeological features associated within Crystal Palace were deemed high and of national or international importance, and contains the remains of the former Crystal Palace as well as the landscaped gardens associated with the Palace.

Ecology and Biodiversity

2.3.7 There are four statutorily designated sites for nature conservation within 2km of the Site, the closest of which is Dulwich Upper Wood Local Nature Reserve (LNR) located 150m west. The other three sites within 2km are the Sydenham Hill Wood and Fern Bank LNR (250m north-west), Dacres Wood LNR (1.2km north-east) and South Norwood Country Park LNR (1.95km south-east). No European sites for nature conservation (i.e. Special Areas of Conservation, Special Protection Areas or Ramsar sites) are present within 10km of the Site. Due to the distance from the Site, and nature of the Proposed Development, no impacts on statutorily designated sites for nature conservation are anticipated.

2.3.8 Crystal Palace Park is designated in part as a non-statutory Site of Borough Importance grade 1 (SBG1) importance.

2.3.9 A further 22 non statutorily designated sites for nature conservation are situated within 2km of the Site comprising one site of metropolitan importance, five SBG1, ten sites of borough grade 2 importance and six sites of local importance for nature conservation.

Public Transport and Accessibility

2.3.10 The public transport accessibility level (PTAL) is a Transport for London (TfL) approved quantitative measure of public transport accessibility. The index produces a score that ranges between 0 and 6b, with 6b being the highest available score, representing excellent access to public transport. The current PTAL for the Site has been established with reference to Transport for London's (TfL) WebCAT Database (Ref. 5), and achieves a PTAL score that ranges between 0 to 6a. The highest rated areas are located in close proximity to the Crystal Palace Station and Bus Station / interchange. The PTAL score decreases eastwards across the Park, with scores of 0 and 1a located in the centre-north-west parts of the Site. The Sydenham Villas and Rockhills sites which are proposed to be redeveloped for residential uses feature a PTAL of 3. The neighbouring Capel Manor site features a PTAL of 6a.

Water Resources and Flood Risk

2.3.11 The Site is located in an area classified as 'Flood Zone 1' by the Environment Agency (EA). This represents land assessed as having a 'low risk' of fluvial or tidal flooding, of less than 1 in 1,000 annual probability (<0.1%).According to the LBB Strategic Flood Risk Assessment (SFRA) (Ref. 6), the area is not considered likely to be at risk of fluvial flooding in the future, considering the anticipated impacts of climate change.

2.3.12 The Environment Agency online mapping (Ref. 7) shows that areas of the Site are at medium to high risk of flooding from surface water, particularly around the area of the sports centre and other topographically low lying areas.

2.3.13 According to the British Geological Survey (BGS) Groundwater Flooding Susceptibility dataset (Ref. 8), the Site is located in an area with potential for groundwater flooding to occur below ground level, or at the surface.

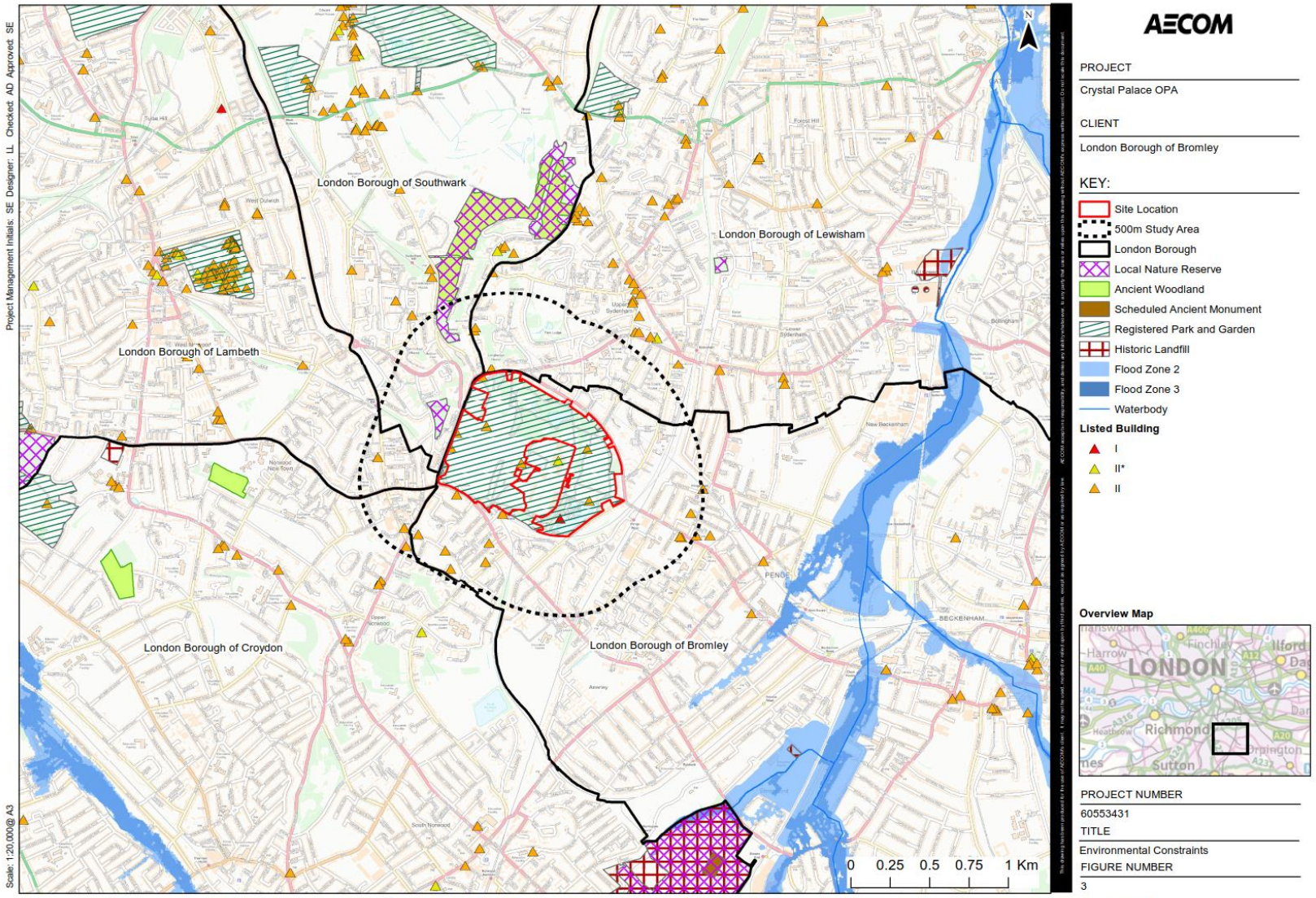
2.3.14 Refer to Section 6 of this report for further information regarding the baseline per environmental topics.

2.4 Potential Environmental Sensitivities / Sensitive Receptors

2.4.1 When undertaking an EIA it is important to understand which receptors will be considered as part of the assessment. Initial studies and consultations have revealed the following potential sensitive receptors to the Proposed Development:

- Existing and future users of the Crystal Palace Park;
- Future users of the Proposed Development, including residents of the residential element and visitors of the cultural elements of the Site;
- Existing community and social infrastructure;
- Cultural heritage and archaeological assets (i.e. listed buildings / structures, conservation areas);
- Existing ecology, biodiversity and arboriculture;
- Existing and future residential properties in the locality, including those currently under construction;
- Pedestrians, cyclists and road users within proximity of the Site;
- Local road networks and public transport including the local bus and cycle network;
- Existing views to and from the Site;
- Nearby waterbodies (e.g. Tidal Lake, Intermediate Lake and ponds); and
- Air quality on the local human population.

Figure 3: Environmental Designations of the Site and Surrounding Area



3. The Proposed Development

3.1 Scheme Description

3.1.1 The Applicant will be seeking the following:

"Comprehensive phased scheme for landscaping including planting of new trees and improvements to the Park comprising the dismantling and refurbishment of, alterations to, and demolition of existing buildings and structures to facilitate the conservation and repair of heritage assets. This will include: conservation and repair of heritage assets; removal of existing hard surfaces; alterations to ground levels and tree removal, creation of new pedestrian paths / vehicular access roads / car and coach parking / highway works; changes of use including part of the caravan site to part public open space and part residential; erection of new buildings and structures comprising: 830sqm for a cultural venue (Use Class D1), up to 420sqm of park maintenance facilities (Sui Generis) including the dismantling and reconstruction of existing maintenance depot; up to 670sqm for a community centre (Use Class D1), and up to 5519sqm of residential (Use Class C3) accommodation to provide up to 210 residential dwellings, together with associated and ancillary works, plant and equipment."

3.1.2 The Crystal Palace Park Regeneration Plan (2017) is an update of the 2007 Masterplan that is an achievable scheme within the resources available.

3.1.3 The Proposed Development will comprise the following elements:

- Conservation and repair of heritage assets including:
  - The Crystal Palace basement wall (Paxton Tunnel Wall) (works may include the construction of a new 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, including repairing and re-building the Crystal Palace basement wall, 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 3.8 hectare 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 63 car parking spaces; removal of existing playground within the Cricket Ground area to be replaced by two new playgrounds within Tidal Lakes 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 420 sqm] to be located beside Sydenham Gate;

- Formation of new vehicular access from Westwood Hill (A212) into the proposed residential development at 'Rockhills';
- Amendments to the vehicular access from Westwood Hill to serve new car and coach parking areas and servicing access to Lower Palace Terrace and Italian Terraces;
- Improvements to highway, pedestrian and cycle access points at Penge Gate, Sydenham Gate Norwood Gate and Anerley Hill;
- Construction of public car and coach parking areas and related work accessed via Rockhills Gate (comprising 10 permanent coach parking spaces and 37 car parking spaces, including 4 disabled spaces); refurbishment of existing car parks at Penge Gate and Sydenham Gate;
- The construction of:
  - A cultural venue (Use Class D1) with viewing platform comprising up to [830] sqm, together with the change of use of the eastern end of the Crystal Palace subway to museum / interpretation centre (Use Class D1);
  - A Community Centre (Use Class D1) of up to 670sqm at 'Rockhills'; and
  - Up to 210 residential dwellings in 8 buildings up to a total of 5,519 sqm comprising:
    - 'Rockhills' – 140 permanent residential dwellings (Use Class C3) in 2 blocks of up to 3,899 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; and
    - 'Sydenham' – 70 permanent residential dwellings (Use Class C3) in 6 blocks of up to 1,620 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.
- 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 east of Crystal Palace Museum; and
  - Breaking up of surface car parking/areas of hardstanding.

4. Key Legislative and Planning Policy Documents

4.1 EIA Statutory Requirements and Guidance

4.1.1 The ES will be prepared in accordance with legislative requirements and current guidance for EIA, covered by 'statutory requirements'. In particular, the ES will be prepared with due consideration to:

- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017; and
- Institute of Environmental Management and Assessment's (IEMA) Guidelines for Environmental Impact Assessment, 2004 (as amended 2006) (Ref. 9).

4.2 Planning Policy Context

4.2.1 Each of the technical chapters contained within the ES will include reference to relevant national, regional and local planning policy, a summary of which is given below.

National Planning Policy and Guidance

4.2.2 The ES will have regard to the National Planning Policy Framework (NPPF) (2012) (Ref. 10). The policies contained within the NPPF articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

4.2.3 It will also take into consideration the Planning Practice Guidance (PPG) (Ref. 11) which is an online resource that became effective in March 2014. The PPG aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date; as such the PPG was amended July 2017 to reflect the updated EIA Regulations.

Regional Planning Policy and Guidance

4.2.4 The Proposed Development is subject to the following regional planning policy and guidance:

- The London Plan: The Spatial Development Strategy for Greater London Consolidated with Alterations Since 2011 (2016) (Ref. 12);
- Sustainable Design and Construction SPG (2014) (Ref. 13);
- Clearing the Air: The Mayor's Air Quality Strategy (2010) (Ref. 14);
- Housing SPG (2016) (Ref. 15);
- Social Infrastructure SPG (2015) (Ref. 16);
- London View Management Framework SPG (2012) (Ref. 17);
- Shaping Neighbourhoods: Character and Context (2014) (Ref. 18);
- Accessible London: Achieving an Inclusive Environment SPG (2014) (Ref. 19);
- Shaping Neighbourhoods: Play and Informal Recreation SPG (2012) (Ref. 20); and
- Regional Flood Risk Appraisal for the London Plan (2009) (Ref. 21).

Local Planning Policy and Guidance

4.2.5 The Proposed Development is subject to the following local planning policy and guidance from the LBB:

- Unitary Development Plan (UDP) (2006) (Ref. 22);
- UDP supporting planning guidance / documents:
  - Adopted SPG1 – General Design Principles (Ref. 23);
  - Adopted SPG2 – Residential Design Guidance (Ref. 24);
  - Affordable Housing Supplementary Planning Document (as amended) (Ref. 25); and
  - Planning Obligations Supplementary Planning Document (as amended) (Ref. 26).

5. EIA Consultation

5.1.1 The process of consultation is important to the development of a comprehensive and balanced ES. Views of the interested parties serve to focus the environmental studies and to identify specific issues that require further investigation.

5.1.2 Consultees involved in the evolution of the design of the Proposed Development and preliminary assessment of environmental effects will include, but are not limited to:

- London Borough of Bromley (LBB);
- London Borough of Croydon (LBC);
- London Borough of Lambeth (LBLm);

- London Borough of Lewisham (LBLw);
- London Borough of Southwark (LBS);
- Greater London Authority (GLA);
- Environment Agency (EA);
- Transport for London (TfL);
- Network Rail;
- Natural England (NE);
- Historic England (HE), including Greater London Archaeological Advisory Service (GLAAS);
- Thames Water Utilities Limited (TWUL); and
- Local residents, community organisations and local businesses.

5.1.3 Consultation is an ongoing process and will be fed back into the design of the Proposed Development as appropriate. A summary of the key consultation responses received from consultees which are relevant to the EIA process will be included within the ES.

6. Environmental Topics to be addressed within the EIA

6.1 Introduction

6.1.1 The EIA and associated technical studies will reflect current guidelines and relevant legislation and will be carried out in accordance with statutory guidance, including the requirements for the contents of an ES. For the EIA to be an effective decision-making tool, the ES needs to focus on the main or likely significant environmental effects, within a range of topics. These issues have been identified through a review of existing information, baseline studies and a preliminary review of the emerging proposals for the Proposed Development.

6.1.2 The EIA will consider the likely significant effects associated with the following environmental 'topics':

- Air Quality;
- Cultural Heritage;
- Ecology and Biodiversity;
- Ground Conditions and Land Contamination;
- Noise and Vibration;
- Townscape and Visual Impacts; and
- Traffic and Transport.

6.1.3 The following sub-sections of this Scoping Report provide details on each of the above environmental topics, specifically, the works proposed to fulfil the requirements of the EIA process.

6.2 EIA Methodology

6.2.1 This section outlines the methodology to be used throughout the ES.

6.2.2 The EIA will address the direct effects of the Proposed Development in addition to the likely indirect, cumulative, short, medium and long-term, permanent, temporary, beneficial and adverse significant effects arising from the Proposed Development. The main mitigation measures envisaged in order to avoid, reduce or remedy any likely significant adverse effects identified will be described.

6.2.3 Each technical chapter of the ES will define the baseline against which the likely significant environmental effects of the Proposed Development will be assessed. Following on from the definition of the baseline conditions, the impact of the Proposed Development will be assessed during the enabling works, demolition and construction phase, and on completion and occupation of the

Proposed Development. Mitigation measures will be identified to eliminate, mitigate or reduce adverse effects and following the incorporation of mitigation measures, the significance of any remaining residual effects will be defined by applying a standard set of significance criteria. Cumulative effects will then be assessed (see below for further details).

6.2.4 The following sections provide further detail on the proposed EIA methodology for establishing assessment scenarios and years, and determining baseline conditions.

6.2.5 In summary, each technical chapter of the ES will:

- Define baseline conditions;
- Assess the likely effects of the Proposed Development; and
- Assess the likely effects of the Proposed Development in addition to a number of other schemes considered as having the potential to give rise to cumulative effects.

6.3 Environmental Design and Management Measures

6.3.1 Throughout the ES, where applicable, the way that likely environmental effects have been or will be avoided, prevented, reduced or offset through design and/or management measures will be described. These are measures that are inherent in the design and construction of the Proposed Development (also known as 'embedded measures').

6.3.2 Embedded measures will be considered prior to the assessment of effects to avoid considering assessment scenarios that are unrealistic in practice, i.e. do not take account of such measures even though they are likely to be standard practice and/or form part of the proposed design. These will then be followed through the assessment to ensure that realistic likely environmental effects are identified. Where likely significant adverse effects are identified after considering these embedded measures, 'mitigation measures' will be proposed.

6.4 Cumulative Effects Assessment

6.4.1 In accordance with the EIA Regulations, the EIA will give consideration to 'cumulative effects'. By definition, these are effects that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the Proposed Development. For the cumulative assessment, two types of effect will be considered:

- The combined effect of individual effects, for example noise, airborne dust or traffic on a single receptor;
- The combined effects of nearby consented or under construction development schemes which may, on an individual basis be insignificant but, cumulatively, have a likely significant effect.

6.4.2 The list of schemes surrounding the Site that will be considered within the cumulative assessment comprises:

- Those with planning permission (or with a resolution to grant consent) and those currently under construction;
- Located within an approximate 500m radius of the Site; and
- Result in an increase of more than 10,000m^2 gross external area (GEA) in floor area (or over 150 residential units).

6.4.3 A 500m radius for cumulative schemes was chosen relative to the scale of the Proposed Development, based on a combination of previous experience from similar developments across London and a consideration of the likely maximum distance where effects on socio-economics and traffic related factors may be felt.

6.4.4 Appendix A sets out the list and map of schemes to be considered within the cumulative effect assessment. The information provided within Appendix A regarding construction and operation is based on a review of publically available data for each scheme.

6.4.5 It should be noted that there may be some schemes in the vicinity of the Site that are currently 'under construction' and/or due to be occupied imminently. As a result these schemes may be considered 'as built' within the EIA baseline (particularly for those studies that involve massing modelling, such as Townscape and Visual Impact studies). Where this is the case, this will be stated within the relevant ES chapter.

6.4.6 Further to the list within Appendix A there may be additional schemes outside of the 500m distance that may be considered in connection with specific environmental topics, e.g. the Transport Assessment and Townscape and Visual Impact Assessment. Townscape and Visual effects are potentially more extensive than the majority of the technical aspects covered within Volume I of the ES. Justification of the reasons behind including other schemes within the aforementioned studies will be provided in each technical ES chapter where relevant.

6.4.7 A slightly different approach is being proposed for the cumulative effects assessment of those topics which rely on traffic data (i.e. Traffic and Transport, Air Quality, and Noise and Vibration). For these topics, it is proposed to include cumulative traffic figures in the future baseline, rather than trying to extract cumulative traffic to report on the effects of a development against a baseline that attempts to separate natural growth in traffic, from traffic related specifically to new developments. This is the approach typically adopted for Traffic and Transport assessments, and is also the method required for noise assessment, as set out within the Design Manual for Roads and Bridges. Therefore, the main assessments for Traffic and Transport, Air Quality and Noise will include 'other developments'.

6.4.8 The assessment of cumulative effects will be a qualitative assessment for the majority of topic chapters and will be reported as a collective assessment of the schemes rather than an assessment of each of the individual schemes identified. For some of the topics (Traffic and Transport, Air Quality and Noise and Vibration) it is proposed a quantitative assessment is undertaken, with information being derived from each of the planning applications on the floor areas, number of rooms to calculate a population and employment numbers. For Townscape and Visual the cumulative schemes will be built into the 3D model.

6.5 Significance Criteria

6.5.1 For each technical ES chapter, the significance of effects will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it has not been possible to quantify effects, qualitative assessments will be carried out, based on expert opinion and professional judgement. Where uncertainty exists, this will be noted in the relevant ES chapter.

6.5.2 Specific significance criteria for each technical discipline will be developed, giving due regard to the following:

- Extent and magnitude of the impact;
- Effect duration (whether short, medium or long-term);
- Effect nature (whether direct, indirect, reversible or irreversible);
- Whether the effect occurs in isolation, is cumulative or interactive;
- Performance against any relevant environmental quality standards;
- Sensitivity of the receptor; and
- Compatibility with environmental policies.

6.5.3 In order to provide a consistent approach across the different technical disciplines addressed within the ES, the following terminology will be used throughout the ES to define residual effects (i.e. the effect post the application of any required additional mitigation measures):

- **Adverse** – Detrimental or negative effects to an environmental resource / receptor; or
- **Negligible** – Imperceptible effects to an environmental resource / receptor; or
- **Beneficial** – Advantageous or positive effect to an environmental resource / receptor.

6.5.4 Where adverse or beneficial effects are identified, these will be assessed against the following scale:

- **Minor** – Slight, very short or highly localised effect of no significant consequence; or
- **Moderate** – Limited effect (by extent, duration or magnitude), which may be considered significant; or
- **Major** – Considerable effect (by extent, duration or magnitude) that may be in breach of recognised acceptability, legislation, policy or standards.

6.5.5 In general, residual effects found to be 'moderate' or 'major' are deemed to be '**significant**'. Effects found to be 'minor' are considered to be '**not significant**', although they may be a matter of local concern. 'Negligible' effects are considered to be '**not significant**' and not a matter of local concern.

6.5.6 Each technical chapter of the ES will provide further explanation and definition on the scale of effect significance, i.e. minor through to major. Broadly, short to long-term (temporary) effects will be considered to be those associated with the construction phase and permanent effects will be those associated with the completed operational Proposed Development. 'Local' effects will be defined as those affecting the Site and neighbouring receptors. Effects affecting the Greater London will be considered to be at a 'regional' level, whilst effects, which affect different parts of the country, or England as a whole, will be considered to be at a 'national' level.

6.5.7 Mitigation measures will then be identified to either eliminate or reduce adverse effects. These will be incorporated into either the design of the Proposed Development, construction commitments, or operational / managerial standards / procedures. These measures will be in addition to the environmental design and management measures.

6.5.8 Where mitigation measures are inherent (e.g. industry standard best practice), this will be outlined up front in the ES chapter and included within the assessment of effects.

6.6 Alternatives Assessment

6.6.1 The EIA process provides an opportunity to consider alternative development options with their respective environmental effects before a final decision is taken on the design. In accordance with the EIA Regulations and statutory guidance, the ES will describe those alternatives that were considered by the Applicant, project team and architects, including:

- '**Do nothing scenario**' – the consequences of no redevelopment taking place on the Site.
- '**Alternative Sites**' – the rationale behind choosing the Site.
- '**Alternative designs**' – the ES will summarise the evolution of the design of the Proposed Development; the modifications which have taken place to date and the environmental considerations which have led to those modifications. A summary of the main alternatives considered, will be presented together with a summary justification for the final design.

6.7 Enabling Works, Demolition and Construction

6.7.1 Where available, the ES will provide details of an indicative enabling works, demolition and construction programme together with proposed enabling works, demolition and construction activities and methods, and their anticipated duration. Information to be provided may include site preparation and construction logistics, including: site access and egress; welfare facilities; and working hours. Details of any assumptions made will be in the ES narrative.

6.7.2 An estimate of the peak periods of daily heavy goods vehicle (HGV) movements will be provided where sufficient construction information is available – it is anticipated that this will be provided in annual average daily traffic (AADT) and annual average weekday traffic (AAWT) format.

6.7.3 The ES will define and assess the potential effects of a reasonable worst-case scenario. The peak period or level of activity will be assessed in terms of traffic, noise and air quality effects. The peak period will be defined on the basis of the maximum number of HGV movements and an indication of the plant and equipment location on the Site in relation to the excavation and construction boundary.

6.8 Air Quality

Summary Baseline

6.8.1 In 2007, the London Borough of Bromley (LBB) declared an Air Quality Management Area (AQMA) due to exceedances of the National Air Quality Strategy (NAQS) objective values for nitrogen dioxide (NO_2). This area encompasses the whole of the north-west corner of the borough including Bromley, Beckenham and Penge. The Site is therefore wholly located within this AQMA.

6.8.2 LBB currently operates one automatic monitoring site measuring NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) in Harwood Avenue in Bromley town centre (approximately 6km east). This roadside monitoring site is approximately 7km from Crystal Palace Park. Both NO_2 and PM_{10} concentrations measured at this site met the relevant objective value over the last seven years (Ref. 28). There are also nine NO_2 diffusion tubes located within the AQMA.

6.8.3 The nearest air quality monitoring sites to the Proposed Development are: Anerley Hill, located on the south-western edge of the Park; Anerley Road, approximately 1km to the south-east; and Beckenham Road, 2km to the south-east. Measured annual mean NO_2 concentrations at these locations are above the air quality objective value and have shown no consistent downward trend in the last seven years (see Table 1: Annual mean NO_2 concentrations at kerbside monitoring sites close to the Site). These are kerbside sites which are located closer to the road than relevant locations such as residential properties.

6.8.4 A full baseline review will be conducted as part of the assessment to consider all nearby air quality monitoring data sources and background concentrations from the Department for Environment, Food and Rural Affairs (Defra) maps (Ref. 29).

6.8.5 As part of the detailed assessment, it is recommended that additional short term monitoring is conducted at six sites for a period three months, to be located within 200m of the Site. The data from these sites will be used as part of for the model verification process.

Table 1: Annual mean NO_2 concentrations at kerbside monitoring sites close to the Site

Site	*Distance to Site*	*Annual mean NO_2 concentrations ($\mu g/m^3$)*						
		2010	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*
Anerley Hill	<1km	53.5	48.1	48.0	54.7	51.1	43.7	49.6
Anerley Road	1km	57.7	44.4	48.6	49.9	51.3	46.4	47.9
Beckenham Road	2km	55.8	54.5	54.7	52.8	49.6	44.8	47.9

Potential Effects

6.8.6 Sensitive receptors in the vicinity of the Proposed Development include residential properties, community facilities (e.g. schools and hospitals) and designated ecological sites that include features sensitive to local air pollution. These will be identified from a review of aerial photography and Ordnance Survey (OS) mapping. Following this a representative set of receptors (both existing and proposed) will be selected from those identified for further assessment.

6.8.7 During the demolition and construction phases, there are a number of activities that have the potential to result in air quality impacts at nearby sensitive receptors. These activities include fugitive emissions of dust due to demolition, earthworks or construction work and increases in particulate matter (PM_{10} and $PM_{2.5}$) and NO_2 concentrations due to emissions from associated vehicles and plant (i.e. non-road mobile machinery (NRMM)).

6.8.8 Dust-producing construction activities along with vehicle and plant emissions are unlikely to be significant, particularly in comparison to levels of similar emissions from vehicle movements on the local road network and will be localised and temporary in nature. However, they are scoped into the assessment as the site is within an AQMA and there are nearby sensitive receptors (i.e. within 350m of the Site boundary).

6.8.9 In terms of the operational impacts, there are existing high traffic flows and congestion on the local road network (including the A212 Crystal Palace Parade to the west, A234 Crystal Palace Park Road to the north and A214 Anerley Hill to the south-west). Therefore, any further increases in traffic associated with access to the proposed residential Rockhills and Sydenham Villas developments could potentially further increase road traffic emissions of nitrogen oxides (NO_x), PM_{10} and $PM_{2.5}$. Based on the proposed 126 new car parking spaces and trip rates associated with the 204 proposed residential units, it is likely that the Proposed Development will generate more than 400 additional daily trips. These may result in an increase in flows on the local road network that are above the Environmental Protection UK (EPUK)/Institute of Air Quality Management (IAQM) screening criteria of a change in daily flows of more than 100 additional light duty vehicles or 25 additional heavy duty vehicles within an AQMA (Ref. 30).

6.8.10 There are a number of existing sensitive receptors within 200m of the Site boundary, including properties in Sydenham, Penge and Upper Norwood as well as additional proposed residential properties as part of the Proposed Development. These new residential properties will introduce human health exposure into an existing AQMA. It is, therefore, recommended that a detailed air quality assessment is conducted for the operational stage of the Proposed Development to determine the potential effects of air quality at human health receptors. The impact at these sensitive receptors is scoped into the assessment.

6.8.11 There are four statutory designated sites for nature conservation within 2km of the Site, the closest of which is Dulwich Upper Wood Local Nature Reserve (LNR) located 150m west (refer to the 'Ecology and Biodiversity' section of this Report for further details on designated sites for nature and conservation). However, it is expected that due to nature of the Proposed Development and distance from the Site, there will be no impact due to air quality at these ecological sites. These impacts can be scoped out of the assessment.

Outline Scope of Assessment

6.8.12 The scope of the air quality assessment will include:

- identification of baseline air quality conditions and nearby sensitive receptors;
- qualitative consideration of any demolition and construction phase dust impacts;
- quantitative modelling of road traffic emissions (NO_x, PM_{10} and $PM_{2.5}$) using the ADMS Roads detailed dispersion model;
- assessment of significance of impacts on pollutant contributions at existing and proposed sensitive receptors due to the Proposed Development. and;
- completion of an air quality neutral assessment.

Demolition and Construction Methodology

6.8.13 The potential impacts from demolition and construction dust emissions generated during the demolition and construction phase of the Proposed Development will be considered using an approach based on the IAQM Guidance for assessing impacts from construction activities (Ref. 31). This is a screening assessment and risk based qualitative assessment approach, as recommended by the GLA's Sustainable Design and Construction SPG (Ref. 13).

6.8.14 Demolition and construction plant emissions will not be explicitly modelled, as these are considered to be a small emission source relative to ambient local conditions in the vicinity of the Site.

6.8.15 The number of demolition and construction vehicles that will be in operation during the construction phase of the Proposed Development will be considered in the context of the guidance from EPUK/IAQM and the Design Manual for Roads and Bridges (DMRB) (Ref. 32).

6.8.16 Suitable mitigation measures for site plant and vehicles will be presented as part of the mitigation measures based on advice presented in the GLA SPG on control of dust and emission during construction (Ref. 27) and the IAQM guidance. The standards required for the NRMM Low Emission Zone for the Proposed Development will also be outlined.

Operational Methodology

6.8.17 If the Proposed Development is determined to generate traffic above the IAQM screening criteria as outlined above, the detailed dispersion model ADMS-Roads will be used to assess existing baseline air quality and to predict future air quality which will be used to assess both the impacts on local air quality and the proposed occupants.

6.8.18 The road traffic scenarios that will be considered as part the detailed assessment will include:

- Baseline scenario;
- Opening Year – without development scenario, including committed developments; and
- Opening Year – with development scenario, including committed developments.

6.8.19 If there is to be an on-site energy centre, then the detailed dispersion model ADMS 5 will be used to identify potential impacts. As a minimum the Proposed Development building which houses the on-site energy centre will be included in the model. Other significant nearby buildings will also be included, based on the proximity and height of those buildings relative to the energy generation emission source. The combined impact on predicted pollutant concentrations from both roads and on-site energy generation will be compared with relevant air quality objectives.

6.8.20 The opening year 'without development' and 'with development' scenarios will both include vehicle trips associated with general growth from the baseline situation and also relevant committed developments. The opening year 'with development' scenarios will also include additional traffic associated with the Proposed Development. The inclusion of relevant committed developments in the traffic data utilised in the assessment will allow an inherently cumulative assessment of the Proposed Development to be undertaken.

6.8.21 Air quality modelling for road sources will use the dispersion model ADMS-Roads which use a defined year of meteorological data from Heathrow Airport and key parameters such as surface roughness. Qualitative reference would be made to any potential variations in impacts that could be expected from differing years of meteorological data.

6.8.22 Contour plots will not be provided as part of the air quality assessment. This is because contour plots are subject to interpolation (i.e. estimation). The assessment will therefore provide concentrations for each scenario at individual selected receptor locations (both existing relevant receptors and proposed residential receptors).

Air Quality Neutral

6.8.23 An air quality neutral assessment will be prepared following the GLA's Air Quality Neutral Planning Support (Ref. 33). This document provides guidance on how to complete an air quality neutral assessment with regards to emissions from on-site energy (if applicable) and local road vehicles associated with development proposals. The Air Quality Neutral Assessment is based on the mass of key emissions from the Proposed Development (oxides of nitrogen and particulates) compared against defined benchmarks for a development of this type.

Overall Significance and Mitigation

6.8.24 The overall significance of air quality impacts will be described based on the approach outlined in the EPUK/IAQM guidance. In determining the overall significance of effects reference will also be made to the magnitude of change in air quality predicted relative to the normal inter-annual variations expected around the Proposed Development and to relevant planning policy as appropriate.

6.8.25 Where necessary, mitigation and monitoring measures will be recommended to reduce air quality impacts at sensitive locations around the Proposed Development. Mitigation requirements will be determined based on an evaluation of the results of the air quality assessment, a review of source apportionment of pollutants (i.e. background contributions and road sources), the location of existing receptors to local pollutant sources and relevant planning policy.

6.9 Cultural Heritage

6.9.1 This section sets out the proposed scope and methodology for Cultural Heritage including both above (built) and below ground (archaeology) designated and non-designated heritage assets.

Summary Baseline

6.9.2 A data search was carried out within a 1km radius (the 'Study Area') of the approximate site centre (SU 51808021), utilising online sources such as the Archaeological Data Service (ADS) (Ref. 34), Oasis (Ref. 35) and the National Heritage List for England (NHLE) (Ref. 36). The DEFRA Magic mapping website (Ref. 37) and the London Borough of Bromley's website and planning portal were also utilised during this research.

Designated assets

6.9.3 The Park is designated as a grade II* Registered Park and Garden (RPG) (NHLE 1000373). The Park boundary contains nine listed buildings, namely Prehistoric Animal Sculptures, Geological Formations and Lead Mine on Islands and on Land Facing the Lower Lake (grade I, NHLE 1067798); Crystal Palace National Recreation Centre (grade II*, NHLE 1031539); Gate piers to Rockhills (grade II, NHLE 1376636); North and South Railings, Walls and Boundary Marker (grade II, NHLE 1393659); Pedestrian Subway Under Crystal Palace Parade (grade II, NHLE 1385457); the Upper and Lower Terrace of the Crystal Palace Gardens (grade II, 1064352); Bust of Sir Joseph Paxton at Crystal Palace Park (grade II, NHLE 1389535); Royal Naval Volunteer Reserve Trophy (War Memorial) (grade II, NHLE 1400245); and Gorilla sculpture (grade II, NHLE 1431362).

6.9.4 There are no World Heritage Sites, Scheduled Monuments or Registered Battlefields within the Park, Site or surrounding Study Area.

6.9.5 Within the wider Study Area, the following designated assets have been identified:

6.9.6 Crystal Palace High Level Station, a terminal station to the west of Crystal Palace Parade. It was closed in 1954 and had been dismantled by 1957. The pedestrian subway linking the station to the park remains and is a Grade II listed building. Crystal Palace Lower Level Station to the south of the Park is still operating and is listed grade II (NHLE 1064353).

6.9.7 The streets encircling the Park are lined with substantial Victorian villas, many of which are within the Crystal Palace Park Conservation Area and are locally listed (see Non-Designated Built Heritage Assets below). Two are listed, Sunnydene to the north of the park (grade II, NHLE 1358518) and Harefield to the south-west of the Park (grade II, NHLE 1254286).

6.9.8 The area to the south of the Park, including Anerley Road had largely been developed with semi-detached villas and terraces by the time of the first Ordnance Survey (OS). Listed buildings in this area include 20 and 22 Hamlet Road (grade II, NHLE 1359319); 3-5 Palace Grove (grade II, NHLE 1186779); the Swedenborgian Church (grade II, NHLE 1186801); and a mid-late 19th century hexagonal pillar box outside 36 Belvedere Road (grade II, NHLE 1186821).

6.9.9 Another group of listed buildings is clustered around the junction of Church Road, Belvedere Road, Lansdowne Place and Westow Street. At the apex of Church Road and Westow Street is the Church of St Andrew (grade II, NHLE 1079279). Diagonally opposite is the War Memorial at Westow Street (grade II, NHLE War Memorial at Westow Street) south of the junction is Rosebank (grade II, NHLE 1253004), while to the east of it is 11-25 Belvedere Road (grade II, NHLE 1359371).

6.9.10 There are three isolated listed buildings within the 1km study area. The Wood (grade II, NHLE 1079936) is a 19th century Tudor style house on Sydenham Hill. The associated stables are also listed (grade II, NHLE 1079937). In Gipsy Hill is the mid-19th century Christ Church (grade II, NHLE 1080465).

6.9.11 The majority of the Site lies within the Crystal Palace Conservation Area (designated by LBB in 1989). The conservation area includes the entirety of the Registered Park and Garden with the exception of Upper Palace Terrace, the TV transmitter and covered reservoir. The conservation area also takes in the Lower Level Station, an area to the south of the Park between Thicket Road and the railway line,

houses between the Park and Crystal Palace Park Road and a small area at the south-west corner of the Park between Anerley Hill, Milestone Road and Church Street.

6.9.12 The Study Area takes in the Belvedere Road, Anerley Conservation Area (designated by LBB in 1973). The conservation area comprises mainly large Victorian villas, a number of which are locally listed.

6.9.13 The Study Area takes in the Gipsy Hill and Westow Hill (North Side) Conservation Areas (Lambeth); part of the Upper Norwood Triangle Conservation Area (Croydon) to the south-west of the Park and a small area of the Dulwich Wood Conservation Area (Lewisham) to the north of the Site.

Non-designated assets

Built Heritage

6.9.14 Bromley's local list was established in 1973 and contains a number of buildings both within the Park and within 500m. There are six locally listed buildings within the Park, four of which (the NSC, which includes the 1964 athletics stadium; the adjacent accommodation building, The Lodge; and two further accommodation buildings) are outside the boundary of the Site. Two further buildings within the Park appear on the local list, Paxton Basin at the southern boundary of the Park and the Lower Engine House inside the Penge Gate entrance. The latter was demolished to make way for a new visitor centre.

6.9.15 A total of 31 detached 19th century villas, outside the Site boundary but within the Crystal Palace Conservation Area appear on the local list. Other locally listed buildings within the conservation area include the Crystal Palace Museum on Anerley Hill; a terrace of shops with flats above at the eastern end of Church Road; and rail bridges over High Street and Thicket Road. Four further buildings on the Bromley Local List are located within the Study Area, one each on Sydenham Avenue and Lawrie Park Road and two on Lawrie Park Crescent.

6.9.16 The four further conservation areas will contain locally listed buildings and other non-designated built heritage assets, which can be identified by site walkover at the assessment stage. The area within the Study Area outside the six conservation areas will also contain non-designated built heritage assets that can be identified by site walkover at the assessment stage.

Archaeology

6.9.17 Crystal Palace Park contains the remains of the former Crystal Palace as well as the landscaped gardens associated with the Palace. Crystal Palace was constructed in 1854 in park land of Penge Place and the landscaped gardens of the palace set out. In 1936 the palace, which sat astride two levels, was completely destroyed by a fire. After much of the ironwork had been sold for scrape, the site was levelled with the rubble of buildings destroyed during bombing in World War Two. The gardens, established after the construction of Crystal Palace were set out by Paxton with a deliberate mathematical unity of parts with areas of formal and informal garden created around the grand Paxton Axis which ran the length of the park. Elements of Crystal Palace Park are still extant within the current site; however other elements have been disturbed by the demolition and levelling of the former Crystal Palace as well as the modern development within the site.

6.9.18 An archaeological evaluation of the western end of the Site was conducted in 2007 to clarify the key buried structural remains of the palace and its grounds. The archaeological evaluation identified that there is fairly good survival of basement level foundations within the area of the Palace, although some have been truncated or removed. In addition the location and surface of Paxton's Tunnel and the ground surface of the North Wing remain in-situ and fairly well preserved. Based on the results of the archaeological investigation, the potential for further archaeology was determined to be high for structural remains within the area of the Palace. An assessment of the potential of the lower terrace was restricted by the limited number of test pits; therefore further research is required to understand the potential for archaeological remains within the lower terrace as well as the wider Crystal Palace Park. The overall value of the archaeological features associated within Crystal Palace were deemed high and of national importance.

Potential Effects

Construction

6.9.19 The regeneration of the Park will include enhancement of infrastructure including the opening up of Paxton's central axis, restoration of the terraces, conservation and interpretation of historic features, demolition of negative buildings and development on the vacant sites. Construction within the Site may impact on the setting of the Registered Park and Garden and the designated and non-designated buildings/structures within it and on the setting of discrete areas of the Crystal Palace Park Conservation Area, and the designated and non-designated buildings within it.

6.9.20 The Site contains two main development sites: the Rockhills development site within the RPG to the north; and the Sydenham Villas development site borders the RPG to the west and is included in the conservation area. The Rockhills development site is screened from the interior of the Park by deciduous trees, while the Sydenham Villas development site is partially screened from the interior by deciduous trees.

6.9.21 The Rockhills development site is within the setting of two designated assets outside the Park but within the Crystal Palace Conservation Area. It also has the potential to impact upon the setting of the Gate piers to Rockhills (grade II) and Sunnydene (grade II); and one locally listed building, 77 Crystal Palace Park Road.

6.9.22 The Sydenham Villas development site is not within the setting of any listed building outside the Park.

6.9.23 Construction on both sites, including the effects of increased traffic, has the potential to impact upon the setting of discrete areas of the Crystal Palace Park Conservation Area including the Victorian houses surrounding the Park's boundary.

6.9.24 The Proposed Development has the potential to cause direct and permanent physical impacts on the buried archaeological resource. These may arise during earthworks associated with landscaping activities in particular re-profiling the Italian Terraces and the Transitional Landscape area; landscaping to create gardens on the Palace terrace and landscaping associated with the new event space.

6.9.25 Similarly, ground work activities associated with the demolition of a number of the amenity buildings could have direct and permanent physical impacts on the archaeological resource. This includes activities such as grubbing out foundations, concrete slab removal and ground remediation associated with the demolition of the following buildings:

- Nursery near Sydenham Gate;
- Rangers' Lodge near Sydenham Gate;
- St Johns Ambulance building on Crystal Palace Park Road;
- Public Conveniences near Westwood Gate;
- Buildings at Caravan Club;
- Park Rangers' offices near Penge Gate;
- St Johns Ambulance facility and associated storage buildings in Transitional Landscape area;
- Maintenance shed east of Crystal Palace Museum; and
- Breaking up of surface car parking/areas of hardstanding.

6.9.26 Furthermore, construction of the new cultural venue; a community centre / nursery and eight residential buildings along the north eastern boundary of the Park could result in the truncation or removal of any archaeological remains that survive within the Site. These could include:

- Ground reduction for Site preparation;
- Construction of new building foundations; and
- Enabling works for the provision of new utilities and services.

Operation

6.9.27 Operational effects of the regeneration of the Park on the settings of all designated and non-designated built heritage assets inside the Park will be beneficial. Given appropriate design, height and massing, the operational effects of the Rockhills and Sydenham Villas development sites also has the potential for beneficial effects on these settings.

6.9.28 Those archaeological features exposed and retained in situ could be impacted by environmental and visitor impacts during operation unless appropriately managed.

Cumulative Effects

6.9.29 Cumulative effects on the settings of designated and non-designated heritage asserts within the study areas will be assessed within the Cultural Heritage ES chapter.

Outline Scope of Assessment

6.9.30 Cultural heritage (incorporating built heritage and archaeology) has been scoped into the EIA due to the potential for the Proposed Development to affect designated and non-designated heritage assets, identified above. The proposed methodology outlined below aims at establishing the baseline conditions for the cultural heritage resource within the Site and wider Study Area. The baseline will inform the impact assessment completed within the ES chapter to determine the likely effects of the Proposed Development and propose mitigate measures for such effects.

Baseline Report

6.9.31 A detailed assessment of the cultural heritage assets will be necessary in order to assess the potential impacts of the Proposed Development.

6.9.32 In order to place the Site in its full archaeological and historical context, baseline information will be collected on the known heritage assets within the Study Area. Specifically, the baseline report will:

- Identify all known designated and non-designated assets and/or areas within the Site and in a defined study area;
- Assess the significance and setting of any archaeological assets within the Site and study area; and
- Identify areas of modern disturbance within the Site that might have affected the survival of the potential archaeological resource.

6.9.33 Baseline data sources will include, but may not be limited to:

- Historic England National Heritage List and archive database;
- Greater London Historic Environment Record (GLHER);
- Various online resources including the British Geological Survey (BGS) Geology of Britain Viewer and London Borough of Bromley planning portal for the Local Plan and other planning information;
- Existing geotechnical data; and
- Documentary, cartographic and other resources as deposited within the Bromley Local Studies and Archives, the London Metropolitan archives and the National Archives at Kew.

6.9.34 The baseline report will be prepared following national policy and industry best practice guidance. The Historic England Greater London Archaeological Advisory Service and the Conservation Officer for the LBB will also be consulted to ensure that all appropriate sources are consulted examined and that the key heritage issues are identified and addressed within the baseline of the EIA.

Study Area

6.9.35 The impact assessment's study area for the assessment will be 500m from the Site boundary for designated heritage assets and 1km for non-designated heritage assets. These two study areas have been defined through consideration of the condition of the Site, in particular their urban nature, and the

development design. Within this area, the known heritage resource will be reviewed to judge the archaeological potential of the Site and the potential effects on the setting of surrounding assets.

6.9.36 The determination of archaeological potential will also draw on available geotechnical data to assess the level of ground disturbance arising from previous land use, and the potential impact this has had on archaeological remains. The archaeological potential of the Site will be assessed by chronological period and rated as high, medium, low, negligible or unknown according to the number, proximity and significance of known and predicted archaeological / historical sites or finds spots within the Site and its surrounding study area.

Impact Assessment and Environmental Statement

6.9.37 The impact assessment will assess potential impacts on the heritage assets and their setting identified in the baseline report. This will entail an assessment of the heritage significance (sensitivity) of each asset which is defined in the NPPF as the value of a heritage asset because of its heritage interest, and that interest may be archaeological, architectural, artistic or historic. The NPPF also notes that the significance of a heritage asset derives not only from its physical presence, but also from its setting. The assessment of significance is guided by statutory and non-statutory designations, national, regional and local policies, archaeological research frameworks and professional judgement.

6.9.38 The impact assessment will review the emerging design of the Proposed Development and will identify the level and degree of impact that will arise as a result of the demolition and construction and, if relevant, operation of the Proposed Development. The heritage significance of an asset will then be combined with the predicted magnitude of impact arising from the Proposed Development in order to determine the significance of effect. This will take into account any mitigation that has been embedded into the design in order to minimise impacts to known heritage assets. Additional mitigation, such as archaeological investigation and reporting, may be proposed to reduce or compensate for any significant adverse effects.

Conclusion

6.9.39 The Site comprises the majority of the grade II* listed Crystal Palace Park RPG and contains a number of listed and locally listed buildings, including the remains of the former Crystal Palace, which have been identified as potentially of national importance. Further designated and non-designated assets are located within a 1km of the Site, many of them in five designated conservation areas.

6.9.40 Construction within the Site has the potential to cause direct and permanent physical impacts on the buried archaeological resources and may impact upon the setting of discrete areas of the Crystal Palace Park Conservation Area, the RPG and the listed and locally listed buildings / structures within it. The construction works may also impact on the settings of selected designated and non-designated built heritage assets beyond the Park's boundaries.

6.9.41 Operation of the Site will impact on the settings of all designated and non-designated built heritage assets inside the Park. It is considered that in all cases the effect of that impact will be beneficial. Given appropriate design, materials, height and massing, the operational effects of the Rockhills and Sydenham Villas development sites also has the potential for beneficial effects on these settings.

6.9.42 Due to the potential for the Proposed Development to affect designated and non-designated heritage assets cultural heritage has been scoped into the EIA. An initial desk-based assessment (DBA) study to determine the baseline conditions for the cultural heritage resource within the Site and wider study area will be undertaken. The baseline will subsequently inform the impact assessment and proposed mitigation set out in the Cultural Heritage ES chapter.

6.10 Ecology and Biodiversity

Summary Baseline

6.10.1 To date, the following ecological baseline survey work has been undertaken:

- Phase 1 habitat survey (September 2017);

- Invasive species walkover survey (September 2017);
- Bat activity survey, supplemented with static bat echolocation detector surveys (September and October 2017);
- Bat roost assessment of buildings (external) and trees (October 2017);
- A desk study including a data search from Greenspace Information for Greater London (GiGL), including any records of protected or notable species and non-statutory designated sites within 2km of the redline boundary of the Site; and
- Review of existing ecological data for the Site (from 2007) in support of the previous planning applications.

6.10.2 The following ecological survey work (with estimated dates of completion) is to be undertaken at a later date to support the planning application:

- Internal bat roost assessment of buildings (January/February 2018);
- Bat emergence surveys of buildings assessed as having a low or moderate suitability to support roosting bats (Spring/Summer 2018);
- Bat activity survey (Spring/Summer 2018); and
- Reptile survey (April/May 2018).

Designated sites

6.10.3 There are four statutorily designated sites for nature conservation within 2km of the Site, the closest of which is Dulwich Upper Wood Local Nature Reserve (LNR) located 150m west. The other three sites within 2km are the Sydenham Hill Wood and Fern Bank LNR (250m north-west), Dacres Wood LNR (1.2km north-east) and South Norwood Country Park LNR (1.95km south-east). No European sites for nature conservation (i.e. Special Areas of Conservation, Special Protection Areas or Ramsar sites) are present within 10km of the Site. Due to the distance from the Site, and nature of the Proposed Development, no impacts on statutorily designated sites for nature conservation are anticipated.

6.10.4 Crystal Palace Park is designated in part as a non-statutory Site of Borough Importance grade 1 (SBG1) importance. The citation states reasons for designation as follows:

"A large area of mature parkland provides access to nature in the most urban part of Bromley borough, in an area where five Boroughs meet. The main lake is the most important site for waterfowl in the Borough of Bromley except for Ruxley Gravel Pits. Breeding birds include great crested grebe, tufted duck, mallard, moorhen, coot and Canada goose. Scrub around the Intermediate Lake supports a colony of broad-leaved helleborine (Epipactis helleborine), normally a plant of ancient woods on the chalk. The rest of the park contains some fine mature trees and supports a good range of breeding birds, including tawny owl, great spotted woodpecker, blackcap and goldcrest. At least four species of bats have been recorded in the park."

6.10.5 A further 22 non statutorily designated sites for nature conservation are situated within 2km of the Site, comprising: one site of metropolitan importance, five SBG1, ten grade 2 Sites of Borough Importance and six Sites of Local Importance for Nature Conservation.

Habitats

6.10.6 A Phase 1 habitat survey of the Site was undertaken on 7th and 14th September 2017 and concluded that the Site predominantly comprises closely mown amenity grassland with scattered mature broadleaved trees, lakes and broadleaved woodland. The Site also has buildings and built structures, and areas of dense and scattered scrub, tall ruderal and ornamental planting.

6.10.7 Areas of amenity grassland were dominated by perennial rye grass (*Lolium perenne*), annual meadow grass (*Poa annua*) and red fescue (*Festuca rubra*) with common herbaceous species, recorded within the sward.

6.10.8 The Site features a variety of specimen tree species, both native and non-native, planted in rows or scattered within the amenity grassland habitat. London plane (*Platanus x hispanica*) trees line an avenue along the main footpath at the eastern entrance to the Park. Common tree species scattered

throughout the Park include large-leaved lime (*Tilia platyphyllos*), sycamore (*Acer pseudoplatanus*), pedunculate oak (*Quercus robur*), horse chestnut (*Aesculus hippocastanum*), English yew (*Taxus baccata*), Scot's pine (*Pinus sylvestris*) and beech (*Fagus sylvatica*).

6.10.9 The dominant tree species within the areas of woodland were pedunculate oak, sycamore and horse chestnut. An understory of bramble (*Rubus fruticosus* agg.), rhododendron (*Rhododendron ponticum*) and holly (*Ilex aquifolium*) was present in most areas. Ivy (*Hedera helix*) was dominant within the ground cover.

6.10.10 At the far western boundary of the Site, adjacent to the transmitter tower, an area of dense scrub was recorded. This habitat was dominated by bramble with ruderal species present.

6.10.11 Small pockets of scattered scrub and tall ruderal habitats appear across the Site. Species in these areas typically included creeping thistle (*Cirsium arvense*), common ragwort (*Senecio jacobaea*), hoary mustard (*Hirschfeldia incana*), bristly oxtongue (*Helminthotheca echioides*), prickly sow-thistle (*Sonchus asper*), bramble, butterfly bush (*Buddleja davidii*) and hedge bindweed (*Calystegia sepium*).

6.10.12 Ornamental hedgerows were present across the Site, containing a mixture of non-native shrubs and trees including cherry laurel (*Prunus laurocerasus*), snowberry (*Symphoicarpos albus*), choiysa (*Choisya ternate*), weeping willow (*Salix babylonica*), monkey puzzle tree (*Araucaria araucana*) and swamp cypress (*Taxodium distichum*). Native trees are also present including large-leaved lime, hawthorn (*Cratageus monogyna*) and blackthorn (*Prunus spinosa*).

6.10.13 An area to the west of the Site was found to be managed as an ornamental garden as well as planted sections close to the Lower Lake and areas surrounding the 'dinosaurs' designed to evoke a prehistoric feel, all of which comprise many non-native shrubs, herbs and trees.

6.10.14 Waterbodies within the Site include the 'Tidal Lake' (also referred to as the 'Lower Lake') in the south-eastern part of the Park, the 'Intermediate Lake' in the north-eastern part of the Park, a pond in front of the concert bowl and a small circular, steep concrete walled pond opposite the car park in the centre of the Park which contains solely reedmace (*Typha latifolia*). The Tidal Lake comprises a man-made, concrete lined eutrophic lake featuring hard and soft edges. Marginal vegetation where present is fairly sparse due to management with woodchips, non-native shrubs and scattered native and non-native trees, notably willows (*Salix sp*); although smalls areas of vegetation with purple loosestrife (*Lythrum salicaria*), Michaelmas daisy (*Aster amellus*), creeping thistle, spotted medick (*Medicago arabica*), pendulous sedge (*Carex pendula*) and purple toadflax (*Linaria purpurea*) were recorded. The Intermediate Lake, also a eutrophic lake, is understood to be managed as a fishing facility but was not accessible at the time of the Site survey. The pond near the concert bowl is man-made, square and supports very little vegetation.

Invasive species

6.10.15 Japanese knotweed (*Fallopia japonica*), wall cotoneaster (*Cotoneaster horizontalis*) and rhododendron (*Rhododendron ponticum*), all listed as invasive species on Schedule 9 of the Wildlife and Countryside Act 1981 (Ref. 38), were recorded during the Phase 1 habitat survey of the Site in September 2017.

6.10.16 Japanese knotweed was recorded within the Site at the northern edge of the pond within the broadleaved woodland in the north of the Site, within amenity grassland in the south of the Site and around the Crystal Palace subway.

6.10.17 Cotoneaster was recorded within ornamental shrub planting, adjacent to the Lower Lake.

6.10.18 Rhododendron was recorded within to the broadleaved woodland in the north of the Site, and is also present in the centre of the Site.

Bats

6.10.19 Bat activity surveys (supplemented with static bat echolocation detector surveys) have been undertaken during September and October 2017 following current best practice guidelines (Ref. 39). Activity has been recorded by common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Leisler's bat (*Nyctalus leisleri*),

noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), brown long-eared (*Plecotus auritus*) bats and *Myotis* species. Additional bat activity surveys are scheduled for Spring/early Summer 2018.

6.10.20 Review of existing ecological data for the Site from 2007 identified up to eight species of bat were recorded on-site during the surveys conducted during 2007 which included common pipistrelle, soprano pipistrelle, noctule (*Nyctalus noctula*), Leisler's bat, serotine, *Myotis* species, Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*Myotis nattereri*) and possible whiskered bat (*Myotis mystacinus*).

6.10.21 On the basis of the external survey undertaken on 19th October 2017, of the buildings scheduled for demolition:

- Two buildings (Buildings A and G) were assessed as having a moderate suitability to support roosting bats;
- Four buildings (Buildings B, E, F and L) were assessed as having a low suitability to support roosting bats; and
- 10 buildings (Buildings C, D, H, I, J, K, M, N, O and P) were assessed as having a negligible suitability to support roosting bats.

6.10.22 Internal inspections of buildings will be undertaken during early 2018. Emergence surveys of buildings assessed as having a low or moderate suitability to support roosting bats will be undertaken in Spring/early Summer 2018.

6.10.23 On the basis of the surveys undertaken on 19th and 23rd October 2017, a total of 40 trees scheduled for removal were assessed as having a low suitability to support roosting bats. This was predominantly due to dense ivy cover which can cover suitable features, or become a feature in itself by providing crevices between branches, or between the ivy and the tree itself. All other trees scheduled for removal were assessed as having negligible suitability to support roosting bats.

Reptiles

6.10.24 The mosaic of scrub, disturbed ground and grassland within the west of the Site close to the transmitter tower offers potential habitat for common reptile species. A survey to confirm the presence / likely absence of common reptile species was scheduled to be undertaken in September 2017. Artificial refugia (0.5m^2 squares of corrugated metal) were initially placed within the Site in September 2017; however, these were unknowingly removed from Site by a third party and therefore the survey will be re-conducted in April 2018. These refugia will be checked seven times in April 2018 for presence of reptile species.

6.10.25 No reptiles were recorded during surveys conducted at the Site in 2007. As such although suitable habitat is present the presence of reptiles is considered unlikely; however, the surveys in 2018 will confirm presence or absence.

Potential Effects

6.10.26 The Proposed Development will result in the loss of trees, scrub and amenity grassland predominantly in the west of the Site.

6.10.27 The key potential impacts on ecology from construction and operation are as follows:

- Construction pollution impacts (dust and spillages) on adjacent retained habitats and designated sites;
- Permanent changes to the layout of habitats within the Site and Crystal Palace Park SBG1 designated site;
- Temporary loss of nesting and foraging habitat for birds;
- Temporary loss of foraging habitat for bats;
- Potential loss of roosting habitat for bats;
- Loss of habitat potentially suitable for reptile species; and
- Spillage of light during construction or operation onto sensitive ecological receptors.

Outline Scope of Assessment

6.10.28 The 'Guidelines for Ecological Impact Assessment in the UK and Ireland' issued by the Chartered Institute of Ecology and Environmental Management (CIEEM) (the 'CIEEM EcIA guidelines') (Ref. 40) provide guidance on the process of identifying the value of ecological features, characterising impacts upon them and assessing whether these impacts are significant. The 'mitigation hierarchy' of avoidance, mitigation, compensation and enhancement underpin the CIEEM EcIA guidelines.

Determining construction and operational effects

6.10.29 The potential ecological effects of the regeneration plan will be identified and characterised. This will take into consideration the following criteria:

- Positive or negative – whether the effect will result in net loss or degradation of an important ecological feature or whether it would improve or enhance it;
- Magnitude – the size and intensity of the effect measured in relevant terms, e.g. number of individuals lost or gained, area of habitat lost or created, the degree of change to existing conditions;
- Extent – the spatial scope of the effect;
- Reversibility – the extent to which effects were reversible either spontaneously or through active mitigation;
- Duration – the length of time over which the effect occurred; and
- Timing and frequency – consideration of the timing of events in relation to ecological change; some effects might be of greater significance if they took place at certain times of year.

6.10.30 Potential impacts will be characterised initially by the absence of any mitigation, except where this was integral to the design of the regeneration plan. A sequential process will be applied to avoid, mitigate and compensate for any significant impacts. Any additional mitigation or compensation proposed will be subsequently identified and its likely effectiveness assessed.

Significance criteria

Determining the significance of effects

6.10.31 The significance of the predicted impacts on important ecological features arising from the potential impacts associated with the regeneration plan, including designed-in and additional mitigation measures, will be assessed. The significance of the effects will be assessed as negative, positive or not significant.

6.10.32 The CIEEM EcIA guidelines state that: *"A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project... A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision making process. In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)."*

6.10.33 The valuation of sites made will use established value systems (e.g. SSSIs are all of national importance) and reflect the geographical context of the valuation. The categories shown in Table 2 will be applied to give geographic context. Although the categories differ from those recommended within CIEEM EcIA guidelines, they are considered appropriate to ensure consistency of approach with the other topic reports.

Table 2: Examples of criteria used to evaluate important ecological features in a defined geographical context

Geographical level at which ecological feature	*Examples of criteria*

is importance	
International (Very high)	An internationally important site, e.g. Special Protection Area (SPA), Special Area of Conservation (SAC) or Ramsar; a regularly occurring population of an internationally important species (listed on Annex IV of the Habitats Directive).
National (High)	A nationally designated site, e.g. SSSI, or a site considered worthy of such designation; a large regularly occurring population of a nationally important species.
Regional (Medium)	An ecological feature identified in the local BAP. A smaller area of local BAP habitat which are essential to maintain the viability of a larger whole; non-statutory designated sites; a regularly occurring, locally significant number of a nationally important species. An ecological feature identified as of priority within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
Borough (Low)	Ecological features that are scarce within the district or borough or which appreciably enrich the district or borough habitat resource.
Local (Very low)	A good example of a common or widespread ecological feature in the local area.
Negligible	No or very limited ecological value.

Magnitude of potential impacts

6.10.34 Professional judgement will be used to assign the impacts on the important ecological features to one of four classes of magnitude (see Table 3). This approach deviates from that advocated by the CIEEM EcIA guidelines, however allows comparison between different impact topics.

6.10.35 Major or moderate effects are regarded as significant. Minor or negligible effects are considered not significant. Where significant effects occur, the scale of the effect is also considered on a geographical scale (i.e. international, national, regional, county, district or local). For example, effects on habitats within a SSSI (a feature of high/national importance) may not always be significant at a national scale, but may be significant at regional, county or district level.

Table 3: Definition of magnitude of impacts

Magnitude	*Definition*
High	A permanent or long-term effect on the extent or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to substantially enhance its conservation status.
Medium	A permanent or long-term effect on the extent or integrity of a site, habitat, species assemblage or community, population or group. If adverse, this is unlikely to threaten its sustainability; if beneficial, this is likely to be sustainable but unlikely to enhance its conservation status.
Low	A permanent or long-term reversible effect on a site, habitat, species assemblage or community, population or group whose magnitude is detectable but will not threaten its integrity.
Very low	A short-term but reversible effect on the extent or size or integrity of a site, habitat, species assemblage or community, population or group that is within the normal range.

Significance of potential impacts

6.10.36 Impacts and effects could be permanent or temporary, direct or indirect, and could be cumulative.

6.10.37 For this assessment a matrix approach will be used where ecological value / importance and magnitude of impact are cross referenced to identify a level of significance. Table 4 presents the categorisation of the significance of effects.

Table 4: Significance of impacts

Feature importance	*Magnitude of impact*			
	High	***Medium***	***Low***	***Very low***
International and National (High)	Major	Major	Moderate	Minor
Regional (Medium)	Major	Moderate	Minor	Negligible

Borough (Low)	Moderate	Minor	Negligible	Negligible
Less than Borough (Very low)	Negligible	Negligible	Negligible	Negligible

6.10.38 With reference to Table 4, in accordance with CIEEM EcIA guidelines, a clear distinction between evidence-based and value-based judgements will be made so that decision-makers and other stakeholders are aware of the level of subjective evaluation that has been used.

Terminology

6.10.39 In order to provide consistency of terminology in the conclusions of the assessment the residual effects of the illustrative masterplan will be translated to a significance level on a scale of negligible, minor, moderate and major as outlined in Table 5. In addition, Table 5 converts these conclusions an equivalent conclusion based on the CIEEM 2016 EcIA guidelines.

Table 5: Relating CIEEM Assessment terms to those used in other assessments

Effect significance terminology		***Equivalent CIEEM assessment***
Significant (Beneficial)	Major Beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate Beneficial	Beneficial effect on structure/function or conservation status at regional level.
Non-significant	Minor Beneficial	Beneficial effect on structure/function or conservation status at Site or local level.
Non-significant	Negligible	No effect on structure/function or conservation status.
Non-significant	Minor Adverse	Adverse effect on structure or conservation status at Site - local level.
Significant (Adverse)	Moderate Adverse	Adverse effect on structure/function or conservation status at regional level.
	Major Adverse	Adverse effect on structure/function or conservation status at regional, national or international level.

6.10.40 In addition to the above a cumulative assessment will be undertaken, taking in to account relevant schemes that lie within 1km of the Site and have the potential to affect the Site.

6.11 Ground Conditions and Contaminated Land

Summary Baseline

6.11.1 Published geological maps and British Geological Society (BGS) borehole logs (77) suggest that the Site is generally underlain by made ground, overlying Claygate Member and London Clay, with Lambeth Group and Upper Chalk at depth. Superficial deposits (sand and gravels) border the Site to the west.

6.11.2 The underlying solid geology of Claygate Member, identified only in the western part of the Site, is classified as a Secondary A Aquifer, which is described as permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers.

6.11.3 The London Clay Formation is classified as Unproductive Strata. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. The Chalk strata, which is at depth beneath the Lambeth Group is classified as a Principal Aquifer. These are layers of rock or drift deposits that have inter-granular and/or fracture permeability and can often

provide a high level of water storage. They may support water supply and/or river base flow in a strategic scale. Due to their high permeability, Principal Aquifers are considered to be highly vulnerable to pollutants.

6.11.4 Review of the Environment Agency's (EA) website indicates that the Site is not located within a Groundwater Source Protection Zone (SPZ).

6.11.5 The EA Flood Maps indicate that the Site lies in a Flood Zone 1 ('Low Probability'). Flood zones refer to the probability of river and sea flooding (Flood Zone 1 has a less than 0.1% annual probability of river or sea flooding), ignoring the presence of defences.

Potential Effects

6.11.6 Potential impacts and their effects on this Site (as a result of the construction and operation of the Proposed Development) are likely to be from:

- Potential soil contamination;
- Potential surface water / groundwater contamination;
- Potential unexploded ordnance (UXO); and
- Enabling, demolition and construction processes.

Outline Scope of Assessment

6.11.7 The Model procedures for the Management of Land Contamination (CLR 11) (Ref. 42) have been developed to provide the technical framework for applying a risk management process when dealing with land affected by contamination. The process involves identifying, making decisions on, and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the UK. The guidance presented in CLR11 is relevant to the Proposed Development and has been considered in developing the methodology below.

6.11.8 The evaluation will be specific to the environmental setting of the Site, the Proposed Development and likely construction elements (e.g. foundation works, etc.). The following evaluation methodology will be followed:

- Review of the legislative and planning policy context;
- Explanation of the assessment methodology and significance criteria;
- Review of available third party information;
- Collection, review and assessment of up to date environmental information (such as an EnviroCheck Report, and the EA and British Geological Society (BGS) websites);
- Site visit to determine the current environmental sensitivity at the Site and the immediate surroundings;
- An evaluation of the potential for the historical use of the Site to represent a potentially contaminative use and the likelihood of residual contamination being present in the ground or groundwater;
- Description of the baseline conditions to include: geological conditions, made ground, hydrogeology, contamination potential, presence of underground structures, UXO and asbestos;
- The potential for source-pathway-receptor pollutant linkages to exist;
- Assessment of the potential impacts (both the construction and operational phases of the Proposed Development); and
- Assessment of residual and cumulative impacts.

6.11.9 The results of the impact assessment will be presented in the Ground Condition ES chapter.

6.12 Noise and Vibration

Summary Baseline

6.12.1 Off-site sound sources in the area of the Park tend to be dominated by local road networks with the A212 Crystal Palace Parade bordering the Site to the west, A234 Crystal Palace Park Road to the north and Anerley Hill / Anerley Road to the south. All of these roads experience high density traffic flows. Rail traffic associated with Crystal Palace train station also contributes to the sound environment through which Southern and East London Line trains run. The rail lines are underground to the west of the station but above ground to the east where they approximately follow the south and east Site boundaries.

6.12.2 On-site sound sources are mainly associated with the NSC, which has an associated stadium that hosts athletics meetings which generate sound from crowd and public address (PA) systems. The NSC and Park have associated parking facilities which introduce road traffic sound onto the Site. In general, road traffic flows accessing the Site are low; however, flows can increase during periods prior to and after events at the NSC. In addition, activities associated with the Phoenix Motorcycle Training and the Caravan Club generate sound from vehicle movements and people using the Park facilities contribute to the overall soundscape across the Site.

6.12.3 Sensitive receptors that may be affected by noise and vibration associated with the Proposed Development include Residential properties and users of the Park.

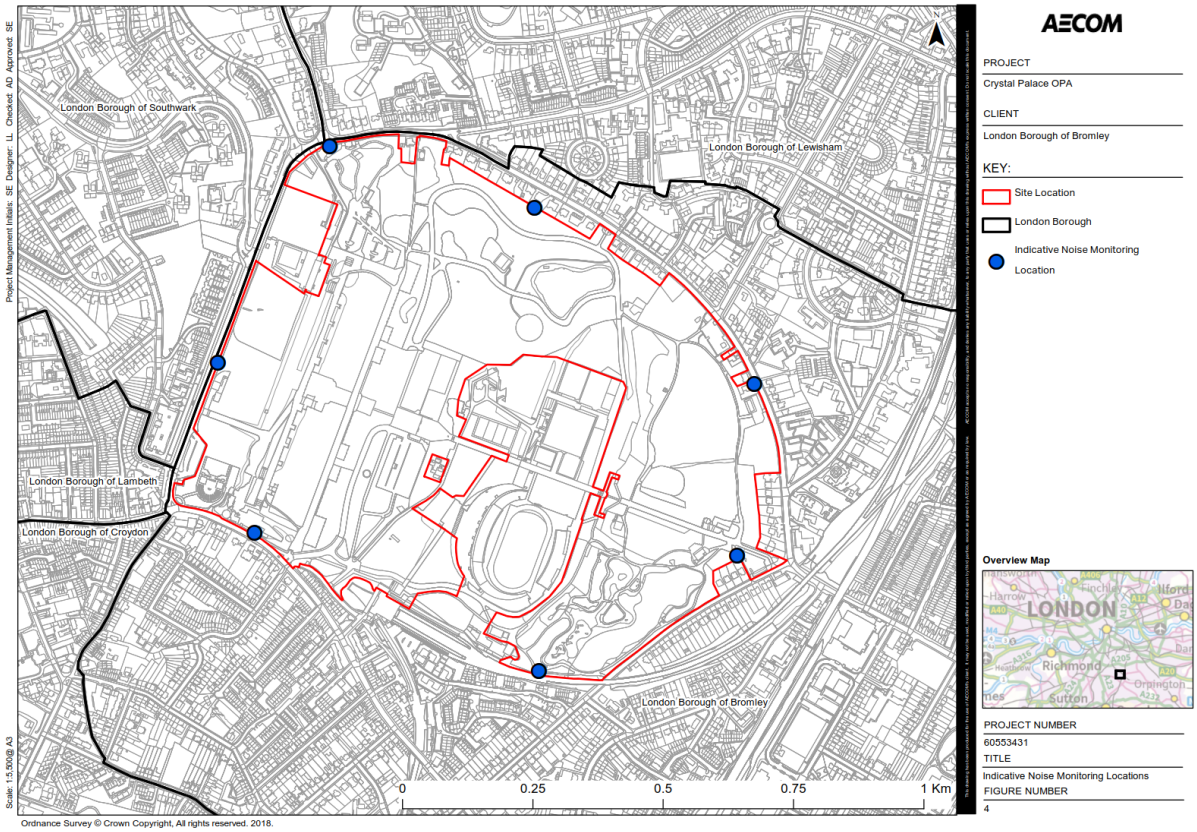
6.12.4 A full baseline noise survey will be undertaken in line with BS 7445:1991 Parts 2 (Ref. 43) and 3 (Ref. 44) and BS 7445:2003 Part 1 (Ref. 45). A combination of long-term and short-term noise measurements will be carried out at locations around and within the Site in order to:

- Characterise representative daytime and night-time noise levels at existing noise sensitive receptors for subsequent use in setting appropriate fixed plant noise emission criteria;
- Establish ambient and maximum noise levels around the Site in order to construct a detailed noise map; and
- Assess the suitability of the Site for its intended use.

6.12.5 Noise monitoring will be undertaken at locations on-site and at nearby noise sensitive receptors. Noise monitoring will be long-term continuous where secure locations are available. Where secure locations are unavailable, a series of attended measurements will be undertaken. Should construction activities be taking place on neighbouring sites during the period scheduled for noise monitoring, noise measurements will be undertaken during weekends, evenings, and nights to provide indicative noise levels at the site.

6.12.6 Proposed noise monitoring locations are presented in Figure 4: Proposed Noise Monitoring Locations.

Figure 4: Proposed Noise Monitoring Locations



Potential Effects

6.12.7 Potential noise and vibration impacts may occur at existing and future noise sensitive receptors due to the Proposed Development as a result of:

- Construction activities;
- Changes in road and rail traffic flows;
- Noise generating activities in new park facilities; and
- Fixed plant associated with the Proposed Development.

Outline Scope of Assessment

6.12.8 The suitability of the Site for development in terms of noise and vibration will be considered in line with guidance contained in the NPPF and with reference to the relevant sections of the LBB Local Plan.

Site Suitability

6.12.9 The suitability of the Site for residential and commercial development will be assessed in terms of noise will be considered in line with local guidance and guidance contained in the NPPF. Details will be provided on suitable glazing and ventilation strategies in order to achieve the indoor ambient noise levels recommended in BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of practice' (Ref. 46). Design criteria for external noise will be considered when assessing external garden and balcony areas.

Enabling Works and Construction Phase

6.12.10 The LBB expect working hours to be between 0800-1800 on Monday to Friday and 0800-1300 on Saturdays, with no working outside of those periods or on bank or public holidays. Percussive piling will not be permitted unless there are overriding engineering reasons. In the event that impact piling is required it is likely that further time restrictions, over and above those above would be required.

6.12.11 Noise levels associated with construction traffic and future operational traffic flows will be assessed in line with Calculation of Road Traffic Noise (CRTN). The impact of construction traffic noise levels will be assessed based on a range of relevant guidance including the Design Manual for Roads and Bridges (DMRB) and mitigation measures detailed where necessary.

6.12.12 Noise due to Site traffic (e.g. delivery vehicles and refuse vehicles) will be considered and strategies to minimise disturbance to residents will be provided.

6.12.13 A construction noise and vibration assessment will be undertaken based on construction activity, plant use and traffic movement information. Noise levels at receptors will be calculated using BS 5228-1:2009 (and update A1 2014 Part 1 Noise) data (Ref. 47) and procedures. Vibration risks will be assessed based on the types of plant used and their proximity to receptors, using guidance in BS 5228-2:2009 and BS 7385:1990 (Part 1) (Ref. 48) and 1993 (Part 2) (Ref. 49). From the results of the construction noise and vibration assessment, preliminary mitigation measures will be advised in line with BS 5228 and LBB local planning policy.

Operational Noise

6.12.14 Building services noise associated with the operation of the completed development will be assessed in line with BS 4142:2014 (Ref. 50) and limits recommended such that noise does not exceed the typical LA90 background noise level.

6.12.15 Noise levels associated with construction traffic and future operational traffic flows will be assessed in line with CRTN. The impact of operational road traffic noise levels will be assessed based on a range of relevant guidance including the DMRB and mitigation measures detailed where necessary.

6.12.16 Noise generated by activities at new park facilities will be assessed. The assessment methodology applied will be dependent on the source of noise. New sources of noise will be assessed with reference to the methodology in BS 4142, whereas if noise is considered to be a change in level of an existing noise source, an assessment methodology similar to that applied for assessment of road traffic noise will be adopted.

Additional considerations

6.12.17 It is considered that the Proposed Development will not give rise to any vibration or ground borne noise at surrounding sensitive receptors and therefore it is not proposed to undertake an assessment of operational vibration.

6.12.18 The Noise and Vibration ES chapter will be supported by a technical appendix which will contain relevant reference material and tabulated noise and vibration survey results.

6.13 Townscape and Visual Impact Assessment

6.13.1 The Townscape and Visual Impact Assessment (TVIA) will identify and assess any potential effects of the Proposed Development on the existing townscape fabric and character and visual amenity of people in and around the Site.

6.13.2 As the majority of the study area is predominantly built-up, the term 'townscape' has been used throughout this assessment to mean landscapes within the urban context, reflecting The European Landscape Convention (Council of Europe, 2000) definition of landscape as "…*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*" which covers "…*natural, rural, urban and peri-urban areas*" and may include "*outstanding as well as every day or degraded landscapes*". The terms townscape and landscape are therefore considered to be inter-changeable.

6.13.1 Various technical terms are used throughout this section, which are defined below:

- *Townscape Character Area (TCA)*: areas of relatively homogenous townscape which are defined by a combination of physical elements including landform, street patterns, buildings, vegetation and open space and experiential characteristics, such as openness and enclosure, levels of activity and unity;
- *Zone of Theoretical Visibility (ZTV)*: a digitally produced map showing areas of land within which the Proposed Development will theoretically be visible;
- *Visual receptor*: people who will have views of the Proposed Development; and
- *Representative viewpoint*: locations selected to represent the experience of different types of visual receptor where larger numbers of viewpoints cannot all be included individually and where the levels of significance of effects are unlikely to differ.

6.13.2 Built heritage, such as Listed Buildings and Conservation Areas, contribute to the character of the townscape and influence its quality and value. However, effects on the significance of these designated assets and their setting will be assessed in the Cultural Heritage ES chapter.

Summary Baseline

6.13.3 An initial study has been carried out to gain an understanding of the townscape and visual baseline and the extent of the likely effects.

6.13.4 The initial study area has been determined through desk study and investigation of maps, aerial photography and designations within geographic information system (GIS) and has been verified by fieldwork and initially extended up to 6.5km from the Site, in the context of the panoramic view from Addington Hills (approximately 6.5km south of the Park). This view is identified as a 'View of Local Importance' within the LBB's Unitary Development Plan (UDP).

6.13.5 Given the panoramic nature of the view from Addington Hills, the scale of the development and the distance between the viewpoint and the Site, it is not anticipated that there would be any potentially significant effects resulting from the Proposed Development and therefore the view has been scoped out of this TVIA .

6.13.6 The TVIA study area has therefore been defined as 500m from the boundary of the Site (measured radially), as shown on Figure B2 of Appendix B.

6.13.7 The extent of the study area will be reviewed during the assessment by considering the extent of direct and indirect impacts on character and may be further refined to focus on those receptors which are likely to experience significant effects.

Townscape Character

6.13.8 TCAs consist of the scale, design, layout and density of streets, buildings and open spaces and their 'sense of place' and identity.

6.13.9 As demonstrated by Figure B1 in Appendix B of this report,, the published character areas within the study area which will form the basis of the assessment include:

- Natural England National Character Assessment:
  - Area 112 Inner London;
  - Area 114 Thames Basin Lowlands;
- Borough Character Appraisal London Borough of Croydon, DRAFT, 21st September, 2015:
  - Crystal Palace and Upper Norwood LCA;
- Lambeth Local Distinctiveness Study, 2012:
  - Survey Square 'O';
- Lewisham Borough Wide Character Study, October 2010:
  - Sydenham LCA.

6.13.10 To provide an additional level of detail to the published character studies, the TVIA will identify local character areas via fieldwork.

Townscape Designations

6.13.11 Townscape designations may relate to areas or features which contribute to the value of a TCA or affect its susceptibility to change and can be recognised by national, regional or local designations. A preliminary review of designations shows a number of townscape designations and areas of recognised value within the study area:

- National designations:
  - Registered Parks and Gardens: Grade II* Crystal Palace Park.
- Regional and Local designations:
  - Metropolitan Open Land (MOL): Crystal Palace Park;
  - Urban Open Space: Crystal Palace Park;
  - Conservation Areas: Crystal Palace Park (Bromley), Upper Norwood Triangle (Croydon) and Westow Hill (Lambeth); and
  - Listed and Locally Listed Buildings and structures.

Visual amenity

6.13.12 Figure B2 of Appendix B demonstrates the 11 viewpoints, identified through field work, which may experience views of the Proposed Development. Viewpoint 1, located on the upper terrace of Crystal Palace Park is included in the LBB's UDP as a 'View of Local Importance'.

6.13.13 The following criteria have been considered in the identification of the TVIA visual receptors and viewpoints:

- Receptor type (residents, people using footpath or open spaces, etc.) and numbers of people likely to be affected;
- Relative elevation to the Proposed Development;
- Existing views (composition, quality, visual characteristics – nature and extent of skyline, aspects of visual scale and proportion and key foci);
- Distance to the nearest point of the Proposed Development;
- Proportion of the Proposed Development potentially visible;
- Field or angle of view (e.g. narrow or wide, up, down or level);
- Location of the Proposed Development within the overall composition of the view (e.g. foreground, middle ground or background);
- Nature of the view, for example, direct or oblique, screened or filtered; and
- Duration of view (e.g. continuous, intermittent or fleeting).

6.13.14 From the above, the TVIA will therefore include 6 viewpoints within the Site to represent views experienced by:

- Recreational users of Crystal Palace Park (Viewpoint number 1, 2, 4, 5 and 6);
- Visitors to the National Sports Centre (Viewpoint number 3); and
- Walkers on the Green Chain Walk and Capital Ring (Viewpoint number 2, 4, 5 and 6).

6.13.15 The TVIA will also include 5 viewpoints located outside the Site to represent views experienced by:

- Residents situated adjacent to the Site (Viewpoint number 7, 8, 9, 10 and 11);
- Pedestrians travelling along adjacent paths, including at the north-western end of Penge High Street and the convergence of Westow Hill and Church Road (Viewpoint number 7, 8, 9, 10 and 11); and
- Road users travelling along adjacent highways including Crystal Palace Parade, Westwood Hill, Crystal Palace Park Road, Thicket Road, Sydenham Avenue, Ledrington Road and Anerley Hill (Viewpoint number 7, 8, 9, 10 and 11).

Potential Effects

6.13.16 Some of the key townscape and visual issues relate to the extent to which the Proposed Development:

- Has the potential to improve the townscape character by reinforcing and/or enhancing its overall integrity and character value, including removal of any potential detracting features;
- May be visible as experienced by residents and people working or passing through the area;
- Has the potential to improve views and visual amenity, particularly within the Park; and
- May improve the Site for tourists and visitors.

6.13.17 The following potential effects on townscape character and visual amenity will be included in the TVIA assessment:

- Construction effects: townscape and visual effects during construction may potentially result from:
  - Movement of machinery and traffic to and around the construction site;
  - Removal of vegetation and soil stripping as part of Site clearance and preparation;
  - Demolition of existing facilities and removal of materials arising;
  - Localised changes to topography on account of excavation and temporary stockpiling;
  - Construction compounds and associated hoardings and fencings;
  - Temporary public access diversions;
  - Construction lighting, fencing and security; and
  - Construction of new buildings and features.
- Year 1 Operational effects: townscape and visual effects may potentially result from the rejuvenation of the Site, restoration of views, planting of new trees and vegetation and the introduction of new buildings and features as part of the Proposed Development;
- Year 15 Operational effects: townscape and visual effects will change from the year 1 operation assessment as a result of the establishment of any mitigation planting included as part of the Proposed Development; and
- Cumulative effects: an assessment of townscape and visual effects resulting from the construction of the Proposed Development in conjunction with other developments within the 500m study area will be conducted.

Outline Scope of Assessment

TVIA Standards and Guidance

6.13.18 The TVIA will be undertaken in general accordance with the following best practice guidance documents:

- Guidelines for Landscape and Visual Impact Assessment 3rd edition (GLVIA3), Landscape Institute and Institute of Environmental Management and Assessment (2013) (Ref. 54);
- An Approach to Landscape Character Assessment, Natural England (2014) (Ref. 55); and
- Photography and photomontage in landscape and visual impact assessment. Advice note 01/11, Landscape Institute (2011) (Ref. 56).

6.13.19 Townscape and visual effects are interrelated with other environmental effects but will be assessed separately. Townscape effects associated with a development relate to the changes to the fabric, character and quality of the townscape and how it is experienced. Visual effects concern changes in people's views as a result of the Proposed Development.

Baseline Data Collection

6.13.20 A study of the existing baseline townscape components and character of the study area and views of the Site will be carried out to form the basis of the TVIA assessment, including for the existing:

- Site context;
- Topography and hydrology;
- Movement and connectivity;
- Built form and land use;
- Vegetation;
- Green Infrastructure;
- Townscape designations;
- Townscape character; and
- Visual receptors and representative views.

6.13.21 The TVIA written assessment will be supported by tables, plans and photographs as appropriate. The baseline study will form the basis of the assessment of the predicted effects of the Proposed Development.

6.13.22 The TVIA will be compiled with reference to the following information sources:

- Ordnance Survey mapping;
- LIDAR Digital Surface Model;
- Aerial photography; and
- Historic mapping.

Impact Assessment Methodology

6.13.23 GLVIA3 requires that a clear distinction is drawn between townscape and visual effects:

- Townscape effects relate to the degree of change to characteristics or physical components of an urban area, which together form the character of that townscape, e.g. topography, streets, buildings and open space; and
- Visual effects relate to the degree of change to an individual receptor or a receptor group's view of that townscape, e.g. local residents, users of public open space, views from footpaths or motorists passing through the area.

Townscape

6.13.24 Townscape effects may arise from changes to the physical components of the townscape, its setting, character or how it is experienced. This may, in turn, affect the perceived value attached to the townscape. Townscape effects will be assessed by considering the sensitivity of the townscape and the magnitude of change in relation to the baseline.

6.13.25 The sensitivity of each published TCA and those identified via field work will be assessed by combining judgements of the value attached to the townscape and their susceptibility, so as to ascertain their respective sensitivity to the Proposed Development.

6.13.26 The assessment of townscape value will be informed by the information set out in the baseline and GLVIA3 Box 5.1 (see page 84 of the document) as well as for including consideration of any townscape designations. Townscape value will be judged with reference Table 6.

Table 6: Townscape value

Classification	*Value of TCA*
National	Townscape with elements of national importance, e.g. protected by Act of Parliament.
Regional	Townscape with elements of regional importance, e.g. Metropolitan Open Land (MOL), regional parks or designated regional leisure routes and conservation areas.
Local	Townscape with elements which are protected or valued through local or neighbourhood planning policies, such as protected open space or groups of listed buildings or buildings of townscape merit.
Community	Townscape with relatively common elements which are likely to be valued by the community which lives and works in the area.
Limited	Townscape with weak or discordant elements and characteristics which detract from the quality of the area.

6.13.27 Susceptibility to change is defined in GLVIA3 as the ability of the townscape to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies. Susceptibility of the townscape within the study area to change will be assessed in consideration of the baseline analysis of the Site, relating to landform, pattern and complexity, as well as its relationship to the existing settlement pattern. The susceptibility will be assessed using a scale of high, medium and low with supporting justification in the text.

6.13.28 The value and susceptibility to change will then be combined to judge the sensitivity of each TCA the Site and Site features, as follows:

- High: townscape of national or regional value with distinctive elements and characteristics, susceptible to small changes of the type of development proposed;
- Medium: townscape of local value, with relatively common elements and characteristics, reasonably tolerant of the changes proposed; or
- Low: townscape of limited value and relatively inconsequential elements and characteristics, the nature of which is potentially tolerant of substantial change of the type proposed.

Magnitude of change

6.13.29 The magnitude of change will be determined by considering: the size, scale and intensity of the Proposed Development; its geographical extent of influence; the level of integration of new features with existing elements and its duration and reversibility. The size and scale of impacts is considered at local (within the Site or its setting) district (within the London Boroughs of Bromley, Lambeth, Southwark, Lewisham and Croydon) and regional (within Greater London) scales. Magnitude of change is classified as follows:

- High: the total loss of key characteristics or the addition of new features or components that will substantially alter the character or setting of the area;

- Medium: the partial loss or alteration of key characteristics or the addition of new features or components that may be in keeping with the existing character or the setting of the area;
- Low: the limited loss or alteration of common components or characteristics or the addition of new features or components that largely reflect the existing character or setting of the area;
- Negligible: very limited loss or alteration of common components or to the setting of the character area; and
- Neutral: no change discernible in any component or characteristic.

Visual assessment

6.13.30 Visual effects result from the changes in the composition of views and or changes to the overall visual amenity. During the assessment, the ZTV will be based on a 3D model of the maximum parameters of the Proposed Development, the buildings and topography within 500m of the Site. Fieldwork will further clarify the influence of existing landform, buildings and vegetation on the degree of potential views.

6.13.31 The sensitivity of each visual receptor will be assessed by combining judgements of the value attached to the view and their susceptibility to the type of change proposed. The assessment of value will be informed by the location of the viewing place and the quality or designation of the elements in the view as shown in Table 7.

Table 7: Value of views

Classification	*Value of view*
Regional	Strategic views and panoramas identified in the London View Management Framework.
Local	Views across high quality townscape and interest of the view, which may be identified in the Local Plan.
Community	Views of relatively common elements of townscape, likely to be valued by the community which experience the view.
Limited	Views across poor quality townscape with a high degree of detracting or common elements.

6.13.32 Susceptibility to change will be judged by considering the occupation or activity of the people experiencing the view and the extent to which their attention or interest is focused on the view, in consideration of the criteria set out in Table 8.

Table 8: Susceptibility to change of views

Visual Receptor	*Susceptibility to Change*		
	High	*Medium*	*Low*
Occupation or activity	People living in the area or visiting areas of high townscape value	People passing through the area on designated routes	People working inside or passing through the area on public roads or railway lines
Degree of attention on the view	Views are an important part of the experience of the townscape	Views are relevant to the experience or activity but not central to it	Views are likely to be focused on the activity of the receptor, rather than the view
Degree of exposure to the view	Views are likely to be open	Views may be framed, partially screened or filtered	Views are likely to be limited to glimpses or are heavily screen ed
Length of exposure to the view	Views are likely to be experienced daily or for long periods of time	Views may be fleeting or experienced as a sequence of views moving through the area	Views are likely to be short

6.13.33 Visual receptors will be assigned a category of sensitivity based on a combination of the value of the view and their susceptibility to the type of change proposed, as follows:

- High: activity resulting in a particular interest or appreciation of the view (e.g. residents or people engaged in outdoor recreation whose attention is focused on the townscape) and/or a view of national value (e.g. a designated landscape or townscape);
- Medium: activity resulting in a general interest or appreciation of the view (e.g. people engaged in outdoor recreation that does not focus on an appreciation of the townscape) and/or a view of local or limited value of (e.g. suburban residential areas); and
- Low: activity where interest, appreciation or period of exposure to the view is limited (e.g. people at work or motorists travelling through the area) and/or a view of limited value (e.g. industrial areas or derelict land).

Magnitude of change to visual receptors

6.13.34 The magnitude of change results from a combination of the degree of change, the extent over which the changes will be visible, the period of exposure to the view and reversibility or permanence of the change and is classified as follows:

- High: extensive change to the composition of the existing view (e.g. widespread loss of characteristic features or the addition of new features within the view) and/or high degree of exposure to view (e.g. long-term, close, direct or open views);
- Medium: partial change to the composition of the existing view (e.g. noticeable loss of some characteristic features or the addition of new features within the view) and/or medium degree of exposure to view (e.g. medium-term, middle-distance or partially screened views);
- Low: subtle change to existing view (e.g. limited loss of characteristic features or the addition of new features within the view) and/or low degree of exposure to view (e.g. medium-term, long-distance, substantially screened or glimpsed views);
- Negligible: barely perceptible change to the existing view and/or very brief exposure to view; and
- Neutral: no change discernible in existing view.

Assessing the significance of effects

6.13.35 The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the Proposed Development.

6.13.36 Whilst there is a degree of professional judgement involved in determining the level of significance of townscape and visual effects, they can broadly be determined by the interaction of the sensitivity of the receptor and magnitude of change. This interaction results in categorisation of effects as shown in Table 9. As noted where professional judgement considers that the effect may not align with the below table, a justification will be provided within the TVIA as set out in GLVIA3 paragraphs 3.35 and 3.36.

Table 9: Classification of townscape and visual effects

Sensitivity of resource / receptor	***Magnitude of change***			
	High	***Medium***	***Low***	***Negligible***
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

6.13.37 Townscape and visual effects are categorised as being beneficial, adverse or neutral. Effects classified as major or moderate are ‘significant’ in EIA terms. Those classified as minor or negligible are ‘not significant’ in EIA terms.

6.13.38 A textual description of townscape and visual effects is given in Table 10.

Table 10: Description of townscape and visual effects

Degree of significance	*Description of townscape effect*	*Description of visual effect*
Major	Wide scale change across all or most of the TCA resulting in substantial loss, alteration or replacement of existing components, scale or pattern of the townscape which transforms the character of the area. This may relate to a townscape of national or regional value with a high susceptibility to change.	Pronounced loss, alteration or replacement of existing components which cause a change in the existing composition of the view.
Moderate	Partial loss, alteration or replacement of existing components, scale or pattern of the townscape within part of the TCA. This is may relate to a townscape of regional or local value with a medium susceptibility to change.	Noticeable loss, alteration or replacement of existing components which cause a change in the existing composition of the view.
Minor	Limited loss, alteration or replacement of existing components or the character, scale or pattern of the townscape without compromising the overall existing townscape character area. This may relate to a townscape of local or limited value with a low susceptibility to change.	Limited loss, alteration or replacement of existing components which caused a change in the overall composition of the view.
Negligible	A very limited loss, alteration or replacement of existing components or the character, scale or pattern of the townscape, which does not alter the overall character.	A barely perceptible loss, alteration or replacement of existing components which cause a change in the existing composition of the view.
Neutral	The Proposed Development would not affect the townscape receptor.	The Proposed Development would not be visible.

Assumptions and limitations

6.13.39 The scope of assessment will be refined during the consultation and assessment period. Viewpoints selected and agreed for inclusion in the assessment will be representative unless specific viewpoints are consulted and agreed with consultees.

6.13.40 As the TVIA will relate to an outline planning application, some information regarding the architectural details and finishes will not be available to inform the assessment. It is recognised that the design may continue to evolve within the parameters set out within the outline planning application. The assessment will therefore be based upon the scale and massing of the Proposed Development as indicated in the Parameter Plans and within the Design and Access Statement.

Scope for mitigation

6.13.41 The principal scope for mitigation is that of primary measures, so that those developed through the iterative design process are integrated or embedded into the Proposed Development and form part of the assessment. This approach helps to ensure that wherever possible beneficial or adverse impacts on townscape character and visual amenity are designed out, or minimised, and that the opportunity for beneficial impacts are maximised.

6.13.42 The TVIA is an iterative process which has and will continue to run concurrently with the design of the Proposed Development. The proximity of the Proposed Development to designated townscapes and sensitive visual receptors will further influence the design with the townscape and visual context

influencing the development of the scheme particularly in terms of consideration of mass, scale and use of buildings and the public realm.

6.14 Traffic and Transport

Summary Baseline

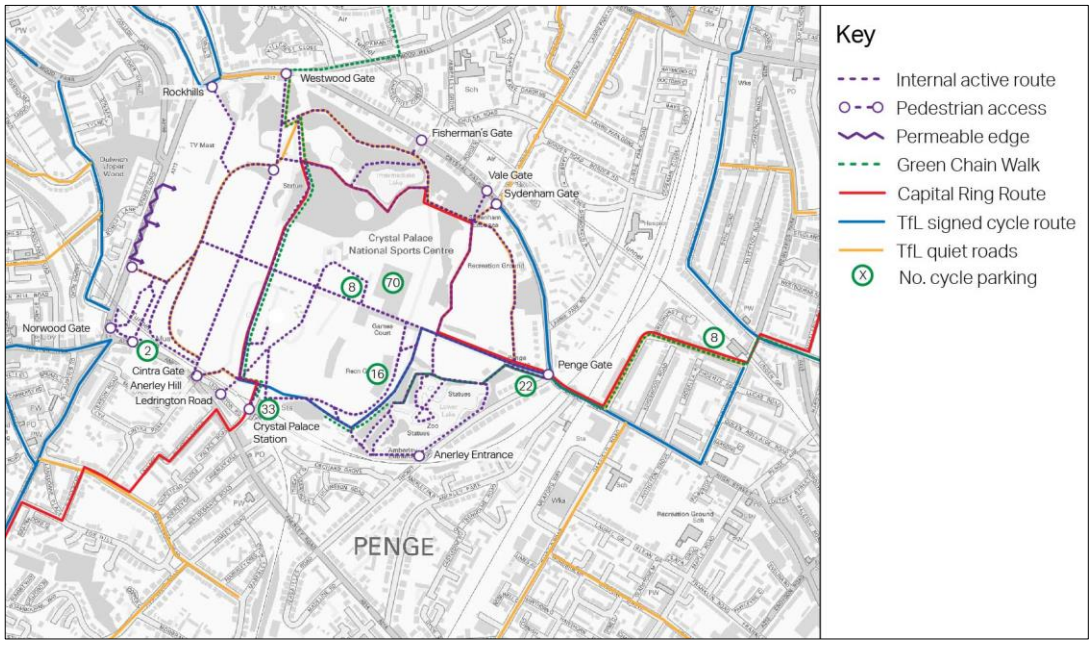
6.14.1 The Park is bound by the A234 to the north and the north-east, Thicket Road to the south-east, the rail line and Anerley Hill to the south and Crystal Palace Parade to the west.

Active Modes

6.14.2 Various points of access to the Park exist for walking and cycling: five are located along the northern boundary (Rockhills, Westwood Hill, Fisherman's Gates and two at Sydenham); one at the south-east corner at Penge Gate; one on Thicket Road (Anerley Entrance); four along the southern boundary (Crystal Palace Station, Ledrington Road, Cintra Gate and Anerley Hill); two at the south-western corner of the Site; and one on Crystal Palace Parade. A section of the western boundary of Crystal Palace Park is permeable permitting the free movement of pedestrians to/from Crystal Palace Parade.

6.14.3 An internal network of cycle/pedestrian routes bisect the Park, a number of which are identified by Transport for London (TfL) as routes suitable for cycling (illustrated in Figure 5). In addition, the Green Chain Walk and the Capital Ring run through the Park, both of which are TfL initiatives to provide safe walking routes across London, passing through various parks. Sections 10 and 11 of the Green Chain Walk originate at Crystal Palace Park and provide a route to Beckenham Palace Park and Nunhead.

Figure 5: Active Mode Routes To and Through Park



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6.14.4 At the boundary of the Park continuous pedestrian footways are present on both sides of the A234 (Crystal Palace Park Road). In addition, a marked on-road cycle route runs between Penge Gate and Sydenham Gate. The cycle route terminates at Sydenham Gate, with a TfL quiet route identified, continuing along Sydenham Avenue.

6.14.5 Wide footways are provided on both sides of Crystal Palace Parade; however, no formal cycle lanes are provided until the approach to the Crystal Palace Parade / Anerley Hill Junction, adjacent to the Park entrance.

6.14.6 Similarly, no formal cycle routes are provided on Anerley Hill; however, wide and recently upgraded footways are located along both sides of the carriageway. At the entrance to the Park on Anerley Hill, a designated on-road pedestrian route is provided along the northern side of the carriageway, which continues until the Crystal Palace National Sports Centre (NSC) and connects with the internal footway network within the Park.

6.14.7 Sufficient footways are provided on both sides of Thicket Road; although no delineated cycle route is provided. The Park offers a similar pedestrian route, parallel to Thicket Road.

Sydenham Villas

6.14.8 The existing St Johns Ambulance, Pre-school and Park Maintenance Depot occupy the land at Sydenham Villas and are accessed via a narrow footway which lines the southern side of Crystal Palace Park Road. This road is street lit on the eastern side of the carriageway. Small sections of guard rail are provided outside of the St Johns Ambulance depot and pre-school providing barriers between the footway and carriageway. An uncontrolled pedestrian crossing formed of an island in the centre of the carriageway and tactile paving on both sides is located directly to the south of the Depot building. A delineated on-road cycle route is provided on both sides of the carriageway in the vicinity of the Site.

Rockhills

6.14.9 The Caravan Club currently occupy the Rockhills site, which is accessed from Old Cople Lane at Rockhills Gate. A narrow unlit footway is provided on the eastern side of Old Cople Lane connecting the site to Westwood Hill. Generous street lit footways are provided on both sides of Westwood Hill in the vicinity of the Site and cycle improvements are currently being constructed at the Westwood Hill junction with Sydenham Hill.

Public Transport

Public Transport Accessibility Level (PTAL)

6.14.10 PTAL is a TfL approved tool which measures public transport accessibility. The WebCAT tool presents a PTAL score ranging between 0 (worst) and 6b (best) for each 100m^2 grid square across London. The Park features a PTAL that ranges between 0 to 6a. The highest rated area is located, as one would expect in close proximity to the Crystal Palace Station and Bus Station / Interchange. The PTAL score decreases rapidly northwards across the Park.

Bus Services

6.14.11 TfL define 640m (eight minutes) walking distance as an acceptable distance to access bus based public transport. Crystal Palace Bus Interchange, located at the south-west corner of the Park provides access to various bus services. Bus routes 3, 157, 227, 322, 358, 410 and 417 are accessible from this Interchange, whilst additional services are available from bus stops located on the surrounding road network within walking distance of the Site (illustrated in 6 and Table 11). It is evident from this figure and table that a wide range of services are available around the Park.

Figure 6: Public Transport Network

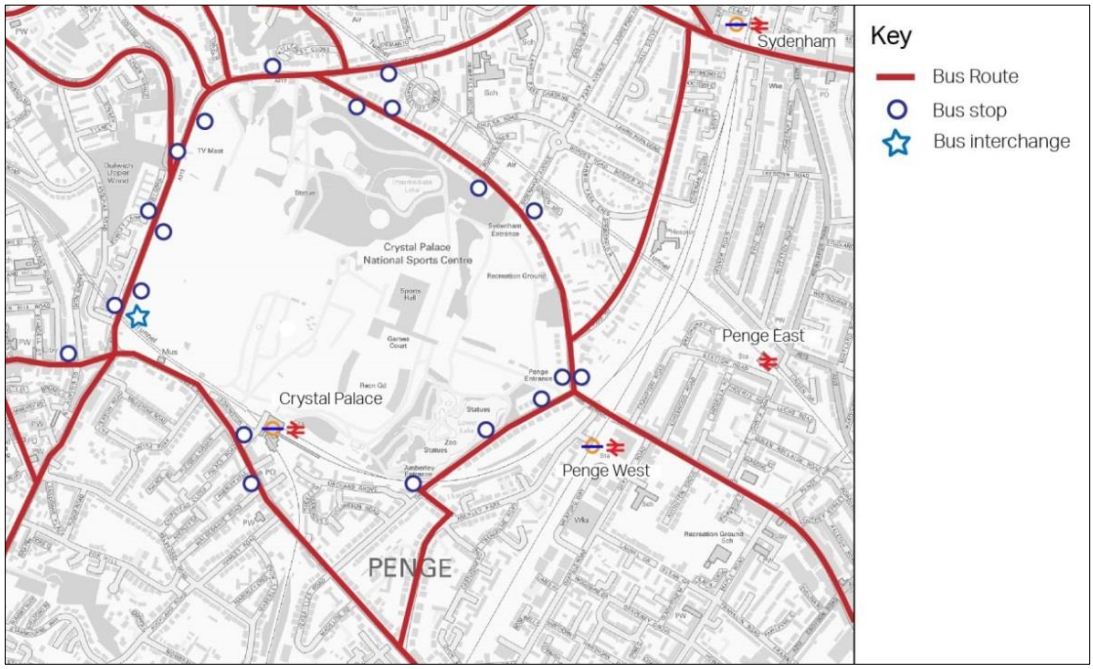

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Table 11: Bus services and Frequencies

Bus Route No.	Bus Route	Frequency (per hour)		
		AM Peak	PM Peak	Saturday (13:00 – 14:00)
3	Regent Street - Crystal Palace Bus Station	7	8	5
	Crystal Palace Bus Station - Regents Street			8
122	Woolwich - Crystal Palace	5	5	5
	Crystal Palace - Woolwich			
157	Crystal Palace - Morden	4	5	5
	Morden - Crystal Palace	5		4
176	Crystal Palace - Tottenham Court Road	8	8	7
	Tottenham Court Road - Crystal Palace			6
197	Crystal Palace - Peckham	6	6	5
	Crystal Palace - Croydon			
202	Crystal Palace - Greenwich	6	7	6
	Greenwich - Crystal Palace		4	
227	Bromley - Crystal Palace	8	6	7
	Crystal Palace - Bromley			
249	Clapham - Crystal Palace	5	6	6
	Crystal Palace - Clapham		3	
354	Crystal Palace - Bromley	3	3	3
	Bromley - Crystal Palace			

Bus Route No.	Bus Route	Frequency (per hour)		
		AM Peak	PM Peak	Saturday (13:00 – 14:00)
358	Orpington - Crystal Palace	4	5	5
	Crystal Palace - Orpington			
363	Elephant and Castle - Crystal Palace	6	6	12
	Crystal Palace - Elephant and Castle		4	14
410	Crystal Palace to Wallington	5	5	5
	Wallington to Crystal Palace			
417	Crystal Palace - Clapham	7	6	6
	Clapham - Crystal Palace			
432	Brixton to Crystal Palace	8	8	8
	Crystal Palace to Brixton			
450	Crystal Palace - Lower Sydenham	5	5	6

Overground and National Rail

6.14.12 Crystal Palace Overground and National Rail Station is located at the southern boundary of the Site accessed from Crystal Palace Station Road. TfL define 960m (12 minute walk) as an acceptable walking distance to access London Underground, Overground and rail services; therefore along with Crystal Palace station, Penge West, Penge East, Sydenham and Gypsy Hill stations all sit within 960m isochrones of the Park providing access to additional Overground, Southeastern, Southern and Thameslink services.

6.14.13 Crystal Palace Station is the terminus station on the East London Overground line to Highbury and Islington. Four services an hour operate from this station.

6.14.14 Southern Rail services operate from Crystal Palace station, providing access to services to London Bridge, Beckenham Junction, South Bermondsey and Sutton. Table 12 sets out the rail services available at this station and their associated frequencies.

Table 12: Crystal Palace Station – Southern Rail services and frequencies

Destination	Frequency (per hour)		
	AM Peak	PM Peak	Saturday
Victoria	5	6	4
London Bridge	7	6	4
Beckenham Junction	2	2	2
South Bermondsay	4	4	2
Sutton	4	4	4
West Croydon	4	4	2

6.14.15 Southern services are also available from Penge West station and Gipsy Hill, whilst Southeastern and Thameslink services are accessed from Penge East station. Table 13 to Table 15 set out the rail services available at these stations and their associated frequencies.

Table 13: Penge West Station – Southern Rail services and frequencies

Destination	Frequency (per hour)		
	AM Peak	PM Peak	Saturday
London Bridge	2	2	2
Caterham	2	0	2
West Croydon	4	6	4

Table 14: Penge East Station – Southern Rail services and frequencies

Destination	Frequency (per hour)		
	AM Peak	PM Peak	Saturday
Orpington	4	3	4
London Victoria	4	4	4

Table 15: Gipsy Hill Station – Southern Rail services and frequencies

Destination	Frequency (per hour)		
	AM Peak	PM Peak	Saturday
South Bermondsey	1	4	2
London Victoria	4	4	4
London Bridge	4	4	4
Beckenham Junction	2	2	2
Sutton	1	1	0

Car Club Bays and Electric Charging Points

6.14.16 Car club spaces are located on Jasper Road, Colby Road, Gipsy Hill Station and Venner Road, all of which are within 15 minutes walking distance of the Park. Future Car Club bays are proposed by LBB in the local area. At present, no electric vehicle charging points are provided within the Park. The closest charging point is available at Penge East station.

Sydenham Villas

6.14.17 The Sydenham Villas development site receives a PTAL rating of 3. The closest bus stops are located on Crystal Palace Park Road, approximately 90m and 180m north-west (southbound and northbound respectively), providing access to the route 227 which runs between Crystal Palace and Bromley. Routes 176 and 197 can be accessed via additional bus stops located approximately 300m south of the Site, adjacent to the junction with Thicket Road. Bus shelters, flag poles and route information are provided at all these bus stops.

6.14.18 Penge West Rail Station is located 500m walk from the Site and Penge East Rail Station is located 1km east of the Site. Crystal Palace Station is located approximately 1.4km walk via local roads which can be reduced to 1.2km via the internal Park footways; however, this is restricted by time due to the limited lighting across the Park making it a less safe route.

Rockhills

6.14.19 The Rockhills development site receives a PTAL rating of 3. The closest bus stop is located directly opposite, providing south and westbound services for routes 122, 227 and 450. Nine additional bus stops are located within a 5 minute walk, on Sydenham Hill, Crystal Palace Parade, Westwood Hill and Crystal Palace Park Road.

6.14.20 Gipsy Hill Rail Station is located 1.7km walk west of the Rockhills development site, whilst Crystal Palace Overground Station is located 1.4km walk via local roads and 1.1km via the internal Park routes.

Vehicular Access

Access and Circulation

6.14.21 There are nine points of access to the Park for vehicles. Anerley Hill is the main public entrance to the Park and is formed of a large priority junction with ghost island right turn facility. A further access point is located immediately to the south providing a connection to Ledrington Road. A through road connects Ledrington Road to the NSC access road, which is lined on both sides with parking. A further two points of public access are located at Penge Gate and Sydenham Gate providing direct access to associated car parking only. The fifth is located at Rockhills known as Old Cople Lane; however, access is limited approximately 200m from the junction with Crystal Palace Parade by a gate restricting access to maintenance of the TV mast. Access to the Thames Water reservoir is also taken via an entrance off this road. Prior to the gate, private access to the Caravan Club is also taken via this road. A further restricted vehicular access to the Crystal Palace transmitting station is located on Crystal Palace Parade, opposite Dulwich Wood Park.

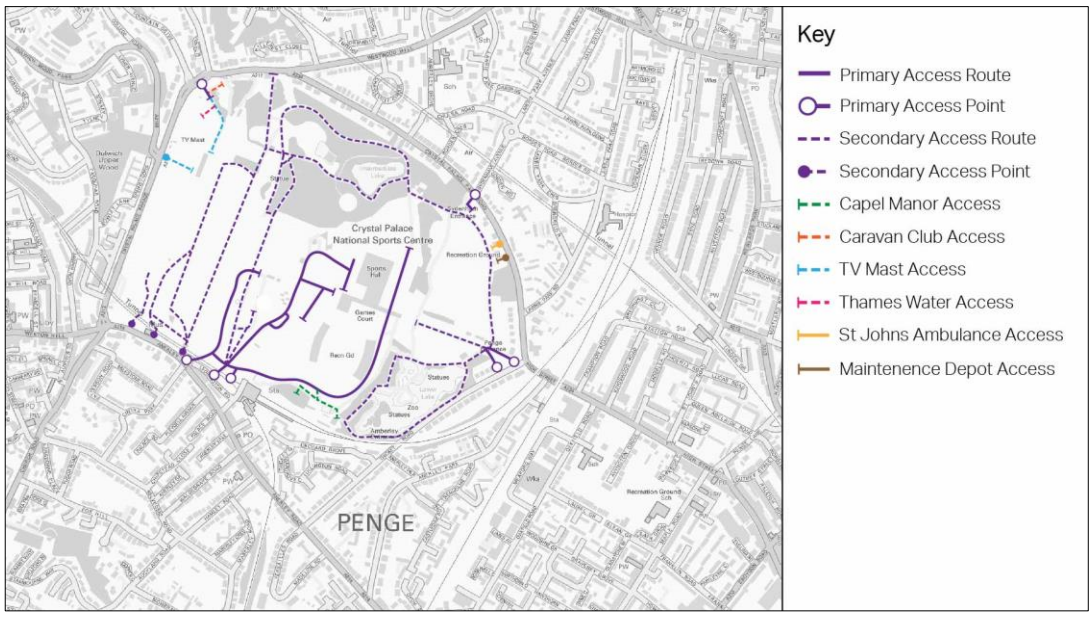
6.14.22 Three 'secondary' points of access exist for maintenance vehicles only, all located on Anerley Hill with two adjacent to the Crystal Palace Museum and one next to the Anerley Hill access, providing routes through to the Palace Terrace and top level of the Park.

6.14.23 The main vehicular routes across the Park are accessed from Anerley Hill, and provide access to the Upper Terrace Car Parks via South Terrace Road, the NSC and various car parks associated with this. A road running parallel to the Jubilee Stadium provides the main access to the NSC. Access to Capel Manor is taken via a secondary route which branches from this road. The route is paved and for the majority of its extents does not feature parking restrictions except for the first 200m closest to Anerley Hill.

6.14.24 There is also a network of secondary roads across the Park which are restricted by gates for access by Park maintenance vehicles only. These comprise of paved and gravelled areas. The main access points to these routes are via a barrier at Penge Gate, a gate on Jubilee Stand Road and gated accesses on Anerley Hill.

6.14.25 Figure 7 illustrates the primary and secondary vehicular access routes across the Park and vehicular access points.

Figure 7: Vehicular Access and Circulation



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Highway Network

6.14.26 The main Park access and two secondary access points are located on Anerley Hill, which runs along the south-western border of the Site. Anerley Hill is a two-way single carriageway road, is subject to a 30mph speed limit and restricted by double yellow lining along its extents. Anerley Hill/Road (A214) runs between the A213 Croydon Road in the south and the A212 Church Road, A214 Westow Hill and A212 Crystal Palace Parade located at the south-western corner of the Site. The junction is a signalised crossroad, featuring one to two lanes in each direction at the stop lines.

6.14.27 Ledrington Road runs parallel to the southern boundary of the Site, is formed of a two way single carriageway road and runs west from Crystal Palace Station Road and terminates adjacent to the Anerley Hill entrance junction to the Park. On street parking bays are located on both sides of the carriageway (pay and display / residential permit holder) and a turning head enables vehicles to turn around. A through road branches off Ledrington Road, providing vehicular access to the Park. Unrestricted parking is permitted on both sides of the carriageway in this location.

6.14.28 Crystal Palace Station Road runs between Anerley Road and Crystal Palace Station where a small car park is located.

6.14.29 Between Anerley Hill and Ledrington Road, Crystal Palace Station Road is restricted by double yellow lining on both sides of the road, with five garages and parking spaces for residents set back from the carriageway. At the northern end the road provides access to the station approach road which provides 11 standard bays and two disabled bays and is a no through road.

6.14.30 Crystal Palace Parade runs along the western boundary of the Site, is subject to a 30mph speed limit and varies between one and two lanes in each direction. One lane in each direction to the north of the bus interchange are marked as bus lanes. Yellow ‘box’ markings restrict stopping at the entry and exit of the Crystal Palace bus interchange. At the north-western corner of the Park, Crystal Palace Parade forms a double roundabout with Fountain Drive, Sydenham Hill, A212 Westwood Hill and the Old Cople Lane access road to the Park.

6.14.31 The existing Caravan Club, which currently occupies the Site, is accessed via Old Cople Lane, at a junction between the two mini roundabouts. Old Cople Lane is a two way single carriageway, which is restricted by double yellow lining on both sides of the carriageway. A layby is provided directly to the south of the access, enabling vehicles to turn around.

6.14.32 Westwood Hill runs along the north-eastern boundary of the Park, is subject to a 30mph speed limit and is formed of a two way single carriageway road. No parking restrictions are present along the section of road in the direct vicinity of the Park. Approximately 215m east of the roundabout, Westwood Hill forms a priority junction with A234 Crystal Palace Road. Westwood Hill continues towards Sydenham, whilst Crystal Palace Park Road continues south-west to where it forms a junction with High Street and Thicket Road.

6.14.33 The A234 Crystal Palace Park Road runs along the north-western boundary of the Park, is formed of a two way single carriageway, is subject to a 30mph speed limit and restricted by single yellow line parking restrictions along its extents. Some on street parking is located along the northern side of the carriageway. At the eastern corner of the Park at Penge Gate, Crystal Palace Park Road forms a priority junction with Thicket Road and becomes the A234 High Street.

6.14.34 Thicket Road runs along the south-eastern boundary of the Park, is formed of a two way single carriageway road and is subject to a 30mph speed restriction. At the entry point at Penge Gate, southbound traffic is prohibited from accessing Thicket Road. Thicket Road is one way between the Penge Gate car park and the junction with Anerley Park Road. The southern section of the road is two way, and no parking restrictions are present allowing parking on both sides of the road.

Parking

6.14.35 The Park currently features a number of surface car parks as well as parking along the main vehicular route to the NSC and ad-hoc parking in un-delineated / grass areas.

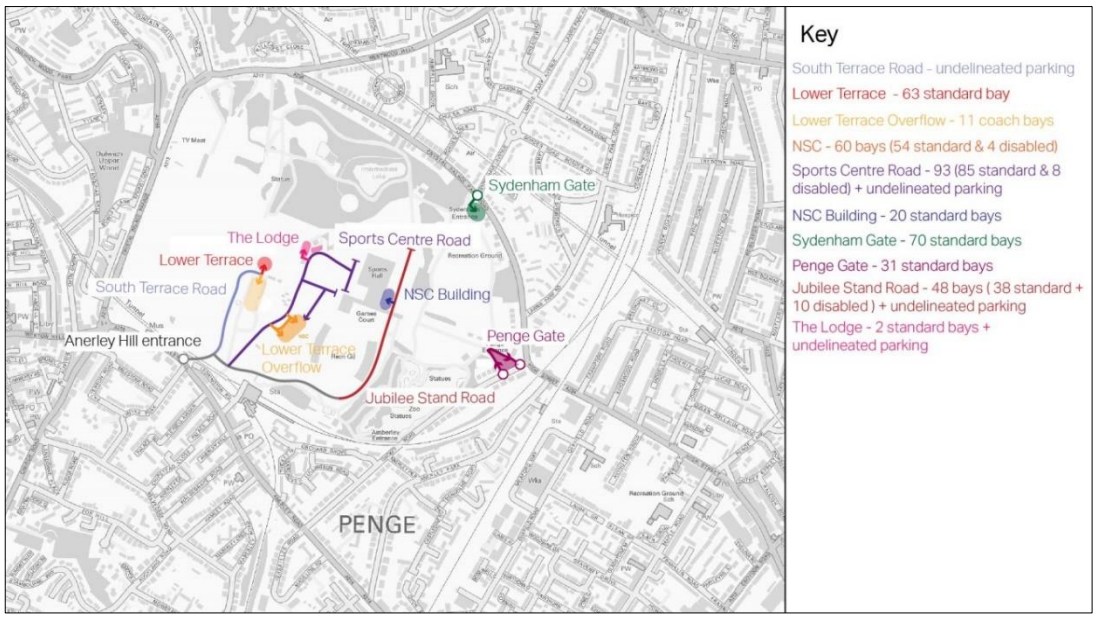
6.14.36 Table 16: Car Park Location and Associated Capacity sets out the number of delineated parking spaces within the Park, whilst Figure 8 illustrates the spatial distribution of these across the Park.

Table 16: Car Park Location and Associated Capacity

Car Park	*Number of Delineated Spaces*		
	Standard	*Disabled*	*Coach*
Lower Terrace Car Park	63	-	-
Lower Terrace Overflow Car Park	-	-	11
South Terrace Road	-	-	-
NSC Car Park	46	6	-
Sports Centre Road (incl. Paxton Axis)	85	8	-
Sydenham Gate Car Park	63	7	-
Jubilee Stand Road	38	10	-
Penge Car Park	29	2	-
The Lodge	-	2	-
NSC Building	20	-	-
Total	**344**	**35**	**11**

Source: Site Visit 27th September 2017.

Figure 8: Crystal Palace Car Parking



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6.14.37 Table 17 illustrates the total number of delineated, un-delineated and overall theoretical capacity for parking across the park within the redline boundary and outside (NSC land). The total number of parking spaces proposed across the park is also set out along with the change in the number of parking spaces.

Table 17: Total Parking Capacity

Scenario	Delineated bays		Un-delineated (grass and hardstanding)		Total Theoretical Parking Capacity	
	Car	Coach	Car	Coach	Car	Coach
Within red line boundary	309	11	480	10	789	21
Outside of red line boundary (NSC)	70	0	85	0	155	0
Total	**379**	**11**	**565**	**10**	**944**	**21**

6.14.38 Table 17 demonstrates that whilst there are 379 car and 11 coach delineated bays across the whole Park, there is theoretical capacity for 944 cars and 21 coaches in total.

Potential Effects

6.14.39 The potential effects of the proposals will be measured both during the demolition and construction and operational phases of the Proposed Development. To determine potential effects a preliminary trip generation has been derived for each proposed use on the Site during both phases of Proposed Development. This provisional trip generation represents an initial estimate of the net effects of the Proposed Development and will be further refined as part of preparation of the planning application.

Demolition and Construction Effects

6.14.40 A preliminary construction traffic estimate has been undertaken based upon:

- An initial cut and fill exercise for the landscaping works proposed across the Park;
- The demolition and construction of new residential development at Rockhills and Sydenham; and
- The construction of a new Cultural Centre adjacent to the subway on Crystal Palace Parade.

6.14.41 Table 18 outlines the daily demolition and construction traffic estimate for the Site assuming all works within the Park are undertaken simultaneously.

Table 18: Daily Construction Traffic Estimate

Type	Arrivals		Departures	
	All Vehicles	Heavy Goods Vehicles	All Vehicles	Heavy Goods Vehicles
Daily	67	34	67	34

6.14.42 Further information about the construction phase of the Proposed Development and the effects of construction traffic on the transport network will be outlined within the Transport Assessment (TA) and Environmental Statement (ES). The transport input will be prepared in accordance with TfL Construction Logistics Plan guidance (Ref. 51).

Operational Effects

6.14.43 A preliminary operational traffic estimate (see Table 19) has been prepared to establish the potential net additional trip generation of the development proposals based upon:

- Residential development at Rockhills and Sydenham totalling 212 dwellings
- A community facility at Rockhills; and
- A new Cultural Centre adjacent to the subway on Crystal Palace Parade.

Table 19: Daily Net Development Traffic Estimate

Mode	*Total Net Increase*		
	AM	*PM*	*Daily*
Rail/ Overground	53	57	579
Bus / Coach	13	17	170
Taxi	0	0	2
Motorcycle, scooter or moped	1	1	11
Driving a car or van	36	53	502
Passenger in a car or van	1	1	12
Bicycle	4	4	44
On foot	5	25	217
Other method of travel to work	1	1	6
Total	**114**	**159**	**1543**

Outline Scope of Assessment

6.14.44 The Traffic and Transport ES chapter will draw upon the findings of the separately prepared TA and will consider the following key transportation issues:

- Policy compliance;
- Accessibility of the Site by all modes of transport;
- Effects on the existing accident record of the highway network;
- The number of additional trips generated by the Proposed Development during the peak hours and across the day and their directional distribution onto the surrounding transport network;
- Effects of the Proposed Development on the local pedestrian and cycle infrastructure and local public transport services;
- Effects of the Proposed Development on the surrounding highway network including operational capacity assessments at junctions where a material traffic impact is identified;
- Identification of the residual effects of the Proposed Development on the surrounding transport network both during demolition and construction and operational phases; and
- Mitigation measures and proposals for encouraging sustainable travel.

6.14.45 The scope of work for the Traffic and Transport ES chapter will be driven by the delivery of the key issues outlined above and in consultation with both TfL and LBB as appropriate.

6.14.46 A separate Transport Assessment Scoping Report (TASR) has been produced and AECOM is in the process of seeking the opinion of TfL, LBB, London Borough of Southwark, London Borough of Lewisham, London Borough of Croydon and London Borough of Lambeth. The TASR outlines the main details of the Proposed Development for the benefit of the key transport authorities and the transport aspects that will need to be examined as part of the TA. This will include proposed assessment locations. In addition, discussions will also be held with TfL and LBB officers to agree the assessment methodology and, where appropriate, assumptions incorporated to the study of the traffic and transport effects of the development of the Site.

6.14.47 The output for the Traffic and Transport ES chapter will identify the Proposed Development effects, the severity of the effects and any necessary mitigation; as well as describing the transportation benefits that the Proposed Development will deliver.

6.14.48 The methodology for the transportation work will be based on the appropriate sections of the National Planning Practice Guidance (2014) and IEMA's Guidelines for the Environmental Assessment of Road Traffic (1993) (Ref. 52).

6.14.49 In accordance with the IEMA guidance the Traffic and Transport ES chapter will consider the effects of the development on:

- Severence;
- Driver Delay;
- Pedestrian delay;
- Pedestrian and cycle amenity;
- Fear and intimidation; and
- Accidents and safety.

6.14.50 The effect of the Proposed Development on each mode of transport will also be assessed in detail with mitigation measures being proposed, where appropriate.

6.14.51 The cumulative effects of the Proposed Development will be considered in combination with other committed developments in the vicinity of the Site, as agreed by TfL and LBB.

6.14.52 The IEMA Guidelines also requires the assessment of hazardous loads: however, as the Proposed Development is not expected to generate any such vehicle movements, no further assessment will be undertaken.

6.14.53 Table 20 indicates how these assessment criteria relate to different modes of transport.

Table 20: Scope of Impact of Assessment Criteria

Assessment Criteria	*Mode of Transport*			
	Car	*Bus*	*Cycle*	*Walk*
Severance	-	-	✓	✓
Driver delay	✓	✓	-	-
Pedestrian/cycle delay	-	-	✓	✓
Pedestrian and cycle amenity	-	✓	✓	✓
Fear and intimidation	-	✓	✓	✓
Accidents and safety	✓	✓	✓	✓

6.14.54 Potential effects will be considered during the demolition and construction and operational phases. Potential effects during the demolition and construction period are typically considered as either short-term or medium-term (i.e. 'temporary'), while potential effects during the operational phase are typically considered as either medium-term or long-term (i.e. 'permanent').

6.14.55 In considering the effects of the Proposed Development on the transport network a number of scenarios will be assessed as follows:

- Existing baseline;
- Future baseline including committed development (i.e. cumulative schemes) traffic; and
- Future baseline including committed development (i.e. cumulative schemes) traffic plus Proposed Development traffic.

6.14.56 To determine existing baseline conditions a series of traffic surveys have been undertaken on the highway network surrounding the Site. These include:

- Junction Turning Counts:
  - Old Cople Lane/A212 Westwood Hill Junction;
  - Sydenham Gate car Park Entrance / Crystal Palace Park Road / Sydenham Ave;
  - High Street / Thicket Road / Penge Car Park Exit (one-way) / Crystal Palace Park Road;
  - Crystal Palace Park Access Egress / Anerley Hill junction;
  - Norwood Gate Junction (A214 Anerley Hill / A214 Church Road / A214 Westow Hill / A212 Crystal Palace Parade);
  - A212 Crystal Palace Parade / Fountain Drive / A212 Westwood Hill Roundabout + Queues;
  - A212 Westwood Hill / Sydenham Hill / A212 Westwood Hill Roundabout + Queues;
  - A212 Westwood Hill / Crystal Palace Park Road junction; and
  - Thicket Road / Penge Car Park Entrance (one-way).
- Automatic Traffic Counts:
  - A234 Crystal Palace Park Road (between Sydenham Ave and High Street);
  - A214 Anerley Hill (between Norwood Gate junction and Park access);
  - A212 Crystal Palace Parade (between Norwood Gate junction and the double roundabout); and
  - A212 Westwood Hill (between double roundabout and Crystal Palace Park Road).

6.14.57 The significance of effect will be determined through consideration of two elements; the magnitude of the impact and the sensitivity of the receptor. The following sections outline the approach that will be used to determine these factors.

Magnitude of Impact

6.14.58 The IEMA Guidelines state that the size of each impact should be determined as the predicted deviation from the baseline conditions, during the demolition and construction phase and during normal operating conditions.

6.14.59 The IEMA Guidelines set out a number of criteria by which the magnitude of impact can be measured (as outlined below). Many of the criteria do not provide specific thresholds by which such impacts can be measured, and as a result the impacts will be measured qualitatively where necessary:

- **Severance** is defined in the IEMA Guidelines as the *"…perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impede pedestrian access to essential facilities"*. The Guidelines suggest that a 30%, 60% and 90% increase in traffic flows will result in a slight (i.e. minor), moderate, and substantial (i.e. major) change in severance respectively. Baseline annual average daily traffic (AADT) flows will be used as the basis of this assessment.
- **Driver Delay** can be determined through the analysis of junction capacity assessments contained within the TA, which will be measured in terms of change in delay per vehicle (in seconds) from the baseline situation. This criterion is considered to be applicable to all modes of transport using the public highway, namely cars, motorcycles, pedal cycles and buses.
- **Pedestrian Delay** is considered to be affected by the changes in volume, composition or speed of traffic, in terms of their respective impacts on the ability of pedestrians to cross roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in pedestrian delay. Pedestrian Delay will be measured at the highway links in the vicinity of the site.

- **Pedestrian and Cycle Amenity** is broadly defined by the IEMA Guideline as *"…the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width / separation from traffic"*. The Guidelines suggests that a tentative threshold for judging the significance of changes in pedestrian and cycle amenity would be where the traffic flow is halved or doubled.
- **Fear and Intimidation** is *"…dependent on the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by such factors as narrow pavement widths"*. In the absence of commonly agreed thresholds it is considered that an average 18 hour traffic flow of 600–200 vehicles has a moderate impact upon fear and intimidation, 1200–1800 vehicles a great impact (i.e. major), and above 1800 vehicles an extreme impact.
- A detailed assessment of **Accidents and Safety** will be carried out by examination of road traffic accident data for the most recent five year period available. This analysis will be included in the supporting TA. Department for Transport (DfT) Transport Analysis Guidance (TAG) (Ref. 53) indicates that a change in accidents of less than 30% has a slight impact while a change of greater than 30% has a significant impact. For the purposes of this assessment, a change of 5–20% is deemed to be 'minor', while a change of 20–30% would be 'moderate', anything above 30% is deemed to be 'major'.

Sensitivity of Receptors

6.14.60 The projected impacts of the Proposed Development will be measured on two separate scales dependent upon the receptor.

6.14.61 In terms of **Driver Delay** and **Accidents and Safety**, the impacts of the Proposed Development will be assessed at junction level. The sensitivity of these receptors will be expressed in terms of Ratio of Flow to Capacity (RFC) or Degree of Saturation (DoS). The worst-case of the AM and PM peak assessments has been taken and thresholds for sensitivity of junctions have been defined as:

- Low Sensitivity: RFC under 85% or DoS below 90%;
- Medium Sensitivity: RFC between 85% and 95% or DoS between 90% and 95%; and
- High Sensitivity: RFC over 95% or DoS above 95%.

6.14.62 In terms of **Severance, Pedestrian Delay, Pedestrian / Cycle Amenity** and **Fear and Intimidation**, the links within easy walking / cycling distance of the Site will be used as receptors. The sensitivity of pedestrian routes and cycle routes is based on a qualitative assessment, taking into consideration the importance and attractiveness of the route and the destinations served. The thresholds are defined as:

- Neutral Sensitivity: Rural road with no pedestrian / cycle facilities provided;
- Low Sensitivity: Strategic vehicular route in a rural setting with pedestrian / cycle facilities provided;
- Medium Sensitivity: Main vehicular route with pedestrian / cycle facilities provided in built up area; and
- High Sensitivity: Lightly trafficked route provided in town centre setting.

Significance of Impacts

6.14.63 In order to determine the significance of an impact on specific receptors, both the sensitivity of the receptors and the magnitude of impact, outlined above will be considered and follow the methodology outlines in Section 6.5.

7. Other Environmental Considerations

7.1 Health, Natural Disasters and Climate Change within the EIA

Health and Natural Disasters

7.1.1 In relation to the provisions within the EIA Regulations, the assessments undertaken within the ES will consider human receptors such as local residents, employees and construction workers. Therefore, the effects of the Proposed Development in relation to health and population will, where relevant, be considered in the technical chapters of the ES, such as Noise and Vibration, Air Quality and Socio-Economics. The effects of the Proposed Development on population and human health will also be addressed within a separate Health Impact Assessment and mitigation measures will be recommended as required within this report.

7.1.2 The Site is not located in an area which is anticipated to be at risk of foreseeable major disasters or accidents. Similarly, as previously stated, areas of the Site are within Flood Zone 1 and therefore, with the predictions relating to climate change, there is 'low' potential risk for future flooding to occur. This risk will be assessed within the Flood Risk Assessment which will be prepared in support of the planning application. Given the nature of the Proposed Development and the Site location it is therefore concluded that no further consideration of natural disasters or major incidents is required for the purposes of the ES.

Climate Change

7.1.3 The key climate projections for the UK (according to the UKCP09 (Ref. 57) which is the name given to the UK Climate Projections) are that:

- Summers will become hotter and drier;
- Winters will become milder and wetter;
- Soils will become drier on average;
- Snowfall and the number of very cold days will decrease;
- Sea levels will rise; and
- Storms, heavy and extreme rainfall, and extreme winds will become more frequent.

This section presents the outcomes of the scoping assessment for climate change. To align with the requirements of the EIA regulations it has been divided into three separate aspects as shown in Table 21.

Table 21: Climate Change Scoping Assessment breakdown

Assessment	*Description*
Lifecycle greenhouse gas (GHG) impact assessment	Impact on climate change of GHG emissions arising from the Proposed Development
In-combination climate change impacts assessment	Combined effect of the impacts of the Proposed Development and potential climate change impacts on the receiving environment[1].
Climate change resilience assessment	The resilience of the Proposed Development to climate change impacts.[2]

Lifecycle GHG Impact Assessment

7.1.4 At present, the site has a range of land use including parkland, associated leisure facilities and other buildings including a nursery, lodge and St Johns Ambulance facility. The Proposed Development will involve the demolition of some of the existing buildings as well as construction of new facilities such as residential units and a community centre as well as landscaping and repair of heritage assets. A range

[1] In line with IEMA guidance (Ref. 58), the combined effect of the impacts of the Proposed Scheme and potential climate change impacts on the receiving environment are referred to as 'in-combination impacts' and 'in-combination effects'.
[2] As set out in the Climate Change Act 2008, including a reduction of at least 80% on 1990 levels by 2050. Currently UK greenhouse gas emissions are about 42% lower than in 1990. Since 2012, emissions reductions have been largely confined to the power sector, whilst emissions from transport and building stock are rising. Committee on Climate Change, 2017 [online] https://www.theccc.org.uk/publication/2017-report-to-parliament-meeting-carbon-budgets-closing-the-policy-gap/ (Accessed 08.09.2017) (Ref. 59)

of GHG emissions (and carbon sinks) are expected to be associated with both the existing land use as well as the Proposed Development including from the "in-use" phase from operational energy of the existing (and new) buildings and embodied energy associated with materials used in the construction phase.

7.1.5 Based on the outline nature of the application the GHG assessment will focus on identifying and discussing the expected GHG emissions across the lifecycle of the Proposed Development. Where the level of detail in design enables, GHG emissions will be quantified and reported as tonnes of carbon dioxide equivalent (tCO_2e) and consider the six Kyoto Protocol gases:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Sulphur hexafluoride (SF_6);
- Hydrofluorocarbons (HFCs); and
- Perfluorocarbons (PFCs).

7.1.6 All GHG emissions will contribute to global climate change and can therefore be considered to have some level of significance. The UK has legally binding GHG reduction targets and therefore the level of significance will consider how the Proposed Development will contribute to the National GHG inventory and the UK achieving its reduction targets. The baseline for the GHG assessment of the Proposed Development will be a 'Do Nothing' scenario i.e. where the Proposed Development does not go ahead and the land remains in its current state.

7.1.7 The GHG assessment will identify GHG hotspots associated with the Proposed Development and focus mitigation efforts in areas with the most potential for GHG reduction. Mitigating measures to be considered will include:

- A Construction Environmental Management Plan (CEMP) prepared and implemented by the selected construction contractor to include a range of best practice construction measures;
- Identification of alternative materials with lower embodied GHG emissions; and
- Low carbon design specifications such as energy-efficient lighting and durable construction materials with enduring design life to reduce maintenance and replacement cycles.

In-Combination Impacts

7.1.8 Projected changes to average climatic conditions, as a result of climate change, and an increased frequency and severity of extreme weather events (such as heavy and/or prolonged precipitation, storm events and heatwaves) have the potential to impact the ability of the surrounding natural environment to adapt to climate change. The key parameters of climate change as identified within UKCIP09 are: changing temperature, changing rainfall quantities and frequency, wind strength and sea level rise.

7.1.9 The main in-combination impact of the climate change parameters and the Proposed Development is considered to be the potential for changes in surface water run-off. Mitigation measures to reduce the impacts identified will be developed as part of the assessment of flood risk and drainage within the Flood Risk Assessment and Drainage Strategy, we have assumed that no further assessment of in-combination affects will be required as part of the ES.

Climate Resilience

7.1.10 Climate change resilience relates to the resilience of the Proposed Development to climate change. This will be considered through the design options appraisal process and will be presented in within *ES Vol I - Chapter 4: Proposed Development.*

8. Environmental Topics to be 'Scoped Out' of the EIA

8.1 Arboriculture

Summary baseline context

8.1.1 A walkover tree survey in accordance with BS5837: 'Trees in relation to design, demolition and construction – Recommendations' (Ref. 63) was undertaken in October 2017 which identified the quality and value of the existing trees on Site and the spatial constraints associated with them. Tree dimensions, health and structural condition, quality category and likely remaining useful contribution (in years) have been considered.

8.1.2 The majority of trees on the Site were categorised as being of moderate quality (417 of 637 in total). 95 trees have been classed as high quality and 107 trees as low quality. 18 trees were considered unsuitable for retention regardless of any proposed development on Site.

8.1.3 The trees on Site are predominantly broadleaved in nature with scattered conifers such as cedar of Lebanon and yew, and range from young to mature in age class.

8.1.4 Prominent species recorded include lime, London plane, oak and horse chestnut. Willow species are well represented around the lakes. A number of more unusual or ornamental species such as cut leaved beech (*Fagus sylvatica* 'laciniata'), weeping beech (*Fagus sylvatic* 'pendula') and wild service tree (*Sorbus torminalis*) were identified on-site.

8.1.5 The trees generally form a group feature around the periphery of the formal parkland along with avenue plantings and scattered individuals as well as clumps adjoining the established access routes across the park. Trees found in the west of the Site are often typically self-sown specimens on areas of unmaintained land and there are established belts of closely spaced trees to the north and western parts of the Site in particular.

8.1.6 The trees of the highest value include individual and grouped mature trees or various species, particularly those at the periphery of the Site as well as key trees and group features which provide the greatest amenity to visitors and the wider locality.

8.1.7 The receptors potentially affected by any impact to trees within the Site boundary include residential properties and road users outside of the Site boundary, as well as pedestrian visitors to the park, associated sports complex, museum and college grounds.

8.1.8 A Tree Constraints Plan has been produced and sets out the spatial constraints associated with the trees on and immediately adjacent to the Site.

Additional assessments

8.1.9 Following design freeze, an Arboricultural Impact Assessment will be developed to consider the likely direct and indirect impacts of the Proposed Development on the trees on Site. This will constitute a desk top analysis of the proposals for the Site overlaid onto the Tree Constraints Plan and will identify those trees to be removed in relation to the Proposed Development. This will consider how trees to be retained can be protected throughout the construction phase. Suitable mitigation measures will also be recommended as appropriate. This could include the use of robust tree protection fencing to create an exclusion zone around retained trees and the use of fit for purpose ground protection where access is unavoidable. Other measures include specialist foundations for new structures which are being proposed close to retained trees, hard surfacing installed using a no dig methodology, services installed or diverted via trenchless techniques or carefully hand dug excavations can also be implemented to allow for the retention of significant tree roots.

8.1.10 A Tree Protection Plan will set out the required locations of measures to protect retained trees and will also identify trees for removal.

8.1.11 This assessment will be a stand-alone report included as a Technical Appendix to the ES.

8.2 Daylight, Sunlight, Overshadowing, Solar Glare

8.2.1 Daylight, Sunlight and Overshadowing considers the potential for likely significant effects caused by reductions in available direct sunlight and daylight to be created by new structures associated with the Proposed Development.

8.2.2 The BRE BR209 (2011) 'Site layout planning for daylight and sunlight – a guide to good practice' (the 'BRE guidance') (Ref. 64) and the British Standard (2008) 8206 Part 2 (Ref. 65) are the current industry guidance documents which cover daylight, sunlight and overshadowing matters. Effects to daylight, sunlight and overshadowing have been considered in line with the methodology and recommendations provided within the BRE guidance.

8.2.3 Typically, construction and operational, phases are assessed, unless there is a period of long-term rolling construction where additional interim assessments are necessary. These works phases consider the following:

- Construction phase assessment considers the effects of temporary construction works and mobile equipment from commencement to completion of all construction activities.
- Operational, phase considers the Proposed Development in its completed state, including the existing permanent structures and context that will be retained, plus any new features and the built development in place.

Summary Baseline

8.2.4 Existing Site conditions are considered as the baseline conditions, to establish the daylight and sunlight access available to existing or consented development, or wildlife / habitat found within, adjacent to or in close proximity of the Site boundary.

8.2.5 Baseline conditions are identified from a review of the Site and surrounding context, this process includes a Site survey, Site photography and review of aerial mapping for buildings and spaces internal and external to the Site boundary. They consider the current daylight and sunlight accessing within the Site and within the immediate and surrounding area to identified receptors. Receptors are primarily expected to be comprised of wildlife and habitats found within the Park, in addition to existing residential development which borders the Site. The area including the Site and potential receptors comprises the study area, within which the likelihood for significant effects is reviewed.

Built Environment and Context

8.2.6 The Park is designated as the largest park in South London, with the majority of land used for recreation and green space amenity. Structures found within the Site are generally low in height, in the region of one to two storeys, with the exception of those found within the NSC boundary which range from a single storey up to 13.

8.2.7 Whilst the Park contains areas of hardstanding the majority of the Park is designated as green amenity space, with dense, mature landscape and woodland found throughout the interior as well as along the Site boundary. Much of the Site perimeter between the public realm, and adjacent residential development found primarily along Crystal Palace Park Road and Anerley Hill, is expected to be largely protected from any effects of new built development within the Park by existing hedgerows, shrubs and trees which contribute to current shadowing conditions.

8.2.8 There are three main bodies of water within the Park, two of which are to the north of the Site, and the largest, the Tidal Lake, to the south.

8.2.9 Wildlife and habitat are associated primarily with the woodland, scrub and standing water. Previous ecological surveys (refer to the 'Ecology and Biodiversity' section of this report) have confirmed that there is likely to be a notable presence of bat, bird and potentially invertebrates which are significant and protected, or in the case of the Tidal Lake, a designated place of importance for breeding and wintering waterfowl.

8.2.10 With the relatively undeveloped nature of the Site in comparison to the wider area, it is expected that there is greater potential for daylight and sunlight effects to be noticeable by wildlife and habitats than

existing residential development which already experiences a degree of obstruction from existing, mature landscape and overall density of the existing built environment in the locality.

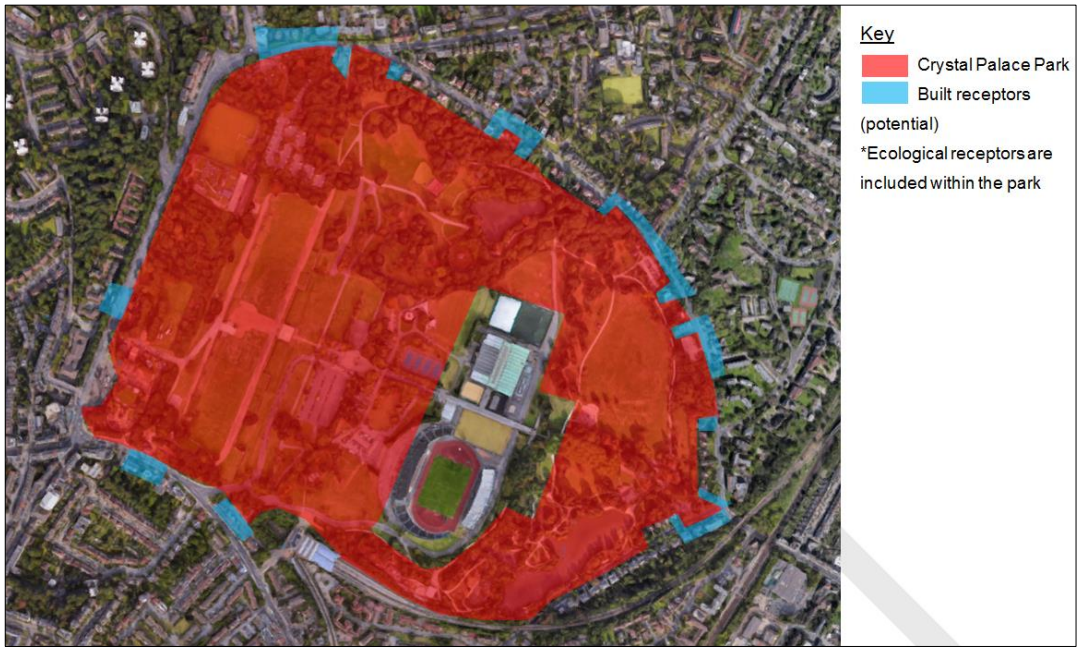
8.2.11 Figure 9 illustrates the indicative receptors within the Site boundary.

8.2.12 There are three main bodies of water within the Park, two of which are to the north of the Site, and the largest, the Tidal Lake, to the south.

8.2.13 Wildlife and habitat are associated primarily with the woodland, scrub and standing water. Previous ecological surveys (refer to the 'Ecology and Biodiversity' section of this report) have confirmed that there is likely to be a notable presence of bat, bird and potentially invertebrates which are significant and protected, or in the case of the Tidal Lake, a designated place of importance for breeding and wintering waterfowl.

8.2.14 With the relatively undeveloped nature of the Site in comparison to the wider area, it is expected that there is greater potential for daylight and sunlight effects to be noticeable by wildlife and habitats than existing residential development which already experiences a degree of obstruction from existing, mature landscape and overall density of the existing built environment in the locality.

Figure 9: Current Site Layout and Indicative Receptors



(Googlemaps overlay – Map data © Google).

Potential Effects

8.2.15 Potential effects are those that are likely to occur but are not able to be physically measured or observed. It is possible to predict certain types of effects through demonstrating a given change in lighting condition through a measurable parameter. Changes in lighting effects that are observed to create a negative response for people, animals and the environment are created by reductions in daylight and sunlight to dwelling which renders a room or space uninhabitable without the introduction of supplementary lighting, or a reduction to daylight and sunlight within habitat or amenity space which results in reduced use of the space or possibly desertion by a species.

Outline Scope of Assessment

8.2.16 The majority of the proposed redevelopment of the Site incorporates changes which do not include the introduction of new structures which have large massing or highly reflective surfaces. This leaves both residential buildings and habitat / amenity space in a relatively similar condition to the existing Site, and is likely that any potential change to daylight and sunlight access will be minor and not contribute to a significant change to receptors. As such, it is recommended that assessment of Daylight, Sunlight, Overshadowing and Solar Glare be 'scoped out'.

8.3 Water Resources and Flood Risk

8.3.1 The potential impacts of the Proposed Development on the water environment are considered in this section. The water environment includes surface water quality, groundwater quality, hydromorphology, flood risk and drainage. Baseline information has been reviewed in the context of the proposed development in order to identify potentially significant effects.

Summary Baseline Context

8.3.2 The Site is approximately 80 hectares (ha) in area and is centred on National Grid Reference TQ 342 709. The topography of the Site shows a general decline in elevation form the northwest of the park (approximately 90m AOD) towards the southeast of the park (approximately 55m AOD).

8.3.3 A study area of approximately 1km around the site has been considered in order to define surface water bodies that could reasonably be affected.

8.3.4 There are three main lakes and ponds within the red line boundary for the Proposed Development, two of which are to the north of the Site ('Intermediate' lakes/ponds) at an elevation of around 70m AOD, and the largest, the Tidal Lake, is to the southeastern corner at the low point of the Site with an elevation of around 60 m AOD. Due to its location at the low point, the Tidal Lake is downslope from the majority of working areas. Ordnance Survey mapping does not show any obvious connectivity between these lakes/ponds and any other waterbodies.

8.3.5 The Site is situated in the catchment of Pool River, which rises close to Kent House Rail Station in New Beckenham and flows in a generally northerly direction to meet the Ravensbourne River at NGR TQ 37275 73042. Pool River is designated as a Main River and is a reportable reach under the Water Framework Directive (WFD). The waterbody ID for Pool River is GB106039023250, and it is currently classified as being at Moderate Ecological Potential. However, Pool River does not fall within 1.5 km of the eastern boundary of the Proposed Development, and it is not reasonable to assume that any overland flow from the site would reach the river due to the network of roads and railway lines that lie between the Site and the river. As such, Pool River is scoped out of further assessment.

8.3.6 The bedrock and superficial geology for the area has been identified from British Geological Survey (BGS) online mapping (available at http://mapapps.bgs.ac.uk/geologyofbritain/home.html). The bedrock beneath the western extent of the Development Site consists of Claygate Member – Sand, Silt and Clay, and is designated as Secondary A aquifer. The eastern extent of the Development Site is underlain by London Clay Formation – clay and silt, which is unproductive strata. There is a patch of superficial geological deposits at the western margin of the park which is Sand and Gravel of Uncertain Age and Origin, with a small patch of Head deposit - Clay, Silt, Sand and Gravel immediately south of the park.

8.3.7 According to the Environment Agency's What's In My Backyard website (http://maps.environment-agency.gov.uk/wiyby) there are no surface or groundwater abstractions within 1.5 km of the Proposed Development. The Site is not within a Groundwater Source Protection Zone, Nitrate Vulnerable Zone or a Drinking Water Safeguard Zone for surface or groundwater.

8.3.8 Any impacts to the groundwater aquifers from the Proposed Development will be captured within the assessment of Ground Conditions and Contaminated Land (see section 6.11).

8.3.9 There are two sites of ecological importance within 1 km of the Proposed Development. Dulwich Upper Wood LNR is located approximately 100 m west of the Site, to the west of Crystal Palace Parade. Sydenham Hill Wood and Fem Bank LNR is located approximately 350m northwest of Crystal Palace Park. Neither site is dependent on water resources from the Proposed Development Area, with both being upslope from the park.

Potential Effects on Water Resources

8.3.10 The Development has the potential to result in surface water quality effects during its construction and operational phases, notably to the three Lakes and Ponds located within the Proposed Development Site.

8.3.11 During construction works the following potential effects may occur:

- Changes in the rate and volume of surface water runoff entering the identified waterbodies due to earthworks and changes in land use;
- Changes in the natural form which may have an subsequent effects on surface water drainage patterns in the Proposed Development Site;
- Increased sediment supply to waterbodies through earthworks and erosion of exposed soils by runoff, potentially impacting water quality and geomorphology of water bodies (i.e. the Intermediate and Tidal Lakes/ponds);
- Potential supply of construction material (e.g. concrete) to waterbodies through accidental spillage or leakage of fuel oils and lubricants from construction vehicles, with impacts on surface water and groundwater quality.

8.3.12 During the operation phase of the development the following potential effects may occur:

- Potential deterioration in surface and groundwater quality, and excess fine sediment input to waterbodies from catchment runoff during usage of the Proposed Development (e.g. operation of the access roads);
- Increased local demand on the capacity of public sewers and waste water treatment provision; and
- Increased local demand for potable water supply.

Mitigation Measures

8.3.13 In order to avoid, prevent, minimise and reduce adverse effects to the waterbodies (surface and groundwater) at the Proposed Development Site, both direct and indirect, a Construction Environmental Management Plan (CEMP) would be required to be developed by the Contractor. The CEMP would be reviewed, revised and updated once the project progresses towards construction to ensure all potential impacts are considered and addressed as far as practicable in keeping with available good practice at that point in time. The principles of mitigation and the measures set out below are the minimum standards that the Contractor would implement. Methods of dealing with pollutant risk will need to continually be reviewed and adapted as construction works progress (e.g. the management of construction site runoff containing excessive levels of fine sediments).

8.3.14 The CEMP would be standard procedure for the Proposed Scheme and will describe the principles for the protection of the water environment during construction. The CEMP would be supported by a Water Management Plan that will provide greater detail regarding the mitigation to be implemented to protect the water environment from adverse effects during construction.

8.3.15 The construction of the Proposed Development would be undertaken in accordance with good practice. CIRIA document C741, 4th Edition (2015) Environmental good practice on site contains examples of best practice measures which can be used in specific situations. For example there is a case study on use of non-potable water, and reducing sediments within silty site runoff water. SuDS should be utilised wherever possible for drainage solutions.

8.3.16 In particular, the measures outlined below, which are included in the CEMP, would be required for the management of fine particulates in surface water runoff as a result of the construction activities:

- All reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing waterbody, arising from construction activities. The measures will accord with the principles set out in industry guidelines including the CIRIA report 'C532: Control of water pollution from construction sites'. Measures may include use and maintenance of tanks and bunds, and consideration of the type of plant used.
- A temporary drainage system would be developed to prevent runoff contaminated with fine particulates from entering surface water drains without treatment during the construction works. This will include identifying all land drains and water bodies on the Site and ensuring that they are adequately protected using drain covers, sand bags, earth bunds, geotextile silt fences, straw bales, or proprietary treatment (e.g. lamella clarifiers).
- Site drainage, including surface runoff and dewatering effluents, will be discharged to sewers where possible and relevant permissions will be obtained from the sewerage or statutory undertaker. Discharge to waterbodies will only be permitted where discharge consent or other relevant approval has been obtained.
- Site drainage will meet the effluent standards required by the sewerage undertaker or the Environment Agency as appropriate. Holding or settling tanks, separators and other measures as may be required, will be provided and maintained. Access will be provided to the sewerage undertaker so that samples of discharge can be obtained and analysed and the flows verified as required.
- The relevant sections of BS 6031: Code of Practice for Earthworks for the general control of site drainage will be followed.

- The approval of the Environment Agency will be sought for works likely to affect any surface or groundwater resource, where relevant.
- Where possible, earth works will be undertaken during the drier months of the year. When undertaking earth moving works periods of wet weather will be avoided, if possible, to minimise the risk of generating runoff contaminated with fine particulates. However, it is assumed that some working during wet weather periods will be unavoidable, in which case other mitigation measures will be implemented to control fine sediment laden runoff.
- To protect watercourse from fine sediment runoff, topsoil/subsoil will be stored a minimum of 20 m from waterbodies on flat lying land. Where this is not possible and it is to be stockpiled for longer than a two week period, the material will, as soon as possible either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a waterbody without prior treatment.
- Appropriately sized runoff storage areas for the settlement of excessive fine particulates in runoff will be provided. It is assumed that treated water will then be pumped (after settlement/treatment) directly to the nearest public sewer, once the relevant permissions have been obtained.
- Mud deposits will be controlled at entry and exit points to the Proposed Development Site using wheel washing facilities and / or road sweepers operating during earthworks activities or other times as considered necessary.
- Equipment and plant are to be washed out and cleaned in designated areas within the Site compound where runoff can be isolated for treatment before removal from site for appropriate disposal at a licenced waste facility.
- Debris and other material will be prevented from entering surface water drainage, through maintenance of a clean and tidy site, provision of clearly labelled waste receptacles, grid covers and the presence of site security fencing.

8.3.17 In addition, measures will be undertaken to manage the risk of accidental chemical spillages on site and potential conveyance to nearby waterbodies. To allow chemicals, fuels / oils and other such substances to enter the water environment could be in breach of the Water Resources Act 1991 (as amended). As such, measures to control the storage, handling and disposal of these substances will need to be put in place prior to and during construction. Measures are to be included in the CEMP and would be in accordance with the Control of Substances Hazardous to Health Regulations 2002, the Control of Pollution (Oil Storage) (England) Regulations 2001 and PPG26. Particular care should be taken with the delivery and use of concrete and cement as it is highly corrosive and alkaline.

8.3.18 Measures to prevent accidental spillages would include, but not be limited to, storage of fuel and other potentially polluting chemicals either in self bunded leak proof containers or secure impermeable and bunded areas (minimum capacity of 110% of the capacity of the containers); washing down of vehicles and equipment to take place in designated areas and wash water to be prevented from passing untreated into waterbodies or surface drainage; and a commitment to the implementation of an Emergency Response Plan for spillages.

Outline Scope of Assessment

8.3.19 The proposed redevelopment of the Site does not include any physical alterations to the existing waterbodies, namely the Tidal and Intermediate lakes/ponds. There are no additional surface water receptors within 1 km of the Site, and no dependence of nearby sites of ecological importance on surface water. Presuming that standard mitigation for control of surface water runoff and prevention and control of accidental spillages is accounted for within the CEMP as described above, then further assessment of the impacts of the Proposed Scheme on the surface water environment can be 'scoped out' of the full Environmental Statement. However, assessment of impacts to groundwater will be incorporated within the Ground Conditions and Contaminated Land chapter.

Fluvial Flood Risk

8.3.20 The Site is located in an area classified as Flood Zone 1 by the Environment Agency (EA). This represents land assessed as having a 'low risk' of fluvial or tidal flooding, of less than 1 in 1,000 annual probability (<0.1%).

8.3.21 The National Planning Policy Framework (NPPF) details acceptable compatibility between flood zones and development types. According to Table 3 in the NPPF technical guidance, all development types are deemed to be acceptable in Flood Zone 1 without the need for further justification.

8.3.22 According to the 2017 London Borough of Bromley Strategic Flood Risk Assessment (SFRA) (Ref. 60), the area is not considered likely to be at risk of fluvial flooding in the future, considering the anticipated impacts of climate change.

8.3.23 The construction and operation of the Proposed Development is unlikely to have any impact on existing levels of fluvial tidal flood risk.

Pluvial Flood Risk

8.3.24 EA online mapping shows that areas of the Site are at medium to high risk of flooding from surface water, particularly around the area of the NSC and other topographically low lying areas. Due to the steep gradient of the Park from north-west to south-east and clay subsoils it is likely that overland flow within the Park would flow towards the existing lakes and ponds in the south.

8.3.25 No historic flood incidents have been recorded in the local area, according to the Bromley SFRA.

8.3.26 Construction activities may disrupt existing surface water flow pathways and, post-development, existing levels of surface water flood risk may be exacerbated by an increase in impermeable surfacing or changes in topography. This may also be influenced by increased rainfall as a result of climate change over the lifetime of the Proposed Development.

8.3.27 In order to mitigate the risk of surface water flooding to the Site and its surrounding areas, the Proposed Development will be required to incorporate sustainable drainage measures. The Site drainage strategy will need to provide suitable attenuation to reduce peak discharge to the required rates and be developed in accordance with the Sustainable Drainage Systems (SuDS) Hierarchy (as described within Policy 5.13 of the London Plan). The drainage system will be designed to provide sufficient capacity to cater for up to the 1 in 100 year storm event, incorporating the latest guidance regarding climate change. The proposed site drainage is required to be in accordance with the guidance issued by the LBB, as the Lead Local Flood Authority (LLFA).

Groundwater Flood Risk

8.3.28 According to the BGS Groundwater Flooding Susceptibility dataset (Ref. 61), the Site is located in an area with potential for groundwater flooding to occur below ground level, or at the surface. However; there has been no recorded evidence of historic groundwater flooding in the vicinity of the Park.

8.3.29 There is some potential for groundwater flooding to impact upon below ground excavations, or the operation of any below ground areas. As such, appropriate methodologies will be required to manage the risk of flooding during the construction phase. This may include dewatering of any deep excavations, and implementation of construction phase drainage measures. Waterproofing measures may be required to manage the risk of groundwater flooding to any below ground development areas.

Sewer Flood Risk

8.3.30 According to mapping produced during the SFRA, the Site is located in a postcode area which has experienced between 0 and 5 previous sewer flooding incidents. There is no other information to suggest that the Site is likely to be at risk of sewer flooding.

8.3.31 The Proposed Development will lead to new sewer connections and an increase in the load of foul sewage being discharged from the area. Application to Thames Water will be required for any new sewer connections and LLFA approval will be required for any works in the vicinity of the existing lakes

and ponds within the Park. Low flow devices are also recommended for installation within the Proposed Development.

Artificial Flood Risk

8.3.32 The EA mapping (Ref. 62) indicates that the Site is not at risk of flooding due to reservoir breach.

8.3.33 Several lakes and ponds are present throughout the area and within the Site; however, there is no known flood risk associated with these waterbodies. There may be a risk associated with construction activities in the vicinity of the existing lake and pond areas within the Site; however, this can be managed through appropriate construction techniques.

Conclusions

8.3.34 In summary, it is considered that appropriate mitigation measures can be implemented to manage any residual flood risk. These mitigation measures will ensure that the Proposed Development has no adverse impact on the Site or its surrounding area with respect to flood risk and that the residents and users of the Site (and Park) will be safe from all sources of flooding. Therefore, the Site is considered appropriate for its intended use and there are no significant effects in terms of flood risk likely as a result of the Proposed Development.

8.3.35 A site-specific flood risk assessment will be undertaken for the Proposed Development to confirm in further detail whether the Site may be at risk of flooding from any other sources, and recommend appropriate mitigation measures. The Proposed Development will also be supported by a site-specific Drainage Strategy.

8.3.36 Given that the application will be supported by a site-specific FRA and Drainage Strategy, which will identify any mitigation that may be required to be incorporated into the Proposed Development; it is considered that flood risk issues are unlikely to result in significant environmental effects and may be scoped out of the ES.

8.3.37 The impacts on surface waterbodies in a study area of up to 1 km from the Proposed Development have been considered. Only the three lakes/ponds within the Site are likely to be at risk of being impacted, and this could be through receipt of polluted water from construction runoff relating to earthworks and erosion, and/or pollutants from accidental spillages. These potential construction impacts should be negligible given the standard mitigation practices that would be included in the CEMP. Operational impacts are expected to be minimal and any issues relating to runoff containing contaminants from access roads will be considered within the Drainage Strategy. The nearest surface watercourse (which is Main River) is the Pool River approximately 1.5km to the east of the Site. No impacts to this watercourse are envisaged. As such, impact assessment to surface water receptors is 'scoped out' of further work.

8.3.38 Impacts to groundwater from construction runoff and accidental spillages will be mitigated for by standard procedures outlined in the CEMP, but will be given further consideration within the Ground Conditions and Contaminated Land impact assessment chapter.

8.3.39 The potential impact regarding increased local demand on the capacity of public sewers and waste water treatment provision for new buildings will be considered within the site-specific Drainage Strategy.

8.4 Lighting

8.4.1 Lighting considers the potential for likely significant effects to be created by new artificial lighting associated with the Proposed Development. Crystal Palace Park is designated as the largest park in South London, with the majority of land used for recreation and green space amenity. It is expected that there will be light sensitive species or habitat present within the Site. There are also limited occurrences of residential properties associated with the Site periphery.

8.4.2 With a focus on reinvigorating the park as a contemporary and historic showcase to create a place of discovery, learning, recreation and fun, it is expected that a new lighting strategy will be introduced to encourage use of the Park during the hours of darkness.

8.4.3 New temporary and permanent lighting resulting from the Proposed Development has the potential to cause changes to the night-time visual envelope and be noticeable to identified sensitive receptors. A lighting assessment will be undertaken in support of a planning application for the redevelopment of the Site following the recommendations provide by the Institute of Lighting Practitioners' (ILP) guidance notes for the reduction of obtrusive light (GN:01-2011) (Ref. 66).

8.4.4 Typically, construction and operational, or post-construction, phases are assessed unless there is a period of long-term rolling construction where additional interim assessments are necessary. These works phases consider the following:

- Construction phase assessment considers the effects of temporary lighting required for safe working and Site access from inception to completion of all construction activities; and
- Post-construction, or operational, phase considers the Proposed Development in its final form, including permanent elements of the existing lighting and context that will be retained, plus any context change and the new lighting provision in place.

8.4.5 In order to carry out an assessment of a new lighting installation, the area that the new or changed installation is planned for is reviewed. This process establishes the baseline condition and identifies the characteristics for lighting in a particular area, or environmental zone, as well as identifying specific receptors that may be affected by a change in their local lighting condition.

Summary Baseline

8.4.6 Existing conditions of the Site are considered to be baseline conditions, which are reviewed in order to establish the current night-time lighting condition experienced by existing development, or wildlife / habitat found within the Site boundary, adjacent to the Site boundary, or considered to be in close proximity. Baseline conditions are identified from Site and context review which includes Site survey, Site photography and aerial mapping for development and lighting installations internal and external to the Site boundary.

8.4.7 Baseline conditions consider the performance of lighting within the Site and surrounding area, and how current lighting installations affect identified receptors. Receptors are primarily expected to be comprised of wildlife / habitat found within the Park, and existing residential development outside of it. The area including the Site and potential receptors which are likely to be affected by a change in lighting condition comprise the study area, within which the likelihood for significant effects is reviewed.

Built Environment and Context

8.4.8 The Park itself is mixed in terms of both use and accessibility. It contains sections which are considered to be dilapidated and others which retain a more ‘park-like’ setting. The parkland is split by the existing structures of the NSC with the surrounding land owned and managed by the LBB. For the purposes of this technical topic, only the areas of the Park under LBB ownership are included within this study.

8.4.9 LBB land contains areas of hardstanding used for car parking, paved paths, and water bodies. The majority of the Park is designated as green amenity space, with dense, mature landscape and woodland found throughout the interior as well as along the Site boundary. While not covering the full Site, plantings are extensive and much of the Site perimeter between the public realm and adjacent residential development is expected to be largely screened / protected from direct views of the Park interior by dense hedgerows, shrubs and trees throughout the year.

8.4.10 Woodland, scrub and other plantings are found predominantly toward the north of the Site, and more direct views are likely to occur from the south-west as the plantings are sparser. Additionally, there are three main bodies of water within the Park, two of which are to the north of the Site, and the large Tidal Lake to the south.

8.4.11 Wildlife and habitat are associated primarily with the woodland, scrub and standing water. Previous ecological surveys (refer to the ‘Ecology and Biodiversity’ section of this report) have confirmed that there is likely to be a notable presence of bat, bird and potentially invertebrates which are significant due to the rarity of species, or in the case of the Tidal Lake, a designated place of importance for breeding and wintering waterfowl. Where sensitive species are confirmed as being present, reference should be made for ecological recommendations to limit obtrusive effects to either the species or identified habitat. This may require avoidance of placing light in sensitive locations to preserve dark areas and corridors, or introducing more stringent requirements for obtrusive effects, such as for light spill to be limited to 1 lux or below, where lighting is needed.

8.4.12 Lighting is not prevalent within the Site, and the majority of lighting found on-site is associated with existing vehicle / pedestrian shared surfaces or the sport facility near the NSC. This lighting is provided by a combination of street light style luminaires and floodlighting. Building perimeter lighting has been observed around existing buildings at ground floor level.

8.4.13 Lighting outside of the Site boundary is consistent with a fairly dense, urban context. The majority of illumination near the Site is associated with highways, residential development and an assortment of commercial, retail and leisure uses.

Built Environment and Brightness District Classification

8.4.14 The degree to which an artificial lighting installation is likely to impact on an environment is in part dependent on visual context. Lighting installations in areas of low district brightness are likely to have a greater effect on their environment than those in areas of high district brightness. By establishing the category of local area or district brightness, then appropriate lighting characteristics can be recommended which will ensure the new lighting installation will fit with minimal obtrusion. The ILP have provided recommendations and guidance intended to limit obtrusive lighting effects in the context of district brightness and good practice within GN:01-2011.

8.4.15 Although located within a built up urban context, the overall Site is not considered to be brightly lit, nor is it considered to be intrinsically dark, but it sits within an area that combines predominantly residential development, moderate levels of night-time activity, and open green space that serves both public amenity and habitat for wildlife.

8.4.16 The area associated with the surrounding area is considered be a lighting environmental zone E3, which, as a general rule, has roads lit to traffic route standards and a moderate population density. The Site itself is considered to be more of a combination of lighting environmental zones E1 / E2, which considers little to no lighting of roads or paths and a generally low or transient population.

8.4.17 ILP Guidance GN:01-2011 recommends that the more stringent lighting zone be applied when an area falls within the influence of two different lighting zones and this indicates that an environmental zone E1 should be applied. It is recommended, however, that considering the nature of Proposed Development, most of it may be treated more as a rural type setting and a lighting environmental zone E2 may be considered to be more appropriate for destination locations and navigable routes where increased space use at night is encouraged.

Potential Effects

8.4.18 Potential effects are those that are likely to occur but are not able to be physically measured or observed. It is possible to predict certain types of effects through demonstrating a given change in lighting condition through a measurable parameter. Changes in lighting effects that are observed to create a negative response for people, animals and the environment are created by light that strays away from the area that is being lit, results from a too bright installation, or from lighting that is not correctly aimed.

8.4.19 While the effects of a lighting installation may be commented on, the visual impact for both construction and operational lighting to adjacent properties is subjective and will not form part of the analysis. The three direct metrics that are tested include:

- Light Spill, which is considered to be ‘the spilling of light beyond the boundary of the site on which a light source is located’, to a degree which causes a visual nuisance. Light Spill is often considered to be the intrusion of light into homes; however it may occur when light reaches an area where it is not intended. Light Spill can have a negative impact on wildlife and ecological systems local to an installation.
- Sky Glow, which is considered to be ‘the brightening of the night sky’ above illuminated areas. This brightness created is constantly varying as a function of many parameters such as direct upward-lighting, ground surface reflectance, overhead cloud cover, and the degree of water droplets in the atmosphere - rain, fog/mist, and snow, for example, exacerbate the effect.
- Glare, which may include the placement of luminaires, their optical and photometric characteristics, how brightly they are lighting a building or external space compared to the relative brightness of the viewing context.

8.4.20 Elements of a lighting installation that can contribute to these effects may include:

- Light Levels and Illuminances – New developments often require or warrant lighting installations for functional safety or aesthetic purposes. A new lighting installation has the

potential create a noticeable difference in local area brightness. Often this is the result from overlighting that reflects off buildings and surfaces into receptors or the sky.

- Light Colour / Spectral Composition – Light colour has the potential to alter an individual's perception of their environment with respect to colour and clarity, as the human eye responds best to whiter light with higher quantities of ultraviolet wavelengths. Various wildlife species may respond differently to a UV rich spectral composition depending on how reliant they are on darkness; many nocturnal animals continue their social habits and feeding behaviours with increased activity in the area while others may decrease their activity and possibly desert their habitat.
- Materials / building illuminance – Materials that are used for ground and building surfaces should be considered in line with lighting environmental recommendations when they will be lit at night. Darker, less specular materials reflect less light and may require higher output lamps than lighter and more reflective surfaces to achieve the same effect. Using higher power lamps, surfaces with higher reflectances can appear overlit against a dark background or reflect light into the night sky, contributing to local area sky glow.

8.4.21 New temporary and permanent lighting as part of a new installation has the potential to cause change in the night-time visual envelope. This assessment focuses on potential permanent lighting effects and considers the development in its final form.

Outline Scope of Assessment

8.4.22 New lighting as part of the proposed redevelopment of the Site is not expected to introduce significantly obtrusive effects as a result of thoughtful lighting masterplan strategy and selection of equipment which supports the desire to introduce a comfortable and complementary aesthetic enhancing the historic park through subtle illumination of key features and connecting pathways.

8.4.23 Due to the controlled nature of the developing design proposals, it is not likely that new lighting will contribute to significant effects to the majority of built receptors, and effects within the Park near habitat areas will be controlled.

8.4.24 On this basis, it is recommended that lighting be 'scoped out' for inclusion into a full Environmental Statement; however, a standalone technical report assessing predicted effects of new lighting is proposed to further support the planning application.

8.5 Socio-Economics

Baseline

8.5.1 According to the Office for National Statistics (ONS) (Ref. 67), the LBB has a total population of over 326,000 inhabitants, of which about 62% are of working age. The borough has an unemployment rate of 4.4%, which is slightly lower than the Greater London average (5.8%). Its strongest employment sectors are health (15%), retail (12.9%) and business administration and support services (11.1%), which is broadly similar to the Outer London employment structure (BRES, 2016). In proximity of the Site there are a total of 37 primary schools (excluding independent, special and free schools), which have a current cumulated surplus of places of 1,901; and a total of 32 secondary schools which have a current cumulated surplus of 5,754 places (Ref. 68). Eight GP practices are also located within 1km from the Site and have a total patient list size of 1,383, which is a better provision than the national target of 1,800 patients per GP (Ref. 69).

Potential Impacts (Construction and Operation)

8.5.2 The Proposed Development will deliver new high quality housing, to deliver private residential units, as well as creating jobs through the construction and operational element of the scheme. There would be a number of new residents introduced into the area through the proposed new housing, and therefore demand on local social infrastructure such as healthcare, education, open space and play space would be likely to increase.

8.5.3 The principal socio-economic impacts of the Proposed Development are expected to be beneficial. The Proposed Development will create new homes and enhance the local public realm. Therefore, it is unlikely that there will be any significant adverse socio-economic effect as a result of the Proposed Development

Mitigation Measures

8.5.4 At this stage no mitigation measures are required as there is sufficient capacity at local schools and primary health infrastructures to absorb the additional residents arising from the occupation of the Proposed Development.

9. Proposed Structure of the Environmental Statement

9.1 Environmental Statement (ES)

9.1.1 The ES will comprise the following set of documents:

ES Volume I: Main Document

9.1.2 This will contain the full text of the EIA with the proposed chapter headings as follows:

- Introduction;
- The Proposed Development;
- Alternatives and Design Evolution;
- EIA Methodology;
- Enabling Works, Demolition and Construction;
- Air Quality;
- Cultural Heritage;
- Ecology and Biodiversity;
- Ground Conditions and Contaminated Land;
- Noise and Vibration;
- Townscape and Visual Impact Assessment;
- Traffic and Transport;
- Effect Interactions; and
- Summary of Environmental Effects and Conclusions.

ES Volume II: Technical Appendices

9.1.3 These will provide supplementary details of the environmental studies conducted during the EIA including relevant data tables, figures and photographs.

ES Non-Technical Summary (NTS)

9.1.4 This document will provide a concise summary of the ES, which will include information regarding the Proposed Development, alternative designs that were considered, likely environmental effects and mitigation measures.

9.2 Planning Application Documents

9.2.1 In addition to the ES, the planning applications will be supported by various documents, as detailed in the Planning Performance Agreement and including:

- Application Drawings (Site location plan(s), existing and proposed floor plans/ sections/ elevations);
- Affordable Housing Statement Financial Viability Assessment;
- Contextual drawings;
- Design and Access Statement;
- Drainage Strategy;
- Energy Statement;
- Environmental Statement (as presented in Section 9.1);
- Flood Risk Assessment;
- Heritage Statement;
- Illustrative drawings;
- Lighting Assessment;
- Planning Application Form;
- Planning Obligations draft Heads of Terms;
- Planning Statement;
- Plans for approval;
- Statement of Community Involvement;
- Sustainability Statement;
- Transport Assessment (including Delivery and Servicing Plan), Residential Travel Plan, Park Travel Plan (including event management plan) & Construction Logistics Plan; and
- Tree Survey / Arboricultural Implications Report.

9.2.2 Given the nature of the regeneration proposals, and the outline nature of the Proposed Development, it is hoped that many of these documents can be relatively simple and concise, and focused on specific areas of the proposals, such as the residential development areas or the Italian Terraces area etc.

10. Summary and Conclusions

10.1 Conclusion

10.1.1 This report requests a Scoping Opinion from the LBB pursuant to Regulation 15 of the EIA Regulations. The EIA Scoping Report suggests a comprehensive scope of work based on previous experience of the assembled team of specialists and existing knowledge of the Site.

10.1.2 LBB and consultees are invited to consider the contents of this report and comment as to whether the scope and methodology proposed is acceptable within the five-week period prescribed by the EIA Regulations.

10.2 Summary of Environmental Topics

10.2.1 To help the reader, Table 21 presents a summary of which environmental topics are to be scoped in and out of the EIA and provides brief justification for those scoped out.

Table 21: Scoping Summary Table

Environmental Topic	*Sub-components*	*Scoped in (✓) or out (x)*		*Reason (if scoping out)*
		Construction	*Operation*	
Air Quality	Fugitive emissions of dust and particulate matter and road traffic emissions of NO_x and PM_{10} at human health receptors	✓	✓	
	Fugitive emissions of dust and particulate matter and road traffic emissions of NO_x and PM_{10} at ecological sites	x	x	Ecological sites within 1km are not likely to be sensitive to air quality impacts
Arboriculture	Arboricultural survey (in accordance with BS 5837:2012), development impact assessment, mitigation measures and tree protection	x	x	Arboricultural survey already completed. The effects of the proposed development in relation to the arboricultural features within and adjacent to the Site will be considered in a stand-alone report, included as a Technical Appendix to the ES.
Climate Change	Climate change projections and impacts, adaptation and mitigation measures	✓	✓	
Cultural Heritage and Archaeology	Cultural Heritage	✓	✓	
	Archaeology	✓	✓	
Daylight, Sunlight, Overshadowing and Solar Glare	Daylight	x	x	The proposed development does not introduce new obstruction which could affect daylight access to buildings, therefore daylight assessment could be scoped out
	Sunlight	x	x	The proposed development does not introduce new obstruction which could affect sunlight access to buildings, therefore sunlight assessment could be scoped out
	Overshadowing	x	x	The proposed development does not introduce new obstruction which could affect daylight and sunlight access to habitat or amenity spaces, therefore overshadowing assessment could be scoped out
	Glare	x	x	The proposed development does not introduce new obstruction with reflective surfaces which could affect glare conditions to motorists, space users or pedestrians, therefore glare assessment could be scoped out
Lighting	Light Spill	x	x	The locations of new lighting are limited and largely cover areas within the Park that already contain lighting, therefore new effects are not as likely to be introduced to residential receptors. There is some potential for new lighting within the Park to affect habitat receptors, although this will be controlled through thoughtful lighting masterplan strategies and equipment selection. As such, assessment of light spill informing an ES could be scoped out. It is proposed that a standalone technical report be provided demonstrating predicted effects new lighting be provided to support the planning application.

Environmental Topic	Sub-components	Scoped in (✓) or out (x)		Reason (if scoping out)
		Construction	Operation	
	Sky Glow	x	x	The locations of new lighting are limited and largely cover areas within the Park that already contain lighting, therefore new effects are not as likely to be introduced to residential or habitat receptors. The potential for sky glow will be controlled through thoughtful lighting masterplan strategies and equipment selection. As such, assessment of sky glow informing an ES could be scoped out. It is proposed that a standalone technical report be provided demonstrating predicted effects new lighting be provided to support the planning application.
	Glare	x	x	The locations of new lighting are limited and largely cover areas within the Park that already contain lighting, therefore new effects are not as likely to be introduced to residential or habitat receptors. The potential for glare will be controlled through thoughtful lighting masterplan strategies and equipment selection. As such, assessment of glare informing an ES could be scoped out. It is proposed that a standalone technical report be provided demonstrating predicted effects new lighting be provided to support the planning application.
Ecology & Biodiversity	Construction pollution effects on habitats and designated sites	✓	x	There are no pollution effects anticipated during operation
	Light spillage on to sensitive ecological receptors	✓	✓	
	Permanent changes to layout of habitats within the Site and Crystal Palace Park SBG1 designated site	✓	✓	
	Changes in the provision of nesting and foraging habitats for birds, foraging habitat for bats and potential loss of roosting habitat for bats	✓	✓	
	Removal of habitat suitable to support reptiles	✓	✓	
Ground Conditions and Land Contamination	Impacts on human health (e.g. local residents, employees and construction workers); controlled waters (Secondary A Aquifers and Principal Aquifer); existing and proposed new utilities and infrastructure both on-site and in close proximity; and land stability.	✓	✓	
Health	Impacts on populations and human health (e.g. local residents, employees and construction workers)	✓	✓	The effects of the Proposed Development in relation to health and population will, where relevant, be considered in the technical chapters of the ES (e.g. Noise and Vibration, Air Quality and Socio-Economics) and within the separate Health Impact Assessment.
Natural Disasters				
Noise and Vibration	Construction noise	✓	x	Construction effects are not applicable during construction
	Construction vibration	✓	x	Construction effects are not applicable during construction

Environmental Topic	*Sub-components*	*Scoped in (✓) or out (x)*		*Reason (if scoping out)*
		Construction	*Operation*	
	Construction traffic	✓	x	Construction effects are not applicable during construction
	Suitability of site	x	✓	These effects are only applicable during operation
	Changes in road traffic	x	✓	These effects are only applicable during operation
	Operational development	x	✓	These effects are only applicable during operation
Townscape and Visual Impacts	**Townscape Character** Townscape Character areas to be informed by published assessments and defined as part of assessment process.	✓	✓	
	Views and Visual Amenity 11 Viewpoints as shown on Figure B2 of Appendix B.	✓	✓	
Socio-economics	Impacts on local residents, including employment, school spaces, and capacity at local health care facilities.	x	x	It is anticipated that the Proposed Development will improve the public realm and provide new high quality housing; therefore it is unlikely there will be any significant adverse socio-economic effect as a result of the Proposed Development.
Traffic and Transport	Severance	✓	✓	
	Driver delay	✓	✓	
	Pedestrian/cycle delay	✓	✓	
	Pedestrian and cycle amenity	✓	✓	
	Fear and intimidation	✓	✓	
	Accidents and safety	✓	✓	
Water Resources, Flood Risk and Drainage	Impacts of flood risk to or arising from the proposed development.	x	x	In general, the risk of flooding to the development is considered low and appropriate mitigation measures can be implemented to manage any residual flood risk. The development in this location will be supported by a site-specific FRA, and drainage strategy, which will fully assess flood risks and identify any mitigation that may be required to be incorporated into the scheme.

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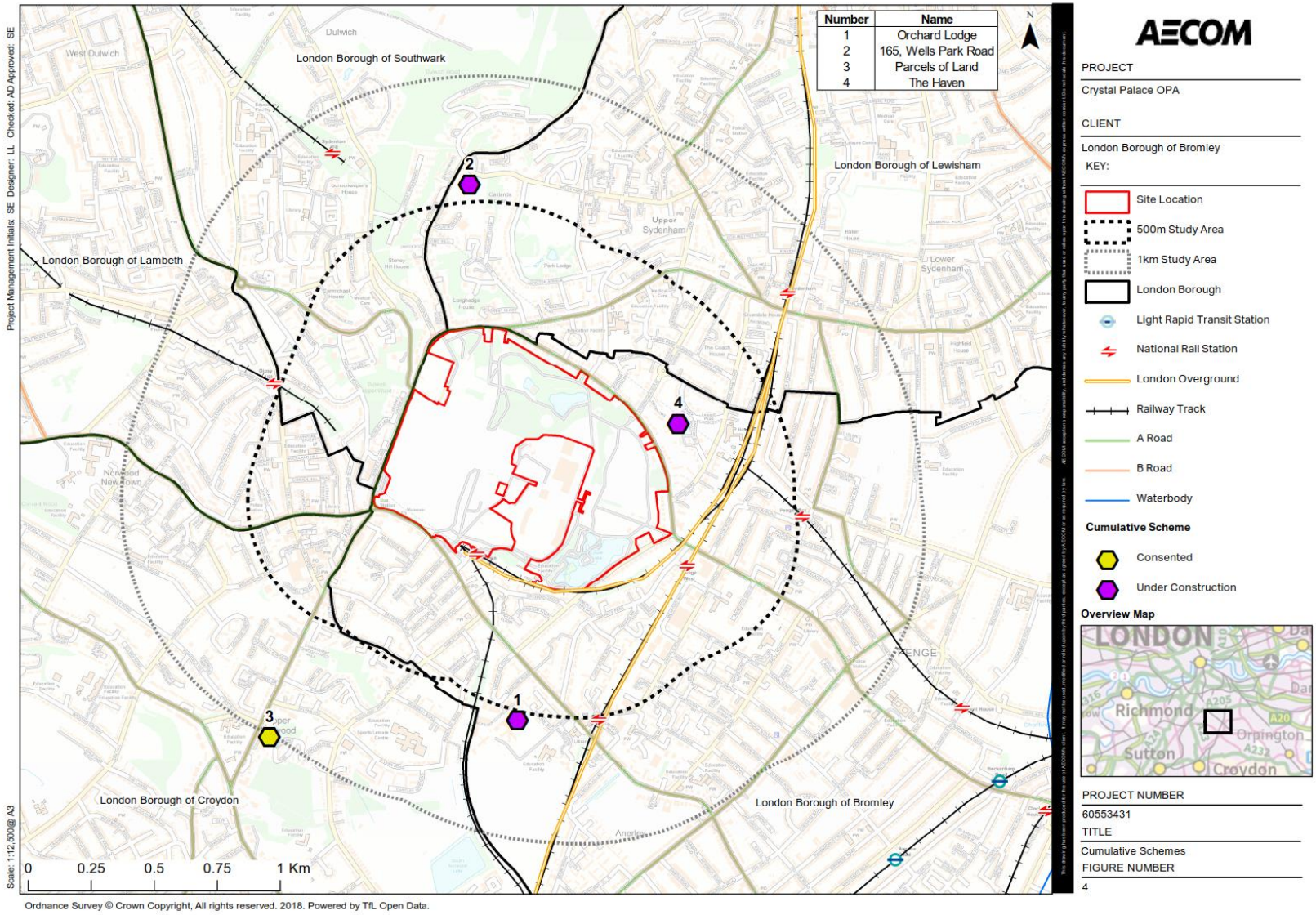
Appendix A – Cumulative Schemes

Table A1: Cumulative Schemes to be included in the Cumulative Effects Assessment of the Proposed Development

No	Address (Borough)	Application Number	Description	Status as of 24 Nov 2017
1	Orchard Lodge, William Booth Road, SE20 8BG (Bromley) 765m south of Site	16/02117/FULL1	Demolition of existing buildings and erection of two 4-5 storey blocks and one 5-6 storey block of flats comprising 252 residential units (80 x 1 bed, 129 x 2 bed and 43 x 3 bed including affordable housing provision), basement car parking, landscaped podium deck, open space, play space, associated access roads, private and communal landscaping, cycle parking, recycling and refuse stores and associated works including widening of existing vehicular access onto William Booth Road.	Under Construction
2	165, Wells Park Road, SE26 6RP (Lewisham) 605m north of Site	14/090031	Reserved matters including details of access, appearance, layout, height and scale (submitted in compliance with Condition (1) of the Outline planning permission DC/11/78207 dated 19 November 2013) for the demolition of existing buildings at St Clement's Heights, 165 Wells Park Road SE26 and the construction of 5 three to five storey buildings comprising 50 one and two bedroom Almshouses, 20 four bedroom dwelling-houses and 26 two and three bedroom self-contained flats, together with the provision of 76 car parking spaces, cycle and refuse stores, vehicular accesses onto Sydenham Hill and Wells Park Road and associated landscaping.	Under Construction
3	Parcels Of Land Adj To Auckland Rise, SE19 2DX (Croydon) 935m south-west of Site	16/06512/FUL	Demolition of buildings and erection of 6 buildings varying between three and five storeys in height comprising 29 two bedroom and 28 one bedroom flats. Provision of associated car parking, landscaping and other associated works (AMENDED PLANS RECEIVED - BLOCK F REMOVED, BLOCK B INCREASED IN HEIGHT BY 1 STOREY, RETENTION OF A NUMBER OF TREES)	Consented
4	The Haven, Springfield Road, SE26 6HG (Bromley) 120m north-east of Site	14/03991/FULL1	Demolition of existing buildings and redevelopment of The Haven and Rookstone House to provide 46 residential units comprising 27 x 4 bedroom houses, 7 x 1 bedroom flats, 6 x 2 Bedroom flats and 6 x 3 bedroom flats, together with 71 car parking spaces, cycle parking provision, refuse and recycling provision, a relocated vehicular access to Springfield Road and landscaping and associated works	Under Construction

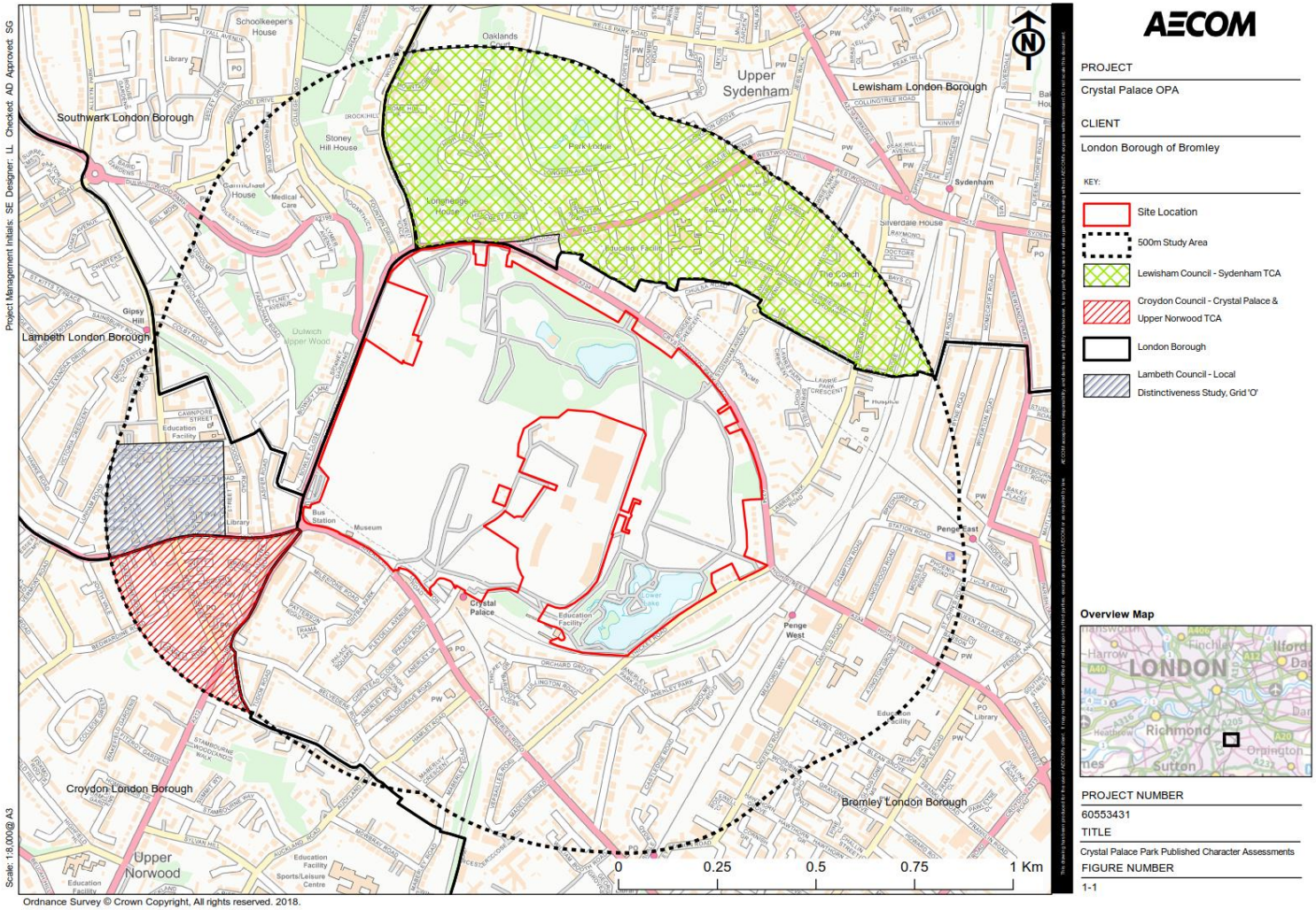
Figure A1: Location of Cumulative Schemes to be included in the Cumulative Effects Assessment of the Proposed Development



Appendix B – Townscape and Visual Impact Assessment Figures

Figure B1: Published Character Assessments

Figure B2: Proposed Viewpoints



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