Aylesbury Estate Regeneration
Phase 2B
Planning Application

Environmental Statement Vol 1: Main text

May 2022

Notting Hill Genesis

Southwark Council
southwark.gov.uk

Environmental Statement
Aylesbury Estate
Phase 2B

On behalf of Notting Hill Genesis

May 2022

Contents

List of Figures

Appendices (Volume 2)

1. Introduction

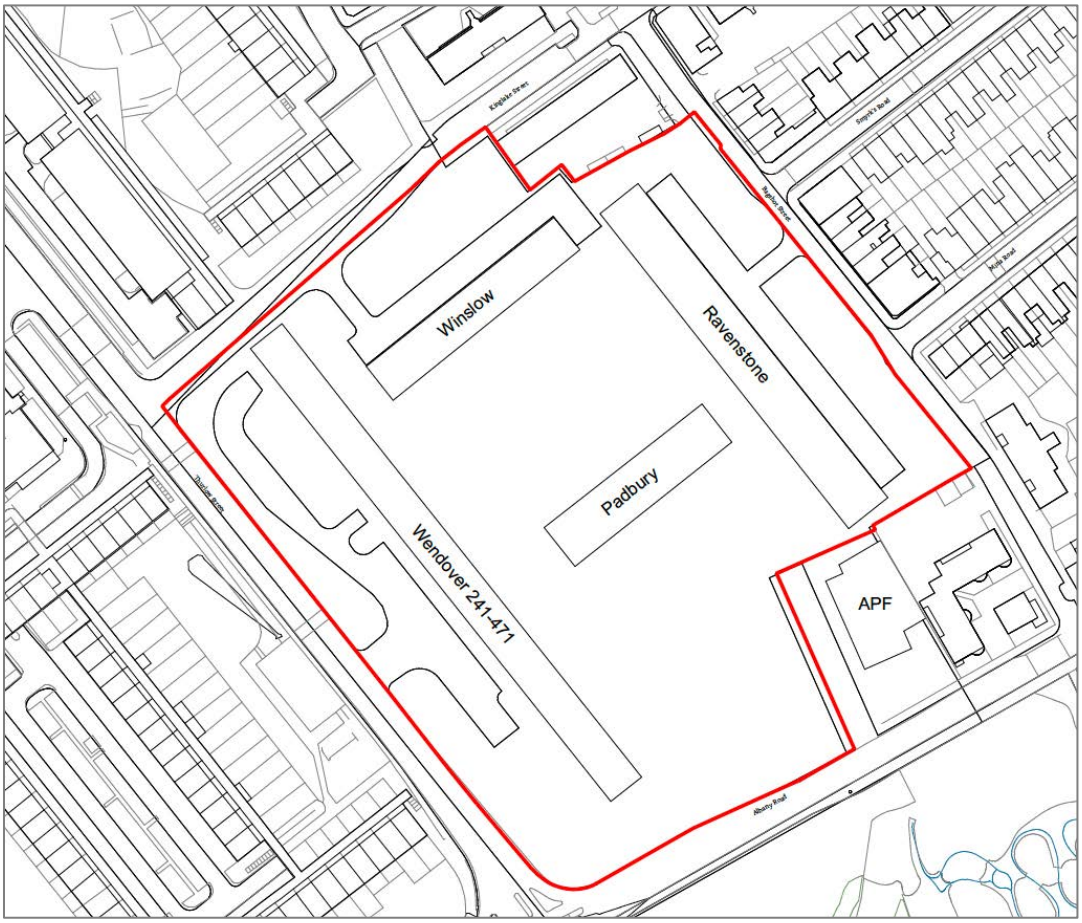
1.1. Introduction

1.1.1. This Environmental Statement (ES) has been prepared on behalf of Notting Hill Genesis ('the Applicant') to accompany a planning application for what is known as Phase 2B of the Aylesbury Estate Regeneration (the 'Project Site'). The Project Site covers an area of 2.72 hectares (ha) and is located within the administrative boundary of the London Borough of Southwark (LBS).

1.1.2. The above development is referred to hereinafter after as "The Project". A more detailed description of the development is outlined in Chapter 4 of this ES.

1.1.3. An existing Project Site location plan has been submitted with the planning application drawings are submitted in support of the planning application documentation, it shows in detail the location and boundary of the Project Site. This is illustrated in Figure 1.1 below.

Figure 1.1. Existing Site location Plan



1.1.4. In summary, a detailed planning application is proposed for the redevelopment of Phase 2B of the Aylesbury Estate. In summary, the Project will include:

- Demolition of existing buildings and structures;
- Up to 614 residential homes;
- Up to 480.13 sqm of flexible non-residential floorspace (Use Classes E/F1/F2(a)(b));
- Two new public garden squares;
- Associated amenity and landscaping;
- Cycle and car parking in line with local and regional policy; and
- Buildings ranging from 4 to 25 storeys.

1.1.5. Environmental Impact Assessment (EIA) is a formal procedure underpinned by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations'). The EIA process enables developers to respond iteratively to the prevailing environmental conditions and constraints pertaining to their proposals. As the size of the development exceeds all relevant thresholds set out in Category 10b of Schedule 2 of the EIA Regulations, an EIA is considered as part of the Planning Application.

1.2. Background

1.2.1. The Aylesbury Estate was constructed between 1966 and 1977 and is one of the largest housing estates in south London. The existing Estate is predominately residential, with a mixture of houses, flats, and maisonettes, in buildings ranging from 2 and 14 storeys.

1.2.2. A number of planning applications relating to the Aylesbury Estate Regeneration have been granted, an overview of which is outlined below.

Outline Planning Permission

1.2.3. Outline Planning Permission (OPP) (LPA ref: 14/AP/3844) was granted on 5th August 2015 for a mixed-use redevelopment at the Aylesbury Estate Regeneration. The OPP red line boundary is shown in Figure 1.2 below.

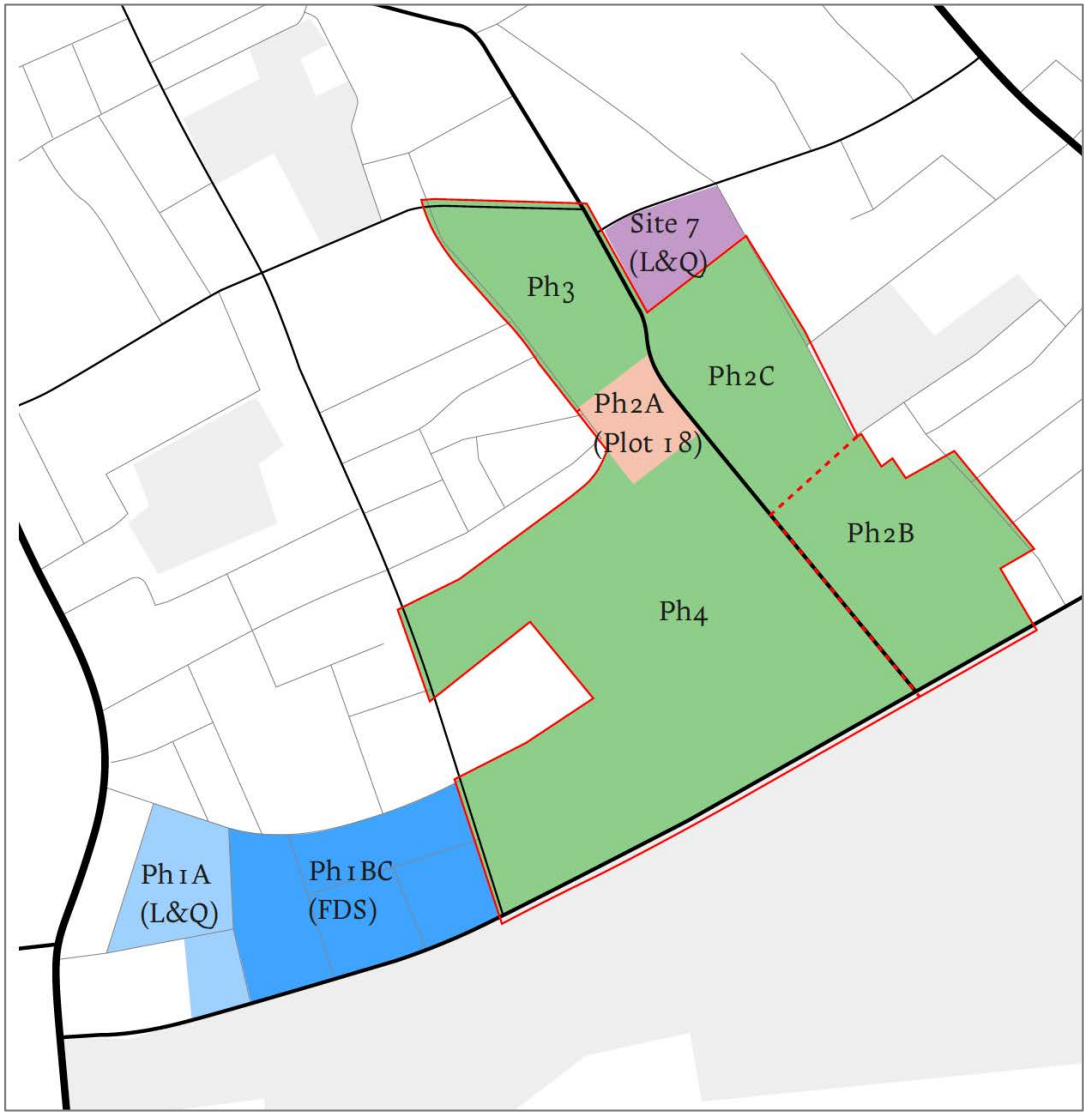
Figure 1.2: Site Boundary of Outline Application (ref: 14/AP/3844)

1.2.4. The description of the OPP consent is as follows:

"Demolition of existing buildings and phased redevelopment to provide a mixed use development comprising a number of buildings ranging between 2 to 20 storeys in height (12.45m - 68.85m AOD) with capacity for up to 2,745 residential units (Class C3), up to 2,500sqm of employment use (Class B1); up to 500sqm of retail space (Class A1); 3,100 to 4,750sqm of community use; medical centre and early years facility (Class D1); in addition to up to 3,000sqm flexible retail use (Class A1/A3/A4) or workspace use (Class B1); new landscaping; parks, public realm; energy centre; gas pressure reduction station; up to 1,098 car parking spaces; cycle parking; landscaping and associated works."

1.2.5. The OPP divided the site into development phases (Phase 2A, 2B, 2C, 3 and 4) (see Figure 1.3 below).

Figure 1.3: Outline Development Phases



1.2.6. The OPP assumed indicative provision of approximately 490 residential units and 3,900 sqm of public open space would be delivered on Phase 2B.

Plot 18

1.2.7. The first (and only) phase of the OPP to have commenced to date is Plot 18. A reserved matters application was granted in December 2021 (LPA ref: 16/AP/2800) for 122 residential units (C3), retail (A1/A3/A4) and a community facility (library D1) in a part 15, part 7 and part4/6 storey building (known as the North Block); a health centre (D1) and early years facility (D1) in a 4 storey (plus basement) building (known as the South Block); public realm; landscaping; cycle

parking and car parking. Several minor material and non-material amendments have since been permitted and works have now commenced.

First Development Site

1.2.8. The OPP was submitted simultaneously with a detailed application for the First Development Site (FDS) (LPA ref: 14/AP/3843) for:

"Demolition of existing buildings and redevelopment to provide a mixed use development comprising a number of buildings ranging between 2 to 20 storeys in height (9.45m - 72.2m AOD), providing 830 residential dwellings (Class C3); flexible community use, early years facility (Class D1) or gym (Class D2); public and private open space; formation of new accesses and alterations to existing accesses; energy centre; gas pressure reduction station; associated car and cycle parking and associated works."

Figure 1.4: Illustration of the FDS (Red Line)

1.2.9. The FDS application was also approved at committee on the 5th of August 2015.

1.2.10. There have been several material and non-material amendments and condition discharge applications for the FDS. The extant FDS permission (LPA ref: 17/AP/3885) is for 842 residential units, comprising 283 private units, 211 intermediate and 348 for social rent, in a mixture of buildings ranging from houses to apartment blocks up to 20 storeys in height.

1.2.11. The FDS permission has been implemented and construction is being carried out within three separate contracts (known as A, B and C). Construction on contract A is at an advanced stage with occupation currently anticipated from Autumn 2022.

1.2.12. LBS are the in process of rehousing residents and the existing residents at the Project Site will be rehomed within Phase A of FDS, however the timescales are indicative at this stage.

1.3. Structure of the Environmental Statement

1.3.1. This ES is set out in a structured manner to allow for easier navigation:

- **Volume 1:** (this Volume) Main Text;
- **Volume 2:** Appendices;
- **Volume 3:** Heritage and Townscape Visual Impact Assessment; and
- **Non-Technical Summary (NTS).**

1.3.2. In this volume, the ES is split into three parts:

1.3.3. Chapters 1—5 sets out the assessment requirements, the location and uses on and surrounding the Project Site, sets out alternatives that have been considered when formulating the Project, the Project description and sets out an approximate construction process.

1.3.4. Chapters 6 – 13 considers the potential effects of the Project on the sensitive receptors in the surrounding area. These chapters have been structured in a uniform manner so that the assessment method and criteria, the baseline conditions, the predicted effects, and proposed mitigation measures can be easily identified.

1.3.5. Chapter 14 summarises the conclusions of the ES by setting out any residual significant effects that may arise from the construction and development of the Project.

1.4. Technical Team

1.4.1. The specialist consultant team appointed to undertake the assessments for the EIA are set out in Table 1.1 below:

Table 1.1: EIA Technical Team

Company	Technical Topic
WSP	Air Quality
Waterslade	Daylight, Sunlight and Overshadowing
WSP	Ground Conditions
Montagu Evans	Heritage, Townscape and Visual Impact
Max Fordham	Noise and Vibration
WSP	Socio Economics and Health
RPS	Transportation
Price & Myers	Water resources
RWDI	Wind

1.4.2. In addition to this ES and its technical appendices, the following key documents have been submitted in support of the planning application. Where appropriate some of these will inform the ES:

- Plans and Elevations;
- Arboricultural Impact Assessment and Method Statement;
- Biodiversity Net Gain Report;
- Circular Economy Statement;
- Delivery and Servicing Plan;
- Design and Access Statement;
- Energy Assessment;
- Environmental Statement;
- Equalities Impact assessment;
- Fire Statement;
- Flood Risk Assessment and Drainage Strategy;
- Ground Investigation Report;
- Health Impact Assessment;
- Landscape DAS;
- Preliminary Ecology Assessment;
- Statement of Community Involvement;
- Sustainability Statement;
- Transport Assessment;
- Travel Plan Statement;
- Parking Management Plan;
- Outline Delivery and Servicing Plan;
- Outline Construction Management Plan;
- Outline Demolition Environmental Management Plan;
- Overheating Assessment;
- Utilities Statement;
- Financial Viability Assessment;
- Whole Life Carbon Assessment.

1.5. Opportunity for Public Consultation

1.5.1. Should interested parties wish to make representations on the content of this ES, or any other documents, plans or drawings associated with the planning application of the planning application, they should be made in writing to:

The London Borough of Southwark

Planning Division

Strategic Applications

160 Tooley Street

London, SE1 2QH

www.southwark.gov.uk

1.5.2. Hard copies of the complete ES can be purchased from HGH Consulting at a cost of £400. The ES can be purchased on CD at a cost of 5 and an electronic version can be sent free of charge in PDF format, upon request.

2. EIA and the Scoping Process

2.1. What is an Environmental Impact Assessment?

Legal Background

2.1.1. The Town and Country Planning (Environmental Impact Assessment Regulations 2017 requires that for certain planning application EIA is undertaken and an ES is produced and submitted with the planning application.

2.1.2. EIA is a procedure which assesses the environmental impacts of a Project and provides the information within an ES which serves to inform the decision-making process. EIA is a systematic and objective process through which the likely significant environmental effects of a project can be identified, assessed and, wherever possible, mitigated. The process and its outcomes are then reported in the ES to the local planning authority and its advisors, and the public. The NTS is provided to allow a wider public understanding of the environmental effects of the Project.

2.1.3. EIA follows an iterative process that usually involves the following stages:

- Screening is the first stage of the EIA process where the relevant authority (local planning authority of the Secretary of State) will decide if EIA is required.
- Once it has been agreed that EIA is required for the Project, scoping is undertaken to define what should be assessed. This is done in partnership between the applicant, the local planning authority and relevant statutory consultees (e.g. the Environment Agency, Natural England and Historic England).
- With the scope of the EIA set, relevant information on the environmental baseline conditions is collected. This information is then used initially to understand the dynamics of the likely environmental effects an inform the design of the Project to avoid and/or minimise potentially significant adverse environmental effects. It is also at this stage that areas of potential environmental enhancement are identified.
- Any significant adverse effects that are identified during the formal assessment stage are then reviewed against the design to consider whether alterations could be made to avoid or reduce the effect. Should the design be altered, the stage is repeated.
- Where significant adverse effects cannot be avoided or reduced through alterations to the design itself, mitigation measures are considered. Monitoring may also be considered to measure the actual significance of the effect during and after construction to allow management of mitigation where appropriate.

2.1.4. Once the EIA is completed, the ES is submitted to the local planning authority for consideration with the planning application(s).

2.2. EIA Scoping Requirements

2.2.1. The ES must contain the information specified in Regulation 18(3) and any additional information specified in Schedule 4 of the 2017 Regulation which is relevant to the specific characteristics of the Project and to the environmental effects likely to be significantly affects.

2.2.2. Regulation 4(2) states:

"the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors:

(a) population and human health;

(b) biodiversity

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to un sub-paragraphs a) to d)".

Scope of the EIA

2.2.3. The principle of Scoping is to determine the likely significant effects associated with the Project and the scope of the technical assessments that should be included as part of the EIA.

2.2.4. The potential for likely significant effects can arise during both the demolition/construction and the operational stages of the Project. This is considered in further detail within the below environmental technical topics:

- Air Quality;
- Daylight, Sunlight and Overshadowing;
- Ground Conditions;
- Noise and Vibration;
- Socio-Economics and Health;
- Transportation;
- Water Resources; and
- Wind.

2.2.5. An assessment of Heritage, Townscape and Visual Impact is provided in Volume 3.

2.2.6. A Scoping Report (see Appendix 2.1) was submitted to LBS in October 2021, which set out the environmental issues to be addressed within the EIA (i.e. those to be scoped in), and what issues are deemed not significant and therefore scoped out of assessment within the EIA. LBS appointed Land Use Consultants (LUC) to review the Scoping Report and they produced a Report ("Review of the EIA Scoping Report") which was issued to hgh consulting on the 25th January 2022, the LUC Review of the EIA Scoping Report can be found at Appendix 2.2.

2.2.7. The LUC Review of the EIA Scoping Report (Appendix 2.2) broadly aligned with the Scoping Report (Appendix 2.2) and made a number of requests for points of clarification; these points have been addressed within the individual technical chapters of the ES.

2.2.8. At the time of writing LBS have not formally adopted a Scoping Opinion. However, following a request made by hgh Consulting, LBS issued via email on the 11th April 2022 the consultee (Environmental Protection Team (EPT) and Transport for London (TfL)) response to the Scoping Report, this correspondence can be found at Appendix 2.2. Similarly to the approach with LUC Review of the EIA Scoping Report, the comments have been addressed where necessary within the technical chapters of this ES.

2.3. Topics to be Scoped Out

Energy and Sustainability

2.3.1. An Energy Strategy has been developed for the Project which has in turn informed the EIA (the Energy Strategy can be found at Appendix 2.3). It demonstrates how the Project meets the net zero carbon target, with at least a 35% reduction beyond the minimum requirement of Part L 2013 of the Building Regulations being achieved on Site. The Strategy accords with London Plan energy hierarchy of Be Lean, Be Clean, Be Green and Be Seen, which are briefly summarised below:

2.3.2. Be Lean: the Project incorporates passive measures such as enhanced fabric U-values, improved air tightness and active enhancement measures such as Mechanical Ventilation with Heat Recovery (MVHR) and low energy lighting. Measures for mitigating the risk of overheating and reduction of cooling demand include reduced distribution heat losses in heat network within the buddings, openable windows and MBHR with summer bypass. The Be Lean measures are calculated to have a 17% improvement over the current Building Regulations for the residential elements and a 32% improvement for the commercial element.

2.3.3. Be Clean: the Project is located within a Heat Network Priority Area (HNPA), however there are no currently feasible options to connect to an existing heat network, such as the SELCHP district heating. SELCHP have confirmed that the Aylesbury Estate (and as such the Project Site) is located too far from their network to be able to be connected.

2.3.4. Be Green: the Project will incorporate a district heating system fed by central Air Source Heat Pumps (ASHPs) with local Heat Interface Units (HIUs) with high efficiency gas boilers as back up. Solar photovoltaics (PVs) will be located on appropriate areas of roof in order to maximise the renewable energy generation. The available roof space can accommodate up to 184kWp of PV panel.

2.3.5. Be Seen: In line with London Plan Guidance “Be Seen” Energy Monitoring Guidance” (September 2021), the Project’s energy performance will be monitored post-construction through the installation of smart meters for heat and electricity networks which will enable occupants to monitor, manage and reduce their energy use. In addition, a Building Management System (BMS) for the energy centre will be provided to facilitate the monitoring, management, and control of the central plant.

2.3.6. Overall, the above measures will see that the regulated carbon emissions reduction of 70% when compared to the Building Regulations Part L 2013 minimum requirements. The remaining CO2 emissions for the Project will be achieved via a payment to LBS's carbon offset fund.

Sustainability

2.3.7. A Sustainability Statement has been submitted in support of the planning application as a stand-alone document. The Statement outline the measures which are proposed to meet the London Plan's carbon reduction targets including summarising the energy measures (Be Lean, Be Clean, Be Green and Be Seen) as well as 'Climate Change Risk Adaption', which summarises the measures used to reduce overheating and climate change rainfall events and surface water runoff. The Sustainability Statement also summarises Project design measures such as green roofs, cycle parking, daylight and sunlight, biodiversity (including biodiversity net gain and urban greening) and topic-based mitigation measures which are set out within this ES. It is not considered necessary to duplicate the information contained within the Sustainability Statement within the ES.

Waste

2.3.8. It is proposed to scope the topic of waste out of a detailed assessment within the EIA. The EIA will however consider the related impacts of both operational and construction waste related to the technical topics of air quality, noise, and transportation.

2.3.9. The operational site waste strategy is detailed within the Design and Access Statement. The anticipated quantity of demolition and construction waste will be detailed within an outline Demolition Environmental Management Plan (DEMP) and outline Construction Management Plan (CMP) have been produced and inform the EIA, further detail is contained within Chapter 5 of this ES.

Electronic Interference

2.3.10. In the OPP (2014) ES, the Telecommunications chapter concluded there was 'minor negative significance' to existing dwellings from the OPP it concluded that:

"The sensitivity of reception for residents to the north of the Comprehensive Development is medium and the magnitude of change, prior to any required mitigation, is low. Therefore taking this into account and for the reasons set out below, there is likely to be a direct, temporary, long-term effect on reception of minor negative significance prior to the implementation of mitigation measures."

2.3.11. The proposed layout of the Project is broadly in line with the layout that was assessed as part of the OPP (2014) ES. However, it is acknowledged that the massing will see an increase on some parts of the Project Site.

2.3.12. The Crystal Palace transmitter is a considerable distance south of the Project Site, and to the east is the Shooters Hill transmitter and to the north are the BT Tower and Alexandra Palace

transmitters. Therefore, any additional transmission shadow caused by the increase in massing is unlikely to cause significant reductions in signal due to a) signal reflections from any of the transmitters and b) the affected properties being a significant distance from the Project Site.

2.3.13. Furthermore, analogue television broadcasting has now been phased out and replaced by digital television, which is largely unaffected by atmospheric conditions that rendered analogue television unwatchable and does not suffer reflection effects and ghosted image generation.

2.3.14. Without mitigation there is potential for effects on satellite (TV and radio). The introduction of new buildings may affect users of satellite TV services by blocking the signal between the receiving dish antenna and the satellite from which services are transmitted. The main potential for satellite effects associated with the Project relate to shadowing / signal blocking caused by the physical size of a building.

2.3.15. It is considered that little can be done to 'design out' the effects on broadcast satellite caused by the Project and that most of the mitigation measures would remain the responsibility of the end users, and could include one of, or a combination of, the following:

- Realigning satellite dishes;
- Upgrading end-user equipment;
- Relocating end-user satellite dishes on building façades or rooftops to maintain a direct line of sight,
- Switching end users' systems to subscription cable or ADSL services.

2.3.16. As such it is anticipated that the findings of the OPP (2014) ES are to be applicable to the current Project with the same mitigation measures for any dwellings affected. It is proposed to Scope Out Electronic Interference from the EIA. This position has been agreed in the LUC Review of the Scoping Report (see Appendix 2.2)

Health and Wellbeing

2.3.17. The potential for the Project to give rise to significant effects relating to health and wellbeing will be considered within specific technical chapters, namely ground conditions, air quality, noise, transportation and socio-economics.

Accidents, Fire and Natural Disasters

2.3.18. Given the nature and the location of the Project, it is considered that the potential for either large volume storage or frequent passage/delivery of fuels and chemicals during either the construction phase or following completion, is considered to be low when compared to more industrial development proposals such as chemical works, storage depots, docks, or major highways. It is therefore considered that whilst there is always a potential risk that an accident, fire or natural disaster could result in a significant environmental impact, this risk can be appropriately mitigated through embedded design measures and through compliance with statutory design guidelines. It is therefore proposed that these potential risks are scoped out of the ES for this Project.

Archaeology

2.3.19. No significant effects on buried heritage (archaeology) are anticipated since the original Archaeological Desk Based Assessment[1] produced in 2014 concluded that there was very low potential for archaeological remains pre-dating the post-medieval period. Any post-medieval or modern remains would likely be of low or negligible heritage significance and, following appropriate mitigation, any residual effects on archaeology would be negligible.

2.3.20. The Project Site does not contain any nationally designated (protected) heritage assets, such as scheduled monuments, listed buildings or registered parks and gardens, nor are there any near of the Project Site. Similarly, there are no conservation areas on or near the Project Site.

2.3.21. The Project Site does not lie within an Archaeological Priority Zone (APZ) as defined by the London Borough of Southwark, the closest being the Old Kent Road APZ, along the line of the former major Roman road known as Watling Street which lies 250m north-east of the Project Site. However, the projected line of another former Roman road, running from north-west to south-east, lies 80m north-east of the Project Site according to 'Southwark Maps'[2], which is considered to be of a sufficient distance from the Project Site so as to not give rise to significant impacts.

2.3.22. An Archaeological Desk Based Assessment was produced in 2014 to support the detailed planning application for Phase 1, Sites 1b and 1c (First Development Site/FDS) and the outline planning application for Phases 2, 3, 4 and Site 10 from Phase 1 (Masterplan Application Site), This concluded that there is a very low potential for the survival of archaeological remains from the prehistoric to the medieval period, moderate potential for the survival of post-medieval remains and high potential for modern remains, with the greatest potential for archaeological survival being in areas of open space such as recreational areas and green space.

2.3.23. It is noted that a planning condition (no. 20) was attached to the OPP (ref. 14/AP/3844) which required the submission of a Written Scheme of investigation (WSI):

"Condition 20

Before any work, including demolition, hereby authorised begins, the applicant or successors in title shall secure the implementation of a programme of archaeological building recording in accordance with a written scheme of investigation, which shall be submitted to and approved in writing by the Local Planning Authority.

Reason:

In order that the archaeological operations are undertaken to a suitable standard as to the details of the programme of works for the archaeological building recording in accordance with

[1] WSP (2014) Archaeological Desk-Based Assessment, Aylesbury Estate, Southwark, London

[2] https://geo.southwark.gov.uk

PPS5, Strategic Policy 12 – Design and Conservation of the Core Strategy 2011 and Saved Policy 3.19 Archaeology of the Southwark Plan 2017."

2.3.24. A WSI was produced by NHG and submitted to LBS on the 24th November 2015, and Condition 20 of the OPP was subsequently discharged on the 12th August 2016.

2.3.25. At the time of writing, no historic building recording has taken place. However, on behalf of NHG, WSP consulted with the Conservation Officer at LBS (at a meeting held of 30th June 2021) to discuss the proposed methodology of a new WSI for Phase 2B only. As a result of the meeting and the new application a new WSI has been produced and can be found at Appendix 2.5. Archaeology is Scoped Out of further assessment within the EIA, as agreed by the LUC Review of the Scoping Report (see Appendix 2.2).

Ecology

2.3.26. A Preliminary Ecological Appraisal (PEA) has been carried out in support of the planning application and can be found at Appendix 2.4. The PEA comprised an ecological desk study and an extended Phase 1 habitat survey.

2.3.27. The desk study found a total of 27 Sites of Importance for Nature Conservation (SINCs) located within 2km of the Project Site. The nearest being Burgess Park SINC, located to the north of the Project Site and Surrey Square SINC, is located to the North of the Project Site. Four priority habitat types occur within 2km of the Project Site, with the closet type to the Project Site comprising lowland mixed deciduous woodlands, located within the Burges Park SINC.

2.3.28. The desk study found records of six European protected species (all of which are bats), and a further three species records (one invertebrate and two bird species), all recorded within 1km of the Project Site within the last 10 years.

2.3.29. The extended Phase 1 habitats survey found the Project Site to be urban in nature, dominated by buildings and hardstanding with pockets of scattered trees, introduced shrubs and amenity grassland. Habitats and buildings on site were identified as offering foraging and nesting potential for common bird species. A number of invasive plant species were identified on the Project Site. Recommendations were provided for birds, invasive plant species, and ecological enhancements.

2.3.30. Thomson Environmental Consultants undertook updated bat surveys of the buildings within Phases 2 and 3 on 29th and 30th September 2020 consisting of PRAs and subsequent dusk emergence or dawn re-entry surveys of the six buildings assigned low potential to support roosting bats in accordance with the Bat Conservation Trust's Good Practice Guidelines. No bats were found emerging from, or returning to, any buildings during the dusk emergence or dawn re-entry surveys, therefore roosting bats are considered to be likely absent from these buildings.

2.3.31. The PEA set out a series of ecological enhancements, which include: landscaping to be species native to the UK and of local provenance; green/brown roofing; vegetation of a varied structure; installation of bird and bat boxes; sympathetic lighting; creation of green 'stepping stones'. Full details can be found at Section 7 of the PEA (see Appendix 2.4).

Planning Policy Context

2.3.32. The ES will consider legislation and relevant national, regional, and local planning policy and guidance, including:

- The National Planning Policy Framework (NPPF);
- National Planning Policy Guidance (PPG); and
- The Southwark Plan 2022.

2.4. Community and Statutory Involvement

Consultation Process

2.4.1. Extensive consultation has taken place with both statutory and non-statutory authorities since 2021, including:

- A total of 14 pre-application meetings with planning and urban design officers at LBS, with separate meetings held with the Tree Officer and Conservation Officer.
- Two Design Panel Review (DRP) Sessions (12th July 2021 and 14th December 2021).
- Three GLA pre application meetings (26th February 2021, 6th July 2021 and 7th December 2021).

2.4.2. Feedback from the pre application meetings including the DRP's and consultation informed the design process.

Public Consultation

2.4.3. Extensive consultation has been carried out with Local Residents and key stakeholders (for example TRA's, nearby schools and churches, community groups such as Creation Trust, local businesses, and amenity groups such as Friends of Burgess Park) over several years. Full details of this process is detailed within the Statement of Community Involvement (SCI) which accompanies the planning application as a standalone document. The consultation is summarised below.

Stage One: June - Aug 2021

2.4.4. A series of online youth workshops, online stakeholder meetings and street-based pop-ups. A dedicated project website was set up and feedback was collected digitally, verbally and via printed forms. The aims of Stage One were to raise awareness of the regeneration of the wider Aylesbury Estate and Phase 2B and to explain the changes to the planning and policy context which resulted in the evolution of the proposals for Phase 2B. Stage One also included information gathering to better understand how people live on the Aylesbury Estate and what they need from the regeneration proposals.

Stage Two: Sept-Dec 2021

2.4.5. Included two in-person public exhibitions, youth club and school workshops, public online discussions, and a range of stakeholder meetings. The concept designs for the proposals were presented and focussed discussions were held to discuss certain topics such as public realm, playspace, non-residential spaces and design.

Stage Three: Jan - Mar 2022

2.4.6. Included online themed workshops and a public Q&A session along with an outdoor public exhibition, street pop-ups and group walkabouts. The consultation aims for this Stage were to explain why the proposals had been amended and to request comments and feedback on the revised designs.

2.5. Baseline Information

2.5.1. A wide range of baseline data on the environment has been obtained for the purposes of the assessment including:

- Published documentary information from a variety of sources, including historical and contemporary records;
- Survey information, including background noise levels, ecological features, landscape character, traffic levels in the road network, community facilities, etc;
- Aerial photography; and
- Data provided by stakeholders, including statutory and non-statutory consultees.

2.5.2. A description of the Project Site and surroundings is given in Chapter 3. More detailed baseline information considered for each topic assessment is presented in each of the relevant chapters of this ES as appropriate to describe the significant environmental effects arising from the Project.

2.6. Project Details to be Assessed

2.6.1. In order for the significant environmental effects of the Project to be identified and assessed, it is necessary to understand the Project Site and Location (Chapter 3), as well as to clearly identify all the components of the Project (Chapter 4).

2.6.2. The planning application is being made in full, with details of the Project being submitted for approval. These details are set out in Chapter 4 of this ES.

2.6.3. A full suite of plans and elevations accompany the planning application, the assessment work has been informed by the detailed drawings however to avoid duplication they are not appended to the ES.

2.7. Impact Assessment Guidance

2.7.1. The assessments that are being presented in the ES consider the potential for significant environmental effects to affect the baseline conditions as a direct/indirect result of the Project.

A description of the aspects of the environment likely to be significantly affected by the development is a requirement of the EIA Regulations. The baseline conditions are defined as the existing state of the environment and how it may develop in the future in the absence of the Project and with certain committed developments included.

2.7.2. Where likely significant adverse effects have been identified during the assessment, it is a requirement to set out the measures that have been proposed to prevent, reduce and where possible offset any effects. These are described in each topic chapters if required.

2.7.3. The remaining residual effects taking account of mitigation measures are stated in each of the ES topic sections and included within summary tables. In each case, significance criteria are applied to identify the extent to which mitigation measures would reduce the effect that has been assessed and the residual effect that would remain.

2.7.4. In order to forecast potential future effects, it is necessary to make predictions. To ensure that predictions are as accurate as possible, a description of the methods used to assess the effects of the Project are also required by the EIA Regulations. It is also necessary to provide an indication of any difficulties or limitations encountered by the technical consultants during the EIA process.

2.7.5. Unless specifically stated otherwise, the proposed assessments will be undertaken in accordance with best practice guidelines published by the relevant professional bodies. Each technical chapter in this statement provides brief details of the baseline and assessment methodology that has been employed for that topic area.

2.7.6. Where there is no topic specific guidance available, a generic framework of assessment criteria and terminology has been developed to enable the prediction of potential effects and their subsequent presentation. The development of this generic framework has drawn upon hgh's experience of undertaking EIA. Where specific guidance is available, full details of the assessment criteria and terminology have been set out in the context of that topic.

2.8. General Assessment Framework

Receptor Sensitivity and Impact Magnitude

2.8.1. Receptors are those aspects of the environment sensitive to changes in baseline conditions. The sensitivity of a particular receptor depends upon the extent to which it is susceptible to such changes.

2.8.2. Impact magnitude is determined by predicting the scale of any potential change in the baseline conditions. Where possible, magnitude is quantified; however, where this is not possible a fully defined qualitative assessment is undertaken. The assessment of magnitude is carried out taking account of any inherent design mitigation in the proposal that forms part of the development description.

Table 2.1: Receptor Sensitivity and Impact Magnitude

Receptor		Impact	

Sensitivity to Change		Magnitude of Change	
Very High	VH	Very High	VH
High	H	High	H
Medium	M	Medium	M
Low	L	Low	L
Very Low	VL	Very Low	VL
Negligible	N	Negligible	N

2.9. Effect Significance

2.9.1. As shown in Table 2.1, the effect significance is determined by combining the predicted magnitude of impact with the assigned sensitivity of the receptor. Table 2.2 sets out the broad definitions of significance. The definition of the level of significance at which a significant impact arises will be provided within the topic method section of each chapter of the ES.

Table 1.2: Effect Significance

Criteria			Receptor Sensitivity				
			VH	H	M	L	VL
Impact Magnitude	Positive	VH	Substantial	Substantial	Major	Moderate	Moderate
		H	Substantial	Major	Moderate	Moderate	Minor
		M	Major	Moderate	Moderate	Minor	Minor
		L	Moderate	Moderate	Minor	Minor	Minor-Neutral
		VL	Moderate	Minor	Minor	Minor-Neutral	Minor-Neutral
	Negligible		Neutral	Neutral	Neutral	Neutral	Neutral
	Negative	VL	Moderate	Minor	Minor	Minor-Neutral	Minor-Neutral
		L	Moderate	Moderate	Minor	Minor	Minor-Neutral
		M	Major	Moderate	Moderate	Minor	Minor
		H	Substantial	Major	Moderate	Moderate	Minor
		VH	Substantial	Substantial	Major	Moderate	Moderate

Table 2.3: Definition of significance[3]

[3] As set out IEMA

Significance	Definition
Substantial	These effects represent key factors in the decision-making process. They are generally, but not exclusively associated with sites and features of national importance and resources/features which are unique and which, if lost, cannot be replaced or relocated.
Major	These effects are likely to be importance considerations at a regional or district scale but, if adverse, are potential concerns to the Project, depending upon the relative importance attached to the issue during the decision-making process.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may led to an increase in the overall effects on a particular area or on a particular resource.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in the detailed design of the Project.
Neutral	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

2.9.2. A required by the EIA Regulations, the likely significant effects of the EIA proposals are described as:

- Adverse or beneficial;
- Direct or indirect;
- Temporary or permanent;
- Reversible or irreversible; and
- Cumulative.

2.9.3. Adverse effects are undesirable and result from negative impacts. Beneficial effects are desirable and result from positive impacts.

2.9.4. Each effect will have a source originating from the development, a pathway and a receptor. Effects which operate in this direct way are regarded as direct effects. Effects on other receptors via subsequent pathways are regarded as indirect effects.

2.10. Qualitative and Quantitative Assessments

2.10.1. The assessment will be based on the comparison of qualitative and where possible quantitative predicted impacts compared with existing baseline environmental conditions. Any significant changes expected in future baselines due to environmental trends will also be described qualitatively, or in certain cases calculated as quantitative future baseline to allow meaningful

future year assessment. These future year baselines can take account of cumulative developments not yet built although in the planning system. Each technical chapter of the ES clearly sets out where the assessments are quantitative and qualitative.

2.11. Initial and Residual Effects

2.11.1. As stated previously, the EIA process enables the likely significant effects of a Project to be identified so that, where possible, adverse effects predicted to arise as a result of the proposal can be prevented, reduced and where possible offset through the adoption of suitable measures. Additionally, enhancement measures can be incorporated to maximise the beneficial effects of the development. The adoption of mitigation and enhancement measures results in initial and residual effects. These can be defined as:

- *Initial Effects*: Effects occurring as a result of the Project prior to the adoption of any additional mitigation or enhancement measures; and
- *Residual Effects*: Effects occurring as a result of the Project taking into account the adoption of identified additional mitigation or enhancement measures.

2.11.2. All of the assessments have involved a process of interaction between the EIA team and the design team with the different technical consultants commenting on the design and suggesting design changes to reduce an adverse environmental effect or increase an environmental benefit, either during the construction or operational stages of the Project.

2.11.3. Measures that design out significant effects that form an inherent part of the Project as proposed, known as inherent effects, are considered in the initial impact. For example, many environmental constraints such as flood risk, must be designed out of a Project for it to be viable and it would be impractical to consider the Project without such measures in place.

2.11.4. Additional mitigation and enhancement is defined as a measure that is additional to the Project as initially proposed to address any outstanding residual effects.

2.12. EIA Assumptions and Limitations

2.12.1. The following key assumptions have been made in the preparation of this ES:

- All legislative requirements will be met. Therefore, any standard guidance which is provided to ensure minimum legal compliance is not considered to constitute mitigation in the EIA and will not be taken into account;
- The assessment of effects prior to the adoption of mitigation measures will assume that the Project will be constructed in accordance with industry standard techniques. Such techniques will therefore not be considered as mitigation;
- Where further assumptions have been made for individual topic assessments these will be identified within the relevant topic chapters; and
- Any limitations or uncertainties associated with impact prediction or the sensitivity of receptors due to the absence of data or other factors will give rise to uncertainty in the

assessment. Any such limitations will be referred to in the relevant technical chapters of this ES.

2.13. Cumulative Assessment

2.13.1. Schedule 4 of the EIA Regulations requires that the cumulative effects of the Project should be included within the ES.

2.13.2. The EIA Regulations does not set out a methodology for cumulative impact assessment. However, in many cases the broad methods employed for Sustainability Appraisal (SA) and Strategic Environmental Assessment (SEA) can be used. The European Commission has also produced a 'Study on the Assessment of Indirect and Cumulative Impacts as well as Impact Iterations' (May 1999). These methodologies are generally qualitative since many of the interactions are too complex to robustly model quantitatively.

2.13.3. European guidance on cumulative impacts (Document EC DH XI) "Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions" (May 1999) defines cumulative impacts as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the Project".

2.13.4. The guidance goes on to state that:

"Activities in the past, present and future can all have a bearing on the project being assessment and will influence the time frame set for the EIA. Setting time frame "boundaries" will allow for the inclusion of past and future developments which could lead to indirect or cumulative impacts or impact interactions.....

In practical terms the extent of the assessment in terms of how far into the past and into the future will be dependent upon the availability and quality of information. Past activities can often be identified from historical maps, present activities from current maps and future development activities from development plans.....

In setting the future time boundary it is suggested that in general beyond 5 years there is too much uncertainty associated with most development proposals.....

.....it is only reasonably to consider current events and those that will take place in the foreseeable future. Furthermore, the assessment can only be based on the date that is readily available. There needs to be a cut off point at which it can be said that the impacts cannot be reasonably attributed to the project."

2.13.5. As well as the above cumulative impacts, others will be considered on a case by case basis.

2.13.6. The cumulative impact assessment will be considered in the following categories:

- Combined Effects of Individual Impacts – For example, when air quality impact caused by increased vehicle emissions combines with a microclimate impact of reduced wind speed causing a reduction in dispersion, resulting in adverse air quality; and
- Combined Effects with Other Developments – Those that are major applications (10+ units / 1000+sqm floorspace) that were approved in the last 5 years or pending, that were considered as having the potential to give rise to cumulative impacts.

Combined Effects of Individual Impacts

2.13.7. Combined effects on individual receptors have been assessed and are set out within the Summary Chapter at the end of the ES, no significant combined effects on individual reports have been identified that cannot be adequately mitigated via standard construction practice measures, such as a Construction Environmental Management Plan. The residual impacts that have been identified by each discipline have been analysed to identify receptors that may be impacted by combined effects from, for example, air quality and microclimate.

2.13.8. Where a single receptor has been identified as being impacted by combined effects, this exercise has assessed the potential residual impacts on that single receptor.

Combined Effects with Other Development

2.13.9. In respect of potential cumulative effects with other developments the Planning Practice Guidance (Paragraph 24) states the following:

"Each application (or request for a screening opinion) should be considered on its own merits. There are occasions where other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development. There could also be circumstances where two or more applications for development should be considered together. For example, where the applications in question are not directly in competition with one another, so that both or all of them might be approved, and where the overall combined environmental impact of the proposals might be greater or have different effects than the sum of their separate parts."

2.13.10. Therefore, it is considered that that a robust cumulative assessment will account for any existing or approved developments (i.e. anything with planning permission) and any application which could give rise to cumulative impacts.

2.13.11. The scope of committed developments to be assessed within the cumulative assessment will be based on a criteria set out in each technical topic, if relevant.

2.13.12. The projects to be included within the cumulative assessment are listed in Table 2.4 below and shown in Figure 2.1.

Table 2.2: Summary of Cumulative Development

Map Ref No.	Site	Reference	Description of Development	Status
1	Aylesbury Estate Outline Permission	14/AP/3844	Outline application for; demolition of existing buildings and phased redevelopment to provide a mixed use development comprising a number of buildings ranging between 2 to 20 storeys in height (12.45m – 68.85m	Under Construction Approved 05/08/2015

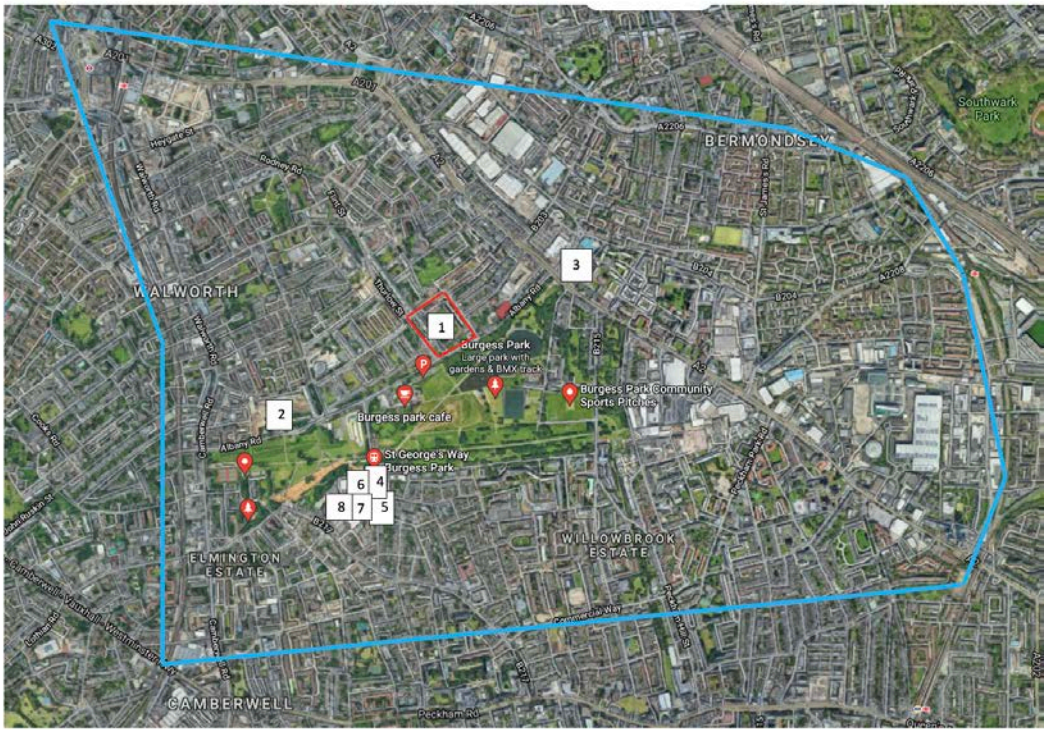
			AOD) with capacity for up to 2,745 residential units (Class C3), up to 2,500sqm of employment use (Class B1); up to 500sqm of retail space (Class A1); 3,100 to 4,750sqm of community use; medical centre and early years facility (Class D1); in addition to up to 3,000sqm flexible retail use (Class A1/A3/A4) or workspace use (Class B1); new landscaping; parks, public realm; energy centre; gas pressure reduction station; up to 1,098 car parking spaces; cycle parking; landscaping and associated works.	
2	Aylesbury Estate FDS	14/AP/3843	Demolition of existing buildings and redevelopment to provide a mixed use development comprising a number of buildings ranging between 2 to 20 storeys in height (9.45m – 72.2m AOD), providing 830 residential dwellings (Class C3); flexible community use, early years facility (Class D1) or gym (Class D2); public and private open space; formation of new accesses and alterations to existing accesses; energy centre; gas pressure reduction station; associated car and cycle parking and associated works.	Under Construction Approved 05/08/2015
3	Southernwood Retail Park	18/AP/3551	Hybrid planning application for detailed permission for Phase 1 and outline planning permission for Phase 2 comprising: Application for full planning permission for 'Phase 1' comprising demolition of existing buildings and the erection of a part 9, part 14, part 15, part 48 storey development (plus basement) up to 161.25m AOD, with 940 sqm GIA of (Class A1) retail use, 541 sqm GIA of flexible (Class A1/A2/A3) retail/financial and professional services/restaurant and café use, 8671 sqm GIA (Class C1) hotel; 541 (class C3) residential units	Approved 18/AP/3551 and subject to legal agreement

			(51,757 sqm GIA); landscaping, public realm and highway works, car and cycle parking and servicing area, plant and associated works. Application for outline planning permission (with details of internal layouts and external appearance reserved) for 'Phase 2' comprising demolition of existing buildings and the erection of a part 9, part 12, storey development (plus basement) up to 42.80m AOD, with 1049 sqm GIA of flexible (Class A1/A2/A3) retail/financial and professional services/restaurant and café use; 183 (Class C3) residential units (17,847sqm GIA), 1141 sqm GIA (Class D2) cinema and the creation of a 475 sqm GIA (Class C1) hotel service area at basement level; landscaping, public realm and highway works, car and cycle parking and servicing area, plant and associated works.	
4	35-39 Parkhouse Street	19/AP/2011	Demolition of existing buildings and construction of a mixed use building ranging from six to 10 storeys in height (35.15m AOD) comprising 100 residential units (Use Class C3) and 1,323 sqm (GIA) of Class B1/B2/B8 floorspace) with associated car parking, landscaping and other associated works.	Pending determination
5	1-13 Southampton Way	21/AP/0451	Clearance of site and redevelopment to provide 32 homes and a flexible commercial (use class E) / community unit (Use Class F2) in a building ranging in height from three to seven storeys, along with cycle parking, refuse facilities and landscaped public realm including provision of land to be incorporated into Burgess Park.	Pending determination

6	25-33 Parkhouse Street	20/AP/0858	The redevelopment of the site to provide a mixed-use development comprising buildings up to 11 storeys in height and accommodating new homes (Use Class C3) and commercial floorspace (Use Class B1c), car parking, cycle parking and associated landscaping. Further information: The proposal is for 109 dwellings and 1,351sqm (GIA) of commercial floorspace. The proposal would be a departure from saved policy 1.2 of the Southwark Plan (2007) owing to the proposed provision of residential units within a preferred industrial location, and the proposal would be within the setting of the Addington Park Conservation Area and grade II listed buildings the Lime Kiln in Burgess Park and the former St Georges Church and Groundwork Trust Offices on Wells Way.	Pending determination
7	Burgess Industrial Park Parkhouse Street London SE5 7TJ	21/AP/1342	Demolition of the existing buildings and redevelopment of the site to provide 386 residential units (Class C3), up to 4,410sqm of flexible commercial floorspace (Class E) and 112sqm of community floorspace (Class F) within 12 blocks of between 2-12 storeys (max AOD height 48.25m), with car and cycle parking and associated hard and soft landscaping and public realm improvements. This application represents a departure from strategic policy 10 'Jobs and businesses' of the Core Strategy (2011) and saved policy 1.2 'strategic and local preferred industrial locations' of the Southwark Plan (2007) by virtue of proposing residential and community uses in a preferred industrial location.	Pending Determination

			In the Council's opinion the proposal may affect the setting of the following grade II listed buildings and conservation areas: 73, 75 and 77 Southampton Way Collingwood House, 1, 2 and 3 Cottage Green 113 Wells Way Former Church of St George, Wells Way Ground trust offices and attached chimney, Wells Way Addington Square Conservation Area and grade II listed buildings therein (nos 13-20 and 33-42).	
8	21-23 Parkhouse Street London SE5 7TQ	19/AP/0469	Demolition of existing building at 21-23 Parkhouse Street and erection of two blocks (Block A and Block B) of 5 and part-7/part-10 storeys. Block A comprises 5-storey block for commercial/employment use (879sqm) and Block B comprises a part-7/part 10-storey block with ground floor commercial/employment use (111sqm) and 33 residential dwellings, accessible car parking, cycle parking, refuse storage, and associated landscaping	Pending Determination

Figure 2.1: Cumulative Development Locations



Site for Aylesbury Phases 2 and 3 outlined in red

3. The Project Site and Setting

3.1. Introduction

3.1.1. This chapter sets out the location of the Project Site and gives an overview of the existing land uses and features as well as an overview of the surrounding area.

3.2. Project Site Location

3.2.1. The Project Site occupies an area of 2.72 ha and lies within the Aylesbury Estate, a local authority housing estate, within Faraday Ward in LBS, south London.

3.3. Existing Project Site

3.3.1. The Project Site comprises Phase 2B (Second Phase) of the Aylesbury Estate Regeneration. The Phase 2B Project Site Location is shown in Figures 3.1 and 3.2 below.

Figure 3.1: Aylesbury Estate Regeneration Phase 2B site

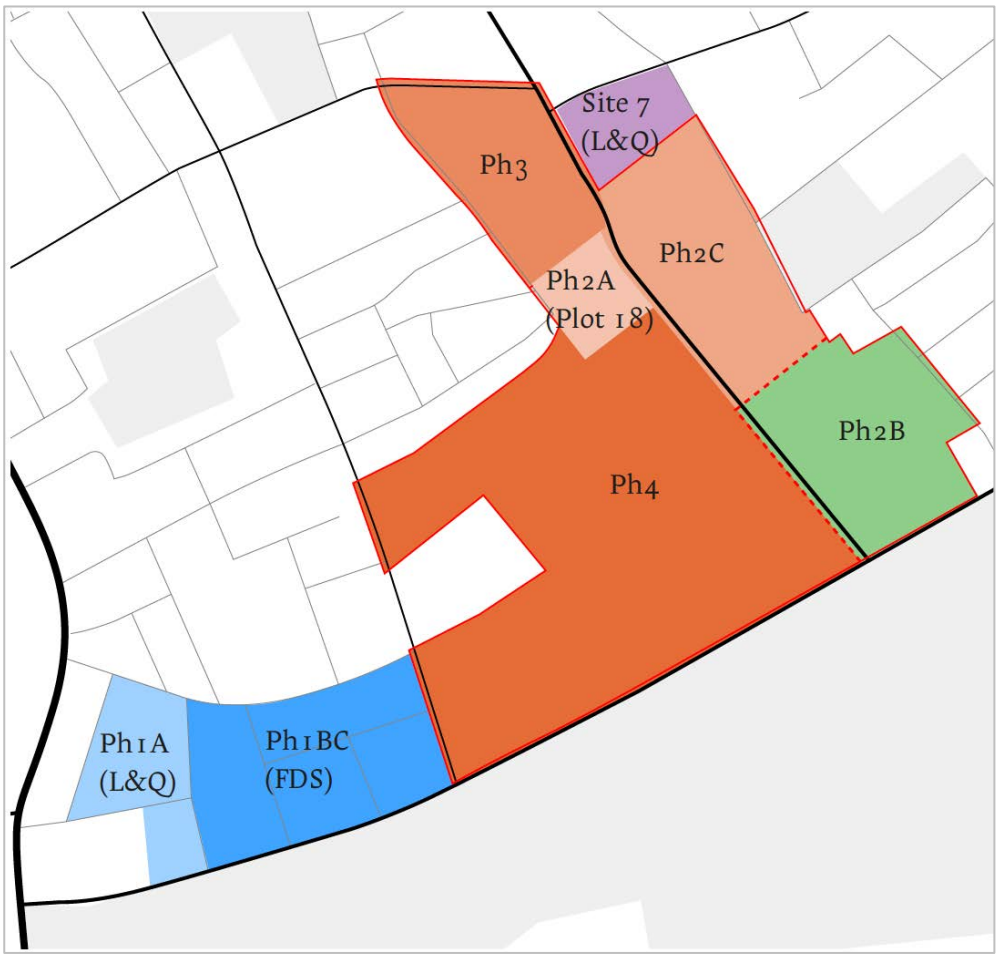
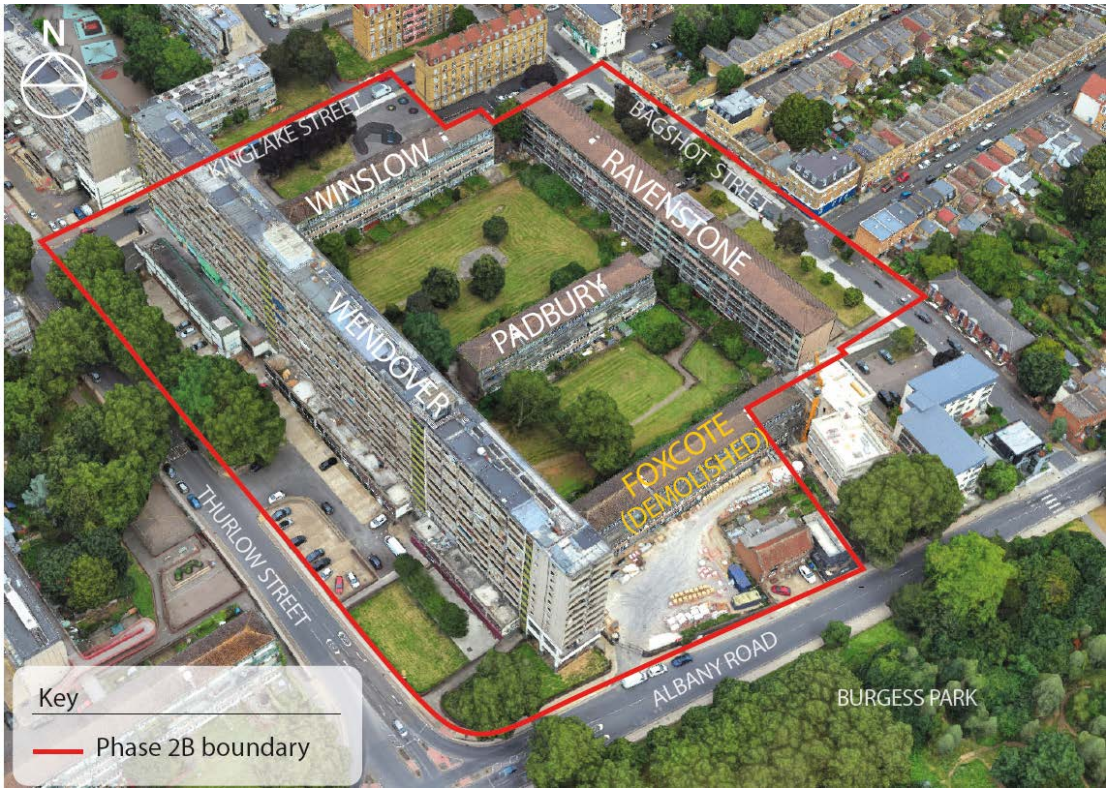


Figure 3.2: Phase 2B Existing Areal 3D View



3.3.2. The Project Site is located in southeast of the Aylesbury Regeneration Area and is in the second phase of the regeneration of the Estate. The Aylesbury Estate was constructed between 1966 and 1977 and is one of the largest housing estates in south London. The existing wider estate is predominately residential, with a mixture of houses, flats, and maisonettes, in buildings ranging from 2 and 14 storeys.

3.3.3. The existing Project Site contains 373 (predominantly social rented) units and 529 sqm of public open space. Current occupation is scattered across each of the existing buildings and comprises leaseholders, secure tenants and temporary accommodation. At the time of writing the total number of occupied dwellings is 90. LBS is in the process of decanting the blocks and expects to rehome the final balance on FDS contract A.

3.3.4. There are currently 4 blocks on the Project Site. The building to the south of the Project Site (Foxcote) in Figure 3.2 has already been demolished (in 2020) as part of the Approved Premise Facility which was completed in early 2021.

3.3.5. The general height of the existing buildings on the Project Site is up to 6 storeys except for the block fronting Thurlow Street (Wendover), which extends to 14 storeys.

3.3.6. The Project Site fronts Thurlow Street to the west; Bagshot Street to the East; Kinglake Street to the north; and Albany Road to the south. Images of the existing Project Site are shown below.

Figure 3.3: Images of the Existing Project Site

3.4. The Surrounding Area

3.4.1. The Aylesbury Estate is located within a wider primarily residential area that includes the Elephant and Castle (major town centre) and former Heygate Estate to the north.

3.4.2. Just south of Albany Road lies Burgess Park which is designated as a Site of Importance for Nature Conservation (SINC) and Metropolitan Open Land (MOL). The park contains many facilities including restaurants, leisure, and amenity/play spaces. Further to the north of the

Project Site is Surrey Square Park (approximately 135 ft from the Project Site) which is designated as a SINC and Borough Open Land.

3.4.3. A few shops, takeaways and restaurants are located along Bagshot Street directly adjacent to the Project Site. A greater variety of shops and services including retail, supermarkets, and commercial are located nearby along Walworth Road High Street to the west and Old Kent Road to the east. As an Opportunity Area, the Old Kent Road is pursuant to a number of mixed-use redevelopment proposals coming forward.

3.4.4. Several schools also exist in the surrounding area, including Ark Walworth Academy School to the east (approximately 4-minute walk from the Project Site) and Surrey Square Primary School (approximately 3-minute walk from the Project Site).

3.4.5. Several planning applications for the initial phases of the Aylesbury estate regeneration have been granted consent and are under construction or complete. Further details of the planning history of the Project Site and the wider estate are provided in the Planning Statement which is submitted in support of the planning application.

3.5. Key Designations

Local Plan Policy Designations

3.5.1. As set out in the Southwark Plan Policies Map (shown on the extract below), the Project Site is designated within the Aylesbury Area Action Core - Phase 2 (black outline). It is also with an area suitable for tall buildings (pink shading). Other designations include an Air Quality Management Area, and Hot food Takeaway Secondary School Exclusion Zone (beige shading).

Figure 3.4: Extract from Local Plan Policies Map

Ecological Destinations

3.5.2. There are no ecological designations on the Project Site.

3.5.3. Burgess Park to the South of the Project Site is designated as Metropolitan Open Land (MOL) and Site of Importance for Nature Conservation (SINC). Surrey Square to the north of the Project Site is also designated as a SINC and Borough Open Land.

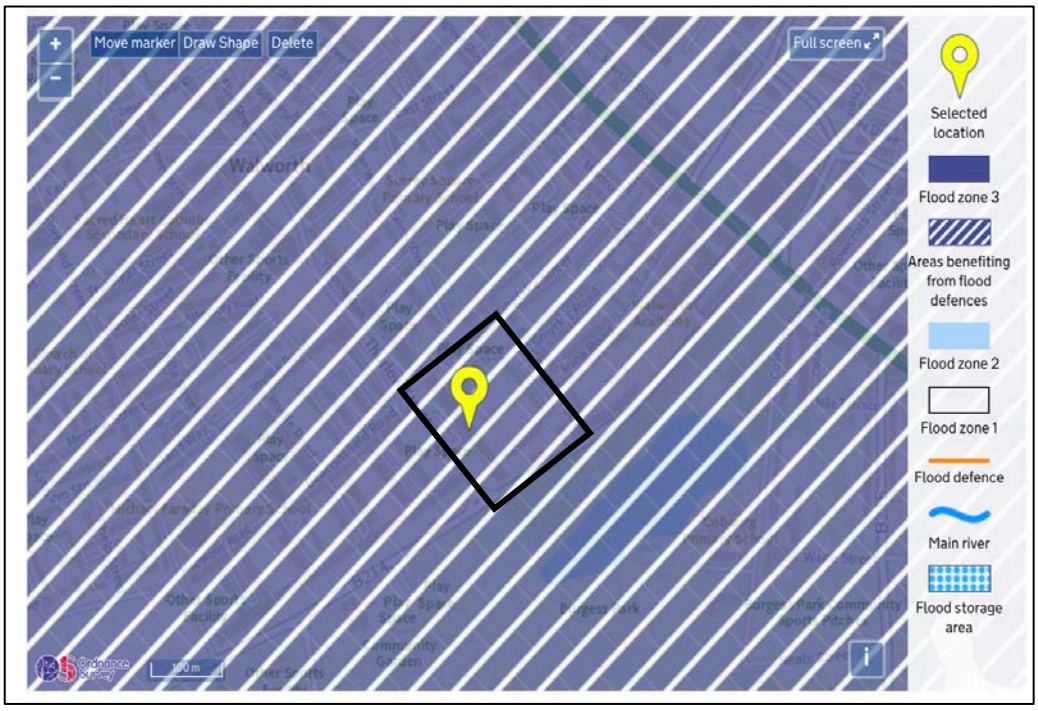
Air Quality

3.5.4. The Project Site lies within an Air Quality Management Area (AQMA).

Flood Risk

3.5.5. The Project Site is located in Flood Risk Zone 3 (in an area that benefits from flood defences) as shown on the Environment Agency Flood Risk Map for Planning extract below.

Figure 3.5: Extract from the Environment Agency Flood Risk Map for Planning.



Heritage

3.5.6. There are no locally or statutorily listed buildings on the Project Site, nor is the Project Site located within a Conservation Area.

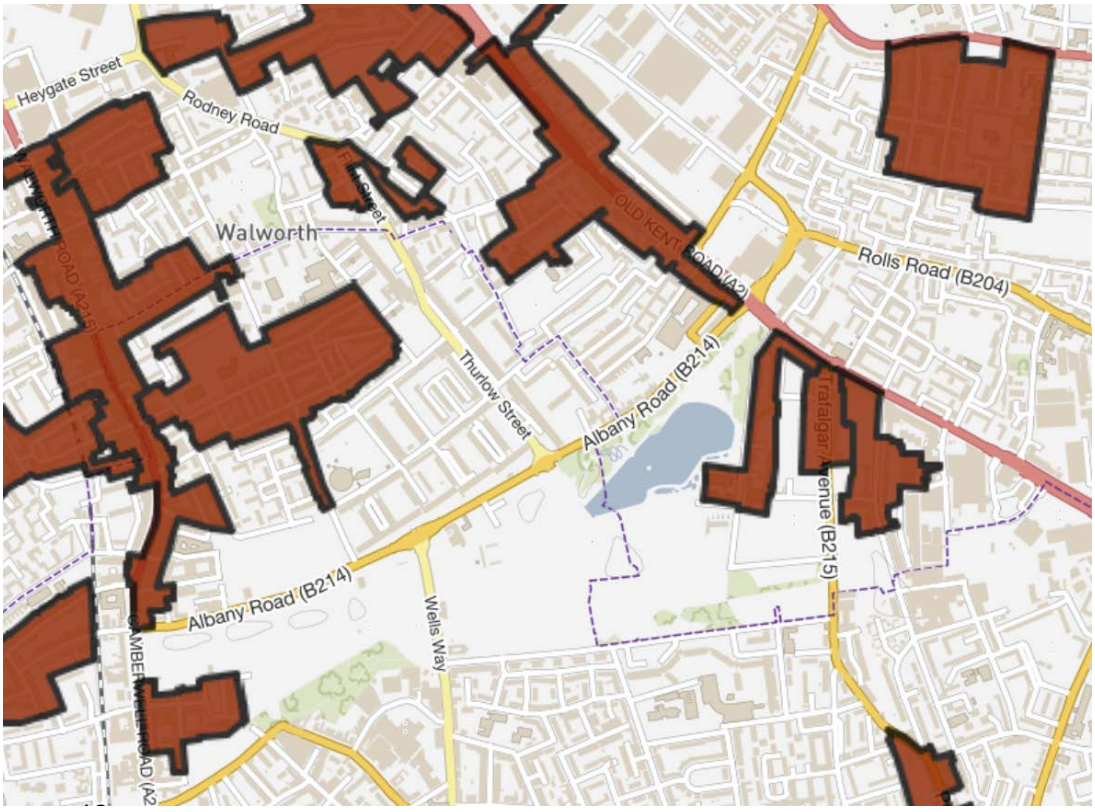
3.5.7. The nearest Grade II listings to the Project Site include the Former Fire Station on Old Kent Road (approximately 330 metres from the Project Site), and Numbers 20-54 and attached

railings and the raised pavement in front of numbers 20-54 Surrey Square (approximately 235 metres from the Project Site).

3.5.8. As shown in Figure 3.6 below, the nearest Conservation Areas to the Project Site include: Thomas A'Becket and High Street (approximately 140 m to the north); The Mission (approximately 340 m to the north); Cobourg Road, Trafalgar Avenue, and Glengall Road (approximately 320 metres to the south east); Addington Square (approximately 800 metres to the south); Liverpool Grove (approximately 250 metres to the north west); Pages Walk (approximately 640 metres to the north); Walworth Road (approximately 620 metres to the west); Larcom Street (approximately 830 metres to the north west); Thornburn Square (approximately 750 metres to the east); and Peckham Hill Street (approximately 830 metres to the south).

3.5.9. These Conservation Areas are shown in Figure 3.5 below.

Figure 3.6: Conservations Areas Near the Project Site as Shown on LBS Adopted Policies Map

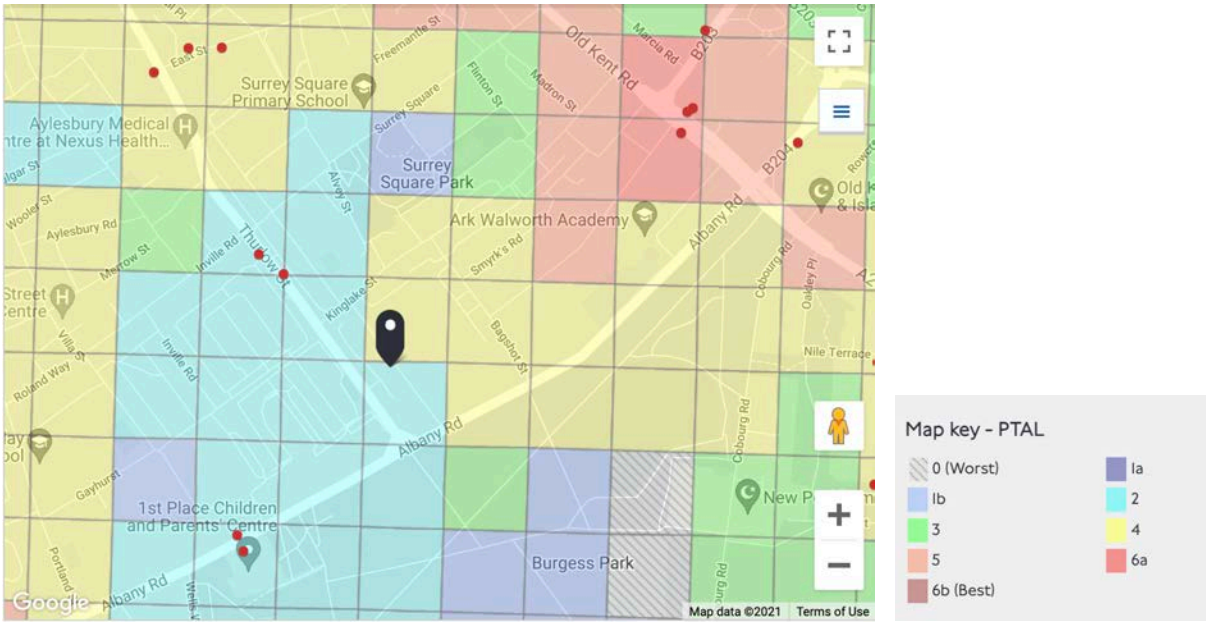


Project Site Accessibility

3.5.10. All the streets surrounding the Project Site are accessible to pedestrians.

3.5.11. The Project Site is in a reasonably accessible part of London. As shown on Figure 3.7 below, the majority of the Project Site is shown as having Public Transport Accessibility Level (PTAL) 4, with some areas fronting Thurlow Street having a PTAL 2. This coarse mapping does not include all pedestrian connections through the Project Site and a more detailed assessment finds that the whole Project Site is PTAL 4.

Figure 3.7: Extract from TfL's Public Transport Accessibility Map



3.5.12. The Project Site is situated approximately 1 mile to the southeast of Elephant and Castle Underground Station (Bakerloo and Northern Lines) and Elephant and Castle Station (Thameslink and Southeastern), and approximately 1.2 miles to Kennington Underground Station (Northern Line). The Project Site is also directly served by multiple buses along Thurlow Street and is a short walk to several bus stops on Old Kent Road which have a high frequency of services.

3.5.13. Thurlow Street adjacent to the Project Site is designated as Southwark Cycle Spine Route by LB Southwark who are progressing designs for this route.

Topography

3.5.14. The Project Site topography is generally flat with a high point of 3.3m AOD to the centre of the Project Site and a low point of 1.9m AOD to the southwest. The topographical survey drawings are available in full in Appendix A of the Flood Risk Assessment (see Appendix 12.1).

4. The Project Description

4.1. Introduction

4.1.1. This chapter presents the key characteristics of the Project which have informed the assessment. The assessment has also been informed by the detailed application drawings and elevations which have been submitted in support of the planning application. To avoid unnecessary duplication both in hard copies, and on the planning register, the application. Drawings and elevations have not been appended to this ES but they have informed the assessment (including the use of a 3D electronic model). The drawings and elevations for the Project accommoany the planning application documentation.

4.2. Background to the Estate Regeneration and The Need for the Project

4.2.1. The Aylesbury Estate was constructed between 1966 and 1977 and is one of the largest housing estates in London.

4.2.2. The existing buildings on the Project Site are at the end of their intended design life. Numerous reports and investigations (including structural surveys and pre demolition audits) have been carried out in the past to investigate if the existing structures can be re-purposed. The reports highlighted concerns over concrete degradation and the fact that the structural system used lacks inherent robustness. The remedial details to resolve these issues are not considered to be appropriate. The demand for more housing results in denser urban environments and the current housing demand would not be met with the current dwelling numbers in the existing buildings.

4.2.3. The Aylesbury Area Action Plan (AAAP), which was prepared by Southwark Council in consultation with the local community and the Creation Trust, was adopted in 2010. The purpose of the AAAP was to establish a planning framework to enable the regeneration of the Estate in a comprehensive manner.

4.2.4. NHG and Southwark Council are working together to bring forward the regeneration of the Estate. This includes a development programme for the whole regeneration with a final completion date of January 2034.

4.2.5. An Estate wide review identified Phase 2B as being the best situated to form the next part of the Aylesbury Regeneration.

4.2.6. The Project will deliver a total of 614 residential homes, which is a net increase of 241 homes. It will also provide 480.13 sqm of flexible floorspace for commercial business and service uses (Class E) and local community and learning uses (Class F1/F2(a)(b)).

4.3. The Planning Application

4.3.1. The planning application is being made in full (i.e. a detailed planning application), with no matters reserved for determination at a later stage. As such, the detailed planning drawings

and supporting information will inform the process of the EIA. Parameter plans will not be used as the basis of the assessment.

4.3.2. The Project as sought by the Planning Application, is described as:

"Demolition of the existing buildings and redevelopment to provide a mixed use development comprising five buildings of a variety of heights with basements, providing affordable and market homes (Class C3); flexible floorspace for commercial business and service uses (Class E) and local community and learning uses (Class F1/F2(a)(b)); public open space and playspace; private and communal amenity space; formation of new accesses and routes within the site; alterations to existing accesses; and associated car and cycle parking; refuse storage; and hard and soft landscaping; and associated works."

4.4. The Project

4.4.1. The Project involves the comprehensive redevelopment of the Project Site, including demolition of the existing homes.

4.4.2. In order for the significant environmental effects of the Project to be identified and assessed, it is necessary to clearly identify all of the components of the Project. Detailed plans have been assessed for the Project.

4.4.3. Table 4.1 below set out the key elements of the Project which have informed the EIA.

Table 4.1: Key Elements of the Project

Accommodation Schedule								
Size	**Private**		**Social**		**Intermediate**		**Total**	
	Units	**HR**	**Units**	**HR**	**Units**	**HR**	**Units**	**HR**
1 Bed	161	*322*	26	*52*	31	*62*	**218**	**436**
2 Bed	199	*597*	47	*180*	46	*138*	**292**	**915**
3 bed	9	*45*	37	*185*	5	*25*	**51**	**255**
4 bed	-	-	50	*300*	-	-	**50**	**300**
5 bed	-	-	3	*21*	-	-	**3**	**21**
Total	369	964	163	738	82	225	**614**	**1927**

Demolition	Demolition of all existing buildings and structures
Residential	58,569.51 sqm of GIA floorspace: Block 4A: 209 units in buildings from 6 to 25 storeys Block 4B: 24 units in a building of 5 storeys

	Block 4D: 88 units in a building from 6 to 7 storeys Block 5A: 250 dwellings buildings from 5 to 9 storeys Block 5C: 43 dwellings in a building from 4 to 6 storeys Total number of dwellings: 614
Non-Residential Floorspace	480.13 sqm of flexible floorspace (Use Class E and F2/F1(a)(b)) Located at the ground floor of Block 5A
Basement	2 level basement (car/cycle parking) in Block 4A (2,178sqm) 1 level basement (car/cycle parking) in Block 4D (1,223sqm)
Storeys	The number of storeys to be developed is between 4 and 25 storeys.
Car Parking	The car parking ratio across the Project Site is 1 space per 0.13 residential units. There will be a total of 79 residential parking spaces. 20% of parking spaces will have active provision of Electric Charging Points.
Cycle Parking	A total of 1,194 cycle parking spaces will be provided: • 1121 long stay residential • 62 visitor spaces • 3 long stay non residential • 8 visitor non residential

4.5. Layout

4.5.1. The Project comprises the construction of five buildings (known as Blocks 4A, 4B, 4C, 5A and 5C). The heights range between 4 and 25 storeys, with the tallest elements located on the corner of Albany Road and Thurlow Street. The buildings are set around two new public spaces (Thurlow Square and Bagshot Street) and the Project Site will be connected through a network of tree-lined streets.

4.5.2. The layout of the Project is shown on Figure 4.1 below.

Figure 4.1: Illustration of the Project layout

4.6. Amenity and Open Space

4.6.1. The landscape and public realm are structured around two new public spaces:

- A neighbourhood square, referred to as Thurlow Square, located in the west of the Project Site to the west of Block 4A and to the east of Thurlow Street.
- A neighbourhood park (containing a Multi-Use Games Area (MUGA)) referred to as Bagshot Park, located in the east of the Project Site, to the north of Block 4B and to the south of Block 5.

4.6.2. Illustrations of Thurlow Square and Bagshot Park are shown at Figures 4.2 and 4.3 below.

Urban Greening Factor

4.6.3. Policy G5 of the London Plan requires Urban Greening to be integral to the planning and design of new developments and has set an Urban Greening Factor (UGF) target of 0.4 for residential led developments. The Project Site is calculated to achieve an UGF score of 0.38, which is achieved through a series of measures including green roofs, an attenuation swale, rain gardens, areas of semi natural habitat planting, areas of flowering, ground cover, grass and planting, appropriate and increased tree planting, and permeable paving where possible.

Biodiversity Net Gain

4.6.4. The Biodiversity Net Gain (BNG) has been calculated at 38.97%, this greatly exceeds the 10% net gain requirement detailed within the Environmental Act 2021 and provides a net gain in line within Local and Regional Planning Requirements

Figure 4.2: Illustration of Thurlow SQ (Looking North)

Figure 4.2: Illustration of Bagshot Park (Looking West)

4.7. Playspace

4.7.1. A total of 3,202sqm of playspace is provided and can be broken down as follows:

- 0 – 4yrs: 1,186sqm
- 5 -11yrs: 1,033sqm
- 12+yrs: 983sqm

4.7.2. This in line with the GLA Play Calculator and the location of the playspace per age group is illustrated in Figure 4.3 below.

Figure 4.3: Illustration of Playspace by Age Category

4.8. Access and Movement

Pedestrian

4.8.1. The Project proposes to establish a new street network that will create more legible, safe, and accessible environment.

Highway

4.8.2. Vehicle access to the Project will be via Thurlow Street and Albany to create two internal loops that will return to the original road of entry. This is achieved by restricting east to west vehicle movement on to the extension of Mina Street between the two loop roads. This is illustrated in Figure 4.4 below which shows the existing road movements marked in blue and the proposed routes marked in red. The existing no-through rote for vehicles on Bagshot Street between Mina Road and Smyrks Road is retained.

Figure 4.4: Illustration of Existing (blue) and Proposed (Red) Movements

4.8.3. The vehicle access strategy will ensure that it will not be possible to use the internal streets to bypass the Thurlow Street / Albany Road traffic signal junction. The internal streets will only be used by vehicles that are either going to or from the parking or by vehicles servicing the buildings and spaces within the Project Site.

4.9. Refuse and Servicing

4.9.1. Residential waste and recycling collection facilities have been designed in line with LBS's Waste Management Guidance Notes for Residential Developments (February 2014).

4.9.2. On collection day bins will be directly collected from bin stores and transferred to collection points at the adjacent carriage way. The distances between the bin stores and the collection points are within 10m.

4.9.3. Block 4A will require a managed refuse collection strategy, with bins serving the tower being split between a storage room which will only be accessed by the management team who will move the bins to the collection point.

4.9.4. Provision has also been made for food waste storage and bulky waste.

4.9.5. A swept path analysis has been carried out to ensure that refuse vehicles can transverse through the internal highway network of Project Site in forward gear. This is detailed with a Delivery and Servicing Plan (DSP), which is submitted as a stand-alone document in support of the planning application.

4.9.6. Full details of the Refuse Strategy are set out within the Design and Access Statement which accompanied the planning application.

4.9.7. A total of 5 loading bays will be provided throughout the Project Site (so that each residential core has close access to a loading bay). Given that refuse vehicles are typically larger in size than delivery vehicles it is considered that the road network will also accommodate delivery vehicles (as demonstrated by the swept path analysis in the DSP). The location of the loading bays has been determined following consultation with LBS highway officers.

4.10. Parking

Car Parking

4.10.1. The Project Site will be served by 41 on-plot car parking spaces (across two locations), 32 on-street parking spaces within the new public realm and 6 on-street car club spaces. This results in a parking ratio of 1 space per 0.13 dwellings, which is in line with current policy requirements.

4.10.2. The residential dwellings will be served by 21 Blue Badge parking spaces which equates to a 3.4% at the stage of practical completion. The Blue Badge spaces will be provided on site and split proportionally between the podium level car park associated with Block 5A (at the north west corner of the Project Site) and the basement beneath Block 4B. Provision will be made to increase the number of Blue Badge spaces to approximately 7% should demand increase, which has been agreed with TfL. Full details are set out within a Car Park Management Plan which is submitted in support of the planning application as a stand-alone document.

Cycle Parking

4.10.3. Cycle parking is provided in line with the requirement of the LBS Local Plan (2022). Long stay parking will be secure and covered parking in each Block Short stay parking will be located within the public realm. Provision for cycle hire will be located within Thurlow Square.

4.10.4. A total of 1124 secure and covered long-stay cycle parking spaces will be provided. A total of 70 short-stay cycle parking spaces will be provided in the form of 35 Sheffield stand spread throughout the Project Site and located at key destinations near entrances to the buildings in order to encourage visitors to cycle. Short-stay stand will also be located at Thurlow Square and Bagshot Park.

4.10.5. A total of 3 long-stay and 8 short-stay cycle parking will be provided for the non-residential element of the Project. Further detail is set out within the Car Park Management Plan which is submitted in support of the planning application as a stand-alone document.

4.11. Trees

4.11.1. A total of 28 trees are proposed to be removed, of these 12 are categorised as U category, 14 C category and 2 B category.

4.11.2. A total of 125 new trees will be planted, which results in a net increase of 97 trees across the Project Site. The new trees will be of high-quality planting stock and will be located within best practice planting pits. It is considered that this will result in a more diversified tree population which will be better suited to long term development and retention.

4.11.3. Full details of the tree removal, planting and root protection are set out within an Arboriculture Impact Assessment and Method Statement and the Landscape Design and Access Statement which are submitted in support of the planning application as stand-alone documents.

4.12. Characteristics and Materials

4.12.1. All buildings include a palette of red/brown brick and light precast concrete elements to ensure that the proposals will form a cohesive neighbourhood. Full details of the materials for each Block can be found within the Design and Access Statement.

4.13. Building Heights

4.13.1. The illustration at Figure 4.5 shows the number of storeys across the Project Site. Building heights will range between 4 and 25 storeys with the tallest element on the corner of Albany Road and Thurlow Street.

Figure 4.5 Illustration of the Number of Storeys

Whole Carbon Life Cycle

4.13.2. As per the London Plan requirements a Whole Life Carbon (WLC) assessment has been undertaken in support of the planning application and is submitted as a stand-alone document. The WLC analysis of the embodied carbon of the Project was assessed with the aim of implementing measure to the reduce the carbon impact of the Project. The WLC emission are set fully detailed within the WSC assessment and in summary the results are found to be at the lower end of the GLA benchmarks for typical residential development, but outside of the GLA WLC Aspirational benchmarks.

Circular Economy

- In line with the London Plan requirements, a Circular Economy Statement has been prepared in support of the planning application and has been submitted as a stand-alone document. The key principles adopted for the Project are listed below:
- Re-using excavation waste directly on the Project Site where possible (cut and fill);
- Deriving at least 20% of the total value of materials from recycled and reused content in the products and materials selected, and higher proportions will be targeted where feasible;
- Reusing / recycling / recovering at least 95% of construction waste, including some on Site;
- Design for deconstruction for balustrades, rainwater pipes, windows, doors, and bathroom pods (if incorporated);
- Targeting 65% of municipal waste to be diverted from landfill by 2030, and
- Carrying out whole life carbon modelling.

4.14. Utilities

4.14.1. A Utilities Statement has been prepared and submitted with the planning application and can be found at Appendix 4.1. The Statement covers gas, water, electrical and telecommunications supplies.

Gas

4.14.2. The existing Project Site benefits from a network of gas infrastructure and as stated above it is proposed that the Project will be served with a single energy centre which will be ASHPs coupled with dwelling heat interface units, and high efficiency gas boilers as back up.

Water

4.14.3. New clean water connections will be provided for each Block on the Project Site. A total of 4 new clean water supply connections from the local Thames Water network will supply all the Blocks. Thames Water no longer provide budget quotations setting out the anticipated costs for the provision of new clean water supply connections. There is now an expectation for customers to use Thames Water information tables to estimate their own budget costs for new supplies based on supply pipe size, length of pipe, number of bends, material, excavation depth, landscape etc. This information will be used to give an indication of budget costs at the detailed design level (i.e. post planning permission), see Appendix 4.1 for further details.

Electrical

4.14.4. New electrical connections and alterations will be required across the Project Site. Max Fordham LLP have been in regular contact with the electrical distribution network operator UKPN throughout the Stages 2 and 3 design periods. UKPN have provided budget quotations for electrical diversions and disconnection activities.

Telecommunications

4.14.5. The existing Project site includes data/telecoms infrastructure elements owned and operated by Openreach and Virgin Media. General diversions will be carried out by Virgin Media. Therefore, no significant Openreach diversion works are required to the Phase 2B site, beyond the recovery of copper cables on the Project Site by Openreach.

4.14.6. An existing BT phone box is also located on the Project site, and discussions with BT are ongoing regarding its relocation and costs.

4.14.7. New fibre telecommunications will be provided to each Block. Discussions with BT are ongoing to progress these new connections.

4.15. Alternative Locations and Options

Introduction

4.15.1. The EIA Regulations do not require a full assessment of all potential alternatives, only a reasonable account of those actually considered by the developers prior to submission of the application.

Alternative Locations

4.15.2. Alternative development options within EIA are often considered primarily in terms of location, however, the nature of the Project, that of an estate regeneration, it is not considered appropriate to consider alternative locations to deliver the Project. The Applicant does not wish to seek alternative locations for the Project and wishes to regenerate the existing estate. Therefore, it is not considered necessary to assess alternative locations for the Project.

Alternative Options

4.15.3. There is a limited realistic option that have been considered, the quantum of development has been considered from the outset which is determined on the basis of design and financial viability.

4.15.4. The key requirements of the Project are to reprovide the social rented dwellings and to provide up to 50% affordable homes. To achieve these two objectives a number of private market housing is to be provided.

4.15.5. It could be considered that the 2015 OPP is an alternative scheme of the same nature. However, it has been this is no longer in line with current planning policy aspiration and that an increase in the density will make better use of the land.

4.15.6. A ‘do nothing’ alternative is also not considered to be a feasible alternative. The Project is part of a wider aspiration by the Applicant and LBS.

Alternative Layouts

4.15.7. The design process was an iterative process whereby the evolution of the design commenced in the early 2020. Since that time, design team meetings occurred approximately every two weeks and a significant amount of stakeholder engagement also took place over the same period, including two design review panels on 12th July 2021 and 14th December 2021. Throughout this process design comments were taken on board at each stage in the consultation process and the design evolved into its current form, which is submitted for planning.

4.15.8. The design evolution is set out within the Outline DAS (Volume 1) which is submitted with the planning application documentation. The key alternatives to the layout are briefly set out below, however it is considered that they do not give rise to substantially different environmental impacts as to require detailed assessment under EIA.

Initial Option Analysis

4.15.9. A series of layout options were explored as part of the extensive pre application process in conjunction with the planning and design officer at LBS. of Phase 2B were produced. This is fully detailed within the Design and Access Statement

Figure 4.6: Project Design Options

4.15.10. Option 1 (see below), included a central building which separated the two central parks. This option was tested against design criteria including levels of dual aspect homes. However, this layout was not supported by officers at LBS or by the Design Panel. As such this option was not fully assessed under EIA or brought forward to detailed design for the planning application.

OPTION 1

4.15.11. Option 2 (see below), explored the removal of the central block (as shown in Option 1) and the southern expansion of the northern block on Thurlow Street. This option was considered by the design team to allow for good levels of private communal amenity but it was found to support less dual aspect dwellings and less public amenity, in that it resulted in only one public

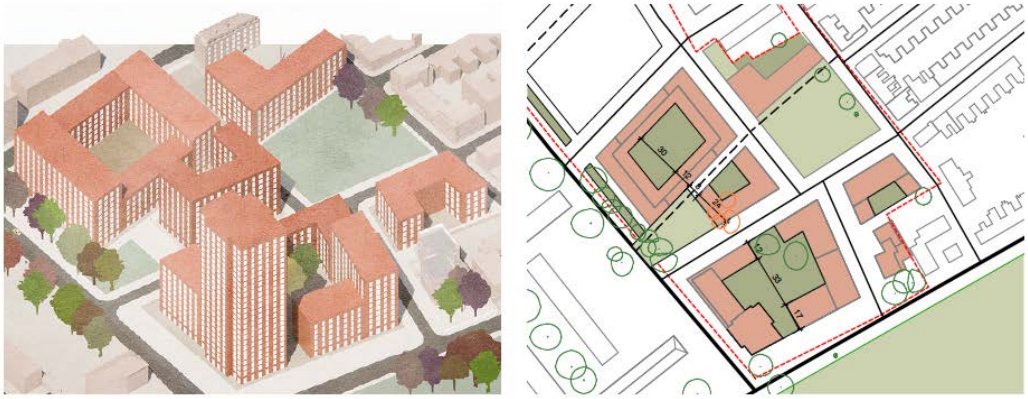
park area. As with Option 1, this was not supported by LBS officers, GLA officers or the Design Panel at LBS.

OPTION 2

4.15.12. Option 3 (see below), included the eastern blocks of Option 2 being broken down into smaller plots. This resulted in narrow streets in relation to the surrounding building heights and, as with Option 2 it resulted in the loss of a key public amenity park within the east of the Project Site. This was not supported by the design team or explored further with the LBS officers or the GLA and as such not assessed within the remit of the EIA.

OPTION 3

4.15.13. Option 4 (see below) saw a return to incorporating a central block to the overall layout. Which would result in the provision of 2 public parks. However, initial testing on daylight, sunlight and overshadowing indicated that this would result in poor levels of daylight and sunlight and overshadowing of the communal amenity space for the central block. This was not supported by the design team or explored further with the LBS officers or the GLA and as such not assessed within the remit of the EIA.



OPTION 4

Summary

4.15.14. The design evolution was informed by initial high level appraisal of the daylight, sunlight and overshadowing impacts with significant input from the landscape designers and the planning and design officers at LBS and the GLA. Of the options presented above the scheme which advanced to the design of the Project, and fully assessed under EIA, it is the evolution of Option 2 which bears most relation to the fixed scheme for planning. As such it is not considered appropriate to consider alternative layouts and massing in any further detail as part of the EIA.

5. Phasing, Construction, and Implementation

5.1. Overview

5.1.1. This chapter of the ES sets out an overview of the proposed programme of construction works and the key activities that will be undertaken during the demolition and construction of the Project.

5.1.2. Construction methods are influenced by a combination of factors. These include the existing Project Site conditions, vacant possession and the preferred methods of the building contractor that will be appointed. No contractor has been appointed at this stage and a contract will be subject to the approval of planning.

5.1.3. This chapter, along with its technical appendices inform the detailed assessment of demolition and construction, including mitigation, which are set out within the technical chapter 6 to 13.

5.1.4. This chapter is supported by the following technical appendices, which have been produced to inform the EIA:

- Outline DEMP (see Appendix 5.1), containing:
- Project Management Plan;
- Traffic Management Plan;
- Site Waste Management Plan;
- Environmental Management Plan and Outline Method Statement;
- Outline CMP (see Appendix 5.2),

5.2. Indicative Phasing Strategy

5.2.1. Demolition and construction works are planned over a total duration of 4yrs and 5months. The indicative phasing is set out below and illustrated on Figure 5.1. It should be noted that at this stage the dates are necessarily indicative at this stage as it will be subject to the grant of planning permission, the discharge of planning conditions and vacant possession. However, it is not anticipated that the overall sequence of the phasing and the overall duration of each phase will significantly change from that which is set out below.

5.2.2. The indicative phasing is as follows:

- Phase 1 – Construction of Block 4D (March 2023 – April 2025);
- Phase 2 - Demo of existing buildings (November 2023 – May 2025);
- Phase 3 - Construction of Block 4B and Block 5A (June 2024 – June 2026),
- Phase 4 - Construction of Block 5A (May 2025 – August 2027).

5.2.3. Block 4D will not be occupied until the hard demolition (i.e. exclusive of soft strip) of the existing building has been completed.

5.2.4. With the exception of Block 4A, occupation of each Block will follow practical completion of that particular Block. However, it is anticipated that the occupation of Block 4A will commence which the internal fit out of the tower section is still underway. with the expectation of 4A which will be occupied while the fit of out the tower section is still completing.

5.2.5. The indicative phasing plan is detailed in Figure 5.1 below.

Figure 5.1: Indicative Phasing Plan

5.3. Estimated Volumes of Waste Arisings from Demolition and Construction

Demolition

5.3.1. A Pre-Demolition audit carried out by BRE in 2014 (see Appendix 5.3) in support of the OPP estimated the breakdown of materials arising by phase and by type. This is summarised below.

Table 5.1: Materials by Weight and Volume

	Tonnes	Volume (m3)
Phase 2 (the Project)	61,869	26,371

Table 5.2: Summary of Estimated Quantity of Materials Arisings from the Project

Material	Material Source	Tonnes
Concrete	Substructure, superstructure, floor slabs, roof, walls and columns	58,112
Brick	External and internal walls and garages	1,901
Metal	Reinforcement, windows, plant, superstructure, sub assemblies	1,095
Plaster	Partitions and ceilings	568
Glass	Windows	179
PVC	Double glassed window units	4
Timber	Internal fittings, doors and windows	9
Total		61,869

5.3.2. As set out in the Circular Economy Statement (which accompanies the planning application as a stand alone document) the approach is for 97% of the accumulated waste (concrete, brick and metal) to be recycled using a combined strategy of on and off site recycling. The Project intends to meet the GLA target of greater than 97% of waste being re-used or recycled, resulting in less than 5% being send to landfill / incineration.

5.3.3. The project will be registered with the Environment Agency in relation to waste. Registration details will be issued to all contactors. The Waste Removal Contractor will be made responsible for the removal of all waste from the Project Site and will comply with the Duty of Care requirements. Records of all waste materials and their removal will be maintained in accordance with Statutory Legislation and records kept on site. These include ensuring waste is transported by registered carriers, disposal to appropriately licensed sites and maintenance of appropriate waste transfer documentation.

Construction

5.3.4. An estimate of construction waste arising has been generated using the total GIA floorspace (65,040. 93 sqm) and using a target of 0.093 tonnes / sqm GIA, which is 9.3 tonnes / 100sqm (using the GLA median). The Project is therefore estimated to generate 6,093 tonnes of waste arising during construction. A more detailed breakdown of the estimated amount will be completed upon the appointment of the Principal Contractor and will be set out within a detailed CMP, an outline CMP can be found at Appendix 5.2.

Excavation

5.3.5. The bulk of excavation is from the geometry of the basement (within Blocks 4A and 4D), which is governed by requirements for parking and plant spaces. The Project Site cut and fill approach makes allowance for the re-use of approximately 21,980 m^3 of excavation soil for beneficial purposes.

5.4. Construction of the Project

Competence, Training and Awareness

5.4.1. Specific training needs will be developed for individuals to reflect the work to be carried out on the Project and the significant risks and opportunities identified.

5.4.2. The requirement is for all personnel to be aware if their general environmental management responsibilities, and for those who work may cause, or have the potential to cause, a significant impact on the environment, to receive specific environmental awareness briefings. Environmental awareness will be reinforced through information, such as poster campaigns, environmental/sustainability performance indicator reports and environmental alerts available onsite notice boards.

5.4.3. All contractors are responsible for ensuring the competency of their environmental staff. In the event that environmental training is needed for staff, a contractor is responsible for ensuring this requirement is fulfilled.

Material Storage and Handling

5.4.4. Materials will be stored on site efficiently to reduce the risk of damage, environmental incidents, injury to site-based staff and theft. Plant and equipment would be stored in areas that are less susceptible to possible pollution incidents, or in dedicated areas of hard standing. A spill kit will be available for use in the event of an incident.

5.4.5. All deliveries will be supervised by a responsible person. Any fuel deliveries will take precautions to ensure that the fuel storage tanks are checked before and during delivery. to prevent overfilling. Any refuelling will take place away from any drains and will be adequately signposted to ensure the refuelling area is clearly visible to all.

5.4.6. Vehicles will be off-loaded using the lorry mounted forklift or Site forklift. Where practicable, the loading and unloading operations must be carried out so as to avoid the need for persons to

climb onto the vehicles to undo straps etc. If this is not possible then a system of fall prevention, for example scaffold platforms with guardrails, will be provided.

Lighting

5.4.7. The extent of the area to be lit will vary during the different stages of construction according to area of construction, security and health and safety requirements. If flood lights are installed to provide safe levels of light for operations, they will be within the bounds of the Project Site and consideration will be given to the positioning so that they do not create a nuisance to surrounding neighbours. Safety lighting will be shrouded and pointed downwards at night. They will be switched off at the end of the working day. Appropriate lighting to the hoardings will be installed.

Security

5.4.8. Site security is an important component of good environmental management and every effort shall be made to ensure the safety of the Project Site and local community. Security measures have been considered and are outlined within the Outline DEMP (see Appendix 5.1) and Outline CMP (see Appendix 5.2).

Site Offices and Facilities

5.4.9. There is no proposed fixed location for a construction compound. This will need to be flexible so that it can be informed by the appointed contractors requirements once appointed. It is considered that due to the size of the Project Site and the phased development there are limited constraints on the location of site offices and that they can sensitively located in order to give rise to minimum disruption.

5.4.10. However, all welfare facilities and officers will be located within the Project Site and accessed via Albany Road. Access to the project offices will also be taken from Albany Road. The portacabin units will allow adequate space for all staff and visitors, along with meeting rooms, welfare facilities including changing / drying rooms with male and female toilet facilities and canteen.

Hours of Work

5.4.11. It is anticipated that the core working hours during demolition and construction will be as follow:

- 08:00 to 18:00 Monday to Friday;
- 08:00 to 13:00 Saturday, and
- No working undertaken on Sundays or Bank Holidays.

5.4.12. The hours of work will ensure that no work will be undertaken at antisocial hours when the impact of noise on neighbours would be considered to be greatest.

5.4.13. Approval from LBS will be required for any works that need to be carried out outside the core hours (as stated above).

5.5. Demolition Method

Wendover

5.5.1. It is anticipated that Wendover will be the only existing building to be fully encapsulated with scaffolding. It is likely that Ravenstone will be part scaffolded to the Bagshot and south elevation.

5.5.2. Soft strip works will be carried out in advance of any hard demolition works and will include (but not limited to) the removal of suspended ceilings, fixtures and fittings, non-load bearing partition walls, doors, door furniture, skirtings and sanitary ware.

5.5.3. Wendover will be demolished using a top-down method. A crane will lift plant and competent persons to the roof levels and mini diggers will break the roof slab and create a ramp down to the next level to allow all plant to relocate to the floor below. Once the roof slab is demolished the pre case panels which from the outside of the building will then be removed. This process will be repeated until reaching the 4th floor. From the 4th floor a excavator will carry out the remaining demolition.

Winslow, Ravenstone and Padbury

5.5.4. Due to Winslow, Ravenstone and Padbury being lower than Wendover, they will be demolished using a 360 degree excavator (located at ground level) with a pulveriser attachment used to demolish working down from roof level.

Foundations and Slabs

5.5.5. Once all buildings have been demolished to ground floor level the slabs, footings and foundations will be removed using a combination of breaker attachment and excavators. The pile caps will be reduced or removed and the void created will be backfilled with crushed material.

Utilities

5.5.6. Site clearance, demolition and utility diversions will take place under a single demolition contract, with the appointed contractor being responsible for managing and undertaking all the necessary diversions and disconnections necessary to allow demolition and construction. Further detail is set out within the Utilities Statement at Appendix 4.1.

5.6. Construction

5.6.1. Construction methods are influenced by a combination of factors. These include the existing ground conditions and the preferred methods of the building contractor that will be appointed. More details of this are found within the Outline CMP (see Appendix 5.2).

5.6.2. Consideration has been given to the types of plant and equipment that are likely to be used during the construction works. An indication of the typical types of plant and equipment associated with each key element of the works are set out below.

- Bituminous mixing and laying plant;
- Breakers;
- Bulldozers;
- Compressing Air Plant;
- Concrete Plant;
- Skips;
- Cranes
- Dumpers;
- Earth Moving Plant;
- Excavators;
- Forklift Trucks and lifting Devices;
- Loaders;
- Lorries (Deliveries and Muck Away);
- Mobile Elevating Work Platforms;
- Pallet Jack;
- Piling Equipment;
- Power Float;
- Pumps and Dewatering Equipment;
- Road Sweeper; and
- Rollers.

5.6.3. Where feasible, the appointed contractor will procure Non-Road Mobile Machinery (NRMM) emissions in line with the engineer emission requirement. The appointed contractor will produce an inventory tracker for all plant and machinery used during Site set up, demolition and construction, including NRMM.

5.7. Method Statements

5.7.1. Method statements will be completed by the PC/DC or sub-contractor by trained engineers or other appropriately experienced personnel, in consultation with on-site staff and, where necessary, environmental specialists. Their production will include a review of the environmental risks and commitments, so that appropriate control measures are developed and included within the construction/demolition process.

5.7.2. Method statements will be reviewed and signed off by the appointed Environmental Manager as well as the PC/DC and, where necessary reviewed, by an appropriate environmental specialist (e.g. ecologist). Where required, method statements will also be submitted to the enforcement agencies for information (EA, EHO at LBS etc.). As a minimum, method statements will contain the following:

- Location of the activity and access/egress arrangements;
- Work to be undertaken and methods of construction;
- Plant and materials to be used;
- Labour and supervision requirements;
- Health, safety, and environmental considerations; and
- Any permit or consent requirements beyond those already obtained.

5.8. Construction Environmental Management Plan

5.8.1. Details of measures to protect the environment and sensitive receptors, such as construction workers, existing residents and new residents, during the construction of the Project will be set out in a detailed Construction Environmental Management Plan (CEMP). Such measures will address hours of working, noise, vibration, dust, light spill, wheel washing and control of run-off. It is anticipated that the implementation of the CEMP will be a condition on the planning permission, and it will be regularly monitored.

5.8.2. An Outline CEMP has been prepared in support of the ES (see Appendix 5.2) in order to provide a framework for the mitigation, monitoring and management. It sets out a series of actions and measure to be implemented in the run up to, and during the construction to avoid, remedy or mitigate the potential environmental impacts arising from the works.

5.8.3. The Outline CEMP identifies the key potential issues / constraints as:

- The sequencing of the construction of the Block which will need to be closely co-ordinated, and monitoring procedure that will have to be implemented to ensure that adjacent stakeholder properties are no affected, and
- Live services located on the Project Site to be disconnected by the relevant authorities, these comprise of gas, electricity, and water.

5.8.4. The Potential Effects and Sensitive Receptors are also identified within the Outline CEMP within a topic based table with includes: Transport; Air Quality; Noise and Vibration; Water Resources and Flood Risk and Ground Conditions and Contamination.

5.9. Construction Site Waste Management Plan

5.9.1. An accompanying draft Site Waste Management Plan is included within the Outline DEMP(see Appendix 5.1 and the Construction Waste including within the CMP has been produced (see Appendix 5.3), providing details on forecast waste quantities and classifications likely to be generated during the construction of the Project. The Project will be constructed in line with the

waste hierarchy. A Demolition and Construction Waste Management Strategy (CWMP) will be prepared by the Environment Manager in accordance with the waste hierarchy principles and best practice guidance, which will be implemented throughout the demolition and construction phases.

5.10. Demolition and Construction Traffic Management Plan

5.10.1. A Demolition and Construction Traffic Management Plan (CTMP) will be agreed with LBS prior to works commencing. The CTMP would seek to keep demolition and construction traffic on the strategic road network and avoid sensitive routes and local communities in order to minimise impacts on receptors and manage environmental effects.

5.10.2. The CTMP will manage the daily delivery profiles and control movements and routeing of demolition and construction traffic through the following measures:

- Traffic Routing Strategy;
- Ensuring vehicles access the Project Site via the most appropriate route and avoid unnecessary conflict with sensitive areas and receptors;
- Traffic Timing Strategy – Programme vehicle arrival and departures and working hours to lessen the impact on the highway network;
- Temporary Signage – In accordance with the Department for Transport Traffic Signs Manual Chapter 81 to inform road users of construction access points and the presence of HGVs and plant;
- Temporary Traffic Management – Provided on approaches and access in the form of traffic warning signs, possible reductions in speed limit signs to ensure safe passage of vehicles;
- Site Accesses – Designed in accordance with Design Manual for Roads and Bridges 42/95 Geometric Design of Major/Minor Priority Junctions; and
- Staff Travel Plan – Will provide details of how staff will travel to the Project Site by alternative modes in an effort to reduce single occupancy vehicles travelling to the Project Site.

<u>Demolition and Construction Traffic</u>

5.10.3. Access to the Project Site will be via Albany Road, Thurlow Street, and the A2 Old Kent Road to the east of the Project Site. The A2 Old Kent Road is part of the TLRN and a key strategic road in London. Thurlow Street is a primary road and Albany Road is a connector road and considered to be appropriate to provide access to the A2 Old Kent Road.

5.10.4. Demolition and construction traffic will be avoided on local roads such as Walworth Road.

5.10.5. Qualified Banksman and Traffic Marshalls will be employed throughout the duration of demolition and construction and will be responsible for the safe movement and guidance of plant and vehicles within the Project Site and at the access.

Access / Egress

5.10.6. The Project Site will be fully fenced with a 2.4m hoarding along the perimeter allowing access to the Project Site for vehicular movements with a segregated and pedestrian gate.

5.10.7. Pedestrian access will be maintained around the perimeter of the Project Site and any crossings or temporary use of the public footpath for access will be controlled with a qualified banksman.

Jet Washing

5.10.8. A jet washing facility will be located at the access point as vehicles leave the Project Site. It will be installed and controlled by the appointed contractor until works are completed. Temporary drainage will be provided to prevent dirty water and arising washed onto the road / footpath. A sump will be used to minimise the risk of oils or other contaminants entering the drainage system.

Road and Footpath Closure

5.10.9. Any temporary road closures will be agreed with the local highway's authority, LBS and emergency services. Notices will be posted to alert the public to any planned road closures and / or diversions.

Deliveries

5.10.10. A Delivery Management System will be used to plan deliveries entering the Project Site. The Site management will be responsible for the system along with its contractors and a delivery schedule provided for the Banksman to control.

<u>Considerate Constructor Scheme</u>

5.10.11. The Project Site will be registered with the Considerate Constructor Scheme and agree to abide by the Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

5.10.12. Contact numbers for management will be displayed on the hoarding and direct contact numbers will be provided to all key stakeholders.

5.10.13. A complaints register will be held at the site offices and any complaints will be recorded for action within the register. Complaints or incidents where actions levels are exceeded will be reported and immediately investigated.

<u>Other Sites with the Surrounding Area</u>

5.10.14. Prior to demolition and construction, the developer and the appointed contractor will consult with LBS and other contractor's developers in the area in order to minimise disruption. Following which collaboration will take place with other neighbouring site and LBS.

6. Air Quality

6.1. Introduction

6.1.1. This Chapter presents the likely significant effects on local air quality resulting from air quality emissions associated with both the construction and operation phases of the Project. It considers the potential impacts on local air quality concentrations on sensitive receptors both on, and in the vicinity of, the Project Site.

6.2. Appendices

Table 6.1: Appendices for Chapter 6

Appendix No.	Document
6.1	Figures
6.2	Glossary of Terms and Abbreviations
6.3	Construction Dust Assessment Methodology
6.4	Traffic Data
6.5	Road Traffic Emissions: Dispersion Model Assumptions
6.6	Energy Centre Emissions: Dispersion Model Assumptions

6.3. Legislation, Policy and Guidance

Legislative Framework

6.3.1. The following legislation is relevant to the air quality assessment:

- The Environmental Protection Act 1990[4], Part III concerning prevention of statutory nuisance due to emissions from demolition/construction site activities by using Best Practicable Means;
- The Environment Act 1995[5], Part IV giving requirements for a National Air Quality Strategy[6] and Local Air Quality Management (LAQM) duties for local authorities.

[4] Environmental Protection Act 1990. Available online at: https://www.legislation.gov.uk/ukpga/1990/43/resources
[5] Environment Act 1995. Available online at: https://www.legislation.gov.uk/ukpga/1995/25/contents
[6] Department for Environment, Food and Rural Affairs (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1) [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf

Where a local authority determines that one or more objective(s) is/are not likely to be met then it is required to declare one or more Air Quality Management Area (AQMA) and draw up an Action Plan to improve air quality;

- The Environment Act 2021[7] Schedule 11 includes amendments to Part IV of the Environment Act 1995 concerning the LAQM framework. This is to strengthen the LAQM framework and enable greater cooperation at local level, bringing more organisations into the process of improving air quality;
- The Air Quality (England) Regulations 2000 (as amended 2002)[8] [9], setting ambient air quality objectives as given in the National Air Quality Strategy;
- The Air Quality Standards Regulations 2010 (as amended 2016)[10][11], setting mandatory limit and target values (amongst other things) for ambient air pollutants to be met at national level. Where exceedance of any limit is determined, the Secretary of State must draw up and implement an Air Quality Plan (which may require a Clean Air Zone) to bring about compliance within the shortest possible time; and
- Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[12] includes an amendment to the Air Quality Standards Regulations 2010 limit value for $PM_{2.5}$ to 20μg/m^3.

6.3.2. The relevant ambient air quality standards are given in Table 6.1.

Table 6.3: Relevant ambient air quality standards

Pollutant	Concentration in micrograms per cubic metre (μg/m^3)	Measured as	Number of exceedances allowed in a calendar year
Nitrogen dioxide (NO_2)	40	Annual mean	None
	200	1-hour (hourly) mean	No more than 18 (equivalent to the 99.79th percentile)
	40	Annual mean	None

[7] Environment Act 2021. Available online at: https://www.legislation.gov.uk/ukpga/2021/30/schedule/11/enacted
[8] The Air Quality (England) Regulations 2000. Available online at: https://www.legislation.gov.uk/uksi/2000/928/contents/made
[9] The Air Quality (England) (Amendment) Regulations 2002. Available online at: https://www.legislation.gov.uk/uksi/2002/3043/contents
[10] The Air Quality Standards Regulations 2010. Available online at: https://www.legislation.gov.uk/uksi/2010/1001/contents/made
[11] The Air Quality Standards (Amendment) Regulations 2016. Available online at: https://www.legislation.gov.uk/uksi/2016/1184/contents/made
[12] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 – Statutory Instrument No.1313. Available online at: https://www.legislation.gov.uk/uksi/2020/1313/regulation/1/made

Pollutant	Concentration in micrograms per cubic metre ($\mu g/m^3$)	Measured as	Number of exceedances allowed in a calendar year
Particulates less than 10 micrometres in diameter (PM_{10})	50	24-hour (daily) mean	No more than 35 (equivalent to the 90.4th percentile)
Particulates less than 2.5 micrometres in diameter ($PM_{2.5}$)	20	Annual mean	None
	10	Annual mean	None (WHO former guideline. The London Environment Strategy targets the achievement of this by 2030[13])

Planning Policy

National Planning Policy

6.3.3. The National Planning Policy Framework (NPPF), which was updated on 20 July 2021[14], includes requirements for policies and plans to improve air quality by:

- promoting sustainable transport to *"help to reduce congestion and emissions"* (paragraph 105); and
- sustaining and contributing "towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan." (paragraph 186).

Regional Planning Policy

[13]The Mayor of London, (2018). London Environment Strategy. Available online at: https://www.london.gov.uk/what-we-do/environment/london-environment-strategy

[14] Ministry of Housing, Communities and Local Government, (2021). National Planning Policy Framework. Available online at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

6.3.4. The London Plan 2021[15] Policy SI 1 is the key policy specific to the improvement of air quality with Greater London. In particular:

- *"1) Development proposals should not:*

  a) lead to further deterioration of existing poor air quality

  b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits

  c) create unacceptable risk of high levels of exposure to poor air quality"

6.3.5. The policy also sets out that all new development "must be at least Air Quality Neutral" and larger developments that are subject to EIA "should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach" and that "a statement should be submitted" to demonstrate this.

Local Planning Policy

6.3.6. The Southwark Plan 2022[16], which was adopted by the London Borough of Southwark (LBS) in February 2022, includes policy P65 'Improving air quality':

- "Development must:
  1. *Achieve or exceed air quality neutral standards; and*
  2. *Address the impacts of poor air quality on building occupiers and public realm users by reducing exposure to and mitigating the effects of poor air quality. This must be achieved through design solutions that include:*
     1. *Orientation and layout of buildings, taking into account vulnerable building occupiers, and public realm and amenity space users; and*
     2. *Ventilation systems; and*
     3. *Urban greening appropriate for providing air quality benefits proportionate to the scale of the development; and*
- Any shortfall in air quality standards on site must be secured off site through planning obligations or as a financial contribution."

Guidance

6.3.7. The following guidance is referenced in the air quality assessment:

[15] The Mayor of London, (2021). The London Plan: Spatial Development Strategy for Greater London. Available online at: https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/london-plan-2021

[16] London Borough of Southwark, (2022). Southwark Plan 2022. Available online at: https://www.southwark.gov.uk/planning-and-building-control/planning-policy-and-transport-policy/new-southwark-plan

- LBS: Technical Guidance on Air Quality[17]);
- Mayor of London: The Control of Dust and Emissions During Construction and Demolition - Supplementary Planning Guidance [18];
- Institute of Air Quality Management (IAQM): Guidance on the Assessment of Dust from Demolition and Construction[19];
- Environmental Protection UK (EPUK)/IAQM: Land Use Planning and Development Control - Planning for Air Quality [20];
- Mayor of London: London Local Air Quality Management Technical Guidance LLAQM.TG(19)[21];
- Department for Environment Food and Rural Affairs (Defra): Local Air Quality Management Technical Guidance LAQM.TG(16)[22] ;
- Environment Agency: Conversion Ratios for NOx and NO2[23];
- Mayor of London: London Plan Guidance Air Quality Neutral[24]l; and
- London Councils: Air Quality and Planning Guidance[25].

[17] London Borough of Southwark, (2017). Technical Guidance on Air Quality. Available online at: https://www.southwark.gov.uk/environment/air-quality/what-we-re-doing/air-quality-strategies-plans-and-letters?chapter=2

[18] Mayor of London, (2014). The Control of Dust and Emissions During Construction and Demolition - Supplementary Planning Guidance. Available online at: https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance-and-spgs/control-dust-and

[19] Holman *et al*, (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. Available online at: https://iaqm.co.uk/guidance/

[20] Ref. 6.17 – Moorcroft and Barrowcliffe et al. (2017). Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London. Available online at: https://iaqm.co.uk/guidance/

[21] Mayor of London, (2019). London Local Air Quality Management (LLAQM) Technical Guidance 2019 (LLAQM.TG (19)). Available online at: https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-london-boroughs

[22] Defra, (2021). Local Air Quality Management Technical Guidance LAQM.TG(16). Available online at: https://laqm.defra.gov.uk/air-quality/featured/uk-regions-exc-london-technical-guidance/

[23] Environment Agency, (2019). Specified generators: dispersion modelling assessment. Available online at: https://www.gov.uk/guidance/specified-generators-dispersion-modelling-assessment

[24] Mayor of London (2021). London Plan Guidance Air Quality Neutral Consultation Draft, November 2021. Available online from: https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance/air-quality-neutral-aqn-guidance

[25] London Councils, (2007). London Councils Air Quality and Planning Guidance. Available online at: https://www.londoncouncils.gov.uk/node/25533

6.4. Historic Assessment

6.4.1. The 2014 ES Chapter 13 'Local Air Quality' included *"the assessment of the impacts resulting from:*

- *Dust generated by on-site activities on surrounding sensitive receptors during the construction phase;*
- *Particulate matter (PM_{10} and $PM_{2.5}$) generated by on-site activities on local air quality during the construction phase;*
- *Increases in pollutant concentrations (NO_2, PM_{10} and $PM_{2.5}$) as a result of exhaust emissions arising from construction traffic and plant on local air quality;*
- *Increases in pollutant concentrations (NO_2, PM_{10} and $PM_{2.5}$) as a result of exhaust emissions from road traffic generated by the operation of the proposed developments on local air quality and public exposure;*
- *Increases in pollutant concentrations (NO_2) as a result of onsite energy centre emissions generated by the operation of the proposed developments on local air quality and public exposure;*
- *Introducing new exposure to prevailing ambient air quality concentrations (NO2, PM10 and PM2.5) in the opening year, due to the residential nature of the proposed developments; and*
- *The required secondary supplies for fire-fighting and life safety in terms of nuisance."*

6.4.2. The ES assessment considered the potential impacts in the construction and operational stages for the First Development Site (FDS) and overall Outline Planning Permission (the latter incorporating the Project Site). All impacts were determined to cause negligible residual effects.

6.4.3. Both development options were found to be air quality neutral. Exposure at new residential receptor locations (introduced by the proposals) were found to be within the London Councils' Air Pollution Exposure Criteria (APEC) 'A', meaning that there should be "No air quality grounds for refusal; however mitigation of any emissions should be considered".

6.5. Scope of the Assessment

6.5.1. The proposed scope for the air quality assessment was set out in Chapter 5 of the EIA Scoping Report (see Appendix 2.1). Following receipt of the Scoping Report, Land Use Consultants (LUC), on behalf of LBS, reviewed the Report and produced a Scoping Review Report (see Appendix 2.2); this gives seven recommendations:

- *"AQ1: It is recommended that 2019 monitoring data is assumed for the future opening year." This is considered under Section 6.8 'Baseline Conditions' with reference to trends in monitoring data.*
- *"AQ2: It is recommended that a model verification exercise is undertaken using nearby roadside monitoring data to ensure that the modelled concentrations replicate the monitored concentrations within +/-10% as recommended in the Local Air Quality*

Management Technical Guidance – LAQM.TG(16)." This is discussed under Section 6.7 'Assessment Methodology and Significance Criteria' under the heading 'Limitations and Assumptions'. See also the details of model verification in Appendix 6.5.

- *"AQ3: It is recommended that further information should be provided to justify screening out any A3 property uses out of the assessment. Should screening identify potentially significant impacts it is recommended that an odour assessment should be undertaken with regard to the guidance in IAQM Odour Guidance (2014) Appendix 2 Step 3." Odour has been discussed with the LBS Environmental Protection Team and scoped out, see Section 6.6 'Consultation'.*
- *"AQ4: Consideration should also be given to predictive quantitative assessments to establish if there could be odour issues at different heights of the proposed development." The matter of odour was discussed with the LBS Environmental Protection Team and scoped out, see Section 6.6 'Consultation'.*
- *"AQ5: The in-combination impacts from road traffic, committed developments and the proposed energy centre should be established at different heights of the Proposed Development (the proposed receptors) and existing receptors."* This is addressed in the assessment presented in Section 6.9 'Assessment of Effects, Mitigation and Residual Effects' under the heading 'Traffic and Energy Centre Emissions Impacts'.
- *"AQ6: It is recommended that where the car park meets the IAQM assessment thresholds, that the car park emissions are considered as part of the combined impact."* This is addressed in Section 6.7 'Assessment Methodology and Significance Criteria' under the headings 'Operational Phase' and 'Road Traffic Emissions'.
- *"AQ7: Where it is anticipated that the new occupants will occupy the property in a phased approach while some of the construction work will be undertaken then the ES chapter should also consider the air quality impacts at these occupants or residents."* This is addressed in the assessment presented in Section 6.9 'Assessment of Effects, Mitigation and Residual Effects' under the heading 'Construction Phase.'

6.5.2. Table 6.2 sets out the air quality impacts scoped into the assessment.

Table 6.4: Air quality impacts scoped in

Phase	Potential impact(s)	Potential effects(s)	Addressed by
Construction	Dust and PM_{10} emissions	Adverse effects from dust: - complaints - statutory nuisance Adverse effects from increased ambient concentrations of PM_{10}: - human health.	Qualitative assessment with regard to LBS, the Mayor of London and IAQM guidance

Phase	Potential impact(s)	Potential effects(s)	Addressed by
Construction and operation	Vehicle emissions of NO_x, PM_{10} and $PM_{2.5}$, and building emissions of NO_x (gas boilers)	Adverse effects from increased ambient concentrations of NO_2, PM_{10}, $PM_{2.5}$: - human health - hindrance of LBS and Mayor of London efforts in improving local air quality.	Quantitative assessment to predict pollutant concentrations and assess the impacts of the Project at sensitive receptors, with regard to guidance from LBS, EPUK/IAQM, the Mayor of London, Environment Agency, Defra and London Councils Air quality neutral assessment in accordance with guidance from the Mayor of London.

6.5.3. The air quality impacts below were scoped out for the given reasons:

- Odour, as there are no known substantial sources of odour associated with the Project. With reference to LUC recommendations AQ3 and AQ4, should the future tenant of the flexible commercial space wish to install and operate a commercial kitchen within Block 5A, then appropriate measures that are acceptable to LBS would need to be implemented by the tenant; and
- Impacts on nitrogen and acid deposition, as there are no designated (or other) habitat sites within the borough that are likely to be affected.

6.6. Consultation

6.6.1. LBS's Environmental Protection Team was contacted[26] to discuss the scope as set out in Chapter 5 of the EIA Scoping Report (see Appendix 2.1). In this discussion it was agreed that the following matters would not be dealt with in the ES but would be considered in the separate Air Quality Positive Statement, which is required under the London Plan 2021.

- Control of odour and PM2.5 mitigation should the future tenant of the flexible commercial space wish to install and operate a commercial kitchen within Block 5A;
- Control of emissions from life-safety generators;
- Details of enclosed car park exhaust vents; and
- Building ventilation provisions.

[26] Telephone conversation between A Talbot (WSP) and B Legassick (LBS EPT) on 8 April 2022.

6.6.2. On 11 April 2022, LBS provided Scoping Opinion comments (Appendix 2.2), stating that the "… EPT reviewed the section regarding Air Quality and is satisfied that the approach will address the current and future air quality for the protection of receptors."

6.7. Assessment Methodology and Significance Criteria

Baseline

6.7.1. Baseline information has been collated and reviewed by desk-study. The sources of information are:

- Southwark Air Quality Annual Status Reports for details of LAQM status and local air quality monitoring data[27];
- The London Atmospheric Emissions Inventory (LAEI) for spatial data defining Air Quality Focus Area (AQFA) extents, emissions sources within the LBS area, and strategic modelling of baseline pollutant concentrations[28];
- 'UK AIR' Air Information Resource for spatial data defining AQMAs and background pollutant concentrations[29];
- Ordnance Survey OpenData map products for spatial data showing built-up areas (residential, schools and hospitals), public open spaces and roads[30]; and
- Google Earth satellite and Street View images[31].

Construction Phase

Dust Emissions

6.7.2. The dust assessment has been undertaken with regard to LBS, the Mayor of London and IAQM guidance documents, which address the risks posed by dust and PM10 emissions from demolition and construction activities.

6.7.3. Following initial screening which scoped in human receptors and scoped out ecological receptors (as there are no ecological receptors present within the study area, shown in Appendix 6.1, Figure 6.1), the methodology has three further steps:

[27] London Borough of Southwark. Southwark Air Quality Annual Status Reports for 2019 and 2020. Available online at: https://www.southwark.gov.uk/environment/air-quality/what-we-re-doing/air-quality-strategies-plans-and-letters?chapter=2

[28] Greater London Authority, (2021). London Atmospheric Emissions Inventory (LAEI) 2019 – London Datastore. Available online at: https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2019. At the time of writing, AQFA data were available online at: London Atmospheric Emissions Inventory (LAEI) 2016 Air Quality Focus Areas - London Datastore

[29] Department for Environment, Food and Rural Affairs. UK AIR Air Information Resource. Available online at: https://uk-air.defra.gov.uk/

[30] Ordnance Survey OpenData. Available online at: https://www.ordnancesurvey.co.uk/business-government/tools-support/open-data-support

[31] Google Earth. Available online at: https://earth.google.com/web/

- The risk of dust and PM_{10} (human health) impacts was determined for demolition, earthworks, construction and trackout activities. This considers the potential dust emission magnitude and sensitivity of the area in terms of defining the risk of impacts;
- Next, appropriate site-specific mitigation was determined to minimise the identified risks; and
- Finally, the significance of the residual effects (i.e. after accounting for mitigation) was determined.

6.7.4. Details of receptors are given later in this chapter under the heading 'Identification of Receptors'. Further information regarding the above steps can be found in Appendix 6.3.

Road Traffic Emissions

6.7.5. The air quality impacts due to road traffic emissions during the construction phase were determined by detailed dispersion modelling using ADMS-Roads software[32]. The modelling was based on traffic data provided by the transport consultant (RPS) and meteorological data for London Heathrow 2019. Ordnance Survey base mapping OpenData products and Google Earth images were used to determine land use characteristics and identify representative receptor locations. The selected receptor locations are shown in Appendix 6.1, Figure 6.2, with details given later in this chapter under the heading 'Identification of Receptors'.

6.7.6. The modelling was undertaken with reference to guidance produced by LBS, EPUK/IAQM, the Mayor of London and Defra. The following scenarios were modelled:

- 2019 base year, to indicate 'current' (pre-COVID 19) conditions and enable the verification of model predictions; and
- 2025 without and with the Project (with reference to LUC's recommendation AQ7, this is the assumed first full year of occupation of Block 4D with ongoing construction of all other blocks/peak construction).

6.7.7. The traffic data used are provided in Appendix 6.4, and account for committed development including the wider Aylesbury Estate and Southernwood Retail Park.

6.7.8. The model was set up to predict the contributions from road traffic emissions to annual mean concentrations of NOx, PM10 and PM2.5 at selected sensitive receptors. The road NOx contribution was adjusted according to the model verification process and converted to the road NO2 contribution using the standard method supported by the Mayor of London and as specified by Defra.

6.7.9. Total annual mean concentrations of NO2, PM10 and PM2.5 were calculated by adding the background components, which were taken from background map data published by Defra (see also Appendix 6.5 which includes the background data used). The resultant total annual mean concentrations are directly comparable to the respective standards given in Table 6.1,

[32] Cambridge Environmental Research Consultants Ltd. ADMS-Roads. Details available at: http://www.cerc.co.uk/environmental-software/ADMS-Roads-model.html

and were used in determining the significance of effect (discussed later in the chapter under the heading 'Significance Criteria').

6.7.10. To compare 1-hour mean NO2 and 24-hour mean PM10 concentrations with the respective standards in Table 6.1 require different approaches. In the case of 1-hour mean NO2, it is standard practice to consider the total annual mean NO2 concentration and if this does not exceed 60μg/m3 then it is likely that the 1-hour mean standard of 200μg/m3 not to be exceeded more than 18 times per year (Table 6.1) would be met. For 24-hour mean PM_{10} if the total annual mean PM_{10} concentration does not exceed 32μg/m^3 then it is likely that the 24-hour mean standard of 50μg/m^3 not to be exceeded more than 35 times per year (Table 6.1) would be met.

6.7.11. Further details of ADMS-Roads dispersion model assumptions, base model verification and adjustment are given in Appendix 6.5.

Operational Phase

Road Traffic Emissions

6.7.12. The methodology followed for determining the air quality impacts from road traffic emissions in the operational phase is the same as that for the construction phase; however, for the operational phase, the impacts of road traffic emissions were considered in-combination with the energy centre emissions (discussed under the heading below 'Combining Traffic and Energy Centre Model Results').

6.7.13. For the operational phase, the modelling of road traffic emissions was based on the verified 2019 base model and included the following scenarios:

- 2027 without and with the Project (all blocks assumed to be completed and occupied).

6.7.14. The traffic data used are provided in Appendix 6.4, and account for committed development including the wider Aylesbury Estate and Southernwood Retail Park.

6.7.15. When completed, there will be two enclosed car parking areas providing a total of 79 spaces: one in the basement of Block 4A, and the other at podium level within Block 5A. These car parks will have mechanical ventilation to draw in clean air and remove stale air to the external environment via louvres on the building façades at ground level. With reference to LUC's recommendation AQ6, vehicle movements associated with each car park are not expected to exceed 100 AADT, and therefore do not meet the indicative threshold for air quality assessment as given in EPUK/IAQM guidance.

Energy Centre Emissions

6.7.16. In the operational phase, heating and hot water for the Project residential space will be provided primarily by Air Source Heat Pump (ASHP) technology, with gas boilers installed in the basement of Block 4A to meet peak demand and to provide backup in the event of ASHP failure. The heating and hot water requirements of the flexible commercial space within Block 5A will

need to be determined and met by the future tenant(s) but will either be an electric system or through district heating network connection.

6.7.17. The total energy demand to be met by the ASHP and boilers is 2,149MWh. Under normal operations the use of gas boilers will be limited to provide approximately 15% of the total energy demand (i.e. 322MWh).

6.7.18. The installed boilers will be specified to have NOx emissions below 40mg/kWh to minimise the air quality impacts and will have efficiencies of at least 95% in terms of fuel input and energy output. The boiler flues will terminate above the roof level of Block 4A (the tallest new building within the Project Site) to ensure effective dispersion of emissions and minimise the impacts at receptor locations. The locations of the permanent boiler flue terminals and receptors are shown in Appendix 6.1, Figure 6.2, with details given later in this chapter under the heading 'Identification of Receptors'.

6.7.19. The air quality impacts due to the permanent boiler emissions have been determined by detailed dispersion modelling using ADMS 5.2 dispersion modelling software[33] (Ref. 6.29). The modelling was undertaken with reference to guidance produced by LBS, EPUK/IAQM, Defra and the Environment Agency . To ensure a robust assessment, it has been assumed that 100% of the heating and hot water energy demand is met by gas boiler operation over a year as would be the case in the event of the ASHPs not operating – even though such a scenario is highly unlikely.

6.7.20. The model was set-up to predict the contributions from the boiler emissions to annual mean and 1-hour mean (99.79th percentile) NO_x concentrations at receptors. Environment Agency procedure was followed to convert the predicted boiler contributed NO_x to NO_2. For annual mean concentrations, the predicted boiler contribution of NO_x was converted to NO_2 by multiplying by a conversion factor of 0.7. For 1-hour mean concentrations, the boiler contribution of NO_x was converted to NO_2 by multiplying by 0.35.

6.7.21. Further details of ADMS 5.2 dispersion model assumptions are given in Appendix 6.6.

Combining Traffic and Energy Centre Model Results

6.7.22. For annual mean NO_2, PM_{10} and $PM_{2.5}$, to enable the significance of effect due to air quality impacts to be determined where the pollutant concentrations were modelled (as discussed later in this chapter), the annual mean contributions from road traffic and boilers were simply added together. This was done at each receptor and for each pollutant for the 'with Project' scenario. The relevant annual mean background concentration was then added to give the total concentration of each pollutant. These total annual mean concentrations are directly comparable to the respective standards given in Table 6.1.

Air Quality Neutral Assessment

[33] Cambridge Environmental Research Consultants Ltd. ADMS 5.2. Details available at: http://www.cerc.co.uk/environmental-software/ADMS-model.html

6.7.23. In accordance with the London Plan, an air quality neutral assessment has been undertaken for the Project, with reference to the Mayor of London's guidance. The introduction to the guidance document explains that *"'Air Quality Neutral' is a term for developments that do not contribute to air pollution beyond allowable benchmarks. The benchmarks, set out in this guidance, are based on research and evidence carried out by building and transport consultants."*

6.7.24. The Building Emissions Benchmark (BEB) sets the annual emission limit for NOx, which is the sum of the total gross internal area (GIA) for each land use class included in the Project multiplied by the relevant published benchmark emission rate. If the calculated building emission for the Project is less than the BEB then the building emission is air quality neutral. For the Project, the only building emissions are from the gas boilers. The guidance excludes backup diesel generators from the emissions calculation on the basis that these are run in an emergency and operational testing for no more than 50 hours per year.

6.7.25. Once complete, the Project will provide 614 residential dwellings, with a GIA of 58,570m^2 and space for flexible commercial (potentially a convenience store and/or cafe) with a total GIA of 480m^2. The relevant BEB is given in Table 6.4.

Table 6.4: Building emissions benchmarks for Inner London

Land Use*	GIA (m^2)	Published benchmark NO_x emission rate ($gNO_x/m^2/yr$)	Calculated benchmark emissions (gNO_x/yr)	Calculated benchmark emissions ($kgNO_x/yr$)
Residential (Class C3)	58,570	5.7	333,846	333.8
Retail (Class E)	480	1.0	466	0.5
Restaurants and bars (Class E)	-	3.2	-	-
Offices (Class E)	-	2.6	-	-
Industrial (Class B2)	-	2.0	-	-
Storage and distribution (Class B8)	-	1.0	-	-
Hotel (Class C1)	-	15.4	-	-
Care homes and hospitals (Class C2)	-	14.9	-	-
Schools, nurseries, doctors' surgeries, other non-residential institutions (Class E/F1)	-	1.7	-	-
Assembly and leisure (Class E/F2)	-	4.8	-	-
BEB				**334.3**

* Separate use classes for commercial uses, including retail and offices, have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the intended use is not specified, or where use class E has been specified, the benchmark for retail should be used.

6.7.26. The Transport Emissions Benchmark (TEB) sets the annual vehicle trip limit for cars/light vans. It does not account for trips associated with servicing, deliveries, taxis or heavy duty vehicles from non-occupiers. If the two-way vehicle trip rate for the Project is less than the TEB then transport emissions are considered to be air quality neutral.

6.7.27. The TEB for the Project is given in Table 6.5. Details on derivation of the vehicle trips data, as provided by the transport consultant, are provided in Appendix 6.3.

Table 6.5: Transport emissions benchmarks for Inner London

Land use	Annual trips per	GIA (m²) / No. dwellings	Benchmark trip rate	Total benchmark trip rate (trips/yr)
Residential (Class C3)	dwelling	614	114	69,996
Office / Light Industrial (Class E)	m² (GIA)	480	1	480
Retail (Superstore) (Class E)	m² (GIA)	-	73	-
Retail (Convenience) (Class E)	m² (GIA)	-	139	-
Restaurant / Café (Class E)	m² (GIA)	-	137	-
Drinking establishments (Sui generis)	m² (GIA)	-	8	-
Hot food takeaway (Sui generis)	m² (GIA)	-	32	-
Industrial (Class B2)	m² (GIA)	-	4	-
Storage and distribution (Class B8)	m² (GIA)	-	1	-
Hotels (Class C1)	m² (GIA)	-	1	-
Care homes and hospitals (Class C2)	m² (GIA)	-	1	-
Schools, nurseries, doctors' surgeries, other non-residential institutions (Class E/F1)	m² (GIA)	-	30	-
Assembly and leisure (Class E/F2)	m² (GIA)	-	11	-
TEB				**70,476**

* Separate use classes for commercial uses including retail and offices have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the separate use is not specified, or where use class E has been specified, the benchmark for office/light industrial should be used.

Identification of Receptors

6.7.28. Table 6.6 sets out details of the receptors that have been selected to enable the air quality impacts of the Project to be identified and for the effects to be assessed. This selection includes existing locations which are likely to experience the highest levels and greatest changes in

pollutant concentrations, and where there is likely to be relevant human exposure to ambient air pollutants as addressed by the air quality standards (Table 6.1).

6.7.29. The selection also includes three new receptors representative of the Block 4A façades onto Thurlow Street and Albany Road (F1, F2 and F3, first occupied in 2027), and two new receptors representative of the Block 4D façade onto Albany Road (F4 and F5, first occupied in 2025). These were included to indicate the likely worst-case exposure of new residents to air pollutants.

6.7.30. All receptors are considered to be highly sensitive to air quality impacts. With the exception of receptor 10 (Michael Faraday Primary School), the receptors represent residential premises. The modelled height of 1.5m is the average breathing height above ground level. Where the relevant exposure is not at ground floor level, the modelled height represents the location with relevant exposure above.

Table 6.6: Selected discrete receptors

Receptor	Location	Easting	Northing	Modelled height (m)
1	Camberwell Rd	532386.1	177638.5	1.5
2	Urlwin St	532386.5	177657.3	1.5
3	Camberwell Rd	532389.8	177671.5	1.5
4	Albany Rd	532428.6	177662.0	4.5
5	Albany Rd	532438.8	177662.0	4.5
6	Albany Rd	532500.1	177671.3	1.5
7	Albany Rd	532563.1	177690.2	1.5
8	Albany Rd	532866.6	177802.1	1.5
9	Portland St	532793.9	177905.2	1.5
10	Michael Faraday Primary School, Portland St	532807.4	177943.1	1.5
11	Albany Rd	533214.7	178018.4	1.5
12	Thurlow St	533138.0	178118.1	1.5
13	Thurlow Walk	533148.8	178157.9	1.5
14	Albany Rd	533331.7	178060.4	1.5
15	Albany Rd	533378.2	178073.3	1.5
16	Albany Rd	533393.6	178082.2	1.5
17	Albany Rd	533567.3	178241.2	1.5
18	Albany Rd	533603.0	178279.5	1.5
19	Old Kent Rd	533636.6	178318.9	4.5
20	Old Kent Rd	533603.7	178344.0	4.5
21	Old Kent Rd	533310.0	178596.4	4.5
22	Old Kent Rd	533294.0	178612.6	4.5
23	Old Kent Rd	533716.2	178290.9	4.5
24	Old Kent Rd	533768.3	178251.0	1.5
25	Old Kent Rd	533744.1	178233.6	4.5

Receptor	Location	Easting	Northing	Modelled height (m)
26	Thurlow St	532994.1	178366.3	1.5
27	Rodney Rd	532645.4	178676.6	6.0
28	Rodney Rd	532633.6	178682.1	4.5
F1	Block 4A, Thurlow St (assumed first occupation in 2027)	533233.2	178043.4	1.5
F2	Block 4A, Thurlow St (assumed first occupation in 2027)	533243.2	178023.4	1.5
F3	Block 4A, Albany Rd (assumed first occupation in 2027)	533263.2	178023.4	1.5
F4	Block 4D, Albany Rd (assumed first occupation in 2025)	533293.2	178033.4	1.5
F5	Block 4D, Albany Rd (assumed first occupation in 2025)	533313.2	178043.4	1.5

6.7.31. Discrete receptors for consideration of construction dust impacts have not been identified because the assessment method looks at receptor densities within specified distance bands of the Project Site. There is a high density of residential premises in close proximity to the Project Site and this was taken into consideration in assessing the potential impacts.

Significance Criteria

6.7.32. Determination of a significant effect is ultimately an exercise of professional judgement. However, the available guidance does set out advice on how significance should be assessed.

6.7.33. For construction dust impacts the IAQM guidance, which underpins the Mayor of London's SPG, recommends *"that significance is only assigned to the effect after considering the construction activity with mitigation".* In other words, only the residual effect is assigned significance.

6.7.34. For air quality impacts on annual mean pollutant concentrations associated with road traffic and energy centre emissions, the EPUK/IAQM guidance provides descriptors for the impacts at individual receptors. These are based on the magnitude of the change in pollutant concentration and whether the change is above or below the relevant air quality standard. Table 6.7 sets out the relevant impact descriptors, which were used in this assessment. The impacts of modelled road traffic and energy centre sources were considered in-combination for the operational phase.

Table 6.7: Impact descriptors for discrete receptors

Annual mean concentration at receptor in assessment year	% Change in concentration relative to the air quality standard			
	1	2 – 5	6 - 10	>10
75% or less of the standard	Negligible	Negligible	Slight	Moderate
76 - 94% of the standard	Negligible	Slight	Moderate	Moderate

95 - 102% of the standard	Slight	Moderate	Moderate	Substantial
103 - 109% of the standard	Moderate	Moderate	Substantial	Substantial
110% or more of the standard	Moderate	Substantial	Substantial	Substantial

Notes:

Where the percentage change in concentrations is <0.5%, the change is described as 'Negligible' regardless of the concentration. In the assessment, the % changes have been rounded to whole numbers as per the EPUK/IAQM guidance (Ref. 6.17).

When defining the concentration as a percentage of the AQS, 'without scheme' concentration should be used where there is a decrease in pollutant concentration and the 'with scheme;' concentration where there is an increase.

Where concentrations increase, the impact is described as adverse, and where it decreases as beneficial.

6.7.35. The EPUK/IAQM guidance notes that the criteria in Table 6.7 should be used to describe impacts at individual receptors and should be considered as a starting point to make a judgement on significance of effects, as other influences may need to be accounted for. The EPUK/IAQM guidance advises that the assessment of overall significance should be based on professional judgement including consideration of the following factors:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

6.7.36. To consider local air quality at new locations with relevant exposure that are introduced by the Proposed Development, the London Councils' Air Pollution Exposure Criteria (APEC) (Ref. 6.22) were applied. These criteria are reproduced in Table 6.8. Whilst it is not possible to comment on the significance of effect for new receptor locations (as there is no 'without Project' scenario as far as new receptors are concerned), the criteria indicate the likely acceptability of introducing new exposure and if mitigation should be considered or required in determination of acceptability.

Table 6.8: London Councils' Air Pollution Exposure Criteria

APEC level	Applicable range annual average NO_2	Applicable range PM_{10}	Recommendation
A	>5% below national objective	Annual Mean >5% below national objective 24-hour mean	No air quality grounds for refusal; however, mitigation of any emissions should be considered.

APEC level	Applicable range annual average NO_2	Applicable range PM_{10}	Recommendation
		>1 day less than the national objective	
B	Between 5% below or above national objective	Annual Mean Between 5% below or above national objective 24-hour mean Between 1 day above or below the national objective	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., maximise distance from pollution source, proven ventilation systems, parking considerations, winter gardens, internal layout considered, and internal pollutant emissions minimised.
C	>5% above national objective	Annual Mean >5% above national objective 24-hour mean >1 day more than the national objective	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/ industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.

6.7.37. With regard to the consideration of the air quality neutral assessment, if the finding is for overall neutrality then the effect can be said to be not significant, but if this is not the case then the effect is considered to be significant.

Limitations and Assumptions

6.7.38. The assessment was based on the data and information concerning baseline conditions and the Project available at the time. There will always be some degree of uncertainty attached to the data and information, with the greatest levels of uncertainty associated with data that is forecast into the future.

6.7.39. In undertaking dispersion modelling there are levels of uncertainty and limitations in all the assumptions made, from those that are inherent in the model software to the traffic and meteorological data used. Such uncertainty was minimised in the assessment by using the best available data and following established best practice guidance.

6.7.40. In terms of the dispersion modelling software used (ADMS), this has been independently validated and is considered fit for purpose. Additionally, in the case of the ADMS-Roads modelling, local model verification was undertaken for this assessment with adjustment of predicted base year pollutant concentrations to bring these more in line with the LBS monitoring data for 2019. This verification process is appropriate as it is common for ADMS-Roads models to underestimate pollutant concentrations.

6.7.41. With regard to LUC recommendation AQ2 concerning model verification, Defra's LAQM.TG(16) guidance advises that most modelled concentrations should be *"within 25% (as a minimum - preferably within 10%) of monitored concentrations"* - before model adjustment. This was found to be the case in this assessment (see Appendix 6.5).

6.7.42. The verification process undertaken compensated – as far as it was practicable to do so – for systematic differences between modelled and monitored concentrations to ensure that the prediction of future concentrations is robust.

6.7.43. With regard to traffic data, there is particular uncertainty in the assumptions for construction traffic; however, the AADT flows assumed in this assessment are considered to robustly represent the worst case.

6.7.44. In the case of ADMS 5.2, where point source emissions (such as from the boiler flues) are modelled, it is not practicable to undertake local model verification. The assumption that 100% of the heating and hot water energy demand is met by gas boiler operation is very much worst case as the Energy Strategy (Appendix 2.3) is for the gas boilers to meet only 15% of the demand, with ASHP's meeting 85%.

6.8. Baseline Conditions

Current Baseline

6.8.1. The Project Site is within the Southwark Air Quality Management Area (AQMA), declared in 2003 due to exceedances of standards (Table 6.1) for annual mean concentrations of NO2 and 24-hour mean concentrations of PM10. The high concentrations are attributed to road traffic sources. The AQMA covers the entire northern part of the borough, extending from Rotherhithe to Walworth and Camberwell and up to the boundary on the River Thames.

6.8.2. The Project Site (shown in Appendix 6.1, Figure 6.3) is bounded to the south by the B214 Albany Road, Thurlow Street to the west, Kinglake Street to the north and Bagshot Street to the east. Albany Road connects the A215 Camberwell Road and the A2 Old Kent Road. The GLA has designated a NO2 AQFA around the A215 and A2 due to high levels of exposure to annual mean concentrations exceeding the limit value of 40μg/m3 (Table 6.1). The Project Site is not within an AQFA.

6.8.3. According to the LAEI for 2019, the dominant source of NO_x, PM_{10} and $PM_{2.5}$ emissions within Southwark is the industrial and commercial sector. For NOx this has changed from road transport being the dominant sector in the LAEI for 2016 when this made up 55% (618 tonnes) of the total (1,120 tonnes). For 2019, road transport made up 40.5% (344 tonnes) of the total (849 tonnes) NOx emissions. Domestic NOx emissions have also declined from 71.6 tonnes for 2016 to 63.9 tonnes for 2019. Overall emissions of PM10 and PM2.5 have also declined between 2016 and 2019.

6.8.4. Long-term local air quality monitoring is undertaken by LBS. The nearest and most representative monitoring locations to the Project Site are on Albany Road (LBS ref. SDT 150) and on Portland Street (LBS ref. SDT 154). These two locations (shown in Appendix 6.1, Figure 6.3) indicate annual mean NO2 concentrations only, at kerbside. For 2019 (pre-COVID 19 pandemic) the concentrations were close to the air quality standard of 40μg/m3 (Table 6.1): 38.9μg/m3 at SDT 150 and 40.8μg/m3 at SDT 154. Concentrations exceeding the standard were indicated at locations along the A215 and A2, for 2019 and preceding years (Ref. 6.23).

6.8.5. Assuming monitoring location SDT 154 is indicative of worst-case kerbside concentrations at the Project Site, Appendix 6.1, Figure 6.4 – which has been generated using Defra's 'NO2 Fall Off with Distance' calculator – shows the expected decline in annual mean NO2 concentration up to 50m from the kerbside. The implication is that concentrations within the Project Site are likely to meet the air quality standard.

6.8.6. Long-term trends in NO2 concentrations in the period 2013 to 2019 inclusive are illustrated in Appendix 6.1, Figure 6.5. This figure shows clear, statistically significant decreasing trends in concentrations at roadside and background. These trends will have been influenced by national, regional and local policy and regulatory measures to drive down emissions from road traffic and other sources within London and nationally.

6.8.7. Concentrations of PM_{10} and $PM_{2.5}$ have not been monitored in the vicinity of the Project Site, and - until 2020 - $PM_{2.5}$ was not monitored at all within the borough. For years 2013 and 2019 inclusive, concentrations of PM_{10} at LBS monitoring locations on the A2 Old Kent Road (LBS ref. SWK 5, at roadside) and at the Elephant and Castle (LBS ref. SWK 6, representative of urban background conditions) met the air quality standards for annual and 24-hour mean PM10 concentrations (Table 6.1). The highest annual mean concentration of 24μg/m3 was recorded in 2019 at SWK 5 at roadside, with the background concentration at SWK 6 being 17μg/m3.

6.8.8. Regarding PM2.5, monitoring commenced at SWK 5, SWK 6 and Tower Bridge Road (LBS ref. SWK 8, representative of roadside conditions) part way through 2020 and the results for this year are therefore indicative only but suggest that annual mean concentrations in that year were no higher than the WHO former guideline limit of 10μg/m3 (as adopted by the Mayor of London as a target for 2030).

6.8.9. NO2 concentrations for 2020 have been reported by LBS as being substantially lower than in preceding years, with no annual mean concentrations exceeding the air quality standard. This is attributed to reductions in road traffic due to COVID-19 lockdown restrictions (Ref. 6.23). Since the easing of these restrictions traffic flows have returned to similar levels pre-pandemic.

6.8.10. Model results for the 2019 base year are presented in Table 6.9 (see Table 6.6 and Appendix 6.1, Figure 6.2 for receptor location details). In general, the highest modelled concentrations and exceedances of the annual mean NO2 standard of 40μg/m3 (Table 6.1) are at receptors on Old Kent Road (receptors 19, 20, 21, 23, 24 and 25) which is expected due to the relatively high levels of traffic and congestion on this road. Modelled annual mean NO_2 concentrations on Albany Road are below the standard except at receptor 18 which is close to the junction with Old Kent Road. The annual mean NO_2 concentrations are all well below the threshold of 60μg/m^3 above which there is likely exceedance of the 1-hour mean standard of 200μg/m^3 not to be exceeded more than 18 times per year (Table 6.1).

6.8.11. Modelled annual mean concentrations of PM_{10} and $PM_{2.5}$ are well below the legislated standards (40μg/m^3 and 20μg/m^3 respectively, see Table 6.1). The annual mean PM_{10} concentrations are all well below the threshold of 32μg/m^3 above which there is likely exceedance of the 24-hour mean standard of 50μg/m^3 not to be exceeded more than 35 times per year (Table 6.1). However, the modelled annual mean $PM_{2.5}$ concentrations do exceed the non-statutory WHO former guideline limit of 10μg/m^3 (Table 6.1).

Table 6.9: 2019 base year modelled pollutant concentrations at existing discrete receptors

Receptor	Annual mean NO_2 (μg/m^3)	Likely exceedance of 1-hour mean NO_2 standard? (if annual mean >60 μg/m^3)	Annual mean PM_{10} (μg/m^3)	Likely exceedance of 24-hour mean PM_{10} standard? (if annual mean >32 μg/m^3)	Annual mean $PM_{2.5}$ (μg/m^3)
1	33.7	No	20.2	No	12.9
2	33.8	No	20.3	No	13.0
3	34.6	No	20.4	No	13.0
4	35.7	No	20.5	No	13.1
5	34.4	No	20.4	No	13.0
6	31.3	No	19.9	No	12.7
7	30.5	No	19.8	No	12.7
8	34.8	No	20.6	No	13.2
9	31.8	No	20.0	No	12.8
10	31.6	No	20.0	No	12.8
11	39.0	No	22.0	No	14.0
12	37.6	No	21.8	No	13.8
13	34.6	No	21.2	No	13.5
14	35.6	No	21.4	No	13.6
15	39.3	No	22.1	No	14.1
16	39.1	No	22.1	No	14.0
17	39.8	No	22.2	No	14.1
18	**40.6**	No	22.3	No	14.2
19	**44.5**	No	22.8	No	14.5

Receptor	Annual mean NO_2 ($\mu g/m^3$)	Likely exceedance of 1-hour mean NO_2 standard? (if annual mean >60 $\mu g/m^3$)	Annual mean PM_{10} ($\mu g/m^3$)	Likely exceedance of 24-hour mean PM_{10} standard? (if annual mean >32 $\mu g/m^3$)	Annual mean $PM_{2.5}$ ($\mu g/m^3$)
20	**41.3**	No	22.3	No	14.2
21	**41.1**	No	22.3	No	14.2
22	39.8	No	22.2	No	14.1
23	**45.3**	No	22.9	No	14.6
24	**48.4**	No	23.7	No	15.0
25	**42.8**	No	22.6	No	14.3
26	36.5	No	21.6	No	13.7
27	32.6	No	20.8	No	13.2
28	33.9	No	21.0	No	13.4

Future Baseline

6.8.12. In the future, with the expansion of the central London Ultra-Low Emissions Zone (ULEZ) out to the North and South Circular Roads from October 2021 and the bans on the sale of new conventional petrol and diesel cars from 2030 and hybrid cars from 2035, it is likely that ambient concentrations of NO_2, PM_{10} and $PM_{2.5}$ will noticeably decline, particularly at roadside. With regard to the LUC recommendation AQ1 *"…that 2019 monitoring data is assumed for the future opening year"*, there is clear evidence of downward trends in background and roadside NO_2 concentrations from monitoring (Appendix 6.1, Figure 6.5) to add support to the case for future year concentrations being lower than at present or for 2019.

6.8.13. Model results for future baseline conditions that are applicable to the future years 2025 and 2027 are presented in Table 6.10. These results account for committed development. The concentrations presented reflect progressive increases in proportions of cleaner vehicle technologies within the vehicle fleet for Inner London between 2019, 2025 and 2027, but do not reflect any additional improvements brought about by the ULEZ expansion as this is not yet accounted for in the available emissions factors.

6.8.14. No exceedances of legislated standards (Table 6.1) are predicted in the future baseline. For annual mean concentrations of PM_{10} and $PM_{2.5}$, there are very slight differences when comparing between 2025 and 2027 at one decimal place (i.e. the improvements between 2025 and 2027 are expected to be very small). As for 2019, the modelled annual mean $PM_{2.5}$ concentrations exceed the non-statutory WHO former guideline limit of 10$\mu g/m^3$ (Table 6.1).

6.8.15. Results for 1-hour mean NO_2 and 24-hour mean PM_{10} have not been presented as the annual mean concentrations of NO_2 and PM_{10} do not exceed the indicative thresholds of 60$\mu g/m^3$ or 32$\mu g/m^3$ (respectively).

Table 6.10: 2025 and 2027 future baseline modelled annual mean concentrations ($\mu g/m^3$) at existing discrete receptors

Receptor	NO_2		PM_{10}		$PM_{2.5}$	
	2025	2027	2025	2027	2025	2027
1	25.4	24.6	18.5	18.5	11.8	11.8
2	25.5	24.7	18.6	18.6	11.8	11.8
3	25.8	24.9	18.7	18.7	11.9	11.9
4	26.5	25.5	18.8	18.8	12.0	12.0
5	25.9	24.9	18.7	18.7	11.9	11.9
6	24.4	23.6	18.2	18.2	11.7	11.7
7	24.0	23.3	18.1	18.1	11.6	11.6
8	26.5	25.5	18.9	18.9	12.0	12.0
9	24.9	24.0	18.4	18.4	11.7	11.7
10	24.8	23.9	18.4	18.3	11.7	11.7
11	28.6	27.2	20.3	20.3	12.8	12.8
12	27.8	26.5	20.1	20.1	12.7	12.7
13	26.1	25.0	19.6	19.5	12.4	12.4
14	26.6	25.5	19.7	19.7	12.5	12.5
15	28.7	27.3	20.4	20.3	12.9	12.9
16	28.6	27.2	20.3	20.3	12.8	12.8
17	28.9	27.4	20.4	20.4	12.9	12.9
18	29.2	27.7	20.5	20.5	12.9	12.9
19	31.0	29.4	21.0	21.0	13.2	13.2
20	29.2	27.8	20.5	20.4	12.9	12.9
21	29.2	27.7	20.5	20.5	12.9	12.9
22	28.5	27.1	20.4	20.4	12.9	12.9
23	31.4	29.7	21.1	21.0	13.2	13.2
24	32.9	31.1	21.7	21.7	13.6	13.6
25	30.1	28.6	20.7	20.7	13.1	13.1
26	27.6	26.5	19.9	19.9	12.6	12.6
27	25.4	24.6	19.1	19.1	12.1	12.2
28	26.1	25.2	19.4	19.4	12.3	12.3

6.9. Assessment of Effects, Mitigation and Residual Effects

Construction Phase

Dust Emissions Impacts

6.9.1. The four main construction phase activities as identified in the guidance and assigned dust emission magnitudes are given in Table 6.11.

Table 6.11: Construction phase activities and dust emissions magnitudes

Activity	Dust emission magnitude	Justification
Demolition	Large	>50,000m³ volume of buildings to be demolished comprising potentially dusty materials
Earthworks	Large	>10,000m² Project Site area affected by groundworks
Construction	Large	>100,000m³ total building volume
Trackout (vehicles leaving the Project Site)	Large	Potentially >50 outward lorry movements in any one day moving over large unpaved area

6.9.2. There are multiple highly sensitive residential receptors within 50m of construction activities. The sensitivity of the area to dust soiling effects is therefore considered to be high. Taking the highest recorded annual mean PM10 concentrations for 2019 of 24μg/m3 at SWK 5 as worst case, the sensitivity of the area to human health impacts from generated demolition/construction PM10 is also considered to be high.

6.9.3. The risks from dust and PM10 were therefore evaluated as high for all activities, without the application of appropriate mitigation.

Traffic Emissions Impacts

6.9.4. In summary, all impacts are negligible, with no exceedances of legislated standards at any existing or new receptors. Annual mean $PM_{2.5}$ concentrations exceed the WHO former guideline limit of 10μg/m³ (Table 6.1) in all cases. Concentrations of NO_2 and PM_{10} at all new receptors fall within APEC A (Table 6.8). Note that 'without Project' concentrations for future receptors F1 – F5 are not shown as these receptors do not exist without the Project and therefore the future residents would not be present to be impacted by changes in concentrations.

6.9.5. Details of impacts on annual mean concentrations at each receptor where the change is at least 0.1μg/m3 are given in Table 6.12 for NO2, Table 6.13 for PM10, and Table 6.14 for PM2.5. Results for receptors where the 'with Project' concentration is imperceptibly different to the 'without Project' concentration (i.e. the same as in Table 6.10) are not shown. The tables also include the predicted concentrations at new receptors.

6.9.6. In general, perceptible but ultimately negligible impacts are limited to receptors along the assumed construction traffic route including Albany Road to the east of Thurlow Street, and the A2 Old Kent Road to the south of Albany Road. The contributions from road traffic emissions associated with the completed and occupied Block 4D are imperceptible.

Table 6.12: Construction phase (2025) impacts on annual mean NO_2 concentrations (μg/m³) and exposure at new receptors

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (40µg/m³)	% Change in concentration relative to air quality standard (40µg/m³)	Impact
14	26.6	26.7	0.1	67%	<1%	Negligible
15	28.7	28.8	0.1	72%	<1%	Negligible
16	28.6	28.7	0.1	72%	<1%	Negligible
18	29.2	29.3	0.1	73%	<1%	Negligible
24	32.9	33.0	0.1	83%	<1%	Negligible
F4	N/A	28.2	N/A	71%	N/A	APEC A
F5	N/A	27.5	N/A	69%	N/A	APEC A

Table 6.13: Construction phase (2025) impacts on annual mean PM_{10} concentrations (µg/m³) and exposure at new receptors

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (40µg/m³)	% Change in concentration relative to air quality standard (40µg/m³)	Impact
25	20.7	20.8	0.1	52%	<1%	Negligible
F4	N/A	20.2	N/A	51%	N/A	APEC A
F5	N/A	20.0	N/A	50%	N/A	APEC A

Table 6.14: Construction phase (2025) impacts on annual mean $PM_{2.5}$ concentrations (µg/m³) and exposure at new receptors

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (20µg/m³)	% Change in concentration relative to air quality standard (20µg/m³)	Impact
23	13.2	13.3	0.1	67%	<1%	Negligible
F4	N/A	12.8	N/A	64%	N/A	N/A
F5	N/A	12.6	N/A	63%	N/A	N/A

Construction Mitigation

6.9.7. Mitigation will be required to ensure no adverse significant effect due to dust and PM_{10} emissions during the construction phase. With appropriate mitigation in place, all impacts are anticipated to be negligible. This mitigation will be secured by planning condition and accord with the Mayor of London's SPG requirements to address dust and PM10 emissions. 'Highly

recommended' and 'desirable' measures taken from the SPG for a high risk site are included for reference in Appendix 6.3.

6.9.8. London's 'Low Emission Zone' for Non-Road Mobile Machinery and ULEZ vehicle requirements34,35 will apply.

6.9.9. No additional mitigation is required for emissions from construction traffic.

Residual Effects

6.9.10. With appropriate mitigation, the residual effects due to negligible impacts during the construction phase are short-term, temporary and not significant.

Operational Phase

Traffic and Energy Centre Emissions Impacts

6.9.11. In summary, all impacts are negligible, with no exceedances of legislated standards at any existing or new receptors. Annual mean $PM_{2.5}$ concentrations exceed the WHO former guideline limit of 10μg/m3 (Table 6.1) in all cases. Concentrations of NO2 and PM10 at all new receptors fall within APEC A (Table 6.8). Note that 'without Project' concentrations for future receptors F1 – F5 are not shown as these receptors do not exist without the Project.

6.9.12. Details of impacts on annual mean concentrations at each existing receptor where the change is at least 0.1μg/m3 are given in Table 6.15 for NO2 (boiler contributions are shown in square brackets '[…]'), Table 6.16 for PM_{10}, and Table 6.17 for $PM_{2.5}$ (below). Results for receptors where the 'with Project' concentration is imperceptibly different to the 'without Project' concentration (i.e. the same as shown in Table 6.10) are not shown. The tables also include the predicted concentrations at new receptors.

Table 6.15: Operational phase (2027) impacts on annual mean NO_2 (μg/m^3) and exposure at new receptors

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (40μg/m^3)	% Change in concentration relative to air quality standard (40μg/m^3)	Impact (Table 6.7) / APEC (Table 6.8)
18	27.7	27.8 [0.0042]	0.1	70%	<1%	Negligible
21	27.7	27.8 [0.0031]	0.1	70%	<1%	Negligible
26	26.5	26.6 [0.0018]	0.1	67%	<1%	Negligible
F1	N/A	26.0 [0.0313]	N/A	65%	N/A	APEC A

[34] https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/nrmm
[35] https://tfl.gov.uk/modes/driving/ultra-low-emission-zone

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (40µg/m³)	% Change in concentration relative to air quality standard (40µg/m³)	Impact (Table 6.7) / APEC (Table 6.8)
F2	N/A	26.2 [0.0000]	N/A	66%	N/A	APEC A
F3	N/A	26.3 [0.0670]	N/A	66%	N/A	APEC A
F4	N/A	26.9 [0.0181]	N/A	67%	N/A	APEC A
F5	N/A	26.2 [0.0144]	N/A	66%	N/A	APEC A

6.9.13. The maximum boiler contribution to annual mean NO_2 at 1.5m above ground level is 0.07µg/m³. This occurs at receptor F3, close to the Block 4A tower façade onto Albany Road. Also at this location is the maximum contribution to 1-hour mean NO_2 at 1.5m of 0.2µg/m³, which is just 0.1% of the 1-hour mean standard of 200µg/m³ not be exceeded more than 18 times per year (Table 6.1) and well below the Environment Agency 10% screening threshold. The boiler contributions are substantially lower at other locations within the Project Site and are lower still at discrete receptors in the surrounding area. The contributions to ambient NO_2 concentrations are therefore anticipated to be imperceptible. These contributions are considered to be very much worst case as the assumption is the boilers provide all the heating and hot water demand whereas the Energy Strategy (see Appendix 2.3) is for only 15% of the demand to be met by gas boilers, with 85% being provided by the ASHPs.

6.9.14. Gridded ADMS 5 model results showing the dispersed boiler contributions to annual mean and 1-hour (99.79th percentile) NO_2 concentrations at Block 4A roof level, level 24 (top residential level) and ground level are illustrated in Appendix 6.1, Figure 6.6 (annual mean NO_2) and Figure 6.7 (1-hour mean NO_2). The maximum concentrations shown are at roof level. The maximum contributed annual mean concentration is 0.76µg/m³ and occurs a few metres away from the north-eastern part of the roof. The maximum contributed 1-hour mean concentration is 6.9µg/m³ and occurs at the western side of the roof; it is less than the Environment Agency 10% screening threshold and can be discounted as insignificant. At level 24, where there is relevant exposure, the concentrations are predicted to be at least 10 times lower and essentially negligible. The contributed concentrations decrease further down to ground level and will also be negligible.

Table 6.16: Operational phase (2027) impacts on annual mean PM_{10} (µg/m³) and exposure at new receptors

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (40µg/m³)	% Change in concentration relative to air quality standard (40µg/m³)	Impact (Table 6.7) / APEC (Table 6.8)
13	19.5	19.6	0.1	49%	<1%	Negligible

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (40µg/m³)	% Change in concentration relative to air quality standard (40µg/m³)	Impact (Table 6.7) / APEC (Table 6.8)
15	20.3	20.4	0.1	51%	<1%	Negligible
F1	N/A	19.9	N/A	50%	N/A	APEC A
F2	N/A	20.0	N/A	50%	N/A	APEC A
F3	N/A	20.0	N/A	50%	N/A	APEC A
F4	N/A	20.2	N/A	51%	N/A	APEC A
F5	N/A	20.0	N/A	50%	N/A	APEC A

Table 6.17: Operational phase (2027) impacts on annual mean $PM_{2.5}$ (µg/m³) and exposure at new receptors

Receptor	Without Project	With Project	Change	Concent-ration as % of air quality standard (20µg/m³)	% Change in concentration relative to air quality standard (20µg/m³)	Impact (Table 6.7) / APEC (Table 6.8)
11	12.8	12.9	0.1	65%	<1%	Negligible
F1	N/A	12.6	N/A	63%	N/A	N/A
F2	N/A	12.7	N/A	64%	N/A	N/A
F3	N/A	12.7	N/A	64%	N/A	N/A
F4	N/A	12.8	N/A	64%	N/A	N/A
F5	N/A	12.6	N/A	63%	N/A	N/A

Air Quality Neutral Assessment

6.9.15. The Energy Strategy (see Appendix 2.3) determined the total annual domestic space heating and hot water demand to be approximately 2,149MWh, of which approximately 85% will be met by the ASHP and approximately 15% by natural gas boilers. Assuming 20% system losses and 95.6% boiler efficiency, the annual gas consumption will be approximately 404.623MWh. The assumed gas boiler emission rate is 37mg/kWh. On this basis the annual NO_x emission is approximately 15kg. This is well below the BEB of 334.3kg (Table 6.4). The Project building emissions therefore meet the air quality neutral requirement.

6.9.16. As a sensitivity test, if the gas boilers are used to provide 100% of the annual requirement, then the gas consumption would be approximately 2,697MWh, giving a total annual NO_x emission of approximately 100kg. This is still well below the BEB, confirming that the building emissions do meet the air quality neutral requirement.

6.9.17. The transport consultant has estimated the number of annual two-way vehicle trips associated with the Project once complete to be 77,745. Of these trips 55,845 are cars, with the rest made up by servicing and delivery trips. The TEB (Table 6.5) of 70,476 is based only on car trips,

with servicing and delivery trips discounted by the methodology. As the number of car trips generated by the Project is less than the TEB then the Project transport emissions meet the air quality neutral requirement.

6.9.18. Overall, the Project is air quality neutral.

Operational Phase Mitigation

6.9.19. As the in-combination impacts of traffic and energy centre emissions are negligible and the Project is air quality neutral, there is no requirement for additional mitigation. Future receptors were found to meet London Councils' APEC A level, indicating relatively good ambient air quality and compliance with legislated standards. For mechanical heating and ventilation systems, measures beyond fine particulate removal should not be required, and opening windows should be permitted.

Residual Effects

6.9.20. The residual effects due to the negligible air quality impacts in the operational phase are medium/long- term, permanent and not significant.

6.10. Summary

6.10.1. The air quality assessment considered the potential air quality impacts and likely effects in the construction and operational phases of the Project. The findings are summarised in Table 6.18.

6.10.2. For the construction phase, the impacts from dust and PM10 emissions were assessed with regard to LBS, Mayor of London and IAQM guidance. Mitigation will be required to ensure no adverse significant effect due to dust and PM10 emissions during the construction phase. With appropriate mitigation in place, all impacts are anticipated to be negligible. This mitigation will be secured by planning condition and accord with the Mayor of London's SPG requirements to address dust and PM10 emissions.

6.10.3. The potential air quality impacts on NO2, PM10 and PM2.5 concentrations due to road traffic emissions during the construction phase – assuming peak construction activities in 2025 and Block 4D completed and occupied – were assessed, with reference to guidance produced by LBS, EPUK/IAQM, the Mayor of London and Defra. These impacts were determined to be negligible, with no significant adverse effect. Future receptors were found to meet London Councils' APEC A level, indicating acceptable air quality.

6.10.4. The potential air quality impacts on NO2, PM10 and PM2.5 concentrations due to road traffic and energy centre (gas boiler) emissions in the operational phase were assessed, with reference to guidance produced by LBS, EPUK/IAQM, Defra and the Environment Agency. These impacts were determined to be negligible, with no significant effect (even assuming worst-case boiler operations to provide 100% of the heat and hot water demand). These impacts were determined to be negligible, with no significant adverse effect. Future receptors were found to meet London Councils' APEC A level, indicating acceptable air quality.

6.10.5. With regard to the London Plan Policy SI 1, the Project was determined to be air quality neutral, in accordance with the Mayor of London's guidance.

Table 6.18: Summary of effects due to impacts on air quality

Receptor	Potential Effects	Significance of Effects Prior to Mitigation	Additional Mitigation	Residual Effects
Construction				
Existing human receptors (residential premises) within 350m of the Project Site and 50m of the Thurlow Street/ Albany Road to 500m from the egress	Adverse effects from dust: - complaints - statutory nuisance Adverse effects from increased ambient concentrations of PM_{10}: - human health.	N/A	Industry best practice measures to prevent/control emissions in line with the Mayor of London's SPG requirements	Not significant T, D, ST
Existing human receptors (residential premises and school)	Adverse effects from increased ambient concentrations of NO_2, PM_{10}, $PM_{2.5}$ due to emissions from construction traffic: - human health - hinderance of LBS and Mayor of London efforts in improving local air quality.	Not significant T, D, ST	N/A	Not significant T, D, ST
Operation				
Existing human	Adverse effects from increased	Not significant	N/A	Not significant

Receptor	Potential Effects	Significance of Effects Prior to Mitigation	Additional Mitigation	Residual Effects
receptors (residential premises and school)	ambient concentrations of NO_2, PM_{10}, $PM_{2.5}$ due to emissions from operational traffic and permanent energy centre boilers: - human health - hinderance of LBS and Mayor of London efforts in improving local air quality.	P, D, ST		P, D, ST

Key to table: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

7. Daylight, Sunlight, and Overshadowing

7.1. Introduction

7.1.1. This Chapter assesses the likely significant environmental effects of the Project on daylight, sunlight availability and overshadowing. In particular, it considers the likely significant effects on the neighbouring residential properties and amenity spaces around the Project Site. The assessment also considers the likely daylight and sunlight availability and the overshadowing expected within the Project.

7.1.2. This Chapter should be read together with Chapters 1 to 4 in this ES.

7.2. Appendices

Table 7.1: Appendices for Chapter 7

Appendix No.	Document
7.1	Drawings of the existing baseline and future project
7.2	Drawings showing locations of windows assessed
7.3	Daylight and Sunlight Analysis in relation to surrounding properties
7.4	Daylight and Sunlight Analysis in relation to surrounding properties – with the effect of balconies/recessed windows removed
7.5	BRE 2 Hour Overshadowing Assessments
7.6	Drawings of the Consented Maximum Parameter Masterplan
7.7	Daylight and Sunlight Analysis of the consented Maximum Parameter Masterplan (2014 ES) vs the Project
7.8	Façade Study Drawings

7.3. Legislation, Policy and Guidance

Planning Policy

National Planning Policy

7.3.1. The National Policy Framework 2021[36]

Chapter 11 of the NPPF deals with "Making effective use of land." Under the sub-heading "Achieving appropriate densities" it states at paragraph 125 that, "Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important

[36] Ministry of Housing, Communities & Local Government, (2021) National Planning Policy Framework

that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site. In these circumstances:

c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."

Planning Practice Guidance

7.3.2. "1.3. The National Planning Practice Guidance[37] (NPPG) was launched in 2014, creating an online resource for planning practitioners. This has subsequently been updated, and is split into guidance categories."

7.3.3. "In relation to guidance on effective use of land, the document states at paragraph 007 (Reference ID: 66-007-20190722) that, "All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example in areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings."

National Design Guide

7.3.4. The National Design Guide[38] forms part of the Government's collection of planning practice guidance.

7.3.5. "1.6. In respect to daylight and sunlight, the document states at paragraph 70, "Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their location and siting; relationship to context; impact on local character, views and sight lines; composition - how they meet the ground and the sky; and environmental impacts, such as sunlight, daylight, overshadowing and wind. These need to be resolved satisfactorily in relation to the context and local character."

Regional Planning Policy

<u>The London Plan 2021[39]</u>

7.3.6. Policy D6 Housing Quality Standards

[37] Ministry of Housing, Communities & Local Government, (2014) National Planning Practice Guidance
[38] Department for Levelling UP, Housing and Communities/Ministry of Housing, Communities & Local Government, (2021) National Design Guide
[39] [39] Greater London Authority, (2021) The London Plan

"D The design of development should provide sufficient daylight and sunlight to new and surrounding housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing and maximising the usability of outside amenity space."

Local Planning Policy

7.3.7. Strategic Policy 13 – High environmental standard notes that:

"Setting high standards and supporting measures for reducing … light pollution ... [will help avoid] problems that affect how we enjoy the environment in which we live and work."

7.3.8. Southwark Plan (Saved Policies), 2013

There are no saved policies in the Southwark Plan (Saved Policies), 2013 which make reference to daylight, sunlight and overshadowing impacts to receptors surrounding redevelopment sites.

The Southwark Plan (2022)[40]

7.3.9. Policy 14 – Design quality

"Adequate daylight, sunlight, outlook, and a comfortable microclimate including good acoustic design for new and existing residents."

7.3.10. Policy P16 – Tall Buildings - states that:

"The design of tall buildings will be required to ... Avoid harmful and uncomfortable impacts including ... overshadowing and solar glare;

7.3.11. Policy 56 – Protection of Amenity

"Development should not be permitted when in causes an unacceptable loss of amenity to present or future occupiers or users"

7.3.12. Residential Design Standards[41] Supplementary Planning Documents

Part 1 of the Housing SPG covers housing supply and sets out the Mayor's approach to optimising housing output. In relation to the effect on daylight and sunlight to surrounding properties, referring to Policy 7.6Bd of the London Plan, it advises:

"Policy 7.6Bd requires new development to avoid causing 'unacceptable harm' to the amenity of surrounding land and buildings, particularly in relation to privacy and overshadowing and where tall buildings are proposed. An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves. Guidelines should be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where BRE advice suggests considering the use of

[40] London Borough of Southwark, (2022) The Southwark Council

[41] London Borough of Southwark, (2011) Residential Design Standards

alternative targets. This should take into account local circumstances; the need to optimise housing capacity; and scope for the character and form of an area to change over time."

"The degree of harm on adjacent properties and the daylight targets within a proposed scheme should be assessed drawing on broadly comparable residential typologies within the area and of a similar nature across London. Decision makers should recognise that fully optimising housing potential on large sites may necessitate standards which depart from those presently experienced, but which still achieve satisfactory levels of residential amenity and avoid unacceptable harm."

Guidance

7.3.13. Building Research Establishment Handbook 'Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice[42]

7.3.14. The BRE Guidelines provide advice on site layout planning to achieve good sunlighting and daylighting within buildings and in the open spaces between them.

7.3.15. It also sets out criteria and methods for calculating the effect of a proposed development on the daylight and sunlight availability to surrounding properties. The advice it provides is not mandatory and should not be used as an instrument of planning policy. Of particular relevance, it states that "This guide is…purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location".

7.3.16. The BRE Guidelines also state that:

"...the aim of the document is to help rather than constrain the designer. Though it gives numerical guidelines, these should be interpreted flexibly because natural lighting is one of many factors in site layout design. In special circumstances, the developer or the planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings"

7.3.17. In addition, the BRE Guidelines state (paragraph 1.3) that "it is intended to be read in conjunction with the interior daylighting recommendations in the British Standard 8206-2 Code of practice for daylighting, and in the CIBSE publication Lighting guide: daylighting and window design"[43]

7.3.18. Whilst updated BRE guidance is anticipated, this is yet to be published. However, no major changes to the assessment of the impact to neighbouring properties are expected in the new guidance. Waterslade have been part of the design team from the outset and have undertaken testing and provided advice on how to minimise the daylight impact at various stages during the design development.

[42] Building Research Establishment (BRE), (2011); BRE Guidelines: 'Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice' 2011
[43] British Standard, (2008); BS 8206-2:2008 – Lighting for buildings. Code of practice for daylighting

7.4. Historic Assessment

7.4.1. Comments on a comparison of the historic 2014 ES which can be found in paragraphs 7.8.1-7.8.6

7.5. Assessment Methodology and Significance Criteria

Relevant Elements of the Project

7.5.1. The assessment has been undertaken in relation to the guidance set out Building Research Establishments (BRE) Site Layout Planning for Daylight and Sunlight; A Guide to Good Practice 2011 and BS8206-2:2008. The assessment will be based on a scale three-dimensional contextual computer model of the baseline and Project situations.

7.5.2. As some of the surrounding properties are characterised by deep balconies, which inhibit the penetration of daylight and sunlight, the true effect of developing the Project Site may also be assessed in a baseline scenario in which the effect of these balconies is discounted. This is provided for by paragraph 2.2.11 of the BRE Guidelines;

- The results of the following assessments will be used in order to quantify the effect of the Project; Vertical Sky Component (VSC), No Sky Line (NSL), Average Daylight Factor (ADF) and Annual Probable Sunlight Hours (APSH).

7.5.3. Any overshadowing of surrounding areas of amenity space by the Project has been assessed using the sun on ground and/or time in sun assessment methodologies. Any amenity areas within the Project have also been assessed by consideration of the sun of ground and/or time in sun methodology.

7.5.4. The cumulative daylight impact to future phases 4 and 2C of the Outline Planning Permission (OPP) (LPA ref: 14/AP/3844 has been assessed by undertaking a façade study of the closest buildings to the Project Site. The remaining phases of the OPP are considered too far away for the Project to impact.

Scope of the Assessment

7.5.5. A detailed daylight, sunlight and overshadowing assessment of the Project has been undertaken. This considers the impact on the amenity to the neighbouring residential properties.

7.5.6. Consideration will be given to both the reductions in amenity, and also the overall retained levels of amenity and their acceptability in relation to the urban context. Appendix F of the guidelines will be referenced in relation to consideration of appropriate urban targets.

Extent of the Study Area

7.5.7. Figure 7.1 identifies the properties surrounding the Project Site which have been considered in the assessment.

Figure 7.1: Plan Showing the Project and the Properties surrounding the Project Site

Consultation

7.5.8. The proposed approach to the daylight, sunlight and overshadowing assessment was set out in the EIA Scoping Report (see Appendix 2.1), which was submitted to LBS. The following comments, issued following a review of the Scoping Report by Land Use Consultants (see Appendix 2.2) have been addressed in this report:

7.5.9. *"The scope, in relation to the assessment to be undertaken, is considered acceptable including the comparison of the impacts compared to the 2014 ES Results."* An assessment comparing the daylight and sunlight levels of the current Project with both the Maximum Parameter massing and the OPP illustrative massing has been included.

7.5.10. *"The potential cumulative daylight and sunlight effect to neighbouring Phases 4 and Phase 2C should also be considered."* This is in reference to the outline planning permission Outline Planning Permission (OPP) (LPA ref: 14/AP/3844). Since detailed scheme information on these blocks is not available, a façade assessment has been undertaken to show the potential impact of the Project on the future phases.

7.5.11. It has been agreed that a cumulative assessment of any surrounding consented developments are not near to the Project Site.

Method of Baseline Data Collation

7.5.12. In order to create an accurate baseline, a measured survey was undertaken that captured the existing buildings on and in the vicinity of the Project Site. The captured data was converted to a three-dimensional computer model for testing in our bespoke daylighting analysis software. Photography recorded during a site visit has been referred to throughout the technical assessment work.

Identification of Sensitive Receptors

Daylight and Sunlight

7.5.13. The locations of the sensitive receptors are shown in **Figure 7.1** above, within the drawings within **Appendix 7.1** and are listing in **Table 7.2** below.

Table 7.2: Daylight and Sunlight Sensitive Receptors

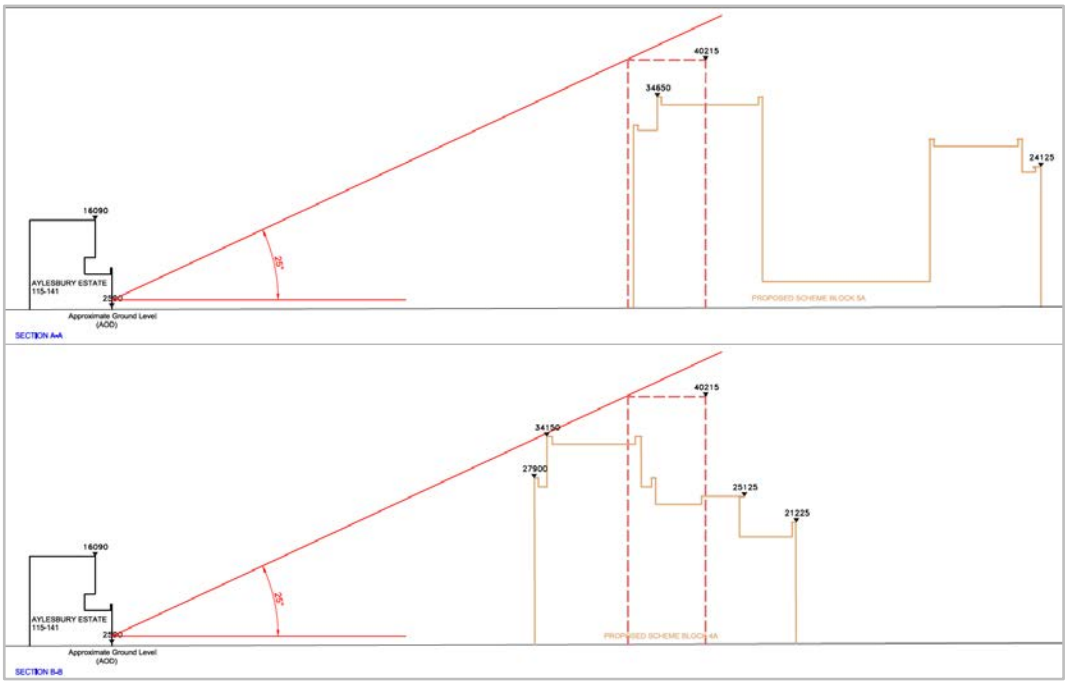
Plan No	Address	Plan No	Address
1	1 Haywood Street (APF Development)	10	23 Bagshot Street
2	70 Bagshot Street (Domville Court)	11	21 Bagshot Street
3	47-53 Bagshot Street	12	19 Bagshot Street
4	37 Bagshot Street	13	17 Bagshot Street
5	35 Bagshot Street	14	15 Bagshot Street
6	33 Bagshot Street	15	1-28 Faversham House
7	31 Bagshot Street	16	Flats 176-192 Wolverton, Alvey Street
8	29 Bagshot Street	17	Flats 114-141 Latimer, Beaconsfield
9	25-27 Bagshot Street		

7.5.14. Usually, the local planning authority will only be concerned with the impact to main habitable accommodation (i.e. living rooms, bedrooms and kitchens) within residential properties which also accords with best industry practice. As such any residential accommodation within the above properties will be considered in detail.

7.5.15. In line with the BRE guidelines, if the elevation angle to the top of the Project from the lowest windows is less than 25° the impact should be considered acceptable, and a detailed analysis is not required. Therefore, with reference to the sectional drawing shown in **Figure 7.2** below and within **Appendix 7.1,** the residential properties of Flats 114-141 Latimer to the west of site are too far away to be materially impacted by the Project.

7.5.16. Furthermore, the section shows that the angle of view from the ground floor windows to the existing building would be greater or similar to that of the Project. Therefore, not only would the daylight and sunlight impacts to these properties not be material, they would likely be negligible.

Figure 7.2: Section showing development angles through Flats 114-141 Latimer



Overshadowing (Sun on Ground)

The location of the current overshadowing sensitive receptors can be seen in **Figure 7.3** and within the drawings in **Appendix 7.5** The receptors are listed in **Table 7.3** below.

Figure 7.3 Location of the Surrounding Current Overshadowing Receptors Relative to the Project Site

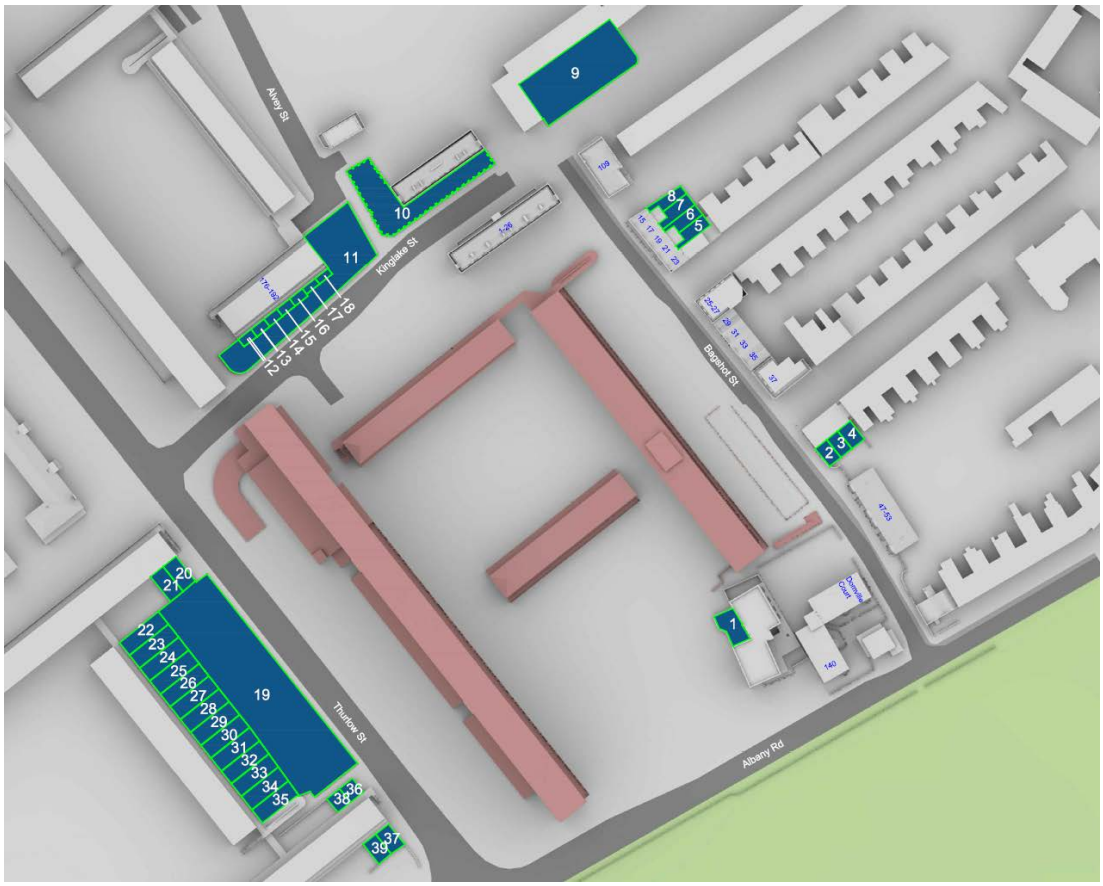


Table 7.3 Surrounding Overshadowing Sensitive Receptors

Plan No	Address	Plan No	Address
1	1 Haywood Street (APF Development)	21	57 Latimer, Beaconsfield Road
2	105 Mina Road	22	114 Latimer, Beaconsfield Road
3	103 Mina Road	23	116 Latimer, Beaconsfield Road
4	101 Mina Road	24	118 Latimer, Beaconsfield Road
5	21 Bagshot Street	25	120 Latimer, Beaconsfield Road
6	19 Bagshot Street	26	122 Latimer, Beaconsfield Road
7	17 Bagshot Street	27	124 Latimer, Beaconsfield Road
8	15 Bagshot Street	28	126 Latimer, Beaconsfield Road
9	1-30 Southborough House	29	128 Latimer, Beaconsfield Road
10	1-20 Tenterden House	30	130 Latimer, Beaconsfield Road
11	176-192 Wolverton Alvey	31	132 Latimer, Beaconsfield Road

Plan No	Address	Plan No	Address
12	176 Wolverton Alvey Street	32	134 Latimer, Beaconsfield Road
13	179 Wolverton Alvey Street	33	136 Latimer, Beaconsfield Road
14	181 Wolverton Alvey Street	34	138 Latimer, Beaconsfield Road
15	184 Wolverton Alvey Street	35	140 Latimer, Beaconsfield Road
16	186 Wolverton Alvey Street	36	31-33 Eberton, 190 Albany Road
17	189 Wolverton Alvey Street	37	31-33 Eberton, 190 Albany Road
18	191 Wolverton Alvey Street	38	34-35 Eberton, 190 Albany Road
19	114-141 Latimer, Beaconsfield	39	34-35 Eberton, 190 Albany Road
20	60 Latimer, Beaconsfield Road		

Assessment Modelling

7.5.17. Using a three-dimensional (3D) computer model of the Project Site and its surrounding context (visualisations of which can be found within **Appendix 7.1),** the levels of daylight, sunlight and shadow in the existing situation have been analysed and compared to the levels following the construction of the Project. Detailed analysis results can be found within **Appendices 7.3** and **7.4**.

Assessment of Daylight and Sunlight

7.5.18. Daylight and sunlight have been assessed with reference to the guidance set out within the Building Research Establishment (BRE) Report, *'Site layout planning for daylight and sunlight - A guide to good practice*' (henceforth referred to as the 'BRE guidelines'). This document provides advice on site layout planning to achieve good daylighting and sunlighting within buildings, and to the open spaces between them.

7.5.19. The BRE guidelines are not mandatory, and they explicitly state that the numerical target values should be interpreted flexibly. While local planning authorities will consider the acceptability of a proposed scheme in relation to BRE guidance, consideration will be given to the context within which a scheme is located, and daylight and sunlight will be one of a number of planning considerations. Of particular relevance, the document states: *"This guide is a comprehensive revision of the 1991 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."*

7.5.20. In addition, paragraph 1.6 states of the BRE guidelines states "[…] the aim of the document is to help rather than constrain the designer. Though it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design. In special circumstances, the developer or the planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."

7.5.21. In relation to the properties surrounding a site, usually the local planning authority will only be concerned with the impact to main habitable accommodation (i.e. living rooms, bedrooms and kitchens) within residential properties.

7.5.22. Commercial properties are generally deemed to have a greater reliance upon supplementary electric lighting and, as is usual, have not been included within the assessment.

7.5.23. To determine whether a neighbouring existing building may be adversely affected, the initial test provided by the BRE is to establish if any part of the proposal subtends an angle of more than 25˚ from the lowest window serving the existing building. If this is the case then there may be an adverse effect, and more detailed calculations are required to determine whether this is the case and quantify the extent of any impact.

Assessment of Daylight Impacts

7.5.24. The BRE guidelines provide two principal measures of daylight for assessing the impact on properties neighbouring a site, namely Vertical Sky Component (VSC) and No-Sky Line (NSL). They also detail a third measure of daylight which is primarily used for assessing amenity within proposed accommodation, namely Average Daylight Factor (ADF).

7.5.25. In relation to the impact on properties neighbouring a site, as ADF is a measure of the overall level of daylight within a space it enables a more detailed understanding of retained amenity. It can also provide a helpful point of reference to understand how levels of daylight reaching a specific building (as measured by VSC) might relate to the overall amenity within that building.

7.5.26. These measures of daylight are discussed in the following paragraphs and are summarised in Table 7.4.

Vertical Sky Component (VSC)

7.5.27. VSC is a measure of the direct skylight reaching a point from an overcast sky. It is the ratio of the illuminance at a point on a given vertical plane to the illuminance at a point on a horizontal plane due to an unobstructed sky.

7.5.28. For existing buildings, the BRE guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall.

7.5.29. The BRE guidelines state that if the VSC at the centre of a window is less than 27%, and it is less than 0.8 times its former value (i.e. the proportional reduction is greater than 20%), then the reduction in skylight will be noticeable, and the existing building may be adversely affected.

No-Sky Line (NSL)

7.5.30. NSL is a measure of the distribution of daylight within a room. It maps out the region within a room where light can penetrate directly from the sky, and therefore accounts for the size of and number of windows by simple geometry.

7.5.31. The BRE suggest that the area of the working plane within a room that can receive direct skylight should not be reduced to less than 0.8 times its former value (i.e. the proportional reduction in area should not be greater than 20%).

Average Daylight Factor (ADF)

7.5.32. ADF is a measure of the overall amount of diffuse daylight within a room. It is the average of the daylight factors across the working plane within a room. This equates to the ratio of the average illuminance across the working plane, to the illuminance due to an unobstructed sky.

7.5.33. In addition to accounting for external obstructions, the ADF accounts for the number of windows and their size in relation to the size of the room, the window transmittance and the reflectance of the internal walls, floor and ceiling.

7.5.34. The ADF is detailed in Appendix C of the BRE Report. This provides guidance on acceptable ADF values in the presence of supplementary electric lighting, depending on the room use. These are 1.0 % for a bedroom, 1.5 % for a living room and 2.0 % for a kitchen.

Assessment of Sunlight Impacts

7.5.35. In terms of sunlight, the BRE Annual Probable Sunlight Hours (APSH) method of assessment is used.

Annual Probable Sunlight Hours (APSH)

7.5.36. In relation to sunlight, the BRE recommends that the APSH received at a given window in the proposed case should be at least 25 % of the total available, including at least 5 % in winter.

7.5.37. Where the proposed values fall short of these, and the absolute loss is greater than 4 %, then the proposed values should not be less than 0.8 times their previous value in each period (i.e. the proportional reductions should not be greater than 20%).

7.5.38. The BRE guidelines state that, "[...] all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90 degrees of due south. Kitchens and bedrooms are less important, although care should be taken not to block out too much sun".

7.5.39. The APSH figures are calculated for each window, and where a room is served by more than one window the contribution of each is accounted for in the overall figures for the room. The acceptability criteria are applied to each room.

Table 7.4 Summary of BRE Assessment Criteria

Topic	Method	2011 BRE Criteria
Daylight	Vertical Sky Component (VSC)	A window may be adversely affected if the VSC measured at the centre of the window is less than 27% and less than 0.8 times its former value.
	No Sky Line (NSL)	A room may be adversely affected if the daylight distribution (no sky line) is reduced beyond 0.8 times its existing area.
	Average Daylight Factor (ADF)	A room may be adversely affected if the ADF is less than 1% for a bedroom, 1.5% for a living room or 2% for a kitchen

Topic	Method	2011 BRE Criteria
Sunlight	Annual Probable Sunlight Hours (APSH)	If a window receives less than 25% of total APSH, or less than 5% of APSH during the winter months, then it may be adversely affected if – • There is an absolute reduction in total APSH of greater than 4%; and • It receives less than 0.8 times its former sunlight hours during either period.

7.5.40. Whilst VSC and NSL are separate measures of daylight, for an impact to be fully compliant with the BRE guidelines, it must comply with both these daylight criteria. It may be the case that one room might comply in relation No Sky-Line (NSL) but one or more window serving the room, does not reach the VSC criteria.

7.5.41. Similarly, a window can comply with the BRE guidelines in relation to VSC, but the room does not meet the recommended NSL figures. This is often the case when the depth of the room is disproportionate to the size of the window serving it. In such circumstances, there can be significant changes in NSL due to small changes towards the rear of the room in the sky visibility. This does not indicate a significant reduction in daylight amenity, and it is a well-known limitation of the NSL methodology.

7.5.42. Therefore, VSC should be regarded as the principal measure of daylight by which to judge the impact of a proposed scheme, since it is relatively unaffected by the particular design of the neighbouring property.

Assessment of Overshadowing Impacts

Sun on Ground

7.5.43. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not. This assessment reviews the total percentage of an area that receives at least two hours of direct sunlight on the March 21st.

7.5.44. The BRE suggests at paragraph 3.3.17 that "…to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable."

Assessment of Façade Study

7.5.45. When room layouts and window locations are undecided or unavailable, the BRE guidelines suggest that the VSC is calculated at a series of points on each main face of the building to check that it is possible to provide adequate daylight into new rooms.

7.5.46. The BRE suggests in paragraph 2.1.22 that "*if the VSC is*

- *at least 27% conventional window design will usually give reasonable results*
- *between 15% and 27% special measures are usually needed to provide adequate daylight*
- *between 5% and 15% it is very difficult to provide adequate daylight unless very large windows are used*
- *less than 5% it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed."*

Significance Criteria

7.5.47. The assessment of likely significant effects as a result of the Project has taken into account both the enabling, demolition and construction phase and once the Project is complete and occupied.

7.5.48. The significance of effects will be determined using professional judgement and by reference to Appendix I of the BRE guidelines.

7.5.49. As the approach is to categorise all receptors being assessed as sensitive (i.e. not assign a level of sensitivity as per general EIA methodology), the scale of effect is directly correlated to the magnitude of impact i.e. the higher the magnitude of impact, the greater the scale of an effect.

7.5.50. The nature of the effects may be either adverse (negative or detrimental) or beneficial (advantageous or positive).

7.5.51. The scale of each effect has been categorised as being:

- Major;
- Moderate;
- Minor; or
- Negligible.

7.5.52. More information on how the scale of effect has been determined for each type of assessment undertaken is discussed in the following sections of this chapter.

Significance of Effects

Daylight and Sunlight and Sun on Ground

7.5.53. The assessment criteria specified within the BRE guidelines only suggests where a change in daylight and sunlight may be noticeable to the occupants. It does not further define effects beyond this, apart from within Appendix I – Environmental Impact Assessment paragraphs I3-I4, where it states:

"*Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching*

an open space. The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied."

7.5.54. Appendix I (paragraph I6) further states:

"*where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse.*"

7.5.55. The Appendix I definitions of beneficial, negligible, minor adverse and major adverse effects are shown in **Table 7.5**. Moderate adverse effects are not specifically defined by the BRE.

Table 7.5 BRE Appendix I Daylight and Sunlight Criteria

2011 BRE Criteria	
Beneficial (paragraph I8)	*"…a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space."*
Negligible (paragraph I5)	*"Where the loss of light is well within the guidelines, or only a small number of windows or a limited area of open space lose light (within the guidelines)"*
Minor Adverse (paragraphs I5-I6)	*"Where the loss of light is only just within the guidelines, and a larger number of windows or open space area are affected…especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space"* *"Where the loss of skylight or sunlight does not meet the guidelines…only a small number of windows or limited area of open space are affected…the loss of light is only marginally outside the guidelines…an affected room has other sources of skylight or sunlight…the affected building or open space only has a low level requirement for skylight or sunlight…there are particular reasons why an alternative, less stringent, guideline should be applied."*
Major Adverse (paragraph I7)	*"Where the loss of skylight or sunlight does not meet the guidelines…a large number of windows or large area of open space are affected…the loss of light is substantially outside the guidelines…all the windows in a particular property are affected… the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight."*

7.5.56. In determining the scale of effect by considering BRE guidance, it must be noted that the default guidance was established in relation to a suburban environment.

7.5.57. The default nationwide BRE numerical criteria are therefore based on 25 degree development angles, which are frequently inappropriate, and indeed unachievable, in urban areas. The BRE VSC target of 27 % is based on a uniform 25 degree development angle. Appendix F of the BRE guidelines provides advice on setting alternative targets for access to daylight and sunlight. In relation to the default targets it says; *"These values are purely advisory and different targets may be used […] for example, in a mews in a historic city centre, a typical obstruction angle might be close to 40 degrees. This would correspond to a VSC of 18%, which could be used as a target".*

7.5.58. In many urban areas development angles of 40 degrees, or more, are common. This is equivalent to a VSC of 18 % which is a reasonable and accepted level of daylight in many

urban areas; and has been in many desirable central areas for well over a century. In recent years the need to make best use of available land means that the redevelopment of previously comparatively low-rise, low-density sites has required an increase in density, with corresponding increases in typical development angles and reductions in daylight. In many recent developments, therefore, angles substantially greater than 40 degrees are not uncommon.

7.5.59. As well as considering the proportional reductions in daylight and sunlight levels, it is therefore also important to consider retained levels of amenity and whether they are commensurate with those typical within a high-density urban location.

7.5.60. Therefore, in this location it is considered that a retained VSC of 18% is a good level of daylight for an urban location such as this.

7.5.61. Appendix F also states "In assessing the loss of light to an existing building, the VSC is generally recommended as the appropriate parameter to use. This is because the VSC depends only on obstruction and is therefore a measure of the daylit environment as a whole."

7.5.62. The daylight and sunlight effects are defined with reference to the criteria summarised within **Tables 7.6 and 7.7** and in paragraphs 7.5.61-7.5.68.

7.5.63. **Table 7.7** summarises the Scale of Effect Criteria based on retained levels of daylight as measured by VSC. While this is considered in conjunction with the proportional reductions listed in **Table 7.6**, where the scale of effect as determined by the proportional reductions is in a more significant category, the category as determined by retained levels should generally take precedence.

Table 7.6 Daylight (VSC, NSL) and Sunlight (APSH) Impact Magnitude and Scale of Effect Criteria

Scale of Effect	Magnitude of Impact
Beneficial	An increase in the amount of skylight and sunlight compared to the existing situation.
Negligible	No alteration or a small alteration from the existing scenario which is within the numerical levels suggested by the BRE (i.e. <20% proportional reduction from existing baseline)
Minor Adverse	20-30% proportional reduction from existing baseline, which should be viewed in context. This includes consideration of the acceptability of retained daylight and sunlight levels.
Moderate Adverse	30-40% proportional reduction from existing baseline, which should be viewed in context. This includes consideration of the acceptability of retained daylight and sunlight levels.
Major Adverse	40%+ proportional reduction from existing baseline, which should be viewed in context. This includes consideration of the acceptability of retained daylight and sunlight levels.

Table 7.7 Retained VSC Scale of Effect Criteria

Scale of Effect	Retained VSC
Negligible	>27%
Minor	18-27%
Moderate	12-18%
Major	0-12%

7.5.64. When determining the overall scale of effect per property for daylight and sunlight, consideration has been given to the proportion of rooms / windows affected, as well as the percentage alterations, absolute changes, existing levels, retained levels and other relevant factors such as the presence of balconies and overhangs.

7.5.65. As such, the assessment criteria / thresholds are not applied mechanistically, and professional judgement is formed following a review of the numerical analysis.

7.5.66. Negligible or minor adverse effects are considered to be not significant. Moderate to major adverse effects are considered to be significant.

7.5.67. Since 1 Haywood Street (APF Development) was part of the OPP (LPA ref: 14/AP/3844), more emphasis should be put on the retained daylight and sunlight levels once the Project is implemented.

7.5.68. Therefore, a further assessment of the Average Daylight Factors within each room (ADF) has been undertaken. Given that this building was part of the wider Aylesbury Masterplan, its detailed design was based on each of its habitable rooms achieving the recommended ADF target once the masterplan was complete. Therefore, if the habitable rooms in 1 Haywood Street continues to achieve the daylight targets as measured by ADF, the situation will be as predicted in the design stage and the effect should be considered negligible.

Limitations and Assumptions

7.5.69. Room layouts of the surrounding properties have been obtained where possible from LBS planning register and through searches on the internet. Where room layout information was unavailable, reasonable assumptions have been made about the likely use and internal configuration of rooms behind the fenestration observed. Where no indicators of room depth were available a reasonable standard of 14ft, or half the depth of the property was used, which is in accordance with industry practice.

7.5.70. The uses of adjoining properties, in terms of commercial and residential, were established using external observations and Valuation Office Agency (VOA) checks. Only those adjacent residential properties which have windows facing towards the Project Site, were included in the assessment. Commercial properties are generally deemed to have a greater reliance upon supplementary electric lighting and have, therefore, not been included within the assessment.

7.5.71. An assessment of the potential impact of the existing buildings, within the Project Site, on the daylight and sunlight, has not been carried out. The indicative phasing, see Chapter 5, set out that occupation of Block 4D will not occur until the existing buildings have been demolished. Similarly, an assessment of the impact of the new buildings (namely 4D) on the daylight and sunlight of the existing buildings has not been undertaken because Block 4D will not be fully completed until the surrounding buildings have been cleared for soft strip demolition (see Chapter 5 for more details).

7.6. Baseline Conditions

7.6.1. Detailed drawings of the current baseline scenario can be found at **Appendix 7.1**. Figure 7.1 and the drawings within the appended annexes indicate the position of the existing daylight and sunlight receptors in relation to the Project Site.

7.6.2. The model was analysed in order to ascertain the baseline levels of daylight and sunlight amenity within the sensitive receptors listed in **Table 7.2.**

Daylight and Sunlight

7.6.3. The current baseline VSC, NSL and APSH conditions were assessed for the receptors listed in **Table 7.2**. Full detailed results can be found in **Appendix 7.3.**

7.6.4. The results for VSC, NSL and APSH are summarised in **Table 7.8, Table 7.9** and **Table 7.10** respectively.

7.6.5. The results in the below tables show the number of windows (VSC) and rooms (NSL and APSH) which, in the baseline situation, meet the minimum levels recommended by the BRE.

Table 7.8: Summary Baseline VSC

Address	Total No of Windows that meet VSC Criteria (>27%)	Total Number of Windows
1 Haywood Street (APF Development)	39	49
70 Bagshot Street	16	32
47-53 Bagshot Street	35	54
37 Bagshot Street	18	18
35 Bagshot Street	3	3
33 Bagshot Street	2	2
31 Bagshot Street	2	2
29 Bagshot Street	2	2
25-27 Bagshot Street	15	15
23 Bagshot Street	2	2
21 Bagshot Street	3	3
19 Bagshot Street	3	3
17 Bagshot Street	3	3
15 Bagshot Street	3	3

Address	Total No of Windows that meet VSC Criteria (>27%)	Total Number of Windows
109 Kinglake Street	12	12
1-28 Faversham House	76	77
176-192 Wolverton, Alvey Street	30	45
Total	**264**	**325**

Table 7.9: Summary Baseline NSL

Address	Total No. of Rooms that Received NSL in Excess of 80%	Total No. of Rooms
1 Haywood Street (APF Development)	31	39
70 Bagshot Street	21	24
47-53 Bagshot Street	16	18
37 Bagshot Street	12	12
35 Bagshot Street	2	2
33 Bagshot Street	1	1
31 Bagshot Street	2	2
29 Bagshot Street	2	2
25-27 Bagshot Street	6	6
23 Bagshot Street	2	2
21 Bagshot Street	3	3
19 Bagshot Street	3	3
17 Bagshot Street	3	3
15 Bagshot Street	3	3
109 Kinglake Street	6	6
1-28 Faversham House	77	77
176-192 Wolverton, Alvey Street	45	45
Total	**235**	**248**

Table 7.10: Summary Baseline APSH

Address	Total No. of Rooms that Meet the APSH Criteria	Total No. of Rooms
1 Haywood Street (APF Development)	25	27
70 Bagshot Street	12	16
47-53 Bagshot Street	16	18
37 Bagshot Street	12	12
35 Bagshot Street	2	2

Address	Total No. of Rooms that Meet the APSH Criteria	Total No. of Rooms
33 Bagshot Street	1	1
31 Bagshot Street	2	2
29 Bagshot Street	2	2
25-27 Bagshot Street	6	6
23 Bagshot Street	2	2
21 Bagshot Street	3	3
19 Bagshot Street	3	3
17 Bagshot Street	3	3
15 Bagshot Street	3	3
109 Kinglake Street	6	6
1-28 Faversham House	77	77
176-192 Wolverton, Alvey Street	38	45
Total	**213**	**228**

VSC and APSH Figures Measured on the facade i.e. with the effect of balconies and recessed windows removed

7.6.6. The BRE VSC and APSH methodology is intended to be applied to plain facades and not to windows in recessed location or under projecting balconies or similar design features will typically receive less daylight. This is because the balcony cuts out light from the top part of the sky such that even a modest obstruction opposite may result in a large relative impact on the VSC, and on the area receiving direct skylight. The BRE guidelines suggest at para 2.2.11 that

"One way to demonstrate this would be to carry out an additional calculation of the VSC and area receiving direct skylight, for both the existing and proposed situations, without the balcony in place. For example, if the proposed VSC with the balcony, but the same ratio for the values without the balcony was well over 0.8, this would show that the presence of the balcony, rather than the size of the new obstruction, was the main factor in the relative loss of light."

7.6.7. As a result of this, where windows are experiencing reductions in daylight beyond the BRE numerical targets due to the presence of balconies, an alternative assessment has been undertaken for those windows without the balconies in place as the BRE guidelines recommend.

7.6.8. The 'on facade' baseline VSC and APSH (sunlight assessments are also based upon the amount of visible sky) conditions were assessed for the receptors shown highlighted in blue in **Figure 7.1**. Full detailed results can be found in **Appendix 7.4.**

7.6.9. The results measured on a plain façade (i.e. with the effect of balconies and recessed windows removed) are summarised in **Tables 7.11 and 7.12**.

Table 7.11: Summary Baseline VSC (With the Effect of Balconies Removed)

Address	Total No of Windows that meet VSC Criteria (>27%)	Total Number of Windows
70 Bagshot Street	27	32
47-53 Bagshot Street	40	54
176-192 Wolverton, Alvey Street	37	45
Total	**104**	**131**

Table 7.12: Summary Baseline APSH (With the Effect of Balconies Removed)

Address	Total No. of Rooms that Meet the APSH Criteria	Total No. of Rooms
70 Bagshot Street	16	16
47-53 Bagshot Street	18	18
176-192 Wolverton, Alvey Street	45	45
Total	**79**	**79**

Overshadowing

Sun on Ground

7.6.10. An analysis of the Sun on Ground with the existing baseline buildings has been undertaken in order to demonstrate the extent that shadow from the existing buildings falls upon the external amenity areas and open spaces surrounding the Project Site. Full detailed results can be found in **Appendix 7.5**.

7.6.11. The baseline levels of the Sun on Ground assessment are summarised in **Table 7.13** below.

Table 7.13 Summary Baseline Sun on Ground

Plot No	Address	Baseline Conditions % of Area Receiving Two Hours of Sun on 21st March
1	1 Haywood Street (APF Development)	26.6
2	105 Mina Road	69.0
3	103 Mina Road	75.9
4	101 Mina Road	77.9
5	21 Bagshot Street	0.3
6	19 Bagshot Street	21.2
7	17 Bagshot Street	40.4
8	15 Bagshot Street	28.5
9	1-30 Southborough House	96.1
10	1-20 Tenterden House	95.0

Plot No	Address	Baseline Conditions % of Area Receiving Two Hours of Sun on 21st March
11	176-192 Wolverton Alvey Street – Communal	91.3
12	176 Wolverton Alvey Street	18.6
13	179 Wolverton Alvey Street	37.4
14	181 Wolverton Alvey Street	40.6
15	184 Wolverton Alvey Street	23.5
16	186 Wolverton Alvey Street	25.7
17	189 Wolverton Alvey Street	100
18	191 Wolverton Alvey Street	30.5
19	114-141 Latimer, Beaconsfield Road – Communal	98.9
20	60 Latimer, Beaconsfield Road	81.4
21	57 Latimer, Beaconsfield Road	81.7
22	114 Latimer, Beaconsfield Road	48.1
23	116 Latimer, Beaconsfield Road	48.5
24	118 Latimer, Beaconsfield Road	48.4
25	120 Latimer, Beaconsfield Road	50.6
26	122 Latimer, Beaconsfield Road	46.4
27	124 Latimer, Beaconsfield Road	48.0
28	126 Latimer, Beaconsfield Road	48.2
29	128 Latimer, Beaconsfield Road	49.4
30	130 Latimer, Beaconsfield Road	47.5
31	132 Latimer, Beaconsfield Road	49.4
32	134 Latimer, Beaconsfield Road	46.8
33	136 Latimer, Beaconsfield Road	47.4
34	138 Latimer, Beaconsfield Road	52.5
35	140 Latimer, Beaconsfield Road	20.2
36	31-33 Eberton, 190 Albany Road Garden 1	12.6
37	31-33 Eberton, 190 Albany Road Garden 2	83.3
38	34-35 Eberton, 190 Albany Road Garden 1	11.8
39	34-35 Eberton, 190 Albany Road Garden 2	84.6

7.6.12. The baseline Sun on Ground results show that 14 of the 39 external amenity areas surrounding the Project Site currently receive at least two hours of direct sunlight to over 50% of their area on 21st March.

7.7. Assessment of Effects, Mitigation and Residual Effects

Demolition and Construction

7.7.1. During the construction phase, conditions would gradually transition from those of the current baseline situation to those with the Project completed and operational. The overall effect during the construction phase will therefore likely not be materially greater than that with the Project implemented. In relation to this chapter, it is therefore not necessary to consider the demolition and construction phase independently – it can be considered in the 'worst case' scenario of the completed development.

Completed Development

Daylight Analysis

7.7.2. There are currently 325 windows serving 248 residential habitable rooms surrounding the Project Site which are material for consideration in daylight terms. These have all been assessed in terms of both VSC and NSL. Full detailed results are available with **Appendix 7.3** and are summarised in **Tables 7.14 - 7.17** below.

Table 7.14: Completed Development VSC Summary (Proportional Reductions)

Address	Total that Meet BRE Guidelines (Negligable)	Below BRE Guidelines				Total No. of Windows
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
1 Haywood Street (APF Development)	33	8	7	1	16	49
70 Bagshot Street (Domville Court)	24	2	2	4	8	32
47-53 Bagshot Street	36	11	4	3	18	54
37 Bagshot Street	18	0	0	0	0	18
35 Bagshot Street	3	0	0	0	0	3
33 Bagshot Street	2	0	0	0	0	2
31 Bagshot Street	2	0	0	0	0	2
29 Bagshot Street	2	0	0	0	0	2
25-27 Bagshot Street	15	0	0	0	0	15
23 Bagshot Street	0	0	2	0	2	2

Address	Total that Meet BRE Guidelines (Negligable)	Below BRE Guidelines				Total No. of Windows
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
21 Bagshot Street	0	0	0	3	3	3
19 Bagshot Street	0	0	0	3	3	3
17 Bagshot Street	0	0	1	2	3	3
15 Bagshot Street	0	1	2	0	3	3
109 Kinglake Street	12	0	0	0	0	12
1-28 Faversham House	49	24	4	0	28	77
176-192 Wolverton, Alvey Street	14	20	2	9	31	45
Total	**210**	**66**	**24**	**25**	**115**	**325**

Table 7.15: Completed Development VSC Summary (Retained Values)

Address	Total No. of Windows	Retained VSC			
		<12%	12%-18%	18%-27%	>27%
1 Haywood Street (APF Development)	49	3	4	18	24
70 Bagshot Street (Domville Court)	32	16	0	1	15
47-53 Bagshot Street	54	14	0	34	6
37 Bagshot Street	18	0	0	1	17
35 Bagshot Street	3	0	0	0	3
33 Bagshot Street	2	0	0	0	2
31 Bagshot Street	2	0	0	0	2
29 Bagshot Street	2	0	0	0	2
25-27 Bagshot Street	15	0	0	0	15
23 Bagshot Street	2	0	0	2	0

Address	Total No. of Windows	Retained VSC			
		<12%	12%-18%	18%-27%	>27%
21 Bagshot Street	3	0	3	0	0
19 Bagshot Street	3	0	3	0	0
17 Bagshot Street	3	0	1	2	0
15 Bagshot Street	3	0	0	3	0
109 Kinglake Street	12	0	0	3	9
1-28 Faversham House	77	0	1	27	49
176-192 Wolverton, Alvey Street	45	9	1	31	4
Total	**325**	**66**	**24**	**25**	**148**

Table 7.16: Completed Development VSC Summary (Proportional Reductions) When Measured on an Unfettered Facade

Address	Total that Meet BRE Guidelines (Negliable)	Below BRE Guidelines				Total No. of Windows
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reductions (Major)	Total	
70 Bagshot Street (Domville Court)	32	0	0	0	0	32
47-53 Bagshot Street	42	11	1	0	12	54
176-192 Wolverton, Alvey Street	16	27	2	0	29	45
Total	**90**	**38**	**3**	**0**	**41**	**131**

Table 7.17: Completed Development NSL Summary (Proportional Reductions)

Address	Total that Meet BRE Guidelines	Below BRE Guidelines				Total No. of Rooms
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
1 Haywood Street (APF Development)	27	4	6	2	12	39
70 Bagshot Street (Domville Court)	24	0	0	0	0	24
47-53 Bagshot Street	15	2	1	0	3	18
37 Bagshot Street	12	0	0	0	0	12
35 Bagshot Street	2	0	0	0	0	2
33 Bagshot Street	1	0	0	0	0	1
31 Bagshot Street	2	0	0	0	0	2
29 Bagshot Street	2	0	0	0	0	2
25-27 Bagshot Street	6	0	0	0	0	6
23 Bagshot Street	0	1	1	0	2	2
21 Bagshot Street	0	0	0	3	3	3
19 Bagshot Street	0	0	0	3	3	3
17 Bagshot Street	0	0	0	3	3	3
15 Bagshot Street	0	2	1	0	3	3
109 Kinglake Street	6	0	0	0	0	6
1-28 Faversham House	52	12	6	7	25	77
176-192 Wolverton, Alvey Street	15	2	4	24	30	45
Total	**164**	**23**	**19**	**42**	**84**	**248**

7.7.3. In situations where the construction of the Project would result in VSC and NSL alterations to the windows and rooms within a property which are all within the BRE guidelines, the effect of the Project upon the daylight amenity to that property is considered to be **negligible** (not significant).

7.7.4. Of the 17 property groups and individual properties assessed, the effect upon the daylight amenity of 7 property groups and individual properties listed below would be permanent, direct and **negligible** (not significant).

- 37 Bagshot Street
- 35 Bagshot Street
- 33 Bagshot Street
- 31 Bagshot Street
- 29 Bagshot Street
- 25-27 Bagshot Street
- 109 Kinglake Street

7.7.5. These properties are, therefore, not considered further in the assessment.

7.7.6. As one or more windows / rooms within the following 10 property groups and individual properties breach BRE guidance, the effect upon them is discussed in more detail below.

1 Haywood Street (APF Development)

7.7.7. A total of 39 rooms within this property that could potentially be impacted by the Project have been assessed. These rooms have a total of 49 windows.

7.7.8. Of the 49 windows assessed, VSC reductions to 33 will be less than 20% and therefore fully accord with BRE guidance.

7.7.9. A total of 8 windows will experience proportional reductions of between 20% and 30%, 7 windows will experience proportional reductions between 30% and 40% and the remaining window will experience a proportional reduction of 41%. Despite these noticeable proportional VSC reductions, the retained VSC's to 15 windows will exceed 19% and one window will retain a slightly lower VSC of 17.5%.

7.7.10. As discussed in paragraphs 7.5.67-7.5.68, since each room within this property was designed to achieve its ADF target with the completed phase 2b in place, it is necessary in this case to consider the retained ADF results. Indeed, the results show that all rooms within this property will continue to meet their ADF target. Therefore, daylight levels will remain good and are in line with those achieved at the design stage.

7.7.11. The overall effect of the Project on the daylight amenity to this property is considered to be **negligible**, and the effect is therefore **not significant**.

70 Bagshot Street (Domville Court)

7.7.12. There are 32 windows serving 24 habitable rooms in this property that overlook the Project Site.

7.7.13. Of those 32 windows, 24 will fully accord with the BRE guidance in relation to VSC.

7.7.14. A total of 2 windows will experience proportional reductions of between 20% and 30%, 2 windows will experience proportional reductions between 30% and 40% and the remaining 4 windows will experience proportional reductions of up to 53%.

7.7.15. However, the 8 windows that experience proportional VSC reductions of more than 20% are recessed, located underneath access decks and as such have an obstructed outlook over the Project Site. As discussed at paragraphs 7.6.6 to 7.6.8, the BRE recognises that 'balconies' above windows distort the typical daylight and sunlight analysis and advises that a separate analysis should be undertaken which considers the change in daylight and sunlight amenity without the balconies in place. The recessed windows behind access decks have a similar effect and therefore this assessment is relevant.

7.7.16. The additional analysis based on VSC values being measured on the facade is included within **Appendix 7.4** and is summarised in **Table 7.16** above**.**

7.7.17. This shows a notable improvement in the VSC daylight effect to this property when the effect of the access decks is removed. On this basis, all 32 of the habitable windows accord with BRE guidelines.

7.7.18. Considering NSL, reductions to all the 24 habitable rooms will accord with BRE guidance.

7.7.19. The overall effect of the Project on the daylight amenity to this property is considered to be **negligible**, and the effect is therefore **not significant**.

47-53 Bagshot Street

7.7.20. There are 54 windows serving 18 habitable rooms in this block that overlook the Project Site.

7.7.21. Of the 54 windows, 36 will fully accord with the BRE guidance in relation to VSC.

7.7.22. A total of 11 windows will experience proportional reductions of between 20% and 30%, 4 windows will experience proportional reductions between 30% and 40% and the remaining 3 windows will experience proportional reductions of up to 78%.

7.7.23. However, 6 of the 7 windows that record proportional VSC reductions exceeding 30% are recessed by around 2.1 metres from the main facade. The additional analysis based on VSC values being measured on the facade is summarised in **Table 7.16.** On this basis, these windows accord with BRE guidance in relation to VSC.

7.7.24. The one remaining window (W15/30) is a secondary window to a ground floor room that is principally served by a window on the main facade. This window is located in an internal corner with an oblique view of the Project Site. Due to its obstructed outlook over the Project Site, this window has a low existing VSC value of 6% and will experience an absolute reduction in VSC of only 2.3%. Therefore, despite a large proportional reduction, the actual reduction in VSC is minimal.

7.7.25. Considering NSL, reductions to 21 of the 24 habitable rooms will accord with BRE guidance. 2 rooms will experience proportional reductions of between 20% and 30% and one room will experience a proportional reduction of 30.5%.

7.7.26. The overall effect of the Project on the daylight amenity to this property is considered to be **Minor Adverse**, and the effect is therefore **not significant**.

23 Bagshot Street

7.7.27. There are 2 windows serving 2 habitable rooms in this property that overlook the Project Site.

7.7.28. Whilst the proportional VSC reductions to these windows are between 30% and 40%, they will retain VSC values of 19.2% and 20.3% respectively. These are good levels of daylight for an urban location.

7.7.29. Considering NSL, one room will experience a proportional reduction of between 20% and 30% and one room will experience a proportional reduction of between 30% and 40%.

7.7.30. The overall effect of the Project on the daylight amenity to this property is considered to be **minor adverse**, and the effect is therefore **not significant**.

21 Bagshot Street

7.7.31. There are 3 windows serving 3 habitable rooms in this property that overlook the Project Site.

7.7.32. Whilst all 3 windows will experience noticeable proportional VSC reductions of between 42% and 46%, they will retain VSC's of between 15% and 18% are not uncommon in urban locations.

7.7.33. Considering NSL, the 3 rooms will experience proportional reductions of more than 40%.

7.7.34. The overall effect of the Project on the daylight amenity of this property is therefore considered to be **moderate adverse** and the effect is therefore **significant**.

19 Bagshot Street

7.7.35. There are 3 windows serving 3 habitable rooms in this property that overlook the Project Site.

7.7.36. Whilst all 3 windows will experience noticeable proportional VSC reductions of between 42.9% and 47.3%, they will retain VSC's of between 15% and 18%, which are not uncommon in urban locations.

7.7.37. Considering NSL, the 3 rooms will experience proportional reductions of more than 40%.

7.7.38. The overall effect of the Project on the daylight amenity of this property is therefore considered to be **moderate adverse** and the effect is therefore **significant**.

17 Bagshot Street

7.7.39. There are 3 windows serving 3 habitable rooms in this property that overlook the Project Site.

7.7.40. Of which 1 window will experience a proportional VSC reduction of between 30% and 40% and 2 windows will experience noticeable proportional VSC reductions of 40.7% and 44.8% respectively.

7.7.41. The ground floor window will retain a VSC value of 15.8%, and the first-floor windows will retain VSC's of 18.8% and 18.2% respectively. These retained values are not uncommon in an urban location.

7.7.42. Considering NSL, the 3 rooms will experience proportional reductions of more than 40%.

7.7.43. The overall effect of the Project on the daylight amenity of this property is therefore considered to be **moderate adverse** and the effect is therefore **significant**.

15 Bagshot Street

7.7.44. There are 3 windows serving 3 habitable rooms in this property that overlook the Project Site.

7.7.45. Whilst the proportional VSC reductions to these windows are between 20% and 40%, they will retain VSC values of between 18% and 22% which are good levels of daylight for an urban location.

7.7.46. Considering NSL, the 2 rooms will experience proportional reductions of between 20% and 30% and one room will experience proportional a reduction of between 30% and 40%.

7.7.47. The overall effect of the Project on the daylight amenity of this property is therefore considered to be **minor adverse** and the effect is therefore **not significant**.

1-28 Faversham House

7.7.48. There are 77 windows serving 77 habitable rooms in this property that overlook the Project Site.

7.7.49. Of the 77 windows, 49 will fully accord with the BRE guidance in relation to VSC.

7.7.50. A total of 24 windows will experience proportional reductions of between 20% and 30% and 4 windows will experience proportional reductions between 30% and 40%.

7.7.51. 27 out of 28 of these windows will retain VSC's of between 18% and 27% which are considered good for an urban location.

7.7.52. Out of the 28 discussed in paragraph 7.7.51, one window will retain a VSC of 17% which is only marginally below the 18% threshold which is adopted as a good level of daylight for this location.

7.7.53. Considering NSL, the impact to 52 rooms will accord with the guidelines. A total of 12 rooms will experience proportional reductions of between 20% and 30%, 6 rooms will experience proportional reductions of between 30% and 40%, and 7 rooms will experience proportional reductions of over 40%.

7.7.54. The overall effect of the Project on the daylight amenity of this property is therefore considered to be **minor adverse** and the effect is therefore **not significant**.

176-192 Wolverton, Alvey Street

7.7.55. It should be noted that building is part of the OPP and is due to be demolished. Furthermore, some of the units are already vacant (at the time of writing 75 flats of a total of 133 are occupied, some of which are temporary housing).

7.7.56. There are 45 windows serving 45 habitable rooms in this property that overlook the Project Site.

7.7.57. Of the 45 windows, 14 fully accord with BRE guidance in relation to VSC.

7.7.58. A total of 20 windows will experience proportional reductions of between 20% and 30%, 2 windows will experience proportional reductions between 30% and 40% and 9 windows will experience proportional reductions over 40%.

7.7.59. The 22 windows that experience proportional reductions of between 20% and 40%, will retain VSC values of between 18% and 23% which are good for an urban location.

7.7.60. The remaining 9 windows are first and second floor windows that are recessed to form inset balconies. Therefore, this design feature obstructs the access to daylight to these windows. However, if this effect is removed and the VSC is measured on the façade, the retained VSC's are over 18%.

7.7.61. Considering NSL, 15 rooms will fully comply with the BRE guidelines, 2 rooms will experience proportional reductions of between 20% and 30%, 4 rooms will experience proportional reductions of between 30% and 40% and 24 rooms will experience proportional reductions of more than 40%.

7.7.62. Overall, the effect of the Project on the daylight amenity of this property is therefore considered to be **minor adverse** and **not significant**.

Mitigation

7.7.63. No mitigation measures are required for the completed Project. This is on the basis that any effects greater than minor adverse are as a result of the effect of the Project assessed against the baseline of an undeveloped site in an urban location. When measured on an unfettered façade, the retained VSC values are reasonable for an urban location. The use of alternative targets is in line with the Mayor's Housing SPG and applying the BRE guidelines flexibility in urban locations.

Residual Effect

7.7.64. The residual effects resulting from the Project are summarised below in **Table 7.18**

Table 7.18 Summary of Residual Effects (Daylight)

Receptor	Residual Effect	Effect Significance
1 Haywood Street (APF Development)	Negligible	Not Significant
70 Bagshot Street (Domville Court)	Negligible	Not Significant
47-53 Bagshot Street	Minor Adverse	Not Significant
37 Bagshot Street	Negligible	Not Significant
35 Bagshot Street	Negligible	Not Significant
33 Bagshot Street	Negligible	Not Significant
31 Bagshot Street	Negligible	Not Significant

Receptor	Residual Effect	Effect Significance
29 Bagshot Street	Negligible	Not Significant
25-27 Bagshot Street	Negligible	Not Significant
23 Bagshot Street	Minor Adverse	Not Significant
21 Bagshot Street	Moderate Adverse	Significant
19 Bagshot Street	Moderate Adverse	Significant
17 Bagshot Street	Moderate Adverse	Significant
15 Bagshot Street	Minor Adverse	Not Significant
109 Kinglake Street	Negligible	Not Significant
1-28 Faversham House	Minor Adverse	Not Significant
176-192 Wolverton, Alvey Street	Minor Adverse	Not Significant

Sunlight Analysis

7.7.65. There are 228 residential rooms surrounding the Project Site, which have a southerly orientation (i.e. at least one window that is orientated within 90 degrees of due south) and are therefore a material consideration in sunlight terms. These have all been assessed in terms of both winter and annual APSH. Full detailed results are available within **Appendix 7.3** and are summarised in **Tables 7.19 and 7.20** below.

Table 7.19 Completed Project Winter APSH Summary

Address	Total that meet BRE Guidelines	No. of rooms below the APSH stated in BRE Guidelines				Total No. Rooms
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
1 Haywood Street (APF Development)	24	0	0	3	0	27
70 Bagshot Street (Domville Court)	16	0	0	0	0	16
47-53 Bagshot Street	18	0	0	0	0	18
37 Bagshot Street	12	0	0	0	0	12
35 Bagshot Street	2	0	0	0	0	2
33 Bagshot Street	1	0	0	0	0	1

Address	Total that meet BRE Guidelines	No. of rooms below the APSH stated in BRE Guidelines				Total No. Rooms
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
31 Bagshot Street	2	0	0	0	0	2
29 Bagshot Street	2	0	0	0	0	2
25-27 Bagshot Street	6	0	0	0	0	6
23 Bagshot Street	2	0	0	0	0	2
21 Bagshot Street	3	0	0	0	0	3
19 Bagshot Street	3	0	0	0	0	3
17 Bagshot Street	3	0	0	0	0	3
15 Bagshot Street	3	0	0	0	0	3
109 Kinglake Street	6	0	0	0	0	6
1-28 Faversham House	69	0	0	8	8	77
176-192 Wolverton, Alvey Street	30	0	0	15	18	45
Total	**199**	**0**	**0**	**29**	**29**	**228**

Table 7.20 Completed Project Total APSH Summary

Address	No. Rooms meet BRE Guidelines	No. of rooms below the APSH stated in BRE Guidelines				Total No. Rooms
		20-30%	30-40%	>40%	Total	
1 Haywood Street (APF Development))	27	0	0	0	0	27
70 Bagshot Street (Domville Court)	16	0	0	0	0	16
47-53 Bagshot Street	18	0	0	0	0	18
37 Bagshot Street	12	0	0	0	0	12
35 Bagshot Street	2	0	0	0	0	2
33 Bagshot Street	1	0	0	0	0	1
31 Bagshot Street	2	0	0	0	0	2
29 Bagshot Street	2	0	0	0	0	2
25-27 Bagshot Street	6	0	0	0	0	6

Address	No. Rooms meet BRE Guidelines	No. of rooms below the APSH stated in BRE Guidelines				Total No. Rooms
		20-30%	30-40%	>40%	Total	
23 Bagshot Street	2	0	0	0	0	2
21 Bagshot Street	3	0	0	0	0	3
19 Bagshot Street	3	0	0	0	0	3
17 Bagshot Street	3	0	0	0	0	3
15 Bagshot Street	3	0	0	0	0	3
109 Kinglake Street	6	0	0	0	0	6
1-28 Faversham House	77	0	0	0	0	77
176-192 Wolverton, Alvey Street	36	0	1	8	9	45
Total	**199**	**10**	**9**	**10**	**29**	**228**

7.7.66. Of the 17 property groups and individual properties assessed, the effect upon the sunlight amenity of the 14 listed below would be **negligible** and **not significant**.

- 70 Bagshot Street
- 47-53 Bagshot Street
- 37 Bagshot Street
- 35 Bagshot Street
- 33 Bagshot Street
- 31 Bagshot Street
- 29 Bagshot Street
- 25-27 Bagshot Street
- 23 Bagshot Street
- 21 Bagshot Street
- 19 Bagshot Street
- 17 Bagshot Street
- 15 Bagshot Street
- 109 Kinglake Street

7.7.67. These properties are, therefore, not considered further in the assessment.

7.7.68. As one or more rooms within the following 3 property groups and individual properties breach BRE guidance, the effect upon them is discussed in more detail below.

1 Haywood Street (APF Development)

7.7.69. There will be 27 rooms within this property which are material for consideration in sunlight terms in that they are orientated to within 90°of due south.

7.7.70. 24 of the 27 rooms will be fully BRE compliant in both winter and total APSH terms. This means that the occupants of these rooms will not notice any change in their level of sunlight amenity with the Project in place.

7.7.71. The effect upon the annual (total) APSH levels within the remaining 3 rooms accords with the BRE guidelines.

7.7.72. The winter sunlight amenity within these 3 rooms will, as a result of the construction of the Project, fall to between 1% and 4% against the BRE recommended minimum of 5%.

7.7.73. However, the effected windows serve bedrooms which according to the BRE guidelines are less important. The living rooms within this building is compliant with the guidelines.

7.7.74. Therefore, the overall effect upon the sunlight amenity within these three rooms is, therefore, considered to be **negligible** and the effect is therefore **not significant**.

1-28 Faversham House

7.7.75. There will be 77 rooms within this property which are material for consideration in sunlight terms in that they are orientated to within 90°of due south.

7.7.76. 69 of the 77 rooms will be fully BRE compliant in both winter and total APSH terms. This means that the occupants of these rooms will not notice any change in their level of sunlight amenity with the Project in place.

7.7.77. The effect upon the annual (total) APSH levels within the remaining 8 rooms accords with the BRE guidelines.

7.7.78. The winter sunlight amenity within these 8 rooms will, as a result of the construction of the Project, fall to between 0% and 4% against the BRE recommended minimum of 5%.

7.7.79. However, these lower retained levels of winter sunlight amenity are not uncommon in urban locations. Considering all rooms will retain annual APSH values exceeding the BRE guidelines, the retained sunlight amenity is considered reasonable.

7.7.80. The overall effect upon the sunlight amenity within these three rooms is, therefore, considered to be **minor adverse** and the effect is therefore **not significant**.

176-192 Wolverton, Alvey Street

7.7.81. It should be noted that building is part of the OPP and is due to be demolished. Furthermore, some of the units are already vacant (at the time of writing 75 flats are occupied out of a total of 133, some of which are used for temporary housing).

7.7.82. There will be 45 rooms within this property which are material for consideration in sunlight terms in that they are orientated to within 90°of due south.

7.7.83. 30 of the 45 rooms will be fully BRE compliant in both winter and total APSH terms. This means that the occupants of these rooms will not notice any change in their level of sunlight amenity with the Project in place.

7.7.84. The effect upon the annual (total) APSH levels to a further 6 rooms is also accord with the BRE guidelines.

7.7.85. The remaining 9 rooms are first and second floor windows that are recessed to form inset balconies. As with the daylight assessment, the windows that serve these rooms have an obstructed outlook over the Project Site that negatively influences the daylight analysis.

7.7.86. The additional analysis removing the effect of balconies and recessed windows from all surrounding properties is included within **Appendix 7.4.** For ease of reference, a separate summary of the APSH assessment for this property with the effect of recessed windows removed is included below in **Tables 7.21** and **7.22**.

Table 7.21 Completed Project Winter APSH Summary (Effect of Balconies Removed)

Address	Total that meet BRE Guidelines	No. of rooms below the APSH stated in BRE Guidelines				Total No. Rooms
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
176-192 Wolverton, Alvey Street	36	0	0	9	9	45

Table 7.22 Completed Project Total APSH Summary (Effect of Balconies Removed)

Address	Total that meet BRE Guidelines	No. of rooms below the APSH stated in BRE Guidelines				Total No. Rooms
		20-29% Reduction (Minor)	30-39.9% Reduction (Moderate)	>=40% Reduction (Major)	Total	
176-192 Wolverton, Alvey Street	45	0	0	0	0	45

7.7.87. **Tables 7.21** and **7.22** show a notable improvement in the sunlight effect to this property when the APSH is measured on an unfettered facade. These 9 rooms would meet the BRE recommendations for annual (total) APSH levels and experience a **negligible adverse** effect.

7.7.88. The winter sunlight amenity within the 9 rooms will, as a result of the construction of the Project, fall to between 1% and 4% against the BRE recommended minimum of 5%.

7.7.89. These lower retained levels of winter sunlight amenity are not uncommon in urban locations. Considering all rooms will retain annual APSH values exceeding the BRE guidelines, the retained sunlight amenity is considered reasonable. The overall effect upon the sunlight amenity within these three rooms is, therefore, considered to be of no greater than **minor adverse** (not significant).

Mitigation

7.7.90. No mitigation measures are required.

Residual Effect

7.7.91. The residual effects resulting from the Project are summarised in **Table 7.23**

Table 7.23 Summary of Residual Effects (Sunlight)

Receptor	Residual Effect	Effect Significance
1 Haywood Street (APF Development)	Negligible	Not Significant
70 Bagshot Street (Domville Court)	Negligible	Not Significant
47-53 Bagshot Street	Negligible	Not Significant
37 Bagshot Street	Negligible	Not Significant
35 Bagshot Street	Negligible	Not Significant
33 Bagshot Street	Negligible	Not Significant
31 Bagshot Street	Negligible	Not Significant
29 Bagshot Street	Negligible	Not Significant
25-27 Bagshot Street	Negligible	Not Significant
23 Bagshot Street	Negligible	Not Significant
21 Bagshot Street	Negligible	Not Significant
19 Bagshot Street	Negligible	Not Significant
17 Bagshot Street	Negligible	Not Significant
15 Bagshot Street	Negligible	Not Significant
109 Kinglake Street	Negligible	Not Significant
1-28 Faversham House	Minor Adverse	Not Significant
176-192 Wolverton, Alvey Street	Minor Adverse	Not Significant

Overshadowing Analysis

Sun on the Ground at Surrounding Areas of Amenity Space

7.7.92. Full detailed sun on the ground assessment results can be found within **Appendix 7.5**. A summary of results is presented in **Table 7.24**.

Table 7.24 Completed Project Sun on Ground Summary (Surrounding Areas)

Address	% of Area Receiving Two Hours of Sun on 21st March		% Alteration between Baseline and With Development Conditions
	Baseline Conditions	With Project Conditions	
1 Haywood Street (APF Development)	46.1	0.0	100.0
105 Mina Road	69.0	65.7	4.8
103 Mina Road	75.9	71.6	5.7
101 Mina Road	77.9	74.3	4.6
21 Bagshot Street	0.3	0.0	100.0
19 Bagshot Street	21.2	20.5	3.3
17 Bagshot Street	40.4	37.9	6.2
15 Bagshot Street	28.5	28.5	0.0
1-30 Southborough House	96.1	96.1	0.0
1-20 Tenterden House	95.0	95.0	0.0
176-192 Wolverton Alvey Street – Communal Gardens	91.3	63.0	31.0
176 Wolverton Alvey Street	18.6	0.0	100.0
179 Wolverton Alvey Street	37.4	12.6	66.3
181 Wolverton Alvey Street	40.6	41.2	-1.5
184 Wolverton Alvey Street	23.5	34.6	-47.2
186 Wolverton Alvey Street	25.7	35.1	-36.6
189 Wolverton Alvey Street	100.0	68.5	31.5
191 Wolverton Alvey Street	30.5	28.0	8.2
114-141 Latimer, Beaconsfield Road –	98.9	98.0	0.9
60 Latimer, Beaconsfield Road	81.4	76.2	6.4
57 Latimer, Beaconsfield Road	81.7	77.2	5.5
114 Latimer, Beaconsfield Road	48.1	47.5	1.2
116 Latimer, Beaconsfield Road	48.5	48.1	0.8

Address	% of Area Receiving Two Hours of Sun on 21st March		% Alteration between Baseline and With Development Conditions
	Baseline Conditions	With Project Conditions	
118 Latimer, Beaconsfield Road	48.4	48.1	0.6
120 Latimer, Beaconsfield Road	50.6	50.5	0.2
122 Latimer, Beaconsfield Road	46.4	46.4	0.0
124 Latimer, Beaconsfield Road	48.0	48.0	0.0
126 Latimer, Beaconsfield Road	48.2	48.2	0.0
128 Latimer, Beaconsfield Road	49.4	49.4	0.0
130 Latimer, Beaconsfield Road	47.5	47.5	0.0
132 Latimer, Beaconsfield Road	49.4	49.4	0.0
134 Latimer, Beaconsfield Road	46.8	46.8	0.0
136 Latimer, Beaconsfield Road	47.4	47.4	0.0
138 Latimer, Beaconsfield Road	52.5	52.5	0.0
140 Latimer, Beaconsfield Road	20.2	20.5	-1.5
31-33 Eberton, 190 Albany Road Garden 1	12.6	12.6	0.0
31-33 Eberton, 190 Albany Road Garden 2	83.3	83.3	0.0
34-35 Eberton, 190 Albany Road Garden 1	11.8	11.8	0.0
34-35 Eberton, 190 Albany Road Garden 2	84.6	84.6	0.0

7.7.93. **Table 7.24** shows that on 21st March the amenity spaces within 4 of the 39 surrounding amenity areas will experience gains in the area of amenity space receiving 2 hours of sunlight. The overshadowing effect to these amenity areas is considered to be **beneficial** and **not significant**.

7.7.94. A further 29 surrounding amenity areas will experience a negligible alteration in the area of the amenity space receiving 2 hours of sunlight. The overshadowing effect to these amenity areas is considered to be **negligible adverse** and **not significant**.

7.7.95. Despite experiencing reductions of more than 20%, the private amenity areas of 189 Wolverton and the communal amenity of 176-192 Wolverton will continue to achieve 2 hours of sunlight

to over 50% of their area on the 21st of March. Therefore, the impact to these amenity areas is in accordance with he BRE guidelines. Therefore, the overshadowing effect to these amenity areas is considered to be **negligible adverse** and **not significant**.

7.7.96. 21 Bagshot Street receives 2 hours of sunlight to only 0.3% of its amenity space on the 21st of March in the Baseline Conditions. Whilst this is reduced to 0 after the development of the Project, the actual reduction of 0.3% is negligible. Therefore, the overshadowing effect to this amenity area is considered to be **negligible adverse** and **not significant**.

7.7.97. Whilst in the baseline condition, the amenity space serving 1 Haywood Street (APF Development) achieves 2 hours of sunlight, this region was designed with the completed masterplan in mind and in this condition none of this region would receive 2 hours of sunlight on March 21st. As expected, this will also be the case once the Project is completed. Furthermore, it is a very small space surrounded by large walls that we understand was designed to be a outdoor smoking area rather than being a garden amenity space. Therefore, the overshadowing effect to this amenity area is considered to be **negligible adverse** and **not significant**.

7.7.98. To the north of the Project Site, the private amenity areas to the south of 176 and 179 Wolverton, Alvey Street, do not satisfy the absolute recommendations of the BRE in the baseline conditions. These are very small gardens that are principally shaded by their boundary fences. Therefore, despite proportional reductions exceeding 65%, the absolute change in sq. metres of up to 3.2 sq. metres is relatively small. Furthermore, these properties are on the Project Site of the future Phase 2C development, and a number of the ground floor units are already vacant and have their windows boarded up. Therefore, whilst the effect of the Project on these two amenity areas would be considered **moderate adverse**, it should also be considered **temporary.**

Mitigation

7.7.99. No mitigation measures are required for the completed Project. This is on the basis that any effects greater than minor adverse are temporary.

Residual Effects

7.7.100. The residual effects resulting from the Project when assessed against the BRE Guidelines, are summarised in below **Table 7.25.**

Table 7.25: Sun on Ground Residual Effects

Plot No	Receptor	Residual Effect	Effect Significance	Permanent or Temporary (P or T)
1	140 Albany Road (APF Development)	Negligible	Not Significant	P
12	176 Wolverton, Alvey Street	Moderate Adverse	Significant	T
13	179 Wolverton, Alvey Street	Moderate Adverse	Significant	T

Plot No	Receptor	Residual Effect	Effect Significance	Permanent or Temporary (P or T)
	All Other Amenity	Negligible	Not Significant	P

Sun on the Ground to the Amenity Areas within the Project Site.

7.7.101. Full detailed sun on the ground assessment results can be found within **Appendix 7.5**

7.7.102. The location of the proposed overshadowing receptors can be seen in **Figure 7.4** and are described in **Table 7.26** below.

Figure 7.4: Location of the Project on-site Overshadowing Receptors

Table 7.26 Completed Project Sun on Ground Summary (Project Site Amenity)

Plot No	Address	% of Area Receiving Two Hours of Sun		
		21st March	15th April	21st June
1	Block 4A/4D Courtyard	27.7	51.0	74.9
2	Block 4B Courtyard	66.3	82.8	94.9
3	Bagshot Street Park	99.9	100	100

Plot No	Address	% of Area Receiving Two Hours of Sun		
		21st March	15th April	21st June
4	Block 5C and Faversham House Courtyard	32.2	68.8	90.2
5	Block 5C Amenity	11.5	45.1	82.7
6	Block 5C Roof Top Amenity	80.1	90.6	97.7
7	Block 5AB Podium Courtyard	38.4	52.4	77.1
8	Block 5AB Ground Amenity	100.0	100	99.9

7.7.103. The BRE guidance states that for an area of amenity to be adequately sunlit throughout the year, at least 50% of its area should be able to benefit from at least 2 hours of sunlight on the 21st of March.

7.7.104. The analysis results show 4 out of the 8 proposed amenity areas will comply with the BRE guidelines.

7.7.105. Whilst the courtyards of proposed blocks 4A/D and 5A do not achieve 2 hours of sunlight to 50% of their area in March, only 3 weeks later, on the 15th of April, this target is achieved.

7.7.106. The amenity for block 5C achieves 2 hours of sunlight to 11.5% of its area on the 21st of March. Whilst this amenity area does not accord with the BRE guidelines, the principal amenity for block 5C is located on the roof and this area achieves 2 hours of sunlight to 80% of its area on the 21st March, compliant with the BRE guidelines.

7.7.107. Furthermore, the area of amenity provided for blocks 4A, 4D, 5A and 5C far exceed the minimum areas required. Therefore, the percentage has been calculated as of area achieving 2 hours of sun on the 21st of March if it were to consider these minimum areas. This shows full compliance with the BRE guidelines.

7.7.108. Overall, the occupants of this Project will have access to good sunlight levels, especially in the summer months when the areas are most likely to be used.

7.8. Comparison with Consented Masterplan (2014 ES)

7.8.1. In the 2014 ES the daylight and sunlight assessment on surrounding properties was based on an illustrative massing rather than the impact of the maximum parameter plans. It should be noted that the illustrative scheme was significantly smaller than maximum parameter massing.

7.8.2. Furthermore, the OPP assumed an indicative provision of approximately 490 residential units in Phase 2b and it is now proposed to deliver 614 units. Therefore, there will be an increase in massing from the OPP, which corresponds to an increased impact in relation to daylight, sunlight and overshadowing. Furthermore, the distribution of amenity has changed since the OPP and therefore, it is not a like for like comparison.

7.8.3. Therefore, since the OPP illustrative massing was both significantly smaller than the parameter plan and was expected to deliver fewer units than is currently proposed it is not considered appropriate to compare the two.

7.8.4. As part of the OPP, maximum parameter plans were approved. Due to the change in distribution of amenity the Project does breach this massing in some areas and is lower in others. Therefore, a daylight and sunlight assessment has been undertaken comparing this maximum parameter massing with the Project. The drawings showing this scenario is shown in **Appendix 7.6** and the full detailed results can be found within **Appendix 7.7.**

7.8.5. This analysis shows that the effect the Project on the neighbouring receptors is less than the maximum parameter. Whilst the upper floors of 1-28 Faversham House will experience slightly smaller retained VSC and APSH values when compared to the maximum parameter massing, they will continue to exceed BRE guidelines.

7.8.6. Overall, the illustrative massing in the OPP was significantly smaller than the maximum parameter massing. The Project is very different from the OPP massing due to the increase in provision and redistribution of amenity within the Project Site. Therefore, a direct comparison is not appropriate. However, the effect of the project will be less than that of the maximum parameter massing and the residential dwellings surrounding the Project Site will continue to enjoy good levels of daylight and sunlight for a central urban environment, which clearly follows the intentions of the BRE Guidelines.

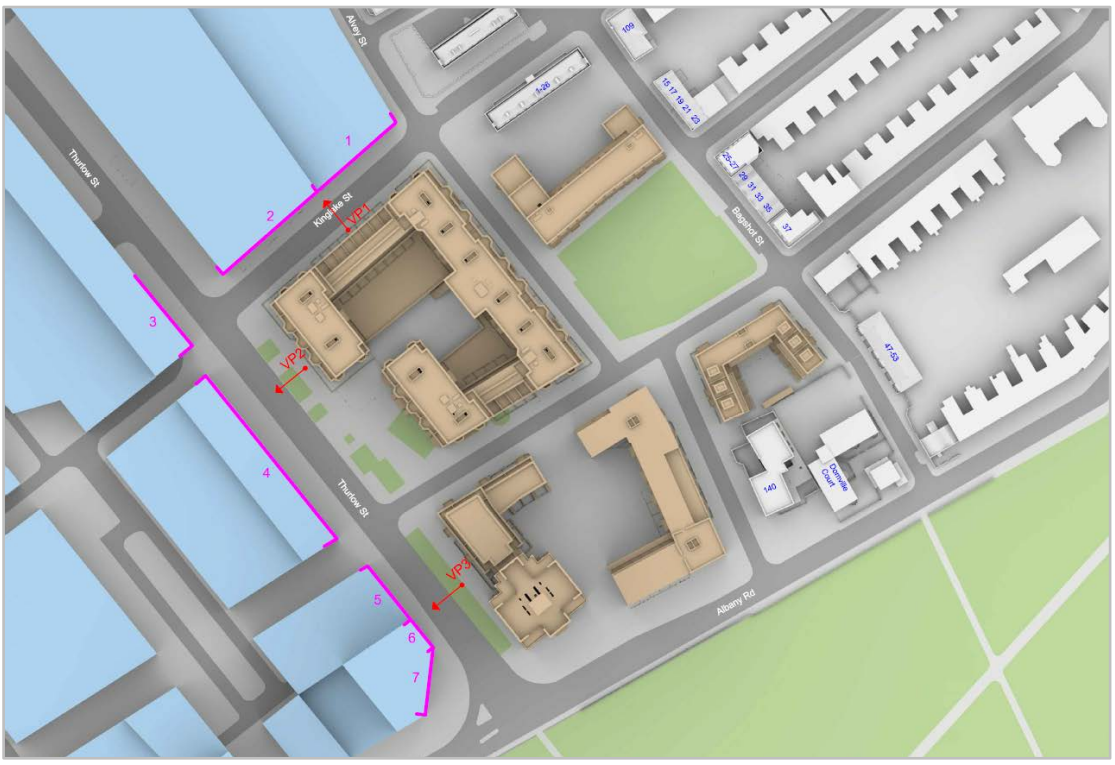
7.9. Potential Impact on Phases 2C and 4

Façade Study

7.9.1. A façade study has been undertaken which maps out the daylight (VSC) levels on the façade at 1 metre intervals. This assessment has been undertaken for the neighbouring future developments of Phases 2C and 4 that are directly adjacent to the Project Site.

7.9.2. **Figure 7.5** identifies the facades of the future developments which have been considered in the assessment.

Figure 7.5: Site Plan Showing the Project and Maximum Parameter Massing



7.9.3. A total of 7 facades of the OPP parameter plans on phases 2C and 4 have been considered for the cumulative effect of the Project. These façade studies are shown in Figures 7.6-7.8 below and within Appendix 7.8.

Figure 7.6: Façade Study of Viewpoint 01

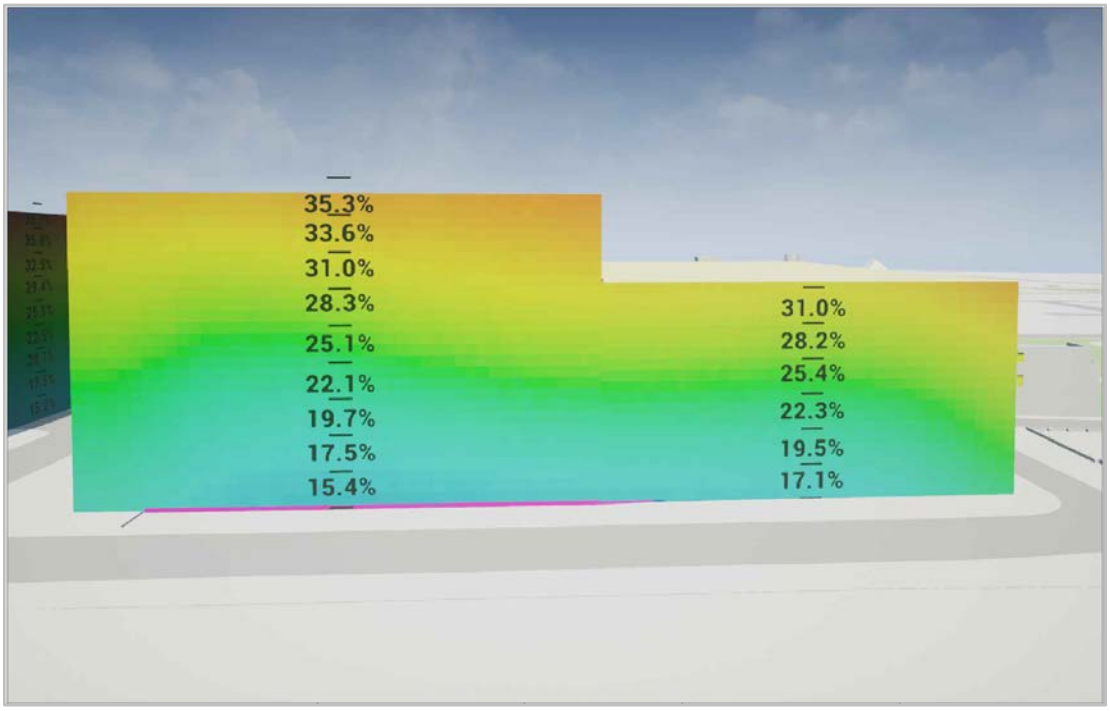


Figure 7.7: Façade Study of Viewpoint 02

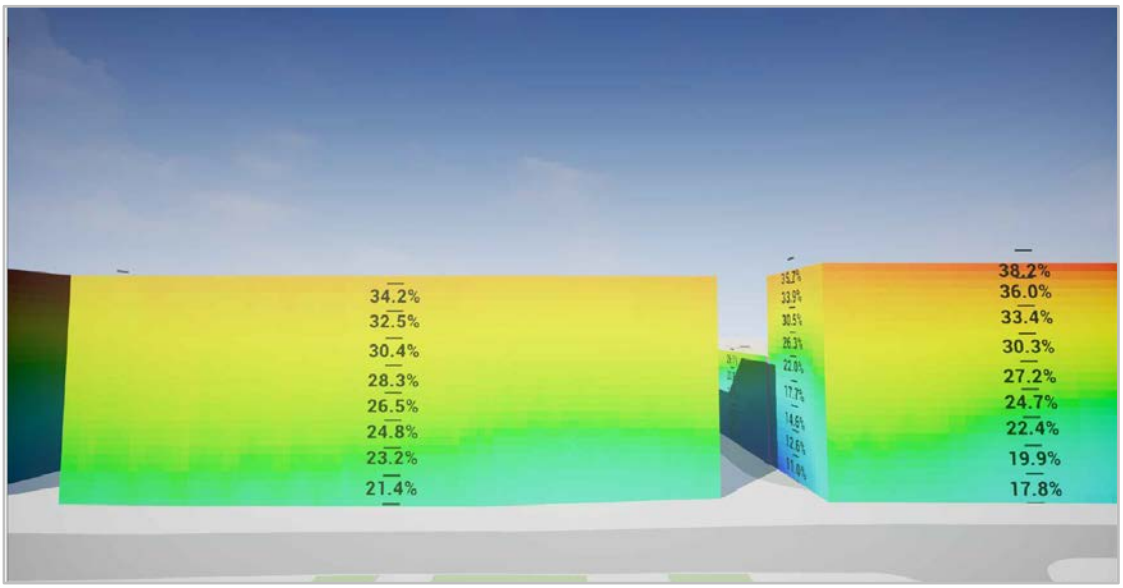
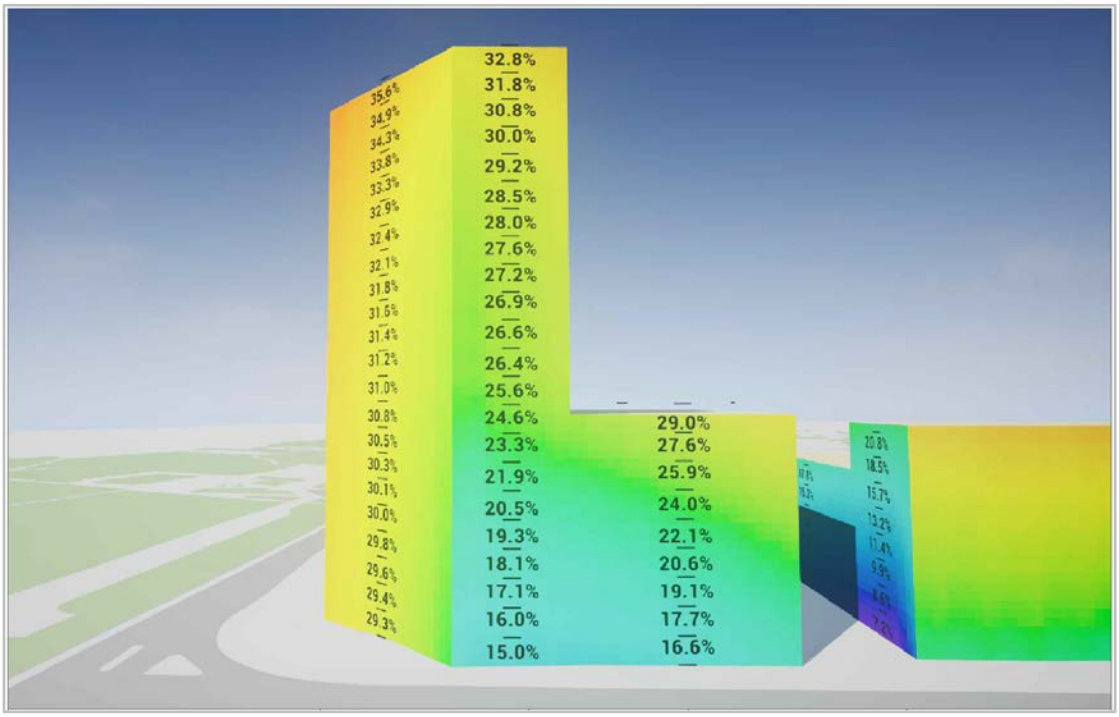


Figure 7.8: Façade Study of Viewpoint 03



7.9.4. Whilst the average across the whole façade at approximate level height intervals are shown on the drawings and figures above, the VSC values have been calculated at 1 metre intervals and have been assigned a corresponding colour.

7.9.5. These show that at ground floor level, the Project Site facing facades will achieve VSC's of at least 15% Therefore, with appropriate detailed design it will be possible to achieve good daylight levels within these buildings.

7.10. Light Within the Scheme

7.10.1. The full detailed internal daylight and sunlight report has been submitted as a standalone document with the planning application and is summarised below.

7.10.2. Table 7.27 below shows the ADF compliance rates of each block for three separate scenarios. As the proposed massing of some of the neighbouring development sites are not yet determined, we have undertaken three analyses. The first is with the current baseline conditions. The second assumes that the OPP Illustrative Massing is built and the third assumes that the maximum parameter massing is built.

7.10.3. As is common in many new urban residential developments, many of the kitchen areas within the development are located in the rear portion of combined living/kitchen/dining rooms. Being located in the area of the room furthest from the window, they will receive lower levels of daylight and will require supplementary electric lighting. Furthermore, the principal use of these spaces are as living rooms. Therefore, it is considered that an ADF of 1.5% should be considered as acceptable for combined living/kitchen/dining rooms (LKDs). Therefore, we have also included the compliance rate if the 1.5% target for a living room was applied to LKDs.

Table 7.27 – Internal ADF Results

	No. Habitable Rooms Assessed	Rooms Achieving ADF Target					
		Existing Scenario		OPP Illustrative Massing Scenario		Maximum Parameter Massing Scenario	
		No.	%	No.	%	No.	%
Block 4A	625	526	84%	510	82%	498	80%
Block 4D	299	249	83%	249	83%	249	83%
Block 4B	124	93	75%	93	75%	93	75%
Block 5A	708	522	74%	521	74%	498	70%
Block 5C	142	109	77%	109	77%	109	77%
Totals	1898	1499	**79%**	1482	**78%**	1447	**76%**

7.10.4. The results show that the overall daylight amenity within the proposed accommodation will be reasonable for an urban location. Overall, 1447 of the 1898 rooms tested will achieve their respective BRE ADF target value with the maximum parameter massing occupying the neighbouring sites. Therefore, the overall compliance rate is **76%,** which is a good result for this scale of development.

7.11. Summary

7.11.1. A detailed assessment of the levels of daylight, sunlight and overshadowing in the existing baseline have been analysed and compared to the levels following the construction of the Project.

7.11.2. The Project will result in Negligible to Minor Adverse effects to the majority of properties, with a few isolated instances of Moderate effects. Given the scale of the massing proposed and the urban context of the Project Site, these effects are likely to be unavoidable in relation to new development.

7.11.3. The sunlight amenity within the project will be good and all residents will have access to reasonable levels of sunlight, especially in the summer months when the amenity areas are most likely to be used.

7.11.4. The potential impact of the project on the future phases of 2C and 4 will be acceptable.

7.11.5. The development of the proposed scheme has involved a carefully considered effort from the project team to respect the daylight and sunlight amenity enjoyed by the existing neighbouring buildings. Waterslade have provided feedback on a number of design iterations throughout this process in order to help minimise the overall impact of the development on existing neighbours. As a result, the majority of residential dwellings surrounding the Project Site will continue to enjoy good levels of daylight and sunlight for a central urban environment, which clearly follows the intentions of the BRE Guidelines. There are, however, clearly a number of other factors to

consider, and daylight and sunlight should be considered in conjunction with other competing constraints to ensure that that the Project Site potential is optimised.

8. Ground Conditions

8.1. Introduction

8.1.1. The Scoping Report was submitted on 13th October 2021 and provided updated information from 2015 ES for the OPP and indicated that Ground Conditions could be scoped out of further assessment. A scoping response was received on 19th January 2022 which requested that the Ground Conditions topic should be scoped into the ES. Therefore, this Chapter reports the findings of the assessment of likely significant environmental effects of the Project on ground conditions and contamination

8.2. Appendices

Table 8.1: Appendices for Chapter 8

Appendix No.	Document
8.1	Geo-Environmental and Geotechnical Preliminary Risk Assessment, WSP UK Limited dated September 2014. Ref: 50600304
8.2	Ground Investigation Report, Aylesbury Estate Phase 2B Regeneration. Hydrock Consultants Limited dated 5 October 2021. Ref: 18520-HYD-XX-XX-RP-GE-1001

8.2.1. This chapter (and its associated appendices) should be read with introductory chapters 1-5 and as part of the wider ES, with particular reference to Chapter 14: Water Resources, Quality & Flood Risk, Chapter 18: Cumulative Effects and Appendix 8-1 (Land Contamination - Preliminary Risk Assessment).

8.3. Legislation, Policy and Guidance

Legislative Framework

8.3.1. The applicable legislative framework is summarised as follows:

- Part IIA of the Environmental Protection Act (EPA), 199044, is the contaminated land regime which provides a risk based approach to the identification of risks to human health or the environment from contaminated land, based on the pathway-receptor concept;
- Environment Act, 199545 sets out liabilities relating to contaminated land;
- Control of Substances Hazardous to Human Health, 200246 (as amended) requires employers to control substances that are hazardous to health;

44 HMSO (1990) Part IIA of the Environmental Protection Act, 1990

45 HMSO (1995) Environment Act, 1995

46 HMSO (2002) Control of Substances Hazardous to Human Health Regulations, 2002 (as amended).

- The Water Environment (Water Framework Directive) (England and Wales) Regulations, 201747 (2000/60/EC) sets out the basis for assessing quality of surface waters and groundwaters;
- Groundwater Directive 2006/118/EC48 sets out the regime for groundwater quality standards and introduces measures to prevent or limit pollution of groundwater;
- Water Resources Act 199149 regulates water resources, water quality and pollution, and flood defence;
- Dangerous Substances Directive (Amendment), 200650 focuses on pollution caused by certain dangerous substances discharged into the aquatic environment;
- Environmental Damage (Prevention and Remediation) Regulations, 201551 sets out the requirements where damage to land or water by pollution is caused;
- The Environmental Permitting (England and Wales) Regulations, 201652 set out the environmental permitting regime;
- Control of Asbestos Regulations, 201253 sets out the duties for managing risk of asbestos in buildings;
- Contaminated Land (England) (Amendment) Regulations, 201254 sets out the actions for remediation of contaminated land; and,
- Construction (Design & Management) Regulations, 201555 requires consideration of the health and safety of workers during the construction stage of a project.

Planning Policy

National Planning Policy

National Planning Policy Framework

8.3.2. Chapter 15 of the National Planning Policy Framework (NPPF) (last updated 20 July 2021)[56] set out the provisions for planning decisions in relation to ground conditions and pollution issues as follows:

- Paragraphs 178 states that 'Planning policies and decisions should ensure that: a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination……';

47 HMSO (2003) The Water Environment (Water Framework Directive) (England & Wales) Regulations (2000/60/EC), 2003

48 HMSO (2006) Groundwater Directive 2006/118/EC

49 HMSO Water Resources Act (1991).

50 HMSO (2006) Dangerous Substances Directive (Amendment) Regulations, 2006

51 HMSO (2009) Environmental Damage and Liability (Prevention and Remediation) Regulations, 2009.

52 HMSO (2010) Environmental Permitting (England and Wales) Regulations, 2011.

53 HMSO (2012) The Control of Asbestos Regulations.

54 HMSO (2012) The Contaminated Land (England) (Amendment) Regulations.

55 HMSO (2015) Construction (Design & Management) Regulations.

56 Ministry of Housing, Communities and Local Government (MHCLG) (February 2019, last updated 20 July 2021). National Planning Policy Framework

- Paragraph 179 states that 'Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.'; and
- Paragraph 180 states that 'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.'

In addition, under Chapter 11 "Making effective use of land", Paragraph 118 states "Planning policies and decisions should: c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated and unstable land".

Regional Planning Policy

The London Plan (Adopted March 2021)

8.3.3. The London Plan was published in March 2021[57]. The relevant policies are as follows:

Policy SD1 Opportunity Areas -
'A To ensure that Opportunity Areas fully realise their growth and regeneration potential, the Mayor will:
(e) encourage the strategic remediation of contaminated land; and

B Boroughs, through Development Plans and decisions, should:
(11) take appropriate measures to deal with contamination that may exist.

Section 2.1.8 - In order to make the best use of land, enable the development of brownfield sites, and contribute to creating a healthy city it is important that development proposals appropriately deal with contamination so land can be safely used. Strategic opportunities should be explored for addressing land contamination, particularly where there are cross boundary issues. A joined-up approach to remediation can enable the costs and benefits of this to be shared.

Section 9.10.6 - Development proposals and planning decisions should ensure that impacts to environment, heritage and amenity values are considered, including the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality. Principal issues include noise, dust, air quality, lighting, archaeological and heritage features, traffic, land contamination, impacts to surface and ground water and land stability.'

Local Planning Policy

The Southwark Plan 2022

57 Mayor of London (March 2021). The London Plan

8.3.4. The Southwark Plan 2022 (the Local Plan) was adopted on 23 February 2022[58] and guides decisions about developments. It sets out the long-term aspirations and indicates the broad locations in the LBS for future housing, employment, retail, infrastructure and other land uses, as well as providing detailed policies that will be used to assess planning applications.

8.3.5. The following policy is relevant to this assessment:

SP6 Climate Emergency

8.3.6. 'We will lead the way in providing spaces for people to connect with nature, making people feel safe, creating cleaner streets, increasing recycling, reducing landfill waste, and reducing carbon and greenhouse gas emissions to address the Climate Emergency. This will be achieved through……Reducing landfill, remediating contaminated land and increasing recycling and the re-use of waste materials will help us minimise our environmental impact and help to protect biodiversity and habitats for future generations to enjoy.'

P64 Contaminated land and hazardous substances

1. Development that has an adverse impact on the environment will not be permitted.

2. Development will be permitted when it:

    1. Provides for safe storage, transportation or usage of hazardous substances on a site; and

    2. Mitigates any contaminated land within the development site and land outside of, but related to, the development site.

Reasons

The regeneration of vacant or under-used land and buildings in Southwark requires development to deal with contamination from past uses and carry out construction in close proximity to neighbours. We need to minimise adverse effects on the natural environment such as soil, water, habitat and biodiversity. There should be no risk to the health, safety or amenity of users of the site and neighbouring occupiers. The effects of new development on the environment can be temporary, permanent and/ or cumulative and if these impacts are not identified at the design stage it can be much more difficult to add measures once a scheme is built. The temporary impacts of the construction process can be detrimental to the surrounding community so it is important that any such impacts arising from development are identified and reduced.'

Contaminated Land Inspection Strategy (2012- 2017)

8.3.7. LBS's Contaminated Land Strategy[59] sets out the strategic approach "to inspecting its area" for the purpose of determining and managing contaminated land in accordance with Part 2A of the Environmental Protection Act 1990. It tackles the problems associated with historic land

58 The London Borough of Southwark, The Southwark Plan 2022 (the Local Plan) , 23 February 2022

59 The London Borough of Southwark, Contaminated Land Inspection Strategy (2012- 2017)

contamination and the risk it can pose to human health and environmental receptors. The strategy sets out:

- To provide a formalised system for the identification and remediation of land, contaminated as a result of historic polluting land use;
- To ensure that contaminated land is made safe for current use and that public health, controlled waters, identified receptors and the wider environment are protected;
- To make safe "Brownfield" sites and seek to bring them back into beneficial and sustainable use;
- To ensure that the cost of redevelopment of contaminated land is proportionate and employs best available techniques or methods without incurring excessive costs;
- To protect historic sites and their environment; and
- To prevent future contamination of land.

Basements and Flooding – Guide for Developers

8.3.8. LBS's guide for developers[60] where new or extensions to basements are proposed outlines the requirements for planning submissions which include these features as LSB is responsible for managing flood risk from surface water, groundwater and ordinary watercourses throughout the borough. The guidance states:

Section 2 Basement Impact Assessments

'Basements and other underground development will only be permitted where it can be demonstrated that the development will not cause harm to the built and natural environment and local amenity, including the local water environment, hydrogeology, ground conditions and biodiversity.

The requirement for a site specific Basement Impact Assessment (BIA) will be dependent on the size of the basement and whether the application falls within a high flood risk area. …. In general a BIA will be required when a proposed development includes a new or extended basement.'

Guidance

8.3.9. The following guidance documents have been used during the preparation of this chapter:

Contaminated Land Statutory Guidance 2012

8.3.10. The Contaminated Land Statutory Guidance 2012[61] describes a risk assessment methodology in terms of 'significant pollutants' and 'significant pollutant linkages' within a source-pathway-receptor conceptual model. The model comprises:

60 The London Borough of Southwark, Basement and Flooding – Guidance for Developers

61 Department for Environment, Food and Rural Affairs, Contaminated Land Statutory Guidance, April 2012

- The principal pollutant hazards (sources) associated with a site;
- The principal receptor(s) at risk from the identified hazards (for example, people, environmental assets, surface water and / or groundwater); and
- The existence, or absence, of plausible pathways which may exist between the identified hazards and receptor(s).

8.3.11. For land to be determined as 'contaminated' in a regulatory sense, and therefore requiring remediation (or a change to less sensitive use), all three elements (source-pathway-receptor) of a significant pollutant linkage must be present. The legislation places a responsibility on the Local Planning Authority to determine whether the land in its area is contaminated by consideration of whether:

- Significant harm is being caused to human health or controlled waters;
- There is a possibility of significant harm being caused; and
- With regard to radioactivity:
- Harm is being caused; or
- There is a significant possibility of such harm being caused.

National Planning Practice Guidance

8.3.12. First published in March 2014[62] (and last updated on 01 October 2019), the Department for Communities and Local Government (DCLG) launched the National Planning Practice Guidance (NPPG) web-based resource. The following guidance from this resource are relevant to this chapter:

- Brownfield land registers (28 July 2017) – provides guidance to local planning authorities in preparing and publishing brownfield land registers;
- Land affected by contamination (12 June 2014) – sets out the legislative regime for dealing with land that may be affected by contamination;
- Land stability (06 March 2014) – sets out the requirement for consideration of land stability issues in planning;
- Natural environment (21 January 2016) - encourages the use of brownfield land; and
- Water supply, wastewater and water quality (23 March 2015) – consideration of the protection and enhancement of surface water and groundwater at the planning application stage.

62 Ministry of Housing, Communities and Local Government. National Planning Practice Guidance (online) (2018) Available at: http://planningguidance.planningportal.gov.uk/

Environment Agency Guidance

8.3.13. All pollution prevention guidance, known as PPGs, previously maintained by the Environment Agency were withdrawn from use on 17 December 2015 and have been replaced by a web-based resource. The following guidance from this resource are relevant to this chapter:

- Pollution prevention for businesses[63];
- Discharge to surface or ground water[64];
- Manage business and commercial waste[65]; and
- Store oil and oil storage regulations for businesses[66] .

Land Contamination Risk Management Guidance

8.3.14. Environment Agency guidance; Land Contamination Risk Management (LCRM) (2020)[67] advocates the use of a conceptual risk assessment model.

8.3.15. The conceptual risk assessment is carried out by identifying and evaluating the significance of the following:

- Potential Sources of Contamination: these include any actual or potentially contaminating materials and activities, located either on or in the vicinity of the Project Site;
- Potential Pathways of Contamination Migration: these are the routes or mechanisms by which contaminants may migrate from the source to the receptor; and,
- Potential Receptors of Contamination: these include present of future land users, activities or persons at the Project Site.

Groundwater Protection Guides

8.3.16. Groundwater Protection Guides by DEFRA and EA were published on 14 March 2017 and include:

- Protect groundwater and prevent groundwater pollution (14 March 2017)[68] ;
- Groundwater protection technical guidance (14 March 2017)[69];
- Groundwater protection position statements (14 March 2017)[70] ; and

63 Environment Agency (2016) Pollution prevention for businesses (https://www.gov.uk/guidance/pollution-prevention-for-businesses).

64 Environment Agency (2016) Discharge to surface or ground water (https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwater-environmental-permits)

65 Environment Agency (2016) Manage business and commercial waste (https://www.gov.uk/managing-your-waste-an-overview)

66 Environment Agency (2016) Store oil and oil storage regulations for businesses (https://www.gov.uk/oil-storage-regulations-and-safety).

67 Environment Agency (2019) Land Contamination: Risk Management https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks

68 Environment Agency (2017) Protect groundwater and prevent groundwater pollution.

69 Environment Agency (2017) Groundwater protection technical guidance

70 Environment Agency (2017) Groundwater protection position statements

- Land contamination groundwater compliance points: quantitative risk assessments (14 March 2017)[71]

8.3.17. These documents contain the conceptual method for risk-based decision making and developing policy statements in areas such as the control of groundwater abstraction and diffuse pollution of groundwater. The Policy is presented as a framework within which decisions should be made and sets out the Environment Agency's broad approach to existing risks and new developments. The Policy is underpinned by published groundwater vulnerability maps and groundwater Source Protection Zones (SPZ).

8.3.18. The protection of key groundwater resources, and in particular, those used for public drinking water supply, is accomplished by the establishment of SPZ. The SPZ provide an indication of the potential risk of pollution, based on the local soil and geological conditions and the depth of the water table. Generally, the closer a polluting activity or release is to a groundwater source, the greater the risk. Three zones (an inner, outer and total catchment) are usually defined. These zones are used to control the activities and discharges in the area to protect the aquifer.

Other Guidance

8.3.19. Other relevant guidance is as follows:

- Health and Safety Executive (HSE) (1991) Guidance Note HS (G) 66, Protection of Workers and the General Public during the Development of Contaminated Land [72];
- CIRIA C532 (2001) Control of Pollution from Construction Sites [73];
- HSE (2006) INDG258 Safe Work in Confined Spaces [74];
- CIRIA C665 (2007) Assessing Risks Posed by Hazardous Gases to Buildings [75];
- CIRIA C682 (2009) The VOCs Handbook[76] ;
- BS 10175:2011+A2 (2017) Investigation of Potentially Contaminated Sites – Code of Practice[77];
- BS 8576 (2013) Guidance on Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds [78];
- CIRIA C552 (2001) Contaminated Land Risk Assessment. A Guide to Good Practice [79];

71 Environment Agency (2017) Land contamination groundwater compliance points: quantitative risk assessments

72 Health and Safety Executive (HSE) (1991) Guidance Note HS (G) 66, Protection of Workers and the General Public during the Development of Contaminated Land

73 Construction Industry Research and Information Association (2001) C532 – Control of Pollution from Construction Sites.

74 Health and Safety Executive (2006) INDG258 Safe Work in Confined Spaces

75 Construction Industry Research and Information Association (2007) C665 – Assessing Risks Posed by Hazardous Gases to Buildings, Wilson, Oliver, Hutchings and Card.

76 Construction Industry Research and Information Association (2009) C682 – The VOCs Handbook

77 British Standards Institution BS10175+A2 (2017) Investigation of Potentially Contaminated Sites – Code of Practice

78 BS 8576 (2013) Guidance on investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds

79 CIRIA C552 (2001) Contaminated Land Risk Assessment. A Guide to Good

- CIRIA C733 (2014) Asbestos in soil and made ground: a guide to understanding and managing risks [80]; and
- NHBC R&D 66 (2008) Guidance for the Safe Development of Housing on Land Affected by Contamination [81].

8.4. Historic Assessment

8.4.1. An EIA was carried out in support of the 2015 ES for the OPP. The OPP includes the Project Site (as referenced in the OPP as Phase 2B).

8.4.2. The 2015 ES was based upon the WSP 'Geo-Environmental and Geotechnical Preliminary Risk Assessment' produced in 2014[82]. More recent ground investigation works (Hydrock – October 2021) were undertaken the findings of which have been summarised within this chapter.

8.4.3. There are a number of changes to policy and guidance since the production of the 2015 ES, which are identified within this assessment.

8.4.4. Of note since the 2015 ES, the former Foxcote block to the south of the Project Site had been demolished and replaced by tarmac hardstanding. The baseline information within this chapter reflects this change.

8.5. Assessment Methodology and Significance Criteria

Relevant Elements of the Project

8.5.1. Relevant elements of the Project in relation to Ground Conditions include:

- Demolition of the existing buildings and structures;
- Development of 614 residential units (Buildings ranging from 5 to 26 storeys);
- Construction of a single storey basement in block 4A/4D;
- Development of 480.13 sqm of flexible commercial floorspace;
- Private and communal amenity space;
- Provision of 2 public parks; and
- Associated car parking.

Assessment Methodology

8.5.2. The EA's guidance LCRM (2020) advocates the use of a conceptual risk assessment model (Conceptual Site Model). The basis of this approach comprises three elements: a source, a pathway and a receptor. Without each of these there can be no contamination risk. Therefore,

80 CIRIA (2014) C733 – Asbestos in soil and made ground: a guide to understanding and managing risks

81 NHBC R&D 66 (2008) Guidance for the Safe Development of Housing on Land Affected by Contamination

82 Geo-Environmental and Geotechnical Preliminary Risk Assessment, WSP UK Limited dated September 2014. Ref: 50600304

the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination risk exists, since the contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the intended use of the Project Site, its characteristics and its surroundings. The potential for harm to occur requires three conditions to be satisfied:

- The presence of substances (potential contaminants) that may cause harm (the 'Source' of pollution);
- The presence of a receptor that may be harmed, (e.g. the water environment or humans, buildings, fauna and flora) (the 'Receptor'); and
- The existence of a linkage between the source and the receptor (the 'Pathway').

8.5.3. LCRM has been used as a technical framework in the understanding of how contamination issues that may arise on the Project Site could be managed.

8.5.4. The Conceptual Site Model has been used to identify and assess the potential effects on the identified sensitive receptors (including human health, controlled waters, buildings and services) and outline mitigation measures to manage the risks identified in the assessment. The assessment will be prepared in accordance with legislation and guidance referenced above.

8.5.5. The potential effect of the Project Site on ground conditions, and/or the effect of ground conditions on the Project Site, has been assessed for the duration of the proposed restoration works. The significance level attributed to each effect has been assessed based on the magnitude of change due to the Project Site and the importance/sensitivity of the affected receptor / receiving environment to change.

Magnitude Criteria

8.5.6. Risk, probability, and consequence inform the magnitude of change (CIRIA C552 guidance). The magnitude of change has been assessed on a scale of high, medium, low, and negligible as defined in **Table 8.2**.

Table Error! No text of specified style in document.**.2: Magnitude Criteria**

Magnitude of Impact	Definition
High	A severe or acute impact to human health. Major derogation of aquifer /surface water quality or status. Impacts which are predicted to result in a major or irreversible change in the habitat/community of ecosystems.
Medium	Minor detrimental impact to human health. Minor derogation of aquifer /surface water quality or status. Impacts with potential to affect key attributes of habitats/communities but without changing overall viability.
Low	A discernible effect that is, however, unlikely to significantly alter human health, aquifer /surface water quality, or the attributes of receptor habitats.

Negligible	Unlikely to have a discernible impact to human health, aquifer /surface water quality or status, or the attributes of receptor habitats/communities.

Receptor Sensitivity / Importance

8.5.7. The sensitivity / Importance of the affected receptor / receiving environment will be assessed on a scale of high, medium, and low as defined in **Table 8.3**.

Table Error! No text of specified style in document.**.3: Classification of Sensitivity / Importance Criteria**

Receptor Sensitivity / Importance	Criteria	Attribute	Typical Examples
High	Human health: high sensitivity land use.	Human Health	Residential or allotments. Construction and maintenance workers (where extensive earthworks, and demolition of buildings are proposed).
	Nationally significant attribute of high importance.	Controlled Waters	Principal aquifer providing a regionally or locally important resource and / or supporting a or supporting a river ecosystem or site protected under UK legislation Ecology and Nature Conservation. Groundwater locally supports Groundwater dependent terrestrial ecosystem or Source Protection Zones (SPZ) 1. Main river.
	Rare and of national importance with little potential for replacement. Geology meeting national	Ecological / Designated Receptors	SSSI, National Nature Reserves (NNR).

	designation citation criteria which is not designated as such.		
	Of national importance	Other (services/structures)	Nationally significant infrastructure.
Medium	Human Health: medium sensitivity land use.	Human Health	Construction workers (where limited earthworks, are proposed). Public Open Space.
	Of moderate quality and rarity	Groundwater	Aquifer providing water for agricultural or industrial use with limited connection to surface water. Groundwater supports a Groundwater dependent terrestrial ecosystem or SPZ2 or SPZ3.
	Regional importance with little potential for replacement.	Ecological / Designated Receptors	Non-statutory designated sites (e.g. Local Nature Reserves (LNR), LGS's, Sites of Nature Conservation Importance (SNCIs). GWTDE.
	Of regional importance	Other (services/structures)	Regionally significant infrastructure.
Low	Low sensitivity land use.	Human Health	Construction and maintenance workers (Minimal disturbance of ground). Infrastructure (roads, bridges, railways, buildings).
	Lower quality	Controlled Waters	Unproductive strata.
	Local importance with potential for replacement.	Ecological / Designated Receptors	Non-designated notable or priority habitats.

	Of local importance	Other (services/structures)	Local infrastructure of little/no significance.

Significance criteria

8.5.8. The significance level attributed to each effect has been assessed based on the sensitivity/value of the affected receptor(s) and the magnitude of change arising from the Project Site, as well as a number of other factors that are outlined in more detail in **Chapter 2: EIA and the Scoping Process**. The sensitivity of the affected receptor is assessed on a scale of very high, high, medium, low and negligible, and the magnitude of change is assessed on a scale of high, medium, low and negligible, as set out in **Chapter 2.**

Temporal Scope

8.5.9. The assessment of environmental impacts relating to ground conditions will comprise:

- Short (2 to 5 years) and medium term (5 to 10 years), temporary effects; and
- Long term (10 to 15 years or more), permanent effects.

EFFECT SIGNIFICANCE

8.5.10. The following terminology has been used to define the nature of the impact effect on the receptor:

- **'Direct'** effects impact the receptor as an immediate consequence; and
- **'Indirect'** effects impact the receptor as a consequential side effect.

8.5.11. The level of risk for each plausible contaminant linkage has been determined through the combination of severity and probability using the risk matrix presented in **Table 8.4**.

Table 8.4: Matrix for Classifying Significance of Effects

Criteria		Receptor Sensitivity			
		Very High	**High**	**Medium**	**Low**
Impact Magnitude	High	Substantial	Major	Moderate	Moderate
	Medium	Major	Moderate	Moderate	Minor
	Low	Moderate	Moderate	Minor	Minor
	Negligible	Neutral	Neutral	Neutral	Neutral

8.5.12. The following terms have been used to define the significance of the effects identified and apply to both beneficial and adverse effects:

- **Major effect**: where the Project Site could be expected to have a large improvement or deterioration on receptors;
- **Moderate effect**: where the Project Site could be expected to have a noticeable improvement or deterioration on receptors;
- **Minor effect**: where the Project Site could be expected to result in a small improvement or deterioration on receptors; and
- **Negligible**: where no discernible improvement or deterioration is expected as a result of the Project Site on receptors, including instances where no change is confirmed.

8.5.13. As set out in **Chapter 2**, effects that are classified as **moderate or above** are considered to be **significant**. Effects classified as below **moderate** are considered to be **not significant**.

Scope of the Assessment

ELEMENTS SCOPED OUT OF THE ASSESSMENT

8.5.14. The following elements are not considered to give rise to likely significant effects as a result of the Project and have therefore not been considered within this ES.

Operational Stage

8.5.15. It is anticipated that any contaminants found during the Demolition and Construction stage will be remediated in line with national and local planning policy taking into account the proposed end uses. This is referred to in more detail in this chapter including proposed mitigation. It is therefore assumed that clean cover layers (and any imported material), if required, will be validated for depth and chemical quality prior to occupation. This negates the requirement for additional consideration of potential impacts to future site users, adjacent site users and vegetation during the Operational stage of the Project. Therefore, the potential exposure of future site users, adjacent site users, plants, potable water supply and groundwater to contamination during the Operational stage will not be significant and is excluded from further assessment.

8.5.16. It is assumed that any potential affects arising from ground gas (including radon and volatile vapours) will be appropriately mitigated prior to the completion of the Construction stage. Therefore, the potential for the presence of ground gas to pose an increased risk to future site users (explosive and asphyxiant) during the Operational stage will be mitigated and is not considered to be significant and therefore, will not be included within this assessment.

ELEMENTS SCOPED INTO THE ASSESSMENT

Demolition and Construction

8.5.17. The following elements are considered to have the potential to give rise to likely significant effects during demolition and construction of the Project and have therefore been considered within this assessment:

- Potential effect on demolition and construction workers from pre-existing contamination within the underlying soils (if present);
- Potential effect on adjacent sensitive site users from potential contamination within the underlying soils during construction activities; and
- Potential effect on Controlled Waters during construction activities.

8.5.18. This chapter sets out the assessment of the potential effects from chemical contamination on controlled waters only. Potential effects relating to physical contamination (i.e. sediment) and changes to groundwater recharge and flow are considered within **Chapter 12: Water Resources.**

Extent of the Study Area

8.5.19. The study area for this Ground Conditions assessment includes the area within the Project Site boundary and also areas outside this boundary that might influence the Project Site or be influenced by the Project. The assessment will include a detailed study of the area up to 250 m from the boundary of the Project Site extending up to 1km from the Project Site boundary in relation to sensitive Controlled Water receptors only, which is considered appropriate for indirect effects. This assessment will establish existing ground conditions on-site and in the vicinity of the Project Site upon which to assess the likely significant effects of the Project on ground conditions, and/or the likely significant effects of existing Ground Conditions on the Project Site .

Consultation

8.5.20. provides a summary of the consultation activities undertaken in support of the preparation of this chapter. Correspondence undertaken in 2014 as part of the 2015 ES for the OPP is included and considered to remain relevant as site conditions and history are not considered to have changed significantly since 2014.

Table 8.4: Summary of consultation undertaken in support of this chapter

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
LBS	Building Control Officer, Adedamola Adenihun	Request for pertinent information submitted 21/05/2014	A response was received on 27/05/2014. The Building Control Officer (BCO) at Southwark Council has been contacted with regard to obtaining geotechnical pertinent information for the Project ite. The Building Control Officer stated that a previous ground investigation was conducted on part of the Project Site by Ground Engineering. The Officer stated that the Made Ground was approximately 2m below ground level (mbgl) and was underlain by the Kempton Park Gravels to approximately 6m bgl and the Lambeth Group. No specific risk was identified for ground stability, no contamination issues were identified, no underground structures were encountered, no flood risk was raised. Due to the shallow depths of the Kempton Gravels pad and piled foundations were considered appropriate. As no changes have occurred on the Project Site it is anticipated this information remains accurate.
LBS	Principal Environmental Health Officer (Ken Andrews)	Request for pertinent information submitted 21/05/2014	A response was received on 23/09/2014.The Officer confirmed that there are no plans to undertake any investigation under Part II A. The Officer also stated that there is no record of landfill waste on the Project Site. Historical uses on the Project Site were recorded as a timber yard, light industry, works, a saw mill, public conveniences and that there is also a history of fly tipping.

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
			It has been identified that there are no pollution incidents within 500m of the Project Site, no prescribed processes, and no premises registered under the radioactive substances act, hazardous substances or a waste management licence. It was noted that an area adjacent to the south of the Project Site, known as Burgess Park, was formerly used for industrial works including lime works, whitening works and a tannery. The area was reported to have recently been investigated and remediated. No further information was been provided. No changes have occurred on the Project Site it is anticipated this information remains accurate.
Environment Agency	Karen Rigg (Customers and Engagement Officer)	Request for pertinent information submitted 21/05/2014	A response was received on 17/06/2014. The Environment Agency was contacted with regard to obtaining additional environmentally pertinent information. The Environment Agency reported one historic landfill, in relation to 'Old Canal Filling' located 45m south of the Project Site, with a last input dated recorded as December 1975 and was for inert waste. There are no category 1 or 2 pollution incidents within 500m of the Project Site, and no abstraction licences. WSP note that five groundwater abstractions have been identified within the Envirocheck report within 500m of the Project Site. Groundwater depths were provided and noted that within the superficial deposits groundwater was encountered at 5m and

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
			9m bgl in April 2010 and at 4m and 7m bgl in June 2007. The groundwater is assumed to be within the Kempton Park Gravels. The groundwater within the Thanet Sands was mapped at 12m bgl.
Land Use Consultants Ltd on behalf of LBS	N/A	Scoping Response received 19/01/22	LBS stated that the Ground Conditions topic should be scoped into the ES. The ES chapter should clearly identify receptors and their sensitivity and assess the significance of pre-mitigation effects before describing appropriate mitigation and post-mitigation significance. Receptors should include humans, aquifers, surface waters, buildings and structures and ecological receptors, and soils (as a resource) (GC1). The assessment should include effects associated with soil and groundwater contamination (including asbestos), UXO, ground gases, piling and other foundations, control of contaminants during demolition, pollution control during construction, waste soils, and drinking water supply pipes (GC2). With reference to GC1 and GC2, identified sensitive receptors are outlined within para 8.6.11 and sensitivity criteria provided within Table 8.3. The assessment of pre-mitigation effects, mitigation and post mitigation effects is provided within Section 8.7. Regarding water supply pipes and buildings and structures, these receptor are discussed in para 8.5.15. Soils (as a resource) have not been considered within this assessment due to the urban nature of the Project Site (i.e no topsoil or agricultural land is present). This is in line

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
			within the guidance and legislation referenced within this assessment.

Method of Baseline Data Collation

DESK STUDY

8.5.21. Data for the baseline conditions at the Project Site was taken from the Preliminary Risk Assessment (PRA) (**Appendix 8.1**) dated September 2014,which was undertaken for the OPP. The desk study includes an Envirocheck Report which is also included within **Appendix 8.1**. I There have been no significant changes at the Project Site since this date and therefore the data remains accurate.

SITE VISIT AND SURVEYS

8.5.22. A walkover of the Project Site was carried out on 20th June 2014 by representatives of WSP undertaking the PRA report[83] (provided as **Appendix 8.1**).

8.5.23. An explosive ordnance threat assessment (UXO) was undertaken for the Project Site by BACTEC International Limited dated 10th June 2014 (provided within **Appendix 8.1**)[84].

8.5.24. A ground investigation was undertaken in June 2021 by Hydrock and reported within a report dated 16 August 2021, Ref. 18520-HYD-XX-XX-RP-GE-1001[85]. A site walkover and intrusive site investigation was included within this survey and confirmed the Project Site uses remained broadly unchanged from the 2014 assessment. The Ground Investigation report is contained within (**Appendix 8.2**).

8.5.25. There are not considered to be any cumulative effects on ground conditions from the Project Site and other committed developments in the immediate area. A number of committed developments have been identified within the immediate vicinity of the Project Site, however, these are not considered likely to affect soil contamination at The Site. Additionally, it is considered that off-site groundwater contamination will be identified under planning conditions for off-site development and will be appropriately remediated in line with primary legislation and best practice.

83 Geo-Environmental and Geotechnical Preliminary Risk Assessment, WSP UK Limited dated September 2014. Ref: 50600304

84 'Explosive Ordnance Threat Assessment in Respect of Aylesbury Estate,
Southwark for WSP LTD'. BACTEC. June 2014. Ref: 5469TA

85 Ground Investigation Report, Aylesbury Estate Phase 2B Regeneration. Hydrock Consultants Limited dated 5 October 2021. Ref: 18520-HYD-XX-XX-RP-GE-1001

Limitations and Assumptions

8.5.26. The work undertaken to provide the basis of this assessment comprised a study of available documented information from a variety of sources and discussions with relevant authorities. The Preliminary Environmental Risk Assessment prepared in September 2014 (Appendix 11-1) for the OPP has been relied upon.

8.5.27. Although the works of third parties has been used to inform this chapter, WSP cannot warrant the work of third parties.

8.5.28. It should be noted that any risks identified in this chapter are perceived risks based on the information reviewed; actual risks can only be assessed following further surveys and intrusive investigation of the Project Site.

8.6. Baseline Conditions

8.6.1. The Project Site is located within the southeast of the Aylesbury Estate. There are currently four blocks on the Project Site (Wendover, Winslow, Padbury, and Ravenstone). All four buildings are linear housing blocks of between six and 14 storeys in height which comprise residential accommodation. Within Wendover, there is a Learning Centre, Music Room, and offices, although these are now all vacant. A fifth building (Foxcote) within the south of the Project Site has already been demolished.

8.6.2. The Project Site is approximately 2.72 ha in area and flat and level across the Project Site with the exception of several grassed mounds, approximately 1m in height.

8.6.3. Review of the historical Ordnance Survey mapping indicates:

- The Project Site was largely industrial between 1876 - 1916, where several factories operated within the Project Site boundary including a floor cloth manufactory, a mineral water factory and a mould works. Terraced residential properties were also present within the Project Site boundary.
- During the 1950's many of the terraced properties were being demolished and a newly built block of residential was erected to the northeast of the Project Site.
- Between 1970 - 1977 all terraced housing within the Project Site had been demolished. Wendover house,, Padbury, Winslow and Ravenstone residential housing blocks was erected during this time.

8.6.4. A specialist UXO assessment indicates a high bomb risk. The Project Site area is located within a London Borough and is therefore an area that was subjected to high bombing density during World War II (WWII). An Explosive Ordnance Threat Assessment was undertaken for the Project Site by BACTEC International Limited dated 10th June 2014. The report assessment gave a varied low to high risk rating across the Project Site.

8.6.5. The registered impacts to the Project Site and the immediate surroundings from WWII were recorded as follows:

- The Project Site area was hit by one oil bomb;

- 25 high explosive bomb strikes including two unexploded bombs within the Project Site area;
- 17 high explosives plotted immediately adjacent to the Project Site area;
- Five 1kg incendiary bomb showers drawn over the Project Site suggesting 1kg incendiary bombs on Project Site area; and
- V1 bomb and V2 rocket (Vengeance weapon) were detonated onsite in the central school and south-eastern corner of the Project Site delivering 1,000kg of high explosive warheads.

8.6.6. It has been assessed that the bomb penetration depth could be up to 10m below ground level (mbgl).

8.6.7. As part of the low to high assessment it has been recommended by BACTEC that in the low risk zones a safety awareness briefing is conducted to all members working on the Project Site. For medium and medium to high zones an explosive ordnance disposal engineer should be present onsite to support shallow intrusive works as well as an intrusive magnetometer survey of all locations of works to maximum bomb penetration depth.

8.6.8. The geology at the Project Site consists of Kempton Park Gravels overlying the Lambeth Group and the Thanet Sands Formation overlying the White Chalk Subgroup. Made Ground is also known to be present on site up to depths of approximately 5m.

8.6.9. The superficial deposits comprise a Secondary A aquifer and the solid geology Lambeth Group and Thanet Sands as a Secondary A aquifer. The underlying White Chalk Subgroup is classified as a Principal Aquifer. There is one known active groundwater abstraction point 992m southwest of the Project Site.

8.6.10. No ecologically sensitive sites (such as Sites of Special Scientific Interest (SSSI)) have been identified within the Study Area.

Ground Investigation Works

8.6.11. Ground Investigation works were undertaken by Hydrock on the Project Site in June 2021. The findings are summarised below:

- The ground conditions as proven by the investigation undertaken at the Project Site comprise:
  - Made Ground - between 0.0m 5.1m below ground level (bgl), comprising sandy clays with general fill, brick, concrete and asphalt.
  - Kempton Park Gravels - between 1.9m - 9.0m bgl comprising medium dense sandy gravels with frequent clay lenses.
  - Lambeth Group - between 6.6m - 11.5m bgl comprising dense clayey silty sands to stiff clays.
  - Thanet Sands Formation between 9.0m - 24.9m bgl comprising medium to very dense green grey fine sands.

- White Chalk Subgroup from 22.3m comprising A1 to A2 structured chalk with flint seams throughout. Depth was not proven.
- Groundwater was encountered at depths between 5.5 bgl and 11.5m bgl during the investigation.
- Water levels recorded post-fieldwork ranged from 5.63m bgl to 9.56m bgl (-3.08m OD to -7.16 OD).

- Soil Contamination Assessment - High concentrations of lead, recorded at a maximum concentration of 1400mg/kg in BH5 and a US95 of 805.60mg/kg against the respective GAC of 200mg/kg. Though lead may be naturally occurring on site as indicated by the desk study information, this exceedance is considered unacceptable and requires additional thought in regards to the Project Site . No Asbestos Containing Materials have been noted. However, there were a number of exploratory hole locations where asbestos fibres and material (<0.001% - 0.737%v/v of chrysotile) have been detected in the Made Ground.
- Controlled Waters Assessment - Within the Kempton Park Gravels the DWS for aluminium and manganese are exceeded. Additionally, the EQS for chromium (III) and copper are exceeded. Within the Thanet Sands Formation/White Chalk Subgroup the DWS for iron and manganese are exceeded. In addition to this, the EQS for copper and nickel are exceeded within the Thanet Sands Formation/White Chalk Subgroup. Whilst there are exceedances of the water quality targets, these exceedances are considered not to represent a significant risk of pollution of Controlled Waters from an on-site source as there is no evidence of artificial accumulations of these substances on the Project Site. Either they originate from the natural geology (Shand et. al. 2007) or they represent inflow from an off-site source. Furthermore, the inland waters EQSs for aluminium, copper, chromium(III), manganese and nickel are based on the bioavailable fraction and because bioavailability has not been calculated for these metals the assessment is conservative as it assumes 100% bioavailability. It would be technically challenging and probably disproportionately costly to remove these natural contaminants from the water or to prevent further infiltration.
- Ground Gas Assessment – Ground gas monitoring was incomplete however preliminary results indicates a Low to moderate risk from ground gases (subject to additional and on-going monitoring) and CS2 conditions apply.

Sensitivity Analysis

8.6.12. The following sensitive receptors have been assessed:

Human Health

- Demolition and Construction workers; and,
- Off-site receptors (residents and workers in the vicinity of the Project Site).

Controlled Waters

- Groundwater including the Secondary (A) aquifers of the Kempton Park Gravel Formation, Lambeth Group Formation, Thanet Sand Formation, and the Principal Aquifer of the White Chalk Subgroup.

Future Baseline

8.6.13. In the absence of the Project, it is likely that the Project Site conditions will remain as they are reported within this chapter, no significant change to the current baseline would be predicted. Any potentially polluting activities that are currently occurring would be likely to continue, however the identified contamination sources are historical, off-site or inactive, so there should be a low increment of increased contamination levels on-site. However, assuming no remediation takes place it is possible that the concentration and accumulation of contaminants could occur, which will increase the effect to receptors.

8.7. Assessment of Effects, Mitigation and Residual Effects

Demolition and Construction

Potential Effect on Demolition and Construction Workers from Pre-Existing Contamination Within the Underlying Soils (If Present)

8.7.1. An intrusive site investigation has been undertaken across the Project Site. Asbestos fibres have been reported within Made Ground materials, no contamination was encountered which was considered to require remediation. Groundwater was reported to be present between 5.63m bgl to 9.56m bgl, a number of inorganic exceedances were reported although no concentrations of contaminants were observed which were considered to require remedial intervention.

8.7.2. Demolition and construction workers will be exposed to any contaminants that are present in the Made Ground, or that are present in the ground after migrating from contaminant sources, during any earthworks or site clearance that includes disturbing or clearing the Made Ground. There is potential for exposure to asbestos or other contaminants during any earthworks or site clearance. They will be affected by inhalation of dusts, gases or vapours, dermal contact with soil and groundwater and ingestion of soil and dust. However, the length of direct exposure will be limited to the duration of works in which they are directly involved, and thus the effect will be short term. Any health effects from the potentially contaminated soil and groundwater could have a medium to long term effect.

8.7.3. In addition, demolition and construction workers could expose UXO during ground investigations, excavation or piling activities. If a device was activated it could have both short and long term effects.

8.7.4. The sensitivity of demolition and construction workers is medium to high and the magnitude of change, prior to mitigation, is high. Therefore, there is likely to be a direct, permanent, medium

to long-term moderate to major adverse effect (significant) on demolition and construction workers prior to the implementation of mitigation measures (see below).

Mitigation

8.7.5. Further ground investigation carried out in compliance with planning conditions relating to the OPP will identify areas of contamination in shallow soils which will be appropriately remediated prior to the Construction Stage. It is possible this further ground investigation could be undertaken as a phased approach.

8.7.6. The Explosive Ordnance Threat Assessment sets out that the following mitigation measures are required and will be implemented during the construction works:

All Works

- Explosive Ordnance Safety and Awareness Briefings to all personnel conducting intrusive works
- The provision of Unexploded Ordnance Site Safety Instructions, such as a UXO Risk Management Plan

Medium and Medium-High Risk Zones Only:

- Explosive Ordnance Disposal (EOD) Engineer presence on site to support shallow intrusive works
- Intrusive Magnetometer Survey (and target investigation) of all borehole and pile locations down to a maximum bomb penetration depth

8.7.7. To ensure imported materials are suitable for their proposed use and to mitigate risks to construction workers, a Materials Management Plan (following the Contaminated Land: Applications in Real Environments (CL:AIRE) 'Definition of Waste: Development Industry Code of Practice')[86] will be produced prior to commencement. This will ensure that soil re-use and imported materials are suitable for their intended use and will not significantly affect human health or the environment

8.7.8. The following measures will be incorporated within the Construction Environmental Management Plan, which is likely to be required by a planning condition of a planning permission for the Project Site.

- Assuming the conditions detailed above, construction workers would be required to wear PPE such as gloves and face masks (where appropriate) to prevent dermal contact and inhalation or ingestion. Appropriate site hygiene facilities will be put in place and the presence of contaminants and the associated risks will be explained to ground workers before they begin work.

86 Contaminated Land: Applications in Real Environments (CL:AIRE) 'Definition of Waste: Development Industry Code of Practice, March 2011

- Water can be sprayed onto material being worked to damp down any potentially contaminated dust and prevent it from becoming airborne where it may affect construction workers and third-party neighbours. Wheel washing of site vehicles may also be implemented to prevent tracking of contaminated material off-site.
- Fuel storage on-site to be carried out under best practice i.e. integrally bunded containers. Plant refuelling to be carried out using best practice techniques and any spills to be controlled with spill kit.
- Dust suppression measures (e.g. damping down) will be implemented to minimise the potential for dust generation.
- Wheel washing of site vehicles will be carried out in order to minimise the potential for dust generation.
- Appropriate covering of on-site stockpiled materials and during transport to/from the Project Site to prevent dust generation.

Residual Effects

8.7.9. The sensitivity of demolition and construction workers is medium to high and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a negligible effect (not significant) on demolition and construction workers following implementation of pre-mitigation measures.

8.7.10. Potential effect on adjacent sensitive site users from potential contamination within the underlying soils during construction activities

8.7.11. Excavation of potentially contaminated soils could pose a health risk to the adjacent site users in the immediate vicinity of the Project Site, through inhalation of contaminated dusts and particulate matter generated by excavation activities or site clearance that includes disturbing or clearing the Made Ground.

8.7.12. The potential risk to third party neighbours would be dependent on the type and nature of contamination, if present, and the characteristics of receptor and duration of exposure. If these receptors are exposed to contaminants above threshold concentrations, there is potential for both temporary and permanent health problems to arise. Exposure can be direct or indirect.

8.7.13. The Ground Investigation Report reported Made Ground materials which are not considered suitable for use in areas of soft landscaping due to detection of asbestos fibres.

8.7.14. The sensitivity of adjacent sensitive site users is high and the magnitude of change, prior to mitigation, is high. Therefore, there is likely to be a direct, permanent, medium to long-term **major adverse** effect (**significant**) on adjacent sensitive site prior to the implementation of mitigation measures (see below).

Mitigation

8.7.15. An intrusive ground investigation should be undertaken as described in para 8.7.5-8.7.8 and an assessment of contamination risk should be undertaken prior to any site works taking place

to ensure all the contamination risks associated with the Project Site are fully understood and the appropriate mitigation measures can be put in place. If necessary, further remediation of affected areas should be completed prior to site works.

8.7.16. Construction would be carried out using current best practice to prevent the generation of dust. This may include measures such as damping down of stockpiles and wheel washing of site vehicles.

8.7.17. To ensure imported materials are suitable for their proposed use and to mitigate risks to adjacent site users, a Materials Management Plan (following the Contaminated Land: Applications in Real Environments (CL:AIRE) 'Definition of Waste: Development Industry Code of Practice') will be produced prior to commencement. This will ensure that soil re-use and imported materials are suitable for their intended use and will not significantly affect human health or the environment.

Residual Effects

8.7.18. The sensitivity of adjacent sensitive site users is high and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a **negligible** effect (**not significant**) on adjacent sensitive site prior to the implementation of mitigation measures.

Potential effect on controlled waters during construction activities

8.7.19. Removal of surface cover (buildings and hardstanding) has the potential to increase the rate of infiltration of rainfall and therefore leaching of contaminants from shallow soils.

8.7.20. The ground investigation did not identify any significant contamination which required remediation within the soils or groundwater underlying the Project Site.

8.7.21. Piling techniques carried out during the Construction Stage have the potential to generate preferential pathways from areas of contamination in the shallow soils to the Secondary (A) aquifers of the Lambeth Group Formation and Thanet Formation and the Principal aquifer of the White Chalk Subgroup.

8.7.22. A single storey basement is proposed in the southwest corner of the Project Site underlying Plots 4A/4D. The introduction of a construction drainage strategy during the construction phase and excavation for development of the basement has the potential to impact upon groundwater levels. During the winter, when groundwater levels are at their highest, the displacement or introduction of additional waters could lead to groundwater mounding, backup/groundwater flooding as well as changes in flow direction or recharge. This has the ability to impact upon both the groundwater environment, local infrastructure and local properties with basements.

8.7.23. The sensitivity of Controlled Waters is considered to be low to medium, and the magnitude of change, prior to mitigation is medium. Therefore, there is likely to be a direct, temporary, long-term **minor to moderate adverse** effect (**significant**) on Controlled Waters prior to the implementation of mitigation measures.

Mitigation

8.7.24. An intrusive ground investigation should be undertaken as described in para 8.7.5-8.7.8. Should contamination be identified which is assessed as presenting a risk to Controlled Waters it will be appropriately remediated prior to the construction phase.

8.7.25. A Piling Risk Assessment would be carried out prior to the works to assess the risks to the aquifers underling the Project Site and give recommendations protective of Controlled Waters, which should be incorporated into the Construction Method Statement.

8.7.26. A Basement Impact Assessment may be required to be undertaken prior to the Construction Phase to assess potential risks to the local groundwater regime from the development of the basement and provide recommendations and mitigation to reduce potential impact.

8.7.27. Measures detailed within the CEMP will be implemented appropriately which would include measures ensuring fuel storage on-site is carried out under best practice i.e. integrally bunded containers. Plant refuelling to be carried out using best practice techniques and any spills to be controlled with spill kit.

Residual Effects

8.7.28. The sensitivity of controlled waters is low to medium and the magnitude of change, following mitigation, is negligible. Therefore, there is likely to be a direct, temporary, medium to long-term negligible effect (not significant) following the implementation of mitigation measures.

8.8. Summary

Table 8.5: Summary of effects table for ground conditions

Description of Effects	Receptor	Significance and Nature of Effects Prior to Secondary Mitigation	Summary of Secondary Mitigation	Significance and Nature of Residual Effects
Demolition and Construction Stage				
Potential Effect on Demolition and Construction Workers and site occupiers From Pre-Existing Contamination Within the Underlying	Demolition and Construction Workers	Moderate to Major (Significant) - / P / D / LT	• Intrusive Site Investigation and Remediation Strategy • UXO mitigation (as detailed in Section • Materials Management Plan	Negligible (Not Significant) N/A / T / D / MT

Soils (If Present)			• CEMP Measures (as referred to in **section 8.9.8**)	
Potential Effect on Adjacent Sensitive Site Users from Potential Contamination Within the Underlying Soils During Construction Activities	Adjacent site users	Moderate to Major (Significant) - / P / D / MT-LT	• Intrusive Site Investigation and Remediation Strategy • Water spray to damp down any potentially contaminated dust. • Wheel Washing facilities • Covered Stockpiles. • Materials Management Plan	Negligible (Not Significant) N/A / T / D / MT
Potential Effect on Controlled Waters during Construction Activities	Controlled Waters	Moderate to Major (Significant) - / P / D / LT	• Intrusive Site Investigation and Remediation Strategy • Piling Risk Assessment • Basement Impact Assessment • Fuel storage on-site to be carried out under best practice	Negligible (Not Significant) N/A / T / D / MT

Key to table:
+ / - = Beneficial or Adverse P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

9. Noise and Vibration

9.1. Introduction

9.1.1. This Chapter assesses the likely significant environmental effects of the Project in respect of noise and vibration. In particular, it considers the potential effects on receptors within and surrounding the Project Site in terms of:

- Noise and vibration from the demolition and construction work associated with the Project;
- Noise from road traffic associated with the demolition and construction work associated with the Project;
- Noise from changes in road traffic attributed to the completed Project;
- Noise from items of plant within the Temporary Energy Centre introduced during the demolition and construction work associated with the Project, and
- Noise from items of permanent fixed plant introduced as part of the completed Project.

9.1.2. It also comments on the suitability of the Noise and Vibration environment at the Project Site for the Project.

9.2. Appendices

Table 9.5: Appendices for Chapter 9

Appendix No.	Document
9.1	Supplementary Baseline Noise Measurement Information
9.2	Supplementary Construction Assessment Information
9.3	Supplementary Traffic Noise Assessment Information
9.4	Environmental Noise Maps
9.5	Noise and Vibration Assessments Limitations and Assumptions
9.6	Calibration Information for Measurement Equipment

9.3. Legislation, Policy and Guidance

9.3.1. The following documents are relevant to the Noise and Vibration assessment.

Legislative Framework

- Environmental Protection Act, 1990
- Environmental Noise (England) Regulations, 2006 (as amended)

Planning Policy

National Planning Policy

- Department for Communities and Local Government – National Planning Policy Framework, 2021
- Department for Environment, Food and Rural Affairs – Noise Policy Statement for England, 2010
- Ministry of Housing, Communities & Local Government – National Planning Practice Guidance, 2014

Regional Planning Policy

- Greater London Authority – The London Plan, 2021
- Greater London Authority – The Mayor's Ambient Noise Strategy, 2004
- Greater London Authority – Sustainable Design and Construction – Supplementary Planning Guidance, 2014

Local Planning Policy

- London Borough of Southwark – The Southwark Local Plan 2022
- London Borough of Southwark – Core Strategy, 2011
- London Borough of Southwark – Technical Guidance for Noise, Rev 3 (Amended November 2019)
- London Borough of Southwark – Technical Guidance for Demolition and Construction, 2016

Guidance

- World Health Organisation Community Noise Guidelines, 1999
- World Health Organisation (WHO) document 'Night Noise Guidelines for Europe', 2009
- BS 8233:2014 – Guidance on sound insulation and noise reduction for buildings

- BS 4142:2014 – Method for rating and assessing industrial and commercial sound
- BS 7445:1991 – Description and Measurement of Environmental Noise
- IEMA (2014) Guidelines for Environmental Noise Impact Assessment
- Institute of Acoustics, Association of Noise Consultants, Chartered Institute of Environmental Health – ProPG: Planning and Noise: Professional Practice Guidance on Planning & Noise – New Residential Development, 2017
- Association of Noise Consultants – Acoustics, Ventilation and Overheating Residential Design Guide – Version 1.1 January 2020
- BS 5228-1:2009 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'
- BS 5228-2:2009 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'
- BS 6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting'
- National Highways – Design Manual for Roads and Bridges (DMRB) LA111 'Noise and Vibration' (2020) (Formerly Volume 11, Section 3, Part 7 'Noise and Vibration' HD 213/11, 2011)
- Department of Transport Welsh Office – The Calculation of Road Traffic Noise (CRTN), Department for the Transport and the Welsh Office, 1988
- Department for Education – Building Bulletin 93 Acoustic design of schools: performance standards, 2015
- Department of the Environment (now the Department for Environment, Food and Rural Affairs (Defra) – Advisory Leaflet AL72, 1976
- Ministry of Housing, Communities & Local Government – Approved Document F: Ventilation (2010 edition incorporating 2010 and 2013 amendments)

9.4. Historic Assessment

9.4.1. The potential effect of Noise and Vibration was assessed as part of the 2015 ES in support of the OPA (LPA ref: 14/AP/3844) for the wider masterplan of the Aylesbury Estate Regeneration. This is a standalone application, assessing Phase 2B in a greater level of detail, and should be viewed as taking precedence over the previous assessment in areas where it discusses previously assessed potential effects.

9.4.2. The methodologies used in this previous assessment are broadly similar to those used within this chapter, and the majority of differences seen in the predicted impacts and effects are the result of the greater level of detail of this assessment.

9.5. Scope of the Assessment

9.5.1. The scope of this assessment is as described in the document AER Phase 2B EIA Scoping Report (see Appendix 2.1). Following the receipt of the Scoping Report, LBS commissioned a review of the document, which was carried out by LUC, see Appendix 2.2 for a copy of the Review.

9.5.2. LUC specifically commented in relation to noise and vibration that:

"The receptor locations and measurements methodology should be agreed in advance with LBS's Environmental Health Officer."

9.5.3. The other noise and vibration items listed in the scoping review were requests for clarification on elements within tables included within the scoping report. Where these tables are included within this chapter, clarification has been added as requested.

9.5.4. In reference to the scoping report, LBS stated on 11th April 2022 that:

"EPT is satisfied with the scoping criteria for noise that will form part of a construction Environmental management plan and also influence the design of the building to provide suitable internal noise environment."

9.5.5. The potential significance of short-term, medium-term and long-term effects as a result of Noise and Vibration related to the Project are assessed at existing and future Noise and Vibration sensitive receptors.

9.5.6. The significance of all Noise and Vibration Effects is either Negligible or Negative, as no significant potential Positive Effects have been identified. All Noise and Vibration Effects are considered to be direct.

9.5.7. With reference to Noise and Vibration Effects, the effect durations are defined as:

- Short-term: Effects anticipated to last less than five years
- Medium-term: Effects anticipated to last five to ten years
- Long-term: Effects anticipated to last more than ten years

9.5.8. The potential short-term effects of noise and vibration produced as a result of the demolition and construction work planned as part of The Project are:

- Noise and vibration from demolition and construction activities (including plant or equipment used on-site)
- Noise from demolition and construction related traffic along the local road network, including Heavy Goods Vehicles (HGVs)
- Noise impact of temporary building services plant introduced during the demolition and construction work

9.5.9. Potential long-term effects as a result of changes to the noise environment as part of The Project are:

- Traffic noise associated with the complete and operational Project Site
- Noise impact of new building services plant associated with the operational Project

9.5.10. Site suitability, with regards to the noise environment of the complete, operational Project Site, is also assessed.

9.5.11. The following items are not included in this assessment, as noted in the Scoping Report (see Appendix 2.X):

- Operational Vibration, which is judged to be insignificant in both baseline conditions and in the completed Project, as the closest significant source of ground-borne vibration is the Bakerloo Line, over 300m away;
- Operational Activity Noise, which is considered to be insignificant, as no new significant sources of activity noise are included within the Project.

9.6. Assessment Methodology

Noise and Vibration from Demolition and Construction Activity

Airborne Noise Assessment Methodology

9.6.1. Noise predictions of demolition and construction noise have been undertaken via a desktop study, applying the methodologies described within BS 5228-1.

9.6.2. Annex E of BS 5228-1 describes the "ABC method" for assessing the impact from construction noise on residential receptors by comparing it to a threshold defined by the existing ambient noise level.

9.6.3. Based on the guidance in BS 5228-1, the adopted criterion for assessing the effects of Demolition and Construction noise are set in line with the ABC thresholds. The ABC categories and threshold values are detailed in Appendix 9.2 - Supplementary Construction Assessment Information.

9.6.4. The semantic scale adopted for the description of the noise impacts based on the exceedance of predicted construction noise level above the ABC category threshold value, is presented in **Table 9.6**.

Table 9.6: Magnitude of Airborne Demolition and Construction Noise Impacts

Exceedance of Construction Noise, over Threshold Value	Magnitude of Impact
< 1 dB	Very Low
1 dB to 5 dB	Low
5 dB to 10 dB	Medium
> 10 dB	High

Vibration Assessment Methodology

9.6.5. The prediction of demolition and construction vibration effects is based on predicted absolute levels of vibration experienced within nearby noise sensitive receptors, in general accordance with BS 5228-2. Vibration levels are predicted using historical data and methodology presented in BS 5228-2. Predictions of vibration levels are made in terms of Peak Particle Velocity (PPV).

9.6.6. The likely impact of vibration is predicted according to guidance contained in BS 5228-2 concerning the effect of PPV vibration on individuals (human response) and on building response.

9.6.7. The adopted criteria used to determine the potential magnitude of impact of Demolition and Construction vibration are presented in **Table 9.7** and **Table 9.8**. For residential receptors, and other high sensitivity receptors, the LOAEL can be defined as a PPV of 1.0 mm/s during the daytime; the SOAEL can be defined as a PPV of 5.0 mm/s.

Table 9.7: Magnitude of Construction Vibration Impacts (Human Responses)

PPV (mm/s)	Description of Effect	Magnitude of Impact
< 0.3	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Very Low
0.3 to < 1.0	Vibration might be just perceptible in residential environments.	Low
1.0 to < 5.0	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.	Medium
> 5.0	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	High

Table 9.8: Magnitude of Construction Vibration Impacts (Building Responses)

PPV (mm/s)	Description of Effect	Magnitude of Impact
< 12.5	Probability of damage to buildings by transient vibration tends to zero at 12.5 mm/s PPV.	Very Low
12.5 - 15.0	Cosmetic damage to buildings is unlikely.	Low
15.0 - 30.0	Cosmetic damage to buildings could occur. Minor damage to building structure is unlikely.	Medium
> 30.0	Minor damage to building structure is possible.	High

9.6.8. The most significant vibration during the construction programme is likely to be the works associated with piling. Therefore, the assessment is carried out for the case in which piling is taking place at the area of the Project Site closest to the NSR. This is considered a worst-case.

9.6.9. All piling is anticipated to be rotary bored piling. If any other types of piling are required, these will be covered as part of the detailed Construction Environmental Management Plan, produced by the contractor. An outline Demolition Environmental Management Plan and an Outline Construction Management Plan have been produced in support of the planning application and can be found at Appendix 5.1 and 5.2 respectively.

9.6.10. Based on data provided in BS 5228-2, and the relationship between PPV and distance given in Ground borne vibration from piling, an estimate has been made of the worst reasonable case of PPV from rotary bored piling at a given distance. Full details of this estimate can be found in *Appendix 9.2 - Supplementary Construction Assessment Information.*

Traffic Noise relating to Demolition and Construction Activity

Assessment Methodology

9.6.11. Anticipated changes to traffic noise on roads surrounding the Project, due to additional construction traffic, are predicted based on construction traffic flow data provided by the transport consultant.

9.6.12. The peak traffic flows predicted are during a period of the construction works where multiple areas across the Project Site are operations. These flows are therefore taken as representative of the worst-case flows across the demolition and construction work as a whole.

9.6.13. The only sections of road utilised by construction traffic in the supplied data are the section of Albany Road east of the Project Site, connecting to Old Kent Road, and the section of Old Kent Road south of the junction of Albany Road.

9.6.14. The baseline for this assessment includes committed developments, so as to represent the "future do-nothing" scenario.

9.6.15. The change in the LA10,18hr on each section of road as a result of the addition of the demolition and construction traffic into the traffic flows in this scenario was estimated using the methodology given in The Calculation of Road Traffic Noise ("CRTN"). The environmental noise model was used to predict the change in LA10,18hr at each NSR as a result of the change in noise produced by each segment of road.

9.6.16. So as to assess the worst case, both the model of the "Do-Nothing" scenario and the model of the "Do-Something" included the geometry of the Project Site as it will be when the demolition of Ravenstone, Winslow, Padbury and Wendover has been completed, resulting in minimal shielding to distant NSRs.

9.6.17. Table 3.1 of the *Design Manual for Roads and Bridges* ("DMRB") provides a methodology for assessing the magnitude of impact of construction traffic noise, which has been adopted for this assessment.

Table 9.9: Magnitude of Road Traffic Noise Impacts

Change in Noise Level (LA10,18hr)	Magnitude of Impact
0 dB	Negligible
0 – 1 dB	Very Low
1 – 3 dB	Low
3 – 5 dB	Medium
>5 dB	High

Traffic Noise relating to the Operational Project Site

Traffic Noise Assessment Methodology

9.6.18. As with the Demolition and Construction Traffic Noise Assessment, the predicted difference in traffic noise level produced by each segment of road, between the future "Do-Nothing" and future "Do-Something" scenarios is calculated used the methodology described in The Calculation of Road Traffic Noise ("CRTN").

9.6.19. Given these calculated changes in the level of noise produced by each segment of road, the environmental noise model was used to predict the total change in LA10,18hr at each receptor.

9.6.20. The same methodology for assessing the magnitude of impact of traffic noise as used for the Demolition and Construction Traffic Noise assessment has been adopted for this assessment. This methodology is repeated in **Table 9.10** for clarity.

Table 9.10: Magnitude of Road Traffic Noise Impacts

Change in Noise Level (LA10,18hr)	Magnitude of Impact
0 dB	Negligible
0 - 1 dB	Very Low
1 - 3 dB	Low
3 - 5 dB	Medium
>5 dB	High

Noise from Introduced Items of Fixed Plant

Assessment Methodology

9.6.21. Noise emissions from plant equipment from the Project are to be designed to satisfy the requirements given in *Technical Guidance for Noise*, published by LBS, that are summarised as follows:

- The sound rating level does not exceed the typical minimum $L_{A90,15min}$ background sound level at any time;
- The unrated specific sound level does not exceed 10dB below the typical minimum $L_{A90,15min}$ background sound level at any time;

9.6.22. Technical Guidance for Noise notes that the terms "specific sound level", "sound rating level", and "background sound level" are to be calculated in in accordance with BS 4142:2014.

9.6.23. The difference between the specific sound level and the sound rating level produced by an item or items of plant is given by the correction for perceptual characteristics defined in BS 4142:2014.

9.6.24. Plant equipment specifications for all parts of the scheme are not available at the time of the planning submission, and so a detailed plant noise analysis is not undertaken. Rather, limits of plant noise, to comply with LBS's requirements, are defined within this assessment, to which the specified plant will adhere.

9.6.25. **Table 9.11** shows an assessment methodology for assessing magnitude of impact which expands on the criteria for assessing plant noise impact given within BS 4142:2014 by adding a requirement for specific plant sound level. As can be seen, plant noise meeting the requirements of *Technical* Guidance *for Noise* is classified as having "Very Low" Impact under this methodology.

Table 9.11: Magnitude of Impact of External Noise Emissions for Operational Plant

Noise Rating Level ($L_{Ar,Tr}$)	Specific Plant Sound Level ($L_{Aeq,T}$)	Description	Magnitude of Impact
Below background sound level	< 10 dB below background sound level	An indication of the specific sound source having a low impact, depending on the context.	Very Low
0 - 5 dB above background sound level	10 - 5 dB below background sound level	Likely to be an indication of an adverse impact, depending on the context.	Low
5 - 10 dB above background sound level	5 - 0 dB below background sound level	Likely to be an indication of an adverse impact, depending on the context.	Medium
above background sound level	above background sound level	Likely to be an indication of a significant adverse impact, depending on the context.	High

Site Suitability

9.6.26. The suitability of the Project Site for the Project is assessed with regards to the predicted noise environment of complete and operational Project Site. This includes noise levels in external amenity spaces, and the impact of external noise on the internal noise levels of dwellings within the Project.

9.6.27. As there are no significant sources of environmental vibration in the vicinity of the Project Site, there are judged to be no potential impacts on site suitability from vibration.

Internal Noise Levels in Dwellings during Background Ventilation

9.6.28. The feasibility of providing desirable internal noise levels in dwellings under Part F "whole dwelling" ventilation conditions – also known as "background ventilation conditions" - is assessed using the criteria defined in BS 8233:2014, reproduced in **Table 9.12**.

Table 9.12: Indoor Ambient Noise Levels for Dwellings (BS 8233)

Activity	Location	07:00 - 23:00	23:00 – 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Internal Noise Levels in Dwellings during Overheating Ventilation

9.6.29. The assessment also considers the potential that internal night-time noise levels in bedrooms within the Project impact upon the ability of the ventilation strategy of the Project to satisfy Part O of the Building Regulations.

9.6.30. Approved Document O states that, in locations where external noise may be an issue, the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours.

9.6.31. It notes that windows are likely to closed if noise within bedrooms exceeds the following limits:

- 40dB LAeq,T averaged over 8 hours (between 11pm and 7am), and
- 55dB LAF,max more thean 10 times a night (between 11pm and 7am).

Noise Levels in External Amenity Spaces

9.6.32. BS 8233 provides guidance on desirable upper limits for external noise levels in external areas used as traditional amenity space, such as gardens and patios. The recommended noise level is 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$. If this target is not achievable across all areas of a development which is considered desirable, the development should be designed to achieve the lowest practicable levels in these external amenity spaces.

9.7. Significance Criteria

9.7.1. The classification of effect is determined by considering the magnitude of impact and the receptor sensitivity in accordance with the matrix for areas as defined in Chapter 2. This is reproduced in

9.7.2. **Table** 9.13 for clarity.

Table 9.13: Abbreviations used for Sensitivity and Magnitude

Receptor		Impact	
Sensitivity to Change		**Magnitude of Change**	
Very High	VH	Very High	VH
High	H	High	H
Medium	M	Medium	M
Low	L	Low	L
Very Low	VL	Very Low	VL
Negligible	N	Negligible	N

Table 9.14: Semantic Classification of Effect

Criteria			Receptor Sensitivity				
			VH	H	M	L	VL
Impact Magnitude	Positive	VH	Substantial	Substantial	Major	Moderate	Moderate
		H	Substantial	Major	Moderate	Moderate	Minor
		M	Major	Moderate	Moderate	Minor	Minor
		L	Moderate	Moderate	Minor	Minor	Minor-Neutral
		VL	Moderate	Minor	Minor	Minor-Neutral	Minor-Neutral
	Negligible		Neutral	Neutral	Neutral	Neutral	Neutral
	Negative	VL	Moderate	Minor	Minor	Minor-Neutral	Minor-Neutral
		L	Moderate	Moderate	Minor	Minor	Minor-Neutral
		M	Major	Moderate	Moderate	Minor	Minor
		H	Substantial	Major	Moderate	Moderate	Minor
		VH	Substantial	Substantial	Major	Moderate	Moderate

9.7.3. This approach is consistent with the IEMA Noise Guidelines, which recommend an evaluation of significance based on impact magnitude and receptor sensitivity.

9.7.4. Whether or not a particular effect is deemed to be “Significant” depends on the classification of the effect, and the duration of the effect.

Table 9.15: Significance of Effect

Effect Duration	Classification of Effect			
	Neutral	Minor	Moderate	Major
Short-Term	Not Significant	Not Significant	Not Significant	Significant
Medium-Term	Not Significant	Not Significant	Significant	Significant
Long-Term	Not Significant	Not Significant	Significant	Significant

9.8. Sensitive Receptors

Classification of Sensitive Receptors

9.8.1. Receptors have been classified according to their use and associated sensitivity to noise and vibration. The criteria defined and adopted for classification purposes are set out in **Table 9.16**.

Table 9.16: Criteria to Define the Sensitivity of Receptors

Sens.	Description	Examples of receptors
High	Receptors where occupants or activities are particularly susceptible to noise	Residential Schools/Education facilities Hospitals/residential care homes Religious institutions e.g. churches or mosques Entertainment / Performance
Medium	Receptors moderately sensitive to noise, where it may cause some distraction or disturbance	Offices Restaurants Shops Leisure Centre
Low	Receptors where distraction or disturbance from noise is minimal	Factories and workshop environments during the daytime

Identification of Sensitive Receptors

9.8.2. In order to assess the potential impacts associated with noise and vibration levels from the demolition, construction and operational phases of the Project, nearby properties or locations whose occupants have been considered most sensitive to disturbance by adverse noise and vibration levels have been identified.

9.8.3. As the impact at all other receptors is predicted to be of lower magnitude, due to their increased distance to the Project Site, the receptors shown below are considered to be representative of the largest potential effect across all other receptors.

9.8.4. It is therefore considered that should noise levels be suitably controlled at the identified receptors, then noise levels will also be suitably controlled at all other noise sensitive receptors in the area surrounding the Project Site.

9.8.5. The key receptors sensitive to changes in noise and vibration levels that could potentially be affected by the impacts of the Project fit into one of the following categories:

- Existing properties outside the Aylesbury Estate which, while distant, have an unobstructed line-of-sight to the Project Site;
- Existing properties outside the Aylesbury Estate which immediately neighbour the Project Site, being located either along the Project Boundary or on the opposite side of Kinglake Street or Bagshot Street;
- Existing residential properties within Phase 2c – to the North of the Project Site – and Phase 4 – to the West – of the Aylesbury Estate;
- Existing residential properties within Phase 2b the Aylesbury Estate which are still occupied during certain phases of the Construction work associated with the Project.
- Residential properties introduced as part of the Project, which become occupied before the Demolition and Construction work associated with the Project is completed.

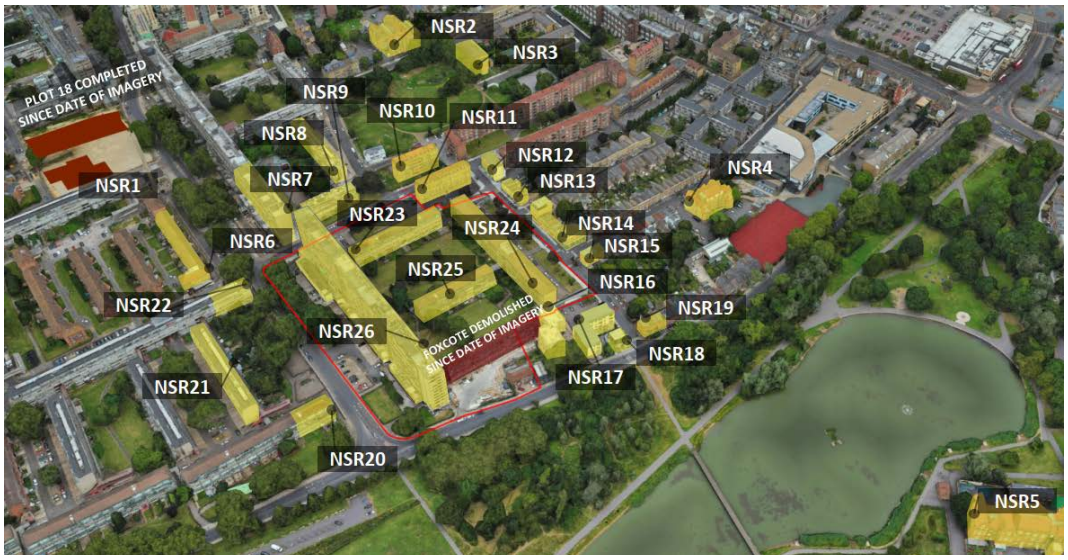
9.8.6. The existing receptors are listed **in Table 9.17** and shown graphically in **Figure 9.6.**

Table 9.17: Summary of Identified Existing Noise Sensitive Receptors

Ref.	Name	Building Type	Sens.	Rec. Height	Closest Plot	Approx. Dist. to Site
NSR 1	Plot 18 - South Building	Residential	High	12m	Plot 5A	220m
NSR 2	Surrey Square Primary	School	High	12m	Plot 5C	200m
NSR 3	Church of the Lord	Religious	High	12m	Plot 5C	160m
NSR 4	Ark Walkorth Academy	School	High	12m	Plot 4B	120m
NSR 5	Cobourg Road Academy	School	High	12m	Plot 4D	260m
NSR 6	Michael Faraday House	Residential	High	10m	Plot 5A	60m
NSR 7	1-240 Wendover	Residential	High	12m	Plot 5A	25m
NSR 8	Wolverton 152-175	Residential	High	12m	Plot 5A	65m
NSR 9	Wolverton 176-192	Residential	High	12m	Plot 5A	35m
NSR 10	Tenterden House	Residential	High	12m	Plot 5C	40m
NSR 11	Faversham House	Residential	High	12m	Plot 5C	10m
NSR 12	109 Kinglake Street	Residential	High	8m	Plot 5C	15m
NSR 13	15-23 Bagshot Street	Residential	High	12m	Plot 5C	10m
NSR 14	25-37 Bagshot Street	Residential	High	9m	Plot 4B	10m
NSR 15	105 Mina Road	Residential	High	12m	Plot 4B	10m
NSR 16	140 Albany Road	Residential	High	12m	Plot 4B	5m
NSR 17	Domville Court	Residential	High	12m	Plot 4B	20m
NSR 18	Apex House	Residential	High	8m	Plot 4B	40m
NSR 19	116-120 Albany Road	Residential	High	7m	Plot 4B	45m
NSR 20	Emberton House	Residential	High	12m	Plot 4A	25m
NSR 21	114-141 Latimer	Residential	High	12m	Plot 4A	60m
NSR 22	1-61 Latimer	Residential	High	12m	Plot 5A	25m
NSR 23	Winslow	Residential	High	12m	-	-

NSR 24	Ravenstone	Residential	High	12m	-	-
NSR 25	Padbury	Residential	High	12m	-	-
NSR 26	Wendover	Residential	High	12m	-	-

Figure 9.6: Aerial View Showing Identified Existing Noise Sensitive Receptors



9.8.7. None of the Committed Developments listed above are sufficiently close to the Project Site to be considered Noise Sensitive Receptors once completed and operational. However, the demolition and construction work associated with the Project will be phased (see Chapter 5) and it is anticipated that some of the blocks within the Project will be occupied before all construction activity is completed across the Project Site as a whole. These blocks are therefore included as receptors for effects which occur after they are likely to become occupied.

9.8.8. These additional receptors are listed in **Table 9.18** and shown graphically in

9.8.9.

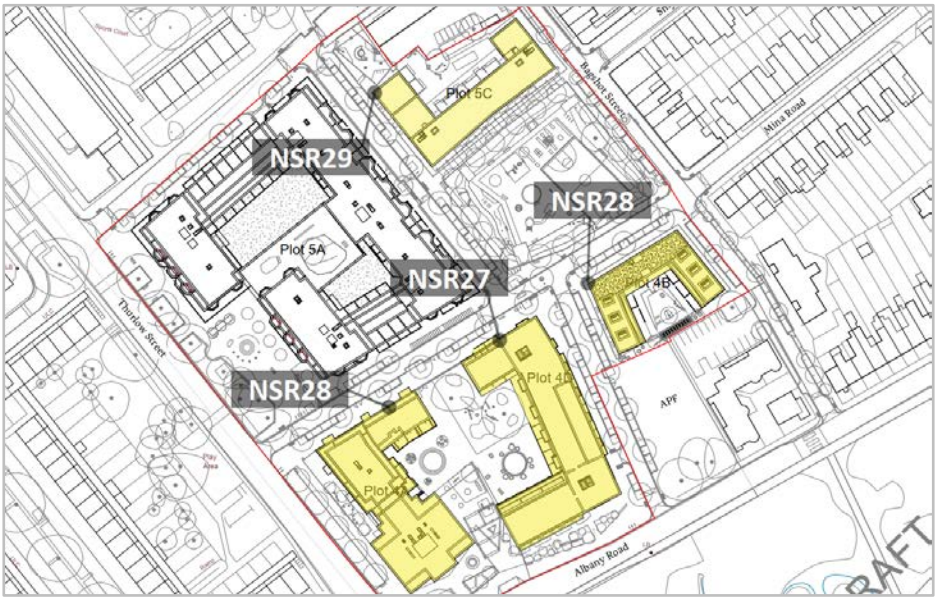
9.8.10.

9.8.11. Figure 9.7**.**

Table 9.18: Summary of Identified Introduced Noise Sensitive Receptors

Ref.	Name	Building Type	Sens.	Receiver Height	Closest Plot	Approx. Dist. to Site
NSR 27	Block 4D	Residential	High	12m	-	-
NSR 28	Block 4A - Wing Section	Residential	High	12m	-	-
NSR 29	Block 4B	Residential	High	12m	-	-
NSR 30	Block 5C	Residential	High	12m	-	-

Figure 9.7: Plan of Project Site Showing Identified Introduced Noise Sensitive Receptors



9.8.12. Receptors are modelled 1m in front of the point of the façade of the associated building anticipated to be most sensitive to noise impact from the Project. In most cases, this is the point closest to the Project Site, but in cases where this point would benefit from shielding from other buildings, a point anticipated to be more sensitive was chosen.

9.8.13. Each receptor is modelled at either a height of 12m, or the maximum height of the associated building if this height is less than 12m. The reduced amount of shielding a receptor can be expected to benefit from at this height receptors suggests that, in most cases, this represents the most part of the façade

9.8.14. As all identified Noise Sensitive Receptors are Residential, Education or Religious type buildings, each is of "High" sensitivity, as defined in **Table 9.16**.

9.9. Baseline Conditions

9.9.1. Baseline environmental noise conditions in and around the Project Site are dominated by Albany Road, running along the southern boundary of the Project Site, and Thurlow Street, running along the western boundary of the Project Site.

9.9.2. Various small residential roads, serve the surrounding estate, but these receive only low levels of traffic, and only dominate the noise environment in their immediate vicinity.

9.9.3. Distant traffic noise sources – and other "city noise" sources such as construction – provide a relatively constant background noise level.

9.9.4. The closest sources of noise of vibration from rail sources are the above-ground line connecting Elephant and Castle, more than 800m to the East, and the above-ground line heading east from London Bridge, over a kilometre to the North-East. No London Underground lines are present in the vicinity of the Project Site. As such, there is no significant noise or vibration from rail sources at the Project Site.

Environmental Noise Measurements

9.9.5. An unattended long-term noise survey was taken in the location marked as "L1" in **Figure 9.8** in May 2021. Attended short-term measurements were also taken at the locations marked in **Figure 9.8** in May 2021. Measurements were repeated at some of these locations in March 2022, to provide data on the change in noise levels. Noise was also measured in an additional location in March 2022, to represent noise produced by the smaller residential roads.

9.9.6. A summary of these measurements is shown in **Table 9.19** and **Table 9.20**. Further details regarding these measurements, can be found in Appendix 9.1 - Supplementary Baseline Noise Measurement Information.

Table 9.19: Summary of Measured Noise Levels during Long-Term Noise Survey

Name	Location	Start Date	End Date	Time Period	Average Noise Level ($L_{Aeq,T}$ dB)	Background Noise Level ($L_{AF90,T}$[1] dB)	Maximum Noise Level ($L_{AF,max}$[2] dB)
L1	Roof of Wendover	24/05/21	28/05/21	Day[3]	58.2	49.1	-
				Night[4]	53.2	40.7	72

1: Minimum background noise level measured
1: Maximum noise level not exceeded more than 10 times in one night
2: Daytime period defined as 7am-11pm
3: Night-time period defined as 11pm-7am

Table 9.20: Summary of Measured Noise Levels during Short-Term Noise Measurements

Name	Location	Date	Time Started	Duration	Average Noise Level ($L_{Aeq,T}$ dB)	Background Noise Level ($L_{AF90,T}$ dB)
S1	Thurlow St.	28/05/21	11:50	30 Minutes	67.5	58.0
		09/03/22	11:50		66.8	56.7
S2	Albany Rd.	28/05/21	12:30	30 Minutes	70.5	57.5
		09/03/22	12:30		69.4	58.1
S3	Albany Rd.	28/05/21	13:10	30 Minutes	69.6	61.1
S4	Thurlow St.	28/05/21	13:50	30 Minutes	67.8	57.4
S5	Courtyard	28/05/21	14:22	5 Minutes	43.4	39.0
		09/03/22	13:50		46.4	42.3
S6	Kinglake St.	09/03/22	13:11	30 Minutes	58.1	49.5

Figure 9.8: Aerial View Showing Baseline Measurement Locations

Environmental Noise Modelling

9.9.7. To predict the levels of environmental noise at the façade of the NSRs during each of the assessed scenarios, an environmental noise model was created with an industry standard 3D modelling software package (SoundPLAN 8.2).

9.9.8. The noise environment was modelled by calibrating the sound power level of line sources representing each section of road in the vicinity of the Project Site such that the modelled sound

pressure level at the long-term and short-term measurement locations matched the measured levels. Traffic data was used to inform the relative level of roads.

Correction for Covid-19 Activity

9.9.9. As the noise measurements made in 2021 were taken at a time when restrictions were in place to prevent the spread of Covid-19, they may not represent typical activity noise at the Project Site.

9.9.10. Measurements were repeated in locations S1, S2 and S5 in March 2022, when the majority of restrictions had been lifted, so as to give an indication of the difference in noise level. As far as possible, the repeated measurements at these locations were made at the same time of day as the original measurements.

9.9.11. Data published by the Department of Transport on the percentage of road network utilisation by cars and HGVs, relative to an equivalent pre-pandemic day, was used in combination with the baseline traffic data provided by the traffic consultant to estimate the difference in traffic on each section of road within the model.

9.9.12. The estimated change in traffic was used to estimate the resultant change in traffic noise level so that it could be used as a set of correction factors between the measured condition and that which forms the Current Baseline. The magnitude of these corrections was no more than 1.5dB on any road segment, and less than 0.8dB on average. Further details on these correction factors can be found in Appendix 9.1 - Supplementary Baseline Noise Measurement Information.

9.9.13. The difference between the $L_{Aeq,30min}$ level measured at the roadside during the 2021 measurements and the 2022 measurements show a reduction of 0.7dBA at position S1 and an increase of 1.1dBA at position S2, suggesting that the magnitude of this correction is appropriate.

9.9.14. These correction factors were applied to the environmental noise model representing the Current Baseline.

Future Baseline

9.9.15. The following future scenarios are used as the basis of the assessments, in line with the assessments carried out in the Transportation Chapter 11.

- The future baseline, incorporating committed developments in the vicinity of the Project Site (the “Do-Nothing” scenario), and
- The future baseline with the addition of traffic related to the completed and operational Project (the “Do-Something” scenario).

9.9.16. The committed developments included within the judged to have an impact on levels of traffic in the vicinity of the Project Site are described in detail in Chapter 11(Transportation), but are summarised as follows:

- Aylesbury Estate FDS – Redevelopment of area of estate around 500m to the west, providing residential dwellings and associated amenity
- Southernwood Retail Park – Development around 400m to the east, providing residential dwellings, retail units, a hotel, and associated amenity
- 35-39 Parkhouse Street – Development around 600m to the southwest, providing residential dwellings and associated amenity
- 1-13 Southampton Way – Development around 650m to the southwest, providing residential dwellings and associated amenity
- 25-33 Parkhouse Street – Development around 750m to the southwest, providing residential dwellings, commercial units, and associated amenity

9.9.17. As this area of London is not predicted to see background traffic growth, the future baseline is not representative of a particular year, but rather of a scenario where all currently committed developments are completed and operational.

9.9.18. There is not anticipated to be a significant increase in through-traffic in the area as a result of the Project. The main sources of additional traffic associated with its operation are therefore expected to arise from increased access requirements, including servicing and deliveries, to the Project Site as a result of the increased number of dwellings.

9.9.19. The extension to the Bakerloo line, which was proposed to run beneath Old Kent Road, is on hold, and is therefore not included as a potential source of vibration within the Future Baseline. It is not anticipated that this extension would cause significant levels of vibration at the Project Site.

9.9.20. More information on anticipated changes in complete and operational traffic can be found in Chapter 11 (Transportation).

9.10. Assessment of Effects, Mitigation and Residual Effects

Effect of Airborne Activity Noise and Vibration from Demolition and Construction Activity

Modelling of Site Activity

9.10.1. The demolition and construction activity planned as part of the Project is to take place across the five plots of the Project Site at different times during the construction period. While the precise programme will not be finalised until the detailed Construction Environmental Management Plan, produced by the contractor, details of an indicative construction programme can be found in Chapter 5.

9.10.2. So as to assess the predicted impact of airborne noise from demolition and construction activity, the indicative demolition and construction programme has been simplified into eight discreet Construction Scenarios. Together, these scenarios are considered representative of activity across the entire construction programme.

9.10.3. Works related to fit-out and landscaping are not anticipated to produced significant noise levels and are not included in this assessment.

9.10.4. To reflect the difference in the amount of activity that is expected to take place in each plot of the Project Site, as well as to more accurately reflect the construction programme, Plot 4A and Plot 5A have been split into two within each Construction Scenario. The category of activity taking place within each plot during each Construction Scenario is presented in **Table 9.21**.

Table 9.21: Representative Construction Scenarios used in Airborne Activity Noise Assessment

	Activity Modelled within Area of Site							
Area	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CS6**	**CS7**	**CS8**
4A - Tower		Demo		Sub	Super	Super	Super	
4A - Wing		Demo		Sub	Super	Super	Super	
4B		Demo	Sub	Super	Super	Super		
4C	Sub	Super	Super	Super				
4D		Demo				Sub	Super	Super
5A - East		Demo	Demo	Demo	Demo	Sub	Super	Super
5A - West		Demo			Sub	Super		
5C		Demo		Sub	Super	Super	Super	

Demo – Demolition Activity, including Site Preparation and Remediation
Sub – Substructure Activity, including Excavations, Piling and Foundations
Super – Superstructure Activity, including Cladding

Assessment

9.10.5. An indicative list of plant and equipment associated with each demolition and construction stage was developed, based on information provided in Chapter 5.

9.10.6. The sound pressure levels given for items of plant and equipment given within Appendix C of *BS 5228-1*, along with predicted quantity and on-times of each item, was used to provide total sound power levels of the equipment and activity planned to be undertaken at each plot of the Project Site during each Construction Scenario.

9.10.7. These sound power levels were used to predict levels of unmitigated construction noise at each receptor, using the 3D environmental noise model.

9.10.8. Full details of the noise modelling assumptions – including assumptions of sound power emissions, on-time, locations of site hoardings etc. – can be found in Appendix 9.2 - Supplementary Construction Assessment Information.

9.10.9. The predicted noise levels due to demolition and construction at the various NSRs during each of the Construction Scenarios are shown in **Table 9.22**.

9.10.10. The exceedance of these noise levels over the appropriate BS 5228-1 'ABC' method threshold for each NSR is shown in **Table 9.23**, along with the predicted Magnitude of Impact, as defined in **Table 9.6**, shown in parenthesis.

9.10.11. The Magnitude of Impact of Demolition and Construction noise is then used to determine the unmitigated Initial Effect at each NSR – as defined by the relationship shown in **Table 9.14** – which is shown in

9.10.12.

9.10.13.

9.10.14. Table 9.24**.**

Table 9.22: Predicted Demolition and Construction Noise Levels at NSRs

	Predicted Total Demolition and Construction Noise (dB LAeq,10hr)							
Ref.	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
NSR 1	39.6	67.9	65.8	68.0	66.3	69.2	68.7	68.5
NSR 2	41.8	63.5	59.5	62.1	62.1	66.5	65.1	65.1
NSR 3	41.7	59.8	57.3	58.6	58.3	62.9	61.0	60.9
NSR 4	56.3	71.7	70.5	71.6	70.2	72.4	66.7	66.5
NSR 5	55.9	63.8	61.2	63.5	59.5	61.7	55.3	50.7
NSR 6	43.1	76.9	75.1	75.6	75.5	80.4	79.7	79.7
NSR 7	49.3	81.4	78.0	78.9	79.4	85.3	84.3	84.4
NSR 8	53.4	78.1	74.6	75.5	76.8	81.3	77.9	77.9
NSR 9	60.0	81.7	77.7	78.6	79.4	85.5	84.3	84.4
NSR 10	51.1	79.6	74.7	76.0	78.0	83.4	80.1	80.1
NSR 11	56.2	82.9	78.4	79.0	82.4	86.6	76.1	76.0
NSR 12	49.1	80.3	77.3	77.9	79.8	83.4	71.3	71.3
NSR 13	51.7	83.2	79.5	80.2	82.9	86.6	67.8	67.7
NSR 14	51.9	85.2	84.6	84.8	84.9	86.3	77.9	77.8
NSR 15	55.2	83.3	82.6	82.9	82.8	84.3	75.2	75.1
NSR 16	79.6	86.8	86.3	86.6	85.3	86.0	67.3	67.1
NSR 17	68.1	82.5	82.2	82.2	82.3	83.3	61.8	61.6
NSR 18	55.0	72.8	72.6	72.7	72.9	73.6	60.3	60.1
NSR 19	58.4	75.5	74.9	75.0	75.1	76.9	59.0	58.8
NSR 20	48.1	81.7	77.7	81.5	80.9	82.8	82.0	79.7
NSR 21	49.2	79.4	76.6	78.9	78.2	81.4	80.7	80.0
NSR 22	45.6	80.8	78.9	80.2	79.7	83.8	83.3	83.1
NSR 23	69.1	-	-	-	-	-	-	-
NSR 24	79.8	-	-	-	-	-	-	-
NSR 25	83.2	-	-	-	-	-	-	-
NSR 26	81.5	-	-	-	-	-	-	-
NSR 27	-	-	-	-	-	-	-	86.4
NSR 28	-	-	-	-	-	-	-	80.4
NSR 29	-	-	-	-	-	-	-	85.5
NSR 30	-	-	-	-	-	-	-	86.9

Table 9.23: Demolition and Construction Exceedance Levels and Magnitude of Impact

	Exceedance over ABC Method Threshold (dB LAeq,T) / (Magnitude of Impact)							
Ref.	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
NSR 1	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)
NSR 2	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	1.5 (L)	0.1 (VL)	0.1 (VL)
NSR 3	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)
NSR 4	0 (VL)	6.7 (M)	5.5 (M)	6.6 (M)	5.2 (M)	7.4 (M)	1.7 (L)	1.5 (L)
NSR 5	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)	0 (VL)
NSR 6	0 (VL)	6.9 (M)	5.1 (M)	5.6 (M)	5.5 (M)	10.4 (H)	9.7 (M)	9.7 (M)
NSR 7	0 (VL)	16.4 (H)	13 (H)	13.9 (H)	14.4 (H)	20.3 (H)	19.3 (H)	19.4 (H)
NSR 8	0 (VL)	13.1 (H)	9.6 (M)	10.5 (H)	11.8 (H)	16.3 (H)	12.9 (H)	12.9 (H)
NSR 9	0 (VL)	16.7 (H)	12.7 (H)	13.6 (H)	14.4 (H)	20.5 (H)	19.3 (H)	19.4 (H)
NSR 10	0 (VL)	14.6 (H)	9.7 (M)	11 (H)	13 (H)	18.4 (H)	15.1 (H)	15.1 (H)
NSR 11	0 (VL)	17.9 (H)	13.4 (H)	14 (H)	17.4 (H)	21.6 (H)	11.1 (H)	11 (H)
NSR 12	0 (VL)	15.3 (H)	12.3 (H)	12.9 (H)	14.8 (H)	18.4 (H)	6.3 (M)	6.3 (M)
NSR 13	0 (VL)	18.2 (H)	14.5 (H)	15.2 (H)	17.9 (H)	21.6 (H)	2.8 (L)	2.7 (L)
NSR 14	0 (VL)	20.2 (H)	19.6 (H)	19.8 (H)	19.9 (H)	21.3 (H)	12.9 (H)	12.8 (H)
NSR 15	0 (VL)	18.3 (H)	17.6 (H)	17.9 (H)	17.8 (H)	19.3 (H)	10.2 (H)	10.1 (H)
NSR 16	14.6 (H)	21.8 (H)	21.3 (H)	21.6 (H)	20.3 (H)	21 (H)	2.3 (L)	2.1 (L)
NSR 17	3.1 (L)	17.5 (H)	17.2 (H)	17.2 (H)	17.3 (H)	18.3 (H)	0 (VL)	0 (VL)
NSR 18	0 (VL)	2.8 (L)	2.6 (L)	2.7 (L)	2.9 (L)	3.6 (L)	0 (VL)	0 (VL)
NSR 19	0 (VL)	10.5 (H)	9.9 (M)	10 (H)	10.1 (H)	11.9 (H)	0 (VL)	0 (VL)
NSR 20	0 (VL)	11.7 (H)	7.7 (M)	11.5 (H)	10.9 (H)	12.8 (H)	12 (H)	9.7 (M)
NSR 21	0 (VL)	9.4 (M)	6.6 (M)	8.9 (M)	8.2 (M)	11.4 (H)	10.7 (H)	10 (H)
NSR 22	0 (VL)	10.8 (H)	8.9 (M)	10.2 (H)	9.7 (M)	13.8 (H)	13.3 (H)	13.1 (H)
NSR 23	4.1 (L)	-	-	-	-	-	-	-
NSR 24	14.8 (H)	-	-	-	-	-	-	-
NSR 25	18.2 (H)	-	-	-	-	-	-	-
NSR 26	16.5 (H)	-	-	-	-	-	-	-
NSR 27	-	-	-	-	-	-	-	21.4 (H)
NSR 28	-	-	-	-	-	-	-	15.4 (H)
NSR 29	-	-	-	-	-	-	-	20.5 (H)
NSR 30	-	-	-	-	-	-	-	21.9 (H)

Table 9.24: Demolition and Construction Noise Resultant Effects

	Classification of Initial Effect							
Ref.	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CS6**	**CS7**	**CS8**
NSR 1	Minor	Minor	Minor	Minor	Minor	Minor	Minor	Minor
NSR 2	Minor	Minor	Minor	Minor	Minor	Moderate	Minor	Minor
NSR 3	Minor	Minor	Minor	Minor	Minor	Minor	Minor	Minor
NSR 4	Minor	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
NSR 5	Minor	Minor	Minor	Minor	Minor	Minor	Minor	Minor
NSR 6	Minor	Moderate	Moderate	Moderate	Moderate	Major	Moderate	Moderate
NSR 7	Minor	Major	Major	Major	Major	Major	Major	Major
NSR 8	Minor	Major	Moderate	Major	Major	Major	Major	Major
NSR 9	Minor	Major	Major	Major	Major	Major	Major	Major
NSR 10	Minor	Major	Moderate	Major	Major	Major	Major	Major
NSR 11	Minor	Major	Major	Major	Major	Major	Major	Major
NSR 12	Minor	Major	Major	Major	Major	Major	Moderate	Moderate
NSR 13	Minor	Major	Major	Major	Major	Major	Moderate	Moderate
NSR 14	Minor	Major	Major	Major	Major	Major	Major	Major
NSR 15	Minor	Major	Major	Major	Major	Major	Major	Major
NSR 16	Major	Major	Major	Major	Major	Major	Moderate	Moderate
NSR 17	Moderate	Major	Major	Major	Major	Major	Minor	Minor
NSR 18	Minor	Moderate	Moderate	Moderate	Moderate	Moderate	Minor	Minor
NSR 19	Minor	Major	Moderate	Major	Major	Major	Minor	Minor
NSR 20	Minor	Major	Moderate	Major	Major	Major	Major	Moderate
NSR 21	Minor	Moderate	Moderate	Moderate	Moderate	Major	Major	Major
NSR 22	Minor	Major	Moderate	Major	Moderate	Major	Major	Major
NSR 23	Moderate	-	-	-	-	-	-	-
NSR 24	Major	-	-	-	-	-	-	-
NSR 25	Major	-	-	-	-	-	-	-
NSR 26	Major	-	-	-	-	-	-	-
NSR 27	-	-	-	-	-	-	-	Major
NSR 28	-	-	-	-	-	-	-	Major
NSR 29	-	-	-	-	-	-	-	Major
NSR 30	-	-	-	-	-	-	-	Major

Mitigation and Residual Effect

9.10.15. *Technical Guidance for Demolition and Construction*, issued by the London Borough of Southwark requires contractors comply with the recommendations set out in BS 5228:2009. In particular, it requires all contractors to employ "Best Practicable Means" for noise control at all times and references the definition of this contained within Section 72 of the Control of Pollution Act 1974.

9.10.16. The document also notes that noisy construction operation – including deliveries and collections, maintenance, and cleaning – will usually be restricted to the following times:

- 08.00 to 18.00 hours Monday to Friday;
- 09.00 to 14.00 hours on Saturdays, and
- No working on Sundays, Bank or Public Holidays.

9.10.17. As a major development, the document states that noise monitoring will be required at the Project Site boundary, and that the following limits to noise levels will apply.

Table 9.25: Technical Guidance for Demolition and Construction Noise Limits

Trigger (Amber)	Action (Red)
75dB $L_{Aeq,15min}$ (short term)	80dB $L_{Aeq,15min}$ (short term)
70dB $L_{Aeq,10hr}$ (08:00-18:00)	75dB $L_{Aeq,10hr}$ (08:00-18:00)

9.10.18. As such, it is assumed within this assessment that the contractor will undertake sufficient mitigation practices to limit noise levels at the boundary to 75dB LAeq,10hr, resulting in noise levels below this at the façade of all NSRs.

9.10.19. The detailed method and programme of construction, along with the measures which will be used to mitigate potential noise effects on nearby noise sensitive receptors to the required level, will be documented in a DEMP and CEMP following appointment of a contractor, post planning and can be secured via a standard planning conditions. An outline DEMP and outline CMP are provided at Appendix 5.1 and 5.2 respectively.

9.10.20. BS 5228-1 provides general guidance on mitigating noise from construction sites, which are to be included in the DEMP and CEMP. Good-practice noise mitigation measures will be followed, including (but not be limited to):

- Appropriate hours of work will be defined and adhered to;
- Adoption of appropriate noise control targets and monitoring where required;
- Site layout will be planned – where possible machinery will be located away from sensitive receptors;
- Use of hoarding. Erecting hoarding around the perimeter of the active demolition or construction sites will assist in the screening of low-level sources;
- Use of enclosures around equipment as appropriate;
- Hydraulic construction to be used in preference to impact techniques where practical;
- Use of low impact techniques, such as demolition munchers and bored or hydraulically jacked piling rigs;

- All plant and equipment to be used for the works will be modern, quiet and properly maintained, silenced where appropriate, operated to prevent excessive noise, and switched off when not in use and where practicable. All equipment will comply with the EC Directives and UK Regulations set out in BS 5228;
- Plant will be certified to meet relevant current legislation and standards;
- All trade contractors will be required to demonstrate familiarisation with current noise legislation and standards, such as BS 5228 which will form a prerequisite of their appointment;
- Loading and unloading of vehicles, dismantling of equipment (such as scaffolding), or moving equipment or materials around site will be conducted in such a manner as to minimise noise generation and, where practical, will be conducted away from noise sensitive areas;
- Careful handling of materials and waste, such as lowering rather than dropping items;
- Avoidance of unnecessary noise (such as engines idling between operations, shouting, loud radios or excessive revving of engines) by effective site management;
- Permission for deviation from approved method statements, only with prior approval from the Principal Contractor and other relevant parties. This will be facilitated by formal review before any deviation is undertaken, and
- Complaints about noise, or incidences where target levels are exceeded, will be reported to the Principal Contractor and immediately investigated.

9.10.21. As noted above, LBS require that noise monitoring take place at the Project Site boundary and that steps are taken to mitigate demolition or construction noise if noise levels exceed 75dB $L_{Aeq,10hr}$ or 80dB $L_{Aeq,15min}$. Demolition and construction noise at the façade of all receptors are therefore anticipated to have a Magnitude of Impact no higher than Medium during all periods of site activity.

9.10.22. As all receptors are of High sensitivity, this equates to a maximum Residual Effect no higher than Moderate. As it is short term in nature, this effect is therefore judged to be Not Significant.

Demolition and Construction Vibration

Assessment

9.10.23. For this assessment, it is assumed that continuous-flight auger ("CFA") piling will be used for all piling within The Project.

9.10.24. So as to represent the worst case, it is assumed that piling is taking place at the closest point of the Project Site to the receptor. As the facades of each block are set back from the Project Site boundary, the actual distance will be greater than this in all cases.

9.10.25. As all substructure works are due to be complete by the time any of the blocks within the Project Site are occupied, NSRs 27, 28, 29 and 30 are not included in this assessment.

Table 9.26: CFA Piling Vibration Potential Maximum Initial Effects

Ref.	Sens.	Approx. Dist. to Site	Max. PPV (mm/s)	Human Response		Building Response	
				Mag. of Impact	Effect	Mag. of Impact	Effect
NSR 1	High	220m	0.32	L	Moderate	VL	Minor
NSR 2	High	200m	0.34	L	Moderate	VL	Minor
NSR 3	High	160m	0.38	L	Moderate	VL	Minor
NSR 4	High	120m	0.43	L	Moderate	VL	Minor
NSR 5	High	260m	0.29	VL	Minor	VL	Minor
NSR 6	High	60m	0.61	L	Moderate	VL	Minor
NSR 7	High	25m	0.95	L	Moderate	VL	Minor
NSR 8	High	65m	0.59	L	Moderate	VL	Minor
NSR 9	High	35m	0.80	L	Moderate	VL	Minor
NSR 10	High	40m	0.75	L	Moderate	VL	Minor
NSR 11	High	10m	1.50	M	Moderate	VL	Minor
NSR 12	High	15m	1.22	M	Moderate	VL	Minor
NSR 13	High	10m	1.50	M	Moderate	VL	Minor
NSR 14	High	10m	1.50	M	Moderate	VL	Minor
NSR 15	High	10m	1.50	M	Moderate	VL	Minor
NSR 16	High	5m	2.12	M	Moderate	VL	Minor
NSR 17	High	20m	1.06	M	Moderate	VL	Minor
NSR 18	High	40m	0.75	L	Moderate	VL	Minor
NSR 19	High	45m	0.71	L	Moderate	VL	Minor
NSR 20	High	25m	0.95	L	Moderate	VL	Minor
NSR 21	High	60m	0.61	L	Moderate	VL	Minor
NSR 22	High	25m	0.95	L	Moderate	VL	Minor

Mitigation and Residual Effects

9.10.26. In addition to the Noise Monitoring described above, Technical Guidance for Demolition and Construction requires continuous vibration monitoring take place during demolition, piling, excavation or any other ground/sub-structure works, and sets a limit of 1mm/s Peak Particle Velocity ("PPV") at occupied residential and educational buildings.

9.10.27. As such, it is assumed within this assessment that the contractor will undertake sufficient mitigation practices to limit levels of vibration to 1mm/s PPV at all NSRs.

9.10.28. The measures required to mitigate potential piling vibration effects on nearby noise sensitive receptors to this level will be documented in a DEMP and CEMP.

9.10.29. Good-practice vibration mitigation measures will be followed, including (but not be limited to):

- Times of vibration inducing activity (e.g. piling) is managed;

- A 'Piling Method Statement' will be provided and agreed prior to the commencement. The statement will include any agreed vibration and noise monitoring and action levels;
- Local residents will be kept informed, and
- Complaints about vibration will be reported to the Principal Contractor and immediately investigated.

9.10.30. Assuming that appropriate mitigation is put in place to limit vibration to 1.0mm/s PPV at all receptors, vibration from piling is anticipated to have a Magnitude of Impact no higher than "Low" in terms of Human Response at all receptors. This indicates a worst-case Moderate Effect in terms of Human Response. As it is a Short-Term, Moderate Residual Effect, it is judged to be "Not Significant".

9.10.31. In terms of Building Response, the Residual Effect is predicted to be no more than Minor, which is therefore also judged to be "Not Significant".

Demolition and Construction Traffic Noise

Assessment

9.10.32. **Table 9.27** shows the results of the assessment of Traffic Noise as a result of Demolition and Construction Activity, in terms of the predicted change in $L_{A10,18hr}$ between the Future "Do-Nothing" and Future "Do-Something" scenarios, as well as the derived absolute levels.

Table 9.27: Demolition and Construction Traffic Noise Initial Effects

Ref.	Sensitivity	$L_{A10,18hr}$ (dB)		Change in level	Initial Effect
		Future "Do-Nothing"	Future "Do-Something"		
NSR 1	High	66.5	66.5	0.0	Neutral
NSR 2	High	57.2	57.2	0.0	Neutral
NSR 3	High	52.9	52.9	0.0	Neutral
NSR 4	High	56.9	57.1	0.2	Minor
NSR 5	High	56.0	56.1	0.1	Minor
NSR 6	High	69.1	69.1	0.0	Neutral
NSR 7	High	56.9	56.9	0.0	Neutral
NSR 8	High	54.2	54.2	0.0	Neutral
NSR 9	High	58.8	58.8	0.0	Neutral
NSR 10	High	58.0	58.0	0.0	Neutral
NSR 11	High	54.6	54.6	0.0	Neutral
NSR 12	High	58.2	58.2	0.0	Neutral
NSR 13	High	58.8	58.8	0.0	Neutral
NSR 14	High	58.6	58.7	0.1	Minor
NSR 15	High	57.4	57.4	0.0	Neutral
NSR 16	High	58.2	58.2	0.0	Neutral
NSR 17	High	57.6	57.7	0.1	Minor
NSR 18	High	69.0	69.2	0.2	Minor
NSR 19	High	61.6	61.7	0.1	Minor
NSR 20	High	68.7	68.7	0.0	Neutral
NSR 21	High	66.2	66.2	0.0	Neutral
NSR 22	High	68.7	68.7	0.0	Neutral

9.10.33. The unmitigated Initial Effect of the changes to noise levels as a result of the addition of construction traffic to the roads in the vicinity of the Project Site is Neutral at most receptors, with NSRs 4, 5, 14, 17, 18, and 19 seeing a Minor Effect.

Mitigation and Residual Effect

9.10.34. While the unmitigated effect is Minor, good-practice traffic mitigation methods will be followed. These will include (but not be limited to):

- Vehicles employed for activity related to the construction works will, where reasonably practicable, be fitted with exhaust silencers and will be maintained in good working order and operated in a manner such that noise emissions are minimised as far as reasonable possible;
- Time slots will be allocated for deliveries to ensure that convoys of vehicles do not arrive simultaneously, and avoid unnecessary idling on site;
- All vehicles will switch off engines;
- Movement of construction traffic around site will be minimised; and

- Appropriate speed limit around site will be enforced.

9.10.35. As the effect of the Demolition and Construction Traffic Noise is a Short-Term, Minor Effect, it is judged to be Not Significant, as per the relationship shown in

9.10.36.

9.10.37. **Table** 9.15.

Building Services Plant Noise

Background Sound Levels

9.10.38. The combined specific plant noise at any existing noise sensitive property in, or in the vicinity of the Project Site, will be designed to meet a noise level that is at a level at least 10 dB below the existing representative background sound level, where the representative minimum background sound level, as defined by the methodology of BS 4142:2014. In addition, the total sound rating level of this noise will not exceed the background sound level. This is consistent with the guidance of Technical Guidance Noise.

9.10.39. The minimum background sound level measured during the long-term noise survey at position "L1" on the roof of Wendover was 49.1dB LAF,90 during the day and 40.7dB LAF,90 during the night. The noise levels measured in this location are taken to be representative of minimum background sound levels at receptors overlooking Thurlow Street and Albany Road.

9.10.40. The receptors which overlook Thurlow Street or Albany Road are NSRs 1, 6, 18, 20 and 21.

9.10.41. It is considered likely, however, that these levels are not representative of minimum background sound levels at more shielded receptors.

9.10.42. The minimum daytime background sound level measured at any of the baseline noise measurement locations was 39.0dB at location "S5", within the courtyard of the existing Project Site, shielded from all surrounding roads. This is therefore taken as the representative daytime minimum background sound level for receptors not overlooking Thurlow Street or Albany Road.

9.10.43. An estimated representative night-time minimum background sound level of 30.6dB $L_{AF,90}$ is derived by applying the same difference between daytime and night-time background sound levels as was measured at location "L1" (-8.4dB). This is taken as the representative night-time minimum background sound level for receptors not overlooking Thurlow Street or Albany Road.

9.10.44. This method of estimating night-time background sound levels provides a conservative estimation of night-time background noise levels, as the difference between daytime and night-time background sound levels is typically greater at locations near major roads.

Noise associated with Permanent Plant

9.10.45. Plant noise will be considered "Not Significant" when is it is classified as being of "Minor" effect or lower. Therefore, all temporary plant will be specified to be of no more than "Very Low" impact when measured at any NSR, which will result in an effect at a high sensitivity receptor

which is no more than “Minor”. The corresponding plant sound level limits to achieve this are defined in **Table 9.28**.

Table 9.28: Representative Background Sound Levels and Adopted Plant Noise Rating Limits for Permanent Plant

Ref.	Representative Minimum Background Sound Level ($L_{AF,90}$)dB		Maximum Total Plant Sound Rating Level		Maximum Total Specific Plant Sound Level	
	Day	Night	Day	Night	Day	Night
NSR 1	49.1	40.7	49.1	40.7	39.1	30.7
NSR 2	39.0	30.6	39.0	30.6	29.0	20.6
NSR 3	39.0	30.6	39.0	30.6	39.0	30.6
NSR 4	39.0	30.6	39.0	30.6	29.0	20.6
NSR 5	39.0	30.6	39.0	30.6	29.0	20.6
NSR 6	49.1	40.7	49.1	40.7	39.1	30.7
NSR 7	39.0	30.6	39.0	30.6	29.0	20.6
NSR 8	39.0	30.6	39.0	30.6	29.0	20.6
NSR 9	39.0	30.6	39.0	30.6	29.0	20.6
NSR 10	39.0	30.6	39.0	30.6	29.0	20.6
NSR 11	39.0	30.6	39.0	30.6	29.0	20.6
NSR 12	39.0	30.6	39.0	30.6	29.0	20.6
NSR 13	39.0	30.6	39.0	30.6	29.0	20.6
NSR 14	39.0	30.6	39.0	30.6	29.0	20.6
NSR 15	39.0	30.6	39.0	30.6	29.0	20.6
NSR 16	39.0	30.6	39.0	30.6	29.0	20.6
NSR 17	39.0	30.6	39.0	30.6	29.0	20.6
NSR 18	49.1	40.7	49.1	40.7	39.1	30.7
NSR 19	39.0	30.6	39.0	30.6	29.0	20.6
NSR 20	49.1	40.7	49.1	40.7	39.1	30.7
NSR 21	49.1	40.7	49.1	40.7	39.1	30.7
NSR 22	39.0	30.6	39.0	30.6	29.0	20.6

9.10.46. With plant specified to meet these targets, the Effect of noise from permanent plant associated with The Project is anticipated to be “Not Significant” at all receptors.

Noise Associated with Temporary Plant

9.10.47. As the noise associated with the temporary plant is a temporary noise impact, an effect is predicted to be “Not Significant” when the effect is it is classified as “Moderate” or lower. Therefore, all temporary plant will be specified to be of no more than “Low” impact when measured at any NSR.

Table 9.29: Representative Background Sound Levels and Adopted Plant Noise Rating Limits for Permanent Plant

Ref.	Representative Minimum Background Sound Level ($L_{AF,90}$)dB		Maximum Total Plant Sound Rating Level		Maximum Total Specific Plant Sound Level	
	Day	Night	Day	Night	Day	Night
NSR 1	49.1	40.7	54.1	45.7	44.1	35.7
NSR 2	39.0	30.6	44.0	35.6	34.0	25.6
NSR 3	39.0	30.6	44.0	35.6	34.0	25.6
NSR 4	39.0	30.6	44.0	35.6	34.0	25.6
NSR 5	39.0	30.6	44.0	35.6	34.0	25.6
NSR 6	49.1	40.7	54.1	45.7	44.1	35.7
NSR 7	39.0	30.6	44.0	35.6	34.0	25.6
NSR 8	39.0	30.6	44.0	35.6	34.0	25.6
NSR 9	39.0	30.6	44.0	35.6	34.0	25.6
NSR 10	39.0	30.6	44.0	35.6	34.0	25.6
NSR 11	39.0	30.6	44.0	35.6	34.0	25.6
NSR 12	39.0	30.6	44.0	35.6	34.0	25.6
NSR 13	39.0	30.6	44.0	35.6	34.0	25.6
NSR 14	39.0	30.6	44.0	35.6	34.0	25.6
NSR 15	39.0	30.6	44.0	35.6	34.0	25.6
NSR 16	39.0	30.6	44.0	35.6	34.0	25.6
NSR 17	39.0	30.6	44.0	35.6	34.0	25.6
NSR 18	49.1	40.7	54.1	45.7	44.1	35.7
NSR 19	39.0	30.6	44.0	35.6	34.0	25.6
NSR 20	49.1	40.7	54.1	45.7	44.1	35.7
NSR 21	49.1	40.7	54.1	45.7	44.1	35.7
NSR 22	39.0	30.6	44.0	35.6	34.0	25.6

9.10.48. With plant specified to meet these targets, the Effect of noise from temporary plant associated with The Project is anticipated to be “Not Significant” at all receptors.

Operational Road Traffic Noise

9.10.49. The predicted effect of the change in traffic noise is assessed at all existing receptors which are present in the Future Baseline (NSRs 1-22). Introduced NSRs within the Project (NSR 27-30) are not assessed, as they are not present in the Future Baseline ‘Do-Nothing’ scenario, and comment can therefore not be made on the change in level between the two conditions.

Table 9.30: Operational Traffic Noise Initial Effects

Ref.	Sensitivity	LA10,18hr (dB)		Change in level	Initial Effect
		Future "Do-Nothing"	Future "Do-Something"		
NSR 1	High	66.7	66.7	0.0	Neutral
NSR 2	High	57.1	57.1	0.0	Neutral
NSR 3	High	52.8	53.1	0.3	Minor
NSR 4	High	56.4	56.6	0.2	Minor
NSR 5	High	56.0	56.2	0.2	Minor
NSR 6	High	69.3	69.2	-0.1	Neutral
NSR 7	High	57.9	57.3	-0.6	Neutral
NSR 8	High	53.3	53.8	0.5	Minor
NSR 9	High	59.4	59.9	0.5	Minor
NSR 10	High	57.3	57.8	0.5	Minor
NSR 11	High	53.4	51.9	-1.5	Neutral
NSR 12	High	58.0	58.0	0.0	Neutral
NSR 13	High	58.3	58.7	0.4	Minor
NSR 14	High	58.3	58.3	0.0	Neutral
NSR 15	High	56.7	57.3	0.6	Minor
NSR 16	High	58.9	58.0	-0.9	Neutral
NSR 17	High	58.3	58.4	0.1	Minor
NSR 18	High	69.1	69.2	0.1	Minor
NSR 19	High	61.8	61.8	0.0	Neutral
NSR 20	High	68.8	69.0	0.2	Minor
NSR 21	High	66.1	66.3	0.2	Minor
NSR 22	High	68.6	68.7	0.1	Minor

9.10.50. The unmitigated Initial Effect of the changes to noise levels as a result of the addition of traffic related to the completed and operational Project to the roads in the vicinity of the Project Site is "Minor" at NSRs 3, 4, 5, 8, 9, 10, 13, 15, 17, 18, 20, 21 and 22, and "Neutral" at all other NSRs.

Mitigation and Residual Effects

9.10.51. The largest potential Effect of noise from Operational Traffic noise identified above is "Minor", which is considered to be "Not Significant", therefore no mitigation is required.

9.11. Site Suitability

Environmental Noise Modelling

9.11.1. A general day time noise map of the completed Project Site, showing predicted daytime average noise levels ($L_{Aeq,16hr}$) at 1.5m above ground level, and free-field levels at the façade of each of the blocks, is shown in **Figure 9.9** and **Figure 9.10**. Night-time average noise levels ($L_{Aeq,8hr}$) are predicted to be 5.0dB lower than the daytime levels.

Figure 9.9: Predicted noise levels across the completed Project Site, viewed from the South-West

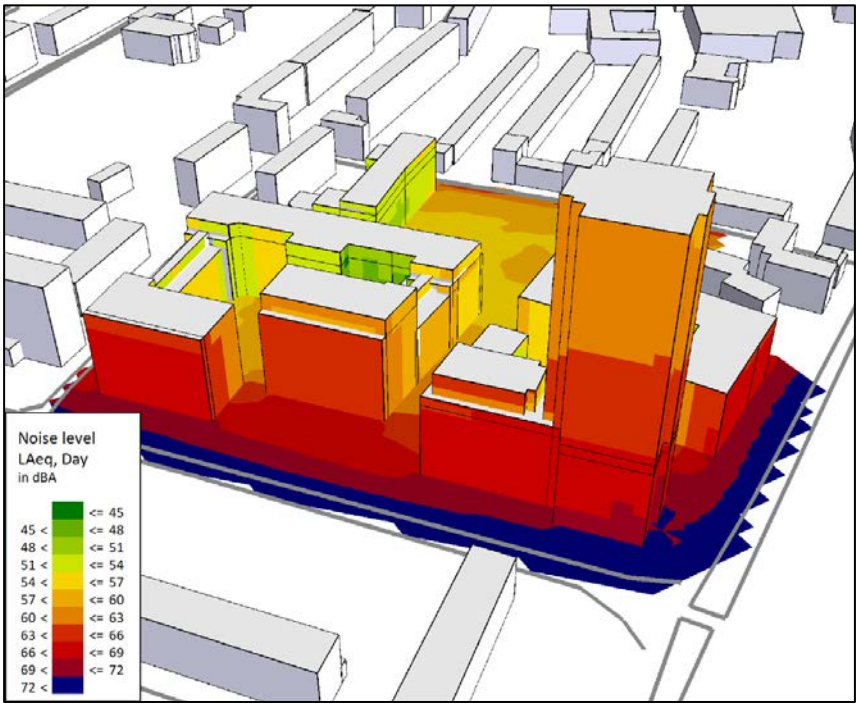
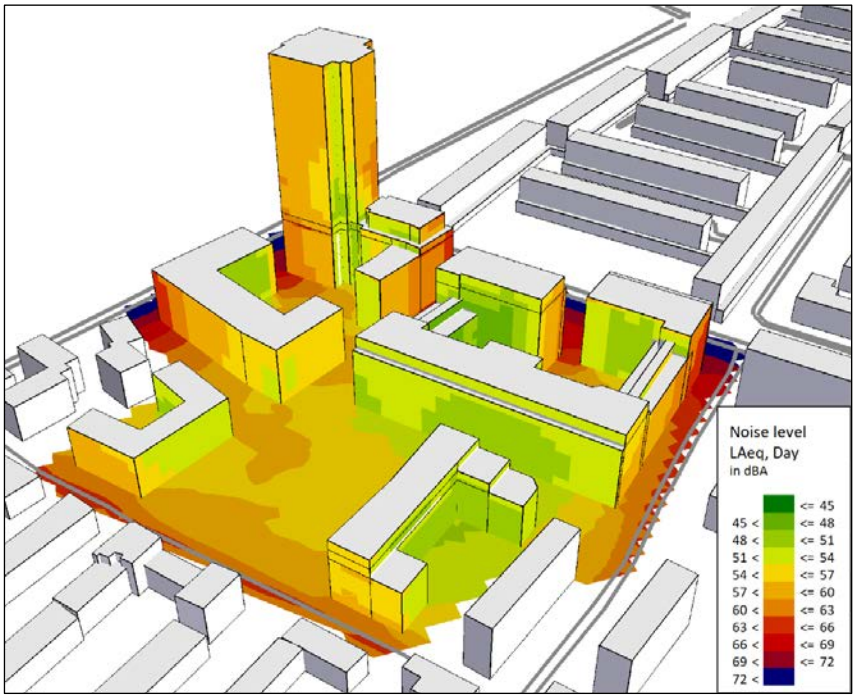


Figure 9.10: Predicted noise levels across the completed Project Site, viewed from the North-East



Internal Noise Levels in Dwellings during Background Ventilation

9.11.2. All residential units within The Project are to be mechanically ventilated during the background ventilation condition. Therefore, the levels given in BS 8233:2014 should be satisfied with windows close, with the result that the difference between external and internal noise levels will be defined by the solid elements of the façade and the glazing.

9.11.3. To satisfy the internal noise level requirements given in *BS 8233:2014* in all rooms, the façade in the area with the highest façade noise level shall provide a level difference of at least 27dB. Achieving this level difference is possible with a standard façade specification, formed of glazing with a sound reduction index of 30dB R_w in a solid façade with a sound reduction index of 50dB R_w. The specification of the façade included in the design of the Project significantly exceeds this performance.

9.11.4. Noise levels at the facades during background ventilation are therefore considered to be suitable for the Project as designed.

Internal Noise Levels in Dwellings during Overheating Ventilation

9.11.5. So as to provide sufficient ventilation to control temperatures during the overheating condition, as defined by Part O of the Building Regulations, openable windows are included on all facades across the Project Site. Across most façades within the Project Site, open windows will not cause the levels in bedrooms to exceed those given in Approved Document O.

9.11.6. On facades overlooking Thurlow Street and Albany Road, the modelled façade noise levels are predicted to cause internal noise levels in bedrooms to exceed the levels given in Approved Document O. Where this is the case, attenuated louvres, capable of providing sufficient attenuation to satisfy the acoustic requirements of Approved Document O have been specified.

9.11.7. These louvres are shown in the architectural and environmental design of the Project as it has been submitted for planning approval.

9.11.8. Noise levels at the facades during ventilation to treat the overheating are therefore considered to be suitable for the Project as designed.

Noise Levels in External Amenity Spaces

9.11.9. A daytime noise map, showing predicted daytime ($L_{Aeq,16hr}$) levels at 1.5m above ground level across the ground-level external amenity spaces in the completed and operational Project, is shown in

9.11.10.

9.11.11.

9.11.12. Figure 9.11.

Figure 9.11: Predicted noise levels across the ground-level external amenity spaces within the completed Project Site

9.11.13. It can be seen that, while noise levels exceed 55dB $L_{Aeq,16hr}$ in some areas, there are more shielded areas in which predicted daytime noise levels are less than 55dB $L_{Aeq,16hr}$, including some small areas below 50dB $L_{Aeq,16hr}$. As effort has been made to provide areas shielded from the noise of Thurlow Street and Albany Road, this is considered to be in line with the recommendations of BS 8233:2014.

9.11.14. Noise levels at balconies facing the main roads can be subject to noise levels higher than 55dB $L_{Aeq,16hr}$, however within the interior areas of the Project Site, noise levels are much lower.

9.11.15. Noise levels in external amenity areas are therefore considered to be suitable for the Project as designed.

9.12. Limitations and Assumptions

9.12.1. Discussion of the limitations of the Noise and Vibration Assessments within this chapter, and the assumptions made within the prediction methodologies can be found in Appendix 9.5 - Noise and Vibration Assessments Limitations and Assumptions.

9.13. Summary

9.13.1. With mitigation measures in place where described in the sections above, the residual effect of all noise and vibration associated with the Project as considered to be "Not Significant". All residual effects are summarised in

9.13.2. Potential Effect	Receptor	Res. Effect	Direct?	Pos/Neg	Dur.	Significant?
Noise from Demolition and Construction	NSR 1 NSR 3 NSR 5	Minor	Direct	Negative	Short-Term	Not Significant
	All Other NSRs	Moderate	Direct	Negative	Short-Term	Not Significant
Vibration from Demolition and Construction (Human Response)	NSR 5	Minor	Direct	Negative	Short-Term	Not Significant
	All Other NSRs	Moderate	Direct	Negative	Short-Term	Not Significant
Vibration from Demolition and Construction (Building Response)	All NSRs	Minor	Direct	Negative	Short-Term	Not Significant
Changes in Noise from Construction Traffic	NSR 1 NSR 2 NSR 3 NSR 6 NSR 7 NSR 8 NSR 9 NSR 10 NSR 11 NSR 12 NSR 13 NSR 15 NSR 16 NSR 20 NSR 21 NSR 22	Neutral	Direct	-	Short-Term	Not Significant
	All Other NSRs	Minor	Direct	Negative	Short-Term	Not Significant
Changes in Noise from Operational Traffic	NSR 1 NSR 2 NSR 6 NSR 7 NSR 8 NSR 9 NSR 10 NSR 13 NSR 15 NSR 17	Neutral	Direct	-	Long-Term	Not Significant

	NSR 18 NSR 20 NSR 21 NSR 22					
	All Other NSRs	Minor	Direct	Negative	Long-Term	Not Significant
Noise from temporary building services plant	All NSRs	Moderate	Direct	Negative	Short-Term	Not Significant
Noise from permanent building services plant	All NSRs	Minor	Direct	Negative	Short-Term	Not Significant

9.13.3.

.

Table 9.31: Significance of Residual Effects

Potential Effect	Receptor	Res. Effect	Direct?	Pos/Neg	Dur.	Significant?
Noise from Demolition and Construction	NSR 1 NSR 3 NSR 5	Minor	Direct	Negative	Short-Term	Not Significant
	All Other NSRs	Moderate	Direct	Negative	Short-Term	Not Significant
Vibration from Demolition and Construction (Human Response)	NSR 5	Minor	Direct	Negative	Short-Term	Not Significant
	All Other NSRs	Moderate	Direct	Negative	Short-Term	Not Significant
Vibration from Demolition and Construction (Building Response)	All NSRs	Minor	Direct	Negative	Short-Term	Not Significant
Changes in Noise from Construction Traffic	NSR 1 NSR 2 NSR 3 NSR 6 NSR 7 NSR 8 NSR 9 NSR 10 NSR 11 NSR 12 NSR 13 NSR 15 NSR 16 NSR 20 NSR 21 NSR 22	Neutral	Direct	-	Short-Term	Not Significant
	All Other NSRs	Minor	Direct	Negative	Short-Term	Not Significant
Changes in Noise from Operational Traffic	NSR 1 NSR 2 NSR 6 NSR 7 NSR 8 NSR 9 NSR 10 NSR 13 NSR 15 NSR 17 NSR 18 NSR 20 NSR 21 NSR 22	Neutral	Direct	-	Long-Term	Not Significant

	All Other NSRs	Minor	Direct	Negative	Long-Term	Not Significant
Noise from temporary building services plant	All NSRs	Moderate	Direct	Negative	Short-Term	Not Significant
Noise from permanent building services plant	All NSRs	Minor	Direct	Negative	Short-Term	Not Significant

10. Socio-Economics and Health

10.1. Introduction

10.1.1. This Chapter assesses the likely significant environmental effects of the Project on Socio-economics. In particular it considers housing provision, employment generation and the demand for education, healthcare, and open and play space. It also identifies proposed mitigation measures to prevent, minimise or control likely adverse significant Socio-economic effects arising from the Project and the subsequent anticipated residual effects.

10.1.2. This chapter should be read together with Chapter 4: The Project Description of this ES and the Original ES.

10.2. Legislation, Policy and guidance

Legislative Framework

10.2.1. There are no legislative requirements which exist in relation to Socio-economics and therefore the assessment is guided by the Government's planning policy and guidance, and regional planning policy within the London Plan. A summary of the planning policy relevant to Socio-economics and the Project is provided below.

Planning Policy

National Planning Policy

10.2.2. The revised National Planning Policy Framework (NPPF [87] was adopted in July 2021, incorporating policy proposals previously consulted on in the Housing White paper and the 'Planning for the Right Homes in the Right Places' consultation. The NPPF sets out the Government's economic, environmental and social planning policies for England. These policies outline the Government's vision of sustainable development, and *"a framework within which locally-prepared plans for housing and other development can be produced"*.

10.2.3. At the heart of the NPPF is a presumption in favour of sustainable development (Paragraph 11). The NPPF states that the purpose of the planning system is to be plan led (Paragraph 15), with plans providing *"a positive vision for the future of each area; a framework for addressing housing needs and other economic, social and environmental priorities; and a platform for local people to shape their surroundings"*.

10.2.4. Chapter 5: 'Delivering a sufficient supply of homes' emphasises that a local housing needs assessment should inform strategic policies, and *"where major development involving the provision of housing is proposed, planning policies and decisions should expect at least 10% of the total number of homes to be available for affordable home ownership"* (Paragraph 65).

[87] UK Government (2021) National Planning Policy Framework

10.2.5. Chapter 6: 'Building a strong, competitive economy' outlines that planning policies should *"set out a clear economic vision and strategy which positively and proactively encourages sustainable economic growth"* (Paragraph 82a).

10.2.6. Chapter 8 of the NPPF outlines how planning policy *"should aim to achieve healthy, inclusive and safe places"* (Paragraph 92). Much of this guidance is relevant to Socio-economics, including the need for local authorities to:

- Ensure *"a sufficient choice of school places is available to meet the needs of existing and new communities";*
- *"Plan positively for the provision and use of shared spaces, community facilities (such as local shops, meeting places, sports venues, open space, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of communities and residential environments"*; and
- *"Ensure an integrated approach to considering the location of housing, economic uses and community facilities and services"*.

Regional Planning Policy

10.2.7. The London Plan – Spatial Development Strategy for Greater London (2021)

10.2.8. The most recent version of the London Plan was adopted by the Greater London Authority (GLA) in March 2021[88]. The Plan supersedes the 2016 version of the document and introduces the 'Good Growth' initiative which aims to *"re-balance development in London towards more genuinely affordable homes for working Londoners to buy and rent"* and deliver *"a more socially integrated and sustainable city"*. The London Plan is the overall strategic plan for Greater London, setting out a framework of policies for development in the capital over a 25-year period. The following policies from the London Plan are relevant to Socio-economics and the Project:

- Policy GG1: 'Building strong and inclusive communities' presents the Mayor's commitment to inclusive growth, including ensuring access to facilities, community spaces and infrastructure which help to increase participation and social integration.
- Policy GG4: 'Delivering the homes Londoners need' outlines a strategic target of 50% affordable housing delivery, and the aim of developing homes which provide for a range of needs, helping to facilitate mixed and inclusive communities.
- Policy GG5: 'Growing a good economy' emphasises London's global economic position and the need to promote the strength and potential of the wider region. It seeks to ensure economic diversity, and plan for the delivery of sufficient employment space, as well as recognising the wider impacts housing, transport, and culture can have on economic success.
- Policy H1: 'Increasing Housing Supply' emphasises the need to optimise housing delivery, particularly on suitable and available brownfield sites, with boroughs encouraged to establish ambitious yet achievable build out rates, in line with the net

[88] Greater London Authority (2021) The London Plan

housing completion targets outlined in the Plan. The Plan aims for an additional 522,870 dwellings to be delivered over the ten-year plan period, or 52,287 dwellings to be built annually in London to meet high demand. The housing delivery target for the London Borough of Southwark (LBS) is 23,550 net new homes in the period to 2028/29, or an annual average of 2,355 dwellings.

- Policy H4: 'Delivering affordable housing' outlines that new homes should comprise 50% new affordable dwellings in London, which should be delivered on site. This will contribute to "meeting the need for an estimated 43,500 new affordable homes per year, as established in the 2017 Strategic Housing Market Assessment"[89]
- Policy H6: 'Affordable housing tenure' outlines that of the affordable dwellings delivered, 30% should be for social or affordable rent, 30% intermediate rent or sale dwellings, and the remaining 40% for either social, affordable, or intermediate rent or sale; to be determined by the borough on the basis of identified need.
- Policy H10: 'Housing size mix' sets out that schemes should consist of a range of unit sizes, helping to deliver mixed and inclusive neighbourhoods. It is noted that one-bedroom units "play a very important role in meeting housing need".
- Policy S4: 'Play and informal recreation' outlines that developments should increase opportunities for play, with "good quality, accessible play provision for all ages", and the delivery of both formal and informal play where possible.

10.2.9. Shaping Neighbourhoods: Children and Young People's Play and Informal Recreation Supplementary Planning Guidance (2012)

10.2.10. The GLA's Supplementary Planning Guidance (SPG) 'Shaping Neighbourhoods: Children and Young People's Play and Informal Recreation'[90] was published in September 2012. The SPG guides the implementation of the London Plan Policy 3.6), which states that *"the Mayor and appropriate organisations should ensure that all children and young people have safe access to good quality, well designed, secure and stimulating play and informal recreation provision, incorporating trees and greenery wherever possible"*.

10.2.11. The SPG outlines a recommended benchmark standard of 10m^2 of dedicated play space per child (any space to be accessible to the newly resident children and young people living within new developments). Levels of accessibility to play space for new developments are set according to age groups.

Homes for Londoners, Affordable Housing and Viability SPG (2017)

10.2.12. The Affordable Housing and Viability SPG[91] was published in August 2017. It provides guidance on the means to accelerate the delivery of housing and affordable housing, and supersedes section 3.3 (Build to Rent) and Part 5 (Viability) of the March 2016 SPG[92]. It sets

[89] Greater London Authority (2017) The London Strategic Housing Market Assessment
[90] Greater London Authority (2012) Shaping Neighbourhoods: Children and Young People's Play and Informal Recreation Supplementary Planning Guidance
[91] Greater London Authority (2017) Homes for Londoners, Affordable Housing and Viability SPG
[92] Greater London Authority (2016) Housing SPG

as a strategic priority for housing delivery to be maximised on brownfield sites at transport nodes. It also proposes a 'threshold approach' set to 35% of affordable housing in terms of habitable rooms whereby *"schemes that do not meet this threshold or require public subsidy to do so will be required to submit detailed viability information which will be scrutinised and treated transparently"*.

Social Infrastructure SPG (2015)

10.2.13. The Mayor of London's Social Infrastructure SPG 2015[93] sets out guidance on identifying and evaluating the need for social infrastructure, including resources for assessing applications for social infrastructure. It emphasises the need for planning across services to ensure that social infrastructure meets the broader built environment aims of the London Plan.

Local Planning Policy

10.2.14. The Southwark Plan 2022[94] was recommended for approval at Cabinet on 7 December 2021, with final adoption at Cabinet on 23 February 2022. The Southwark Plan replaces a number of the Borough's policies, including the Core Strategy (2011)[95], saved Southwark Plan (2013) policies[96], and the Aylesbury Area Action Plan (2010)[97]

10.2.15. Strategic targets are identified for the delivery of quality social rented and intermediate homes, including:

- *"Aim to deliver at least 2,355 new homes every year.*
- *11,000 new council homes will be delivered by 2043 as part of the overall housing target.*
- *Aim to deliver 50% of all new homes as social rented and intermediate homes, with a minimum requirement of 35% (25% social rented and 10% intermediate) in planning applications".*

10.2.16. In Table A: 'Delivery in Vision Areas', Aylesbury is identified as having capacity to deliver a net total of 1,500 new homes, and Policy SP1 'Homes for all' emphasises the need to provide more good quality homes, particularly social rented and intermediate properties, and dwellings of different sizes.

10.2.17. Section AV.01 'Aylesbury Area Vision' identifies that development in the area should *"generate new neighbourhoods with a range of housing tenures and sizes that will attract existing residents to stay and new people to move in…"*, with dwellings suitable for residents at different life stages, with a range of community facilities, employment opportunities, and quality open spaces.

[93] Greater London Authority (2015) Social Infrastructure SPG
[94] London Borough of Southwark (2022) The Southwark Plan 2022
[95] London Borough of Southwark (2011) Local Plan, Core Strategy
[96] London Borough of Southwark (2013) The Southwark Plan
[97] London Borough of Southwark (2010) Aylesbury Area Action Plan

10.2.18. Policy P27 'Education Places' emphasises thar identified need for education facilities must be met, with new school places to be provided for new residents where there is demand.

10.2.19. Policy P28 'Access to Employment and Training' notes that for developments of 5,000m2 or more, training and jobs for local people must be provided as part of the construction stage. This aims to help overcome barriers to employment and improve workforce participation within the Borough.

10.2.20. Policy P57 'Open Space' identifies that 21% of the Borough is open space, providing an essential resource for residents. Development and regeneration provide the opportunity to deliver improved and new facilities for existing and future residents, and employees and visitors to the Borough.

Guidance

10.2.21. The following guidance documents have been used during the preparation of this Chapter:

- Homes and Community Agency (HCA) (2015) Employment Density Guide 3rd Edition[98]; and
- English Partnerships (2014) Additionality Guide 4th Edition[99].

10.3. Historic Assessment

10.3.1. An Environmental Statement was prepared in 2014 to support two separate planning applications for the regeneration of Aylesbury Estate. A Socio-economic assessment was undertaken for the Masterplan Application (Site Wide Development Option) referred to within this ES as the OPP and FDS. Planning permission was granted for both the applications in August 2015.

10.4. Assessment Methodology and Significance Criteria

Scope of the Assessment

10.4.1. The following elements are considered to have the potential to give rise to likely significant effects during construction of the Project and have therefore been considered within this assessment:

- Construction employment generation.

10.4.2. The following elements are considered to have the potential to give rise to likely significant effects during operation of the Project and have therefore been considered within this assessment:

- Operational Employment generation;
- Additional Local Spending;

[98] Homes and Community Agency (HCA) (2015) Employment Density Guide 3rd Edition
[99] English Partnerships (2014) Additionality Guide 4th Edition

- Provision of Housing;
- Local service demand (including primary and secondary education, and primary healthcare facilities); and
- Demand for open space and play space.

Extent of the Study Area

10.4.3. The study area for this Socio-economic assessment varies according to receptor. In the absence of statutory guidance on Socio-economic assessments, reference has been made to planning policy, best practice guidance, and professional judgement / experience. Those Socio-economic receptors for which some specific geographical parameters can be applied in relation to the Project site are outlined below.

10.4.4. The economic impact of the Project is considered relative to Greater London, as this represents the principal labour market catchment area. The LBS is highly accessible from all areas of Greater London, and is likely to be served by labour from all boroughs across Greater London. The Greater London labour market incorporates the population that may reasonably be expected to travel to and benefit from the Project.

10.4.5. The National Travel Survey 2020[100] states that the average distance travelled to school by primary school children in Greater London is 2.3km, and for secondary school children in Greater London is 2.7km. These catchments are the areas within which children are most likely to access education facilities, in proximity to their home address.

10.4.6. The Project Site is located within the NHS South East London Clinical Commissioning Group (CCG) area, and comprises GP surgeries from six boroughs: Bexley; Bromley; Greenwich; Lambeth; Lewisham; and Southwark. There is no standardised catchment area within which residents typically access GP or Dental services. As such, a 'typical' walking distance for central London locations (such as the Project) of 1km has been assumed, on the basis of past experience and professional judgement.

10.4.7. The proximity of the Project to pocket parks, small open space, local parks and district parks has been assessed, as per the GLA Open Space Hierarchy typologies outlined in the London Plan 2021.

10.4.8. Table 10.1 presents the different components of the assessment and the geographical scale at which they have been assessed. Catchments identified are proportionate to describe the likely significant Socio-economic effects.

Table 10.1 – Socio-economic Effects by Geographical Scale

Effect	Geographical Area of Effect	Rationale for Area of Effect
Employment generation during the construction phase (direct, indirect and induced effects)	Greater London	Census 2011 Origin and Destination Statistics

[100] Department for Transport (2020) National Travel Survey: England

Employment generation during the operational phase (direct, indirect and induced effects)	Greater London	Census 2011 Origin and Destination Statistics
Additional local spending	Greater London	Office for National Statistics Regional Statistics 2019-20
Provision of housing	Borough level	London Plan 2021 and the Southwark Plan 2022
Provision of affordable housing	Borough level	London Plan 2021 and the Southwark Plan 2022
Effect on capacity and demand for primary education	Average travel to school area (2.3km)	National Travel Survey 2020
Effect on capacity and demand for secondary education	Average travel to school area (2.7km)	National Travel Survey 2019
Effect on capacity and demand for primary healthcare – GP and Dentist provision	1km radius	Professional judgement and past experience
Provision of open space	0.4km, 1.2km, 3.2km	London Plan 2021
Provision of child play space	100m, 400m and 800m	London Plan 2021, GLA SPG 'Providing for Children and Young People's Play and Informal Recreation'

Consultation

10.4.9. No consultation activities have been undertaken in relation to Socio-economics and the preparation of this Chapter, beyond the Scoping exercise, as described below. Consultation is not typically required or undertaken for Socio-economics and this has been deemed appropriate for this report on the basis of the scope of this assessment.

10.4.10. An EIA Scoping Report was submitted to the LBS in October 2021 (see Appendix 2.1), which provided confirmation of the proposed scope of the Socio-economic assessment. In January 2022 LBS issued a review of the Scoping Report which was carried out by LUC. The LUC review of the Scoping Report stated that, 'The assessment methodology that will be applied to undertake the assessment is outlined in the Scoping Report, this is considered to be appropriate.' (See Appendix 2.2).

Method of Baseline Data Collation

10.4.11. A desk-based baseline data collection exercise has been undertaken which included a review of available information to determine the baseline conditions in the relevant geographical areas of effect. The following data sources have been reviewed:

- Office for National Statistics (ONS) NOMIS[101];
- English Indices of Deprivation 2019[102];
- NHS Choices services finder[103];
- Public Health England – Borough Health Profiles[104]; and
- Education and Skills Funding Agency, Capacity and Forecast Tables[105].

Education

10.4.12. The existing baseline education provision relevant to the Project has been assessed taking account of guidance published by the Audit Commission[106]. In terms of the availability of education places, the Audit Commission states that *"it is unrealistic and probably undesirable to aim for a perfect match at each school; a sensible approach would be to plan for a 95% occupancy rate at schools and accept some variation, say plus or minus 10% around this target"*.

10.4.13. The National Travel Survey 2020 states that the average distance travelled to school by primary school children in Greater London is 2.3km. Given the proximity of the Project Site with the neighbouring London Borough of Lambeth (LBL), the baseline for primary education considers schools in the LBS and LBL within 2.3km of the Project Site.

10.4.14. The National Travel Survey shows that secondary school children travel further to school and therefore it is appropriate to consider secondary school education provision on a wider geographical basis. The average distance travelled by secondary school children in Greater London is 2.7km. Transport links including London Underground and Overground services are more accessible to secondary school students compared with younger primary school students, and are likely to facilitate greater movement of secondary school age children. The baseline for secondary education considers all schools within 2.7km of the Project Site.

Primary Healthcare

10.4.15. The Project Site is located within the NHS South East London CCG area; the location within which the majority of residents at the Project Site are likely to access GP and dentist provision. There is no standardised catchment area within which residents typically access GP and dental services. As such, a 'typical' walking distance for central London of one kilometre (km) has been assumed within this Chapter.

Open and Recreational Space

[101] Office for National Statistics (2021) NOMIS
[102] Department for Communities and Local Government (2019) Indices of Multiple Deprivation
[103] NHS Choices Service Finder. [Online] accessed via https://www.nhs.uk/nhs-services/services-near-you/
[104] Public Health England (2020) Borough Health Profiles – Southwark
[105] Education and Skills Funding Agency (2020) Capacity and Forecast Tables
[106] Audit Commission (1996) Trading Places: The Supply and Allocation of School Places

10.4.16. The London Plan sets out a public open space hierarchy that provides Councils with benchmarks to assess their existing provision of open space (Table 10.2). The baseline presents a summary of the open space hierarchy within the London Plan which will be used to assess open space.

Table 10.2 – Public Open Space Hierarchy in London

Open Space Categorisation	Guidelines on Size of Site (ha)	Distances from Homes to Open Spaces (km)
Regional park	400	3.2 - 8
Metropolitan park	60	3.2
District park	20	1.2
Local parks and open spaces	2	0.4
Small open spaces	<2	<0.4
Pocket parks	<0.4	<0.4
Linear open spaces	Variable	Variable

10.4.17. The GLA's 'Shaping Neighbourhoods: Play and Informal Recreation' SPG provides guidelines on the maximum acceptable walking distances from child play spaces. The SPG states a recommended benchmark standard of 10m^2 of dedicated play space per child (any space to be accessible to the newly resident children and young people living within new developments). The SPG sets levels of accessibility to play space for new developments according to age groups. The baseline presents a summary of the child play space accessibility benchmarks (see Table 10.3) which will be used to assess play space.

Table 10.3 – Accessibility to Play Space (New Developments)

Age Group (years)	Maximum Walking Distance from Residential Unit (Taking into Account Barriers) (m)
Under 5	100
5-11	400
12+	800

Significance Criteria

10.4.18. The Socio-economic assessment seeks to establish the potential economic and social impacts of the Project and assesses these against the current baseline conditions. The impacts of the Project are considered at varying spatial levels according to the nature of the impact. This approach is consistent with the English Partnerships 'Additionality Guide, A Standard Approach to Assessing the Additional Effect of Projects, 4th Edition'.

10.4.19. A socio-economic receptor or resource, which generally include economic entities and users of social infrastructure provision, can experience a socio-economic effect in different ways, including:

- As an economic/financial gain or loss; and
- As a gain or loss of a resource or access to a resource.

10.4.20. The sensitivity of receptors has been identified on a case-by-case basis with reference to relevant guidance where applicable and/or by employing professional judgement; determination of sensitivity varies depending on the type of receptor.

10.4.21. There is no accepted definition of what constitutes a significant (or not significant) socio-economic effect. It is however recognised that classification of an effect reflects the relationship between the scale of an impact (magnitude) and the sensitivity (or value) of the affected resource or receptor.

10.4.22. As such Socio-economic effects are assessed on the basis of:

- Consideration of sensitivity to effects: specific values in terms of sensitivity are not attributed to socio-economic resources/receptors due to their diverse nature and scale, however the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor and, in particular, their ability to respond to change based on recent rates of change and turnover (if appropriate);
- Magnitude of the impact: this entails consideration of the size of the effect on people or business in the context of the area in which effects will be experienced; and
- Scope for adjustment or mitigation: the socio-economic study is concerned in part with economies. These adjust themselves continually to changes in supply and demand, and the scope for the changes brought about by the project to be accommodated by market adjustment will therefore be a criterion in assessing significance.

10.4.23. The assessment process aims to be objective and quantifies effects as far as possible. However, many socio-economic effects can only be evaluated on a qualitative basis. Effects are defined as follows:

- **Beneficial** classifications of significance indicate an advantageous or beneficial effect on an effect area, which may be minor, moderate, or major in effect;
- **Negligible** classifications of significance indicate imperceptible effects on an effect area; and
- **Adverse** classifications of significance indicate a disadvantageous or adverse effect on an effect area, which may be minor, moderate or major in effect.

10.4.24. Based on consideration of the above, where an effect is assessed as being beneficial or adverse, significance has been assigned using the scale below based on professional judgement:

- **Negligible:** no receptors (or very few) are beneficially or adversely affected. The effect is unlikely to make a measurable difference on the receptors in the relevant areas of effect;
- **Minor:** a small number of receptors are beneficially or adversely affected. The effect is likely to make a small measurable positive or negative difference on receptors in the relevant area(s) of effect;
- **Moderate:** a moderate number of receptors are beneficially or adversely affected. The effect is likely to make a measurable positive or negative difference on receptors in the relevant area(s) of effect; and
- **Major:** all or a large number of receptors are beneficially or adversely affected. The effect is likely to make a substantial positive or negative difference on receptors in the relevant area(s) of effect.

10.4.25. The duration of effect is also considered, with more weight given to permanent changes than to temporary ones. Temporary effects are considered to be those associated with the enabling, demolition and construction works, and may be short term (<1 year), medium term (1-4 years) or long term (5+ years). Permanent effects are generally those associated with the completed development and are expected to be non-reversible.

10.4.26. Effects that are deemed to be significant for the purposes of the Socio-economic assessment are those that are described as being moderate or major beneficial or adverse.

Limitations and Assumptions

10.4.27. The assessment of the significance of effects has been carried out against a benchmark of current Socio-economic baseline conditions prevailing around the Project Site. As with any dataset, these may be subject to change over time, which may influence the findings of the assessment and could lead to the assessment being subject to statistical time lag.

10.5. Baseline Conditions

10.5.1. Baseline data is presented (where relevant and available) for the LBS, and a comparison provided with Greater London and Great Britain as a whole.

Population

10.5.2. The 2020 ONS Population estimate for LBS was 320,000 residents, and for Greater London was 9,002,500 residents. The working age population (aged 16-64) as a percentage of the total resident population in LBS, Greater London and Great Britain is shown in Table 10.4.

Table 10.4 – Population aged 16-64 (% of the resident population)

Southwark	Greater London	Great Britain
72.5%	67.2%	62.4%

10.5.3. As shown above, the proportion of working age individuals aged 16-64 in LBS is slightly higher than both Greater London and Great Britain levels, indicating a concentration of working age individuals living in the Borough.

Employment and Economic Activity

10.5.4. The NOMIS Job Densities Report (Ref. 10.15), is available on a Local Authority-wide and sub-regional level and indicates the availability of employment and labour demand. As of 2020[107], the job density level (i.e. the ratio of total jobs to the population aged 16-64) in the LBS was 1.33. This is approximately 25% higher than the Greater London (0.99) level, and over one third higher than the Great Britain level (0.84) and indicates considerably greater employment opportunities within the Borough when compared with Greater London as a whole.

10.5.5. There were estimated to be 241,000 jobs in the LBS in 2020, of which 78.4% were full-time and 22.6% part-time. Table 10.5 shows the proportion of total employees working in each industry sector in 2020.

Table 10.5 – Proportion of total employees in each industry sector (2020)

Industry Sector	Southwark	Greater London	Great Britain
A: Agriculture, forestry and fishing	0.0	0.1	0.8
B: Mining and quarrying	0.0	0.0	0.2
C: Manufacturing	1.2	2.2	7.9
D: Electricity, gas, steam and air conditioning supply	0.5	0.3	0.5
E: Water supply; sewerage, waste management and remediation activities	0.1	0.4	0.7
F: Construction	1.5	3.3	4.8
G: Wholesale and retail trade; repair of motor vehicles and motorcycles	7.1	12.3	14.9
H: Transportation and storage	5.0	5.0	5.1
I: Accommodation and food service activities	6.2	7.5	7.2
J: Information and communication	10.0	7.8	4.5
K: Financial and insurance activities	2.9	7.5	3.5
L: Real estate activities	2.5	2.5	1.8
M: Professional, scientific and technical activities	22.8	13.2	8.7

[107] The most recently available data at the time of writing.

N: Administrative and support service activities	11.2	9.8	8.8
O: Public administration and defence; compulsory social security	5.8	4.7	4.6
P: Education	7.1	7.6	9.0
Q: Human health and social work activities	11.2	11.3	13.6
R: Arts, Entertainment and Recreation	1.9	2.3	2.2
S: Other service activities	2.9	2.3	1.9

10.5.6. **Error! Reference source not found.**10.5 shows that there Professional, Scientific and Technical; Administrative and Support; and Human Health and Social Work activities are the largest employment sectors within the Borough (22.8%, 11.2% and 11.2% respectively). There are some notable differences between the proportions of employees per sector when comparing LBS with Greater London, with almost twice the proportion of employees in the Professional, Scientific and Technical sector in the LBS than within Greater London. By comparison, the proportion of employees in Greater London within the Financial sector is over twice as high as within the LBS. Overall, the diversity of industries within the Borough includes both higher skilled employment sectors (such as education) and lower skilled sectors (such as Wholesale and Retail Trade).

Deprivation

10.5.7. The Indices of Multiple Deprivation uses a combination of information relating to seven 'domains': income; employment; health deprivation and disability; education, skills and training; barriers to housing; and crime and living environment to create an overall score of deprivation. Deprivation is scored between 1 and 317 (representing the 317 local authorities within England), with a score of 1 being most deprived and 317 being least deprived.

10.5.8. The Indices of Multiple Deprivation 2019 ranks the LBS 43rd of the 317 local authorities and falls within the top 15% most deprived areas within England. Southwark ranks 8th of the 33 Greater London Boroughs.

Housing

10.5.9. There are approximately 120,422 dwellings in the LBS based on 2021 Census projections. In terms of tenure, Census data reveals that 53.0% of dwellings within the LBS were privately owned or rented, a lower proportion compared with 73.3% in Greater London.

10.5.10. The Southwark 'Strategic Housing Market Assessment' (SHMA) Update was published in 2019[108], commissioned by the Borough to replace the 2014 combined SHMA covering the

[108] London Borough of Southwark (2019) Strategic Housing Market Assessment

South East London sub-region (Greenwich, Bexley, Bromley, Lewisham and Southwark). The 2019 update noted that the levels of new housing completions in Southwark over the previous five-year period were *"well below"* the delivery targets and assessed need in the Borough. The demand for affordable homes is projected to continue rising, and the ongoing need for affordable homes within Greater London is reflected in the London Plan Policy H4, which outlines targets for provision of 50% affordable housing on sites of 10 or more units.

Education

Primary Education

10.5.11. All children are required to attend primary schools from the September following their fourth birthday (although it is possible to defer a year in some instances) and it is the responsibility of the local education authority to ensure that sufficient primary education places are available. Primary education is provided in a variety of local authority managed settings.

10.5.12. As per the Educaion and Skills Funding Agency, within 2.3km of the Project Site there are 55 primary schools: 20 community schools; 22 voluntary aided schools; five foundation schools; four academy converter schools; two academy sponsor schools; and two free schools. Table 10.6 outlines the difference between the school capacity and the number of pupils enrolled in a school (roll) and indicates whether the provision of school places is over or under capacity. The Department for Education (DfE) data for the 2020 school year (the most recently available data at the time of writing) indicates that there was a total surplus of 2,406 primary education places. If it is assumed that 95% occupancy of school places should be planned for, as per the Audit Commission Guidance and therefore that a 95% occupancy rate means a school has no further capacity[109], there remains a considerable surplus of 1,768 places for primary school children living within 2.3km of the Project Site.

10.5.13. Of the 55 primary schools within 2.3km of the Project Site, 13 of these are located within 1km (the closest of which is Surrey Square Primary School, approximately 0.2km away). Nine of these schools have some surplus available capacity, amounting to 588 places (or 461 places if a 95% occupancy rate is used, as per Audit Commission guidance). Robert Browning Primary School has the greatest number of available places (179, or 158 if assuming 95% capacity) and is located approximately 0.5km from the Project Site. As such, there is a reasonable availability of primary education places at present, both at a local level within 1km of the Project Site, and at the wider catchment level of 2.3km.

Table 10.6 – Rolls and Capacities of Primary Schools within 2.3km

Primary School	Capacity	Roll	Surplus / Deficit	Surplus / Deficit @ 95%	Distance from the Project

[109] Schools which have less than 5% capacity have been assumed to have zero surplus capa-1city and schools with surplus capacity have had a 5% reduction applied to their capacity to account for the fact that they wou-60ld considered to be full at 95% capacity.

					Site (straight line) (km)
Surrey Square Primary School	420	469	-49	-49	0.2
Michael Faraday Community School	420	460	-40	-40	0.3
St Peter's Church of England Primary School	210	192	18	8	0.4
Robert Browning Primary School	420	241	179	158	0.5
Townsend Primary School	210	176	34	24	0.6
Victory Primary School	210	140	70	60	0.8
St George's Church of England Primary School	210	153	57	47	0.8
St Paul's CofE	315	234	81	65	0.9
Angel Oak Academy	420	421	-1	-1	0.9
John Ruskin Primary School	420	497	-77	-77	0.9
Grange primary	420	395	25	4	1.0
Brunswick Park Primary	525	402	123	97	1.0
Boutcher Church of England Primary School	210	209	1	0	1.0
Crampton Primary	210	205	5	0	1.1
Keyworth Primary	210	376	-166	-166	1.3
Comber Grove Community School	315	257	58	42	1.3
St Joseph's Catholic Infant School	180	162	18	9	1.3
Oliver Goldsmith Primary	420	404	16	0	1.5
John Keats Primary School	420	74	346	325	1.5
St John the Divine Church of England Primary School	210	187	23	13	1.5
St Francis RC Primary	420	412	8	0	1.5
Camelot Primary	555	392	163	135	1.7

Charlotte Sharman Primary	420	239	181	160	1.7
Charles Dickens Primary School	420	483	-63	-63	1.7
Archbishop Sumner School	210	398	-188	-188	1.7
St Jude's Church of England Primary School	210	198	12	2	1.7
St James' Church of England Primary School	480	551	-71	-71	1.7
St James the Great Roman Catholic Primary School	210	234	-24	-24	1.7
Crawford Primary	630	533	97	66	1.8
The Cathedral School of St Saviour and St Mary Overy	210	221	-11	-11	1.8
Saint Joseph's Catholic Primary School	210	227	-17	-17	1.8
St Joseph's Roman Catholic Primary School	315	343	-28	-28	1.8
Harris Primary Academy Peckahm Park	420	338	82	61	1.8
Henry Fawcett Primary	420	324	96	75	1.9
Lyndhurst Primary School	420	427	-7	-7	1.9
St George's Cathedral Catholic Primary School	420	216	204	183	1.9
Walnut Tree Walk Primary	350	279	71	54	2.0
Ashmole Primary	210	226	-16	-16	2.0
Friars Primary Foundation School	210	198	12	2	2.0
Christ Church Primary	210	207	3	0	2.0
Van Gough Primary	875	570	305	261	2.2
Pilgrims' Way Primary	210	227	-17	-17	2.2
Vauxhall Primary	210	236	-26	-26	2.2
St Mark's CofE	210	218	-8	-8	2.2
Oasis Academy Johanna	240	217	23	11	2.3

John Donne Primary School	480	470	10	0	2.3
Loughborough Primary	567	373	194	166	2.3
Reay Primary School	210	242	-32	-32	2.3
St Anne's Catholic Primary	420	384	36	15	2.3
Dog Kennel Hill School	450	397	53	31	2.3
The Belham Primary School	420	350	70	49	2.3
St John's Angell Town Church of England Primary School	630	216	414	383	2.3
St Mary Magdalene Church of England Primary School	240	157	83	71	2.3
English Martyrs Roman Catholic Primary School	420	335	85	64	2.3
St Stephen's CofE	210	219	-9	-9	2.3
Total	**19,117**	**16,711**	**2,406**	**1,786**	**-**

Secondary Education

10.5.14. Secondary schools typically provide education for children between the ages of 11-18. All children are required to stay in education (or training) until the age of 18 and can also choose to study at a higher education college or skills centre. Similar to primary schools, secondary education is provided in a variety of local authority managed settings.

10.5.15. Within 2.7km of the Project Site there are 19 secondary schools, as outlined in Table 10.7. There are seven academy sponsor schools, three academy converter schools, four free schools, four voluntary aided schools, and one community school. The DfE data for the 2020 school year (the most recently available data at the time of writing) indicates that there was a total surplus of 2,307 secondary education places. If it is assumed that 95% occupancy of school places should be planned for, as per the Audit Commission Guidance, there remains a considerable total surplus of 1,762 places for secondary school children living within 2.7km of the Project Site.

10.5.16. Of the 19 secondary schools within 2.7km of the Project Site, three of these are located within 1km. Two of these schools have some surplus available capacity, amounting to 256 places (or 155 places if a 95% occupancy rate is used, as per Audit Commission guidance. The closest school is South Bank University Academy of Engineering, approximately 0.2km away, however it is currently oversubscribed and does not have any available capacity. Ark Walworth Academy has the greatest number of available places (177, or 117 if assuming 95% capacity) and is located approximately 0.5km from the Project Site. As such, there is some availability of secondary education places at present, both at a local level within 1km of the Project Site, and at the wider catchment level of 2.7km.

Table 10.7 – Rolls and Capacities of Secondary Schools within 2.7km

Primary School	Capacity	Roll	Surplus / Deficit	Surplus / Deficit @ 95%	Distance from the Project Site (straight line) (km)
South Bank University Academy of Engineering	600	751	-151	-151	0.2
Ark Walworth Academy	1,200	1,023	177	117	0.5
St Saviour's and St Olave's Church of England School	825	746	79	38	0.8
Harris Academy Bermondsey	1,150	851	299	242	1.2
Ark All Saints Academy	800	602	198	158	1.4
Sacred Heart Catholic School	750	864	-114	-114	1.5
City of London Academy (Southwark)	1,500	1,450	50	0	1.5
Saint Gabriel's College	600	565	35	5	1.7
Notre Dame Roman Catholic Girls' School	620	614	6	0	1.8
St Michael's Catholic College	900	894	6	0	1.9
Haberdashers' Aske's Borough Academy	420	175	245	224	1.9
Compass School Southwark	600	391	209	179	1.9
Archbishop Tenison's School	517	335	182	156	2.1
Lilian Baylis Technology School	838	808	30	0	2.2
Oasis Academy South Bank	730	699	31	0	2.2
The St Thomas the Apostle College	860	1,000	-140	-140	2.4
Platanos College	1,000	1,002	-2	-2	2.5

The Charter School East Dulwich	1,130	597	533	477	2.7
Ark Evelyn Grace Academy	1,200	566	634	574	2.7
Total	**16,240**	**13,933**	**2,307**	**1,762**	**-**

Primary Healthcare

10.5.17. Public Health England produces health profiles for each local authority in England. The 2020 local authority health profile for the LBS (the most recently available at the time of writing) indicates that the health status of the population is broadly similar when compared with the England average.

10.5.18. The LBS performed significantly better than England for a number of health indicators including: female life expectancy; hospital admissions for some conditions; smoking rates; physical activity; and obesity. For a number of measures however, the LBS performed significantly worse than the England average, including: mortality rates for under 75 year olds; diabetes rates; and childhood obesity.

GPs

10.5.19. There are seven GP surgeries located within 1km of the Project Site (considered to be a typical walking distance), all of which accepting new patients. At these surgeries there are a total of 20 Full Time Equivalent (FTE) GPs and 43,952 registered patients[110] (Ref. 10.22). The average number of patients per FTE GP at these practices is 2,198 which is somewhat higher than the England average ratio of 1,800 patients per GP, as recommended by the Department of Health[111]. The Dun Cow Surgery and Manor Place Surgery have not published data regarding the number of FTE GPs or registered patients, and therefore cannot be compared to the England average ratio of patients per GP.

Table 10.8 – GP Surgeries within 1km of the Project Site

Name	FTE GPs	Registered Patients	Patients per FTE GP
Penrose Surgery	4.9	13,910	2,839
The Dun Cow Surgery	-	-	-
Old Kent Road Surgery	3.95	10,482	2,654
East Street Surgery	4.03	7,405	1,837
The Trafalgar Surgery	1.07	3,950	3,692
Villa Street Surgery	6.05	8,205	1,356
Manor Place Surgery	-	-	-

[110] NHS Digital Information Service: GP Workforce practice data (2020)
[111] NHS London Healthy Urban Development Unit (HUDU), (2007); HUDU Planning Contribution

Total	**20.0**	**43,952**	**2,198**

Open Space

10.5.20. The Southwark Plan 22 emphasises that the Council's strategy for open spaces centres on the protection of all existing open space, with new spaces and extensions proposed across the Borough to ensure that parks and open spaces meet the needs of a growing and changing population. Open space is protected as Metropolitan Open Land, Borough Open Land or Other Open Space in the Southwark Plan. The Aylesbury Area is identified as a location for new 'green fingers' which will provide new open space for residents and enhance the connections with Burgess Park and Surrey Square Park.

10.5.21. Table 10.9 identifies existing areas of open space within varying distances of the Project Site, in line with GLA Guidance. There are three Small Open Spaces and one Local Park within 0.4km of the Project Site, and two District Darks within 1.2km of the Project Site; all of which provide landscaped public space for active and passive recreation, incorporating benches, planting, and paths.

Table 10.9 – Open Spaces surrounding the Project Site

Open Space Categorisation	Guidelines on the size of open space (ha)	Distance from the Project to open space (km)	Name of open space
Regional Parks	400	3.2-8	Dulwich Park
Metropolitan Parks	60	3.2	Peckham Rye Common Nunhead Cemetery
District Parks	20	1.2	Burgess Park Kennington Park
Local Parks and Open Spaces	2	0.4	Salisbury Row Park
Small Open Spaces	<2	<0.4	Surrey Square Park Nursery Row Park Faraday Gardens
Pocket Parks	0.4	<0.4	-

Play Space

10.5.22. Table 10.10 gives the details of the existing play spaces located within 800m of the Project Site. Surrey Square Playground and the equipped play areas off Kinglake Street and Beaconsfield Road are all situated approximately 100m from the Project Site and contain equipped play areas suitable for 0-5 year olds and 5–11-year-olds. Within 400m there are three

parks with playgrounds, including Burgess Park which offers two different play areas including adventure play facilities and a BMX track suitable for older children. Salisbury Row Park (approximately 500m from the Project Site) also offers play facilities for 0-5 and 5-11 year olds, however this is beyond the recommended walking distance for these age groups to access play facilities.

10.5.23. There is a Multi-Use Games Areas (MUGA) for older age children at the Kinglake Street playground, offering a sports court with football goals. There are also several equipped play facilities within the recommended walking distances outlined within the GLA's SPG Shaping Play and Children's Recreation for 12+ year olds.

Table 10.10 – Play spaces within 1km of the Project Site

Maximum walking distance from Site (m)	Name of space and facilities	Age group served
100	Surrey Square Park (equipped play space for 0-5 and 5-11 year olds) Kinglake Street (equipped play space for younger children, likely to be suitable for 0-5 year olds and 5-11 year olds) Beaconsfield Road (equipped play space for younger children, likely to be suitable for 0-5 year olds and 5-11 year olds)	Under 5 years
400	Faraday Gardens (equipped play space for 0-5 and 5-11 year olds) Nursery Row Park (equipped play space for 0-5 and 5-11 year olds) Burgess Park (equipped play space for 0-5, 5-11 year olds, and 12+ year olds including adventure play and a BMX track)	5-11 years
800	Kinglake Street MUGA (sports court with football goals which could also be used for other court sports)	12+ years

Future Baseline

10.5.24. The Project Site is located in the southeast of the Aylesbury Regeneration Area. The principle of the regeneration of this area has been established within local planning policy and through the grant of outline planning permission (reference 14/AP/3844) for the phased redevelopment of the Aylesbury Estate to provide a mixed use development of up to 2,745 residential units, employment, retail and community floorspace. As set out within the Southwark Plan (2022),

the Project Site is within an area designated as the Aylesbury Area Action Core - Phase 2. The Project Site comprises the southern part of Phase 2, known as Phase 2B.

10.5.25. While much of the Project sits within the boundary of the outline planning permission, the Project is a standalone scheme which builds upon the principles established within the OPP masterplan and comprises a high quality development that will contribute towards the regeneration of the wider Aylesbury Estate. Assuming the Project comes forward, it will comprise the second major phase of the wider Aylesbury Estate regeneration; some of the residential component of the Project Site will already be partly complete and built out.

10.5.26. It is anticipated that in the absence of the Project, a number of demographic factors would be likely to change due to natural fluctuation and change, including total population and a proportion of working age, with population trends also seeing an ageing population who may place a greater demand of local services such as healthcare.

10.5.27. In terms of demand for housing and local services, these are likely to continue in line with projected population growth, with a continuing need to provide education and healthcare provision. This is particularly likely given the Borough's significant housing delivery targets in the London Plan 2021 over the next 25 years.

10.5.28. In terms of economic growth, LBS is a Greater London borough with a strong economy. It is likely to continue growing, with inward investment and business location expected to remain strong.

10.6. Assessment of Effects, Mitigation and Residual Effects

Demolition and Construction

Generation of Direct, Indirect and Induced Construction Employment

10.6.1. Construction employment (including demolition) represents a positive economic effect that can be estimated as a function of the scale and type of construction (infrastructure and buildings). The following section estimates gross employment arising from the Project during the demolition and construction phase and then takes into account leakage, displacement and multiplier effects in order to assess the net effects on construction employment for the Greater London economy.

Gross Direct Demolition and Construction Employment

10.6.2. The estimated enabling works, demolition and construction period is approximately four years and six months. The construction work is not permanent and therefore the effect will be temporary and medium-term in nature. The capital and revenue expenditure involved in the construction period will lead to increased output in the Borough, Greater London and the wider regional economy.

10.6.3. Applying an average gross output per construction industry employee[112] (Ref. 10.24) to the estimated total construction cost, as outlined in the Methodology, it is therefore estimated that there are likely to be 637 Full Time Equivalent (FTE)[113] gross construction employees per annum on the Project Site during the demolition and construction phase.

Net Additional Construction Employment

10.6.4. Table 10.11 presents the temporary employment generated by the Project taking leakage, displacement and multiplier effects into account. The total net additional employment created within Greater London as a result of the Project is estimated to be 639 employees per annum, whilst 174 jobs will be created outside of London, resulting in a total net employment generation of 813 jobs on average per annum during the construction period.

Table 10.11 – Construction Employment Generation Per Annum[114]

FTE Employment Generation	Greater London	Outside London	Total
Gross Direct Employment	501	136	637
Displacement	-125	-34	-159
Net Direct Employment	376	102	478
Net Indirect and Induced Employment	263	72	335
Total Net Employment	**639**	**174**	**813**

10.6.5. In the context of a large labour pool of construction workers in Greater London, the direct, indirect and induced employment, expenditure and upskilling created by the demolition and construction phase of the Project is likely to have a direct, temporary, medium-term minor beneficial (not significant) effect on the Greater London economy prior to the implementation of mitigation measures.

Mitigation

10.6.6. There are no mitigation measures required or proposed for Socio-economics in relation to construction employment generation. It is not considered appropriate for there to be any monitoring arrangements.

[112] Office for National Statistics (2021) Business Register and Employment Survey - GB level employment (thousands) by Broad Industry Group
[113] Full Time Equivalent equates to the number of employees working a 'full' five-day week, given that not all employees will work full time. As such, FTE is used rather than headcount to present accurately the level of employment generation which could suggest a higher employee number than actually exists.
[114] Source: WSP calculations

Residual Effect

10.6.7. Given there is no mitigation in relation to construction employment for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, temporary, medium-term minor beneficial (not significant) residual effect on the Greater London economy.

Operation

Changes to employment during operation

10.6.8. The Project will generate long-term jobs once it is complete and operational. In estimating operational job generation, it is important to consider not just the gross effects of the Project, but also net effects taking into account leakage, displacement and multiplier effects.

Gross Direct Operational Employment

10.6.9. The Applicant is seeking to provide a total of 414m² Gross Internal Area (GIA) flexible floorspace for use classes F1/2 Community and Learning employment floorspace and E Commercial, Business and Service employment floorspace. Class E employment floorspace was introduced via a change to the Use Classes Order 1987[115] in 2020; combining the former classes of A1 (shops), A2 (financial and professional institutions), A3 (restaurants and cafes), as well as some D1 (non-residential) and D2 (assembly and leisure) space. Employment densities in the HCA Employment Densities Guide have not yet been updated to reflect this change. Therefore, for the purposes of assessing a 'worst-case scenario'for employment generation in Socio-economic terms, the employment density which is likely to yield the lowest number of employees for the Class E and F floorspace (in line with the HCA Employment Densities Guide - 3rd Edition 2015) has been applied. This is a density of 20 employees / m² NIA floorspace[116].

10.6.10. When the Project is complete and operational, the employment floorspace on-site is estimated to support an estimated 16.6 gross FTE jobs on-site, as presented in Table 10.12.

Table 10.12 – Gross Direct Operational Employment Generation[117]

Use Class	Floorspace (m²)	Employment Density (per m²)	Gross Direct FTE Employment
Flexible Class E: Commercial, Business and Service / Class F1/2: Community and Learning	331.2m² NIA	20	16.6

[115] UK Government (1987) The Town and Country Planning (Use Classes) Order 1987
[116] The 414m² GIA has been converted to Net Internal Area (NIA) for the purposes of undertaking employment generation calculations, based on the HCA Employment Densities Guide. This results in a NIA of 324.4m².
[117] Source: WSP calculations

10.6.11. The Project also provides 66.13m² ancillary floorspace in association with the Class E floorspace, however; in line with the uses outlined in the HCA Employment Densities Guide this is not considered to be employment generating space and has therefore not been included in employment calculations.

Total Net Employment

10.6.12. Assuming a leakage of 21.4% outside Greater London, a low level of displacement, and a 1.7 multiplier, it is estimated that the Project will result in the creation of an estimated 20.9 net additional jobs, of which 16.5 are estimated to be taken up by residents of Greater London, and 4.4 by residents outside Greater London (Table 10.13).

Table 10.13 – Net Additional Operational Employment Generation

FTE Employment Generation	Greater London	Outside London	Total
Gross Direct Employment	13.0	3.5	16.5
Displacement	-3.3	-0.9	-4.2
Net Direct Employment	9.7	2.6	12.3
Net Indirect and Induced Employment	6.8	1.8	8.6
Total Net Employment	**16.5**	**4.4**	**20.9**

10.6.13. Taking into account the additional net direct, indirect, and induced employment created by the employment generating floorspace, it is assessed that the Project is likely to have a direct, permanent, long-term negligible (not significant) effect on the Greater London economy prior to the implementation of mitigation measures.

Mitigation

10.6.14. There are no mitigation measures required or proposed for Socio-economics in relation to operational employment generation. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.15. Given there is no mitigation in relation to construction employment for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term negligible (not significant) residual effect on the Greater London economy.

Local Spend

10.6.16. To estimate the effect of the Project in terms of additional local expenditure, average weekly spending figures for residents in Greater London have been applied to the accommodation schedule. The likely number of residents arising from the Project has been calculated based on the GLA Population Calculator[118].

10.6.17. With regard to the existing tenants on the Project Site, it is the LBS' intention to rehouse the existing secure tenants and those in temporary accommodation within the First Development Site Contract A, which is due to complete in 2023. The proposed social rented housing on the Phase 2B Site (the Project Site) will provide homes for tenants currently living in Phase 4 of the Aylesbury Estate (located to the west of Phase 2B as identified within the Southwark Plan). To ensure a conservative estimate of new local spending arising from the Project, it is assumed that residents of social rented units will already reside in Greater London (due to the way that local authority housing lists operate) and therefore residents of social rented units are discounted from local spend calculations. It is also assumed that some residents moving to the new private and intermediate homes would already be residents in Greater London and would not generate new net expenditure. To account for this, a displacement rate of 25% has been applied based on English Partnerships Additionality Guidance.

10.6.18. The Project will provide a total of 614 residential dwellings, as outlined in the Accommodation Schedule in Table 10.14. On the basis of the Accommodation Schedule, the Project will support approximately 1,475 residents (Table 10.15).

Table 10.14 – Accommodation Schedule

Dwelling Size	Market	Shared Ownership	Social Rent	Total
1 bedroom	161	31	26	**218**
2 bedroom	199	46	47	**292**
3 bedroom	9	5	37	**51**
4 bedroom	-	-	50	**50**
5 bedroom	-	-	3	**3**
Total	**369**	**82**	**163**	**614**

Table 10.15 – Estimated Number of Residents at the Project[119]

Dwelling Size	Market	Shared Ownership	Social Rent	Total
1 bedroom	239	46	41	**326**
2 bedroom	389	90	122	**601**

[118] Greater London Authority (2019) Population Yield Calculator
[119] Source: WSP calculations.

3 bedroom	25	14	152	**191**
4 bedroom	-	-	287	**287**
5 bedroom	-	-	17	**17**
Total	**653**	**150**	**620**	**1,423**

10.6.19. Applying ONS annual household spending estimates per person, by region (£13,052)[120] (Ref. 10.27) to the estimated 803 residents projected to reside in the market and shared ownership dwellings results in a total net benefit (taking displacement and leakage into account) of approximately £7.1 million (m) per annum, as outlined in Table 10.17.

Table 10.16 – Direct, Indirect, and Induced Spend per person[121]

	Gross Direct Expenditure	Net Direct Expenditure (applying displacement of 0.25)	Net Indirect expenditure (applying leakage of 0.10)	Total Net Expenditure per person
Total spending (£)	13,052	9,789	979	8,810

Table 10.17 – Direct, Indirect and Induced Spend from Market and Intermediate Residents at the Project in Greater London[122]

	Gross Direct Expenditure	Net Direct Expenditure (applying displacement of 0.25)	Net Indirect expenditure (applying leakage of 0.10)	Total Net Expenditure per person
Total spending (£)	10,480,756	7,860,567	786,057	7,074,510

10.6.20. Taking into account the additional net direct, indirect, and induced spend generated by residents at the Project, it is assessed that the Project is likely to have a direct, permanent, long term minor beneficial (not significant) effect on the Greater London economy prior to the implementation of mitigation measures.

[120] Office for National Statistics (2021) Household Spending

[121] Source: Household expenditure by region, 2020-2021, Office for National Statistics

[122] Source: WSP calculations

Mitigation

10.6.21. There are no mitigation measures required or proposed for Socio-economics in relation to additional local spend. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.22. Given there is no mitigation in relation to additional local spending for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term minor beneficial (not significant) residual effect on the Greater London economy.

Effect on Schools

10.6.23. For the purposes of this assessment, child occupancy rates contained within the GLA Population Calculator have been applied to the accommodation schedule for the Project (with discounts applied to take account of leakage to private schools and attendance in other boroughs) to calculate the number of children requiring primary and secondary school places.

10.6.24. The estimated child yields for education have been based on the accommodation schedule outlined in Table 10.14, with the resultant demand for education places outlined in Table 10.18 below.

Table 10.18 – Estimated Child Yields for Education Demand[123]

	Primary Education Places	Secondary Education Places	Total
Child Yield for Education	39	30	68

Primary Education Provision

10.6.25. With respect to primary school places the baseline analysis shows that there is currently a surplus of 2,406 primary school places in the LBS within 2.3km of the Project Site or a surplus of 1,768 places if a school is deemed at capacity if 95% of their places are taken up (as per Audit Commission guidance). In the locality surrounding the Project Site, there are 13 primary schools located within 1km with a surplus of 588 places (or a surplus of 461 places if 95% capacity is used).

10.6.26. The LBS Infrastructure Plan (IP)[124] was updated in 2017 and notes that at the time of writing, expansions to provide an additional 19 Forms of Entry[125] (FE) were underway. The IP notes that *"there is an anticipated 8FE additional need over and above this required by 2024/2025"* however does not specify the locations within the Borough where these FE are projected to be

[123] Source: WSP calculations

[124] London Borough of Southwark (2017) Infrastructure Plan

[125] A Form of Entry equates to one class of 30 pupils.

required. While there has been no update to the IDP since 2017, it can be assumed that given continued population growth and a steady increase in birth rates, combined with increased rates of residential development, there is still likely to be considerable demand for new forms of entry which the Borough are continuing to plan for.

10.6.27. While the IP indicates that demand for primary education at schools in the Borough could continue in the long term, the construction period for the Project is projected to last until spring 2026. As such, estimating the availability of additional capacity and any surplus primary places to meet demand based on current capacity (also taking account of the fact that funding availability may change, and any planned schools may not come forward) is difficult.

10.6.28. Overall, there is currently a reasonable level of capacity at primary schools within 2.3km of the Project Site to accommodate the 39 additional primary aged children projected to reside at the Project (see Table 10.18) without placing significant pressure on existing capacity. Whilst the two closest primary schools to the Project Site (0.2km and 0.3km respectively) do not have available capacity, St Peter's Church of England Primary School (0.4km) has 18 available places (or eight places at 95% capacity) and Robert Browning Primary School (0.5km) has 179 available places (or 158 places at 95% capacity). On the basis that not all children residing at the Project Site are likely to attend the same primary school, and that there is an overall reasonable level of capacity within the locality, and a good level of capacity within 2.3km of the Project Site, it is therefore assessed that the increased demand for primary education places generated by the Project will have a direct, permanent, long term negligible (not significant) effect on primary education provision in the LBS prior to the implementation of mitigation measures.

Mitigation

10.6.29. There are no mitigation measures required or proposed for Socio-economics in relation to the demand for primary education places. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.30. Given there is no mitigation in relation to primary education provision for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term negligible (not significant) residual effect on meeting primary education provision in the LBS.

Secondary Education Provision

10.6.31. With respect to secondary school places the baseline analysis shows that there is currently a surplus of 2,307 primary school places in the LBS within 2.7km of the Project Site, and there will remain a surplus of 1,762 places if a school is deemed at capacity if 95% of their places are taken up. In the locality surrounding the Project Site, there are three secondary schools located within 1km with a surplus of 177 places (or a surplus of 117 places if 95% capacity is used).

10.6.32. The LBS IP notes that an additional 6FE would be required to meet demand by 2019/20, however gives no further projections of need in the longer term. It is assumed that there are fewer long-term pressures on the availability of secondary education places, due to these secondary expansions having taking place.

10.6.33. Overall, there is currently a reasonable level of capacity at secondary schools within 2.7km of the Project Site to accommodate the additional 30 secondary age children projected to reside at the Project without placing significant pressure on existing capacity. Whilst the closest secondary school to the Project Site (0.2km) does not have available capacity, Ark Walworth Academy (0.5km) has 177 available places (or 117 places at 95% capacity) and St Saviour's and St Olave's Church of England School (0.8km) has 79 available places (or 38 places at 95% capacity). On the basis that not all children residing at the Project Site are likely to attend the same secondary school, and that there is an overall reasonable level of capacity within the locality, and a good level of capacity within 2.7km of the Project Site, it is therefore assessed that the increased demand for secondary education places generated by the Project will have a direct, permanent, long term negligible (not significant) effect on secondary education provision in the LBS prior to the implementation of mitigation measures.

Mitigation

10.6.34. There are no mitigation measures required or proposed for Socio-economics in relation to the demand for secondary education places. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.35. Given there is no mitigation in relation to secondary education provision for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term negligible (not significant) residual effect on meeting secondary education provision in the LBS.

Effect on Health

GPs

10.6.36. There are currently seven GP surgeries located within 1km of the Project Site (considered to be a typical walking distance), with a total of 20 FTE GPs and an average list size of 2,198 registered patients; a higher (i.e. worse) level of provision than the 1,800 patients per GP England average as outlined by the Department of Health.

10.6.37. The accommodation schedule will give rise to a projected population yield of 1,423 residents. Taking a 'worst-case scenario' in which all new residents register with a local GP, the additional residents would increase the overall practice list size to 2,269 patients per GP which is an increase of 71 patients per GP.

10.6.38. It is therefore assessed that the increased demand for primary healthcare provision generated by the Project will have a direct, permanent, long term minor adverse (not significant) effect on GP services in the LBS prior to the implementation of mitigation measures.

Mitigation

10.6.39. It is proposed that Socio-economic mitigation in relation to the demand for primary healthcare could take the form of s106 contributions from new development (such as the Project) to fund new or enhanced GP provision. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.40. If it is assumed that mitigation in the form of s106 contributions is provided by the Applicant which will serve to reduce the impact of the Project on the demand for GP provision, therefore there is likely to be a direct, permanent, long-term negligible (not significant) residual effect on meeting GP provision in the LBS following mitigation.

Effect on Housing Needs

Housing

10.6.41. It is the LBS' intention to rehouse the existing secure tenants remaining on-site (estimated to be 84 residents remaining) and those in temporary accommodation within the First Development Site Contract A, which is due to complete in 2023. The proposed social rented housing on the Phase 2B Site (the Project Site) will provide homes for tenants currently living in Phase 4 of the Aylesbury Estate (located to the west of Phase 2B as identified within the Southwark Plan). A proportion of the Phase 2B residential units are therefore facilitating the delivery of future phases of the wider Aylesbury Estate regeneration.

10.6.42. The London Plan 2021 outlines a target for delivery of 2,355 additional homes within the LBS per annum over the period to 2028/29. The Project will contribute to meeting housing delivery targets by adding 369 net market dwellings to the existing stock of the LBS, which represents 15.6% of the annual target outlined in the London Plan.

Affordable Housing

10.6.43. The London Plan does not outline a strategic, London-wide target for affordable housing provision; however, it notes that *"the maximum reasonable amount of affordable housing should be sought"*, with an average of 50% affordable housing delivery on sites of 10 units or more, with a range of homes of different sizes. Affordable housing is made up of homes subsidised below market values, which at the Project comprises shared ownership and social rented dwellings. The Project will deliver 245 gross affordable dwellings; 82 shared ownership units and 163 social rented units.

10.6.44. As outlined above however, the proposed social rented housing to be delivered by the Project will provide homes for tenants currently living in Phase 4 of the Aylesbury Estate. The Project

will therefore deliver a total of 82 net affordable dwellings, all of which are shared ownership tenure. On the basis of London Plan delivery targets (assuming a target of 50% of the annual 2,355 homes per annum to be delivered within the LBS should be affordable) the net units at the Project provides 7% of the Borough's annual affordable housing provision target.

10.6.45. Overall, it is assessed that the provision of housing and affordable housing of different sizes will have a direct, permanent, long term moderate beneficial (significant) effect on meeting the annual target for new housing provision in the LBS prior to the implementation of mitigation measures.

Mitigation

10.6.46. There are no mitigation measures required or proposed for Socio-economics in relation to the provision of housing and affordable housing. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.47. Given there is no mitigation in relation to housing or affordable housing provision for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term moderate beneficial (significant) residual effect on meeting the target for new housing provision in the LBS.

Open and Play Space

Open Space

10.6.48. Public and communal open spaces will be created across the Project Site to serve the 1,475 new residents who will reside at the Project. These spaces comprise a total of c.4,275m^2 new provision which will be linked by a landscaped amenity space and streetscapes, and include:

- Communal amenity space within Blocks 4A, 4B, and 4D – 1,940m2
- A communal courtyard within Block 5A – c.940m2;
- Communal podium amenity space on Block 5A – c.895m2;
- A communal garden within Block 5C – c.415m2; and
- A roof terrace on Block 5C – c.85m2.

10.6.49. These spaces have been designed to have a distinctive character with a range of outdoor environments including areas of raised planting, seating, and flexible hard landscaping space. The new open space will provide active and passive relaxation space for new and existing local residents.

10.6.50. In light of the proposed provision of landscaped open and amenity space, it is therefore assessed that the Prop. Project will have a direct, permanent, long term minor beneficial (not significant) effect on open space provision in the locality, prior to the implementation of mitigation measures.

Mitigation

10.6.51. There are no mitigation measures proposed for Socio-economics in relation to open space provision. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.52. Given there is no mitigation in relation to open space provision for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term minor beneficial (not significant) residual effect on open space provision local to the Project Site.

Play Space

10.6.53. The GLA's SPG recommends that 10m^2 of play and recreation space per child should be provided for children and young people in new developments. In order to calculate the estimated number of children aged 0-17 residing within the Project, the GLA Population Yield Calculator has been used to obtain the child yield arising from the Project. It should be noted that this method differs to that used to calculate education requirements, and results in an estimated 378 children projected to reside at the Project.

10.6.54. Applying GLA Play Space Guidance there is a requirement for 3,201.5m^2 of play space to serve the 320 children aged 0-17 projected to reside within the Project. There is a total of 3,202m^2 play and playable space provided at the Project to serve all age groups:

- 0-5 year olds: 1,186m2
- 5-11 year olds: 1,033m2
- 12+ year olds: 983m2

10.6.55. All play areas have been carefully designed to be inclusive and accessible to children and provide an interesting and playable landscape. Multi-generational play has been pursued across the masterplan area, with an emphasis on doorstep play (for 0-5 year olds) in communal spaces for each plot. Further play provision for the neighbourhood is provided through three public play spaces:

- Thurlow Square will have play provision for all ages, but with the greatest focus on provision for younger children, and accompanying outdoor seating areas;
- Bagshot Park will provide improved play areas for 5-11 and 12+ years play. A new MUGA located in the south-east corner of the park will offer active play and recreation opportunities, and is complimented by a range of natural and interpretive play elements developed with local young people through a number of play workshops (see page the Landscape Design and Access Statement for details); and
- At the corner of the Alvey Street Extension and Kinglake Street, a reconfigured play space is proposed, which will include play facilities for 0-5 year olds and additional planted areas of interest for informal play and exploration.

10.6.56. In light of the proposed provision of landscaped and equipped play space, it is therefore assessed that the Project will have a direct, permanent, long term minor beneficial (not significant) effect on play space provision in the locality, prior to the implementation of mitigation measures.

Mitigation

10.6.57. There are no mitigation measures proposed for Socio-economics in relation to play space provision. It is not considered appropriate for there to be any monitoring arrangements.

Residual Effect

10.6.58. Given there is no mitigation in relation to play space provision for Socio-economics, the pre-mitigation finding remains the same. Therefore, there is likely to be a direct, permanent, long-term minor beneficial (not significant) residual effect on play space provision local to the Project Site.

10.7. Summary

10.7.1. Table 10.19 provides a summary of the findings of the Socio-economic assessment.

Table 10.19 – Summary of Socio-economic Effects

F1	Potential Effects	Significance of Effects Prior to Mitigation	Additional Mitigation	Residual Effects
Construction Phase				
The local and regional economy	Construction employment generation	Minor Beneficial (not significant) T / D, I / MT	N/A	Minor Beneficial (not significant) T / D, I / MT
Operational Phase				
The local and regional economy	Operational employment generation	Minor Beneficial (not significant) P / D, I, LT	N/A	Minor Beneficial (not significant) P / D, I, LT
The local and regional economy	Additional local spending (direct, indirect, and induced)	Minor Beneficial (not significant) P / D, I / LT	N/A	Minor Beneficial (not significant) P / D, I / LT

ƒ1	Potential Effects	Significance of Effects Prior to Mitigation	Additional Mitigation	Residual Effects
The LBS housing market and residents	Provision of housing and affordable housing	Moderate Beneficial (significant) P / D / LT	N/A	Moderate Beneficial (significant) P / D / LT
Education provision (and users) within LBS	Demand for primary education	Negligible (not significant) P / D / LT	N/A	Negligible (not significant) P / D / LT
Education provision (and users) within LBS	Demand for secondary education	Negligible (not significant) P / D / LT	N/A	Negligible (not significant) P / D / LT
Primary healthcare provision (and users) within LBS	Demand for GP and dentist provision	Minor adverse (not significant) P / D / LT	Mitigation in the form of s106 contributions will help to provide additional capacity for primary healthcare facilities in the locality.	Negligible (not significant) P / D / LT
Open space provision (and users) within LBS	Open space provision	Minor Beneficial (not significant) P / D / LT	N/A	Minor Beneficial (not significant) P / D / LT
Play space provision (and	Play space provision	Minor Beneficial (not significant) P / D / LT	N/A	Minor Beneficial (not significant) P / D / LT

ƒ1	Potential Effects	Significance of Effects Prior to Mitigation	Additional Mitigation	Residual Effects
users) within LBS				

10.7.2. Key to table: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

11. Transportation

11.1. Introduction

11.1.1. This Chapter assesses the likely significant environmental effects of the Project In relation to transportation and access. In particular it considers the likely significant effects of additional traffic generated by the Project on the local road network and incorporates a summary of the Transport Assessment[126].

11.2. Appendices

Table 11.1: Appendices for Chapter 11

Appendix No.	Document
11.1	Scoping Responses
11.2	Plan of Study Area
11.3	Traffic Survey Summary Note
11.4	Accident Data

11.3. Legislation, Policy and Guidance

Legislative Framework

11.3.1. There is not legislation applicable to the assessment of transport effects of development.

Planning Policy

National Planning Policy

11.3.2. The following national policy applies:

National Planning Policy Framework (2021)

11.3.3. The current National Planning Policy Framework (NPPF) was issued July 2021.

11.3.4. The NPPF sets out several transport objectives designed to facilitate sustainable development and contribute to a wider sustainability by giving people a wider choice about how they travel, in particular Section 9 'Promoting Sustainable Transport'.

11.3.5. Paragraph 110 states:

[126] RPS, *Transport Assessment Aylesbury Estate Phase 2B*, as submitted for planning relating to the proposed site, 2022

"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users;

c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code; and

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree."

11.3.6. Paragraph 111 continues that:

"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."

11.3.7. In terms of planning applications NPPF states at paragraph 112(a) that development should:

"Give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas, and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use."

11.3.8. Paragraph 113 covers the need for Travel Plans and Transport Statements / Assessments for all developments which generate significant amounts of movement.

Regional Planning Policy

11.3.9. The following regional policy applies:

London Plan (2021)

11.3.10. The London Plan is the overall strategic plan for London which covers the period 2019 to 2041. The document provides a long-term view of London's development to inform decision making.

11.3.11. Policy T1 Strategic Approach to Transport states:

"a) Development Plans should support, and development proposals should facilitate:

- *The delivery of the Mayor's strategic target of 80 per cent of all trips in London to be made by foot, cycle, or public transport by 2041; and*
- *The proposed transport schemes set out in Table 10.1.*

b) *All development should make the most effective use of land, reflecting its connectivity and accessibility by existing and future public transport, walking, and cycling routes, and ensure that any impacts on London's transport networks and supporting infrastructure are mitigated."*

11.3.12. Policy T2 Healthy Streets:

"Development proposals and Development Plans should deliver patterns of land use that facilitate residents making shorter, regular trips by walking or cycling.

Development Plans should:

- Promote and demonstrate the application of the Mayor's Healthy Streets Approach to: improve health and reduce health inequalities; reduce car dominance, ownership and use, road danger, severance, vehicle emissions and noise; increase walking, cycling and public transport use; improve street safety, comfort, convenience and amenity; and support these outcomes through sensitively designed freight facilities.
- Identify opportunities to improve the balance of space given to people to dwell, walk, cycle, and travel on public transport and in essential vehicles, so space is used more efficiently, and streets are greener and more pleasant.
- In Opportunity Areas and other growth areas, new and improved walking, cycling and public transport networks should be planned at an early stage, with delivery phased appropriately to support mode shift towards active travel and public transport. Designs for new or enhanced streets must demonstrate how they deliver against the ten Healthy Streets Indicators.
- Development proposals should:
- Demonstrate how they will deliver improvements that support the ten Healthy Streets Indicators in line with Transport for London guidance.
- Reduce the dominance of vehicles on London's streets whether stationary or moving.
- Be permeable by foot and cycle and connect to local walking and cycling networks as well as public transport."

11.3.13. Policy T3 Transport capacity, connectivity, and safeguarding notes the following:

"Development Plans should appropriately safeguard the schemes outlined in Table 10.1. Development proposals should provide adequate protection for and/or suitable mitigation to allow the relevant schemes outlined in Table 10.1 to come forward. Those that do not, or which otherwise seek to remove vital transport functions or prevent necessary expansion of these, without suitable alternative provision being made to the satisfaction of transport authorities and service providers, should be refused."

11.3.14. Policy T4 Assessing and mitigating transport impacts asserts that:

"When required in accordance with national or local guidance, transport assessments / statements should be submitted with development proposals to ensure that impacts on the

capacity of the transport network (including impacts on pedestrians and the cycle network), at the local, network-wide and strategic level, are fully assessed. Transport assessments should focus on embedding the Healthy Streets Approach within, and in the vicinity of, new development. Travel Plans, Parking Design and Management Plans, Construction Logistics Plans and Delivery and Servicing Plans will be required having regard to Transport for London guidance;

- *Where appropriate, mitigation, either through direct provision of public transport, walking and cycling facilities and highways improvements or through financial contributions, will be required to address any adverse transport impacts that are identified;*
- *Where the ability to absorb increased travel demand through active travel modes has been exhausted, existing public transport capacity is insufficient to allow for the travel generated by proposed developments, and no firm plans, and funding exist for an increase in capacity to cater for the increased demand, planning permission may be contingent on the provision of necessary public transport and active travel infrastructure;*
- *The cumulative impacts of development on public transport and the road network capacity including walking and cycling, as well as associated effects on public health, should be taken into account and mitigated;*
- *Development proposals should not increase road danger."*

Local Planning Policy

11.3.15. The following local policies apply:

New Southwark Plan 2019-2034

11.3.16. Southwark have recently adopted the Southwark Plan 2022 (February 2022). The Southwark Plan 2022 has replaced the previous Development Plan documents, including the Saved Southwark Plan, Core Strategy and Aylesbury Action Plan.

11.3.17. The Southwark Plan 2022 sets out the vision, strategic objectives, and policies for development in Southwark for the period 2019 to 2036. The Plan covers housing, business and town centres, social infrastructure, transport and communications, environment and green infrastructure, quality of the built environment and places and neighbourhoods. Together with the Mayor's London Plan, it forms the statutory development plan for the borough.

11.3.18. The Southwark Plan 2022 provides Area Vision that provide the strategic vision for the future of Southwark's district places and neighbourhoods. They set out infrastructure improvements, opportunities for improved public spaces, transport improvements and growth opportunities for new homes and jobs. Area Visions also identify the character of different places to be renewed, retained, or enhanced. Development proposals should be prepared in the context of the relevant Area Vision and should demonstrate how they contribute towards the strategic vision for that area.

Guidance

11.3.19. The following Guidance documents are also considered applicable and have been referred to in the assessment:

- Planning Practice Guidance (NPG) 'Travel Plans, Transport Assessments and Statements in Decision-Taking' (March 2014);
- Institute of Environmental Assessment (now IEMA) Environmental Assessment of Road Traffic (1993) (IEMA Guidance);
- Design Manual for Roads and Bridges (DMRB), LA 104, Environmental Assessment and monitoring[127].

11.4. Historic Assessment

11.4.1. Outline Planning Permission (OPP) (LPA ref: 14/AP/3844) was granted on 5th August 2015 for a mixed-use redevelopment at the Aylesbury Estate Regeneration. The OPP red line boundary is shown in Figure 1.2 (see Chapter 1). The OPP was supported by a Transport Assessment and Transport ES Chapter within the 2014 ES.

11.4.2. The Design and Access Statement of the OPP (Addendum 2015) identified 490 residential units for Ph2B.

11.4.3. This ES considers the impact of the Project, but also provides the net impact of the Project in addition to the OPP scheme for context.

11.5. Assessment Methodology and Significance Criteria

Relevant Elements of the Project

11.5.1. The following components of the Project are relevant to the consideration of traffic and transportation effects of the assessment:

- Planning application drawings

11.5.2. The planning application drawings set out the content of the Project which are relevant to the assessment of transport effects. The Project content is summarised as follows:

- Demolition of the existing buildings;
- Construction and operation of 614 residential dwellings;
- Construction and operation of 480 sqm of commercial space;
- 1194 cycle parking spaces split across all blocks;
- 30 space London Cycle Hire docking station;

[127] Department for Transport, *Design Manual for Roads and Bridges (DMRB)*, suite of documents accessed online at https://standardsforhighways.co.uk/dmrb/

- 41 on-plot car parking spaces (across two locations), 32 on-street parking spaces within the new public realm and 6 on-street car club spaces; and
- 5 inset loading bays.

Scope of the Assessment

11.5.3. The proposed scope of the assessment was set out in a submission to LBS within a Scoping Report (see Appendix 2.1) in October 2021. This included extent of study area, the impacts to be assessed and the approach to assessing receptor sensitivity. The Scoping Report was reviewed by LUC on behalf of LB Southwark and a response was provided with various recommendations. With regard to transport these were:

- *T1: Any scoping by the Applicant's transport consultants in conjunction with LBS regarding the Transport Assessment should be included in the SR and the ES.*

11.5.4. Details of scoping with LBS has been added into this chapter. The LBS response to scoping of the Transport Assessment is provided as Appendix 11.1

- *T2: The SR should explain how the effects of the extant and proposed schemes will be separated out for the purposes of environmental impact assessment.*

11.5.5. The assessment within the Operation section below separate out the extant and proposed schemes so the effects can be seen.

- *T3: There is no reference to how baseline conditions will be established for other modes of transport.*

11.5.6. The baseline conditions section within this chapter sets out data collection which includes on road cyclists and pedestrian movement surveys.

- *T4: The study area should be reviewed and consideration given to the extent over which cyclists, pedestrians and users of public transport modes may experience change at least qualitatively if not quantitatively.*

11.5.7. The study area has been reviewed but remains as set out in the Scoping Report. The comments on user experience on public transport effects are noted but these are not considered environment effects that should be assessed in this document. The Transport Assessment to support the Ph2B redevelopment includes an Active Travel Zone (ATZ) assessment to consider how future residents of the Project Site will be able to make key journeys from the Project Site to support car-free lifestyles. The assessment has been undertaken in accordance with TfL guidance and informed by site visits to understand pedestrian and cycle connections to the wider area. The ATZ assessment is a review of the key pedestrian and cycle routes to and from the Project Site to key destinations within the area (beyond the ES study area) including schools, retail, public transport, and parks against the 10 healthy streets indicators.

11.5.8. The existing streets around the Ph2B site and proposed changes to these streets have also been assessed using the TfL Healthy Streets Check for Designers as part of Transport

Assessment work. This is to ensure that future designs are safe and welcoming for everyone and encourage active travel. The Transport Assessment also includes a review of public transport facilities in the local area and determines the developments impact.

11.5.9. Therefore the matters raised by LUC in relation to T4 are dealt with in the TA rather than in the ES.

11.5.10. The chapter considers the effects of the Project on transport networks within the study area. The main factors set out in the IEMA document Guidelines for the Environmental Assessment of Road Traffic are identified as follows:

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

11.5.11. It has been agreed that the baseline against which the impact of the Project will be assessed will include the committed development sites set out in Chapter 2. These have been reviewed in transport terms and those found to have transport impacts on the study area are set out in **Table 2.2 (see Chapter 2)**. For the sites listed in Table 2.2 which have published transport assessments that show traffic movements overlapping with the study area, these have been extracted where relevant and included as committed development flows within the assessment. The remaining committed developments are considered to either be remote enough or of a scale that would not see a discernible transport impact on the study area.

11.5.12. A committed transport scheme in the study area is the Southwark Spine Cycle Route planned for Thurlow Street. Designs for the scheme are not yet published by the council but it is understood that the scheme will progress to consultation later in 2022.

Extent of the Study Area

11.5.13. The IEMA Guidance identifies that traffic flow increases of 30% represent a reasonable threshold for inclusion of highway links within the assessment process, although a lower threshold may be appropriate where there are higher HGV flows. It also suggests that other specifically sensitive areas should be included where traffic flows have increased by 10% or more. Such sensitive areas may include collision cluster sites or links with high pedestrian flows.

11.5.14. For the purpose of this assessment, the consideration of the effects of the Project will be undertaken on the following quadrant of streets surrounding the Project Site, and the effects of the changes in traffic composition and volume will be assessed in relation to the significance criteria:

- **Kinglake Street** runs east / west to the north of the Project Site and is a secondary local road;
- **Bagshot Street** runs on a north / south alignment to the east of the Project Site and is a secondary local road;
- **Albany Road** runs east / west to the south of the Project Site and is local connector road; and
- **Thurlow Street** runs north / south to the west of the Project Site and is a primary road.

11.5.15. A plan of the study area for transport effects is provided at **Appendix 11.2**

Consultation

11.5.16. In addition to the EIA scoping consultation, scoping discussions on the assessment of transport effects of the development we also held with Transport for London (TfL) and LB Southwark in March 2021 (see Appendix 11.1 for the TfL pre application consultation response). Although this scoping was primarily related to the content of the TA, the general principles also apply to the preparation of this chapter.

Method of Baseline Data Collation

11.5.17. The data used to establish the baseline conditions and inform the assessment has been collated from a variety of sources as part of a desk study. This data includes:

- Bus timetables and route information (TfL);
- Tube timetables and route information (TfL);
- National rail timetables and route information (national rail data);
- 2011 census statistics (Office for National Statistics (ONS);
- London Travel Demand Survey data for Southwark (TfL) 2017-2019;
- The TRICS (Trip Rate Information Computer system) trip rate database;
- Personal Injury Accident statistics (TfL);
- Traffic survey data including manual classified counts (MCC), automatic traffic counts (ATC), queues and delay (2021 as set out further below);
- Parking data for on-street and off-street parking (2021); and
- Pedestrian survey data (including pedestrian flow data) (2021).

11.5.18. New traffic surveys have been undertaken to update the baseline highway conditions for the quadrant of roads surrounding the Project Site. The brief details of the baseline surveys are set out below:

Surveys

11.5.19. A number of traffic surveys were undertaken to inform the assessment. Details of the surveys are summarised below with further information provided at **Appendix 11.3**.

11.5.20. Automatic Traffic Count (ATC) surveys were undertaken on four roads (Thurlow Street, Kinglake Street, Bagshot Street and Albany Road). ATC surveys collect detailed traffic data comprising elements such as vehicle classification, speed, and volume data. The surveys were commissioned for the week commencing the 17 May 2021. It was agreed in advance of the surveys with TfL that traffic survey data could be collected following the Step 3 of the 2021 Covid road map after 17 May 2021. TfL agreed that data after this date would be considered suitable for traffic assessment purposes. Schools and indoor hospitality were open at this time.

11.5.21. The two-way Annual Average Daily Traffic (AADT) for each road is summarised below. AADT is the total volume of vehicle traffic on a road for a year divided by 365 days. From the survey. This is taken from the average of a full 7-day week.

- Thurlow Street: **9816**;
- Albany Road: **19454**;
- Bagshot Street: **866**; and
- Kinglake Street: **1288**.

11.5.22. The maximum 85th percentile speed (mph) for each road (both directions) is summarised below:

- Thurlow Street: **24.1 mph**;
- Albany Road: **25.75 mph**;
- Bagshot Street: **20.15 mph**; and
- Kinglake Street: **21.45 mph**.

11.5.23. The above data shows that the maximum 85th percentile speed on the roads are not significantly over the speed limit of the roads which is 20mph. The average speeds on Thurlow Street and Albany Road are both around 20mph.

11.5.24. Manual traffic count surveys were undertaken at the following junctions:

- Thurlow Street / Kinglake Street
- Thurlow Street / Albany Road
- Albany Road / Bagshot Street
- Bagshot Street / Kinglake Street

11.5.25. Pedestrian movement surveys were undertaken at the Thurlow Street / Albany Road junction as well as the zebra crossing on Albany Road adjacent to Bagshot Street.

11.5.26. Parking surveys were undertaken within the estate parking areas on the Project Site as well as the other controlled parking areas on Bagshot street, Kinglake Street, Thurlow Street and Albany Road.

Site Visit

11.5.27. Site visits were undertaken on 4 March 2021 to help inform the transport work. These supplemented earlier site visits undertaken by members of the project team as part of ongoing work in relation to the OPP and FDS.

Identification of Sensitive Receptors

11.5.28. Categories of receptor sensitivity will be defined from the principles set out in the IEMA Guidance, and include the following:

1. *the need to identify particularly groups or locations which may be sensitive to changes in traffic conditions;*
2. *the list of affected groups and special interests set out in the guidance;*
3. *the identification of links or locations where it is felt that specific environmental problems may occur and; and*
4. *such locations **"… would include accident blackspots, Conservation Areas, hospitals, links with high pedestrian flows."***

11.5.29. Given the extent of the study area, it is considered that each of the links being considered has residents and users of the links that could be considered sensitive, therefore the following links will be considered sensitive receptors:

- Thurlow Street (between Kinglake Street and Albany Road)
- Albany Road (between Thurlow Street and Bagshot Street)
- Bagshot Street
- Kinglake Street (between Thurlow Street and Bagshot Street)

Demolition and Construction

11.5.30. The methodology for establishing the demolition and construction movements associated with the development is set out below starting paragraph 11.1.95.

Assessment Modelling

11.5.31. The identified links have been assessed using the baseline surveys and then committed development and the Project flows are added. The assessment is based on the Annual Average Daily Flow (AADT) which is effectively all of the traffic movements on a link over a 7-day period divided by 7.

11.5.32. As the assessment is focused on link flows, no specific transport modelling has been undertaken.

Significance Criteria

11.5.33. The assessment of potential effects as a result of the Project has taken into account both the demolition, construction and operational phases. The significance level attributed to each effect has been assessed based on the magnitude of change due to the development proposals, and the sensitivity of the affected receptor / receiving environment to change, as well as a number of other factors that are outlined in more detail in **Chapter 2** of this ES. Magnitude of change and the sensitivity of the affected receptor / receiving environment are both assessed on a scale of high, medium, low and negligible (as shown in **Chapter 2.**

11.5.34. The magnitude of effect depends upon the effect being assessed and this has been informed by the guidance set out in IEMA document Guidelines for the Environmental Assessment of Road Traffic (1993)[128]. The main factors relating to transportation are identified as follows and the associated criteria applied to each factor within this assessment are described below:

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

11.5.35. Severance is defined in paragraph 4.27 of the IEMA guidance as:

"the perceived division that can occur within a community when it becomes separated by a major trafficartery".

11.5.36. Paragraph 4.31 of the IEMA guidance goes on to state:

"Changes in traffic flow of 30%, 60% and 90% are regarded as producing "slight", "moderate" and "substantial" changes in severance respectively."

11.5.37. For this assessment the changes in traffic flow thresholds will follow the above figures but adjusted to reflect the significance as follows:

- **Negligible** less than 30%;
- **Minor** 30% to 60%;
- **Moderate** 60% to 90%; and
- **Major** greater than 90%

11.5.38. The above percentage increase criteria relate to arterial or main and through roads and will include all A roads, B Roads and other main through routes with a strong movement function. DMRB LA 112 provides further guidance on determining severance. Given that percentage changes in very low flows have a disproportionate impact, it is appropriate to establish a traffic

[128] Institute of Environmental Assessment (now IEMA), *Guidance Note 1 Guidelines for the Environmental Assessment of Road Traffic*, 1993

flow threshold below which changes in Severance are not considered significant. For the purpose of this assessment, where the final AADT (Average Annual Daily Traffic) flow is below 800 vehicles severance will not be considered as road crossing delay is nominal.

1.1 Driver delay can be established from the traffic modelling results, identifying the average increase in delay by change in delay at the junction. The IEMA guidance suggests criteria based on delay in seconds per mile but this statistic is not an output from the traffic modelling. The driver delay significance criteria have been based on the change in average junction delay as follows:

- **Negligible** less than 30 seconds change per vehicle;
- **Minor** 30 to 60 seconds change per vehicle;
- **Moderate** 60 to 90 seconds change per vehicle; and
- **Major** greater than 90 seconds change per vehicle.

11.5.39. The IEMA guidance indicates that pedestrian delay is influenced by "changes in the volume, composition or speed of traffic" which affect the ability of people to cross the road. The IEMA guidance goes onto advise that assessors should "… use their judgement to determine whether pedestrian delay is a significant impact".

11.5.40. The assessment of pedestrian and cycle delay has been based on an initial assessment of the change in traffic flow and change in speed as a result of the Project. This has been based on a change of +/-200 vehicles per hour and +/-5 miles per hour for each of the relevant junction approaches. A qualitative assessment will also be undertaken where the number of crossing stages on a signal junction is amended or where specific cycle measures are proposed.

11.5.41. The IEMA guidance defines pedestrian amenity as "the relative pleasantness of a journey", which can be affected by "changes in traffic flow, traffic composition and pavement width/ separation from traffic". Pedestrian amenity also covers the issue of 'fear and intimidation within the IEMA guidelines. There are no commonly agreed thresholds for estimating levels of fear and intimidation but this impact is considered dependent on the volume of traffic, its HGV component, its proximity to people, or the lack of protection or segregation from traffic influenced by factors such as footway width. There are no commonly agreed thresholds for cycle amenity; however reference is made to TfL guidance.

11.5.42. For the purposes of this assessment the pedestrian amenity has been based on the following criteria, based on the change in the number of vehicles passing along the adjacent road, using the junction approaches:

- **Negligible** less than 3 vehicles per minute change
- **Minor** more than 3 vehicles per minute change
- **Moderate** more than 7 vehicles per minute change
- **Major** more than 10 vehicles per minute change

11.5.43. Due to the numerous local causation factors involved in PIAs, the IEMA guidelines do not recommend the use of thresholds to determine significance. With regards to accidents and safety, the IEMA guidance states at paragraph 4.42 that:

> *"Professional judgement will be needed to assess the implications of local circumstances, or factors, which may evaluate or lessen the risk of accidents, e.g. junction conflicts".*

11.5.44. Paragraph 4.5 of the IEMA Guidance makes it clear that:

> *"A critical feature of an environmental assessment is determining whether a given impact is significant".*

11.5.45. Paragraph 4.5 goes on to state:

> *"For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed up by data or quantified data wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact…"*

11.5.46. The accident assessment will review the past five years of available accident data, and will review and undertake a trend analysis and assess the impact of the development proposals in respect of changes to potential conflict points as a result of the development.

Significance of Effects

11.5.47. The following terms have been used to define the significance of the effects identified:

- **Major effect:** where the Project could be expected to have a very significant effect (either positive or negative) on severance, pedestrian amenity, pedestrian and driver delay, accidents or safety;
- **Moderate effect:** where the Project could be expected to have a noticeable effect (either positive or negative) on severance, pedestrian amenity, pedestrian and driver delay, accidents or safety;
- **Minor effect:** where the Project could be expected to result in a small, barely noticeable effect (either positive or negative) on severance, pedestrian amenity, pedestrian and driver delay, accidents or safety; and
- **Negligible:** where no discernible effect is expected as a result of the Project on severance, pedestrian amenity, pedestrian and driver delay, accidents or safety.

<u>Limitations and Assumptions</u>

11.5.48. Any limitations and assumptions relevant to this assessment have been identified in the relevant section of this Chapter as appropriate and are summarised as follows:

- No specific guidelines exist on the assessment thresholds for driver, pedestrian and cycle delay which have therefore been assumed to be those set out above;

- No specific guidelines exist on the assessment thresholds for pedestrian and cycle amenity which have therefore been assumed to be those set out above;
- Any qualitative assessment will be subject to interpretation by the assessor. However, the assessor has experience in this area and has therefore applied their knowledge and expertise in this area to ensure a robust assessment of effects.
- Due to the mainly residential nature of the Project, it is unlikely that will generate significant heavy goods vehicle (HGV) traffic flows. HGVs are considered as triggers for assessment for the construction phase which is when HGV generation is likely to be at its highest.
- Demolition and construction traffic movements have been predicted using information from comparable sites. This information is set out in Framework Demolition Management Plan and Framework Construction Management plans are submitted in support of the application with detailed plans secured by condition. These plans assume that the construction movements will be restricted to the route to and from the A2 Old Kent Road.
- It is assumed that the Southwark Spine is progressing to consultation in 2022 and it will continue to be progressed by the Council. The Project has been designs to not go beyond the existing kerb edge of Thurlow Street and it is assumed that the Southwark Spine will remain within the existing carriageway.

11.6. Baseline Conditions

Pedestrian Infrastructure

11.6.1. The Project Site is bound by a quadrant of roads as follows:

- Kinglake Street runs on a broadly east / west alignment to the north of the Project Site and is a secondary local road;
- Bagshot Street runs on a broadly north / south alignment to the east of the Project Site and is a secondary local road;
- Albany Road runs on a broadly east / west alignment to the south of the Project Site and is local connector road; and
- Thurlow Street runs on a broadly north / south alignment to the west of the Project Site and is a primary road.

11.6.2. Service roads in the forms of cul-de-sacs provide access to the ground level garages via Thurlow Street, Kinglake Street and Bagshot Street. The local road network bounding the Project Site is all subject to a 20mph speed limit.

11.6.3. The quadrant of roads that bound the Project Site are all provided with footways on both sides of the carriageway and benefit from street lighting. The existing linear town block on the western Thurlow Street boundary and apartment block on the eastern Bagshot boundary effectively create a barrier to east / west pedestrian movement. Pedestrians are therefore

required to walk around the northern or southern ends of the blocks to access Mina Road that connects to Old Kent Road to the east of the Project Site.

11.6.4. Thurlow Street provides pedestrian access to the nearest bus stops (Alsace Road Stops A & M) located approximately 80m to the north of the junction with Kinglake Street.

Cycle Infrastructure

11.6.5. The local highway network that forms the Project Site boundary does not include the provision of any formal cycling infrastructure. Bagshot Street accommodates an on-road route with a link through to Alvey Street.

Car Clubs

11.6.6. Two car club bays are located at the southern end of Bagshot Street.

Public Transport

11.6.7. TfL considers that people are willing to walk up to eight minutes in order to access bus services and assumes an average walk speed of 4.8 kilometres per hour whilst travelling to a bus stop. This equates to a walking speed of 80 metres per minute. Thus, TfL considers that bus stops within 640 metres of a development (80 metres x 8 minutes) are accessible.

11.6.8. Bus stops M (southbound) and A (northbound) are located circa 220 metres (3-minute walk) and 270 metres (4-minute walk) northwest of the Project Site respectively on Thurlow Street. The stops are serviced by routes including routes 42, 136 and 343 as well as night bus route N343. Both bus stops are provided by shelter and timetable.

11.6.9. Furthermore, Bus stops WN (northbound) and EB (southbound) are located circa 650 metres (8-minute walk) northeast of the Project Site on A2 Old Kent Road. These bus stops are serviced by several routes including 21, 53, 63, 168, 172, 363, 415 and 453 as well as night bus routes N21, N53 and N63.

11.6.10. These bus services offer a peak combined frequency of approximately 49-98 buses every hour, providing frequent and direct connections to a variety of destinations. A summary of daytime services is provided in Table 11.2.

Table 11.2: Local Bus Services Operating in the Vicinity of the Project Site[129]

Service	Route	Frequency (Buses per Hour)				
		AM Peak	Off Peak	PM Peak	Sat	Sun
42	East Dulwich Sainsbury's - Appold Street	4-6	4-6	4-6	3-6	3-4

[129] Source: Transport for London (accessed February 2021)

136	Grove Park Bus Station – Elephant & Castle/ Newington Causeway	5-8	4-8	5-8	4	4
343	City Hall – New Cross/ Jerningham Road	6-9	3-9	6-9	3-7	3-6
21	Lewisham Centre – Newington Green	8-12	4-12	8-12	4-10	3-6
53	Orchard Road/ Griffin Road – Horse Guards Parade	8	7	8	7	6
63	Forest Hill Tavern – Kings Cross Station/ York Way	6-10	5-10	6-10	4-7	4-7
168	Royal Free Hospital – Dunton Road	7-10	5-10	7-10	5-10	5-10
172	Brockley Rise/ Chandos – King Edward Street	6-8	4-8	6-8	3-5	3-5
363	Crystal Palace Parade – Lambeth Road	6-9	5-9	6-9	4-8	3-6
415	Hardel Rise - Dunton Road	5-6	3-6	5-6	3-6	2-4
453	Deptford Bridge – Great Central Street	12-20	5-15	8-15	3-9	3-9

Highway Network

11.6.11. The existing highway network within the study area is illustrated on the plan at **Appendix 11.2**. it comprises the four roads of Thurlow Street, Albany Road, Kinglake Street and Bagshot Street. The whole area is the subject of a 20mph zone.

11.6.12. Peak hour two way flows for the roads within the study area are set out below. These flows are the baseline used to assess the effects of the Project on the transport network. Traffic flow diagrams for the peak periods are provided at **Appendix 11.3**.

- Thurlow Street – 871 vehicles per hour
- Albany Road – 1,243 vehicles per hour
- Kinglake Street – 105 vehicles per hour
- Bagshot Street – 68 vehicles per hour

11.6.13. The figures above are the worst-case hour during the day which in all of the instances is the AM peak 0800-0900.

Personal Injury Accidents

11.6.14. Personal Injury Accident (PIA) data has been obtained from TfL for the latest five-year period (up to September 2020). An analysis of the PIA data has been undertaken to ascertain if there are safety issues or high-risk accident areas on the local highway network in the vicinity of the Project Site. The relevant data and extent of the study area can be found attached in **Appendix 11.4**.

11.6.15. A total of 164 PIAs were recorded within the area of search (larger than the study area), of which 15 were classified `serious' and the remaining accidents were 'slight' in severity.

Albany Road / Thurlow Street Junction

11.6.16. Three of the serious accidents occurred at the junction between Albany Road and Thurlow Street.

11.6.17. One of the serious accidents occurred during the daylight and resulted from a collision between a car and a pedestrian. The causation factor was identified as the pedestrian failed to look properly. The weather condition was fine.

11.6.18. One serious accident occurred in the daylight and involved a collision between a car and a pedestrian. It was attributed to the pedestrian failing to look properly. The weather condition was fine.

11.6.19. Another serious accident occurred in the daylight and involved a collision between a car and a pedestrian. It was put down to the pedestrian failing to judge vehicle's path or speed. The weather condition was fine.

Thurlow Street / Kinglake Street Junction

11.6.20. One of the serious accidents occurred on Thurlow Street at the junction with Kinglake Street. It involved a collision between a bus and a bicycle. The causation factor was identified as the cyclist losing control and driving aggressively. The weather condition was fine.

Future Baseline

11.6.21. Should the Project not proceed it is reasonable to assume that some development in line with the OPP for the Aylesbury Regeneration area would occur on the Project Site. In addition, committed developments which may contribute to changing traffic levels would also proceed. The future baseline has therefore been established as the observed 2021 traffic flows in the study area with committed development traffic flows added, including the OPP.

11.7. Assessment of Effects, Mitigation and Residual Effects

Demolition and Construction

11.7.1. The effects of demolition and construction on transport come not only from the on-site operations but also from the construction traffic accessing the Project Site.

11.7.2. A contractor prepared an initial assessment of the FDS, located to the west of the Project Site, in terms of operatives on site and vehicle movements making deliveries.

11.7.3. As the FDS is the most dense part of the outline consent for the Aylesbury Estate, in terms of habitable rooms per hectare, it has been assumed that the peak of this phase represents a reasonable worst case in terms of construction traffic for use in assessment for the Project.

11.7.4. The assessment indicates that the peak movements will be a total of 290 operatives on site and there will be 1100 deliveries occurring in the month. This peak period is within the construction phase, but the assessment considers the period of both demolition and construction.

11.7.5. The vehicle movements have been converted to a daily flow by assuming each vehicle arrives and leaves during the day and there are four 5.5-day weeks in each month. This equates to 100 vehicle movements per day (50 in, 50 out).

11.7.6. Peak hour (AM + PM) movements are typically around one-sixth of a daily flow which would equate to 8 arrivals and 8 departures across the two peaks. For a robust assessment 8 arrivals and 8 departures in each peak have been assumed for assessment purposes.

11.7.7. For operatives, it is assumed that a similar mode share to the local census journey to work is appropriate where approximately 10% of work trips are made by car/van. It is expected that most vehicle based operative trips will be by minibus type vans. This would equate to 29 arrivals in the AM peak and 29 departures in the PM peak.

11.7.8. A summary of the peak period trip generation for demolition and construction traffic is provided in Table 11.3 below.

Table 11.3 Peak Construction Traffic for Assessment Purposes

	Light Vehicles	Heavy Vehicles	Total
AM Peak	29	16	45
PM Peak	29	16	45
Daily (weekday)	58	100	158

Demolition and Construction Traffic Routes

11.7.9. The Project Site is located between a number of minor roads with Kinglake Street to the north, Bagshot Street to the east, and Thurlow Street to the west. With Albany Road providing the Project Site direct access to the A2 Old Kent Road this will be the primary route for construction vehicles.

11.7.10. Beyond these streets the construction traffic will be limited to major routes.

11.7.11. Demolition and construction traffic associated with the Project will access the Project Site from the existing road network. Demolition and construction traffic will be limited to accessing the Project Site using Albany Road and Thurlow Street.

Severance

11.7.12. The demolition and construction traffic routes to the Project will be restricted to Albany Road and Thurlow Street. Routing construction traffic along these roads means that the traffic is kept on parts of the highway network which already have relatively high traffic flows and are suitable for large vehicle movement.

11.7.13. **Table 11.4** summarises the links where traffic flows change as a result of the demolition and construction traffic during each time period. **Table 11.5** sets out the percentage change in flow and HGVs on the links related to the observed 2021 baseline flows. **In order to ensure a robust assessment, it is assumed that** all construction traffic will be directed to the A2 Old Kent Road, the movements, and hence impacts, are all to the east of the Project Site. This produces the highest impact by assuming only one route is used.

Table 11.4 Peak Demolition and Construction Traffic Flows by Link

Road	Between		AM		PM	
			All Vehicles	HGV	All Vehicles	HGV
Thurlow Street	Thurlow Street site access	Kinglake Street	0	0	0	0
Thurlow Street	Albany Road	Thurlow Street site access	0	0	0	0
B214 Albany Road	Albany Road Site access	Bagshot Street	45	16	45	16
B214 Albany Road	Thurlow Street	Albany Road Site access	0	0	0	0

Road	Between		Total Vehicles		HGVs	
			AM	PM	AM	PM
Thurlow Street	Thurlow Street site access	Kinglake Street	0%	0%	0%	0%
Thurlow Street	Albany Road	Thurlow Street site access	0%	0%	0%	0%
B214 Albany Road	Albany Road Site access	Bagshot Street	4%	4%	32%	77%
B214 Albany Road	Thurlow Street	Albany Road Site access	0%	0%	0%	0%

Table 11.5 Impact of Demolition and Construction Traffic (% flow change) by Link

11.7.14. Based on these changes in link flows, the demolition and construction with regard to all vehicles will have a negligible effect on severance as none of the changes in total vehicle flow are more than 30%. It is noted that there will be an increase in HGVs by 32% in the AM peak and 77% in the PM peak along the A214 Albany Road, however this will have a **negligible** impact upon the total vehicles flows which contribute to severance.

11.7.15. Overall it is considered that the demolition and construction of the Project will have a **negligible** effect on severance as the total link flow changes at 4% are considerably less than the 30% change in flow required for the effect to be significant.

Mitigation

11.7.16. Demolition and construction access, traffic and temporary diversions will be controlled through a Demolition Management Plan (DMP) and a Construction Management Plan (CMP). A Framework/Outline DEMP and CEMP can be found at Appendix 5.X and 5.X, which has helped inform this assessment.. This will set out how construction traffic will be managed and its impact minimised.

Residual Effects

11.7.17. It is considered that the construction of the Project will have **negligible** effect on severance.

Driver Delay

11.7.18. During demolition and construction, driver delay will be affected by temporary traffic management in the vicinity of the Project Site which will be restricted to the B214 Albany Road.

The increase in heavy vehicle flows in the vicinity of the Project Site during construction may also have an effect on driver delay.

11.7.19. The average construction traffic flow is expected to be around 45 two-way trips at its AM and PM peak, including a total of 16 two-way HGV trips. This vehicle flow is less than one vehicle per minute which in itself is not sufficient to cause any perceptible change in delay to drivers in the area.

11.7.20. Temporary traffic management and speed limit reductions may be required for short periods during the construction of the Project Site which will have a direct, temporary, short-term **minor negative** effect on driver delay as they are likely to cause less than a 60 second increase on average.

Mitigation

11.7.21. Construction access, traffic and temporary diversions will be controlled through a Construction Management Plan (CMP). This will set out how construction traffic will be managed and how its impact will be minimised. See Appendix 5.1 and 5.2 for outline DMP and CMP.

Residual Effects

11.7.22. Overall the demolition and construction of the Project will have a direct, temporary, short-term **minor negative** effect on driver delay.

Pedestrian and Cyclist Delay

11.7.23. Demolition and construction of the Project will result in the temporary closure and/or re-routing of some existing pedestrian and cycle routes within the vicinity of the Project Site which may extend some pedestrian and cycle routes. The demolition and construction period is also likely to involve temporary width restrictions on footpaths adjacent to the Project Site.

11.7.24. The demolition and construction traffic routes to the Project are generally located on roads with some existing provision for pedestrians and cyclists. It is therefore considered that the demolition and construction traffic will have a direct, temporary, short-term **minor negative** effect on pedestrian and cycle delay.

Pedestrian and Cycle Amenity

11.7.25. Pedestrian and cycle amenity reflects the relative pleasantness of pedestrian and cyclist journeys, which includes changes in traffic volume, pavement width and separation from vehicles. Pedestrian and cycle amenity also includes the consideration of whether there are pedestrian and cycle routes available and the quality of these routes (such as whether the route is free of debris or whether adequate street lighting is available).

11.7.26. During demolition and construction of the Project, traffic will be routed along roads which have some existing pedestrian and cyclist provision.

11.7.27. Other effects on pedestrian and cycle amenity due to the demolition and construction activities include:

- Closure of the existing pedestrian and cycle routes within close proximity to the Project Site entrance along Albany Road;
- Construction work adjacent to the footway;
- Temporary closure or width restrictions on footways adjacent to the Project Site; and
- Mud/ debris on footways.

11.7.28. There is likely to be a direct, short term **minor negative** effect on pedestrian and cycle amenity as a result of the demolition and construction activities of the Project.

Mitigation

11.7.29. Some disruptions to footway and cycle routes are unfortunately sometimes unavoidable during construction of project of this size. Demolition and construction access, traffic and temporary diversions will be controlled through a DMP and a CMP. The DMP and CMP will set out how the construction traffic will be managed to ensure that its impact is minimal. See Appendix 5.X and 5.X for further details.

Residual Effects

11.7.30. There is likely to be a direct, temporary, short term **minor negative** effect on pedestrian and cycle amenity as a result of the demolition and construction activities during demolition and construction of the Project.

Fear and Intimidation

11.7.31. The level of fear and intimidation may be impacted by the volume of traffic, HGV composition and speed. The change in traffic however as a result of the construction will be minimal as set out in **Table 11.4** and **Table 11.5.** Although there will be an increase in HGV traffic along the B214 Albany road of 32% in the AM peak and 77% in the PM peak this only equates to 16 total two-way trips within the peak hour period (1 trip every 3.75 minutes). The overall impact on the level of fear and intimidation will be **negligible**.

Mitigation

11.7.32. An Outline DMP and outline CMP have been produced and can be found at Appendix 5.1 and 5.2 and have set out from the outset of the demolition and construction process to ensure that both cyclists and pedestrians are provided with a service level that is equivalent to the service received without the nearby construction activities. The demolition and construction vehicles will be managed to ensure that any impact that they have on fear and intimidation will be sufficiently managed.

Residual Effects

11.7.33. The effect of demolition and construction traffic on fear and intimidation is considered to be **negligible**.

Accidents and Safety

11.7.34. The change in traffic flows as a result of the demolition and construction traffic will be minimal as discussed above. The total daily construction traffic expected is 58 light vehicles and 100 heavy vehicles over the daily period. Whilst this will cause an increase in traffic flow at the Project Site and the roads within the vicinity of the Project Site, it is not expected to cause any materially adverse effects on accidents and safety. It is considered that demolition and construction traffic will have a **negligible** effect on accidents and safety within the vicinity of the Project Site.

Mitigation

11.7.35. Although the overall effect of the demolition and construction vehicles on accidents and safety is expected to be negligible it is imperative that operatives accessing the Project Site maintain high levels of safety awareness when manoeuvring along the roads within the vicinity of the Project Site as it is noted that HGV movements account for a large proportion of cyclist deaths in London. As part of the CMP, it will be noted that standards will be set to ensure that HGV drivers comply with the Freight Operator Recognition Scheme (FORS) which includes driver awareness training.

Residual Effects

11.7.36. It is considered that in general, the demolition and construction traffic generated by the development will have a **negligible** effect on accidents and safety.

Cumulative Effects of Demolition and Construction

11.7.37. There are a number of development schemes progressing in the local area and there is potential for the more than one local scheme to be under construction at one time and hence cause cumulative effects. At the time of the baseline surveys in May 2021, work was ongoing on both the FDS to the west on Albany Road and Plot 18 to the north on Thurlow Street. This means that the cumulative effects of some construction in the local area forms part of the baseline assessment.

11.7.38. All of these sites including the Project will need to be controlled by Demolition and / or Construction Management Plans given their scale. As these works are all within the control of Walworth Homes it will be stipulated that the site managers will need to communicate with adjoining sites to minimise the transport disruption caused by site activities.

Operation

11.7.39. The operational effect of the Project has been established by predicting the number of trips that the Project will create once completed. A comparison is then provided with the OPP to ascertain the net impact of the Project over what has been consented for the Project Site.

11.7.40. The trip generation for the additional dwellings has been established using trip rates established from the Transport Assessment. These trips have then been assigned to modes of travel using local survey data provided by TfL. This comes from the London Travel Demand Survey dataset for Southwark borough for the years 2017-2020 extracted by TfL for the purposes of this assessment. Full details of the trip generation, distribution and assignment methodology are set out in the Transport Assessment.

11.7.41. Tables 11.6 and 11.8 below set out the multimodal trip generation predicted for the proposed 614 home scheme and the consented 490 homes scheme. The trip generation is based on total bedrooms, 1170 and 1070 respectively.

Table 11.6: Multi Modal Trip Generation – Proposed Scheme 614 Homes

Mode	AM 08:00-09:00			PM 17:00-18:00		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Bus/tram	13	57	70	32	21	53
Taxi/ Other	2	8	9	4	3	7
Car driver	9	41	50	23	15	38
Car passenger	6	27	33	15	10	25
Motorcycle	0	0	0	0	0	0
Cycle	5	23	28	13	8	21
Walk	31	138	169	77	50	127
Total	67	294	360	164	106	270

NB. May not sum due to rounding

Table 11.7: Multi Modal Trip Generation – OPP 490 Homes

Mode	AM 08:00-09:00			PM 17:00-18:00		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Bus/tram	12	52	64	29	19	48
Taxi/ Other	2	7	9	4	3	6
Car driver	9	38	46	21	14	35
Car passenger	6	24	30	14	9	23
Motorcycle	0	0	0	0	0	0
Cycle	5	21	26	12	8	19
Walk	29	126	155	70	46	116
Total	61	269	330	150	97	247

NB. May not sum due to rounding

11.7.42. **Table 11.8** below sets out the predicted change in trips by various modes of travel during peak periods as a result of the Project above the consented scheme.

Table 11.8: Multi Modal Trip Generation – Net Impact

Mode	AM 08:00-09:00			PM 17:00-18:00		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Bus/tram	+1	+5	+6	+3	+2	+5
Taxi/ Other	0	+1	+1	0	0	+1
Car driver	+1	+4	+4	+2	+1	+3
Car passenger	+1	+2	+3	+1	+1	+2
Motorcycle	0	0	0	0	0	0
Cycle	0	+2	+2	+1	+1	+2
Walk	+3	+12	+14	+7	+4	+11
Total	**+6**	**+25**	**+31**	**+14**	**+9**	**+23**

NB. May not sum due to rounding

11.7.43. **Table 11.7** shows that a total of 31 additional trips will be generated within the AM peak with 4 of these being additional vehicle movements, 23 additional trips will be generated in the PM peak, with 3 of these being additional vehicle movements.

Severance

11.7.44. Following the completion of the Project the main impact of severance on the road network will be from the increased traffic generated. **Table 11.9** and **Table 11.10** show the car trips generated from the original consented development along with the Project car trips for both the PM and AM peaks.

Table 11.9 Traffic Flow and Flow Change, Consented and Proposed - AM

Link	From	To	Consented	Proposed	Flow Change	Significance
Thurlow Street	Thurlow Street Site Access	Kinglake Street	9	10	1	Negligible
Thurlow Street	Albany Road	Thurlow Street Site Access	10	11	1	Negligible
Albany Road (B214)	Albany Road Site Access	Bagshot Street	10	11	1	Negligible
Albany Road (B214)	Thurlow Street	Albany Road Site Access	9	10	1	Negligible
Bagshot Street	Albany Road	Bagshot Street Site Access	0	0	0	Negligible
Bagshot Street	Bagshot Street Site Access	Kinglake Street	1	1	0	Negligible
Kinglake Street	Bagshot Street	Kinglake Street Site Access	0	0	0	Negligible
Kinglake Street	Kinglake street Site Access	Thurlow Street	1	1	0	Negligible

Table 11.10 Traffic Flow and Flow Change, Consented and Proposed - PM

Link	From	To	Consented	Proposed	Flow Change	Significance
Thurlow Street	Thurlow Street Site Access	Kinglake Street	5	5	0	Negligible
Thurlow Street	Albany Road	Thurlow Street Site Access	7	8	1	Negligible
Albany Road (B214)	Albany Road Site Access	Bagshot Street	6	7	1	Negligible
Albany Road (B214)	Thurlow Street	Albany Road Site Access	6	7	1	Negligible
Bagshot Street	Albany Road	Bagshot Street Site Access	0	0	0	Negligible
Bagshot Street	Bagshot Street Site Access	Kinglake Street	0	0	0	Negligible
Kinglake Street	Bagshot Street	Kinglake Street Site Access	0	0	0	Negligible
Kinglake Street	Kinglake street Site Access	Thurlow Street	0	0	0	Negligible

11.7.45. As shown in the above tables both the AM and PM peak will see a maximum of 11 total additional vehicle trips from the Project on any of the roads in the study area. The net increase is 1 additional trip on any road within the peak hour.. This increase in traffic flow from the Project will have a **negligible** effect on severance either on its own or considering the uplift allowing for the consented development.

Mitigation

11.7.46. As the Project is expected to have no materially adverse effect on severance, no mitigation measures are proposed.

Residual Effects

11.7.47. The residual effect of the operational phase of the Project on severance is **negligible**.

Driver Delay

11.7.48. The Project will generate a maximum of 11 additional vehicle movements an hour on any of the four roads providing direct access to the Project Site, these roads are:

- Thurlow Street;
- Albany Road (B214);
- Bagshot Street; and
- Kinglake Street.

11.7.49. The net impact considering the consented scheme is 1 additional vehicle per hour. The majority of the trips generated will be located along the B214 Albany Road and Thurlow Street which are already subject to high traffic flows. It is therefore evident that this small number of trips will have no materially adverse effect on driver delay. The effect of the Project on driver delay is therefore considered **negligible**.

Mitigation

11.7.50. no measures are proposed to mitigate driver delay as the effect is negligible.

Residual Effects

11.7.51. The residual effect of the Project on driver delay is **negligible**.

Pedestrian and Cyclist Delay

11.7.52. The effect of the Project on pedestrian and cycle delay is measured by the change in the traffic flow along with the change of speed of traffic. **Table 11.10** and **Table 11.11** show the additional trips that the Project will produce in the AM and PM peak. The Project will generate a maximum of 11additional vehicle movements an hour on any road within the study area, there will be no change in vehicle speed due to the development site. The net impact considering the consented scheme is 1 additional vehicle per hour. The development site will therefore cause a negligible impact on traffic flows (a change in traffic flows of +/- 200 vehicles per hour), with no impact in the change of speed.

11.7.53. The improved permeability of the wider Comprehensive Development which includes additional and improved crossing facilities across the wider site. These would offer a moderate beneficial benefit to both pedestrians and cyclists.

11.7.54. Due to the increased trips generated along with the public realm improvements, there is expected to be a **negligible** impact on pedestrian and cyclist delay.

Mitigation

11.7.55. The Project provides new routes for pedestrians and cyclists through a block that currently has no through access. The Project significantly enhances the public realm and provides a low traffic link parallel to Albany Road that will form part of a wider route within the overall masterplan.

Residual Effects

11.7.56. The effect on pedestrian and cyclist delay is **minor beneficial**, as the scheme provides overall improvements to the pedestrian and cycle infrastructure in the area. There are no residual negative effects.

Pedestrian and Cyclist Amenity

11.7.57. The main effects on pedestrian amenity as a result of the Project will be as a result of the following*:*

- Changes in traffic flows alongside pedestrian and cycle routes;
- Ability of pedestrians and cyclists to cross the road;
- Quality of the facilities available for pedestrians and cyclists;
- Increased numbers of pedestrians using existing footways and footpaths; and
- Availability of pedestrian and cycle routes.

11.7.58. Table 11.11 and Table 11.12 provides a summary of the results of the traffic flows alongside the pedestrian routes around the Project Site in terms of the number of additional vehicles per minute that the Project will create alongside that of the consented development and an overall change.

Table 11.12 Summary of change in number of vehicles per minute – AM peak

Link	From	To	Consented	Proposed	Flow Change	Significance
Thurlow Street	Thurlow Street Site Access	Kinglake Street	0.14	0.16	0.02	Negligible

Thurlow Street	Albany Road	Thurlow Street Site Access	0.17	0.19	0.02	Negligible
Albany Road (B214)	Albany Road Site Access	Bagshot Street	0.16	0.18	0.02	Negligible
Albany Road (B214)	Thurlow Street	Albany Road Site Access	0.15	0.17	0.02	Negligible
Bagshot Street	Albany Road	Bagshot Street Site Access	0.00	0.00	0.00	Negligible
Bagshot Street	Bagshot Street Site Access	Kinglake Street	0.01	0.01	0.00	Negligible
Kinglake Street	Bagshot Street	Kinglake Street Site Access	0.00	0.01	0.01	Negligible
Kinglake Street	Kinglake street Site Access	Thurlow Street	0.01	0.01	0.00	Negligible

Table 11.12 Summary of change in number of vehicles per minute – PM peak

Link	From	To	Consented	Proposed	Flow Change	Significance
Thurlow Street	Thurlow Street Site Access	Kinglake Street	0.08	0.09	0.01	Negligible
Thurlow Street	Albany Road	Thurlow Street Site Access	0.12	0.13	0.01	Negligible

Albany Road (B214)	Albany Road Site Access	Bagshot Street	0.11	0.12	0.01	Negligible
Albany Road (B214)	Thurlow Street	Albany Road Site Access	0.09	0.11	0.02	Negligible
Bagshot Street	Albany Road	Bagshot Street Site Access	0.00	0.00	0.00	Negligible
Bagshot Street	Bagshot Street Site Access	Kinglake Street	0.00	0.00	0.00	Negligible
Kinglake Street	Bagshot Street	Kinglake Street Site Access	0.00	0.00	0.00	Negligible
Kinglake Street	Kinglake street Site Access	Thurlow Street	0.00	0.00	0.00	Negligible

11.7.59. The above table demonstrates that there will be a **negligible** increase in the traffic rate along the pedestrian and cyclist routes surrounding the Project Site whether the Project impact is considered alone or as the net impact over the consented site.

Mitigation

11.7.60. Mitigation measures are proposed within the Project to enhance the public realm for use by pedestrians and cyclists. In addition, new London Cycle Hire stands are proposed within the Project with a 30-space docking station.

Residual Effects

11.7.61. The effect of the Project on pedestrian and cyclist amenity is considered to be **minor beneficial**.

Fear and Intimidation

11.7.62. Fear and intimidation within the vicinity of the Project Site related to the volume of traffic, the HGV composition and the speed of the traffic. The change in traffic however as a result of the development will be minimal as set out in **Table 11.10** and **Table 11.11** with no increase in the HGV composition, the overall impact on the level of fear and intimidation will be **negligible**.

11.7.63. The Project will provide a significant improvement to the attractiveness of walking by providing internal routes that are open and well lit. Compared with the existing provision this will offer a significant improvement.

11.7.64. The impact of the development proposals on fear and intimidation is therefore considered to be **moderate beneficial**.

Mitigation

11.7.65. As part of the Transport Assessment a Delivery and Servicing Plan (DSP) will be provided which will manage and inform the larger vehicle movements related to the Project Site which will assist in reducing the number of larger vehicle trips.

Residual Effects

11.7.66. The residual effect of the Project on fear and intimidation is considered to be **moderate beneficial**.

Accidents and Safety

11.7.67. The effect of the Project on accidents and safety will primarily be as a result of the following:

- Increased traffic flows to and from the Project;
- Increased pedestrian and cycle flows to and from the Project;
- Changing road layouts causing potential conflicts;

11.7.68. The Project will lead to an increase in the number of vehicular, pedestrian and cycle flows related to the Project Site. This increased activity within the vicinity of the Project Site increases the likelihood of potential conflicts between road users and pedestrians.

11.7.69. However, the changes in vehicle flows are negligible and the Project includes new streets with pedestrian and cycle provision along with improved crossing facilities on Albany Road for cyclists.

11.7.70. The change in vehicles flows being negligible and with no expected increase in vehicle speed, it is considered that there will be a **negligible** impact on accidents and safety.

Mitigation

11.7.71. The improvements to the public realm for pedestrians and cyclists will help to provide an improvement to the local road network within the vicinity of the Project Site.

Residual Effects

11.7.72. The effect on accidents and safety is **negligible**, therefore there are no residual effects of the application.

11.8. Summary

11.8.1. The Project impact of demolition, construction and operation has been assessed against the likely significant effects of:

- Severance;
- Driver Delay;
- Pedestrian and cycle Amenity;
- Fear and Intimidation and;
- Accidents and Safety.

11.8.2. These potential affects have been assessed against the significance criteria outlined within section 5 of this chapter.

Impact of Project Construction

11.8.3. **Table 11.14** sets out the impact / the significant effects of the Project construction on the local road networks. The assessment of the significant effects has shown that the Project construction will have a **negligible** effect on severance, Fear & Intimidation and Accidents & Safety. Alongside this the project will also have a **minor negative** effect on driver delay, pedestrian & cyclist amenity, pedestrian & cyclist delay. A Construction Management Plan will be implemented to mitigate the minor negative impacts of the Project. The **minor negative** impacts of the Project will be t**emporary**, **direct** and **short term**.

Impact of Project Operation

11.8.4. **Table 11.13** sets out the impact / the significant effects of the Project construction on the local road networks. The assessment of the significant effects has shown that the Project construction will have a **negligible** effect on severance, driver delay, pedestrian & cyclist delay, pedestrian & cyclist amenity, fear & Intimidation, Accidents & Safety. The local road networks surrounding the Project Site will be subject urban realm improvement as part of the Project. The urban realm improvements will provide a **minor positive** effect on pedestrian & cycle amenity, fear & intimidation and accidents & safety. The **minor positive** effects will be **permanent**, **direct** and **long term.**

Table 11.14 Summary of Significant Effects and Mitigation Measures

Description of Likely Significant Effects	Significance of Effects					Summary of	Significance of Residual Effects					Relevant Policy	Relevant Legislation
	(Major, Moderate, Minor, Negligible)	Positive / Negative	(P/T)	(D/I)	ST/MT/LT)	Mitigation / Enhancement Measures	(Major, Moderate, Minor, Negligible)	Positive / Negative	(P/T)	(D/I)	ST/MT/LT)		
Construction													
Severance	**Negligible**	n/a	n/a	n/a	n/a	n/a	**Negligible**	n/a	T	D	ST	n/a	n/a
Driver Delay	**Minor**	**Negative**	T	D	ST	Construction Logistics Plan	**Minor**	**Negative**	T	D	ST	n/a	n/a
Pedestrian and Cyclist Delay	**Minor**	**Negative**	T	D	ST	Construction Logistics Plan	**Minor**	**Negative**	T	D	ST	n/a	n/a
Pedestrian and Cyclist Amenity	**Minor**	**Negative**	T	D	ST	Construction Logistics Plan	**Minor**	**Negative**	T	D	S	n/a	n/a
Fear and intimidation	**Negligible**	n/a	n/a	n/a	n/a	n/a	**Negligible**	n/a	n/a	n/a	n/a	n/a	n/a
Accidents and Safety	**Negligible**	n/a	n/a	n/a	n/a	n/a	**Negligible**	n/a	n/a	n/a	n/a	n/a	n/a
Operation													
Severance	**Negligible**	n/a	n/a	n/a	n/a	n/a	**Negligible**	n/a	n/a	n/a	n/a	n/a	n/a
Driver Delay	**Negligible**	n/a	n/a	n/a	n/a	New Streets and Urban Realm	**Negligible**	n/a	n/a	n/a	n/a	n/a	n/a
Pedestrian and Cyclist Delay	**Negligible**	n/a	n/a	n/a	n/a	New Streets and Urban Realm	**Negligible**	n/a	n/a	n/a	n/a	n/a	n/a
Pedestrian and Cyclist Amenity	**Negligible**	n/a	n/a	n/a	n/a	New Streets and Urban Realm	**Minor**	**Positive**	P	D	LT	n/a	n/a
Fear and intimidation	**Negligible**	n/a	n/a	n/a	n/a	New Streets and Urban Realm	**Minor**	**Positive**	P	D	LT	n/a	n/a
Accidents and Safety	**Negligible**	n/a	n/a	n/a	n/a	n/a	**Minor**	**Positive**	P	D	LT	n/a	n/a

12. Water Resources

12.1. Introduction

12.1.1. This Chapter reports the assessment of the likely significant environmental effects of the Project in respect of water resources, water quality, flood risk and drainage. In particular the assessment considers the likely significant effects that may arise during demolition, construction and operation in terms of surface water drainage and flood risk, surface water quality and surface water/ foul water sewerage capacity.

12.1.2. This Chapter should be read together with Chapters 1 to 5 of this ES.

12.2. Appendices

Table 12.1: Appendices for Chapter 12

Appendix No.	Document
12.1	Flood Risk Assessment and Drainage Strategy
8.2	Ground Investigation Report – Hydrock Oct 2021

12.3. Legislation, Policy and Guidance Strategic Flood Risk Assessment

Legislative Framework

12.3.1. The relevant legislative framework documents are summarised below:

- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- The Environment Act 1995;
- The Water Act 2003;
- The Anti-Pollution Works Regulations 1999;
- The Groundwater (England and Wales) Regulations 2009;
- The Water Industry Act 1991;
- The Land Drainage Act 1991 and 1994;
- The Flood and Water Management Act 2010.

Planning Policy

National Planning Policy

12.3.2. The NPPF was revised in July 2021 and previously replaced Planning Policy Statement (PPS) 25 'Development and Flood Risk' and PPS 23 'Planning and Pollution Control'. The NPPF requires local authorities to adopt proactive strategies to mitigate and adapt to climate change, taking account of flood risk and coastal change. The aim of the NPPF is to steer development areas away from areas which experience flood risk and requires the application of the sequential test when considering new development. The NPPF promotes the use of Sustainable Drainage Systems (SuDS) and states that local authorities should prevent both new and existing developments from contributing to, or being put at unacceptable risk of, water pollution.

Regional Planning Policy

12.3.3. The London Plan (2021).

12.3.4. The London Plan 2021 is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth. The Plan is part of the statutory development plan for London, meaning that the policies in the Plan should inform decisions on planning applications across the capital. Borough's Local Plans must be in 'general conformity' with the London Plan, ensuring that the planning system for London operates in a joined-up way and reflects the overall strategy for how London can develop sustainably, which the London Plan sets out.

- Policy G1 Green Infrastructure

  Development proposals should incorporate appropriate elements of green infrastructure that are integrated into London's wider green infrastructure network.

- Policy S1 12 Flood Risk Management

  Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses

  Current and expected flood risk from all sources (as defined in paragraph 9.2.12) across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.

- Policy S1 13 Sustainable Drainage

  Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy: 1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation) 2) rainwater infiltration to ground at or close to source 3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens). 4) rainwater discharge direct to a watercourse (unless not

appropriate) 5) controlled rainwater discharge to a surface water sewer or drain 6) controlled rainwater discharge to a combined sewer.

Development proposals for impermeable surfacing should normally be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.

Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

Local Planning Policy

12.3.5. The adopted Development Plan for the London Borough of Southwark comprised:

- The Southwark Plan 2022 (February 2022).

12.3.6. Of specific relevance to this assessment are the following:

- London Borough of Southwark – Developer's Guide for Surface Water Management
- London Borough of Southwark – Strategic Flood Risk Assessment (SFRA) (March 2017)

Guidance

12.3.7. CIRIA Document C753 – The SuDS Manual (2015)

12.3.8. DEFRA Non-statutory Technical Standards for Sustainable Drainage Systems (March 2015)

12.3.9. Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England (March 2020)

12.4. Assessment Methodology and Significance Criteria

Relevant Elements of the Project

12.4.1. The following reports are relevant to the assessment of the likely environmental effects of the Project in relation to Water Resource (Flood risk, drainage and hydrology).

- Flood Risk Assessment (FRA) and Drainage Strategy Report (see Appendix 12.1);
- Detailed application drawings (see planning application documents).

Scope of the Assessment

12.4.2. The scope of this assessment was set out in an EIA Scoping Report (October 2021). A Scoping Report Review was prepared by LUC on behalf of the London Borough of Southwark (January 2022) and the comments have been considered as part of this assessment.

12.4.3. The scope of this assessment aims to address:

12.4.4. The impact of the development (including the proposed basements within Blocks 4A and 4D) on flood risk to the Project Site and adjacent areas;

12.4.5. The potential for groundwater or sewer contamination as a result of demolition and construction.

12.4.6. The potential failure of temporary drainage systems required during the construction phase.

12.4.7. The management of surface water run-off and foul water discharge.

12.4.8. The potential effects on water quality to surface water and groundwater receptors during the operational phase.

12.4.9. The potential operational effects of an increased demand on the potable water supply from the increase in residential developments within this area.

Extent of the Study Area

12.4.10. The area covered by this assessment is the immediate site defined by the red line boundary and any associated identified receptors.

Consultation

12.4.11. A number of key stakeholders were consulted during the pre-application process and design development – mainly Thames Water, Environment Agency (EA), and LBS. Please see outlined below a summary of the consultations. Please refer to the detailed FRA at Appendix 12.1 for detailed consultation responses.

- The Project Site is located in Flood Risk Zone 3 and is located within an area benefiting from flood defences and outside of the combined extents of the tidal breach modelling and so no modelled breach flood levels are available;
- The EA consider the Project Site to be at extreme low residual risk of tidal flooding only;
- Thames Water have confirmed that capacity exists within the receiving public sewers (April 2022), see Appendix O of the FRA available within Appendix 12.1;
- LBS have confirmed that discharging from the Project Site at "greenfield rates" is acceptable and would be approved (July 2021), see Appendix J of the FRA available within Appendix 12.1.

Method of Baseline Data Collation

12.4.12. The baseline information was derived from a number of sources as highlighted below:

- Ground Investigation Report by Hydrock (October 2021);
- Site Topographical Survey by Terrain (July 2014);
- Site walkover;
- Site utility sub-scan by Subscan (August 2021);

- Thames Water Asset Records (May 2014).

Identification of Sensitive Receptors

12.4.13. The following possible receptors were identified as part of this assessment:

- Groundwater;
- Existing Public Sewers;
- Construction workers – during site works;
- Off-site developments and areas.

Assessment Modelling

12.4.14. The information contained in the baseline and mitigation techniques sections for the assessment was obtained from the sources referenced above which include the proposed surface water drainage strategy. The effect sections were based on professional judgement following review of the information available.

Significance Criteria

12.4.15. The assessments of potential effects have been undertaken for both the demolition, construction and operation phases. The significance level of each effect is linked to the based on the magnitude of change as a result of Project. It also includes the sensitivity of the receiving receptor to change. The magnitude of change and sensitivity are measured and assessed on a scale ranging from high, medium, low to negligible.

Significance of Effects

12.4.16. Below is list of definitions used to define the significance of the effects discussed:

- **Major effect**: where the Project could be expected to have a very significant effect on hydrology, drainage and flood risk. This effect can be classified as positive or negative;
- **Moderate effect**: where the Project could be expected to have a noticeable effect on hydrology, drainage and flood risk. This effect can be classified as positive or negative;
- **Minor effect**: where the Project could be expected to result in a small, unremarkable effect hydrology, drainage and flood risk;
- **Negligible**: where the Project has no expected palpable effect as a result of the Project on hydrology, drainage and flood risk.

Limitations and Assumptions

12.4.17. This ES Chapter is written and based on the review of information available at time of writing. Conclusions presented are a combination of professional views supported by liaising with relevant key stakeholders and consultees together with the latest relevant policy and guidance.

12.5. Baseline Conditions

The Site and Topography

12.5.1. The Project Site sits within the existing street pattern and comprises the land bound by Kinglake Street to the north, Bagshot Street to the east, Albany Road to the south and Thurlow Street to the west. As set out within the Southwark Plan (2022), the Project Site is within an area designated as the Aylesbury Area Action Core - Phase 2. The Project Site comprises the southern part of Phase 2, and for the purposes of this planning application, including pre-application consultation, is known as Phase 2B.

12.5.2. The Project Site topography is generally flat with a high point of 3.3m AOD to the centre of the Project Site and a low point of 1.9m AOD to the southwest. The topographical survey drawings are available in full in Appendix A of the Flood Risk Assessment (see Appendix 12.1).

Existing Surface and Foul Water Drainage

12.5.3. The Project Site is served by a private drainage network that discharges to the public sewers. The Thames Water sewer records are contained in the FRA show the following:

- A 2,134mm combined sewer in Albany Road that flows northeast;
- A 1219 x 838mm combined sewer in Bagshot Street that connects to the sewer in Albany Road;
- A 600 – 675mm diameter combined sewer in Thurlow Street that connects to the sewer in Albany Road;
- 2 x 375mm diameter combined sewers in Kinglake Street.

Existing Water Mains

12.5.4. Available Thames Water records show the Project Site is served by four water mains; a 355mm diameter and 250mm diameter to the south in Albany Road, and a 90mm diameter and 125mm diameter to the north in East Street.

Existing Watercourses

12.5.5. There are no EA main rivers or ordinary watercourses in the vicinity of the Project Site. The tidal River Thames is an EA main river and is located circa 2km to the north of the Project Site. The river flows to the Thames estuary.

Existing Land Drainage

12.5.6. The Project Site has no obvious land drainage but is served by traditional below ground surface water and foul water networks which outfall to the existing public sewers. Areas of soft landscaping are assumed to infiltrate naturally.

Flood Data

12.5.7. As per the EA flood data, the Project Site is situated in Flood Zone 3 and is protected by flood defences. The EA have determined that the Project Site falls outside of the combined extents of all of the tidal breach modelling, and therefore have no modelled breach flood levels to provide. The EA have confirmed, in writing (see Appendix 12.1), that they consider the Project Site to have an extremely low residual risk of tidal flooding only.

Historical Flood Records

12.5.8. The Southwark SFRA outlined historical flood events which have been recorded in the Borough. These are outlined in Appendix E of the LBS SFRA (March 2017). There is no evidence of flood events occurring on site with nearest local flooding occurring along River Thames frontage due to non-closure of the Thames Barrier.

Flood Defences

12.5.9. The main flood defence afforded to the Project Site, and London in general, is the Thames Barrier which operates when required by the EA. River defences are constructed along both banks of the River Thames and are regularly inspected by the EA to ensure their robust operational integrity. EA information shows the bank defences classified as “good” with a top protection level of circa +5.41mAOD.

12.5.10. The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year tidal flood event.

Geology

12.5.11. A ground investigation for the Phase 2B site has been undertaken by Hydrock in June 2021 and comprised of one borehole to 15m (BH3), three boreholes to 25m depth (BH1, BH2, BH4), one borehole to 30m depth (BH5), and ten window samples to 5m depth. Trial pits have also been excavated to the perimeter of the existing buildings to obtain information on the existing foundations.

12.5.12. The 2021 boreholes show the geology of the area to comprise of the following strata:

- Made Ground – Average Thickness: 3.5m;
- Kempton Park Gravels – Average Thickness: 3.95m;
- Lambeth Group - Average Thickness: 3.05m;
- Thanet Sand Formation - Average Thickness: 10.65m;
- White Chalk Subgroup – Thickness not proven.

12.5.13. Groundwater was encountered at 6.0m below ground level in BH4 and 5.5m below ground level in BH5 during the 2021 Hydrock ground investigation (available in Appendix 8.2). Water levels recorded post-fieldwork, measured in July 2021, ranged from 5.63m below ground level to 9.56m below ground level. On the 18th of March 2022 P&M recorded a water strike at 9.4m below ground level in BH5 (within the Lambeth Group).

Hydrogeology

12.5.14. According to EA information the Project Site is not within a groundwater Source Protection Zone (SPZ).

12.5.15. There is one licensed groundwater abstraction within 1000m of the Project Site and this relates to laundry use.

12.5.16. The superficial Secondary A aquifer present below the Project Site is categorised as 'high' vulnerability. The bedrock Secondary A aquifer below the Project Site is classed as 'low' vulnerability.

12.5.17. Information from the BGS Hydrogeological Maps and supporting data from BGS historical boreholes indicate groundwater levels in the Chalk are likely to be in the order of 30 - 50m bgl. The groundwater within the Chalk, is likely to be confined by the overlying London Clay Formation. The presence of very low to moderate permeability of the Lambeth Group is unlikely to allow a vertical connection between these two potential groundwater bodies.

Surface Water and Groundwater Quality

12.5.18. The groundwater body beneath the Project Site (Greenwich Tertiaries and Chalk) is currently (2019 Cycle 2) classified under the Water Framework Directive as 'poor' – see Table 12.2.

12.5.19. The water body is currently given a 'poor' status due to 'chemical saline intrusion'. There are currently no objectives set for this water body.

12.5.20. A Thames River Basin Management Plan was produced in February 2016 which covers the Project Site and the nearby River Thames. The River Basin Management Plans purpose is to provide a framework for protecting and enhancing the benefits provided by the water environment.

12.5.21. It firstly assesses baseline local river environments and then sets out aims and ambitions in order to approve these. Tables 12.2 and 12.3 respectively outline the current status of the relevant basin district currently and are extracted from the DEFRA online catchment data explorer.

Table 12.2: River Basin Management Plan River Quality (Thames Middle)

River Name	Distance from Project Site	Current Ecological Quality	Current Chemical Quality
River Thames	2km north	Moderate	Fail

Table 12.3: River Basin Management Plan Groundwater Quality

Location	Current Quantitively Quality	Current Chemical Quality

Project Site	Poor	Poor

Existing Water Resources

12.5.22. London and the southeast is amongst the driest regions in England and so severe pressure is put on water supplies as population and urban centres grow. This is exacerbated by the underlying London Clay which restricts groundwater recharge.

12.5.23. Thames Water realise this and in their 2019 Water Resources Management Plan (WRMP) document sets out how they will manage our water resources efficiently alongside developing new supplies of water. This incorporates a number of proposals including water usage reduction, new water supplies, smart meters and leak reduction.

12.5.24. These policies are reflected in the London Plan which also outlines water reduction, re-use and investment in order to reduce the water consumption and ensure security of supply.

Existing Sources of Flooding

Fluvial/Tidal

12.5.25. The EA's indicative floodplain map shows that the Project Site is located in Flood Zone 3 which is associated with the tidal River Thames. Flood zone 3 is defined as land having a 1 in 100 or greater annual probability of river flooding; or land having a 1 in 200 or greater annual probability of sea flooding. The EA's map also shows that the Project Site is located in an area which benefits from flood defences.

12.5.26. The EA have confirmed that the Project Site falls outside of the combined extents of all of their updated tidal breach modelling and therefore have no modelled breach flood levels to provide. The EA consider the Project Site to be at extreme low residual risk of tidal flooding only.

Groundwater

12.5.27. As outlined, the on-site intrusive works have not discovered elevate groundwater levels. Groundwater flooding is not considered a flood risk on the Project Site.

Water Mains/Sewers

12.5.28. Burst or damaged watermains located on site can provide localised flood risk on site should they occur.

Surface Water Flooding

12.5.29. The EA's indicative Surface Water Flooding Map shows that the majority of the Project Site is at 'very low' risk of surface water flooding which means that each year the area has a chance of flooding of less than 0.1%. Some areas of the surrounding public highways including Bagshot Street and Albany Road are shown to be at 'high' (chance of flooding greater than

3.3%) risk of surface water flooding. This is assumed to relate to localised low points and general topography.

12.5.30. Several mitigation measures are proposed including raised Finished Floor Levels (FFLs) and strategic levels conveying any exceedance flows to low risk areas. Surface water flooding is considered low risk and insignificant.

Future Baseline

12.5.31. Future baseline elements relating to surface water and flood risk will not significantly change should development proposals not proceed.

12.5.32. Rainfall intensities may increase due to climate change in the future which may lead to an increased risk of flooding.

12.6. Assessment of Effects, Mitigation and Residual Effects

Demolition and Construction

Alteration of the drainage regime

12.6.1. The initial stages of the construction works will involve a site strip and demolition of existing site infrastructure. This can remove existing areas of soft landscaping and also over-compaction of existing areas of permeable surfacing. This results in a higher intensity of surface water run-off rates reaching existing drainage infrastructure and also the volume of surface water run-off due to the loss of infiltration and interception. If this existing drainage becomes inundated with increased flows it can cause surcharging of sewers and subsequent surface water flooding.

12.6.2. Changes in site topography due to site clearance and construction works can also alter existing flow paths and site low points. This can result in surface water ponding in new areas on site which are not served by existing drainage networks and/or are more vulnerable in terms of surface water flooding.

12.6.3. The above factors can have a high magnitude of change and sensitivity of this existing drainage networks is also considered high without adequate mitigation. Although temporary and short term, this is likely to be a direct **major negative** significance without sufficient mitigation measures.

Mitigation

12.6.4. The Principal Contractor is required to prepare a Demolition Environment Management Plan (DEMP) and a Construction Environment Management Plan (CEMP) which will outline how surface water run-off will be managed and controlled on site. An outline DEMP and outline CMP can be found at Appendix 5.1 and 5.2. This will outline how surface water run-off will be controlled during heavy storm events and prevented from flowing to site low points where it could cause flood risk issues. The use of large gullies and attenuation features to hold and

store surface run-off prior to disposal off site will be a key requirement and will reduce flood risk.

Residual Effects

12.6.5. The above mitigation will result in low magnitude of change with the receptors still considered high. In this regard, there is an overall negligible effect on the existing on and off site drainage infrastructure as a result.

Potential contamination of water resources

12.6.6. Construction traffic operating within the Project Site and accessing site can increase the risk of surface water contamination, especially as a result of hydrocarbon and suspended solids. These contaminates can pollute surface water run-off which finds its way to the public sewers causing water quality issues.

12.6.7. Excavation works for foundations, basements and service routes can increase the risk of suspended solids pollution but also can provide increased pathways for contaminates to reach groundwater and cause groundwater quality issues.

12.6.8. The sensitivity and magnitude of change for of both receptors is considered high. Although temporary and short term, this is likely to be a direct **major negative** significance without sufficient mitigation measures

Mitigation

12.6.9. The CEMP will be required to outline how the movement, control and effect of construction vehicles is implemented on site. This also encompasses the management of stockpiled material on site and the safe storage of fuel and chemicals on site. The CEMP is a key construction document which will be developed and implemented by the Principal Contractor. It will also require input and approval from the local authority in order to ensure a robust procedure is in place to minimise the environmental risk posed by the works. It is an organic and live document which will be reviewed regularly and incorporate all relevant EA guidance.

12.6.10. Construction vehicles are to be maintained and inspected regularly to ensure no leaking of fuel or related substances is happening. Storage of other equipment which uses fuel will follow the same regime and will be stored in safe controlled areas, e.g. drip trays and/or bunding to minimise risk. This will be implemented over the lifespan of the construction works.

12.6.11. Proposed drainage networks to control surface water over the duration of the works will incorporate surface water interception which will capture, separate and store debris, silt, and related contaminants on site prior to discharge to the receiving sewers. This discharge will be subject to approval from the water authority to ensure compliance.

12.6.12. The CEMP will be a live operation document which will require all site operatives and contractors to be familiar with its procedures and processes. This is particularly relevant for large scale environmental events such as chemical spills and or fuel tank bursts.

Residual Effects

12.6.13. The above mitigation will result in low magnitude of change with the receptors still considered high. In this regard, the is an overall negligible effect on the existing on and off site drainage infrastructure as a result.

Flood Risk to construction workers and construction plant

12.6.14. As outlined, the Project Site is located in a low flood risk area and is protected by flood defences. The flood risk from other sources is also considered low and so the risks to construction workers and plant is low. Therefore, there is likely to be a direct, temporary, short term minor negative significance.

Mitigation

12.6.15. Site documents will include site emergency documents including a flood evacuation plan. This plan will relate to site construction workers and all site staff and will outline procedures and evacuation of site to areas of safe refuge in the event of a flood event.

Residual Effects

12.6.16. The above mitigation will result in low magnitude of change with the receptors still considered high. In this regard, the is an overall negligible effect on the existing on and off site drainage infrastructure as a result.

Leak or breakage of the temporary sewerage system

12.6.17. Site welfare facilities will incorporate temporary toilet and wash down facilities for construction workers during site operational hours. These can include above ground pipes and associated drainage conduits. Blockages, leaks and pipe failures could result in uncontrolled foul water leaching into groundwater or reaching watercourses through existing below ground drainage.

12.6.18. This would affect these receiving bodies as foul water can reduce oxygen levels which can lead to the deterioration of existing plants and habitants, especially if nutrient enrichment and eutrophication occurs over time. Fixing of leaks after identification means the issue can be temporary due to the dilution of the receiving waters. In this regard and prior to mitigation measures, there is likely to be a direct, temporary, short term moderate negative significance from this.

Mitigation

12.6.19. Site welfare facilities will incorporate a new temporary connection to the Public Sewer to dispose of foul water flows offsite and/or separate septic tank/cesspool facility to safely store foul water on site for safe disposal. This will reduce the risk of foul water reaching pathways which cause water quality issues.

Residual Effects

12.6.20. The above mitigation will result in low magnitude of change with the receptors still considered high. In this regard, the is an overall negligible effect on the existing on and off site drainage infrastructure as a result.

Operation

Alteration of the existing drainage regime

12.6.21. The Project will drain to the existing Thames Water Public Sewer in Bagshot Street via an existing 525mmø existing connection. The proposed discharge rate will be reduced significantly to equivalent greenfield runoff rate for the 2, 30 and 100 year plus climate change storm events. There will be a slight increase in proposed run-off volume.

12.6.22. The sensitivity and magnitude of change of the receiving sewers prior to any proposed mitigation is considered high with a direct, permanent, long term **major negative** significance.

Mitigation

12.6.23. It is not possible to mitigate against the surface water factors by utilising surface water infiltration systems due to the poor draining soils on site and other constraints such as basement footprints and the close proximity of structural foundations.

12.6.24. In this regard, an extensive SuDS network will be implemented on site which will capture, control and reduce peak run-off rates to the receiving sewers. This will provide significant betterment on site by reducing peak run-off rates from the Project Site to pre-development green field run-off rates for all storms up to and including the peak 1 in 100 year + 40% storm event as outlined in Section 6.3 of the FRA (see Appendix 12.1). Green field run-off rates were calculated using the Greenfield Run-off Estimator tool from uksuds.com.

12.6.25. Green roofs have been utilised across a significant proportion of the building roof spaces (see Appendix D), occupying a total of around 3,500m2 (12.5% of the Project Site area). The green roofs will intercept a proportion of surface water at source and will reduce discharge rates during regular rainfall events.

12.6.26. Rain gardens, bioretention tree pits, swales and permeable paving have also been used to intercept surface water run-off from the roads and hardstanding areas which will reduce the volume of surface water entering the network.

12.6.27. Thames Water have confirmed that capacity exists within the public sewers to receive the proposed peak discharge rate.

12.6.28. The new SuDS/drainage network will replace an old poorly maintained network currently on site and will create a new formal and comprehensive drainage network on site with significant storage capacity on site, circa 1660m^3, and redundancy built in.

Residual Effects

12.6.29. The above mitigation will result in negligible magnitude of change with the receptors still considered high in terms of sensitivity. In this regard, the is an overall negligible effect to end users.

Effect of surface water drainage

12.6.30. The Project has the potential to increase the peak run-off rates to the existing Thames Water sewers if not controlled and managed in a sustainable and controlled manner. This can occur due to the increase in impermeable area and climate change as outlined in the FRA (see Appendix 12.1).

12.6.31. Discharging uncontrolled increased surface water run-off rates and volumes to the receiving Thames Water sewers could increase flood risk the in the downstream network both on and off site.

12.6.32. The above would have a direct, permanent and long term major negative significance effect as the existing sewer network's sensitivity is considered high and the magnitude of change, without any mitigation, is considered high also.

Mitigation

12.6.33. The FRA outlines a comprehensive SuDS strategy proposed for the Project Site which will manage surface water run-off at source and provide betterment in terms of surface water run-off. This will include the following:

- Green roofs on proposed buildings;
- Porous Paving;
- Swales;
- Biodiverse tree pits and raingardens;
- Modular underground attenuation cells.

12.6.34. This surface water network will contribute to reducing peak surface water discharge rates to greenfield run-off rates in line with the LLFA SuDS Guidance and the London Plan. The discharge rate from the Project will be restricted to the equivalent greenfield run-off rate for the 2, 30 and 100 year plus climate change storm events by a complex flow control device. Surface water is proposed to discharge via an existing 525mm diameter connection into the public combined sewer in Bagshot Street to the east of the Project Site.

12.6.35. The drainage system has been designed so that the sewers will not flood for the extreme 1 in 100 + 40% storm event. Exceedance flows have been assessed for events greater than the critical storm event and in the event that the drainage system fails. The external levels have been designed to slope away from the building thresholds in order to reduce the risk of flooding in an exceedance event. A plan showing the exceedance flow routes is included within Appendix N of the FRA.

12.6.36. It is the intention to offer all main sewer runs for adoption to Thames Water. Any remaining drainage will be maintained and managed by private management companies for the lifetime of the development.

12.6.37. The SuDS network also integrates water quality measures to ensure surface water run-off is treated at source before outfalling off-site.

Residual Effects

12.6.38. The implementation of the proposed SuDS network will significantly reduce surface water discharge rates to the public sewers and ensure that the quality of surface water is not reduced. The above mitigation measures mean the magnitude of change is low, although the receiving receptor sensitivity is still considered high.

Increased potable water demand

12.6.39. The Project will increase the demand for potable water from the existing Thames Water delivery network.

12.6.40. The sensitivity of the Thames Water potable water network is high. There is likely to be a long-term, permanent, direct effect of negli**ible** significance with no mitigation measures required.

Mitigation

12.6.41. None required.

Residual Effects

12.6.42. The sensitivity of the receptor is moderate and the magnitude of change, following mitigation, is low. In this regard, there is likely to be a negligible effect to the local potable water supply.

Foul Water Increase

12.6.43. The Project is a major regeneration programme which will result in increased residential density when compared to existing. There are 373 existing dwellings on site and the Project consists of 614 dwellings. This will increase the peak foul water flow rate to the existing Thames Water Sewers.

12.6.44. The increase in peak foul water flow rate could cause the capacity of the public sewer to be exceeded.

Mitigation

12.6.45. It is proposed to re-use the three existing connections to the Thames Water public sewers with a new foul water network constructed to serve the proposed buildings.

12.6.46. A pre-development enquiry has been made to Thames Water who have confirmed that capacity exists within the public sewer network to receive the peak foul water flow rate from the development.

Residual Effects

12.6.47. The sensitivity of the receiving Thames Water infrastructure is high and the magnitude of change following required mitigation, where applicable, is considered negligible. Therefore, there is likely to be a negligible effect to the receiving Thames Water Sewers.

Increased Flood Risk to Site Users

12.6.48. As outlined in the FRA, the flood risk to the Project Site is considered low from all sources. There is still a risk of flooding occurring in site due to exceedance flows within the Project Site as a result of blockages in the surface water network or extreme storm events.

12.6.49. Site users are considered high sensitivity and the magnitude of change, prior to mitigation measures, considered low. There is likely to be a direct, permanent, long term effect of **minor negative** significance prior to any mitigation measures.

Mitigation

12.6.50. The risk of blockages occurring within a new surface water network is considered low when part of a regular and comprehensive maintenance plan. Such a plan will form part of the Project Site's management documentation and operation. Chapter 8 of the FRA and Drainage Strategy report available within Appendix 12.1 sets out the recommended maintenance activities for the surface water drainage network.

12.6.51. Site exceedance routes have been designed to route any overland flows away from building thresholds to areas of low risk such as open soft landscaped areas and highway carriageways. FFLs will be set above flow routes in order to protect buildings and end users.

Residual Effects

12.6.52. There is likely to be a negligible effect to end users although the sensitivity will still be high. Magnitude of change following mitigation is considered negligible.

12.7. Summary

12.7.1. The assessment outlined in this chapter has been carried out to determine potential effects of the Project Site on Water Resource, mainly hydrology, drainage and flood risk. The risks are summarised below:

- Potential increase in Flood Risk to the Project Site;
- Potential increase in surface water discharge off site;
- Potential increase in contamination of existing water sources.

12.7.2. Demolition and construction activities will be informed and underwritten by a detailed DEMP and CEMP which will control all demolition and construction works and will include a temporary surface water management system. The DEMP and CEMP will be submitted and approved by key consultees such as the EA, LPA and LLFA.

12.7.3. The surface water run-off from the Project Site currently discharges off site to the receiving Thames Water Sewers without any attenuation, treatment or restriction.

12.7.4. The proposed SuDS will aim to reduce the peak run-off rates from the Project Site to greenfield run-off rates which is a significant betterment when compared to existing.

12.7.5. SuDS components within the Project Site will control and manage surface water art source in order to reduce run-off rates and also improve surface water quality, amenity and biodiversity. These SuDS components include green roofs, swales, biodiverse treepits, rain gardens and modular attenuation tanks.

12.7.6. A robust site maintenance plan will be implemented for the SuDS network to ensure it performs as designed. Primary drainage routes will be offered for adoption to Thames Water and a private management company taking responsibility for remaining private networks/SuDS.

12.7.7. Exceedance flows within the Project Site will flow to low risk areas away from building thresholds and associated areas. Any off-site flows will be contained within the new road layout and routed to low points away from habitable areas.

12.7.8. The proposed mitigation measures are sufficient to ensure no significant residual effects are caused in terms of Water Resource.

12.7.9. A summary of the effects of the Project Site is shown in Table 12.4

13. Wind

13.1. Introduction

13.1.1. This Chapter presents an assessment of the likely significant environmental effects of the Project on the local wind microclimate, within and surrounding the Project Site. Measures to prevent, offset or mitigate any negative effects are identified, as well as methods that will enhance the Project Site and surrounding area. The assessment summarised in this Chapter is based on the wind modelling and analysis undertaken by RWDI and presented in this ES.

13.1.2. The likely significant effects of the Project on the local wind environment have been assessed against best practice criteria for pedestrian comfort and safety. These two aspects are associated with pedestrian use of public open spaces and it is important to ensure that the design follows UK good practice design guidelines developed to minimise associated negative effects.

13.2. Appendices

Table 13.1: Appendices for Chapter 13

Appendix No.	Document
13.1	Pedestrian Level Wind Microclimate Assessment (May 2022)
13.2	Figures 13.3 to 13.19)

13.3. Legislation, Policy and Guidance

Legislative Framework

13.3.1. There is no legislation direction relating to wind microclimate issues relevant to the Development.

Planning Policy

National Planning Policy

National Planning Policy Framework (2021)[130]

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. It states that the purpose of the planning system is to contribute to the achievement of sustainable development; and

[130] Department for Communities and Local Government, 2021. Revised National Planning Policy Framework. London. HMSO

that the planning system must meet interdependent overarching objectives summarised as: an economic objective, a social objective and an environmental objective.

There are no policies or statements that are directly related to the wind microclimate, although the promotion of high-quality built environments was emphasised in the NPPF. For instance, paragraph 8 describes environmental objectives for sustainable development:

- *c) "[…] to protect and enhance our natural, built and historic environment […] and mitigating and adapting to climate change".*

Additionally, paragraph 130 states the following:

- *"f) Create places that are safe, inclusive and accessible and which promote health and well-being with a high standard of amenity for existing and future users."*

13.3.2. National Planning Practice Guidance (2019)[131]

The NPPG was published in November 2016 to support the NPPF and was updated in October 2019. There is no guidance within the NPPG related to tall buildings and wind microclimate issues.

13.3.3. UK Climate Projections (UKCP18) (2018)[132]

The UK Climate Projections (UKCP18) published by the Met Office presents a number of different predicted scenarios. The 'Climate Projects Report' published by UKCP18 presents the probable changes in wind speed for 2070 - 2099 in both the summer and winter seasons. With these predictions, the current trends in the climate change are not likely to have any significant effects on the predicted wind microclimate conditions in and around the Project Site. It is therefore not necessary to provide a quantitative analysis of the increase in storm frequency and its implication on the effect on the wind microclimate for the Project.

Regional Planning Policy

13.3.4. The London Plan 2021 – The Spatial Development Strategy for Greater London[133]

The London Plan 2021 is the Spatial Development Strategy for Greater London. It places importance on the creation and maintenance of a high-quality environment for London. The following policies apply specifically in relation to wind microclimate:

Policy D3 Optimising site capacity through the design-led approach (Para 3.3.8), states that:

- *"Buildings […] massing, scale and layout […] should complement the existing streetscape and surrounding area. Particular attention should be paid to the design of the parts of a building or public realm that people most frequently see or interact with in terms of its legibility, use, detailing, materials and location of entrances. Creating a comfortable pedestrian environment with regard to levels of […] wind".*

Policy D8 Public realm, Development Plans and development proposals should, states that:

[131] Department for Communities and Local Government, 2019. Planning Practice Guidance.
[132] Met Office, 2018. UKCP18 Science Overview Report.
[133] Greater London Authority, 2021. The London Plan. London. GLA

- *"Consideration should also be given to the local microclimate created by buildings, and the impact of service entrances and facades on the public realm."*
- *"Ensure that appropriate shade, shelter, seating […] with other microclimatic considerations, including temperature and wind, taken into account in order to encourage people to spend time in a place."*

Policy D9 Tall buildings: Environmental impact, states that:

- *"Wind […] around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building";*
- *"Air movement affected by the building(s) should […] not adversely affect street-level conditions".*

Policy D9 Tall buildings: Cumulative impacts, states that:

- *"The cumulative visual, functional and environmental impacts of proposed, consented and planned tall buildings in an area must be considered when assessing tall building proposals and when developing plans for an area. Mitigation measures should be identified and designed into the building as integral features from the outset to avoid retro-fitting."*

Local Planning Policy

Southward Plan 2022[134]

Policy P14, Design quality, states that:

- "*Development must provide:*
    - *3. […] a comfortable microclimate […];*
    - *10. A positive pedestrian experience".*

Policy P14, Reasons, states that:

- *"Sustainable design must […] avoid creation of adverse local climatic conditions (e.g. wind shear)."*

Policy P17, Tall Buildings, states that:

- *"The design of tall buildings will be required to:*
    - *3. Avoid harmful and uncomfortable environmental impacts including wind shear;*
    - *5. Have a positive relationship with the public realm […] and create a positive pedestrian experience"*

Policy P17, Reasons, states that:

[134] London Borough of Southwark, 2022. The Southwark Plan 2019-2036. London. LBS

- *"poorly designed or located tall buildings can […] cause unpleasant environmental effects, especially on the location's microclimate. Detailed modelling and analysis is therefore essential to assess these impacts and is required for all tall building applications."*
- *"Well-designed tall building can add value to […] and provides activities for people at ground level within a good microclimate."*

Policy P56, Protection of amenity, states that:

- "*Development should not be permitted when it causes […]. Amenity considerations that will be taken into account include:*
    - *4. Daylight, sunlight and impacts from wind and on microclimate."*

New Southwark Plan Background Paper: Tall Buildings June 2020[135]

Section 1.3: Approach to tall buildings states that:

- *"Due regard should also be given to the potential harm that tall buildings development can have on […] microclimate […]. Impacts such as […] wind tunnel effects […] should be minimised and eliminated where possible through analysis and required 3D modelling."*

Implementation Strategy states that:

- *"Tall buildings need to be well designed and planned so that they do not cause adverse impacts in terms of microclimate, wind turbulence […] but instead aims to incorporate more landscaped public spaces that creates enlivened public places*

Guidance

Guidance on tall buildings (2007)[136]

English Heritage and the Commission for Architecture and the Built Environment (CABE) produced a revised and updated version of their joint guidance on tall buildings. The final version was released in July 2007 and in section Criteria for evaluation, state that:

- *"… planning permission for tall buildings should ensure therefore that the following criteria are fully addressed: […] The effect on the local environment, including microclimate".*

13.3.5. Historic England Advice Note 4: Tall Buildings (2022)[137]

The Historic England Advice Note 4: Tall Buildings (2022) states in Section 4.1:

[135] London Borough of Southwark, 2020. New Southwark Plan Background Paper: Tall Buildings June 2020. London. LBS
[136] Commission for Architecture and the Built Environment and English Heritage, 2007. Guidance on tall buildings. London. CABE and English Heritage.
[137] Tall buildings: Historic England Advice Note 4, 2022. Swindon. Historic England

- *"The following checklist summarises the main considerations for tall building policies […].*
    - *3) The tall building policy should:*
    - *j) Address the following: Environmental impacts, such as […] wind."*

Section 4.5 states:

- *"The impact on the local environment […] can be affected by factors such as wind and other microclimatic changes."*

Section 4.6 states:

- *"Designing and planning for tall buildings can be enhanced by […] the use of three-dimensional digital modelling. Such models support the development […] as they allow:*
    - *Consideration of other environmental factors such as wind."*

13.4. Assessment Methodology and Significance Criteria

Relevant Elements of the Project

13.4.1. The assessment of this chapter is focused on the residential blocks (4A, 4B, 4D, 5A and 5C) and associated public realm and amenity space that make up the Project.

Scope of the Assessment

13.4.2. The main interactions of wind with a building occurs relatively close to the building, particularly when there are neighbouring buildings and streets along which the wind can be channelled. This means that the focus of the assessment will be within the Project Site and the immediate surrounding streets and public realm, on the relative comfort of Site residents, visitors and users of the public, communal and private open spaces and pedestrians utilising other public realm areas, such as pedestrian routes within and bordering the Project Site.

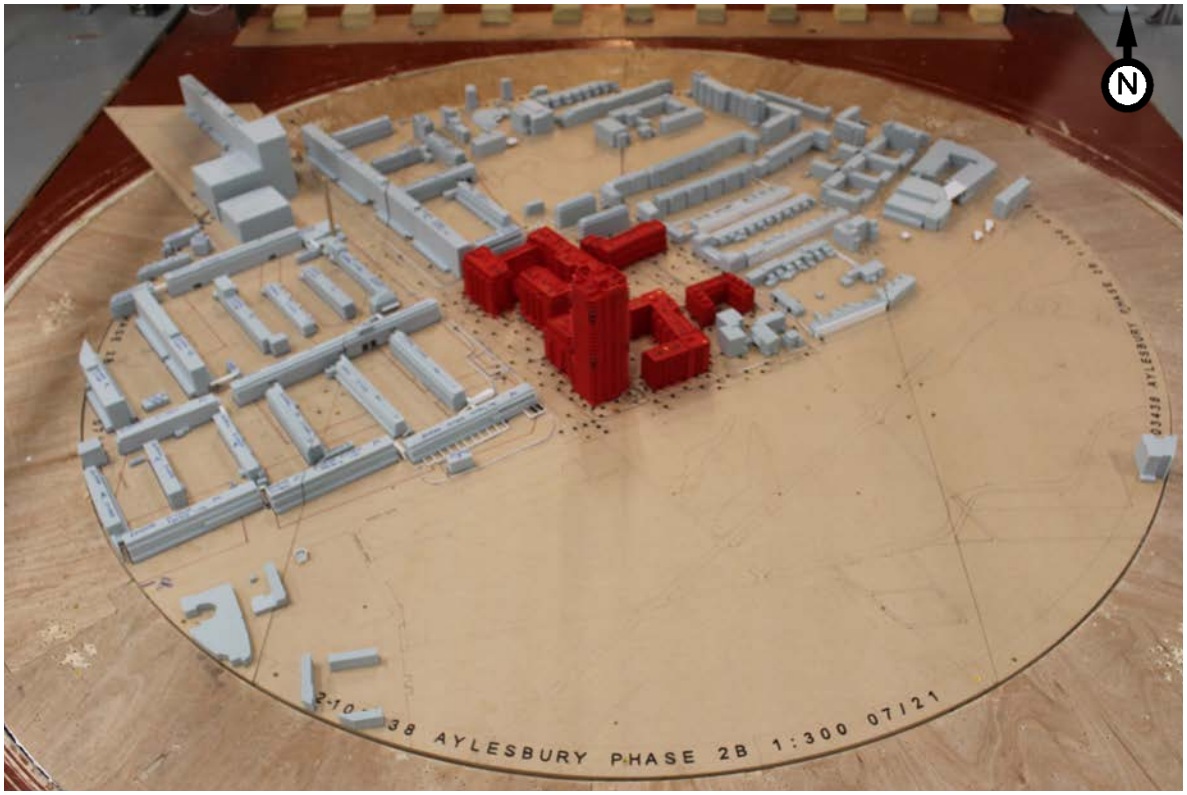
13.4.3. Due to the scale of the Project, a comprehensive assessment of baseline (existing) and likely pedestrian level wind conditions upon completion of the Project has been undertaken, based on wind tunnel testing of a physical scale model and the industry standard Lawson Comfort Criteria.

Assessment Modelling

13.4.4. The wind microclimate is assessed by means of 1:300 scale model tests of the Proejct Site in the surrounding area in a boundary layer wind tunnel (Figure 13.1). The assessment applied historical meteorological data to account for the background wind climate for the Project Site and then considers the proposed building massing in order to determine the likely wind microclimate. This has been classified in accordance with the widely accepted Lawson Comfort Criteria (as discussed further below in Table 13.2). The assessment considers both pedestrian comfort and the potential for 'strong winds' which would impact on pedestrian safety. The main

wind effects are expected within the Project Site and in the streets immediately surrounding the Project Site. Consequently, the key receptors would be pedestrians (and cyclists) in these areas.

Figure 13.1: View from the south of the Project (in red) with Existing Surrounding Buildings in the wind tunnel (Configuration 2).



13.4.5. The assessment undertaken focusses on the windiest season (in northern Europe, generally winter; specifically, December, January and February), to represent a 'worst case' scenario, and the summer season (June, July and August) for amenity spaces, when they are expected to be most frequently used.

13.4.6. In the wind tunnel assessment, the following configurations were assessed:

- Configuration 1: Existing Site with Existing Surrounding Buildings (the Baseline Condition);
- Configuration 2: The Project with Existing Surrounding Buildings;
- Configuration 3: The Project with Cumulative Surroundings;
- Configuration 4: The Project with Proposed Landscaping, Wind Mitigation Measures and Existing Surrounding Buildings; and
- Configuration 5: The Project with Proposed Landscaping, Wind Mitigation Measures and Cumulative Surrounding Buildings.

13.4.7. Wind is unsteady, or gusty, and this 'gustiness' or turbulence, varies depending upon the Project Site. Modelling these effects is achieved by a series of spires and floor roughness elements to create a 'boundary layer' that is representative of the Project Site conditions. The detailed proximity model around the Project Site is used to fine-tune the flow and create conditions similar to those expected at full scale.

13.4.8. The meteorological data obtained for London indicates that the prevailing wind throughout the year is from the south-west (i.e. 210 to 240 degrees on the compass). This is typical for many areas of southern England. There is a secondary peak from the north-east during the late spring and early summer. The winds from the north-east are not as strong as the prevailing winds from the south-west.

13.4.9. The UK Meteorological Office supplies records of the number of hours that wind occurs for ranges of wind speed and by direction. Meteorological data for London Combined (Heathrow and London City Airports) provides a representation of the local wind microclimate for the wider London area. Further details of the meteorological data used for this assessment can be found in **section 2.4 in ES Volume 15, Appendix: Wind Microclimate - Annex 1**.

13.4.10. The meteorological data from each airport has been corrected to open country conditions at 10m height, to account for the effects of nearby terrain, using the methodology set out in ESDU 01008[138].

Lawson Comfort Criteria

13.4.11. This wind microclimate is assessed using the Lawson Comfort Criteria ('the Lawson Criteria'), which have been established for over thirty years and have been widely used on building developments across the United Kingdom. The Lawson Criteria, which seeks to define the reaction of an average pedestrian to the wind, are described in Table 15.2. If the measured wind conditions exceed the threshold wind speed for more than 5% of the time, then they are unacceptable for the stated pedestrian activity and the expectation is that there may be complaints of nuisance or people will not use the area for its intended purpose.

13.4.12. The Lawson Criteria set out four pedestrian activities (comfort categories) and reflect the fact that less active pursuits require more benign wind conditions. The four categories are: 'Sitting', 'Standing', 'Strolling' and 'Walking', in ascending order of activity level, with a fifth category for conditions that are 'Uncomfortable' for all uses. In other words, the wind conditions in an area required for 'Sitting' need to be calmer than a location that people merely walk past.

13.4.13. The distinction between' Strolling' and 'Walking' is that in the 'Strolling' scenario pedestrians are more likely to take on a leisurely pace, with the intention of taking time to move through the area. Whereas, in the 'Walking' scenario pedestrians are intending to move through the area quickly and are therefore expected to be more tolerant of stronger winds. For a mixed-use development Site, such as the Project (and surrounding area), the desired wind microclimate would typically need to have areas suitable for 'Sitting', 'Standing/Entrance' use and 'Strolling'.

[138] ESDU International, Computer program for wind speeds and turbulence properties: flat or hilly sites in terrain with roughness changes, ESDU 01008, 2001 01008

13.4.14. The Lawson Criteria are derived for open air conditions and assume that pedestrians will be suitably dressed for the season. Thermal comfort is not evaluated as part of the assessment.

13.4.15. The assessment undertaken also provide a notification of stronger winds, which are defined as wind speeds in excess of 15 metres per second (m/s) for more than 2.2 hours of the year. Strong winds are generally associated with areas which would be classified as acceptable for 'Walking' or as 'Uncomfortable'. In a residential-led urban development, 'Walking' and 'Uncomfortable' conditions would not usually form part of the 'target' wind environment and would usually require mitigation due to pedestrian comfort considerations. This mitigation would also reduce the frequency of, or even eliminate, any strong winds.

13.4.16. The coloured key in Table 13.2 corresponds to the presentation of wind tunnel test results described later within this chapter and within Figures 13.3 to 13.19 (see Appendix 13.2) provided at the end of this chapter.

Table 13.2: Lawson Comfort Criteria

Key	Comfort Category	Threshold	Description
	Sitting	0-4 m/s	Light breezes desired for outdoor restaurants and seating areas where one can read a paper or comfortably sit for long periods.
	Standing	4-6 m/s	Gentle breezes suitable for main building entrances, pick-up/drop-off points and bus stops.
	Strolling[139]	6-8 m/s	Moderate breezes that would be appropriate for strolling along a city/town centre street, plaza or park.
	Walking	8-10 m/s	Relatively high speeds that can be tolerated if the objective is to walk, run or cycle without lingering.
	Uncomfortable	>10 m/s	Winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.

Demolition and construction

13.4.17. The potential microclimate impacts during demolition and construction works have not been directly assessed within the wind tunnel, as this is a temporary condition and would be highly variable as the existing buildings are demolished and the Project is constructed. The potential wind impacts of the Project when completed are assessed using the professional judgement of an experienced wind engineer, based on an assessment of the background wind climate at

[139] *The distinction between strolling and walking is that in the strolling scenario, pedestrians are more likely to take on a leisurely pace, with the intention of taking time to move through the area, whereas in the walking scenario pedestrians are intending to move through the area quickly and are therefore expected to be more tolerant of stronger winds.*

the Project Site (the results of the tested configurations for the baseline and completed development scenarios) and an understanding of the likely effects based on RWDI's experience of assessing wind in the built environment.

13.4.18. This approach was taken assuming that the activity on-Site during this time (i.e. construction activity) is less sensitive to wind conditions (due to protection from Site hoarding, and Site access being restricted to Site workers) than when the Project is completed and occupied (which would include new building entrances and outdoor seating with amenity spaces, for example). In addition, there would be appropriate health and safety measures implemented (through a CEMP) to ensure that the construction workers were adequately protected.

13.4.19. Windier conditions (in terms of pedestrian comfort) will be tolerable across the active demolition and construction Site as this area is not for typical pedestrian use (see section *'Assumptions and Limitations'* below).

Extent of the Study Area

13.4.20. The wind tunnel model of the Project is built at a scale of 1:300 and includes the surrounding area within a 360m radius of the centre of the Project Site (hereafter referred as the 'surrounding area'). The immediate surrounding area consists of a mixture of mid-rise urban residential and low-rise commercial developments and as such a 360m radius is considered a robust study area for the wind assessment. This will hereafter be referred to as the 'Study Area'.

Consultation

13.4.21. No consultation activities relating to this wind microclimate assessment has been undertaken in support of the preparation of this chapter

13.4.22. Following the review of the Scoping Report. The following comments were received by LUC:

"wind data from London airport from a 30 year period have been combined to produce wind roses per season. it is recommended that the applicant states how they were 'combined' and which years from this 30 year period are included."

13.4.23. Meteorological data from the meteorological stations at Heathrow and London City have been combined to achieve the data for the wider London area. The data from 1987-2017 have been used to produce the wind roses.

Method of Baseline Data Collation

13.4.24. The baseline conditions across the Project Site and the surrounding area have been defined using wind tunnel testing to provide a detailed, quantitative assessment.

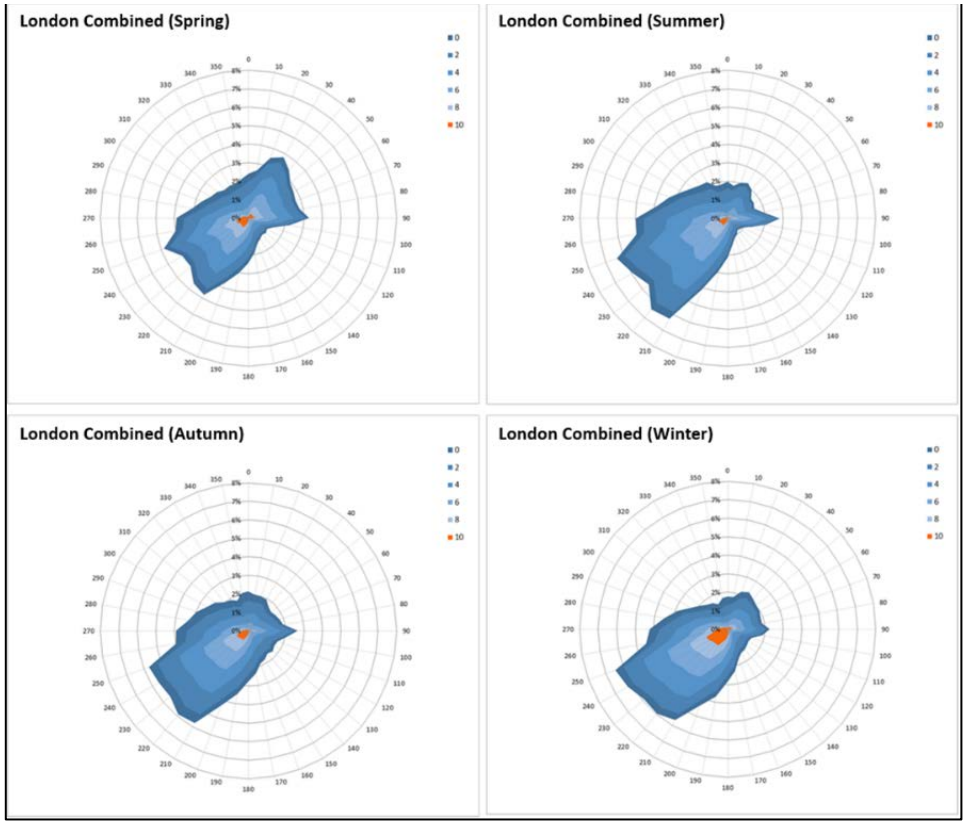
13.4.25. Mean and peak wind speeds have been measured for both the windiest season, normally winter, to show the worst-case scenario and summer season for amenity spaces. Amenity spaces are assessed during the summer season as these areas are expected to be used most frequently during this period with an expectation of calmer conditions compared to other times of the year. Measurement have been taken at locations across the Project Site and surrounding

area (e.g. at buildings, paths, roads and areas of open spaces) for 36 wind directions in 10° increments, which is considered a large enough scale to ensure all wind effects are captured.

13.4.26. The results have been combined with long-term meteorological climate data for the London area. The meteorological data used in this assessment is deemed to be representative of the local wind microclimate for the London area. The meteorological data used is presented in Figure 13.2.

13.4.27. The baseline conditions are reflected within the wind scenario – 'Configuration 1: Existing Site with Existing Surrounding Buildings' (also referred as the 'Baseline Scenario'). Further detail on the wind tunnel testing methodology can be found in Appendix 13.1.

Figure 13.2: Meteorological Data



Identification of Sensitive Receptors

13.4.28. The criteria used in the assessment of the potential effects is based on the relationship between the desired pedestrian uses (as defined by the Lawson Criteria) in relation to the wind conditions measured at a particular receptor location with the Project in place. This allows for the assessment to take into account any changes in pedestrian activity that might accompany the Project.

13.4.29. The sensitivity of receptors is related to the intended pedestrian use at each location. There are no separate definitions for sensitivity. The important consideration is whether the wind

conditions experienced at a particular receptor location are suitable for the intended use, in terms of pedestrian comfort and strong winds. All receptors are considered to be highly sensitive to the local wind microclimate conditions and are given an equal weighting. The sensitivity for all receptors is defined as high.

13.4.30. Sensitive receptors include the following locations (where present on the Project) with the required wind conditions specified for each use:

- Thoroughfares – targeting 'Strolling' wind conditions;
- Entrances – targeting 'Standing' wind conditions;
- Secondary Entrances - targeting 'Strolling' wind conditions or calmer;
- Seating areas – targeting 'Sitting' wind conditions during the summer season;
- Amenity spaces – targeting 'Sitting' wind conditions during the summer season (with 'Standing' wind conditions acceptable at mixed-use amenity areas and large amenity spaces);
- Large terraces – targeting 'Standing' wind conditions during the summer season if no long-term seating is intended; and,
- Private balconies – targeting 'Standing' wind conditions during the summer season.

13.4.31. In addition, the wind conditions on the surrounding area will also be considered within the area that would potentially be influenced by the Project. For sensitive receptors surrounding the Project Site, consideration was given to the uses listed above where appropriate, as well as:

- Pedestrian crossings – targeting 'Walking' wind conditions.
- Roads - targeting no 'Strong Winds'.
- Car Parks - targeting no 'Strong Winds'.

13.4.32. The off-Site locations will include a comparison with the Baseline Scenario. The significance of the effect will be defined based on whether there is a material change in the wind conditions. An example of a material change would be a location which was suitable and safe in the baseline becoming unsuitable or unsafe, or an already unsuitable/unsafe location being made worse by the Project.

Significance of Effects

Magnitude of Impact

13.4.33. The assessment criteria for the modelled wind microclimate, as shown in Table 13.2, comprise an increasing scale to reflect increasing wind speeds.

13.4.34. Table 13.3 shows the low, moderate and major impact magnitude categories indicate the severity of the difference between the desired microclimate and the expected wind conditions in the presence of the Project.

Assessing Significance

13.4.35. The significance criteria used in the assessment of potential and residual effects at the numbered receptors are based upon the comparison of the predicated wind conditions at particular locations with the desired pedestrian use of an area as defined by the Lawson Criteria and, the predicted wind conditions at that area. This comparison takes into account any change in pedestrian activity that might arise as a result of the Project.

13.4.36. A seven-point scale has been utilised within this assessment, as shown in Table 13.3. The reason for this approach is provided in the following example: once the Project has been completed, if the wind conditions at a particular location are required to be suitable for standing, but the expected wind conditions are identified as being suitable for strolling, the difference between the desired and expected wind conditions is described as being one-category windier than desired. In this case, the effect would be identified as adverse, and of low significance.

13.4.37. In terms of the nature of the effect, effects can either be beneficial (calmer conditions than required) or adverse (windier conditions than required). An adverse effect implies that a location has a wind environment that is unsuitable for its intended use and mitigation would therefore be required.

Table 13.3: Magnitude of Impact Descriptors

Expected Wind Microclimate	Scale and Nature of Effect
Wind conditions are 3-steps calmer than those desired	Major Beneficial
Wind conditions are 2-steps calmer than those desired	Moderate Beneficial
Wind conditions are 1-step calmer than those desired	Minor Beneficial
Wind conditions are as desired	Neutral
Wind conditions are 1-step winder than those desired	Minor Adverse
Wind conditions are 2-steps windier than those desired	Moderate Adverse
Wind conditions are 3-steps windier than those desired	Major Adverse

13.4.38. Where potential adverse effects are identified, a corresponding entry has been included in the 'Mitigation' section of the ES to describe the remedial measures expected to mitigate the effect. The size and extent of mitigation measures is typically proportional to the significance of the impact. For example, a low adverse effect (for example) would usually be resolved with small, localised mitigation measures, while a major adverse effect would require a larger intervention.

13.4.39. In line with Lawson's overall methodology, strong winds are reported separately from the comfort assessment and do not form part of the significance criteria. This is because any strong wind exceedance is considered to be significant regardless of its scale.

13.4.40. Effects during the demolition and construction works are direct, local and short-term (temporary).

13.4.41. Effects once the Project is completed are direct, local and long-term (permanent).

13.4.42. Residual effects reported in the assessment for the completed/occupied Project are permanent.

13.4.43. Wind conditions experienced across the Study Area with the Project in place are also compared against the baseline conditions where appropriate.

Limitations and Assumptions

13.4.44. It is assumed that there will be controlled or restricted access (i.e. not accessible to the general public) across the Project Site during the demolition and construction works, and therefore windier conditions will be tolerable.

13.4.45. This assessment is based on worst-case wind speeds, expected to be encountered during the winter season (December, January and February) in the UK. Additional consideration has been made for summer wind conditions due to the presence of ground floor public amenity space, the presence of podium amenity areas, balconies and rooftop terraces. This complies with the standard methodology set out by Lawson for wind-microclimate assessments.

13.4.46. It is expected that outdoor amenity spaces and rooftop terraces would be used for 'Sitting' primarily during the summer season (though a mix of 'Sitting' and 'Standing' conditions may be considered appropriate depending on exactly how the area is intended to be used. This would be considered case by case). During the winter, it would be expected that these spaces would increase a criteria level to 'Standing' use.

13.5. Baseline Conditions

Configuration 1: Existing Site with Existing Surrounding Buildings (the Baseline Conditions)

13.5.1. Wind conditions for Configuration 1 (the baseline scenario) are presented in **Figure 13.3 (see Appendix 13.2)** for the windiest season and **Figure 13.4 (see Appendix 13.2)** for the summer season.

Pedestrian Comfort

13.5.2. During the windiest season, wind conditions at On-Site and Off-Site locations (throughfares and pedestrian crossings) range from suitable for sitting to strolling use during the windiest season. Wind conditions at entrances would range from suitable for sitting to standing use during the windiest season.

13.5.3. Wind conditions during the summer season are typically the same or one category calmer, with more measurement locations being suitable for sitting use.

Strong Winds

13.5.4. There are no instances of strong winds exceeding 15m/s for more than 0.025% of the time (approximately 2.2 hours per year) at any measurement locations at and around the Project Site in the baseline scenario.

Future Baseline

13.5.5. The evolution of the Baseline Conditions (in the event that the Project does not come forward) has been considered using professional judgement informed by the results of the Baseline Scenario (Configuration 1) and the wind tunnel results undertaken as part of the cumulative effects assessment (Configuration 3). Based on the wind conditions presented in Configuration 3, massing of the Cumulative Schemes to the west of the Project Site would be expected to provide beneficial shelter to Project Site users on the western portion of the Project Site. In the absence of the Project, the overall wind microclimate conditions across the Project Site would be expected to remain similar to the current baseline conditions (Configuration 1).

13.6. Assessment of Effects, Mitigation and Residual Effects

Demolition and Construction

13.6.1. Based on the description of the baseline environment (Configuration 1), it would be expected that conditions during demolition and construction would be suitable for a working construction Site and pedestrian thoroughfares around the Project Site (with the hoarding in place). Therefore, the likely effect is expected to be **Negligible (not significant)** and no design and/or management measures are considered necessary during the demolition and construction of the Project.

13.6.2. During the demolition and construction period all Off-Site locations (thoroughfares and entrances) would remain suitable for their intended uses. Strong winds exceeding the safety threshold would not occur at any Off-Site locations. It is therefore considered that there would be a **Negligible (not significant)** effect during demolition and construction of the Project.

13.6.3. As construction of the Project proceeds, wind conditions at the Project Site would gradually adjust from those of the existing Site to those of the completed Development, as described in the following section 'Operation' and would not be significant. Off- Site the effects would be **Negligible (not significant)** and would thus not require wind mitigation.

13.6.4. Wind mitigation measures would however need to be put in place prior to the completion and occupation of the Project to mitigate against negative wind conditions On-Site once the Project is completed.

13.7. Operation

Receptor and Receptor Sensitivity

13.7.1. The new sensitive receptors resulting from the introduction of the Project includes the users entering/exiting the Project; users of the open amenity areas/public realm in the Project (ground floor, podium, terraces and balconies); and pedestrians along thoroughfares that form part of the Project. Table 13.4 sets out the measurement locations and the corresponding uses on and Off-Site with the inclusion of the Project. The intended uses are also presented in Figures 13.5 for ground level and in Figure 13.6 for elevated levels (see Appendix 13.2 for Figures).

Table 13.4: Likely intended uses of the Project (Configurations 2-5)

Intended use	Required Wind Conditions	Measurement Icoation Reference
On-Site		
Pedestrian Thoroughfares (Windiest Season)	Strolling	7, 9-11, 18-20, 23, 25, 26, 30-33, 35, 37-39, 42, 48, 50-52, 55, 56, 59-63, 65, 67-71, 74-77, 86-88, 91, 95, 98-100, 106, 108, 111, 112, 114, 115, 121-123, 127-129, 132, 133, 138, 139, 142, 147-150, 153, 155, 157, 160, 161-163, 168-170, 174, 177, 181-190, 192, 193, 195, 196, 200, 201, 203-206, 209-211, 216, 235, 236, 239, 240, 249-251, 253, 256, 259, 261-265, 272-277, 287-290, 292.
Entrances (Windiest Season)	Standing	21, 22, 24, 34, 36, 40, 43-47, 53, 54, 57, 58, 90, 92, 96, 109, 116-120, 137, 143-146, 151, 152, 154, 156, 158, 175, 198, 237, 241-245, 248, 254, 255, 257, 258, 267-271, 285.
Ground Level – Mixed Use (Summer Season)	Sitting/Standing	64, 107, 113, 171-173, 178-180, 212, 213, 215, 266, 278-280, 282, 284, 286.

Ground Level – Seating (Summer Season)	Sitting	49, 124, 214, 281, 283.
Podium – Mixed Use (Summer Season)	Sitting/Standing	293, 294, 296.
Balconies (Summer Season)	Sitting/Standing	299, 305-307, 309, 321, 323-327, 334-339, 346-359, 364, 365.
Roof Amenity – Mixed Use (Summer Season)	Sitting/Standing	297, 298, 300-304, 308, 310-317, 319, 320, 322, 328-333, 340-345, 360-363, 367-369.
Road Users (Windiest Season)	Walking	41, 66, 89, 93, 94, 97, 110, 136, 141, 159, 176, 191, 194, 197, 199, 202, 208, 218, 222, 238.
Off-Site		
Pedestrian Thoroughfares (Windiest Season)	Strolling	27, 73, 79, 81, 82, 84, 101, 102, 105, 130, 217, 219, 223, 225, 227, 229, 230, 232-234, 247.
Entrances (Windiest Season)	Standing	80, 126, 134, 135, 140, 164-167, 207, 221, 224.
Ground Level – Mixed Use (Summer Season)	Sitting/Standing	13-16, 28, 103
Benches (Summer Season)	Sitting	8
Road Users (Windiest Season)	Walking	1-6, 12, 17, 29, 72, 78, 83, 85, 104, 125, 131, 220, 226, 228, 231, 246, 252, 260, 291.

Configuration 2: The Project with Existing Surrounding Buildings

13.7.2. The assessment of the wind conditions for Configuration 2 is based on the results presented in Error! Reference source not found. and Error! Reference source not found. for the windiest and summer seasons respectively for ground floor level and Error! Reference source not found. for elevated levels during the summer season. Safety exceedances on ground level are presented in **Figure 13.10** See Appendix 13.2 for Figures 13.3 to 13.19).

13.7.3. The residual effects discussed in this section are based on Configuration 4 with the inclusion of the proposed landscaping and wind mitigation measures.

Pedestrian comfort

13.7.4. Inclusion of the Project would increase the windiness along the southern and western facades of the Project as the prevailing winds would down-wash along the building facades. Furthermore, windier conditions would occur between Plots 4A and the southern massing of Plot 5A where the prevailing winds would be expected to channel.

13.7.5. During the windiest season wind conditions would be suitable for sitting to walking use at and around the Project and during the summer season wind conditions at and around the Project would be suitable for sitting to strolling use.

Thoroughfares

On-Site

13.7.6. The majority of thoroughfares would have wind conditions suitable for sitting to strolling use during the windiest season, which represents **Moderate Beneficial (not significant)** to **Neutral (not significant)** effects.

13.7.7. However, the walking conditions at on-Site thoroughfares (measurement locations 7, 10, 55 and 287) during the windiest season would be one category windier than suitable for the intended use. This would represent a **Minor Adverse (significant)** effect.

Off-Site

13.7.8. Thoroughfares in the vicinity of the Project would be suitable for sitting to standing use during the windiest season, which would represent a **Neutral (not significant)** effect.

Mitigation

13.7.9. Wind mitigation measures developed to provide beneficial shelter are discussed in 'Mitigation Measures' section of this chapter.

Residual Effect

13.7.10. With the inclusion of the wind mitigation measures discussed in Configuration 4 below, residual effects for on-Site thoroughfares would range from **Neutral (not significant)** to **Moderate Beneficial (not significant)**.

13.7.11. Off-Site residual effects for thoroughfares would be classified as **Neutral (not significant)**.

Building Entrances

On-Site

13.7.12. The majority of entrances to the Project Site would have wind conditions ranging from suitable for sitting to standing use, representing a **Minor Beneficial (not significant)** to **Neutral (not significant)** effect during the windiest season.

13.7.13. The exception to this is at the entrance to the courtyard of Plot 5A (measurement location 58) which would have wind conditions suitable for walking use during the windiest season. As this would be an entrance to the courtyard of to Plot 5A walking conditions would be one category windier than suitable for the intended use. This would represent a **Minor Adverse (significant)** effect.

Off-Site

13.7.14. Wind conditions at existing entrances to the development surrounding the Project Site would range from suitable for sitting use during the windiest season. This would represent a **Neutral (not significant)** effect.

Mitigation

13.7.15. Wind mitigation measures developed to provide beneficial shelter are discussed in the 'Mitigation Measures' section of this chapter.

Residual Effect

13.7.16. With the inclusion of the developed wind mitigation measures, on-Site residual effects for entrances would range from **Minor Beneficial (not significant)** to **Neutral (not significant)**.

13.7.17. Off- Site residual effects for entrances would be **Neutral (not significant)**.

Ground Level Mixed Use Amenity Spaces

On-Site

13.7.18. The majority of mixed-use amenity spaces would be suitable for sitting and standing use during the summer season, suitable conditions for the intended use. This would represent a **Neutral (not significant)** effect.

13.7.19. However, the strolling conditions in the courtyard between Plot 4A and Plot 4D (measurement location 284) would be one category winder than suitable for the intended use and would represent a **Minor Adverse (significant)** effect.

Off- Site

13.7.20. The back of the house garden spaces and the play area to the west of the Project would be suitable for sitting use during the summer season, which would represent a **Neutral (not significant)** effect.

Mitigation

13.7.21. Mitigation measures which would provide beneficial shelter to the on-Site amenity space with windier conditions are discussed in the 'Mitigation Measures' section of this chapter.

Residual Effect

13.7.22. With the inclusion of the proposed measures, residual effects for on-Site mixed-use amenity would be **Neutral (not significant)**.

13.7.23. Similarly, off- Site residual effects for ground level mixed-use amenity spaces would be **Neutral (not significant).**

Ground Level Seating Provisions

On-Site

13.7.24. The majority of ground level seating provisions would be suitable for sitting use during the summer season. This would represent a **Neutral (not significant)** effect.

13.7.25. However, seating provisions on the courtyard between Plot 4A and Plot 4D with standing conditions (measurement locations 281 and 283) during the summer season would be one category windier than suitable for the intended use. This would represent a **Minor Adverse (not significant)** effect.

Off-Site

13.7.26. The benches to the west of the Project would be suitable for sitting use during the summer season. This would represent **Neutral (not significant)** effect.

Mitigation

13.7.27. Mitigation measures which would provide beneficial shelter to the seating provisions with windier conditions are discussed in the 'Mitigation Measures' section of this chapter.

Residual Effect

13.7.28. With the inclusion of the proposed measures, residual effects for on-Site seating provisions would be **Neutral (not significant)**.

13.7.29. Similarly, off-Site residual effects for the benches would be **Neutral (not significant).**

Balconies, Podium Level and Roof Areas

On-Site

13.7.30. All the podium, balcony and roof terrace amenity spaces would have wind conditions suitable for sitting and standing use during the summer season, suitable conditions for the intended use. These conditions would represent a **Neutral (not significant)** effect.

Mitigation

13.7.31. No Mitigation measures would be required.

Residual Effect

13.7.32. Residual Effects on elevated levels would be **Neutral (not significant)**.

Strong winds

13.7.33. Strong winds with the potential of being a safety concern for vulnerable occupants would occur at on-Site thoroughfares at the south-west corner of Plot 4A (measurement locations 7 and 10), at the entrance to the courtyard of Plot 5A (measurement location 58) and the mixed-use amenity space between Plot 4A and Plot 4D (measurement location 284). This would represent a **significant** effect.

Mitigation

13.7.34. Wind mitigation measures developed to provide beneficial shelter are discussed in 'Mitigation Measures' section of this chapter.

Residual Effect

13.7.35. With the inclusion of the wind mitigation measures, the residual effects on ground level would be **Neutral (not significant)**.

13.8. Operation

Configuration 3: The Project with Cumulative Surrounding Buildings

13.8.1. The assessment of the wind conditions for Configuration 3 is based on the results presented **in** Error! Reference source not found. **and** Error! Reference source not found. (see Appendix 13.2 for Figure) for the windiest and summer seasons respectively for ground floor level and **Error! Reference source not found.** (see Appendix 13.2) for elevated levels during the summer season.

13.8.2. The residual effects discussed in this section are based on Configuration 5 with the inclusion of the proposed landscaping and wind mitigation measures.

Pedestrian comfort

13.8.3. Inclusion of the cumulative schemes to the west would provide beneficial shelter to the majority of the areas of the Project, which would reduce the areas with winder conditions to the south and west of the Project. Wind conditions at and around the Project would be suitable for sitting to walking use during the windiest season and would be suitable for sitting to strolling use during the summer season.

Thoroughfares

On-Site

13.8.4. Thoroughfares would have wind conditions suitable for sitting to strolling use which represents a **Moderate Beneficial (not significant)** to **Neutral (not significant)** effects during the windiest season.

Off-Site

13.8.5. Thoroughfares in the vicinity of the Project would be suitable for sitting to standing use during the windiest season, which would represent a **Neutral (not significant)** effect.

Mitigation

13.8.6. No mitigation measures would be required.

Residual Effect

13.8.7. On-Site residual effects for thoroughfares would range from **Neutral (not significant)** to **Moderate Beneficial (not significant)**

13.8.8. Off-Site residual effects for thoroughfares would be **Neutral (not significant).**

Building Entrances

On-Site

13.8.9. The majority of entrances to the Project would have wind conditions ranging from suitable for sitting to standing use, representing a **Minor Beneficial (not significant)** to **Neutral (not significant)** effect during the windiest season.

13.8.10. The exception to this would be the entrance to Plot 4A on the western façade with strolling conditions (measurement location 21) during the windiest season. This would represent a **Minor Adverse (significant)** effect.

Off-Site

13.8.11. Wind conditions at existing entrances to the development surrounding the Project Site would be suitable for sitting use during the windiest season. This would represent a **Neutral (not significant)** effect.

Mitigation

13.8.12. Wind mitigation measures developed to provide beneficial shelter are discussed in the 'Mitigation Measures' section of this chapter.

Residual Effect

13.8.13. With the inclusion of the developed wind mitigation measures, on-Site residual effects for entrances would range from **Minor Beneficial (not significant)** to **Neutral (not significant)**.

13.8.14. Off- Site residual effects for entrances would be **Neutral (not significant)**.

Ground Level Mixed Use Amenity Spaces

On-Site

13.8.15. The majority of mixed-use amenity spaces would be suitable for sitting and standing use during the summer season, suitable conditions for the intended use. This would represent a **Neutral (not significant)** effect.

13.8.16. However, the strolling conditions in the courtyard between Plot 4A and Plot 4D (measurement location 284) would be one category winder than suitable for the intended use and would represent a **Minor Adverse (significant)** effect.

Off- Site

13.8.17. The back of the house garden spaces and the play area to the west of the Project would be suitable for sitting and standing use during the summer season, which would represent a **Neutral (not significant)** effect.

Mitigation

13.8.18. Mitigation measures which would provide beneficial shelter to the on-Site mixed-use amenity space with windier conditions are discussed in the 'Mitigation Measures' section of this chapter.

Residual Effect

13.8.19. With the inclusion of the proposed measures, residual effects for on-Site mixed-use amenity would be **Neutral (not significant)**.

13.8.20. Similarly, off-Site residual effects for ground level mixed-use amenity spaces would be **Neutral (not significant).**

Ground Level Seating Provisions

On-Site

13.8.21. All the ground level seating provisions would be suitable for sitting use during the summer season. This would represent a **Neutral (not significant)** effect.

Off-Site

13.8.22. The benches to the west of the Project would be suitable for sitting use during the summer season. This would represent **Neutral (not significant)** effect.

Mitigation

13.8.23. Mitigation measures would not be required.

Residual Effect

13.8.24. Residual effects for on-Site and off-Site seating provisions would be **Neutral (not significant)**.

Balconies, Podium Level and Roof Areas

On-Site

13.8.25. All the podium, balcony and roof terrace amenity spaces would have wind conditions suitable for sitting and standing use during the summer season, suitable conditions for the intended use. These conditions would represent a **Neutral (not significant)** effect.

Mitigation

13.8.26. No Mitigation measures would be required.

Residual Effect

13.8.27. Residual Effects on elevated levels would be **Neutral (not significant)**.

Strong winds

13.8.28. When the cumulative developments are in place there would be no instances of strong winds which would pose a safety concern for the on-Site or off-Site pedestrians. This would represent a **not significant** effect.

Mitigation

13.8.29. No wind mitigation measures would be required.

Residual Effect

13.8.30. The residual effects on ground level would be **Neutral (not significant)**.

13.9. Operation

Wind Mitigation Measures

13.9.1. The following areas of the Project would require wind mitigation measures to improve wind conditions such that they would be suitable for the intended pedestrian uses and/or eliminate any safety exceedances:

- On-Site thoroughfares with walking conditions during the windiest season and occurrence of strong winds (measurement locations 7 and 10);
- On-Site thoroughfares with walking conditions during the windiest season (measurement locations 55 and 287);

- Entrance to the courtyard of Plot 5A (measurement location 58) with walking conditions during the windiest season and occurrence of strong winds;
- The mixed-use amenity space between Plot 4A and Plot 4D with strolling conditions (measurement location 284) during the summer season and occurrence of strong winds;
- Seating provisions in the courtyard between Plot 4A and Plot 4D with standing conditions during the summer season (measurement locations 281 and 283); and
- Entrance to Plot 4A on the western façade with strolling conditions (measurement location 21) during the windiest season when the cumulative schemes are in place.

13.9.2. Therefore, the implementation of the following wind mitigation measures would provide beneficial shelter to the areas with conditions windier than suitable for the intended use and occurrence of strong winds:

- Retaining the existing landscaping;
- Inclusion of the proposed landscaping which would consist of 1.5m-5.5m high trees, pergola structure at the south-west corner of Plot 4D and 0.6m-1m high hedges;
- Reducing the porosity of the 2.5m high fence at the entrance to the Plot 5A courtyard to 50% porosity;
- Inclusion of two multi-stem 3m high trees to the north-east of the seating provision in the courtyard between Plot 4A and Plot 4D (measurement location 281); and
- Relocating the proposed seating provision at measurement location 283 to the area represented by measurement location 280.

13.9.3. The retained and the proposed landscaping are provided in the Figure 13 of Appendix 15.1. Model photos of the wind mitigation measures developed are shown in Figure 14 and Figure 15 of Appendix 15.1.

13.9.4. The cumulative phase of the Aylesbury masterplan was assessed with the maximum parameter model. Therefore, wind conditions at the entrance to Plot 4A (measurement location 21) would be reassessed during the assessment of the Aylesbury cumulative scheme when these buildings would be in detail. If the strolling conditions at this entrance persist with the detailed elements of the Aylesbury cumulative scheme, inclusion of 2m high hedges or at least 50% porous screens on either side of the entrance would provide beneficial shelter.

13.10. Operation

Configuration 4: The Project with Proposed Wind Mitigation Measures and Existing Surrounding Buildings

13.10.1. The assessment of the wind conditions for Configuration 4 is based on the results presented in Error! Reference source not found. and Error! Reference source not found. (see Appendix 13.2) for the windiest and summer seasons respectively for ground floor level and Error!

Reference source not found. (see Appendix 13.2) for elevated levels during the summer season.

Pedestrian comfort

13.10.2. It should be noted that measurement location 366 was included at the south-east and south-west corner balconies of Plot 5C to measure the wind conditions on these balconies. These balconies would have wind conditions suitable for sitting use during the summer season which would be suitable for the intended use. This would represent a **Neutral (not significant)** effect.

13.10.3. With the inclusion of the landscaping measures and the developed wind mitigation measures wind conditions on all the on-Site and off-Site areas would have wind conditions suitable for the intended use during the windiest and the summer seasons.

Mitigation

13.10.4. Further mitigation measures would not be required.

Residual Effect

13.10.5. Residual effects for on-Site and off-Site areas would range from **Moderate Beneficial (not significant)** to **Neutral (not significant)**.

Strong winds

13.10.6. With the proposed landscaping and wind mitigation measures in place there would be no instances of strong winds which would pose a safety concern for the on-Site or off-Site pedestrians/cyclists.

Mitigation

13.10.7. No further wind mitigation measures would be required.

Residual Effect

13.10.8. The residual effects on ground level would be **Neutral (not significant)**.

13.11. Operation

Configuration 5: The Project with Proposed Wind Mitigation Measures and Cumulative Surrounding Buildings

13.11.1. The assessment of the wind conditions for Configuration 4 is based on the results presented in Error! Reference source not found. and Error! Reference source not found.**8** (see Appendix 13.2) for the windiest and summer seasons respectively for ground floor level and Error! Reference source not found.**9** (see Appendix 13.2) for elevated levels during the summer season.

Pedestrian comfort

13.11.2. With the inclusion of the landscaping measures and the developed wind mitigation measures, wind conditions on the majority of on-Site areas and all the off-Site areas would have wind conditions suitable for the intended use during the windiest and the summer season. this would represent **Moderate Beneficial (not significant)** to **Neutral (not significant)** effects.

13.11.3. Strolling conditions at the entrance to Plot 4A (measurement location 21) would be one category windier than suitable for the intended use and would represent a **Minor Adverse (significant)** effect. It should be noted that the cumulative phase of Aylesbury masterplan was assessed with the maximum parameter model. Therefore, wind conditions at this location would be reassessed during the assessment of the Aylesbury cumulative scheme when these buildings would be in detail. If the strolling conditions at this entrance persist with the detailed elements of the Aylesbury cumulative scheme, inclusion of 2m high hedges or at least 50% porous screens on either side of the entrance would provide beneficial shelter.

Mitigation

13.11.4. Further mitigation measures would not be required.

Residual Effect

13.11.5. Residual effects for on-Site and off-Site areas would range from **Moderate Beneficial (not significant)** to **Neutral (not significant)**.

Strong winds

13.11.6. With the proposed landscaping and wind mitigation measures are in place there would be no instances of strong winds which would pose a safety concern for the on-Site or off-Site pedestrians.

Mitigation

13.11.7. No further wind mitigation measures would be required.

Residual Effect

13.11.8. The residual effects on ground level would be **Neutral (not significant)**.

13.12. Summary

13.12.1. Table 13.5 provides a tabulated summary of the residual effects during the construction and operation after the implementation of the proposed landscaping and wind mitigation measures.

Table 13.5: Summary Table

Description of Impact/ Receptor	Mitigation Measures	Residual Impact
Construction Site	Mitigation measure required for the completed scenario to be implemented prior to the Project Site being completed and accessible	Neutral (Not Significant)
On-Site thoroughfares	Retained and proposed landscaping measures	Moderate Beneficial to Neutral (Not Significant)
Off-Site thoroughfares	None	Neutral (Not Significant)
On-Site entrances	Proposed landscaping measures, reducing the porosity of the fence at the entrance to the Plot 5A courtyard. Proposed wind mitigation measures if strolling conditions persist at the entrance to Plot 4A when the cumulative scheme is in detail	Minor Beneficial (Not Significant) to Neutral (Not Significant)
Off-Site entrances	None	Neutral (Not Significant)
On-Site ground level mixed-use amenity spaces	Proposed landscaping measures	Neutral (Not Significant)
Off-Site ground level mixed-use amenity spaces	None	Neutral (Not Significant)
On-Site ground level seating provisions	Proposed landscaping, inclusion of two multi-stem 3m high trees to the north-east of the seating provision on the courtyard between Plot 4A and Plot 4D (measurement location 281), relocating the proposed seating provision at	Neutral (Not Significant)

	measurement location 283 to the area represented by measurement location 280.	
Elevated level amenity spaces	None	Neutral (Not Significant)

14. Summary

Environmental Effect	Type of Receptor	Nature of Impact	Sensitivity of Receptor	Significance	Mitigation	Significance of Effect (Post Mitigation)	Additional Mitigation	Residual Significance of Effect
Chapter 6: Air Quality								
Construction								
Dust soiling during demolition/earthworks and construction	Residential (Human Receptors) within 350m of Project Site	Negative, Temporary	High	N/A	CEMP, DMP and CLP	Not Significant	N/A	Not significant
Dust soiling during demolition/earthworks and construction	Residential (Human Receptors) within 50m of Project Site	Negative, Temporary	High	N/A	CEMP, DMP and CLP, London Plan SPG requirements	Not Significant	N/A	Not significant
Exhaust emissions from on site plan and construction vehicles	Residential and Educational	Negative, Temporary	High	Not significant	N/A	Not significant	N/A	Not significant
Operational								
Nitrogen dioxide and particulate matter emissions from operational traffic	Residential and Educational	Negative, Permanent	High	Not Significant	N/A	Not Significant	N/A	Not significant

Emissions from on-site energy generation	Residential and Educational	Negative, Permanent	High	Not Significant	N/A	Not Significant	N/A	Not significant
Chapter 7: Ground Conditions								
Chapter 8: Noise and Vibration								
Construction								
Demolition and Construction Noise	Human Receptor (NRS 1, 3, 5)	Negative, Temporary	High	Minor to Moderate Adverse Significant (due to medium term duration)	DEMP/CEMP	Not Significant	N/A	Not significant
Demolition and Construction Noise	All other NRS	Negative, Temporary	High	Moderate Adverse	DEMP/CEMP	Not Significant	N/A	Not significant
Demolition and Construction Vibration	Residential	Negative, Temporary	High	Minor Adverse Not Significant	DEMP/CEMP	Not Significant	N/A	Not Significant
Demolition and Construction Vibration	Building	Negative, Temporary	High	Minor Adverse	N/A	Not Significant	N/A	Not Significant
Demolition and Construction Traffic Noise	Building	Neutral	High	Neutral	N/A	Not Significant	N/A	Not Significant
Operational								

Fixed Plant Noise emissions	Residential	Negative, Permanent	High	Minor Adverse	Designed to at least 10 dB below the existing representative background sound level,	Not significant	N/A	Not significant
Road Traffic Noise	Residential	Negative, Permanent	High	Neutral	N/A	Not Significant	N/A	Not Significant
Chapter 9: Transportation								
Construction								
Increased traffic of HGV and construction vehicles (network delays and road users safety)	Local distributor and access roads to surrounding land uses.	Negative, Temporary	Low	N/A	CLP	Slight adverse	N/A	Not significant
Pedestrian and cycle amenity	Local access and connection links to roads and surrounding land uses.	Negative, Temporary	Med	N/A	CEMP and CLP	Slight adverse	N/A	Not significant
Public Transport Provision and access	Local bus stops and bus routes	Negative, Temporary	Low	N/A	Development Phasing Plan, CEMP and CLP	Slight adverse	N/A	Not significant
Operational								
Increased traffic flows	Local distributor and access roads	Negative, Permanent	Low	Negligible	Travel Plan	Negligible adverse	Travel Plan monitoring	Negligible

	to surrounding land uses.						and remediation	
Increased number of pedestrians and cyclists	Surrounding highway network	Negative, Permanent	Med	Negligible	Proposed development design	Minor beneficial	N/A	Minor significance
Increased Public Transport Patronage	Local Public Transport Provision	Negative, Permanent	Med	Moderate	Development contribution and changes to the bus routing	Moderate beneficial	N/A	Moderate significance
Chapter 10: Socio Economics and Health								
Construction								
Construction employment	Local and Regional economy	Beneficial, Temporary	Low	Moderate	N/A	Minor-Neutral	N/A	Not significant
Operational								
Operational employment	Local and Regional Economy	Beneficial, permeant	Med	Minor	N/A	Minor	N/A	Not significant
Residents' expenditure	Business	Positive, Minor	Med	Minor	N/A	Positive, Minor	N/A	Not significant
Demand for primary education	Education	Adverse, permanent	Med	Negligible	N/A	Negligible	N/A	Not significant
Demand for healthcare	Healthcare	Adverse, PT	Med	Minor-, Adverse	N/A	Minor	N/A	Not significant
Open Space	Local residents	Beneficial, PT	Med	Minor, Beneficial	N/A	Minor, Beneficial	N/A	Not significant

Housing demand	Local residential	Beneficial, PT	Med	Minor, Beneficial	N/A	Minor Beneficial	N/A	Not significant
Chapter 12: Water								
Construction								
Alteration of the drainage regime	Drainage	Adverse, Temporary	High	Major	DEMP/CEMP Site specific surface water run-off plan to be produced and agreed with LLFA Temporary above ground storage facilities will be provided	Negligible	N/A	Not significant
Potential contamination of water resource	Water	Adverse, Temporary	High	Major	CEMP to control contaminants and manage surface water run-off. Bunding and safe storage of contaminants to be provided	Negligible	N/A	Not significant

Flood Risk to Construction Workers and Plant	Construction workers	Adverse, Temporary	High	Minor	Contractor to provide a flood emergency and contingency plan and inform site users	Negligible	N/A	Not significant
Leak or breakage of temporary sewer system	Environmental	Adverse, Temp	Med	Moderate	Welfare facilities which control and dispose of foul water to public sewer.	Negligible	N/A	Not significant
Operational								
Alteration of the drainage regime		Adverse, PT	High	Major	N/A	Negligible	N/A	Not significant
Effect of surface water drainage		Adverse, PT	High	Major	N/A	Negligible	N/A	Not significant
Increased Potable Water Demand		Adverse, PT	Med	Negligible	N/A	Negligible	N/A	Not significant
Increased Foul Water Discharge		Adverse, PT	Med	Moderate	N/A	Negligible	N/A	Not significant
Increased Flood Risk to end users		Adverse, PT	High	Minor	N/A	Negligible	N/A	Not significant
Chapter 7: Daylight, Sunlight								
Construction								

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operational								
Daylight conditions in the Properties surrounding the Project in 325 windows serving 248 rooms	Residential	Negative, Perm	High	Properties: 9 Negligible 5 Minor 3 Moderate 0 Major	N/A	Properties: 9 Negligible 5 Minor 3 Moderate 0 Major	N/A	N/A
Sunlight conditions in the Properties surrounding the Project in 228 rooms	Residential	Negative, Perm	N/A	Properties: 15 Negligible 2 Minor 0 Moderate 0 Major	N/A	Properties: 15 Negligible 2 Minor 0 Moderate 0 Major	N/A	N/A
Overshadowing conditions in the Properties surrounding the Project in 39 amenity spaces	Residential/Amenity	Negative, Perm	N/A	37 Negligible 2 Temporary& Moderate	N/A	37 Negligible 2 Temporary& Moderate	N/A	N/A

hgh

hghconsulting.com