

Elephant Park H1 Development

Environmental Statement, Volume 1 – Main Text and Figures

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For and on behalf of Avison Young

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1. Introduction

1.1 Background

1.1.1 In March 2013 Outline Planning Permission ('OPP') (reference: 12/AP/1092) was granted for a residential-led development known as Elephant Park. The subject area of the OPP comprises an area of land occupying 9.71 hectares (the 'Masterplan Site') within the administrative area of the London Borough of Southwark (LBS) located to the west of Elephant and Castle Railway Station. At the time of achieving the OPP, the Masterplan Site comprised the Heygate Estate, but this has since been demolished and delivery of Elephant Park is now well advanced. The OPP comprises Plots H1 to H7, H10, H11a, H11b, H12, H13, PAV.1 and a new park ('The Park') at its centre. Reserved Matters Applications (RMA) have been submitted and approved for all Plots but Plot H1. As such, the development approved by the OPP comprises detailed permission for Plots H2 to H7, H10, H11a, H11b, H12, H13, The Park and PAV.1 and outline permission for Plot H1 (the 'Approved Development').

1.1.2 The Elephant Park OPP was subject to an Environmental Impact Assessment (EIA) and, therefore, was accompanied by an Environmental Statement (the 'March 2012 ES') and subsequently an ES Addendum (the 'September 2012 ES Addendum'). In addition, an Updated ES dated August 2020 (the 'August 2020 ES') was submitted in support of the submission pursuant to the OPP of an Updated Detailed Phasing Plan for Elephant Park.

1.1.3 Lendlease (Elephant and Castle) Limited (the Applicant) is now submitting a stand-alone full 'drop-in' planning application (the 'Planning Application') in relation to land comprising Plot H1 of the OPP (the 'Site') for an office-led building (the 'H1 Development'), as an alternative to developing Plot H1 under the OPP. The H1 Development would become part of the Elephant Park development alongside the remainder of the Approved Development. The proposals for the Site for which detailed planning permission is sought would provide:

- One building of ground plus 17 storeys (including a mezzanine floor) with a basement level and rooftop plant.
- Commercial floorspace (all under Use Class E of The Town and Country Planning (Use Classes) Order 1987 (as amended)) totalling 58,365 sqm Gross External Area (GEA), broken down as follows:
 - 49,565 sqm GEA of office floorspace.
 - 6,795 sqm GEA of flexible offices / medical or health floorspace.
 - 1,728 sqm GEA of offices /retail / professional services / food and drink floorspace.
 - 277 sqm GEA of flexible offices / retail / professional services / medical or health floorspace.
- Public realm works, including hard and soft landscaping, and highway works to the neighbouring streets, principally to create Sayer Street North, with alterations to Deacon Street and incidental works to Elephant Road and Walworth Road.
- Servicing carried out from an internal loading dock, accessed from Deacon Street.

- A car free development other than designated accessible spaces to be located on Deacon Street.
- Cycle parking within the basement, accessed from Walworth Road, and within the public realm at ground floor.

1.1.4 The above proposals are known as the 'H1 Development'.

1.1.5 The Planning Application description of the H1 Development is as follows:

"Redevelopment of the site to provide a building of ground plus 17-storeys (including a mezzanine floor) with basement and rooftop plant providing office floorspace (Class E) and flexible office/retail/food and drink/medical and health floorspace (Class E), including ancillary cycle parking, accessible car parking, servicing, landscaping, public realm improvements and other associated works incidental to the development."

1.1.6 Avison Young was commissioned by the Applicant to carry out an EIA of the H1 Development. EIA is a formal procedure underpinned by The Town and Country Planning (EIA) Regulations, 2017 (the 'EIA Regulations')¹ as amended². The procedure must be followed for certain types and scales of development. The EIA process systematically identifies and assesses the likely significant environmental effects of a development. The process also offers an opportunity to promote an iterative design process whereby the likely significant adverse and beneficial effects of a project can be avoided or minimised, and encouraged and maximised, respectively.

1.1.7 Where EIA is required, the results are reported in an Environmental Statement (ES). The ES allows the relevant determining authority, in this case LBS, to consider all likely significant environmental effects arising from a development. The ES is a material consideration to the planning determination process.

1.2 Site Context

1.2.1 The Site and the Masterplan Site, are located within the administrative boundary of LBS, as shown within **Figure 1.1**. As shown in **Figure 1.2** the Site is located on the western edge of the Masterplan Site.

¹ HMSO. The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017.

² HMSO. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018.

Figure 1.1: The Site and Masterplan Site Location

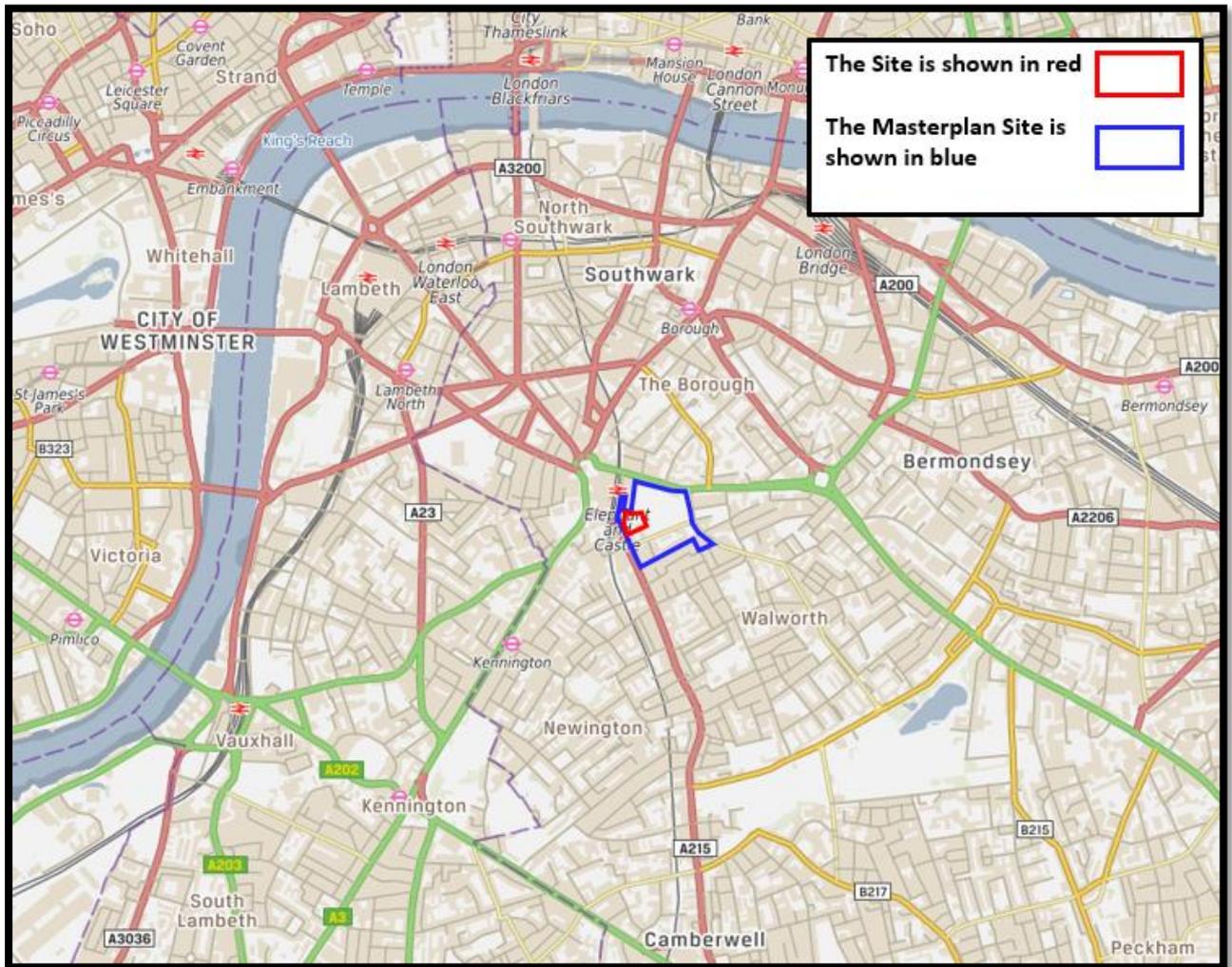
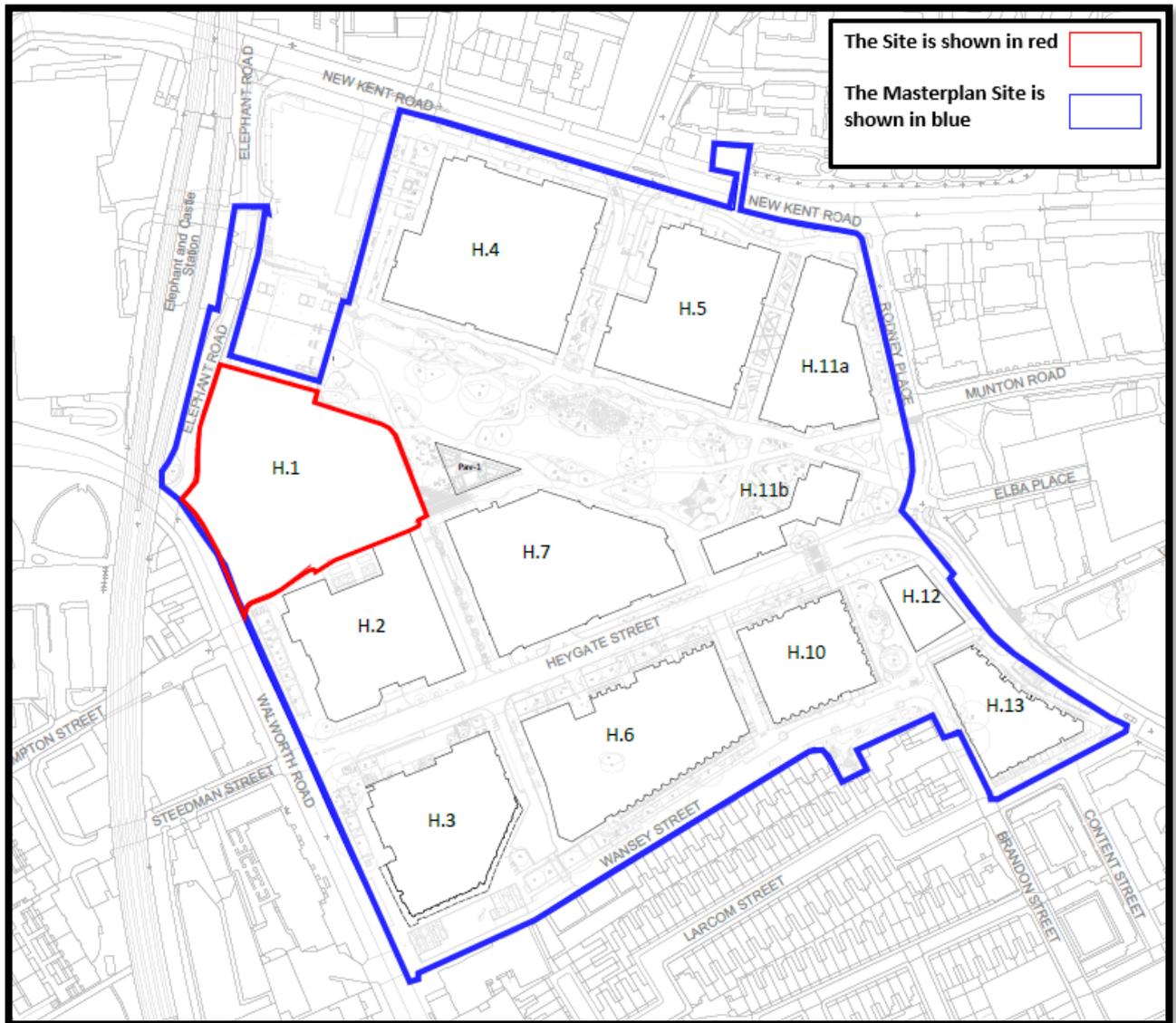


Figure 1.2: The Site and Masterplan Site



1.2.2 The Site comprises an area of 0.78 ha and as shown in **Figure 1.2** is bound by:

- Elephant Road and Walworth Road (A215) to the north-west and south-west respectively.
- Plot H2 (complete and occupied) of the Approved Development to the southeast which comprises predominantly residential accommodation, with retail and food and beverage uses at ground floor.
- A pavilion (PAV.1, currently under construction) and The Park (under construction) of the Approved Development to the northeast.
- Castle Square to the north.

1.2.3 The Masterplan Site comprises an area of 9.71 ha and is bound by:

- New Kent Road (A201) to the north.
- Rodney Place and Rodney Road to the east.
- Wansey Street to the south.

- Walworth Road (A215) and Elephant Road to the west.
- 1.2.4 Construction works for the majority of the 'development plots' of the Approved Development have commenced or are completed and operational (refer to **ES Volume 1, Chapter 3: Existing and Likely Future Land Uses and Activities**), however, no construction works have yet commenced on Plot H1 (i.e. the Site).
- 1.2.5 The Site is void of permanent structures but currently accommodates a modular building for the Masterplan Site welfare. This is associated with the on-going implementation of the Approved Development, including construction set-down. There is also a small area of temporary public realm on south side of the Site, used as a meadow, pathways and seating areas. In addition, a temporary use application was approved by LBS in November 2020 for the Site (planning application reference 20/AP/2612) in the relation to the erection of two containers to accommodate urban farming (Use Class Sui generis), together with storage area, landscaping and other associated works, for a temporary period of one year.
- 1.2.6 In relation to the Masterplan Site, at the time of writing:
- Construction works are complete (and buildings are occupied) for Plots H2, H3, H6, H10, H12 and H13 of the Approved Development.
 - Construction is nearing completion for Plots H4 and H5 including associated public realm, with construction works ongoing for Plot H11a and PAV.1.
 - Above ground work has not yet commenced in relation to Plots H7 and H11b, which are currently used for various temporary purposes including site offices, a construction compound and temporary landscaping. H11b has been technically implemented through the carrying out of a material operation on the site.

1.3 Development Context

- 1.3.1 The area in which the Site is located is experiencing considerable change. This is evident from the Approved Development and the number of approved and planned developments ('Cumulative Schemes') within the immediate vicinity of the Site (refer to **ES Volume 1, Chapter 2: EIA Methodology**). The Approved Development and such Cumulative Schemes provide the context for redevelopment and regeneration of the area, including the Site. In particular, the H1 Development offers a contribution towards to the commercial provision need of LBS. A full description of the H1 Development is provided in **ES Volume 1, Chapter 5: The H1 Development**

1.4 Legal Framework for the Environmental Statement

- 1.4.1 Underpinned by the aforementioned EIA Regulations, EIA is a formal process whereby the likely significant environmental effects of a project are identified, predicted and evaluated. The main purpose of the EIA process is to avoid and / or reduce significant environmental effects of a project via an iterative design process and to identify the likely residual environmental effects of a project so that they can be understood by planning decision makers and stakeholders.

- 1.4.2 The stand-alone Planning Application in relation to the H1 Development will be subject to EIA and will therefore be accompanied by an ES.
- 1.4.3 Whilst the ES will be provided to accompany the H1 Development, it is recognised that the EIA Regulations require the identification of a project, which in this case is the overall Elephant Park development including the H1 Development. Therefore, the EIA and ES will assess the H1 Development in the context of a 'likely future baseline' which will include all other elements of the Approved Development (i.e. the Approved Development except for Plot H1 in its outline consented form) as being completed and operational. **Chapter 2: EIA Methodology** and **Chapter 3: Existing and Likely Future Land Uses and Activities** provide further details in relation to this approach.
- 1.4.4 The scope of the EIA was agreed with LBS via an informal EIA Scoping process (refer to **ES Volume 1, Chapter 2: EIA Methodology**).
- 1.4.5 In accordance with the EIA Regulations, this ES reports the findings of the EIA process. As such, the ES sets out:
- The likely significant environmental effects of the H1 Development during the enabling and construction works for the H1 Development (the 'Works').
 - The likely significant environmental effects of the H1 Development following completion of the Works and during the occupation and operation of the H1 Development.
 - The likely significant cumulative effects of the H1 Development.
 - Mitigation measures required to prevent, reduce, ameliorate and / or offset any likely significant adverse environmental effects.
 - The likely significant residual effects of the H1 Development which would occur following implementation of the above mitigation measures.

1.5 Structure of the Environmental Statement

- 1.5.1 This ES comprises four Volumes:
- **ES Volume 1 - Main Text and Figures** (this document).
 - **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects.**
 - **ES Volume 3 - Appendices.**
 - **ES Volume 4 - Non-Technical Summary.**

Environmental Statement Volume 1 - Main Text and Figures

- 1.5.2 **ES Volume 1** (this document) comprises 12 Chapters, which are illustrated throughout by a series of figures.
- 1.5.3 The 12 Chapters comprise the key findings of the EIA process undertaken in respect of the H1 Development and provide:

- A description of the methodology applied in the EIA (refer to **ES Volume 1, Chapter 2: EIA Methodology**).
- A description of the Site, its environmental context and sensitivity (refer to **ES Volume 1, Chapter 3: Existing and Likely Future Land Uses and Activities**).
- The reasonable alternatives that were considered by the Applicant and a comparison of their environmental effects (refer to **ES Volume 1, Chapter 4: Alternatives and Design Evolution**).
- The nature and purpose of the H1 Development (refer to **ES Volume 1, Chapter 5: The H1 Development**).
- The enabling and construction processes and timetable (refer to **ES Volume 1, Chapter 6: The Works**).

1.5.4 **ES Volume 1, Chapters 7 to 12**, present the findings of the EIA for the following environmental topics:

- Socio-economics (refer to **ES Volume 1, Chapter 7: Socio-economics**).
- Air quality (refer to **ES Volume 1, Chapter 8: Air Quality**).
- Wind microclimate (refer to **ES Volume 1, Chapter 9: Wind Microclimate**).
- Daylight, sunlight, overshadowing, light pollution and solar glare (refer to **ES Volume 1, Chapter 10: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare**).
- Greenhouse Gasses (refer to **ES Volume 1, Chapter 11: Greenhouse Gasses**).
- Effect interactions (refer to **ES Volume 1, Chapter 12: Effect Interactions**).

1.5.5 **ES Volume 1, Chapters 7 to 12** include:

- An introduction.
- A methodology of assessment.
- A description of the relevant existing and likely future baseline conditions.
- An assessment of the likely environmental effects of the H1 Development and their significance.
- A description of additional mitigation measures and an assessment of the likely residual environmental effects of the H1 Development and their significance.
- An assessment of the likely residual cumulative effects of the H1 Development together with other Cumulative Schemes (refer to **ES Volume 1, Chapter 2: EIA Methodology**).
- Conclusion, summarising the findings of the assessment.

Environmental Statement Volume 2 - Townscape, Visual and Above Ground Heritage Effects

1.5.6 **ES Volume 2** presents the key findings of the townscape, visual and above ground heritage setting assessment, including a series of Accurate Visual Representations (AVRs) of the Development. As per **ES Volume 1, ES Volume 2** presents:

- An introduction.
- A methodology of assessment.
- A description of the relevant existing and likely future baseline conditions.
- An assessment of the likely environmental effects of the H1 Development and their significance.
- A description of additional mitigation measures and an assessment of the likely residual environmental effects of the H1 Development and their significance.
- An assessment of the likely residual cumulative effects of the H1 Development together with other Cumulative Schemes (refer to **ES Volume 1, Chapter 2: EIA Methodology**).
- A conclusion.

Environmental Statement Volume 3 - Appendices

1.5.7 **ES Volume 3** comprises the detailed supporting data, information and the full text of all relevant technical assessments undertaken as part of the EIA process.

Environmental Statement Volume 4 - Non-Technical Summary

1.5.8 The EIA Regulations require the submission of a summary of the ES in 'non-technical language'. As such, **ES Volume 4** provides a concise summary of the ES without excessive technical detail or scientific language so as to be readily and quickly understood by non-technical experts and members of the public who may not be familiar with EIA. The Non-Technical Summary (NTS) is produced as a separate document to facilitate wider public dissemination.

1.6 Project Team and Competency

1.6.1 Regulation 18(5) of the EIA Regulations states:

"In order to ensure the completeness and quality of the ES: (a) the developer must ensure that the ES is prepared by competent experts; and (b) the ES must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts."

1.6.2 The EIA was co-ordinated by Avison Young in conjunction with a team of specialist consultants. The Applicant's EIA Team and relevant credentials are set out within **Table 1.1**.

Table 1.1: The Applicant's EIA Team

Name and Professional Title	Organisation	Project Role	Qualification(s)	Statement of Relevant Experience
Hannah Fiszpan, Director.	Avison Young.	EIA Project Director.	BSc (Hons). Practitioner Member of the Institute of Environmental Assessment and Management (IEMA).	19 years' experience managing, co-ordinating and directing EIAs, and preparing ESs for predominantly property and urban regeneration projects.
Kirsty Rimondi, Executive Consultant.	Avison Young.	EIA Project Manager.	BA (Hons) MSc. Member of the Institution of Environmental Science (MIEnvSc). Member of the Institute of Air Quality Management (MIAQM).	20 years' experience managing, co-ordinating and directing EIAs, and preparing ESs for predominantly property and urban regeneration projects.
Alice White, Senior Consultant.	Avison Young.	EIA Project Assistant.	BSc (Hons). MSc. Graduate Member of IEMA.	Over three years' experience co-ordinating and assisting with EIAs and preparing ESs for predominantly property and urban regeneration projects.
Ellie Evans, Partner.	Volterra Partners.	Socio-economics Project Director.	BA (Hons) Economics Member of the Institute of Economic Development.	Over 15 years' experience managing, co-ordinating and directing socio-economic impact assessments, and preparing ES chapters for commercial, residential and mixed-use property, urban regeneration projects.
Luke Thurley, Senior Consultant	Volterra Partners	Socio-economics Project Manager.	Bsc (Hons) Economics MRes Economics	Three years' experience managing, co-ordinating and preparing socio-economic assessments across a wide range of use classes, with a key focus on central London boroughs.

Name and Professional Title	Organisation	Project Role	Qualification(s)	Statement of Relevant Experience
Elizabeth Bamford, Consultant.	Volterra Partners.	Socio-economics Project Lead.	BA (Hons)	Two years' experience co-ordinating and undertaking socio-economic assessments, across a wide range of use classes, with a key focus on central London boroughs.
Louise Newman, Director.	Tavernor Consultancy.	Townscape, Visual and Above Ground Heritage Consultant.	BA (Hons), DipArch, Architect.	Nine years' experience in the preparation of townscape, visual and built heritage assessments for projects across London including complex masterplans, tall buildings and interventions in sensitive historic environments.
Robert Elston, Head of Project Delivery	Cityscape Digital	Accurate Visual Representation.	BA Hons, interior design and Architecture	Over eight years' experience in Architectural Visualisation.
Anna Perela, Head of Planning.	Cityscape Digital	Accurate Visual Representation.	Member of Architects Registration Board Chartered Member RIBA	Over 10 years' experience in Architectural Visualisations
Laurence Caird, Associate Director	Air Quality Consultants Ltd (AQC).	Air Quality and Greenhouse Gas (GHG) Project Director.	BSc (Hons). MEarthSci. CSci (Chartered Scientist). Member of the Institute of Environmental Sciences (MIEnvSc). Member of the Institute of Air Quality Management (MIAQM).	15 years' experience in the field of air quality, GHG footprints and climate change. Laurence has undertaken air quality assessment and developed GHG footprints for a range of projects including large-scale mixed-use urban developments, industrial sites, airport expansion projects and airspace change proposals.

Name and Professional Title	Organisation	Project Role	Qualification(s)	Statement of Relevant Experience
Guido Pellizzaro, Associate Director.	AQC.	Air Quality and GHG Project Manager.	BSc (Hons). MIAQM. MIEnvSc. Practitioner Member of the Institute of Environmental Assessment and Management (IEMA).	14 years' experience in the field of air quality. Guido's main experience relates to managing and delivering air quality and GHG assessments for major planning applications and EIA development.
Jack Buckley, Consultant.	AQC.	Air Quality and GHG Project Consultant.	BSc (Hons). MSc. Associate Member of the Institute of Environmental Sciences (AMEnvSc). Associate Member of the Institute of Air Quality Management (AMIAQM).	Two years' experience in the field of air quality and GHG. Jack Buckley has undertaken numerous air quality and greenhouse gas assessments for a range of development inside and outside of London. He has completed a number of air quality assessment for large scale mixed-use developments throughout Greater London. Jack also has further experience of assessing carbon, climate resilience and in combination climate change impacts.
Krishan Jayyaratnam, Senior Engineer.	RWDI.	Microclimate Senior Project Engineer/ Engineering Team Leader.	C.Eng MIMechE (Member of the Institution of Mechanical Engineers). M.Eng – Aeronautics and Astronautics.	Six years' experience in wind microclimate consultancy and mitigation design guidance for several high-rise developments and masterplans specifically in London and throughout the UK.
Lotte Tobermann	GIA	Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare EIA Coordinator	BA, MSC, Member of the Institute of Environmental Assessment and Management (IEMA).	Over two years' experience working on large scale EIA projects, coordinating and preparing Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution EIA scoping reports and ES chapters.

Name and Professional Title	Organisation	Project Role	Qualification(s)	Statement of Relevant Experience
Jacopo Francisconi	GIA	Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare Senior Consultant	MSc ARB	Over four years' experience supporting developers' and architects' vision by optimising the quality of daylight and sunlight amenity, as well as working on a number of large scale EIA projects in relation to Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution.

1.7 Environmental Statement Availability and Comments

- 1.7.1 Following the submission of the full planning application, there is an opportunity for any interested parties to comment on the proposals. Due to reasons connected with coronavirus, including restrictions on movement, temporary publicity requirements are currently in place which mean that the Applicant is not required to provide physical copies of these documents on request. Instead the ES and a set of documents supporting the full planning application can be viewed on LBS's website <https://www.southwark.gov.uk/>. In addition, a hard copy will be available at the Site.

2. Environmental Impact Assessment Methodology

2.1 Introduction

2.1.1 This Chapter sets out the methodology applied in undertaking the Environmental Impact Assessment (EIA), details the process of identifying the environmental issues to be addressed in the EIA, and the methods used to identify likely environmental effects and their significance.

2.1.2 Details pertaining to the assessment methodologies and significance criteria relating to each environmental topic considered in the Environmental Statement (ES) can be found by reference to **ES Volume 1, Chapters 7 to 12** and **ES Volume 2**.

2.2 General Approach

2.2.1 This ES was prepared to comply with the EIA Regulations¹ which implement Council Directive No. 2011/92/EU² as amended by Council Directive 2014/52/EU³. Reference was also made to currently available good practice guidance in EIA including:

- Impact Assessment Guidelines and ES Review Criteria from the Institute of Environmental Management and Assessment (IEMA)⁴.
- Environmental Impact Assessment: A Guide to Good Practice and Procedures. A Consultation Paper⁵.
- IEMA Guidance 'Shaping Quality Development'⁶.
- IEMA Guidance 'Delivering Quality Development'⁷.
- Topic specific guidance referred to in **ES Volume 1, Chapters 7 to 12** and **ES Volume 2**, where appropriate.

2.2.2 The assessment of likely significant environmental effects was based on current knowledge of the Site and its surrounding environment. The assessments addressed both the likely beneficial and adverse effects of the H1 Development during the enabling and construction works required to facilitate the H1 Development (the 'Works') and of the H1 Development once completed and operational.

2.2.3 In line with legislative requirements, direct, indirect, cumulative, short-, medium-, long-term, permanent, temporary, beneficial and adverse effects are addressed where applicable. The approach taken in the assessment

¹ The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017.

² Directive 2011/92/EU of the European Parliament and of the Council. December 2011.

³ Directive 2014/52/EU of the European Parliament and of the Council. April 2014.

⁴ Institute of Environmental Management (IEMA). Guidelines for Environmental Impact Assessment. 2004.

⁵ Department for Local Communities and Local Government. Environmental Impact Assessment: A guide to good practice and procedures. A Consultation Paper. June 2006.

⁶ IEMA. Environmental Impact Assessment Guide to Shaping Quality Development. 2015.

⁷ IEMA. Environmental Impact Assessment Guide to Delivering Quality Development. July 2016.

of cumulative effects and effect interactions is set out later in this Chapter and within **ES Volume 1, Chapter 12: Effect Interactions**.

2.2.4 As part of the iterative EIA and design process, the design of the H1 Development has evolved to take account of various environmental constraints and opportunities. In this respect, environmental desktop reviews, interim assessments of the emerging H1 Development and relevant knowledge gained from environmental baseline surveys all worked to influence the evolution of the H1 Development (refer to **ES Volume 1, Chapter 4: Alternatives and Design Evolution**). Consequently, a number of potentially significant adverse environmental effects were 'designed out' or reduced in severity as part of the overall EIA and design process. Similarly, where feasible, potentially significant beneficial environmental effects were encouraged. In undertaking the assessment of likely significant environmental effects, such design measures (commonly referred to as 'Primary Mitigation') were considered as inherent components of the H1 Development (refer to **ES Volume 1, Chapter 5: The Development**).

2.2.5 Similarly, and in accordance with IEMA best practice guidance⁸, when identifying likely significant environmental effects, any methods of environmental management or protection that *"...will be required regardless of any EIA assessment, as is imposed, for example, as a result of legislative requirements and / or standard sectorial practices..."* (commonly known as 'Tertiary Mitigation') were reasonably assumed to be implemented. Examples include (not exhaustive):

- Implementation of a Construction Environmental Management Plan (CEMP).
- Considerate Contractor practices.
- Implementation of a Construction Logistics Plan (CLP).
- Remediation of contaminated land, appropriate to the end-use of the land.

2.2.6 Following the assessment of the H1 Development's likely significant environmental effects (inherently accounting for Primary and Tertiary Mitigation), any remaining likely significant adverse effects were identified. Furthermore, additional methods to prevent, reduce, ameliorate and / or offset any remaining significant adverse environmental effects were formulated (commonly referred to as 'Secondary Mitigation'). Such additional mitigation and any monitoring requirements necessary to ensure the efficacy of the mitigation measures are set out in **ES Volume 1, Chapters 7 to 11** and **ES Volume 2**.

2.2.7 Following the identification of Secondary Mitigation and assuming it to be implemented, the remaining likely significant residual effects of the H1 Development were identified.

2.3 Scoping the EIA

2.3.1 Scoping is a voluntary, albeit helpful, component of the EIA process. It involves focussing the EIA (and hence the resultant ES) on the significant environmental effects that are likely to arise as a result of the H1 Development, as

⁸ IEMA Environmental Impact Assessment Guide to Shaping Quality Development. 2015.

opposed to every single environmental effect that might result from development. This focussed and proportionate approach to EIA is encouraged within the online Planning Practice Guidance (PPG)⁹ which states:

“Whilst every ES should provide a full factual description of the development, the emphasis should be on the ‘main’ or ‘significant, environmental effects to which a development is likely to give rise. The ES should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered.”

- 2.3.2 The Applicant recognised the value of seeking an informal Scoping opinion from the LBS and so commissioned Avison Young to undertake an EIA Scoping Study.
- 2.3.3 The purpose of the EIA Scoping Study was to ensure that all relevant environmental issues in respect of the H1 Development were identified from the outset and to confirm that the EIA process would conform to the requirements of the EIA Regulations.
- 2.3.4 The key issues to be addressed by the EIA were identified through consideration of available environmental baseline information and likely future baseline information (see **Section 2.10** below), together with professional judgement and relevant experience. The findings were presented in an EIA Scoping Report dated 7th December 2020 which was informally issued to LBS. A copy of the EIA Scoping Report is provided in **ES Volume 3, Appendix 2.1**.
- 2.3.5 Following receipt of the EIA Scoping Report, a meeting was held on 17th December 2020 with LBS (and their advisors, LUC) to gain agreement to the EIA Strategy and scope of the ES as set out in the EIA Scoping Report. Minutes of this meeting are provided in **ES Volume 3, Appendix 2.2** which confirm that the EIA Strategy (particularly the assessment against likely future baseline conditions as outlined in **Section 2.10** below) and scope of the ES was agreed with LBS (and their advisors, LUC).
- 2.3.6 Through the EIA scoping process, it was identified that the H1 Development would give rise to a number of likely significant environmental effects that would, therefore, warrant assessment as part of the EIA process. These were categorised within the key environmental topics listed below:
- Socio-economics (refer to **ES Volume 1, Chapter 7: Socio-economics**).
 - Air quality (refer to **ES Volume 1, Chapter 8: Air Quality**).
 - Wind microclimate (refer to **ES Volume 1, Chapter 9: Wind Microclimate**).
 - Daylight, sunlight and overshadowing (refer to **ES Volume 1, Chapter 10: Daylight, Sunlight and Overshadowing**).
 - Greenhouse Gasses (refer to **ES Volume 1, Chapter 11: Greenhouse Gasses**).

⁹ <https://www.gov.uk/guidance/environmental-impact-assessment#Preparing-an-Environmental-Statement1>

- Effect interactions (refer to **ES Volume 1, Chapter 12: Effect Interactions**).
- Townscape and Visual and Above Ground Heritage (refer to **ES Volume 2: Townscape and Visual and Above Ground Heritage Assessment**).

2.3.7 The views assessed in **ES Volume 2: Townscape and Visual and Above Ground Heritage Assessment** were agreed with LBS (refer to correspondence in **ES Volume 3, Appendix 2.3**).

2.3.8 The EIA scoping process also identified that the H1 Development would be unlikely to significantly affect a number of other environmental topics, or elements of environmental topics. This being the case, such environmental topics, and such elements of environmental topics, did not require assessment and could be scoped out of the full EIA process and the ES. Further information regarding insignificant effects to be scoped out of the ES can be found by reference to **ES Volume 3, Appendix 2.1**.

2.4 Pre-application Engagement

2.4.1 Pre-application engagement was carried out throughout the EIA process. The following statutory and non-statutory organisations were consulted:

- LBS.
- The Greater London Authority (GLA).
- Transport for London (TfL).
- The Environment Agency (EA).
- Historic England.
- Natural England.
- Local residents, neighbours, amenity societies and stakeholders.

2.4.2 All relevant comments from the consultees relating to the EIA are addressed in **ES Volume 1, Chapters 7 to 12** and **ES Volume 2**.

2.5 Nature of the Planning Application and EIA Compliance

2.5.1 As noted in **ES Volume 1, Chapter 1: Introduction**, a detailed planning application has been submitted for the H1 Development. Where an EIA is required, the description of the H1 Development within the ES must be sufficient to enable the requirements of the EIA Regulations to be fulfilled, and in particular, to enable the likely significant environmental effects of the H1 Development to be identified.

2.5.2 The H1 Development is defined by the quantum of development and the schedule of accommodation, together with the massing, layout, landscaping, articulation and architectural details shown in the planning application drawings submitted for approval. The schedule of accommodation and the planning application drawings, together with the detailed description of the H1 Development and its construction are presented in **ES Volume 1, Chapter**

5: The Development and **ES Volume 1, Chapter 6: The Works**, respectively. The information contained therein was used for the purposes of undertaking the EIA and the preparation of this ES (**ES Volumes 1 to 4**).

2.6 Means of Assessment

2.6.1 The content and extent of the ES is based on the following:

- Review of the current situation through existing information, data and reports.
- Evaluation of the relevant likely future baseline conditions.
- Desk-top studies.
- Site surveys.
- Consideration of planning policies (national, regional and local), where relevant.
- Identification of likely environmental effects and an evaluation of their likely duration, magnitude, spatial extent and significance.
- Consideration of potential sensitive receptors.
- Professional judgement and expert opinion.
- Use of technical guidance and best practice.
- Specific consultations with appropriate statutory and non-statutory consultees.

2.7 Evaluation of Significance

2.7.1 As previously noted, the EIA process as underpinned by the EIA Regulations aims to provide the determining authority with sufficient information regarding the “...likely significant environmental effects...” of a development to enable it to lawfully determine a planning application.

2.7.2 Likely significant environmental effects reported in this ES (**ES Volumes 1 to 4**) were predicted with reference to definitive standards and legislation, where available. Where it has not been possible to precisely quantify effects, qualitative assessments have been undertaken, based on available knowledge and professional judgement. Where uncertainty exists, this has been set out within **ES Volume 1, Chapter 7 to 11** and **ES Volume 2**.

2.7.3 The significance of predicted likely environmental effects was determined by reference to assessment criteria for each environmental topic considered and these are set out in **ES Volume 1, Chapter 7 to 11** and **ES Volume 2**. These criteria apply a common EIA approach of classifying effects (either beneficial or adverse) according to whether they are of minor significance, moderate significance, major significance or insignificant.

2.7.4 Specific criteria for each environmental topic scoped into this ES (**ES Volume 1, Chapter 7 to 11** and **ES Volume 2**) were developed, giving due regard to some or all of the following:

- Extent, magnitude and reversibility of the effect.

- Duration of the effect (whether short-, medium- or long-term).
- Nature of the effect (whether direct or indirect, reversible or irreversible).
- Likelihood for the effect to occur.
- Whether the effect occurs in isolation is cumulative or interactive.
- Performance against environmental quality standards or other relevant pollution control thresholds.
- Sensitivity of the receptor.
- Compatibility with environmental policies, where applicable.

2.7.5 In order to provide a consistent approach to expressing the outcomes of the various assessments undertaken as part of the full EIA process the following terminology has been used throughout the ES. Effects have been expressed as either:

- **Adverse:** Detrimental or negative effects to an environmental resource or receptor.

Or

- **Beneficial:** Advantageous or positive effect to an environmental resource or receptor.

2.7.6 Although there is no recognised definition of what constitutes a 'significant' effect, it is good practice to identify the degree of significance. In this ES (**ES Volumes 1 to 4**), where adverse or beneficial effects are identified 'significance' was assessed as follows:

- **Insignificant:** No significant effect (either adverse or beneficial) to an environmental resource or receptor.
- **Minor significance:** Slight, very short or highly localised effect of low significance.
- **Moderate significance:** Noticeable effect (by extent, duration or magnitude) which may be considered significant.
- **Major significance:** Considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

2.7.7 Effects of minor, moderate and major significance are all considered to be 'significant effects'.

2.7.8 **ES Volume 1, Chapters 7 to 11** and **ES Volume 2** provide specific significance criteria for all environmental topics scoped into the full EIA process and ES. Where possible such significance criteria were based upon quantitative and accepted criteria, together with the use of value judgements and expert interpretations.

2.7.9 For the purposes of the assessment reported in **ES Volume 1, Chapters 7 to 11** and **ES Volume 2, 'short-' / 'medium-term'** effects were considered to be those associated with the Works, and **'long-term'** effects were those associated with the completed, occupied and operational H1 Development. **'Local'** effects were those affecting neighbouring receptors of the H1 Development, whilst effects upon receptors within the wider borough of LBS

were considered to be at a '**District**' level. '**Sub-Regional**' effects, where relevant, were those affecting adjoining boroughs, whilst effects upon Greater London were considered to be at a '**Regional**' level. Effects upon different parts of the country, or England as a whole, where relevant were considered to be '**National**'. Finally, effects across national boundaries, where relevant, were considered at an '**International**' level.

2.7.10 The methodology for the assessment of effect interactions is set out within **ES Volume 1, Chapter 12: Effect Interactions**.

2.8 Cumulative Effects

2.8.1 In line with the EIA Regulations, an ES must provide a description of the likely significant effects of a development on the environment resulting from the cumulation of effects with other projects.

2.8.2 In order to identify other projects to be considered within the cumulative assessment, the following was undertaken:

- The August 2020 ES (refer to **Section 1.1 of Chapter 1: Introduction**) was reviewed to identify the list of cumulative schemes included in that ES, which were approved by LBS.
- A search of online databases¹⁰ and planning portals¹¹ was undertaken to identify any further significant schemes within a similar distance to the Masterplan Site. Significant schemes can be minor in scale but introduce sensitive receptors in proximity to the Site.

2.8.3 This identified 14 schemes to be considered within the cumulative assessment which was agreed with LBS (and their advisors LUC) through the informal scoping process as outlined in **Section 2.3**. However, in January 2021 one of these schemes (Woodlands Nursing Home Ref: 19/02696/FUL) was dismissed at appeal and was therefore removed from the list on agreement with LBS.

2.8.4 Such Cumulative Schemes are identified in **Table 2.1** which should be read in conjunction with **Figure 2.1**. However, it is important to note that each environmental topic assessed as part of the EIA process, and reported within **ES Volume 1, Chapters 7 to 11** and **ES Volume 2** may not necessarily need to consider all Cumulative Schemes within the given 1.5 km distance from the Site boundary. For example, wind microclimate effects are typically highly localised, so that only those Cumulative Schemes located in proximity to the Site and the H1 Development would need to be considered. Conversely, it is recognised that the assessment of long-distance views may necessitate the consideration of relevant Cumulative Schemes which may be located in excess of 1.5 km from the Site boundary. Accordingly, the approach to the assessment of cumulative effects was tailored to the particular environmental topic being considered. Full justification is provided within **ES Volume 1, Chapters 7 to 11** and **ES Volume 2**.

¹⁰ <https://maps.london.gov.uk/map/?lidd>

¹¹ <https://www.southwark.gov.uk/planning-and-building-control/planning-applications/planning-register-search-for-view-and-comment-on-planning-applications>

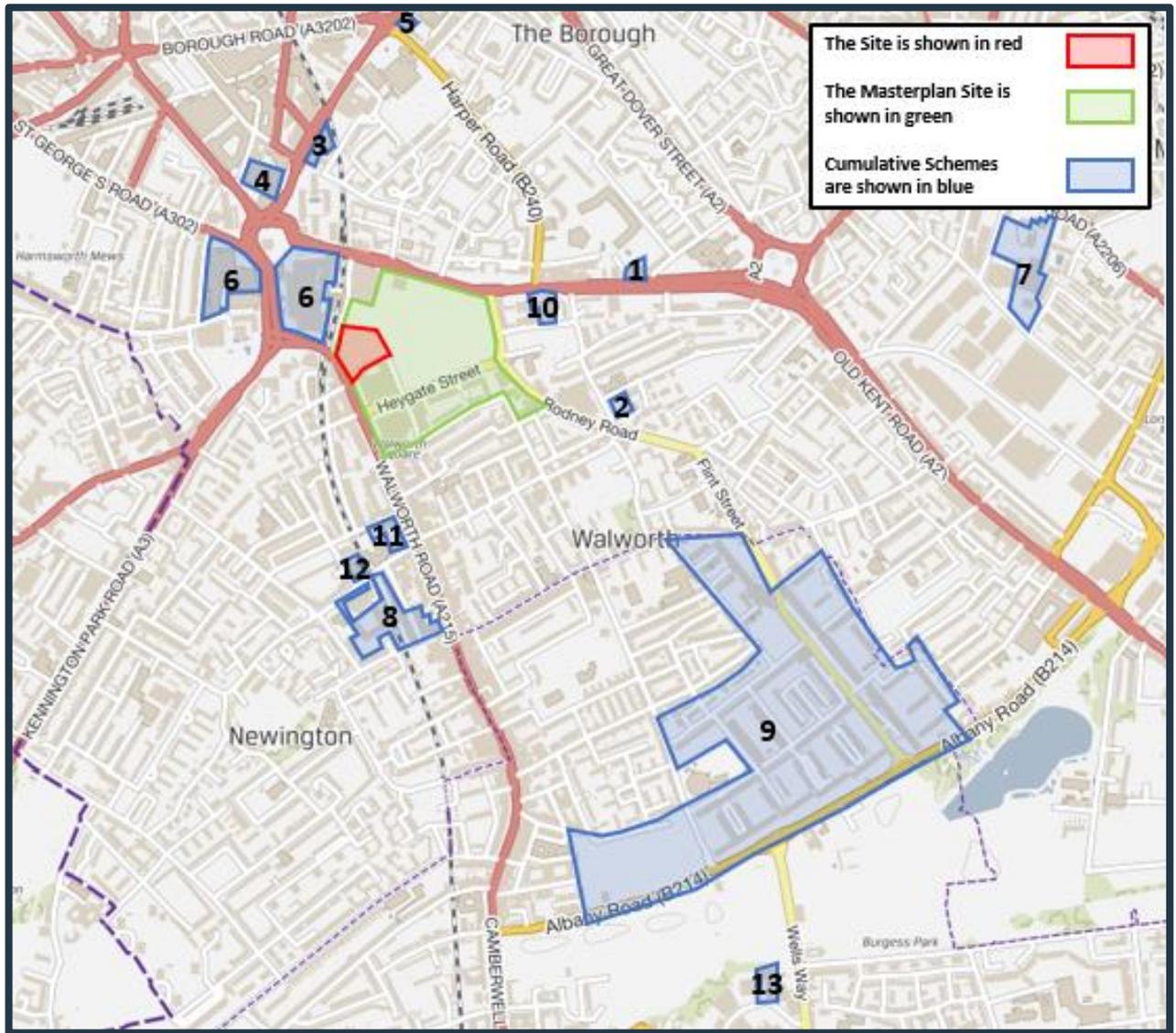
Table 2.1: Cumulative Schemes within 1.5 km of the Site's Boundary

Planning Application Reference and Address	Location Relative to the Masterplan Site	Description	Status
Ref: 19/AP/5389. 221 New Kent Road.	295 m east. Labelled as '1' in Figure 2.	Demolition of existing warehouse building and erection of a part 3 part 6 and part 9 storey building providing 200 hotel rooms (Class C1) and 1,354sqm of work / maker space at ground floor (and mezzanine) (Flexible Class B1) as well as ancillary café / restaurant and bar facilities (Class A3 / A4), along with associated landscaping, servicing yard and access works.	Submitted 25 th September 2019 and currently being determined.
Ref: 19/AP/1506. Salisbury Estate Car Park, Balfour Street, London, SE17 1PA.	175 m south-east. Labelled as '2' in Figure 2.	Redevelopment of the existing car park to provide 26 residential units in a 5 storey block with maximum height of 21.8m AOD (5 x 3 bed 5 person flats, 9 x 2 bed four person flats & 9 x 1 bed 2 person flats, 2 x 2 bed wheelchair units and 1 x 1 bedroom wheelchair unit) together with new private amenity space located within a rear courtyard as well as improving the landscaping of the existing pedestrian link between Chatham Street and the open green space to the south of the site for public use. Two disabled parking spaces to be provided to the north of the site accessed off Chatham Street.	Approved: 12/11/2019.
Ref: 19/AP/0750. 5-9 Rockingham Street & 2-4 Tiverton Street, SE1 6PF.	300 m north-west. Labelled as '3' in Figure 2.	Demolition of existing buildings and erection of a 21-storey building (max height 70.665m AOD) with basement and associated roof plant to provide 6,042.3sqm (GIA) of new commercial floor space and redevelopment of 3 railway arches to provide 340.1sqm of flexible commercial space (A1, B1, D1, D2) with associated cycle parking storage, waste / recycling stores and new public realm.	Approved: 31/01/2020.
Ref: 18/AP/4194. Skipton House, 80 London Road, London, SE1 6LH.	240 m north-west. Labelled as '4' in Figure 2.	Part retention, part demolition, reconfiguration and re-cladding of existing building and extension to create six additional storeys to accommodate 41,750sqm office space (Use Class B1) at upper floor levels, a 780sqm gym (Use Class D2) and 993sqm flexible retail/commercial uses (Use Class A1/A2/A3) at ground floor level with associated cycle parking, landscaping, ancillary servicing and plant and all associated works.	Submitted on 24 th December 2018 and currently being determined (scheme has resolution to grant).
Ref: 18/AP/0657. Land At 19 – 21 & 23 Harper Road, 325 Borough High Street & 1-5 & 7-11 Newington Causeway, London, SE1 6AW,	500 m north. Labelled as '5' in Figure 2.	Demolition of existing buildings and redevelopment to provide construction of a part 5, part 7, part 8 and part 13 storey building a mixed-use development comprising 328 hotel rooms (Class C1) 20 no. residential dwellings (Class C3), offices, workspace and works.	Approved: 03/06/2020.
Ref: 16/AP/4458. Shopping Centre Site Elephant And Castle 26, 28, 30 & 32 New Kent Road, Arches 6 & 7 Elephant Road, * London College Of	70 m west. Labelled as '6' in Figure 2.	Phased, mixed-use redevelopment of the existing Elephant and Castle shopping centre and London College of Communication sites comprising the demolition of all existing buildings and structures and redevelopment to comprise buildings ranging in height from single storey to 35 storeys (with a maximum building height of 124.5m AOD) above multilevel and single basements, to provide a range of uses including 979 residential units (use class C3), retail (use Class A1-A4), office (Use Class B1), Education (use class D1), assembly and leisure (use class D2) and a new station entrance and station box for use as a	Under construction.

Planning Application Reference and Address	Location Relative to the Masterplan Site	Description	Status
Communications, London SE1		London underground operational railway station; means of access, public realm and landscaping works, parking and cycle storage provision, plant and servicing areas, and a range of other associated and ancillary works and structures. In the Council's opinion the proposal may affect the setting of the following listed buildings and conservation areas: Metro Central Heights, Newington Causeway; Metropolitan Tabernacle, Newington Butts; Michael Faraday Memorial, Elephant and Castle; the Imperial War Museum, St George's Road; and the Obelisk at St George's Circus. Elliot's Row; St George's Circus and West Square Conservation Areas and the listed buildings therein, and the Walcot Square Conservation Area in Lambeth.	
Ref: 15/AP/2474. Rich Industrial Estate, Crimscott Street, London, SE1 STE & Willow Walk, London, SE1.	1.3 km east. Labelled as '7' in Figure 2 .	Demolition of four existing buildings and electricity substation and the development of a phased mixed-use scheme ranging from 3-9 storeys plus basements (maximum height 34.03m AOD) comprising a series of new buildings and retained / refurbished / extended buildings to provide a total of 19,468sqm (GIA) of commercial, retail, art gallery and storage floorspace (Use Classes A1, A2, A3, B1, B8 and D1) and 406 residential units (Use Class C3) plus associated highway and public realm works, landscaping, car and cycle parking, infrastructure works and associated works.	Approved: 07/12/2017 (Under construction).
Ref: 15/AP/1062 Manor Place Depot Site, 17-21 & 33, Manor Place, SE17	260 m south. Labelled as '8' in Figure 2 .	Demolition and redevelopment to provide 270 residential units (Class C3) within new buildings ranging from 2 to 7 storeys, a refurbished 33 Manor Place (Grade II listed) and 17-21 Manor Place and 3,730sqm (GEA) of commercial floorspace, comprising 1,476sqm (Classes A1 / A2 / A3 / B1 / D1 / D2) within 9 refurbished railway viaduct arches and 2,254sqm (Class B1) within the refurbished Pool House and Wash House (Grade II Listed), with associated works including disabled car parking spaces, cycle parking, landscaping and access improvements.	Construction started in mid-2017.
Ref: 14/AP/3844. Aylesbury Estate. Land Bounded by Albany Road, Portland Street, Bagshot Street, Alvey Street, East Street & Dawes Street, London, SE17.	900 m south-east. Labelled as '9' in Figure 2 .	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 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.	Outline planning permission granted 05/08/2015 (In construction and applications being submitted pursuant to Reserved Matters).
Ref: 17/AP/3910 and 19/AP/7564. 136-142 New Kent Road, Southwark.	30 m east). Labelled as '10' in Figure 2 .	Demolition of the existing building and construction of a part 13 storey / part 9 storey block fronting onto New Kent Road and a part 6 storey / part 4-storey block fronting onto Munton Road, to provide a mixed-use development, with basement, providing 81 residential units, 1,361sqm of flexible business floor space / non-residential institution (Use Class B1 / D1) and 448sqm of retail floor space (Use Class A1) with associated cycle parking, servicing, refuse and recycling, landscaping and private and communal residential amenity space. Minor	Approved 24 th October 2017, minor material amendment under consideration.

Planning Application Reference and Address	Location Relative to the Masterplan Site	Description	Status
		<p>material amendment (19/AP/7564) including (but not limited to):</p> <ul style="list-style-type: none"> • Increase in overall height from 46.8m AOD to 49.0m AOD (i.e. +2.2m); and • Changes to the residential unit mix. 	
<p>Ref: 13/AP/1122. Chatelain House, 182- 202 Walworth Road, London, SE17 1JJ.</p>	<p>150 m south. Labelled as '11' in Figure 2.</p>	<p>Demolition of the existing building and erection of a building ranging in height from 4 storeys to 6 storeys (plus basement) comprising 4,945 sqm (GEA) of use Class A1 (shops), A3 (restaurants and cafes), D2 (Assembly and Leisure) and B1 (Business) floorspace and 54 residential units with associated landscaping, play space, cycle parking and 6 accessible car parking spaces.</p>	<p>Approved 23rd December 2015, reserved matter applications under consideration.</p>
<p>Ref: 18/AP/0737. Kennington And Walworth Delivery Centre, 111-123 Crampton Street, London, SE17 3AA.</p>	<p>200 m south. Labelled as '12' in Figure 2.</p>	<p>Demolition and redevelopment for a mixed use development in a part four-/five-/six- /seven-storey building consisting of 48 residential units (2 studios, 17 x 1-bedroom, 24 x 2-bedroom and 5 x 3-bedroom flats), 221sqm of commercial floorspace (Use Class B1 - office), creation of new public realm, provision of 3 wheelchair accessible car parking spaces and associated landscaping (amendments received).</p>	<p>Approved 1st March 2019.</p>
<p>Ref: 19/AP/2011. 35-39 Parkhouse Street, London, SE5 7TQ.</p>	<p>1.38 km south. Labelled as '13' in Figure 2.</p>	<p>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.</p>	<p>Under consideration.</p>

Figure 2.1: Cumulative Schemes within 1.5 km of the Site's Boundary



2.8.5 The assessment of cumulative effects reasonably assumes that all mitigation relevant to the H1 Development and Cumulative Schemes (Primary, Secondary and Tertiary) would be implemented. For this reason, only the likely residual cumulative effects and their significance are identified. Such effects are considered for the Works (including any overlap in construction with other elements of the Approved Development, see **Section 2.10**) and for the completed, occupied and operational H1 Development.

2.8.6 The extent to which likely significant cumulative effects can be quantified and / or qualified is dependent upon the information available for each of the Cumulative Schemes. However, where possible, the determination of likely significant cumulative effects was informed by professional and expert judgement, calculations and / or detailed, scientific modelling with the significance of the likely cumulative effect(s) being defined as previously noted.

2.9 Effect Interactions

2.9.1 It is common practice for an ES to acknowledge effect interactions; that is, the combination of different environmental effects resulting from one project upon individual sensitive receptors, or a set of sensitive receptors.

- 2.9.2 The likely significant effect interactions arising from the H1 Development are considered for the Works and for the completed and operational Development. The assessment of effect interactions as presented in **ES Volume 1, Chapter 12: Effect Interactions** draws from the results of the assessments presented in **ES Volume 1, Chapters 7 to 11** and **ES Volume 2 – Townscape and Visual and Above Ground Heritage Assessment**.

2.10 Structure of ES Volume 1 Technical Chapters and ES Volume 2

- 2.10.1 Each key environmental topic considered within the full EIA process is assigned a separate technical Chapter in **ES Volume 1, Chapters 7 to 11** with the full text and images of the Townscape, Visual and Above Ground Heritage Effects presented within **ES Volume 2**. Within each of these Chapters and **ES Volume 2** the assessment is structured as follows.

Introduction

- 2.10.2 The introduction provides a brief summary of what is considered in the Chapter and states the Chapter's author.

Assessment Methodology and Significance Criteria

- 2.10.3 The methods used in undertaking the technical study are outlined in this section with reference to published standards, guidelines and best practice. The significance criteria used in the assessment are also explained and defined as well as any assumptions made for the assessment or limitations to the assessment methodology.

Relevant Baseline Conditions

- 2.10.4 In order to measure or judge the likely significant environmental effects of a project, the change brought about to the environment as a result of the project must be established. It is therefore necessary to establish the relevant environmental conditions that will exist at and around a site in the absence of the project (the baseline conditions). This information then serves to provide a datum against which environmental change is measured or judged. The EIA Regulations require the ES to include a description of the baseline conditions without implementation of the H1 Development as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of available environmental information and scientific knowledge. This is outlined in **ES Volume 1, Chapter 4: Alternatives and Design Evolution**.
- 2.10.5 The Updated Detailed Phasing Plan for the Approved Development as considered in the August 2020 ES (see **ES Volume 3, Appendix 2.4**) indicates that all other elements of the Approved Development will be complete and operational before Plot H1 is completed. In addition, the majority of the Approved Development is already built and occupied or under construction. As a result, as outlined in the EIA Scoping Report in **ES Volume 3, Appendix 2.1**, the likely significant environmental effects resulting from the completed and operational H1 Development will be assessed against a set of 'likely future baseline' conditions (in 2026 as outlined in **ES Volume 1, Chapter 6: The Works**) which assume the full implementation of all other elements of the Approved Development. However, the likely significant effects associated with the Works necessary to implement the H1 Development will take into

account the potential overlap in construction with other elements of the Approved Development, in accordance with the Updated Detailed Phasing Plan provided in **ES Volume 3, Appendix 2.4** (i.e. a potential for overlap with Plots PAV1, H7, H11a and H11b (noting, as outlined in **ES Volume 1, Chapter 1 Introduction**, that H4 and H5 are nearing completion and so wouldn't overlap with the Works for the H1 Development)). Likely future baseline conditions are considered under the 'Baseline Conditions' section, as appropriate, within each technical Chapter.

Likely Effects of the H1 Development and their Significance

2.10.6 This section identifies the likely significant effects resulting from the H1 Development (as defined in **ES Volume 1, Chapter 5: The Development**) and considers effects during the Works, and once the H1 Development is completed, occupied and operational. As previously noted, all likely effects reasonably assume the implementation of Primary Mitigation and Tertiary Mitigation and reflect the H1 Development for which detailed planning approval is sought.

Additional Mitigation / Enhancement and Likely Residual Effects of the H1 Development and their Significance

2.10.7 Should the assessment of likely effects (accounting for Primary and Tertiary Mitigation) give rise to significant adverse environmental effects, this section sets out any additional mitigation (Secondary Mitigation) required to prevent, reduce, ameliorate and / or offset such significant adverse environmental effects, together with any monitoring requirements necessary to ensure the efficacy of the mitigation measures. Similarly, should there be an opportunity to further enhance any likely beneficial effects (accounting for Primary and Tertiary Mitigation), these are also set out.

2.10.8 This section also identifies the likely residual effects for the H1 Development, assuming implementation of the proposed Secondary Mitigation Measures and / or enhancements and includes an assessment of the significance of those residual effects in accordance with the relevant significance criteria.

Likely Residual Cumulative Effects and their Significance

2.10.9 The likely residual effects of the H1 Development with other Cumulative Schemes are identified in this section, together with their significance.

Conclusions

2.10.10 A summary of the key findings of the assessment is provided at the end of each Chapter.

2.11 Assumptions and Limitations

2.11.1 The principal assumptions and limitations associated with undertaking the EIA for the H1 Development are set out as follows:

- Information received from third parties is accurate, complete and up to date.
- The assessment of the Works is based on the assumed enabling and construction programme and methodologies as provided by the Applicant (refer to **ES Volume 1, Chapter 6: The Works**).
- The design, construction and operation of the H1 Development would satisfy environmental standards consistent with contemporary legislation, practice and knowledge as a minimum, but would also strive to achieve best practice at the time of the Works, where reasonable.

2.11.2 Assumptions specifically relevant to each environmental topic are described where applicable in each Chapter of **ES Volume 1** (this document) and **ES Volume 2**.

3. Existing and Likely Future Land Uses and Activities

3.1 Introduction

3.1.1 This Chapter presents a summary of the predominant existing and likely future land uses and activities currently occurring on, and around the Site and the Masterplan Site. This Chapter also describes the key environmental characteristics of the Site, Masterplan Site and their adjacent areas, thereby identifying potentially sensitive receptors which may be affected by the H1 Development.

3.1.2 A full description of the existing and likely future baseline conditions relevant to each environmental topic considered within the Environmental Impact Assessment (EIA) is provided within each technical Chapter of this Environmental Statement (ES) (**ES Volume 1, Chapters 7 to 11**) and **ES Volume 2**.

3.2 Location and Setting

3.2.1 As described in **ES Volume 1, Chapter 1: Introduction**, the Site is located in Elephant and Castle in central London within the administrative boundary of LBS. The extent of the Site is bound by:

- Elephant Road and Walworth Road (A215) to the north-west and south-west respectively.
- Deacon Street to the south and Plot H2 (complete and occupied) of the Approved Development to the southeast which comprises predominantly residential accommodation, with retail and food and beverage uses at ground floor.
- A pavilion (PAV.1, currently under construction) and The Park (under construction) of the Approved Development to the northeast.
- Castle Square to the north, with retail and food and beverage units.

3.2.2 The Masterplan Site comprises an area of 9.71 ha and is bound by:

- New Kent Road (A201) to the north.
- Rodney Place and Rodney Road to the east.
- Wansey Street to the south.
- Walworth Road (A215) and Elephant Road to the west.

3.3 Topography

3.3.1 The Site slopes in an easterly direction with the highest elevation of approximately 4.24 m Above Ordnance Datum (AOD) in the western corner of the Site and a low point of approximately 2.49 m AOD in the eastern part of the Site.

3.4 Existing Land Uses and Activities

Within the Site and Masterplan Site

3.4.1 The Site is void of permanent structures but currently accommodates a modular building for Masterplan Site welfare. This is associated with the on-going implementation of the Approved Development, including construction set-down. There is also a small area of temporary public realm on the south side of the Site, used as a meadow, pathways and seating areas. In addition, a temporary use application was approved by LBS in November 2020 for the Site (planning application reference 20/AP/2612) in the relation to the erection of two containers to accommodate urban farming (Use Class Sui generis), together with storage area, landscaping and other associated works, for a temporary period of one year.

3.4.2 The Masterplan Site is currently undergoing redevelopment in accordance with the Approved Development. In relation to the Masterplan Site, at the time of writing:

- Construction works are complete (and buildings are occupied) for Plots H2, H3, H6, H10, H12 and H13 of the Approved Development.
- Construction is nearing completions for Plots H4 and H5 including associated public realm, with construction works ongoing for Plot H11a and PAV1.
- Above ground work has not yet commenced in relation to Plots H7 and H11b, which are currently used for various temporary purposes including site offices, a construction compound and temporary landscaping. H11b has been technically implemented through the carrying out of a material operation on the site.

Surrounding the Masterplan Site

3.4.3 Existing land uses surrounding the Masterplan Site as are follows:

- Immediately to the north of the Masterplan Site, fronting New Kent Road, land uses are predominantly residential, comprising multi-storey buildings including Albert Barnes House, St. Matthews Court, Tavern Court and Cartwright House. St. Matthews Church is also located to the northwest of the Masterplan Site, at the corner of Meadow Row and New Kent Road. Rachel McMillan College Annexe of South Bank University is located at the corner of Falmouth Road and New Kent Road.
- To the east of the Masterplan Site, land uses are more varied. The disused Crown and Anchor Public House is located at the corner of New Kent Road and Rodney Place, which is now boarded up. Immediately adjacent to the public house there is an industrial unit, currently comprising the Drawing Room (part of Tannery Arts Ltd) which can be hired out as an exhibition space. There are also residential flats and green open space, Victory Community Park, fronting Rodney Road. Victory Primary School is located at the junction of Rodney Road and Heygate Place. Trafalgar Place (formerly referred to as 'Phase 1 of the Heygate Regeneration' and now complete and operational), on a site bounded by Rodney Road, Victory Place and Balfour Street, is located beyond the southernmost tip of the eastern boundary of the Masterplan Site.

- Beyond the south-eastern boundary of the Masterplan Site the land use is predominantly residential with three storey houses and four to six storey residential buildings. Walworth Town Hall on Walworth Road is located directly to the south of the Masterplan Site, at the corner of Wansey Street and Walworth Road. Newington Art Academy London is also located on Walworth Road beyond the south-western boundary.
- Along the south-western boundary of the Masterplan Site there is a mix of land uses including three to four storey buildings with retail on the ground floor and residential on the upper storeys. There is also a multi-storey residential building, Julian Markham House, providing student accommodation (Unite Students) with retail use on the ground floor. Retail, residential, hotel and office uses along Walworth Road also include Kwik Fit, Staysafe London, Eurotraveller Hotel Express and Dashwood Studios. The Mosaic Multicultural Church is also located on the south-western boundary of the Masterplan Site.
- To the west of the Masterplan Site, fronting Elephant Road, is the now closed Elephant and Castle Shopping Centre. Beyond the western boundary there are a number of retail uses including restaurants, a café, a night club and vehicle servicing companies accommodated in the railway arches. Elephant and Castle Overground Railway Station and associated railway lines are also located beyond the western boundary of the Masterplan Site. The Elephant and Castle Shopping Centre closed in September 2020, making way for a mixed-use redevelopment incorporating retail, leisure, residential and student accommodation (planning application reference: 16-AP-4458).

3.4.4 The primary land use surrounding the Masterplan Site is residential. Beyond the Masterplan Site boundary there are housing estates to the north, south and southwest, including the Draper, Newington and Alberta Housing Estates to the southwest, the Peabody Estate, Nelson and Browning Estates to the south, and Rockingham Estate to the north. Strata, which is 43 storeys in height, is also located beyond the western boundary of the Masterplan Site.

3.4.5 With regard to transport infrastructure within proximity of the Masterplan Site, two junctions (hereafter referred to as the 'Northern Roundabout' and the 'Southern Junction') are located to the north-west and south-west of the Site respectively. There is a raised railway viaduct located to the west of the Masterplan Site beyond Elephant Road.

3.4.6 Public transport facilities within the vicinity of the Masterplan Site include the following services:

- Southeastern and Thameslink services from Elephant and Castle Station located to the west of the Masterplan Site utilising the aforementioned raised railway viaduct. Destinations include Sevenoaks, London Blackfriars, Sutton and St Albans City.
- Northern Line and Bakerloo Line London Underground Limited (LUL) from Elephant and Castle London Underground Station with entrances located to the west of the Masterplan Site in two locations north and south of the Northern Roundabout.
- Numerous bus services.
- Santander cycle hire docking stations to the west of the Masterplan Site near the Southern Junction.

3.4.7 There are a number of retail and leisure facilities within the vicinity of the Masterplan Site. Retail uses, including pubs, restaurants, a night club and takeaway establishments are located to the south and north of the Masterplan Site, primarily on Walworth Road, Elephant Road in the railway arches and New Kent Road. Victory Park, located to the east of the Masterplan Site, also provides play space.

3.4.8 Education facilities surrounding the Masterplan Site include:

- Victory School to the east.
- St. John's Walworth Church of England Primary School to the south.
- Ark Globe academy to the north.
- Crampton School to the south-west.
- London College of Communication to the north-west.
- London South Bank University to the north-west.
- Notre Dame Roman Catholic Girls' School to the north-west.

3.4.9 There are light industrial uses, car parking, cafes, restaurants and a club within the arches beneath the railway viaduct to the west of the Masterplan Site, beyond Elephant Road. There are also office and business uses, including the Department of Health located within Skipton House to the north-east of the Masterplan Site.

3.5 Future Land Uses and Activities

Within the Site and Masterplan Site

3.5.1 As outlined in **ES Volume 1, Chapter 1: Introduction**, this ES assesses the likely significant effects of the H1 Development in the context of a 'likely future baseline' with all other elements of the Approved Development complete and operational. Therefore, the likely future land uses within the remainder of the Approved Development include residential, retail, business, community and cultural, and leisure uses, an energy centre and open spaces. The likely future baseline land uses within the Site are assumed to be the same as those currently existing within the Site as outlined in **paragraph 3.4.1**.

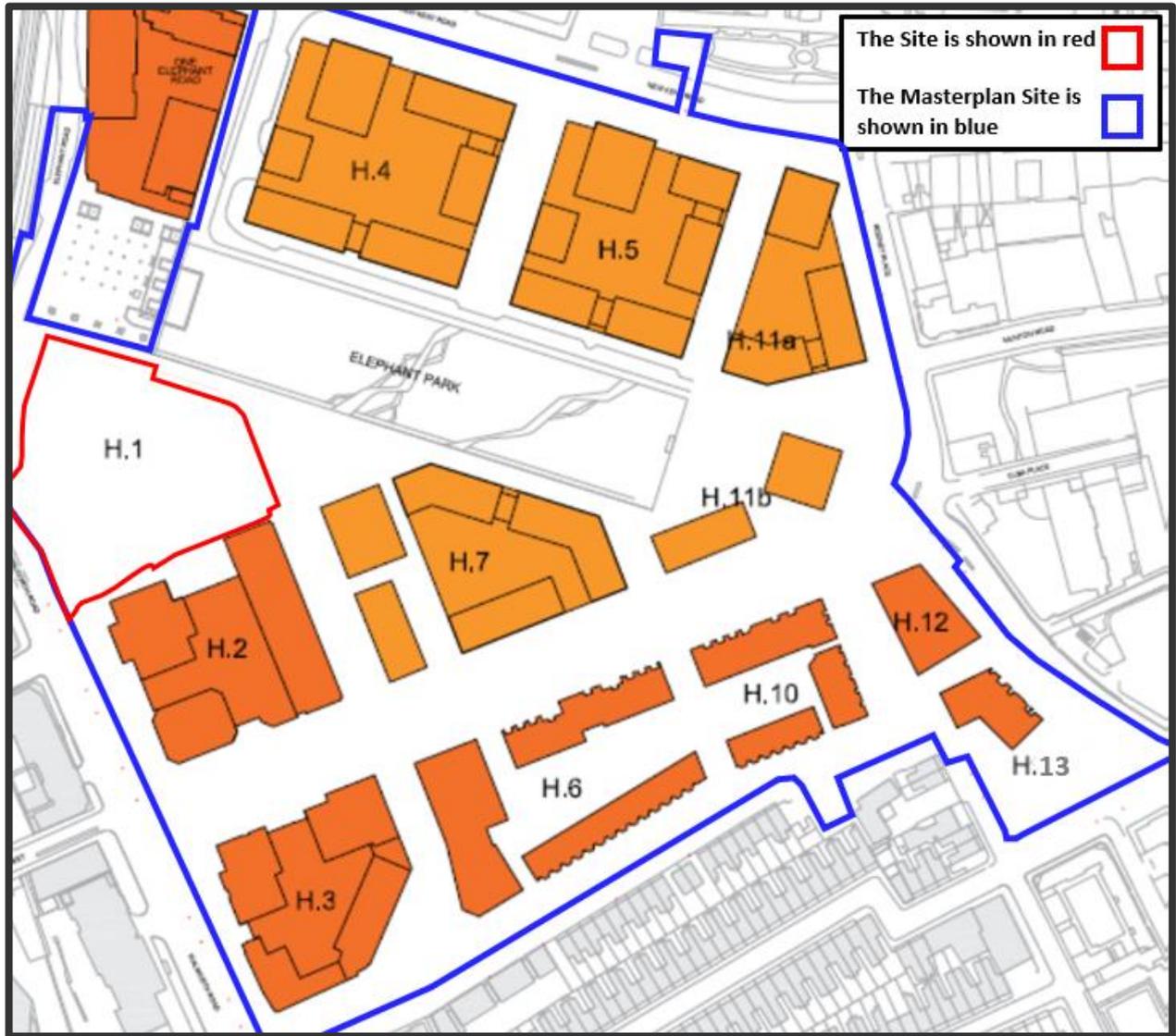
3.5.2 **Table 5.1** outlines the likely future baseline land uses and heights for the Masterplan Site, except for Plot H1.

Table 5.1: Likely Future Baseline Land Uses and Heights of the Approved Development except for Plot H1

Plot	Land Uses	Approved Maximum Height in Storeys
H2.	C3 Residential. A1-A5 Retail & Café / Restaurant.	Between 10 and 31 storeys.
H3.	C3 Residential. A1-A5 Retail & Café / Restaurant.D1 Community.	Between five and 19 storeys.
H4.	C3 Residential. A1-A5 Retail & Café / Restaurany.D2 Leisure.	Between eight and 25 storeys.
H5.	C3 Residential. A1-A5 Retail & Café / Restaurant. D2 Leisure.	Between eight and 25 storeys.
H6.	C3 Residential. A1-A5 Retail & Café / Restaurant.	Between three and 16 storeys.
H7.	C3 Residential. A1-A5 Retail & Café / Restaurant. D2 Leisure.	Between nine and 25 storeys.
H10.	C3 Residential.	Between three and 10 storeys.
H11a.	C3 Residential. A1-A5 Retail & Café / Restaurant. B1 Business.	Between 10 and 19 storeys.
H11b.	C3 Residential. A1-A5 Retail & Café / Restaurant.	Between 11 and 25 storeys.
H12.	D1 Community. Sui Generis Energy Centre & Ancillary Visitors / Café.	Four storeys.
H13.	C3 Residential.	Between three and seven storeys.
PAV1.	A1-A5 Retail & Café / Restaurant. D1 Community.	Single storey.

3.5.3 In addition, the Approved Development includes areas of open space, including The Park, gateway spaces, pocket parks and new streets. **Figure 3.1** shows the layout of the Approved Development except for Plot H1.

Figure 3.1: Layout of the Approved Development except for Plot H1



Surrounding the Masterplan Site

3.5.4 A review of the August 2020 ES, in addition to a search of online databases¹ and planning portals², was undertaken to identify significant schemes within 1.5 km of the Masterplan Site, which represent likely future land uses surrounding the Masterplan Site. The schemes are set out within **Table 2.1** and **Figure 2.1** of **ES Volume 1, Chapter 2: EIA Methodology**. They will be considered as part of the cumulative effects assessment set out in **ES Volume 1, Chapters 7 to 11** and **ES Volume 2** (and will not be included within the likely future baseline which only relates to the Masterplan Site).

¹ <https://maps.london.gov.uk/map/?lidd>

² <https://www.southwark.gov.uk/planning-and-building-control/planning-applications/planning-register-search-for-view-and-comment-on-planning-applications>

3.6 Key Environmental Characteristics

- 3.6.1 Details regarding the key environmental characteristics of the Site and its surrounds are provided in **ES Volume 1, Chapters 7 to 11, ES Volume 2 and ES Volume 3**. However, a summary of key characteristics is set out below.
- 3.6.2 Elephant and Castle lies in the background of the London View Management Framework (LVMF)³ Townscape View from the Serpentine Bridge in Hyde Park to the Palace of Westminster (Assessment Point 23A.1). This is an important consideration for the design of the H1 Development.
- 3.6.3 The Site is not located within a conservation area and although several exist in the wider surrounding area of the Site, none are within proximity. All or part of the Larcom Street, Pullens Estate and Walworth Road conservation areas are within 250m of the Site. No listed buildings are present on-Site but there are a number of Grade II listed buildings within 250m of the Site.
- 3.6.4 The Site is not covered by, or directly adjacent to, any statutory or non-statutory designated sites. Twelve non-statutory designated Sites of Importance for Nature Conservation (SINCs) are located within 1km of the Site. The closest SINC to the Site is Victory Park and Elba Place Nature Garden, located approximately 0.2km east of the Site. All of the statutory and non-statutory sites are separated from the Site by significant built form and transport infrastructure, with no connecting habitats. With regard to habitats on the Site, the 'Extended' Phase 1 Habitat Survey identified the dominant habitats within the Site comprised buildings, hardstanding and bare ground with smaller areas of introduced shrub, scattered scrub, tall ruderal, improved grassland and scattered trees.
- 3.6.1 The Site does not contain any designated or non-designated archaeological (below ground heritage) assets. The Site does not lie within or adjacent to an Archaeological Priority Area (APA). There are no World Heritage Sites (WHSs) or Scheduled Monuments within 1 km of the Site.
- 3.6.2 There are no surface water features within or in proximity to the Site. The closest main river to the site is the River Thames which is located approximately 1.3 km north of the Site. According to the EA, the Site is located within Flood Zone 3 (high risk of flooding). However, it is shown to lie within an area benefitting from the River Thames Flood Defences. From reviewing detailed flood data provided by the EA for the Site, it is confirmed that the western part of the Site is located within the modelled breach zone for the year 2100 (in accordance with Thames Tidal Breach Inundation Modelling Study 2017 completed by Atkins (May 2017)). The EA's surface water (pluvial) flood risk mapping⁴ identifies that the Site has a very low to low risk of flooding from this source. Southwark's Strategic Flood Risk Assessment (SFRA)⁵ includes a map of areas at risk of groundwater flooding which indicates that the Site has the potential for groundwater flooding to occur at surface. Groundwater flood risk will relate to shallow perched groundwater within the Kempton Park Gravels and Alluvium beneath the Site.

³ London View Management Framework, Supplementary Planning Guidance, Mayor of London, March 2012.

⁴ <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

⁵ London Borough of Southwark Strategic Flood Risk Assessment, January 2017

3.6.3 In 2003 the LBS declared the entire Borough an Air Quality Management Area (AQMA) for NO₂ and particulate matter measuring less than ten micrometres or less in diameter, (PM₁₀) attributed to road traffic emissions⁶ because the Borough-wide levels of nitrogen dioxide (NO₂) and fine particulate matter are not meeting the Air Quality Strategy Objectives. Accordingly, an Air Quality Strategy was produced setting out policies and measures to be implemented to improve air quality in the Borough. Based on the air quality assessments within the March 2012 ES, September 2012 ES Addendum and the August 2020 ES, the predominant source of air pollution in the local area is from existing vehicle emissions on the surrounding road network, including Walworth Road.

⁶ Southwark Council, Air Quality Annual Status Report, 2019

4. Alternatives and Design Evolution

4.1 Introduction

4.1.1 Schedule 4, Paragraph 3 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017¹ (the 'EIA Regulations'), states an Environmental Statement (ES) is required to include an outline of the evolution of a site in the absence of the development *"...as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."*

4.1.2 Schedule 4, Paragraph 2 of the EIA Regulations also requires an ES to include:

"A description of the reasonable alternatives...studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."

4.1.3 As identified above, the EIA Regulations do not require the identification of all possible alternatives, only those reasonable alternatives that were studied by the Applicant. In addition, the EIA Regulations require the ES to set out the main reasons for selecting the chosen option and also to include a comparison of the chosen option against the reasonable alternative scenarios. This has been interpreted to mean that justification should be provided that the H1 Development is appropriate and acceptable in comparison to other potential design iterations and that an appropriate balance between environmental effects and commercial / economic implications was reached.

4.1.4 Accordingly, this Chapter focusses on the following:

- The 'Do Nothing' / No Development scenario.
- The 'OPP' scenario.
- Alternative approaches to Design

4.2 The 'Do-Nothing / No Development' Scenario

4.2.1 This scenario covers the consequences of no development taking place on the Site and *"...an outline of the likely evolution thereof [of the Site] without implementation of the development as far as natural changes from the baseline scenario can be assessed..."* Although not strictly a 'reasonable alternative' considered by the Applicant, the EIA Regulations state that the ES must set this information out. The Applicant does not consider this to be a reasonable alternative given that the Site comprises land including the final plot within the wider Approved

¹ The Town and Country Planning (Environmental Impact Assessment) Regulations. 2017.

Development and therefore if the H1 Development were not to proceed under the current Planning Application it would most likely proceed under the OPP (see **Section 4.3** for further discussion of this scenario).

4.2.2 Details regarding the existing baseline conditions of the Site and its surrounds for all environmental topics scoped into this ES, are provided within **ES Volume 1, Chapters 3, 7 to 11** and **ES Volume 2**.

4.2.3 A review was undertaken of the technical areas, which form part of the ES, to determine the implications in terms of evolution of the baseline, if the H1 Development were not to come forward.

Evolution of Baseline Conditions

Socio-economics

4.2.4 In the no development scenario, the Site would remain in its current condition. The conditions in the local area of the Site would be expected to change over time. This would include continued population and employment growth in the area. These projected changes are summarised in the Future Baseline section of **ES Volume 1, Chapter 7: Socio-economics**. If the H1 Development was not to come forward, these projected changes as a result of other schemes coming forward in the area would not be affected and would still be realised.

Air Quality

4.2.5 In the No Development scenario, the Site would remain in its current state. Air quality is generally expected to improve with time, particularly through the introduction of more stringent vehicle emissions standards. Air quality conditions at the Site would therefore be expected to improve and this is reflected in the predicted future baseline concentrations presented in **ES Volume 1, Chapter 8: Air Quality**.

Wind Microclimate

4.2.6 As there would be no development coming forward in this scenario, there would be no impacts or changes to the wind microclimate within the Site or surrounding area. In the absence of the H1 Development, the wind microclimate conditions across the majority of the Site would remain as defined in Configuration 1 in **ES Volume 1, Chapter 9: Wind Microclimate**, with slightly windier conditions expected along Elephant Road to the west of the Site.

4.2.7 The likely evolution of relevant baseline wind conditions were informed by the baseline wind tunnel testing scenario (Configuration 1) and the wind tunnel testing of the H1 Development with the relevant cumulative schemes (Configuration 3) in **ES Volume 1, Chapter 9: Wind Microclimate**. Should the H1 Development not come forward, the wind conditions would gradually adapt to those of Configuration 3, with slightly calmer wind conditions expected to occur on-Site due to the H1 Development not coming forward.

Daylight, Sunlight and Overshadowing

4.2.8 In relation to daylight, sunlight, overshadowing, solar glare and light pollution, an evolved baseline scenario assumes all cumulative schemes in the surrounding environment and all plots within the Approved Development (except for the Plot H1 in its outlined consented form) are built out. Owing to the location of the Elephant and Castle Shopping Centre Cumulative Scheme in relation to the sensitive receptors considered within **ES Volume 1, Chapter 10: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare**, the evolution of the baseline condition without the implementation of the H1 Development is likely to be similar to that as presented within the future baseline scenario within **ES Volume 1, Chapter 10: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare**. As there would be no development coming forward in this scenario on the Site, there would be no impacts or changes to the daylight, sunlight, overshadowing, light pollution and solar glare within the Site or surrounding area. Current conditions would remain; the existing Site does not cause significant daylight and sunlight obstructions, nor light pollution or solar glare effects, to surrounding sensitive receptors including residential receptors and amenity spaces.

Greenhouse Gases

4.2.9 If the H1 Development were not to come forward, and the Site remained in its current state, greenhouse gas emissions from the Site would remain at zero, as presented in **ES Volume 1, Chapter 11: Greenhouse Gases** with relation to the existing Site.

Townscape, Visual and Above Ground Heritage

4.2.10 As there would be no development coming forward in this scenario, there would be no impacts or changes to the townscape, visual amenity and above ground heritage within the Site or surrounding area. If the H1 Development is not implemented, the other elements of the Approved Development would be completed with the Site undeveloped. Therefore,, the existing gap in the frontage of Walworth Road and poorly defined north-eastern edge to Castle Square and the emerging Elephant Park open space would be preserved.

4.2.11 The Townscape, Visual and Above Ground Heritage Assessment and associated figures and appendices are presented at **ES Volume 2**.

Summary

4.2.12 In the no development scenario, the Site would remain vacant. This would greatly limit the potential of the Site, especially with regard to the relationship with its surrounds, existing and future users (including the remainder of the Approved Development) and would result in the lost opportunity for the following key benefits within the Site and surrounds:

- **Loss of opportunity of Social benefits including:**
 - Introduction of new retail and food and drink facilities, and potentially a health hub.

- Public realm improvements including ground floor amenity serving both the occupants and wider public, and improved connections to surrounding open areas.
- **Loss of opportunity of Economic benefits including:**
 - Additional office floorspace.
 - An element of affordable workspace available to local businesses at a discounted rent.
 - Up to 4,800 additional jobs on Site.
- **Loss of opportunity of Environmental benefits including:**
 - Improved streetscape and visual connectivity between the Site and surrounds, including the Approved Development.
 - Improved pedestrian and cyclist permeability within the Site.

4.3 The 'OPP' Scenario

4.3.1 This alternative encompasses Plot H1 as defined in the Approved Development under the OPP. In this scenario H1 has outline consent for a range of uses, including the potential for residential and commercial uses, with active uses at ground floor, to a maximum height of 82.55m AOD.

4.3.2 There remains an amount of residual floorspace available within the maximum amounts permitted under the OPP that could potentially be delivered in the form of a reserved matters application on Plot H1. These comprise:

- 1,986 sqm GIA residential (Class C3).
- 8,530 sqm GIA retail (A1-A5).
- 4,184 sqm GIA business (B1).
- 3,321 sqm GIA leisure (D2).
- 3,393 sqm GIA community (D1).

4.3.3 Whilst such a development could be technically compliant with the OPP, this mix of uses would not optimise the development of the Site. This is because the majority of the floorspace is formed of supporting uses intended to activate the ground plane, rather than predominant land uses (i.e. residential or business). In particular, such a development proposal would fail to optimise the delivery of jobs within the Elephant and Castle Opportunity Area. It would also fail to achieve the vision for placemaking at Elephant Park through the delivery of a significant new office building (through the H1 Development), bringing employment opportunities and investment along with daytime activity to the area to complement the residential focus of the Approved Development.

4.3.4 The Applicant wishes to make the best use of this highly accessible Site, and to deliver improved economic, social and environmental benefits on the Site alongside the Approved Development. For these reasons, whilst the OPP

Scenario is a permitted scheme and therefore a reasonable alternative, it is not the preferred solution for the Site.

4.4 Alternative Designs

4.4.1 The Applicant did not consider fundamentally different alternative uses for the Site (beyond the 'OPP' scenario outlined above), as this Site was identified as the preferred location for the proposals and a commercial led scheme was clearly appropriate given the existing uses surrounding the Site and the Approved Development.

4.4.2 Working in partnership with LBS, the Applicant is delivering a £2.5 billion regeneration programme on 28 acres of land in the centre of Elephant & Castle (including for the Approved Development) creating one of the capital's most exciting places to live, work and visit. The vision for Elephant Park is to create thousands of high-quality new homes, jobs, business opportunities and green space for Londoners.

4.4.3 The H1 Development will contribute to this vision by delivering a vibrant, engaging commercial development within Elephant Park which complements the remainder of the Approved Development. The H1 Development building would serve as a key focal point within Elephant Park and along Walworth Road, with the tallest element situated adjacent to the railway line and stepping down towards the neighbouring residential buildings and The Park. The stepped approach to the massing facilitates the provision of external amenity space serving the office accommodation in the form of roof terraces, which will also allow for a strong visual connection between The Park and the H1 Development building. The ground floor frontages would enhance the surrounding streetscape and the relationship between the H1 Development, the remainder of the Approved Development, Elephant and Castle Town Centre and Walworth Road.

4.4.4 The principles of the H1 Development in terms of its key objectives and the principles of its layout evolved from the outset from the H1 OPP consent. Various opportunities and constraints of the Site and surroundings, and consultation feedback influenced the overall design process which has culminated in the H1 Development. The following section sets out these considerations.

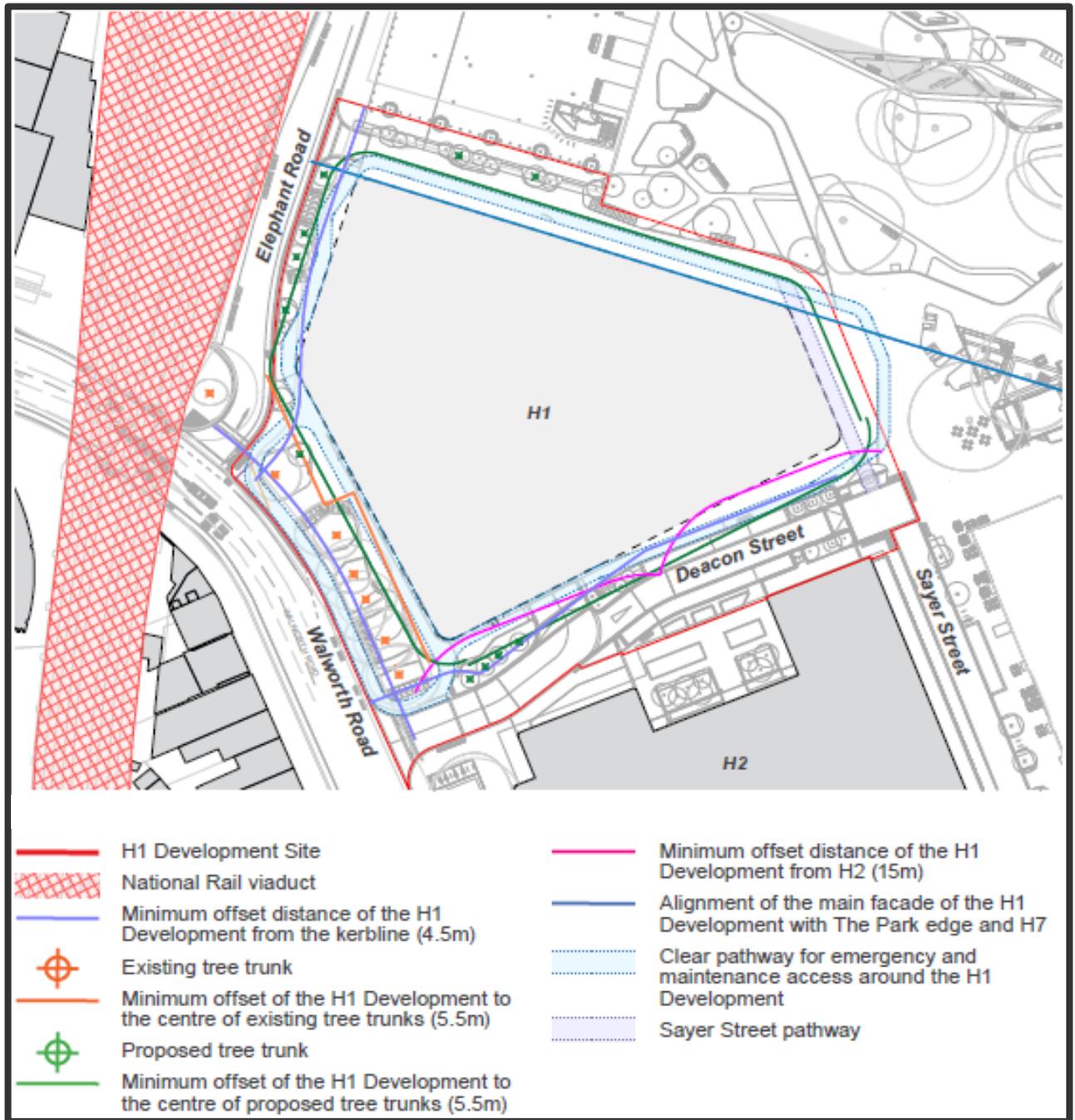
Site Considerations

4.4.5 The Site context was analysed in detail and a number of key factors impacting the H1 Development's layout and operation were considered in the design process. The following key constraints, opportunities and considerations were identified:

- **Below Ground Constraints** - As shown in **Figure 4.1**, below ground Site constraints included the adjacent TfL Bakerloo Line Exclusion Zone, previous building foundations, utilities / services and roots of existing trees.
- **Above Ground Constraints** - As shown in **Figure 4.2** above ground Site constraints for the H1 Development included offset distances from H2, from the kerbline and from existing trees; and alignment of the main façade with The Park edge and Plot H7.

- **Visual Influences** - The massing of H1 was developed in consideration of the London View Management Framework (LVMF) and local views. The strategic view of relevance to the H1 Development is the Protected Vista of the Palace of Westminster from Assessment (Point 23A.1) on Serpentine Bridge designated in the LVMF. A sequence of points moving along Serpentine Bridge, either side of the LVMF Assessment Point, were also considered.
- **Relationship to Surrounding Context** - The form of the building was designed to respond to the existing and emerging surrounding context within the Masterplan Site and the Elephant and Castle Town Centre (the tall buildings of Strata, Elephant One and One the Elephant, and smaller buildings towards Walworth Road). This included alignment to Plot H7 to allow visual continuity along The Park, whilst ensuring the H1 Development would be offset from Plot H2. The final form and massing would also consciously integrate with public realm and The Park. Massing of the H1 Development is required to be conscious of the scale of the surrounding buildings so as to ensure continuity of building heights, with the tallest part of the H1 building orientated towards the Elephant and Castle Town centre, stepping down to its nearest neighbouring building in the Approved Development and The Park.

Figure 4.2: Above Ground Constraints (Source: Modified from ACME)



Design and Consultation

4.4.6 To understand how the H1 Development evolved, it is appropriate to revisit the extensive design and consultation process undertaken to arrive at the final H1 Development designed and assessed as part of this ES and submitted for planning approval. A significant number of discussions with key stakeholders were undertaken, including:

- LBS.

- LBS's Design Review Panel.
- The Greater London Authority (GLA).
- Transport for London (TfL).
- Historic England (HE).
- Local residents, neighbours, amenity societies and other key stakeholders.

4.4.7 The consultation strategy evolved to respond to the coronavirus pandemic and changing government guidance. This included the launch of an online consultation platform that incorporated feedback forms, as well as exhibitions and face to face sessions held either in person or online depending on restrictions at the time.

4.4.8 A first public consultation was carried out in October 2020. The online consultation was open for three weeks, along with a pop-up consultation hub in West Grove on Deacon Street. A second online public consultation was undertaken in January 2021. Full details of the public consultation undertaken are included in the Statement of Community Involvement which is submitted as a stand-alone document accompanying the Planning Application.

Response to Consultation

4.4.9 Adjustments to the design of the H1 Development as a result of the consultation process include the following:

- **Key Connections** - The internal lobby and the pedestrianised street (Sayer Street North) within the H1 Development are to be more strongly connected with each other, allowing for shelter, easier access to and from The Park, plus significantly more greening. The landscaping design at the eastern corner will establish a series of 'landscaped zones', creating a clear separation between the H1 Development and The Park.
- **Integration of Planting within the Public Realm** - Planting at the base of the H1 Development has been increased to soften the building line, extend the perception of the Park towards Elephant Road and down Deacon Street. In addition, the terraces on the H1 Development will be planted, which when combined with climbing plants at the base of the building will give the impression of The Park extending over the facade. The landscaping and highways design proposals for Deacon Street are significantly greener and more pedestrian focused than envisaged under the OPP.
- **The 'shoulders' of the H1 building** on The Park edge and on Walworth Road were lowered to provide greater visual interest at street level and visually connect the terraces to the public realm.
- **Historic References** – The façade of the H1 Development will comprise materials of deep, rich red hues, in order to directly reference colours featured in the immediate area surrounding the Site. Furthermore, awnings historically provided shelter and shade for shop fronts allowing them to have large areas of glass to advertise their wares. Awnings proposed on Sayer Street, Walworth Road and Elephant Road will provide the same function and experience for the active ground floor of the H1 Development and create a human scale at ground level. Finally, the area's historic Victorian shop fronts used panes of glass similar to those proposed in the glazed street level facade of the H1 Development. Further historic references will be made

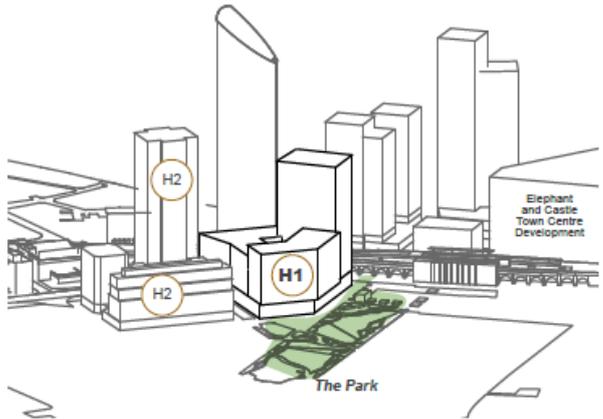
with the inclusion of floor tile patterns inspired by Victorian floor and wall tiles and lanterns in the lobby area inspired by Victorian shop lanterns.

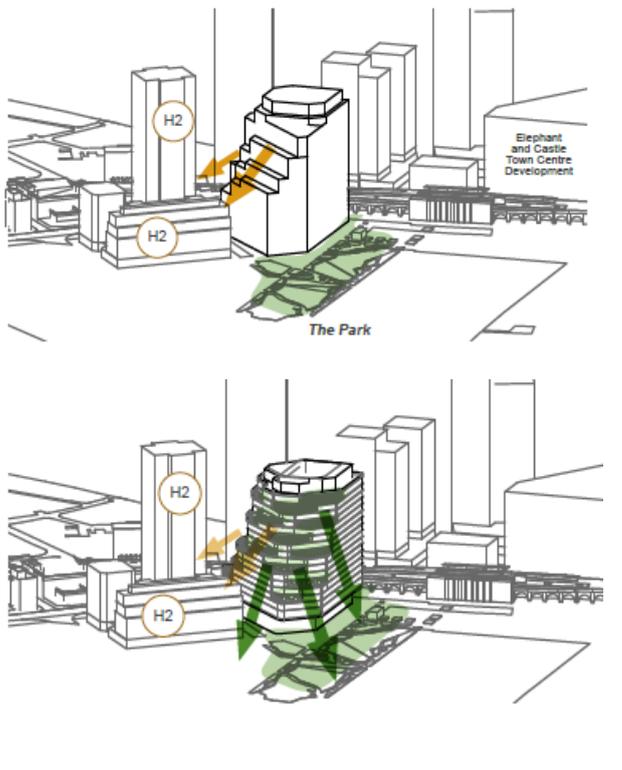
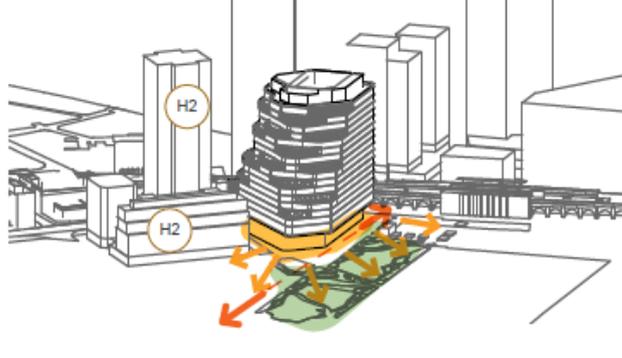
4.4.10 Adjustments to the design of the H1 Development as a result of the consultation process are considered to provide enhanced pedestrian access, ecological, visual and heritage effects.

Massing

4.4.11 Massing studies were undertaken throughout the design process for the H1 Development as shown in **Figure 4.3**. The massing of the H1 Development was defined by the Site constraints and height constraints as outlined above.

Figure 4.3: Massing Studies for the H1 Development (Source: Modified from ACME)

Design Principle Summary	Figure
<p>The maximum massing achievable for H1as was set out within the OPP parameters - placing a residential tower on the north-western portion of the Site towards Elephant and Castle Town Centre and residential mid-rise forms completing all elevations of the Site.</p> <p>However, the massing and design principles of a residential building differ to that of an office building (e.g. floor-to-floor storey heights, requirement for open floorplates, floorplate diversity) which have been considered for the H1 Development.</p>	
<p>Maximum building height of the H1 building would follow the principles of the OPP height parameters in terms of the location of the tallest part, as outlined above. Placing the highest part of the building in the north-western portion of the Site, from where it steps down to respond to heights of smaller Victorian buildings on Walworth Road and the lower rise residential blocks of the Approved Development.</p> <p>The design of the H1 Development commenced with the exploration of a two-building scheme, however, due to challenges with building efficiency including multiple cores and service yards alongside prolonged construction programme, a single building scheme was subsequently development.</p>	

Design Principle Summary	Figure
<p>The south-east, south and south-west facades of the H1 building step up from Deacon Street, Walworth Road and The Park towards the Elephant and Castle town centre and other tall buildings</p> <p>The steps along Deacon Street and Walworth Road mediate with the smaller scale buildings and different scales of this context.</p> <p>The stepping down is maintained to lower the shoulders of the H1 building down towards The Park and relate to its open space.</p> <p>By stepping down, terraces are formed with the lowest terrace close to the level of The Park. The terraces will be landscaped and create a visual relationship between the H1 building and The Park.</p> <p>The stepped form ensures the adequate provision of suitable levels of daylight and sunlight to the surrounding public realm and neighbouring buildings.</p>	
<p>The H1 building is carefully positioned to align with the edge of The Park and the front of Plot H7 within the Approved Development to allow for visual continuity along The Park's edge. Uses at ground floor will create an open and active frontage all the way along The Park's edge, Sayer Street North and Elephant Road.</p>	

4.4.12 The above indicates that the aspirations of the Applicant, objectives set and decisions taken resulted in a scheme that designs in environmental benefits and designs out as far as possible adverse environmental effects.

Microclimate

4.4.13 The analysis of the sun path and shading greatly influenced the position of the steps on the H1 Building, as outlined in **Figure 4.3**, ensuring the form respects established principles for inner city environments and ensuring the adequate provision of suitable levels of daylight and sunlight to the surrounding public realm (including The Park) and neighbouring buildings. Thus, the massing evolution is considered to result in the H1 Development being more beneficial / less negative in relation to sunlight and daylight and overshadowing compared to previous design iterations.

4.4.14 Wind studies dictated the recess of the cycle entrance on Walworth Road, the widening of the Elephant Road colonnade and the cutting of the north-west corner to mitigate the wind and create spaces that are suitable for sitting outside. In addition, following assessment of the massing within a wind tunnel it was determined that the ground floor comfort levels could be further improved with minor alterations to the landscaping proposals. It was proposed that together with the retention of trees along the eastern side of Walworth Road, additional proposed trees to the west of the Site would successfully mitigate conditions otherwise too windy to be suitable for strolling. The proposed landscaping would also include 'large movable planted pots' at ground level along the south-eastern sides of the H1 Development where long term seating is intended. This design evolution would result in more beneficial wind conditions.

Flood Risk

4.4.15 Feedback was received from the Flood Risk Assessment (FRA), completed for the H1 Development confirming that ground floor levels and basement entrances needed to be raised above +3.200 m AOD so that they would be located above the design flood level. Consequently, the design was amended to lift the finished level up by 160 mm to +3.320 m AOD at its lowest point. The amendment was considered to be minor and resulted in no structural implications. However, as the design amendment afforded the H1 Development to be compliant with recommendations included within the FRA, this design amendment is considered beneficial in terms of flood risk to future users of the H1 Development, compared against previous design iterations proposed.

4.5 The H1 Development

4.5.1 The design of the final H1 Development, as described in ES Volume 1, Chapter 5: The Development, has therefore responded to feedback from statutory and other consultees and had been influenced by environmental factors, as outline above.

5. The Development

5.1 Introduction

5.1.1 This Chapter provides a description of the H1 Development, as defined by the detailed Planning Application, and is supported by **ES Volume 3, Appendix 5.1: Detailed Planning Application Drawings**.

5.1.2 The H1 Development is described as:

“Redevelopment of the site to provide a building of ground plus 17-storeys (including a mezzanine floor) with basement and rooftop plant providing office floorspace (Class E) and flexible office/retail/food and drink/medical and health floorspace (Class E), including ancillary cycle parking, accessible car parking, servicing, landscaping, public realm improvements and other associated works incidental to the development.”

5.1.3 The description of the H1 Development in this Chapter together with **ES Volume 3, Appendix 5.1** form the basis for the assessments presented in **ES Volume 1, Chapters 7 to 12** and **ES Volume 2, Townscape, Visual and Above Ground Heritage Effects**.

5.2 Quantum of Development and Land Uses

5.2.1 The H1 Development will comprise one building. The total amount of floorspace is set out in **Table 5.1**.

Table 5.1: Proposed Floorspace for the H1 Development

Land Use And Classes	Level	Gross External Area (GEA) (Sqm)	Gross Internal Area (GIA) (Sqm)	Net Internal Area (NIA) (Sqm)
Offices (Class E)	02-16	49,565	49,351	40,783
Offices / medical or health (Class E)	Mezzanine – 01	6,795	6,728	4,300
Offices / retail / professional services / medical or health (Class E)	GF	277	264	259
Offices / retail / professional services / food and drink (Class E)	GF	1,728	1,689	1,683
Back of House (BOH)	GF	1,722	1,486	-

Land Use And Classes	Level	Gross External Area (GEA) (Sqm)	Gross Internal Area (GIA) (Sqm)	Net Internal Area (NIA) (Sqm)
(loading bay, plant, cycle facilities & facilities)				
BOH (lift)	17 (Roof)	222	190	-
Cycle parking & End of Trip (EOT) facilities	Basement	1,376	1,209	-
BOH (plant & core)	Basement	2,938	2,681	-
Total	-	64,624	63,599	47,025

5.3 Detailed Planning Application Drawings

5.3.1 A series of Detailed Planning Application Drawings are submitted to the London Borough of Southwark (LBS) for approval. For ease of reference, a selection of Detailed Planning Application Drawings, as presented in **ES Volume 3, Appendix 5.1**, are listed within **Table 5.2**.

Table 5.2: Detailed Planning Application Drawings Included within ES Volume 3, Appendix 5.1

Detailed Planning Application Drawing Title	Drawing Reference Number
Site Location Plans	
Proposed Site Plan	259639-A100-H01-01-PL-ZZ-0207
Proposed Roof Plan	259639-A100-H01-01-PL-ZZ-0209
Floor Plans	
Floor Plan-Basement Level 1	259639-A100-H01-20-PL-B1-1002
Floor Plan-Basement Level Mezzanine	259639-A100-H01-20-PL-BM-1003
Floor Plan-Level 00	259639-A100-H01-20-PL-00-1004
Floor Plan-Level Mezzanine	259639-A100-H01-20-PL-MZ-1006
Floor Plan-Level 01	259639-A100-H01-20-PL-01-1007
Floor Plan-Level 02	259639-A100-H01-20-PL-02-1008
Floor Plan-Level 03	259639-A100-H01-20-PL-03-1009

Detailed Planning Application Drawing Title	Drawing Reference Number
Floor Plan-Level 04	259639-A100-H01-20-PL-04-1010
Floor Plan-Level 05	259639-A100-H01-20-PL-05-1011
Floor Plan-Level 06	259639-A100-H01-20-PL-06-1012
Floor Plan-Level 07	259639-A100-H01-20-PL-07-1013
Floor Plan-Level 08	259639-A100-H01-20-PL-08-1014
Floor Plan-Level 09	259639-A100-H01-20-PL-09-1015
Floor Plan-Level 10	259639-A100-H01-20-PL-10-1016
Floor Plan-Level 11	259639-A100-H01-20-PL-11-1017
Floor Plan-Level 12	259639-A100-H01-20-PL-12-1018
Floor Plan-Level 13	259639-A100-H01-20-PL-13-1019
Floor Plan-Level 14	259639-A100-H01-20-PL-14-1020
Floor Plan-Level 15	259639-A100-H01-20-PL-15-1021
Floor Plan-Level 16	259639-A100-H01-20-PL-16-1022
Floor Plan-Level Roof	259639-A100-H01-20-PL-17-1023
Floor Plan-Level Plant 2	259639-A100-H01-20-PL-18-1024
Elevations	
North Elevation	259639-A100-H01-20-EL-ZZ-1200
East Elevation	259639-A100-H01-20-EL-ZZ-1201
West Elevation	259639-A100-H01-20-EL-ZZ-1202
South Elevation	259639-A100-H01-20-EL-ZZ-1203
North East Elevation	259639-A100-H01-20-EL-ZZ-1204
South East Elevation	259639-A100-H01-20-EL-ZZ-1205
South West Elevation	259639-A100-H01-20-EL-ZZ-1206
Public Realm Plans	

Detailed Planning Application Drawing Title	Drawing Reference Number
H1 Public Realm General Arrangement Plan	251797-LA01-REH1-90-PL-00-100
H1 Public Realm Softworks Plan	251797-LA01-REH1-90-PL-00-105

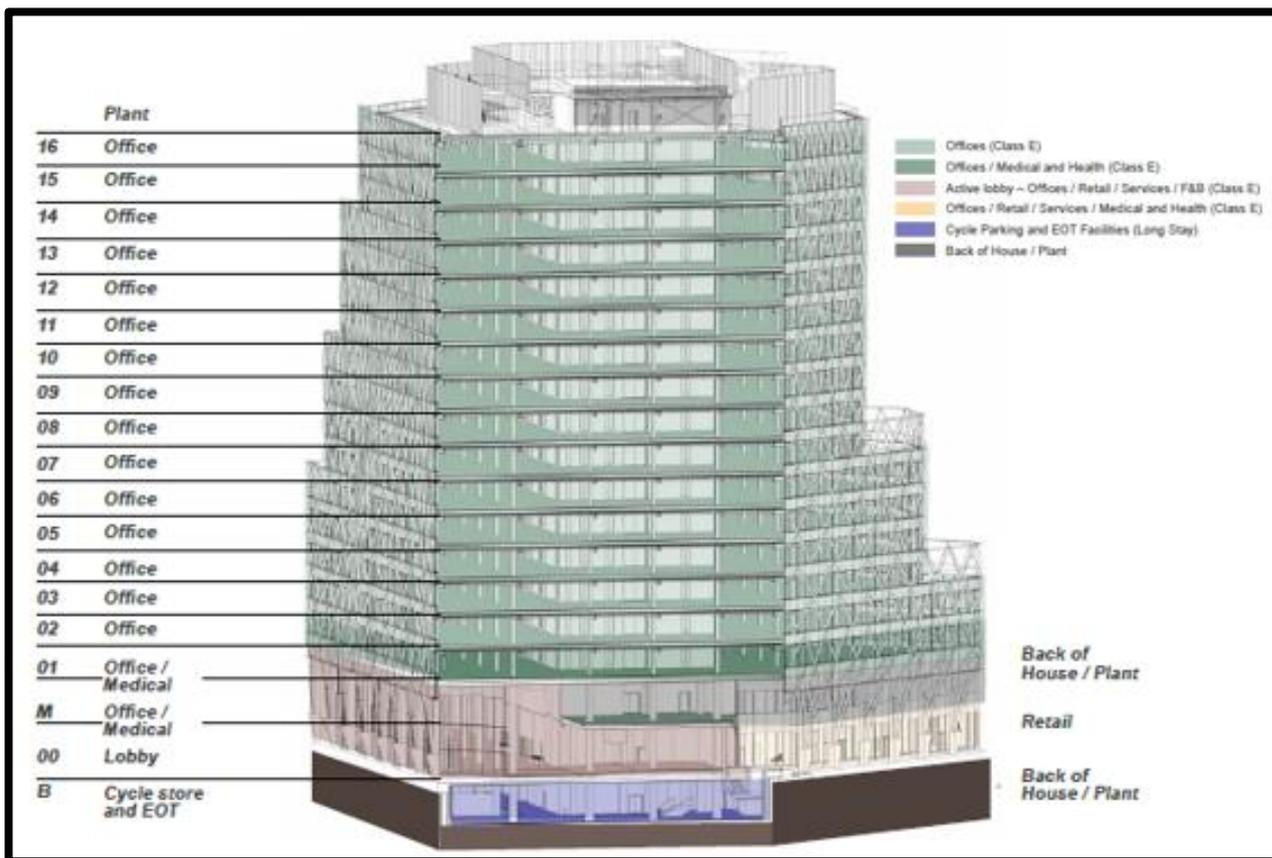
5.4 Structures to be Removed

- 5.4.1 Existing temporary buildings and structures on-Site would be deconstructed and removed prior to H1 Development Works commencing.

5.5 The H1 Development Layout and Massing

- 5.5.1 The H1 Development would comprise a single building, located centrally within the Site and in the western portion of the Masterplan Site. The H1 Development comprises ground plus 17 storeys (including a mezzanine level) with two basement levels and rooftop plant, extending to a maximum height of 85.730 m AOD (including rooftop plant). The building would complete the Walworth Road frontage of the Approved Development. The tallest element would be situated adjacent to the railway line to the west of the Site and stepping down towards the neighbouring residential buildings to the south-east of the Site (where the building would be ground plus four storeys (including the mezzanine level)).
- 5.5.2 At ground floor level the uses would comprise lobby and flexible floorspace suitable for offices / retail / professional services / food and drink / medical or health, with areas for cycle access. At mezzanine and first floor level, uses would comprise flexible floorspace suitable for office / medical or health. Second floor level and above would comprise office use only. All proposed uses fall within Class E of the Use Classes Order 1987 (as amended). Shared building plant and cycle parking facilities would be provided at basement level. Uses at each floor level are shown in **Figure 5.1**.

Figure 5.1: Land Uses of the H1 Development (Source: Modified from ACME)



5.5.3 The H1 Development proposes affordable workspace to meet the LBS emerging policy requirement that at least 10% gross new floorspace be affordable¹. As an alternative to the proposed affordable workspace, there is also a possibility that a new health hub to serve the local area could be provided within the H1 Development. The need for the health hub is existing, and is not generated by the H1 Development, however LBS has identified the H1 Development as a potentially suitable location. In order to accommodate this potential, medical or health use has been sought alongside office use for 6,992 sqm GIA (4,559 sqm NIA) within the lower floors of the H1 Development (see **ES Volume 1, Chapter 7: Socio-economics**, for more detail). Whilst planning permission is being sought for the health hub within the H1 Development, it remains an alternative to the affordable workspace and if its provision is not supported by LBS, the affordable workspace will be provided instead.

5.5.4 The Site layout and ground floor of the H1 Development are shown in **Figure 5.2** and **Figure 5.3** respectively. Further details can be obtained by reference to **ES Volume 3, Appendix 5.1 (Detailed Planning Application Drawing Numbers 259639-A100-H01-01-PI-ZZ-0207 (Proposed Site Plan) and 259639-A100-H01-20-PL-00-1004 (Floor Plan-Level 00)**.

¹ Southwark Council. New Southwark Plan. Submission version – Proposed modifications for examination 2019 to 2034. 2020

Figure 5.2: Site Layout of the H1 Development (Source: Modified from ACME)

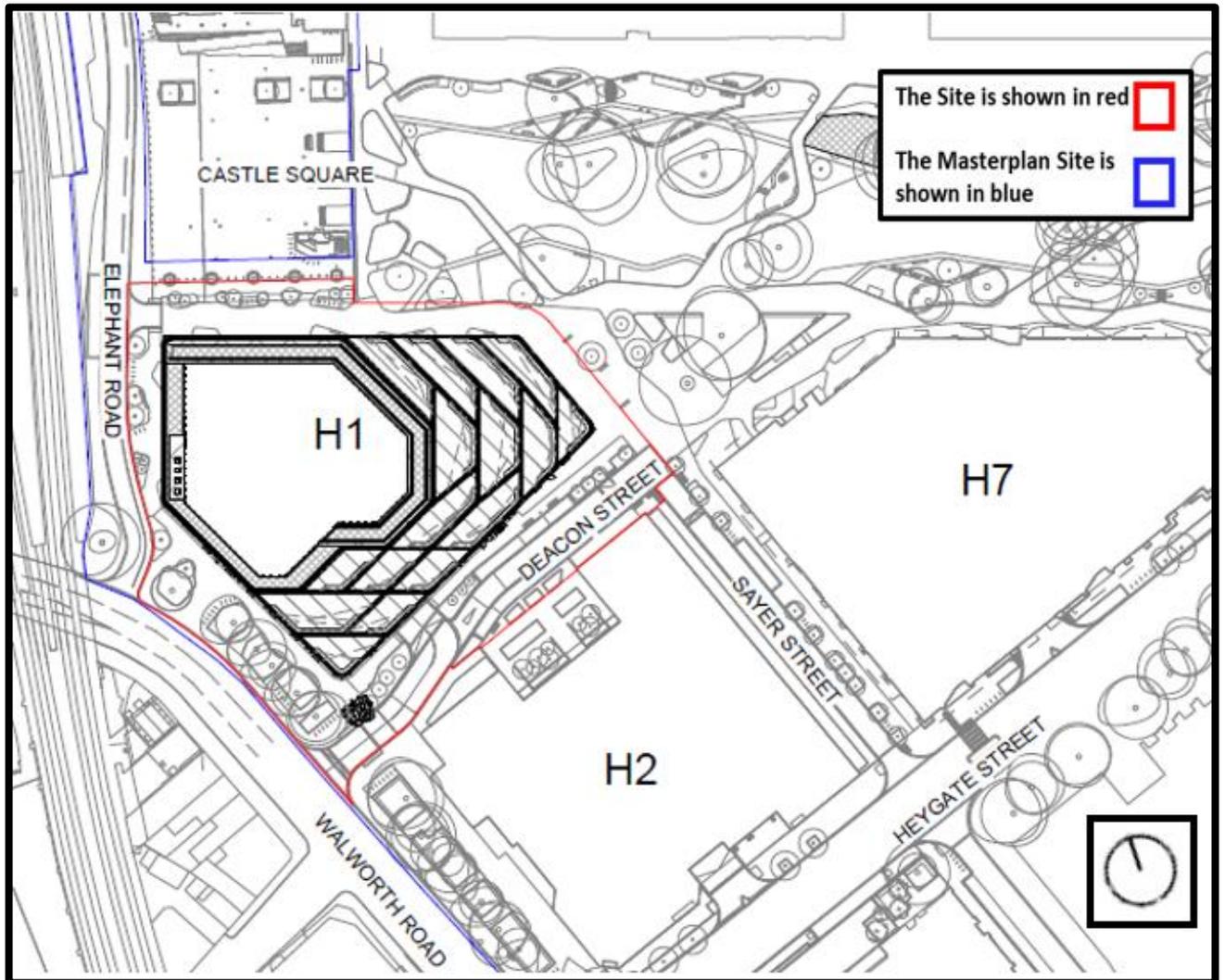
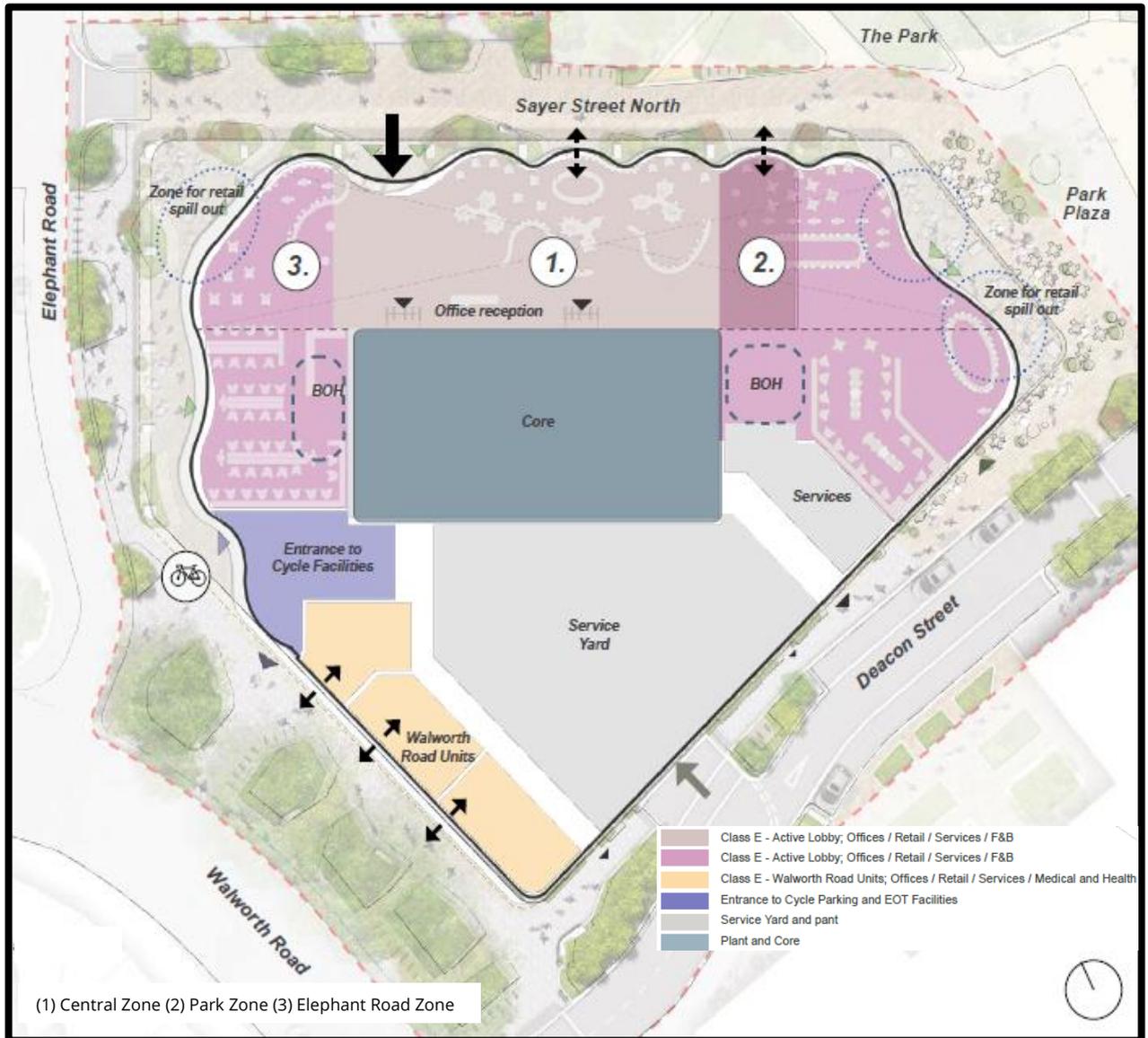


Figure 5.3: Ground Floor Layout of the H1 Development (Source: Modified from ACME)



5.5.5 As shown in **Figure 5.3** the main office entrance in the H1 Development is situated along the north elevation fronting Sayer Street North as it turns to meet Elephant Road, ensuring maximum visibility and accessibility for workers and visitors accessing the building from Elephant and Castle Railway and Underground Stations.

5.6 Basements

5.6.1 As shown in **Figure 5.4** and **Figure 5.5**, a two basement levels (Level 1 and Mezzanine) would be provided beneath the entire building. The basement would provide cycle parking, together with space for building plant and a surface water attenuation tank. Detailed plans illustrating the proposed basement areas are provided in **ES Volume 3, Appendix 5.1 (Detailed Planning Application Drawing Reference Numbers 259639-A100-H01-01-PL-B1-1002 (Floor Plan-Basement Level 1) and 259639-A100-H01-01-PL-BM-1003 (Floor Plan-Basement Level Mezzanine))**.

Figure 5.4: Basement Location and Layout (Basement Level 1) (Source: Modified from ACME)

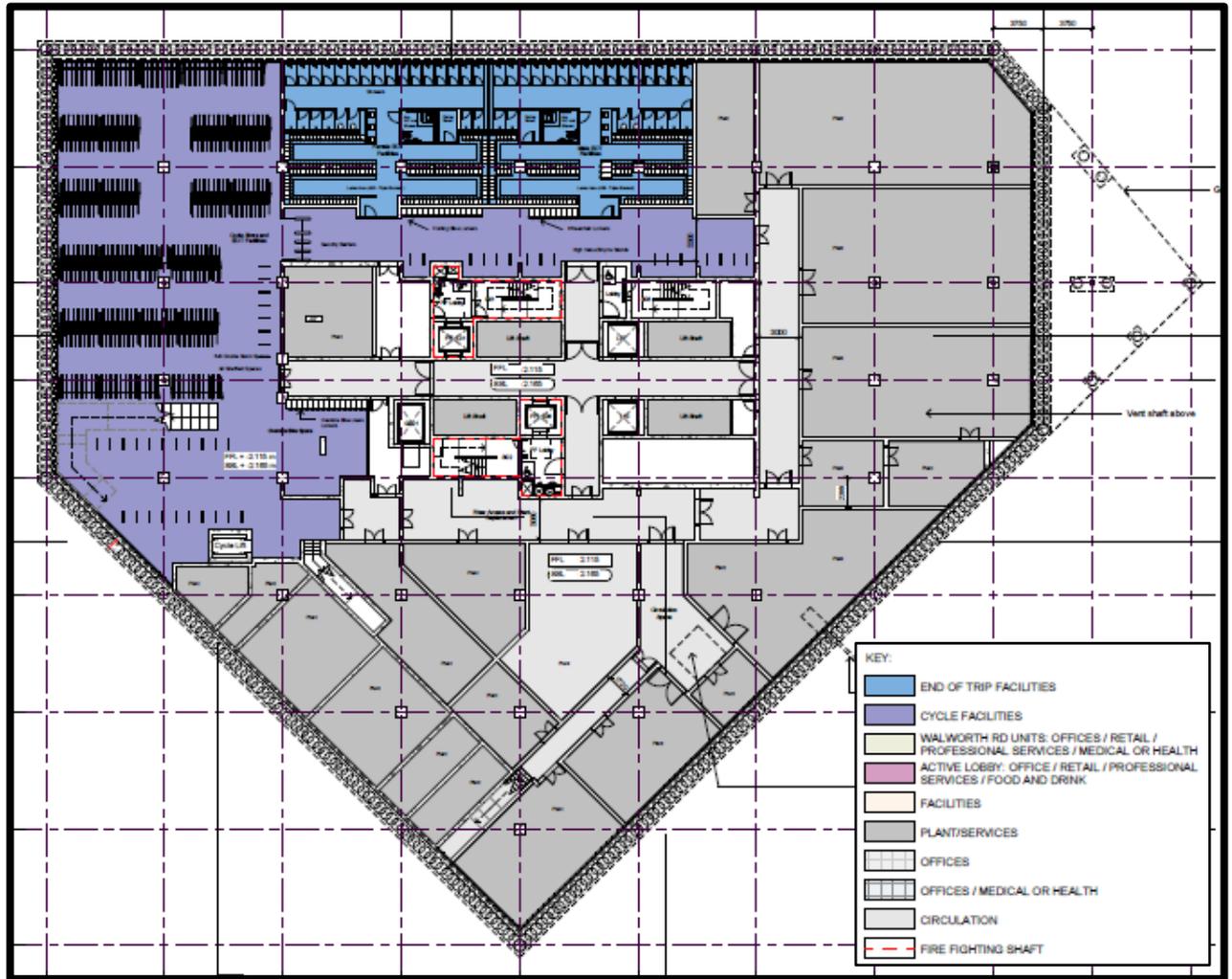
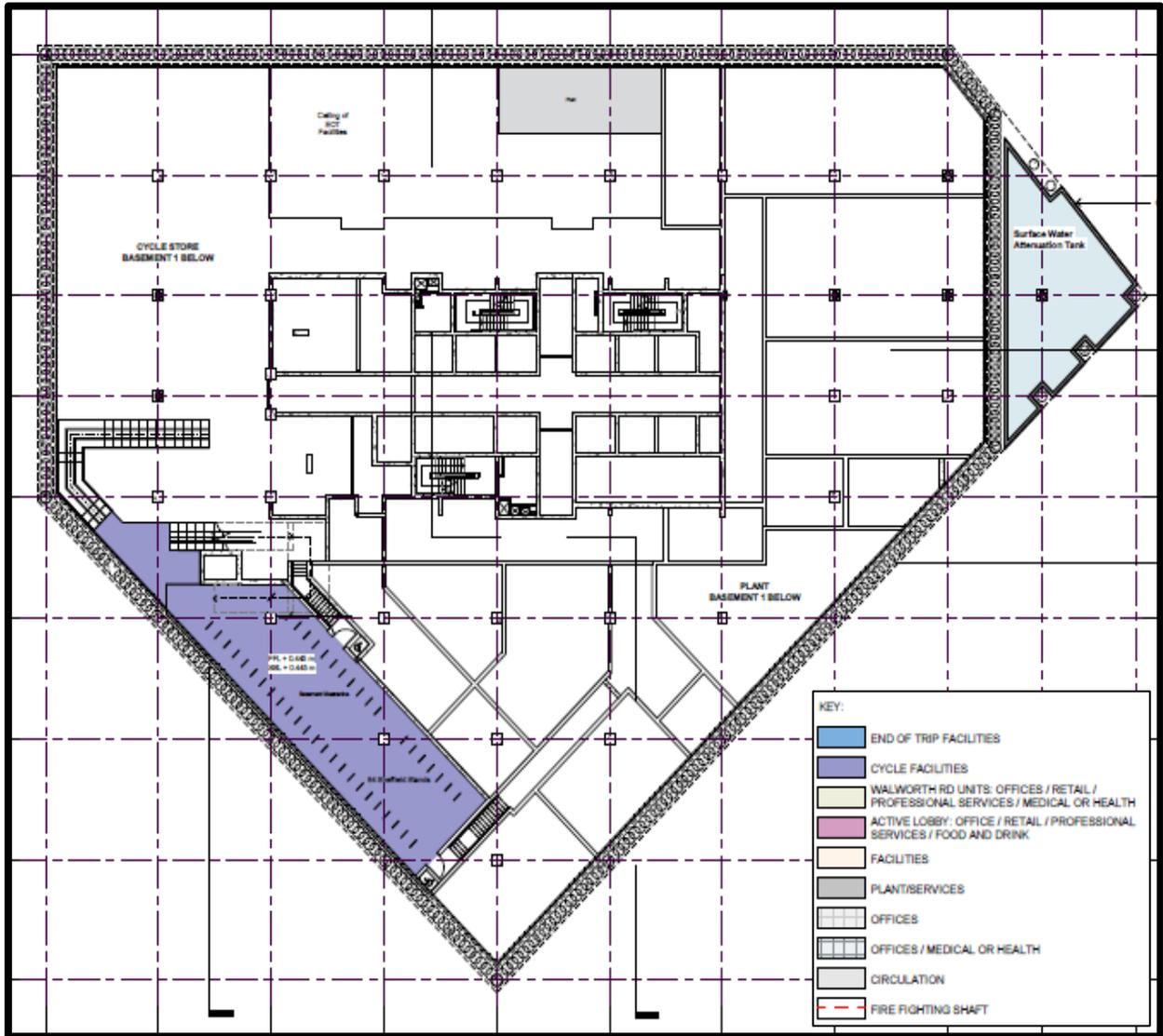


Figure 5.5: Sub-Basement Location and Layout (Basement Mezzanine) (Source: Modified from ACME)



5.7 Façade Materials and Design

5.7.1 The façade of the H1 Development has been designed to create an identity for the building that is anchored in its context and its industrial heritage. The H1 Development building facade would be a unitised system defined by a layer of inclined fins. The horizontal and diagonal coloured aluminium fins would be off-set from the glazing to give the elevations depth and provide sun-shading. To create complexity there would be a change of fin orientation, and therefore a variety of densities, in each façade. The fin density would increase with solar exposure to protect from overheating and glare.

5.7.2 The industrial heritage of the area has also been echoed in the colour palette of the H1 Development chosen to reflect the rich-burnt red and warm russet shades evident in the surrounding brick facades and the colour of core-ten and of old steel, as seen in **Figure 5.6**. The roof plant would be fully screened by a faceted perforated aluminium plant screen with a finish designed to match the colour and quality of the finish of the main facade.

Figure 5.6: Illustrative view from Walworth Road looking Northwards (Source: ACME)

- 5.7.3 The glazing of the ten-metre high active lobby façade would be split into three units with the size of the lower panels enabling flexibility to integrate a variety of openings, to allow ‘counter’ areas, or customers and visitors to spill-out to enjoy the edge of The Park.
- 5.7.4 The glazed facade of small shops or affordable workspace on the Walworth Road elevation is intended to follow the tradition for individual local trades activating the streetscape and engaging with pedestrians. Retractable awnings offer protection from the weather. Feature columns would visually ground the building and would be set in planters to extend the green of the public realm vertically to the green of the landscaped terraces above (see **section 5.10**).

- 5.7.5 The lower level facades along the Deacon Street would be characterised by glazed corners at either side (with an activated unit) and an area of opaque façade in-between (for the entrances to the service yard, back of house and services areas). Where openings and louvres are required, they would be incorporated into the visual facade concept and pattern to make the ground floor and mezzanine facade on Deacon Street an extension of the facades above. Where the vertical facade fins meet the ground, planting beds incorporating climbers have been designed to follow the landscape concept of the terraces above and link to The Park.
- 5.7.6 As the H1 Development building rises it reduces in size by the formation of a series of landscaped terraces stepping inwards to the south, east and west (see **Figure 5.6** and **Section 5.10**). The façade concept of diagonal fins continues by wrapping around each terrace.
- 5.7.7 Further detail on the H1 Development façade can be found by reference to elevations within **ES Volume 3, Appendix 5.1** (as listed within **Table 5.2**) and **ES Volume 2: Townscape, Visuals and Above Ground Heritage Effects**.

5.8 Vehicular Access, Parking and Servicing

- 5.8.1 As shown in **Figure 5.3**, the H1 Development would be serviced from a ground floor internal service yard, with parking bays for trucks and vans, accessed from Deacon Street with vehicles both entering and exiting directly from Walworth Road. All servicing would be carried out from this internal service yard. Waste would be stored centrally within the ground-floor level service yard, including a designated zone for all refuse bins and skip compactors.
- 5.8.2 The H1 Development would be a car free development other than allocated accessible spaces to be located on Deacon Street. Cycle parking would be provided within the basement, accessed from Walworth Road and within the public realm at ground floor level. The H1 Development will not include any internal vehicular routes.

5.9 Cycle Parking

- 5.9.1 The H1 Development would provide 855 long-stay cycle parking spaces in the basements, along with 855 lockers and 46 showers. In addition to the 855 long-stay spaces, a total of 96 short-stay cycle spaces would be provided within the public realm at ground floor level.

5.10 Public Realm and Private Amenity Space

- 5.10.1 As shown in **Figure 5.7** the H1 Development would play an important role in the wider Elephant Park masterplan establishing the western edge of The Park and helping define Sayer Street North. The H1 Development's public realm aims to create a series of attractive and inviting spaces that both contribute to the proposed buildings' setting and uses and add to the enjoyment of the wider community.

Figure 5.7: Illustrative Elephant and Park Masterplan (Source: ACME)

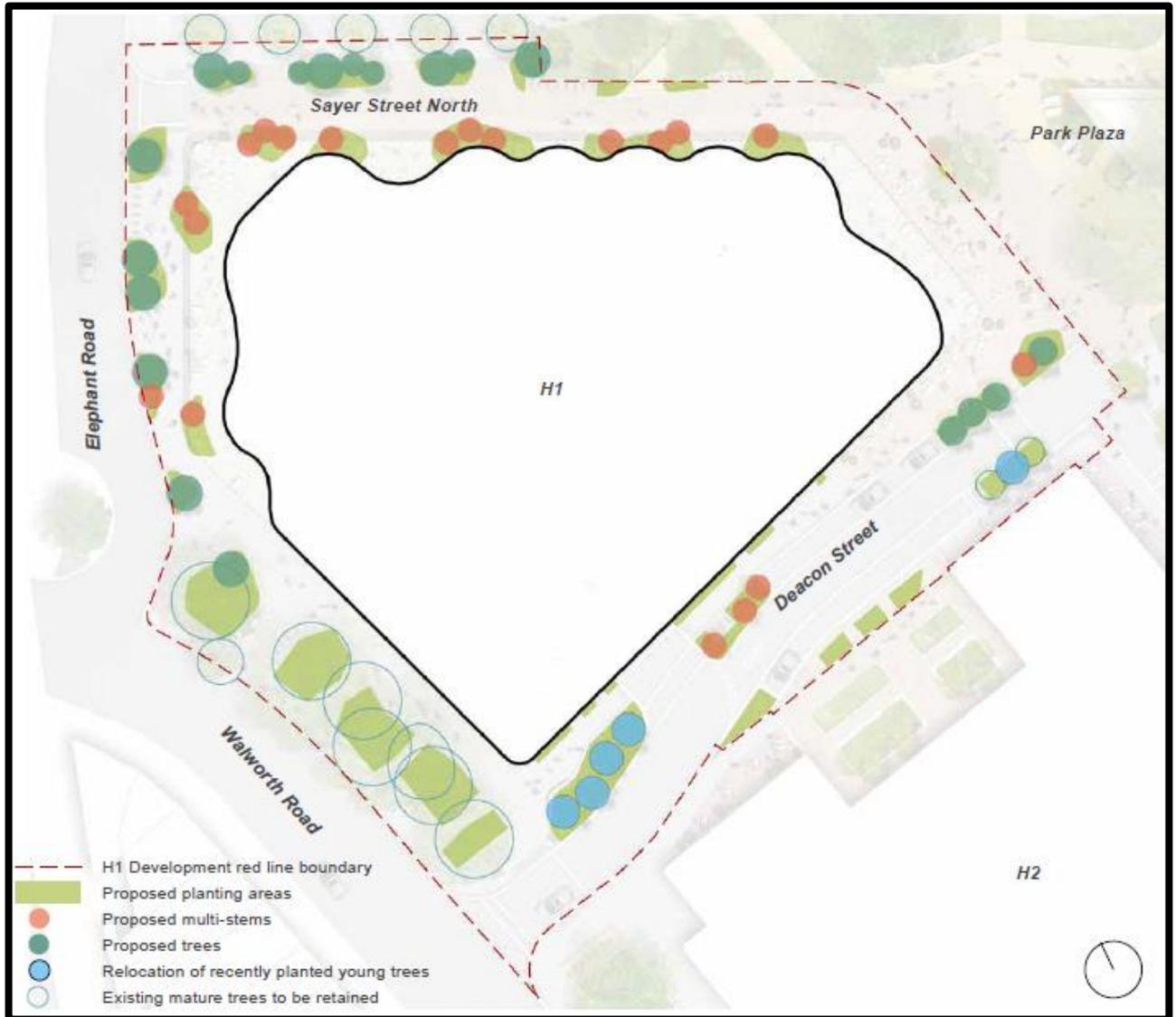


5.10.2 The public realm of the H1 Development has been designed to ensure clarity and safety of movements for all users, distinguishing clearly between the needs of pedestrians, vehicles and cyclists. Sayer Street North will be a pedestrian priority route and cycle route. Appropriate signage and material changes would be implemented to ensure the safe movement of pedestrians and cyclists at all times. The public realm has been developed to create a simple and unobstructed footway network and any unavoidable overlap between pedestrians and vehicles is minimised and closely managed. Trees and street furniture, such as benches and cycle stands, would be positioned to avoid pedestrian pinch points and allow clear views along the lengths of the footpaths.

5.10.3 **Figure 5.8** shows the proposed planting strategy for the H1 Development. This would include elements required as part of mitigation to afford suitable wind conditions at ground floor level. Together with the retention of trees along the eastern side of Walworth Road these measures include additional trees to the west of the Site and large movable planted pots along the south-eastern side of the H1 Development, as shown in **ES Volume 3, Appendix 5.1 Detailed Planning Application Drawing Reference Number 259639-A100-H01-20-PL-00-1004 (Floor Plan-Level 01)**. Further detail on the wind mitigation measure to be included as part of the H1 Development are included in **ES Volume 1, Chapter 9: Wind Microclimate**.

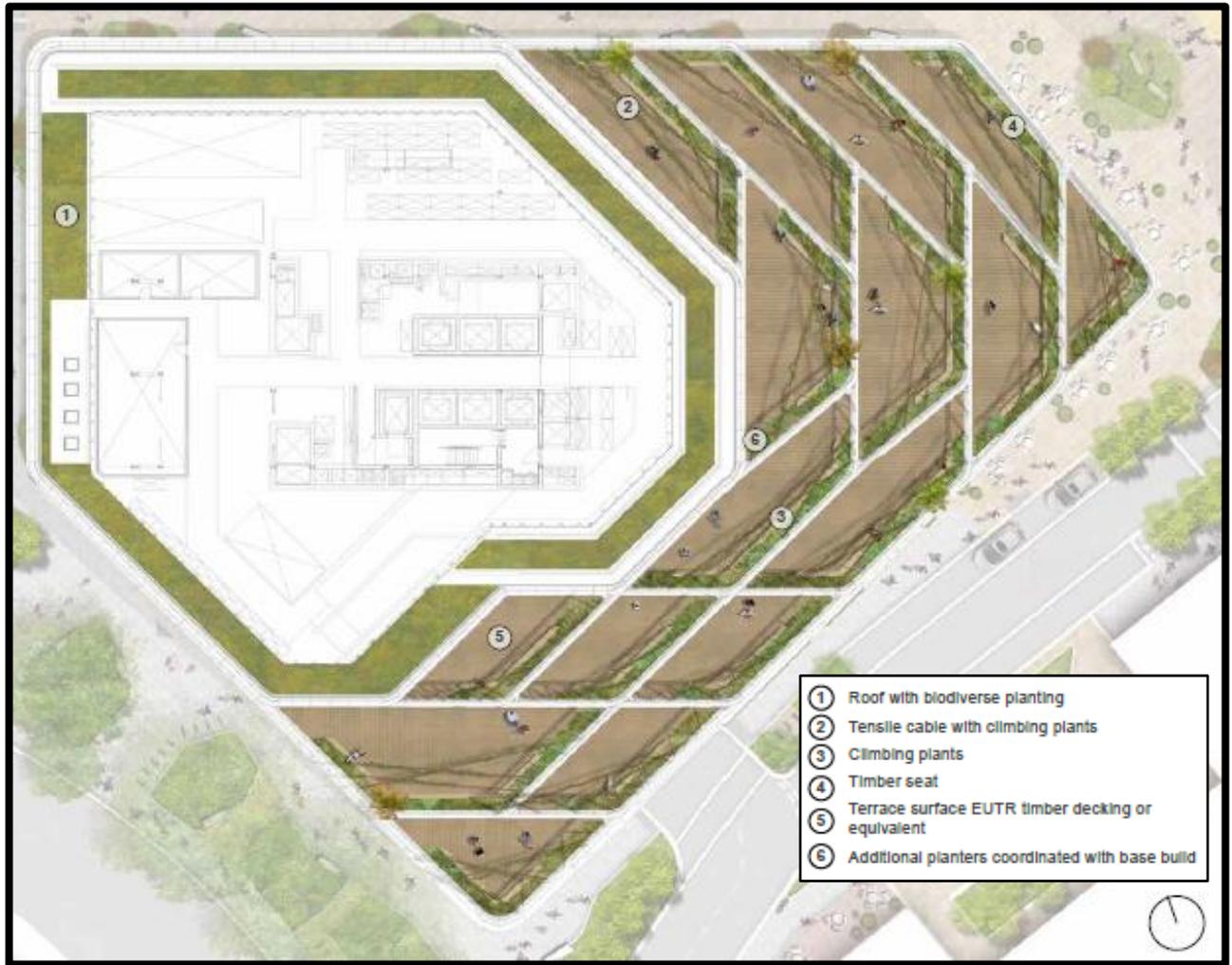
5.10.4 Further details regarding public realm and associated landscaping are included within **ES Volume 3, Appendix 5.1 (Planning Application drawing Numbers 251797-LA01-REH1-90-PL-00-100 (Public Realm General Arrangement) and 251797-LA01-REH1-90-PL-00-105 (Public Realm Softworks Plan))**.

Figure 5.8: H1 Development Planting Strategy (Source: ACME)



5.10.5 As shown in **Figure 5.9** the stepped approach to the massing facilitates the provision of external private amenity space serving the office accommodation in the form of roof terraces, which will also allow for a strong visual connection between The Park and the H1 Development building, whilst responding positively to the Site’s prominent position on Walworth Road. By the omission of glazing, the diagonal fins that wrap around each terrace would create a lattice for terrace plants to climb (as illustrated in **Figure 5.6**). Together, fins and planting would create privacy for residents of nearby buildings and visual amenity for occupiers of the H1 Development and its neighbours.

Figure 5.9: Illustrative Roof and Terrace Plan (Source: Modified from ACME)



5.11 Surface Water Drainage Strategy

5.11.1 The H1 Development incorporates a Site-wide surface water drainage strategy that would achieve a minimum of a 50% reduction to the existing runoff rate generated by the 1 in 100 year rainfall event (an event that has a 1/100 or 1% probability of occurring within any one-year period). As per the existing situation, all surface water runoff from the Site would be discharged to the existing Thames Water sewers. However, the flow of surface water runoff would be restricted and reduced via a combination of SuDS, including an on-Site attenuation tank.

5.12 Energy Strategy

5.12.1 The H1 Development would benefit from connection to a district heating network for the Approved Development (located in Plot H12) fed from a natural gas Combined Heat and Power plant, which offsets emissions through the Green Gas Certification Scheme (GGCS). The network is owned, operated and maintained by E.ON and comprises an energy centre which houses natural gas boilers which supply Low Temperature Hot Water (LTHW) for space heating and domestic hot water.

5.12.2 The proposed cooling strategy for the commercial office areas in the H1 Development is mechanical cooling via energy efficient passive chilled beams with floor plenum ventilation.

5.12.3 Through the above, and maximising the energy efficiency of the H1 Development through passive design measures which reduce energy consumption (e.g. in relation to building form, façade and fabric) and efficient building services, there is the opportunity for 38% savings in CO₂ emissions over Part L2A of the Building Regulations 2013 for the H1 Development, as outlined in the Energy Statement which accompanies the Planning Application.

5.13 Climate Change Resilience

5.13.1 The Development incorporates a number of features that would contribute to climate change resilience. These include:

- The surface water drainage strategy for the H1 Development accounts for future climate change. As part of the drainage strategy the model included an assessment for a 30% climate change on the 1:100-year event in order to investigate potential flood risks. The H1 Development is designed to attenuate the 1 in 30-year storm event with no surface flooding, and no risk to properties or public for a 1 in 100-year storm plus climate change. Even by increasing the climate change allowance to 40% the models demonstrate that there will be no onsite flooding affecting the H1 Development.
- An Energy strategy that reduces energy demand and CO₂ emissions, as described earlier in **Section 5.12**.

5.14 Health and Wellbeing

5.14.1 There are currently no standardised methodologies to scientifically and accurately assess the effects of a new development upon health and wellbeing. However, the H1 Development proposes a number of features that could be inferred to promote and encourage healthy lifestyles and wellbeing. Such design features include the following:

- The provision of significant public and private amenity spaces allowing for physical activity and social interaction and integration.
- The provision of ample cycle parking-spaces, pedestrian and cycle routes. Again, this would encourage physical activity.

5.14.2 In addition to the above, with reference to **ES Volume 1, Chapter 8: Air Quality**, the completed and operational H1 Development would not give rise to any significant air quality effects. Owing to the fact that the air quality assessment included within **ES Volume 1, Chapter 8: Air Quality** is benchmarked against certain air quality pollutant concentrations, standards and objectives and their evidenced implications upon human health, it can be inferred that the H1 Development would not give rise to any air quality health related issues.

- 5.14.3 **ES Volume 1, Chapter 9: Wind Microclimate** concludes that, subject to proposed mitigation (as outlined at **paragraph 5.10.3**), wind conditions at and surrounding the H1 Development, with the proposed landscaping, are expected to be suitable for the intended use in both the context of the existing + Approved Development and cumulative surroundings.
- 5.14.4 **ES Volume 1, Chapter 11: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare** concludes that the H1 Development would give rise to insignificant changes to overshadowing experienced at existing amenity spaces surrounding the Site and to the majority of residential receptors adjacent to the Site in relation to levels of sunlight received. For a number of residential receptors, the effects would be of adverse significance in relation to levels of daylight and sunlight. However, this is not unusual given the cleared nature of the Site and are considered to be acceptable for such a high-density urban location.

6. The Works

6.1 Introduction

- 6.1.1 This Chapter has been prepared by Avison Young with relevant information from the Applicant. It describes the anticipated programme of enabling and construction works, and the key activities that would be undertaken in relation to the implementation and construction of the H1 Development (the 'Works'). It identifies, in general terms, the potential effects associated with the Works. Detailed consideration of likely significant environmental effects related to the Works are assessed within **Environmental Statement (ES), Volume 1: Main Text and Figures** and **ES, Volume 2: Townscape, Visual and Above Ground Heritage Effects**. The Chapter is supported by **Appendix 6.1**: Elephant Park - H1 Development Construction Environmental Management Plan.
- 6.1.2 The Site-specific Construction Environmental Management Plan (CEMP) at **Appendix 6.1** sets out relevant construction environmental management measures, techniques and protocols and has been developed in line with all relevant corporate environmental and sustainability policies and commitments of the Applicant as well as the Technical Guidance for Demolition and Construction¹ produced by LBS. The CEMP would be consistent with, and cognisant of, the requirements of the planning conditions attached to the OPP (reference: 12/AP/1092) and accompanying Section 106 Agreement (S.106) obligations. The development of the CEMP at **Appendix 6.1** into a detailed CEMP would be secured by planning condition.
- 6.1.3 Planning for the Works is necessarily broad at this stage and may be subject to modification. However, based on professional judgement it is considered that sufficient planning has taken place at this stage to enable the likely significant environmental effects relating to the Works to be identified and assessed.

6.2 Programme of Works

- 6.2.1 Enabling works for the H1 Development are anticipated to commence in Q2 2022. Once enabling works are complete, the construction works would commence in Q4 2022 and are anticipated to complete in Q4 2025. As such, 2026 is considered to be the full year of completion and occupation of the H1 Development.
- 6.2.2 An indicative programme for the Works is presented in **Table 6.1**. Although the exact dates may vary, the estimated periods would still apply as an indication for each element / activity of the Works. In addition, it is likely that a number of the activities within **Table 6.1** would overlap.

¹ London Borough of Southwark, Technical Guidance for Demolition and Construction. Guidance document for all developers and contractors undertaking works in the Borough. September 2016.

Table 6.1: Indicative Programme for the Works

Phase	Start Date	END DATE	DURATION (APPROXIMATE WEEKS)
Enabling works / Infrastructure works	Jun-22	Sep-22	13w
Construction	Oct-22	Nov-25	153w
Piling Works	Oct-22	Apr-23	25w
Logistics	Dec-22	Dec-24	98w
Substructure Works	Nov-22	Aug-23	36w
Superstructure	May-23	Nov-24	77w
Envelope and Roofing	Feb-24	Feb-25	48w
Fit Out	Sep-23	Feb-25	24w
Testing & Commissioning	Jan-25	July-25	24w
Internal Finishes - Lobby, Core, Terraces, Landlord Areas	Aug-25	Nov-25	14w
External Landscaping Works	Apr-25	Aug-25	18w

6.2.3 As outlined in **ES Volume 1, Chapter 2: EIA Methodology**, the Updated Detailed Phasing Plan for the Approved Development provided in **ES Volume 3, Appendix 2.4** indicates the potential for overlap between Works for the H1 Development and the construction of Plots PAV1, H7, H11a and H11b.

6.3 Description of the Works

6.3.1 The following sections provide an overview of the anticipated strategy for Works associated with the H1 Development.

Enabling Works, Piling, Substructure and Basement Works

6.3.2 The expected sequence of enabling works, substructure, piling and basement works is set out below:

- Prior to the commencement of any enabling works, hoardings would be erected around the perimeter of the Site, with protective gantries over adjoining pedestrian routes / structures as necessary. The design of the hoarding would be in accordance with Health and Safety Executive (HSE) requirements, and would be agreed

with LBS. The Principal Contractor would be required to maintain the hoarding during the Works, to provide full security and safety for the general public. Suitable security measures would be implemented, including 24-hours security, as and when required.

- Appropriate access routes into the Site shall be established to ensure safe access and egress of vehicles into the Site boundary. Wherever necessary, traffic marshals would be used to safely bank vehicles into the Site, whilst protecting members of the public. During the enabling works period, and if required to do so, any necessary service diversions would be undertaken to ensure this is complete ahead of construction commencing.
- Tower cranes would be used to lift existing plant and lower any structural elements that can't be removed by diggers, to ground floor level, which can then be removed from Site. Where possible, geo-technical ground investigation works would be undertaken ahead of construction, so as to ensure that the classification of waste material can be determined in advance of bulk excavation activities.
- The team would progress to breaking out the slab and enter a piling enabling works period which would involve pile probing and obstruction removal.
- Once all obstruction removal and pile probing is complete, the substructure works for construction would commence. Piling works would involve secant piles around the perimeter and bearing piles in the main Site area. Formation level would be based on underside of pile mat. It is assumed that an 800mm pile mat thickness would be required, but this will need to be formulated based on bearing capacity of ground and loading of rigs. There will be two rigs for the secant piling works and two rigs for the Continuous Flight Auger (CFA) piling works. A crawler crane will be utilised for material distribution at this stage.
- Following the completion of piling works, the Contractor would commence with bulk excavation, removing earth from the Site in a sequenced / timed manner. Excavation will be actioned via a two-part operation. Initial strip would be completed for the pile mat formation level prior to piling. Final excavation to basement slab formation level would be completed after piling. Basement plant installation would take place during the earliest part of the main contract works (superstructure).

Superstructure

- 6.3.3 Once the basement structural works are nearing completion, the superstructure of the building will commence. The building would be constructed using a reinforced concrete core for the full height being constructed using a jump form method of construction (a method to construct the concrete core walls). The structure would also be formed of reinforced concrete up to level 1 plus the central core, with the balance of the structure formed primarily by hybrid steel and cross laminated timber (CLT) construction for office levels and steel for roof plant.
- 6.3.4 When the superstructure frame is sufficiently progressed, the building cladding would start to be installed, progressively moving towards having a watertight building. The cladding system would be a unitised cladding system.

6.3.5 It is estimated that the Works would be constructed using three to four tower cranes, located within the Site boundary. This would allow building material to be lifted from delivery areas to designated material laydown areas.

Fit-Out

6.3.6 Office units would either be left as shell or potentially be fully fitted out by the Principal Contractor; if the latter, this would make the interior spaces suitable for occupation but excludes loose fixtures and fittings. Any tenants would need to undertake internal fit-out and terrace fit-out specific works between the end of the Principal Contractor's Works and occupation.

6.3.7 All other units would either be left as shell, or fitted out as part of the Principal Contractor's Works, depending on terms agreed with tenants. If left as shell, the incoming tenants would provide their own fit out works, according to their own specific requirements.

6.3.8 Fit-out of the Works will also include the lobby, core, landlord areas and terraces.

Landscaping / Public Realm

6.3.9 As set out within **ES Volume 1, Chapter 5: The Development**, external hard and soft landscaping would be delivered as part of the H1 Development, providing landscaping and areas of public realm within the Site.

6.4 Materials and Resource Use

6.4.1 It is anticipated that the Works would give rise to an indicative 39,000m² of excavation waste and 12,053 m³ of construction waste materials, typically comprising soil, concrete, brick, cladding, timber and plasterboard. Considering a 95% diversion from landfill to meeting London Plan Policy SI 7², this would result in a 2,553 m³ of landfill waste. A Construction Waste Management Plan (CWMP) would be prepared and submitted as committed to through the CEMP at **Appendix 6.1** which would set out management / control measures to ensure that waste generated from carrying out the Works is kept to a minimum.

6.4.2 The typical materials arising from, and required for, the construction of the H1 Development are estimated to be as follows:

- Soil / muck-away.
- Piles.
- Steelwork / Aluminium.
- Concrete / Brick / Wood / Tile / Ceramics.
- Plastics.
- Glazing / Glass.

² GLA, The London Plan. The Spatial Development Strategy for Greater London, March 2021

- Building work / Plasterboard / Insulation
- Unitised cladding panels.
- Hazardous material, such as asbestos (itself only feasible if found during the enabling works phase in which case it will be safely removed).
- Bituminous mixtures, coal tar and tar.
- Metallic waste (including cables and pipes).
- Soil, gypsum and cement.
- Paints, varnishes, adhesives and sealants.

6.5 Plant and Equipment

6.5.1 Consideration was given to the types of plant and equipment that would likely be used during the Works. An indication of the typical types of plant and equipment associated with each key element of the Works are shown in **Table 6.2**.

Table 6.2: Indicative Plant and Equipment

Stage of the Works	Plant and Equipment	
Enabling Works	<ul style="list-style-type: none"> • Small tools • Concrete vibrator • Hammering 	<ul style="list-style-type: none"> • Telehandler • Concrete vehicles
Piling	<ul style="list-style-type: none"> • Piling rig (BG33 or similar) • 80T Crawler • Muck away lorries • Breaker 	<ul style="list-style-type: none"> • Concrete pump • Concrete delivery vehicles • Tower crane
Excavation	<ul style="list-style-type: none"> • D6 Dozer (or similar) • Long reach excavator (Hitachi 350) • Tower crane • Chameleon excavator • 20tn excavator • 36tn excavator 	<ul style="list-style-type: none"> • Concrete pump • Muck away lorry • Concrete vehicle delivery • Jet wash • Bursting machine • Small tools • Circular saw
Sub and Superstructure	<ul style="list-style-type: none"> • Excavator • Concrete deliveries • Concrete vibrator • Precast and rebar works 	<ul style="list-style-type: none"> • Muck away vehicles • Jet wash • Form works

6.6 Hours of Work

6.6.1 Prescribed hours of work would be agreed and secured by planning condition with LBS. It is anticipated that the core working hours for the H1 Development would be in accordance with those set out in the LBS Technical Guidance for Demolition and Construction, as follows:

- 08:00 - 18:00 hours weekdays.
- 09:00 - 13:00 hours for Saturday.
- No working on Sundays or bank Holidays.

6.6.2 Approval from LBS would be required for any noisy works that need to be undertaken outside of permitted hours.

6.6.3 Typically, works that may need to be undertaken out of hours would be for the delivery and removal of large plant to / from the Site or abnormal loads, for which the Principal Contractor would be expected to make the necessary road closure applications to LBS, if required.

6.7 Potential Environmental Effects

6.7.1 All construction sites have the potential to cause temporary nuisance and other disruptions to existing users, neighbouring occupants, vehicular users, pedestrians and other sensitive receptors within the vicinity. Detailed assessments of the likely significant environmental effects resulting from the Works are considered in **ES Volume 1, Chapters 7-11** and **ES Volume 2: Townscape, Visual and Above Ground Heritage Effects**. However, **Table 6.3** provides a brief summary of the type of effects which could arise as a result of the Work and in the absence of additional mitigation (i.e. except for the CEMP and CWMP).

Table 6.3: Summary of Potential Environmental Effects, Scoped into the ES, resulting from the Works as outlined in ES Volume 1, Chapters 7-11 and ES Volume 2: Townscape, Visual and Above Ground Heritage Effects

Issue	POTENTIAL EFFECTS
Townscape, visual and above ground heritage setting.	<ul style="list-style-type: none"> • Temporary visual intrusion during the Works.
Wind microclimate.	<ul style="list-style-type: none"> • Temporary and transient changes in the local wind environment both on and off-Site during the Works together with any associated effects to pedestrian comfort and safety giving due consideration to the type of pedestrian activity likely to occur at specific locations and specific seasons.

Daylight, Sunlight and Overshadowing

- Temporary and transient changes to levels of daylight and sunlight to residential properties surrounding the Site during the Works.
- Temporary and transient changes to incidences of overshadowing to amenity areas surrounding the Site during the Works.
- Temporary and transient changes to solar glare at sensitive viewpoints (road users and train drivers) surrounding the Site (including those within the Masterplan Site) during the Works.
- Temporary and transient changes to light pollution at residential properties surrounding the Site during the Works.

Greenhouse Gasses

- Embedded carbon associated with the Works, including GHG emissions arising from the manufacture and production of construction materials.
 - Carbon emissions from construction traffic associated with the Works.
-

Conclusions

- 6.7.2 The Works would be managed via the H1 Development of Site-specific CEMP. The Site-specific CEMP would be agreed with LBS and other relevant bodies prior to the commencement of the Works. This would comply with the Applicant's corporate environmental and sustainability policies and LBS's requirements. The appointed Contractor for the Works would be obliged, via planning condition, to adhere to the Site-specific CEMP.
- 6.7.3 The procedures outlined in **Appendix 6.1** would ensure the delivery of a high level of environmental control throughout the Works, thereby minimising the potential for adverse effects. Further detail regarding specific mitigation during the Works are presented within **ES Volume 1, Chapters 7 to 11** and **ES Volume 2: Townscape, Visual and Above Ground Heritage Effects**.

7. Socio-Economics

7.1 Introduction

7.1.1 This Chapter sets out the likely significant effects of the H1 Development upon socio-economics. It has been prepared by Volterra Partners.

7.2 Assessment Methodology and Significance Criteria

Assessment Methodology

Scope of this Chapter

7.2.1 All effects considered in this Chapter are associated with the completed and operational H1 Development. All potential effects associated with the Works have been scoped out (**ES Volume 3, Appendix 2.1**). The EIA Scoping Report (**ES Volume 3, Appendix 2.1**) contains more detail on the scope of this Chapter, including the effects which have been scoped out. The EIA Scoping Report lists the likely significant socio-economic effects as:

- Creation of new permanent employment opportunities (direct, indirect and induced) resulting from the completed and operational H1 Development.
- The provision of office floorspace, including affordable workspace.
- The provision of other land uses that may arise out of seeking planning permission for flexible land uses, which may include medical or health provision (specifically a health hub).
- The creation of new and enhanced public realm and amenity space.

7.2.2 After the EIA Scoping Report was submitted, further information regarding the potential interaction between affordable workspace and medical or health floorspace provision within the part of the H1 Development where both land uses are being applied for was developed. As outlined in **ES Volume 1, Chapter 5: The Development**, this information identified that the provision of affordable workspace is the intended, or more likely, land use within this flexible floorspace, with medical or health provision (in the form of a health hub) a possible but less likely alternative. As such, the effects identified in relation to the medical or health provision are less likely than those relating to the affordable workspace. In order to clearly reflect this interaction, this Chapter splits the office floorspace effect and assesses affordable workspace separately.

Defining the Baseline

Study Areas

7.2.3 **Figure 7.1** shows the Site within the context of the geographical study areas selected for the assessment. The study areas for each effect vary according to the nature of the effect and the aspect of the H1 Development that gives rise to that effect. **Table 7.1** describes the study areas and provides justification for their selection.

Figure 7.1: Site Location and Study Areas

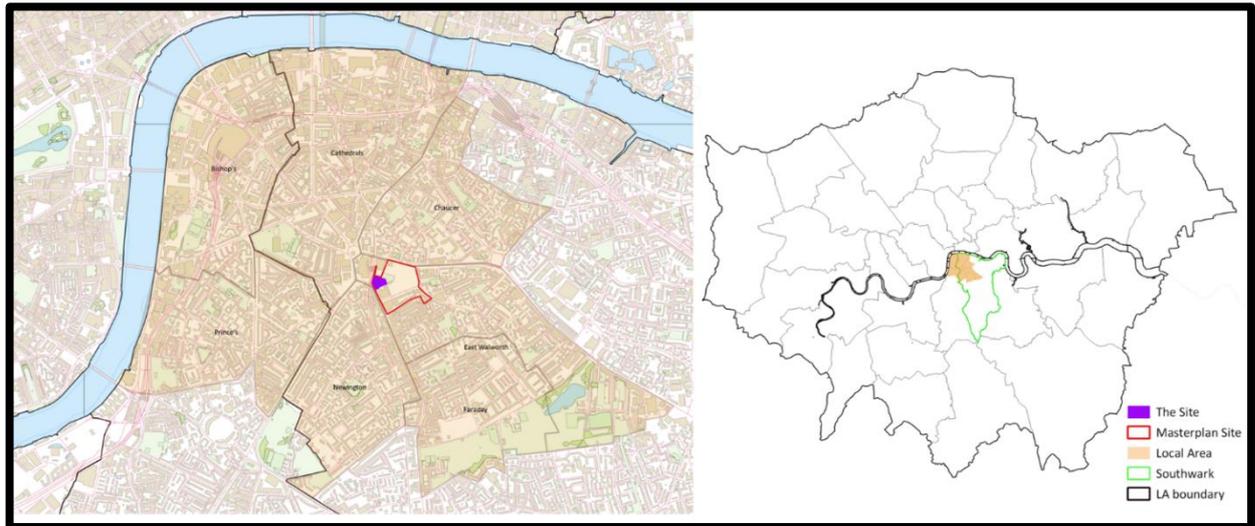


Table 7.1: Study Areas

Study Area*	Definition	Justification
Local Area	Seven 2011 Census wards: Bishop's, Cathedrals, Chaucer, East Walworth, Faraday, Newington, and Prince's.	This local impact area was previously agreed with the (in the August 2020 ES) and so is retained here. The area is based on boundaries from the 2011 Census and contains the ward within which the Site falls (2011 census frozen ward 'East Walworth' or 2019 Electoral ward 'North Walworth').
District	London Borough of Southwark (LBS)	The borough within which the Site sits. Targets for commercial floorspace and employment and skills are set at this level.
Regional	London	Predominantly used as a regional comparator to determine the sensitivity of baseline conditions in the Local Area and District. This is also the area over which total employment is assessed, given it is the Travel to Work Area. ¹
National	UK / GB / England	National comparators are selected based on availability of data. This geography is used as a national comparator to determine the sensitivity of baseline conditions in other geographies.

* The sub-regional area is not relevant to any of the effects in this Chapter and therefore has been excluded.

Current Baseline Conditions

7.2.4 Existing baseline socio-economic conditions have been established through the interpretation of nationally recognised research, data and survey information. These sources are referenced throughout the Chapter and the data are sourced from the Office of National Statistics (ONS) where possible. Where data from the most recent year is not available, the next best alternative has been used, i.e., the most up to date. The description of the baseline utilises the latest publicly available information at the time of preparing the assessment (January 2021).

Future Baseline – Baseline for the Opening Year

7.2.5 Where information is available and where relevant, the baseline quantifies how the socio-economic conditions are likely to change from current levels to the opening year (2026). This provides a future baseline against which to assess operational impacts of the H1 Development.

7.2.6 Publicly available information is considered in order to inform this future baseline. This includes data from the ONS and sub-regional statistical forecasts and / or the local evidence base. For example, the baseline reviews the labour market projections to understand how the local labour market is expected to change before the H1

¹ A Travel to Work Area is a collection of wards for which, of the resident economically active population, at least 75% actually work in the area, and also, that of everyone working in the area, at least 75% actually live in the area.

Development becomes operational. Where information on how the baseline condition is likely to change is not available (for example, on public realm), effects have been assessed against the existing baseline.

7.2.7 All other plots of the Approved Development (excluding Plot H1) are likely to be completed by 2025, before the opening year (2026). The future baseline should therefore also consider changes to the baseline as a result of the operation of the rest of the Approved Development (i.e. the Approved Development in the absence of Plot H1 in its outline consented form). This assessment considered each projection that is used in the future baseline and justified whether the projections include the impact of the rest of the Approved Development or not. It concluded that all projections used in the future baseline are consistent with a likely future scenario that accounts for the rest of the Approved Development.

7.2.8 This assessment distinguishes between cumulative schemes (or phases of cumulative schemes) that have a high likelihood of coming forward before 2026 and those that do not. The former group are assumed to be a part of the future baseline projections and so are excluded from the cumulative effects assessment (CEA) to avoid double counting. The schemes which are captured by the future baseline are those that meet either of the following conditions:

- They are complete but not yet occupied.
- They have planning consent or are under construction and are due to be completed before 2026.

7.2.9 **Table 7.2** presents the cumulative schemes that are assumed to be captured by the future baseline, along with the justification for the allocation. Of the 14 cumulative schemes within a 1.5km radius of the Site (see **ES Volume 1: Chapter 2 EIA Methodology**), four entire schemes and one phase of the Aylesbury Estate scheme are assumed to be captured by the future baseline projections. This leaves nine schemes and two phases of the Aylesbury estate scheme which are assessed in the CEA.

Table 7.2: Cumulative Schemes within a 1.5 km Radius of the Site, the Impacts of which are Considered Captured by the Future Baseline Projections and Therefore Excluded from the Cumulative Effects Assessment

Planning Application Reference	Justification
Ref: 19/AP/1506 Salisbury Estate Car Park Balfour Street London SE17 1PA	LBS Site Allocations Methodology Report ² states that this scheme is approved and due to be completed by 2023.
Ref: 15/AP/2474 Rich Industrial Estate Crimscott Street London SE1 5TE And Willow Walk London SE1	ES Volume 1, Chapter 2: EIA Methodology identifies that planning permission was granted on 07/12/17 and the scheme is currently under construction.
Ref: 15/AP/1062 Manor Place Depot Site, 17-21 & 33, Manor Place, SE17	ES Volume 1, Chapter 2: EIA Methodology identifies that construction on this site started in 2017.
Ref: 14/AP/3844 Aylesbury Estate Land Bounded By Albany Road Portland Street Bagshot Street Alvey Street East Street And Dawes Street London SE17	Only Phase 2 of this scheme is assumed to be captured by the future baseline, since it is due to be completed by 2025. ³ Phases 3 and 4 are due to complete by 2027 and 2035 respectively, and so are assessed in the CEA.
Ref: 13/AP/1122 Chatelain House 182- 202 Walworth Road London SE17 1Jj	LBS Site Allocations Methodology Report ⁴ states that this scheme is under construction and due to be completed by 2021.

Baseline and Future Baseline Data Sources

7.2.10 **Table 7.3** presents the baseline and future baseline data sources used for assessing each socio-economic effect.

² LBS. New Southwark Plan. Site Allocations Methodology Report. July 2020.

³ LBS Planning Committee. Development Management planning application: Application 14/AP/3844 for: Outline Planning Permission. April 2015.

⁴ LBS. New Southwark Plan. Site Allocations Methodology Report. July 2020.

Table 7.3: Baseline & Future Baseline Data Sources

Socio-economic effect	Relevant baseline indicators	Source
Creation of new permanent employment opportunities (direct, indirect and induced) resulting from the completed and operational H1 Development.	Economic activity of residents	ONS. Annual Population Survey. 2019.
		ONS. Claimant count by sex and age. 2020.
	Workplace based employment	ONS. Business Register and Employment Survey. 2010 to 2019.
		GLA. Long term labour market projections. 2017
The provision of office floorspace	Local jobs	ONS. WF01BEW. Location of usual residence and place of work (OA level). 2011.
	Commercial floorspace	Valuation Office Agency (VOA). NDR Business Floorspace Tables. 2019.
The provision of affordable workspace	Office floorspace (existing and future)	GLA. Ramidus Consulting Ltd. The London Office Policy Review. 2017.
	Affordable workspace	Avison Young. LBS. Affordable Workspace Support – Evidence of Needs. 2019.
The provision of other land uses that may arise out of seeking planning permission for flexible land uses, which may include medical or health provision	Retail and Food and Beverage floorspace (existing and future)	Nathanial Lichfield & Partners. Southwark Retail Study – Old Kent Road Update. 2018.
		NHS Digital. GP Practice Level Workforce Statistics. 2020.
	Primary care provision	LBS. Southwark Pharmaceutical Needs Assessment 2018 – 2021. 2017.
		LBL. Lambeth Pharmaceutical Needs Assessment. 2015.
The creation of new and enhanced public realm and amenity space	Pharmacy provision	NHS Digital. Hospital Outpatient Activity, 2017-18; 2016-17, Provider level analysis. 2020.
	Outpatient provision	MGHLG. English Indices of Multiple Deprivation. 2019.

Impact Assessment of Potentially Significant Effects

Study Areas

7.2.11 **Table 7.4** shows the study areas assigned to each likely significant effect.

Table 7.4 Study Areas for Assessment of Likely Significant Effects

Potentially Significant Effect	Study Area(s)
Creation of new permanent employment opportunities (direct, indirect and induced) resulting from the completed and operational H1 Development	Regional (direct, indirect, and induced)
	District (direct)
The provision of office floorspace	District
The provision of affordable workspace	District
The provision of other land uses that may arise out of seeking planning permission for flexible land uses, which may include medical or health provision	District (retail, food and drink)
	Local Area (healthcare)
The creation of new and enhanced public realm and amenity space	Local Area

Employment

7.2.12 The H1 Development includes the provision of 58,032 m² (Gross Internal Area – GIA) of employment supporting floorspace (excluding shared back of house and cycle parking space) within various land uses all falling within Class E. The floorspace breakdown in the first column of **Table 7.5** has been committed to. The flexible allocations in rows 2, 3, and 4 mean that there is a range of employment that could be delivered by the H1 Development. Direct employment is estimated for two scenarios: the minimum scenario (the minimum employment) and the maximum scenario (the maximum employment) that could be supported at the H1 Development given the potential flexible allocations of the Class E floorspace. In this case, the maximum employment would be delivered if the highest employment density floorspace (office) was delivered for all rows of **Table 7.5**. The minimum employment that could be supported is when the floorspace in rows 2, 3, and 4 is allocated to medical or health (rows 2 and 3) and retail / food and drink (row 4) rather than offices, as these uses support fewer jobs per m².

7.2.13 This assessment estimates direct employment using the Employment Densities Guide⁵. Whilst this guide is based on the previous use class order, it is still deemed appropriate and no new guidance has yet been issued for assessment of the new use class order. For office, retail and food and drink floorspace, the mid densities of 12 m² per FTE, 17.5 m² per FTE and 17.5 m² per FTE (all NIA) are used (respectively). For potential medical or health

⁵ Homes & Communities Agency. Employment Densities Guide. Third Edition. 2015.

provision, the guide does not include a density. If it were to come forward, the medical or health floorspace is proposed to be used as a local health hub which is likely to comprise a GP practice, pharmacy and outpatient services. No employment data is available for pharmacies and outpatient services, and so the NHS⁶ guidance that space required per FTE GP is 165 m²(GIA) is assumed to apply to this medical or health floorspace.

Table 7.5: Area Schedule of Employment Supporting Floorspace by Use Class, m² (GIA & NIA), Flexible Floorspace Allocation in Minimum Employment Scenario and Associated Employment Densities

Use Class	Area Schedule (GIA)	Area Schedule (NIA)	Allocation in Minimum Employment Scenario (Density – m ² per FTE)	Allocation in Maximum Employment Scenario (Density – m ² per FTE)
Offices (Class E)	49,351	40,783	Offices (12m ² NIA)	Offices (12m ² NIA)
Offices / medical or health (Class E)	6,728	4,300	Medical or health (165 m ² GIA)	Offices (12m ² NIA)
Offices / retail / professional services / medical or health (Class E)	264	259	Medical or health (165 m ² GIA)	Offices (12m ² NIA)
Offices / retail / professional services / food and drink (Class E)	1,689	1,683	Retail/food and drink (17.5 m ² NIA)	Offices (12m ² NIA)
Total	58,032	47,025		

7.2.14 It is standard practice to compare the proposed use of the H1 Development to its existing use to understand the extent to which the proposed economic activity would be additional, known as gross additional employment. There is no employment existing at the Site, so all provision will be additional.

7.2.15 Direct employment in London is estimated using Census origin destination data,⁷ which shows that 80% of LBS jobs were taken by London residents. This means that 20% is taken as the leakage of employment benefits outside the London area. The LBS Supplementary Planning Document⁸ presents a target for 10% office and 20% retail jobs to be taken by LBS residents. This is taken as the baseline local rate of labour at the H1 Development for these jobs. For other jobs (medical or health), the Census local labour rate of 16% is applied.⁹ This local labour estimate does not account for local employment and skills initiatives that the Applicant has committed to for the Approved

⁶ NHS. London Healthy Urban Development Unit, Planning Contribution Model Guidance Notes. 2009.

⁷ ONS. Census. 2011.

⁸ LBS. Section 106 Planning Obligations and Community Infrastructure Levy (CIL) Supplementary Planning Document. 1 April 2015 (November 2020 Update). 2020.

⁹ ONS. Census. 2011.

Development and is willing to commit to for the H1 Development. The effect of planning commitments to encourage local employment and skills are assessed in the mitigation section of this Chapter.

7.2.16 At the London level, indirect and induced employment effects are also considered. The assessment of net additionality considers aspects such as the likelihood of jobs moving from another location to work at the H1 Development (displacement), or additional economic activity supported in other sectors as a result of the H1 Development due to workers spending more money locally or increased supply chain demand. The HCA Additionality Guide¹⁰ provides a framework for estimating the additional effects of a development:

- Displacement is the proportion of jobs that would otherwise have been supported elsewhere. The Additionality Guide notes that “*displacement arises where the intervention takes market share [...] from existing local firms or organisations*”. A low level of displacement is expected at the regional level, which the Additionality Guide states is 25%.¹¹
- The multiplier impact is the indirect benefit to other sectors supported by the H1 Development, generated through both the supply chain and worker expenditure. The H1 Development is in central London and therefore is likely to have “strong” supply linkages given the scale of its economy. To be conservative, a “medium” regional level composite multiplier of 1.5 has therefore been selected.

Floorspace

7.2.17 The provision of floorspace at the H1 Development is assessed individually for each potential floorspace use: office, affordable office, retail, food and drink, and medical or health. Each floorspace is assessed for two scenarios: the minimum case (lowest possible provision) and the maximum possible provision (**Table 7.6**). The minimum scenario is the EIA requirement. However, since for all but office this would mean zero provision, a maximum scenario has also been presented to allow for more meaningful findings.

7.2.18 Because each floorspace type is assessed individually, they are not necessarily consistent with each other nor with the employment effects. For example, the minimum scenario for office (49,351 m² GIA) would not be delivered along with the minimum scenario for retail, food and drink, and medical or health (0 m²). Similarly, the minimum scenario for employment (as outlined above) is not consistent with the minimum floorspace scenarios; the minimum employment effect is based on the lowest possible employment density at the Site, which relies upon a combined delivery of the minimum floorspace scenario for office and the maximum floorspace scenario for retail, food and drink, and medical or health.

7.2.19 As outlined in **ES Volume 1: Chapter 5: The Development**, the H1 Development proposes affordable workspace to meet the LBS emerging policy requirement that at least 10%¹² gross new floorspace be affordable. However, there is a possibility that a new health hub could be provided within the H1 Development as an alternative to the affordable workspace proposed within the H1 Development, subject to LBS priorities. In order to accommodate this potential, medical or health use has been sought alongside office use for 6,992 m² (GIA) within the lower floors

¹⁰ Homes & Communities Agency. Additionality Guide. Fourth Edition. 2014.

¹¹ Homes & Communities Agency. Additionality Guide. Fourth Edition 2014.

¹² Southwark Council. New Southwark Plan. Submission version – Proposed modifications for examination 2019 to 2034. 2020.

of the H1 Development. Whilst permission is being sought for the possibility of the health hub in the application, the affordable workspace proposals are the intended land use and the health hub is a potential alternative. As such the likely effects resulting from affordable workspace should be considered to be more likely, with the likely effects from the health hub less likely.

Table 7.6: Flexible Floorspace Allocation in Minimum and Maximum Floorspace Scenario for each Individual Allocation, m² (GIA),

Use Class	Minimum Floorspace Scenario	Maximum Floorspace Scenario
Offices (Class E)	49,351	58,032
Retail	0	1,954
Food and drink	0	1,689
Medical or health	0	6,992

7.2.20 For office, the provision is compared against the future baseline of LBS office floorspace capacity between 2016 and 2041, as derived from the London Office Policy Review (LOPR).¹³ For retail and food and drink, the provision is compared against the future baseline of LBS capacity in 2026 as derived from the LBS retail study.¹⁴

7.2.21 For affordable workspace, provision is based on information provided by the Applicant. It is assessed against the emerging LBS policy requirement that at least 10% gross new office floorspace be affordable. The proposed provision is stated in NIA, which will be grossed up, in order to better reflect its allocation within the building.

7.2.22 For medical or health, the potential health hub could include GP consulting space, a pharmacy, and outpatient services along with other general support and staff facilities. Borough pharmaceutical provision is assessed at the Ward level on the basis of pharmacy count per 100,000 residents.¹⁵ The baseline ratio of pharmacies per 100,000 residents is calculated for the wards in the Local Area and the impact of the potential new pharmacy on this ratio is calculated. The health hub is also likely to include GP floorspace. It is not clear how many GP FTEs would be supported at the space, and so these impacts are discussed qualitatively against a future patient to GP FTE ratio. Similarly, it is not clear the extent to which the outpatient provision at the health hub would relieve demand, and so these impacts are discussed qualitatively.

Public Realm

7.2.23 Public realm impacts are qualitatively assessed based on descriptions of the provision provided by the Applicant.

Effects Assessment

7.2.24 Socio-economic effects are identified by the interaction between sensitivity of receptors and magnitude of impacts:

¹³ GLA. Ramidus Consulting Ltd. The London Office Policy Review. 2017.

¹⁴ Nathaniel Lichfield & Partners. Southwark Retail Study – Old Kent Road Update. 2018.

¹⁵ LBS. Southwark Pharmaceutical Needs Assessment 2018 – 2021. 2017; LBL. Lambeth Pharmaceutical Needs Assessment. 2015.

- The receptor sensitivity is the ability of a given geographical area, community, resource or receptor to deal with or respond to change. This sensitivity is derived from an analysis of baseline socio-economic conditions and, where possible, future baseline conditions. Receptor sensitivities can be low (meaning the socioeconomic indicator is performing well and/or is largely insensitive to changes in baseline conditions), medium (a moderate socio-economic issue) or high (representing a significant and persistent socioeconomic issue, where the receptor is highly sensitive to any changes). The receptor sensitivity is assessed on a case-by-case basis, using professional judgement.
- The magnitude of impact is the degree of change in the socio-economic determinant compared to the baseline conditions. Impact magnitudes can be zero (there is no change in the socio-economic indicator as a result of the development), negligible (the change in the socio-economic indicator as a result of the development is imperceptible relative to baseline conditions), low, medium, or high (the change in the socio-economic indicator as a result of the development is expected to make a large difference to baseline conditions).

7.2.25 **Table 7.7** shows how the magnitude of impact and sensitivity of receptor interact to determine the scale of the effect. Effects that are classified as minor, moderate or major are considered to be significant. Significant effects can be either beneficial, adverse; short, medium, or long term; temporary or permanent; direct (resulting without any intervening factors) or indirect; and reversible or irreversible.

Table 7.7: Effect Significance Matrix

	Zero Impact	Negligible Impact	Low Impact	Medium Impact	High Impact
Low sensitivity	No effect	Insignificant	Insignificant	Minor	Moderate
Medium sensitivity	No effect	Insignificant	Minor	Moderate	Major
High sensitivity	No effect	Minor	Moderate	Major	Major

Cumulative Effects Assessment

7.2.26 The cumulative effects assessment (CEA) considers those cumulative schemes outlined in **Table 2.1 of ES Volume 1: Chapter 2 EIA Methodology** not listed in **Table 7.2** and sums their additional contribution to employment and commercial and medical or health floorspace. Where data on the previous uses of the sites are available, net additional provision is considered. Where it is not, it is assumed that all units and floorspace delivered within the schemes are net additional. If no information for expected employment was provided in the application, employment densities¹⁶ are applied to floorspace to estimate employment. If no information on the number of local jobs was provided in the application, they are estimated by applying LBS local labour targets or standard LBS local labour rate of 16%¹⁷ (derived in the local jobs impact methodology) to the additional employment figure. This is the local jobs contribution estimate in the absence of employment and skills initiatives. Cumulative effects are

¹⁶ Homes & Communities Agency. Employment Densities Guide. Third Edition. 2015.

¹⁷ ONS. Census. 2011.

assessed at the same geographical levels as the main assessment. The future baseline and receptor sensitivities are all the same as in the main assessment.

Consultation Undertaken

7.2.27 Detailed pre-application engagement has been undertaken with LBS on the land uses proposed within the H1 Development, including specific engagement on the affordable workspace requirements. Separately to the pre-application process, LBS has identified a requirement for an NHS health hub in the area, including GP consulting space, a pharmacy and outpatients services along with other general support and staff facilities. The H1 Development has been identified as a potential location for this facility.

Assumptions and Limitations

7.2.28 The assessment of socio-economic impacts and effects is carried out against a benchmark of socio-economic baseline conditions prevailing in the area of the Site and other relevant geographies. As with any data set, the baseline data will change over time. The most recent published data sources are used in this assessment, which is usually data from either 2018, 2019 or 2020, but where this has not been available, the next best alternative (i.e., the most up to date) is used as a proxy. For some data, the 2011 Census is the most recent source which, given it is ten years old, could be considered to have limitations with regards to its representativeness of today's population.

7.2.29 There are wider impacts and effects which can result from schemes and are hard to quantify, such as displacement, leakage, and multiplier impacts. Whilst accepted methods of quantification have been used wherever possible, expert judgment has been applied where necessary. Where professional judgement has been used, justification and explanation has been provided.

7.2.30 The assessment presents baseline data over a reasonable period of time, where time series data are available, so that the impact of any short-term changes can be identified in the baseline. This may be relevant to the impact of COVID-19 on health, social and demographic baseline data. Where relevant, the impact of COVID-19 on the receptor sensitivity and conclusions is discussed in this chapter. The extent to which COVID-19 might alter or impact upon the assessment depends on whether the effects considered are short or long term in nature. Short term effects may have to consider the impact of COVID-19, but the effect in the longer term is expected to be reduced significantly.¹⁸ COVID-19 may also impact the reliability of the future baseline estimates, which rely upon developments coming forward, the construction of which might have been hindered by the pandemic, which is discussed where relevant. This represents an unavoidable limitation in the assessment.

¹⁸ Even under the most pessimistic scenario, economic activity is expected to return to pre-crisis levels by 2024, indicating that the majority of the effects of COVID-19 are expected in the short-term, and are forecast to have passed by the time the H1 Development would be operational. Bank of England (2020); Monetary Policy Report November 2020.

7.3 Relevant Baseline Conditions

Existing Baseline

Employment

7.3.1 The baseline of employment informs the effect of permanent employment opportunities (direct, indirect and induced) resulting from the completed and operational H1 Development.

Economic Activity of Residents

7.3.2 Between July 2019 and June 2020, 196,000 residents within the LBS were economically active. This equates to 84% of the total 16-64 (working age) population that resides in the borough. This rate is higher than the London (79%) and Great Britain (79%) averages (**Table 7.8**).¹⁹

7.3.3 Of the working age population in the LBS, 79% were in employment, which is higher than London (75%) and Great Britain (76%). The unemployment rate in LBS was 6% (of economically active residents) which is higher than the London (5%) and Great Britain (4%) unemployment rates.

Table 7.8: Resident Economic Activity (July 2019 – June 2020)

Variable	LBS	London	Great Britain
Total population aged 16-64	233,000	6,093,000	40,211,000
Number economically active	196,000	4,812,000	31,809,000
Proportion economically active (% of 16-64)	84%	79%	79%
Number in employment	184,000	4,585,000	30,529,000
Employment rate (% of 16-64)	79%	75%	76%
Number in unemployment	12,000	227,000	1,280,000
Unemployment rate (% of economically active)	6%	5%	4%

Note: Unemployment and employment rates have different denominators. Unemployment rate denominator is 16-64 year olds who are economically active. Employment denominator is total 16-64 population. These are standard international definitions (International Labour Organisation).

7.3.4 **Figure 7.2**²⁰ shows, over the 10 year-period to October 2020, the proportion of all residents aged 16-64 claiming Job Seekers Allowance or Universal Credit. Between January 2013 and March 2020, the proportion of Local Area residents claiming decreased from 4.9% to 3.8%. However, the outbreak of COVID-19 and subsequent economic

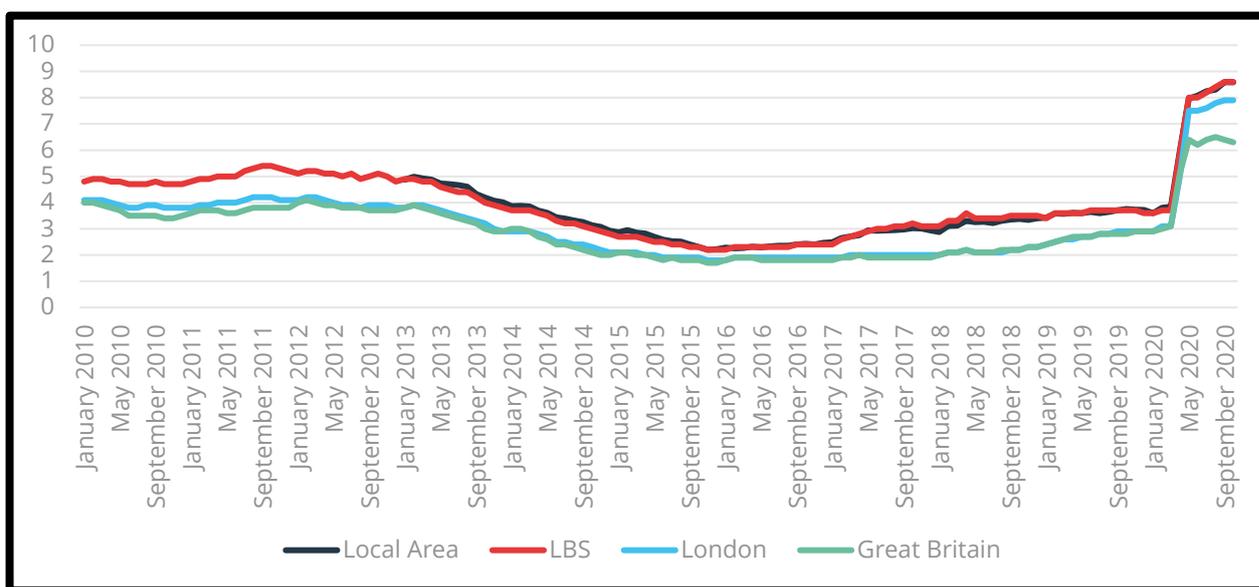
¹⁹ ONS. Annual Population Survey. 2020.

²⁰ ONS. Claimant Count by sex and age. 2020.

downturn has seen a rapid spike in claimant count rate from 3.8% in March to 8.6% in October 2020. **Figure 7.2** shows that this rise in claimant count has occurred across all study areas, although the Local Area and LBS have suffered more than the regional and national comparators, and London’s rate has also risen more severely than the national rate.

7.3.5 Before the COVID-19 crisis, claimant rates across all geographies had been on a steady decline between October 2012 and December 2016 but had risen slowly since then. The Local Area rate was slightly above regional and national rates but on par with LBS. In February 2020, the Local Area reported 3.8% of working age residents were claiming Job Seekers Allowance or Universal Credit, on par with LBS (3.7%) and higher than the regional and national levels (3.1% and 3.0% respectively).

Figure 7.2: Proportion of Resident Population (ages 16-64) on Claimant Count (%)



Site Employment

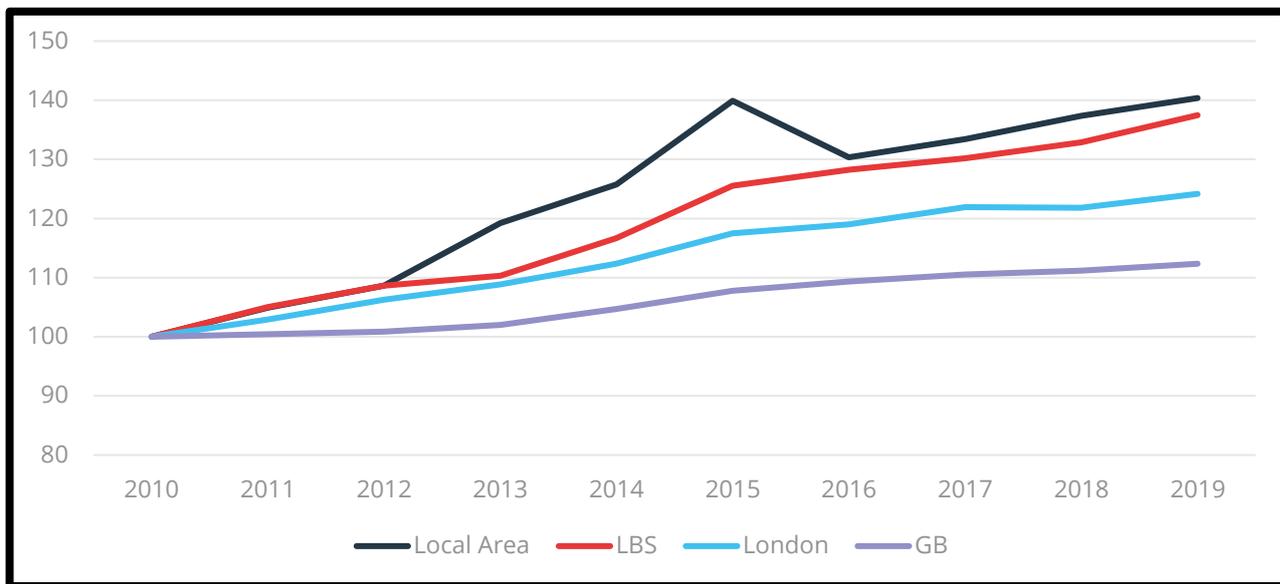
7.3.6 The Site is currently void of permanent, long term, structures but currently comprises a modular building for site welfare (associated with working on other Elephant Park construction projects), construction set down for the live construction sites and a small area of temporary public realm on the south side of the Site, used as a meadow, pathways and seating areas. As such, there is no existing employment associated with the Site.²¹

²¹ A temporary use application was approved by LBS in November 2020 for the Site (planning application reference 20/AP/2612) in the relation to the erection of two containers to accommodate urban farming (Use Class Sui generis), together with storage area, landscaping and other associated works, for a temporary period of one year. Existing employment associated with the Site remains zero.

Surrounding Area Employment Context

7.3.7 **Figure 7.3**²² provides an index of total employment between 2010 and 2019. The figure shows that, over the 10 years displayed, total employment in the Local Area has grown by 40%. This is slightly higher than the LBS average (37%) and much higher than the London (24%) and GB (12%) rates.

Figure 7.3: Total Employment Index 2010 to 2019 (2010 = 100)



Employment Deprivation

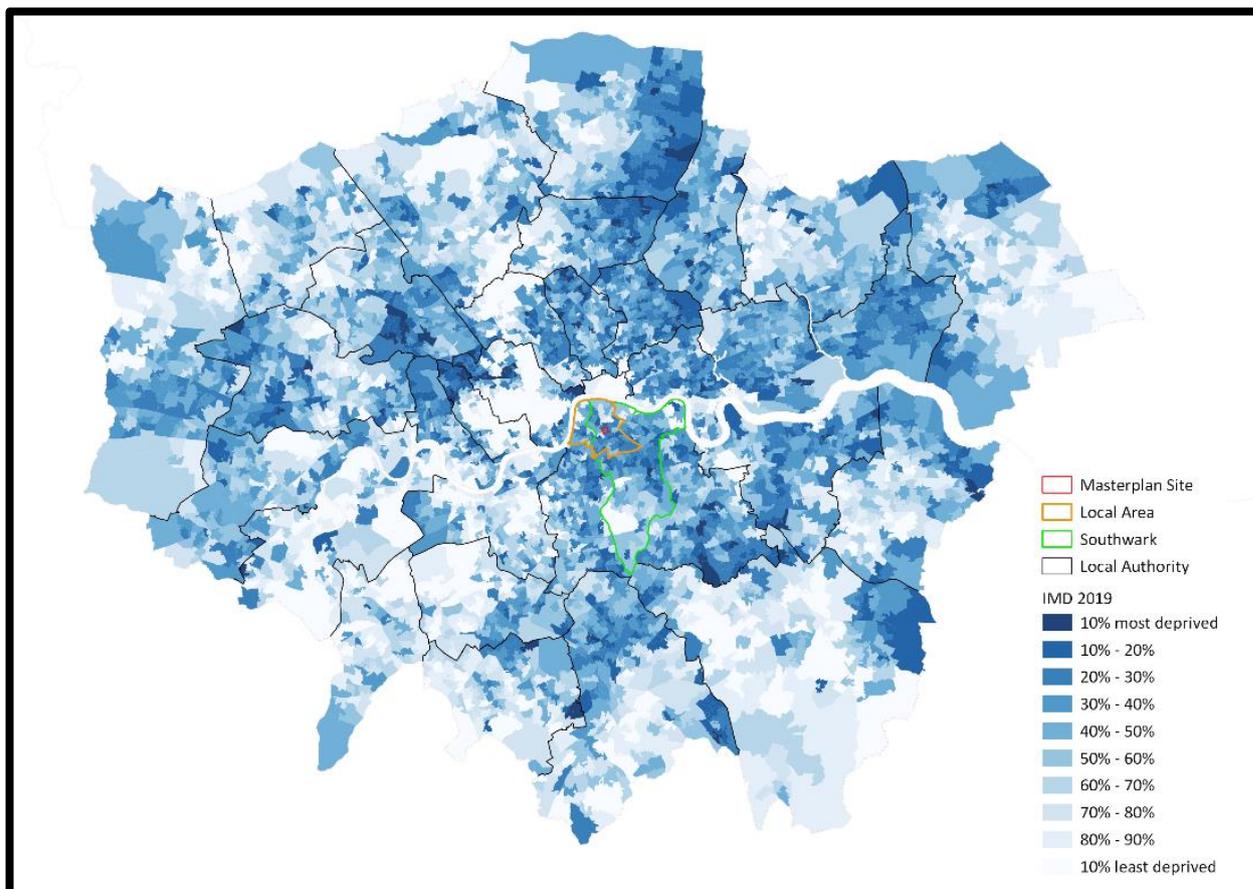
7.3.8 The Index of Multiple Deprivation (IMD) ranks areas in England based on their deprivation on seven key domains: income, employment, health deprivation disability, education skills and training, barriers to housing and services, crime and disorder, and living environment.²³ The IMD rankings occur at both a local authority and lower-layer super output area (LSOA)²⁴ level. Across London, it can be seen from **Figure 7.4** that there are pockets of deprivation on the employment domain, suggesting that, whilst London employment is strong overall, some areas may be performing lower. In LBS, the north of the borough appears more deprived on this measure than the south.

²² ONS. Business Register and Employment Survey. 2010 to 2019.

²³ MGHLG. English Indices of Multiple Deprivation. 2019.

²⁴ Lower-Layer Super Output Areas (LSOA) and are typically the smallest level of geography for which national statistics are produced in non-census years. LSOAs are produced by the ONS and are drawn such that each one ideally contains around 1,500 residents with a minimum of 1,000 residents.

Figure 7.4: Employment Deprivation in London and LBS, 2019²⁵



Local Jobs

7.3.9 **Table 7.9²⁶** outlines the residential location of the LBS’ workforce. As the table shows, 16% of LBS workers reside in LBS, 64% commute from the rest of London (80% commute from London in total) and 20% commute from outside London.

Table 7.9: Location of Residence for LBS Workers, 2011

Place of Residence	Commute into LBS
LBS	16%
Rest of London	64%
Outside of London	20%

²⁵ MGHLG. English Indices of Multiple Deprivation. 2019.

²⁶ ONS. WF01BEW. Location of usual residence and place of work (OA level). 2011.

Commercial Floorspace

7.3.10 The commercial floorspace baseline informs the potential effects of permanent office, retail, and food and drink floorspace provision resulting from the completed and operational H1 Development.

7.3.11 **Table 7.10**²⁷ shows the provision of floorspace by type across the geographical comparators. In LBS, office space accounts for 50% of total floorspace across the borough. In relative terms, this proportion of office floorspace is greater than London (38%) and England and Wales (15%). LBS also has a relatively low proportion of retail (15%) and industrial (24%) floorspace.

Table 7.10: Provision of Commercial Floorspace by Type (2019/2020)

Geographical Area	Floorspace Type				Total
	Retail	Office	Industrial	Other	
LBS	400,000 m ²	1,300,000 m ²	600,000 m ²	300,000 m ²	2,600,000 m ²
	15%	50%	24%	11%	100%
London	22%	38%	29%	10%	100%
England and Wales	18%	15%	56%	11%	100%

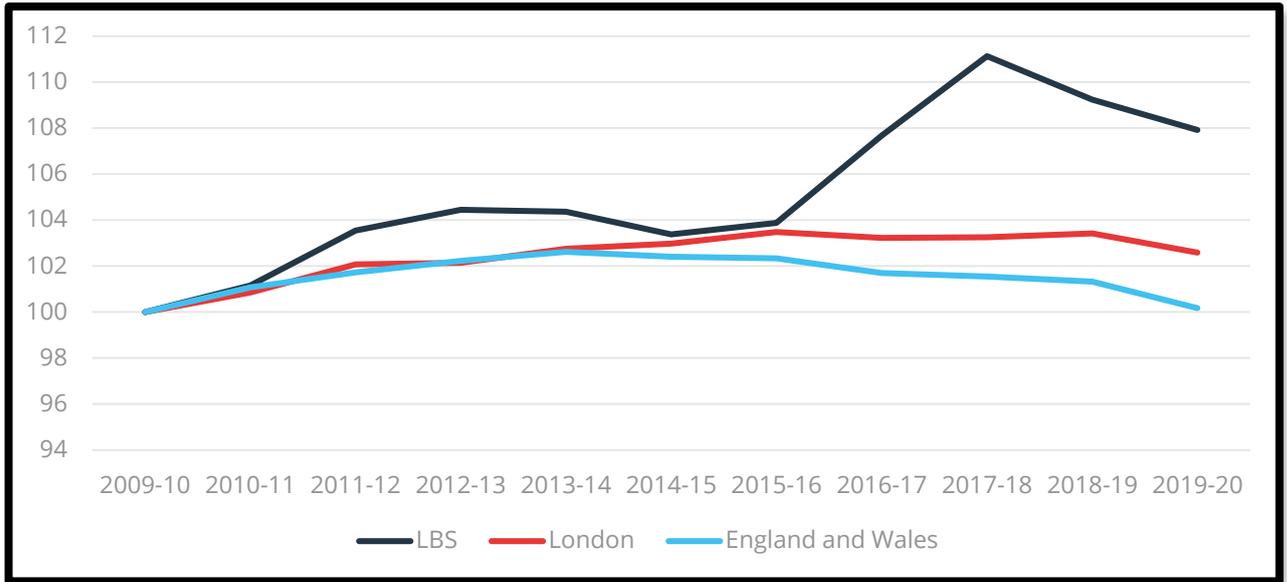
Office Floorspace

7.3.12 **Figure 7.5**²⁸ shows the amount of office floorspace over a ten-year period between 2009-10 and 2019-20. Over this period, LBS' office floorspace has increased by 8%, faster than office floorspace growth recorded in London (3%) and England and Wales (0%). However, more recently (between 2017-18 and 2019-20), LBS floorspace declined by 3% (39,000 m²); a faster rate of decrease than seen in London and England and Wales (both 1%) across the same period.

²⁷ Valuation Office Agency (VOA). NDR Business Floorspace Tables. 2019.

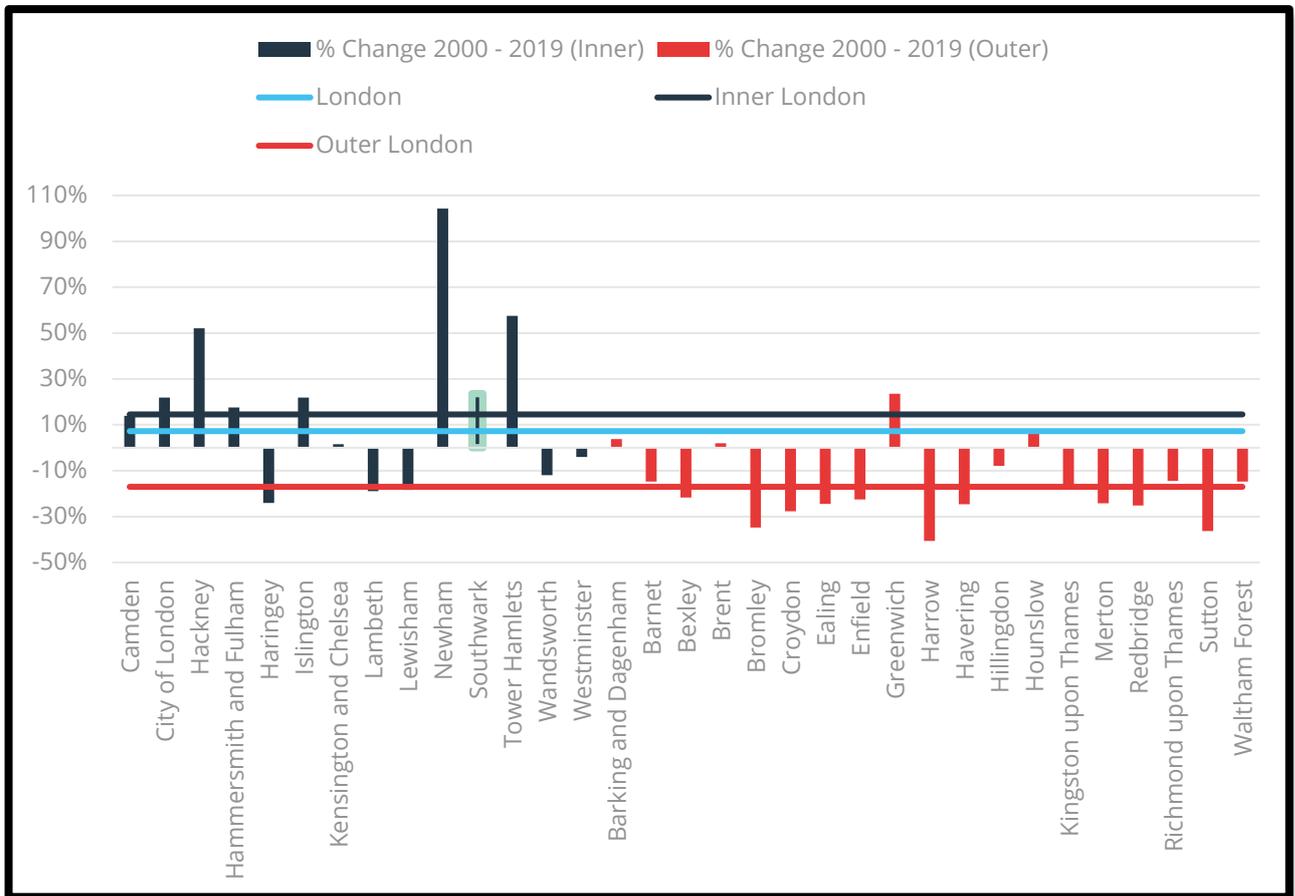
²⁸ Valuation Office Agency (VOA). NDR Business Floorspace Tables. 2019.

Figure 7.5: Index of Office Floorspace (2009 = 100)



7.3.13 **Figure 7.6**²⁹ shows that although LBS office floorspace supply increased by 24% between 2000 and 2019, this was only just in line with the average Inner London growth, and LBS was outpaced by other boroughs, most notably Newham, Tower Hamlets, and Hackney.

Figure 7.6: Percentage Change in Office Provision by London Borough (2000 to 2019)



²⁹ Valuation Office Agency (VOA). NDR Business Floorspace Tables. 2019.

Affordable Workspace

7.3.14 The New Southwark Plan³⁰ states that major developments proposing 500 m² (GIA) or more employment floorspace must:

- Deliver at least 10% of proposed gross new employment floorspace as affordable workspace on site at discounted market rents;
- Secure the affordable workspace for at least 30 years;
- Provide affordable workspace of a type and specification that meets current local demand;
- Prioritise affordable workspace for existing small and independent businesses occupying the site that are at risk of displacement. Where this is not feasible, affordable workspace must be targeted for small independent businesses from the local area with an identified need; and
- Collaborate with the council, local businesses, business associations and workspace providers to identify the businesses that will be nominated for occupying affordable workspace.

7.3.15 The LBS Affordable Workspace Support – Evidence of Needs³¹ report lists various rationales for intervention on affordable workspace delivery. A main incentive is to retain businesses, in turn preserving local job and supply chain opportunities. Provision also answers an affordability issue particularly relevant to Micro and Small Enterprises (MSEs). In LBS, the report states that:

“there are risks of seeing major industries being pushed out of regeneration areas such as the Old Kent Road, Elephant & Castle or Canada Water’. ‘Retaining existing businesses which strengthen an area, such as Latin-American businesses which are particularly concentrated in Elephant and Castle and contributed to its economic dynamism, is particularly important to preserve the sense of community and vibrancy of an area.’”

7.3.16 Another incentive is to encourage start-ups. Between 2002 and 2016, LBS has seen a slightly higher rate of growth in business births than Greater London (c. 240% compared to c. 220%). One year, three year and five year survival rates have been similar across the two geographies over the same period.³²

7.3.17 A third incentive is to offset space losses as a result of permitted development rights (PDR). LBS lost c. 25,000 m² of office space to residential through PDR between 2013 and 2017. This is not as large as the losses in some other boroughs (Tower Hamlets lost nearly 100,000 m² and the London Borough of Lambeth (LBL) lost c. 55,000 m² over the same period) but is still slightly larger than losses incurred in Hackney and nearby Greenwich (below 20,000 m²).³³

7.3.18 The Evidence of Needs report finds that the concentration of Micro and Small Enterprises (MSEs) varies across the borough, with less than 80% in Southbank, Borough, and Elephant and Castle, compared to as high as 96% in other, more southern parts of the borough. The report states that the Elephant and Castle submarket economy is mainly

³⁰ Southwark Council. New Southwark Plan. 2020.

³¹ Avison Young. LBS. Affordable Workspace Support – Evidence of Needs. 2019.

³² Avison Young. LBS. Affordable Workspace Support – Evidence of Needs. 2019.

³³ Avison Young. LBS. Affordable Workspace Support – Evidence of Needs. 2019.

driven (in terms of MSEs) by the professional, scientific, and technical activities, and the information and communication activities. Computer programming, consultancy and related activities and food and beverage service activities are also two large industries. By contrast, there is a really low concentration of MSE manufacturing businesses and a low proportion of MSE construction businesses in this sub-area. The study concludes that:

“There is also a clear need for additional office space based on the data considered particularly to capture and retain growth in high productivity activities such as computer programming and consultancy, activities auxiliary to financial services and insurance activities, legal and accounting activities, activities of head office and management consultancy. Our analysis of the office market suggests without affordable space these may be priced out of the area or have difficulties finding space in this sub-area given the low provision of space and low level of vacancy.”

7.3.19 The fact that the Site area is located in between the thriving and expensive Southbank and the more industrial, less expensive Old Kent Road, makes it an emerging area for office growth.

Retail and Food and Drink Floorspace

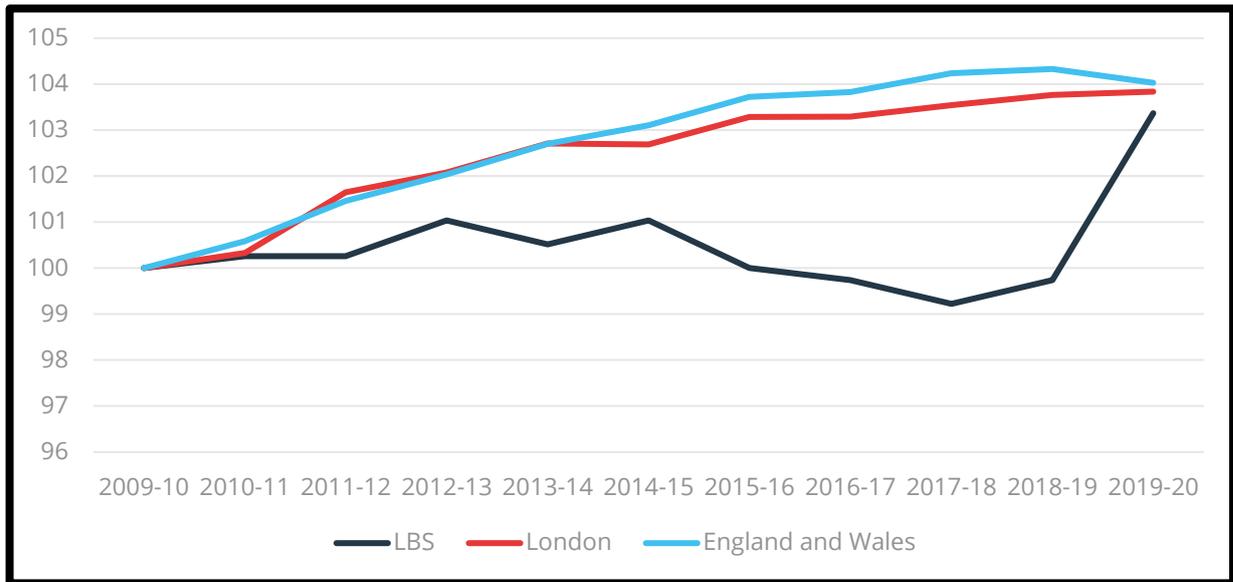
7.3.20 In 2014, LBS had 59,378 m² net of convenience goods floorspace, and 93,085 m² net of comparison goods floorspace.³⁴ It also had 61,793 m² of food and beverage floorspace.

7.3.21 **Figure 7.7**³⁵ shows an index of retail floorspace (not including food and drink which is not available) for the ten years between 2009-10 and 2019-20.³⁶ Over this period, LBS' retail floorspace has increased by 3%, slightly slower than retail floorspace growth recorded in London and England and Wales (both 4%). The retail floorspace on a regional and national level has increased at a fairly constant rate, however, LBS' retail floorspace has experienced much more volatility. Growth was almost flat between 2009-10 and 2015-16, before decreasing to 2017-18 by 1%. After this, growth jumped by 4% to 2019-20.

³⁴ Nathaniel Lichfield & Partners. Southwark Retail Study – Old Kent Road Update. 2018.

³⁵ Valuation Office Agency (VOA). NDR Business Floorspace Tables. 2019.

³⁶ Valuation Office Agency (VOA). NDR Business Floorspace Tables. 2019. This source defines retail as inclusive of more than just comparison and convenience floorspace such as banks or professional services floorspace (Class E, formerly A2).

Figure 7.7: Index of Retail Floorspace (2009 = 100)

Medical or Health Floorspace

7.3.22 As noted above at paragraph 7.2.27, LBS has identified a requirement for a new NHS health hub in the area which could potentially be accommodated within the H1 Development. The requirement includes GPs (primary care), a pharmacy, and outpatient services. The medical or health baseline informs the effect of potential medical or health floorspace that may be provided in an element of the flexible floorspace at the completed and operational H1 Development. However, affordable workspace is the intended use of this flexible floorspace and so the health hub is presented as a less likely alternative scenario.

Primary Care Provision

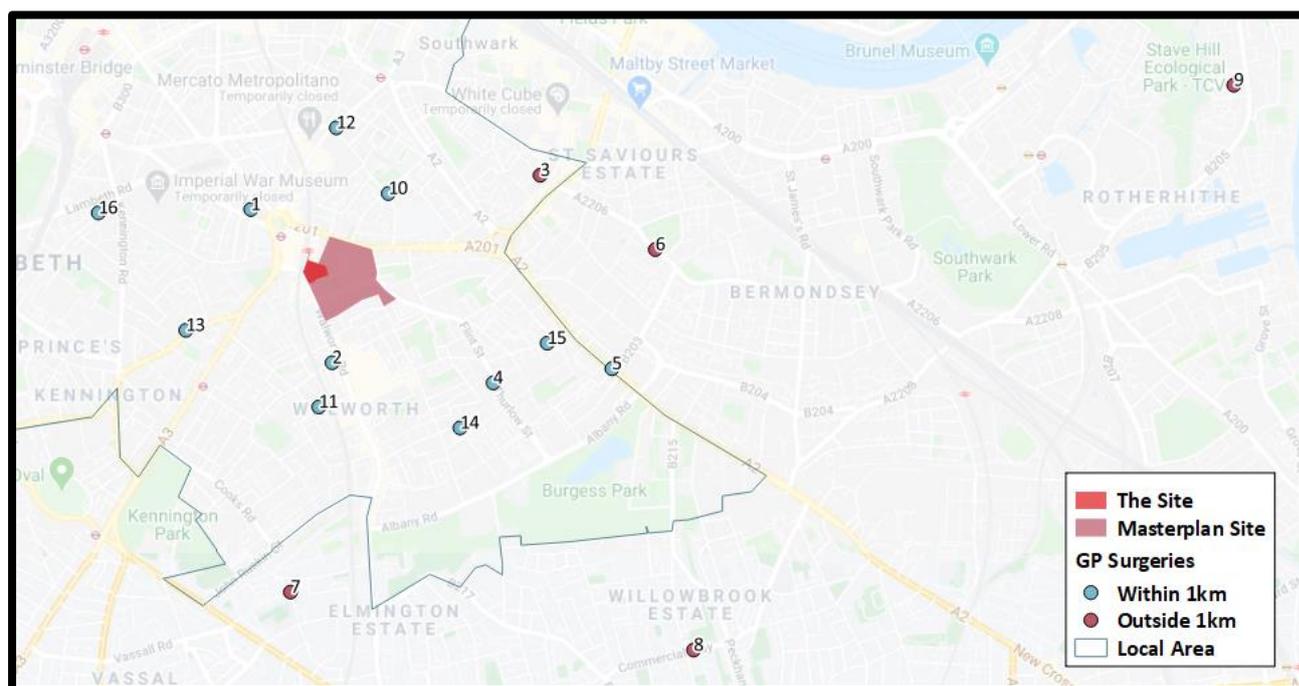
7.3.23 Typically, individuals register with GPs close to their place of residence. However, since January 2015, GPs have been allowed to accept patients who are living outside their practice boundaries, although it is for the GP practice to decide whether this is appropriate. According to the NHS, a GP can refuse to accept patients because:

- It has no capacity to take on new patients.
- It is not accepting patients that do not live within its practice boundary.
- It is not appropriate for an individual to register with a practice given the distance from where they live.

7.3.24 For this assessment, local GP provision would usually be considered within a 1km distance of the Site – a typical walking distance to a GP. In this case, the distance has been measured from the Masterplan Site, as this is where the residential elements of the Approved Development are located. Within this area, there are 11 GPs. Of these, four are part of the Nexus Health Group, which has nine surgeries in total (five lying further than 1km – coloured red in **Figure 7.8**). Given that patient and GP data is only available at the group level for the Nexus Health Group, all have had to be included in the overall assessment of local provision as detailed data at the individual GP level

is not available (**Table 7.11**³⁷ and **Figure 7.8**³⁸) despite some, notably Surrey Docks Health Centre (map reference 9) not being local to the Site. The surgeries have 151,700 patients and 69.9 GP FTEs, equating to an average patient to GP FTE ratio of 2,170. This is higher than LBS (2,128), London (1,951) and national (1,772) averages. Both the local and LBS ratios are much higher than the 1,800 benchmark recommended by the HUDU Planning Contribution Model. Only two local surgeries (map references 14 and 16) have ratios below the benchmark. Information for the Borough Medical Centre is not available and so is excluded from the overall ratio.

Figure 7.8: Local GP Surgeries



³⁷ NHS Digital. GP Practice Level Workforce Statistics. 2020.

³⁸ NHS Digital. GP Practice Level Workforce Statistics. 2020.

Table 7.11: Local GP Surgeries

Map Reference	Practice Name	Total Patients	Total FTE GP	Patients per FTE GP
1 to 9	Nexus Health Group	78,130	32.5	2,405
10	Falmouth Road	11,290	2.8	3,994
11	Penrose Surgery	12,010	4.9	2,450
12	Borough Medical Centre	*	*	*
13	Hurley and Riverside Practices	25,630	12.0	2,141
14	The Villa Street Medical Centre	7,940	8.2	970
15	Dr At Bradford's Practice	7,720	3.7	2,073
16	Lambeth Walk Group Practice	8,960	5.8	1,541
Total		151,680	69.9	2,170
District		346,800	163.0	2,218
London		10.3m	5,300	1,951
National		60.2m	34,000	1,772

Note: Red indicates patient to GP FTE ratio above the 1,800 recommended benchmark. * denotes missing data.

Pharmaceutical provision

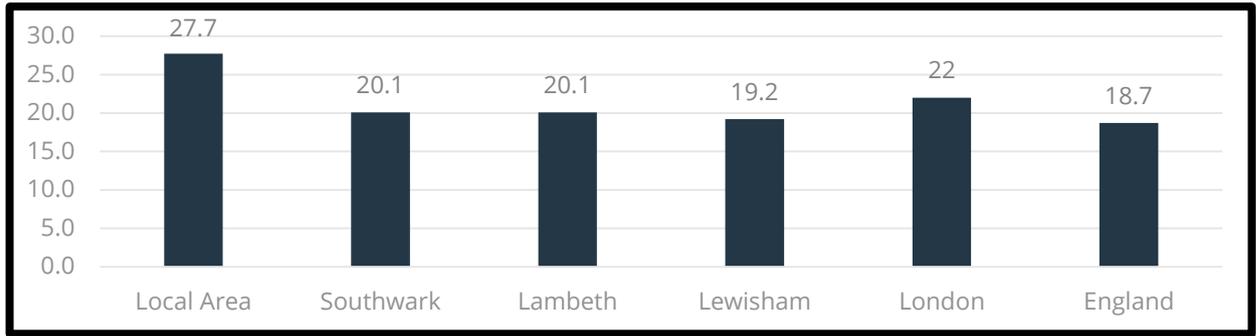
7.3.25 The LBS Pharmaceutical Needs Assessment 2018-2021³⁹ and the LBL Pharmaceutical Needs Assessment 2015⁴⁰ report pharmaceutical provision by ward. Together, these studies report that there are 27 pharmacies in the Local Area, equating to 27.7 per 100,000 population. This is far higher than LBS, London, and England averages (20, 22, and 18 per 100,000 respectively). It is also higher than the average provision in the neighbouring boroughs of Lambeth and Lewisham (**Figure 7.9**).⁴¹

³⁹ LBS. Consultation Version. Southwark Health & Wellbeing Board. Southwark Pharmaceutical Needs Assessment 2018 – 2021. This report utilises old ward boundaries.

⁴⁰ LBL. Lambeth Pharmaceutical Needs Assessment. Draft for Consultation. January 2015.

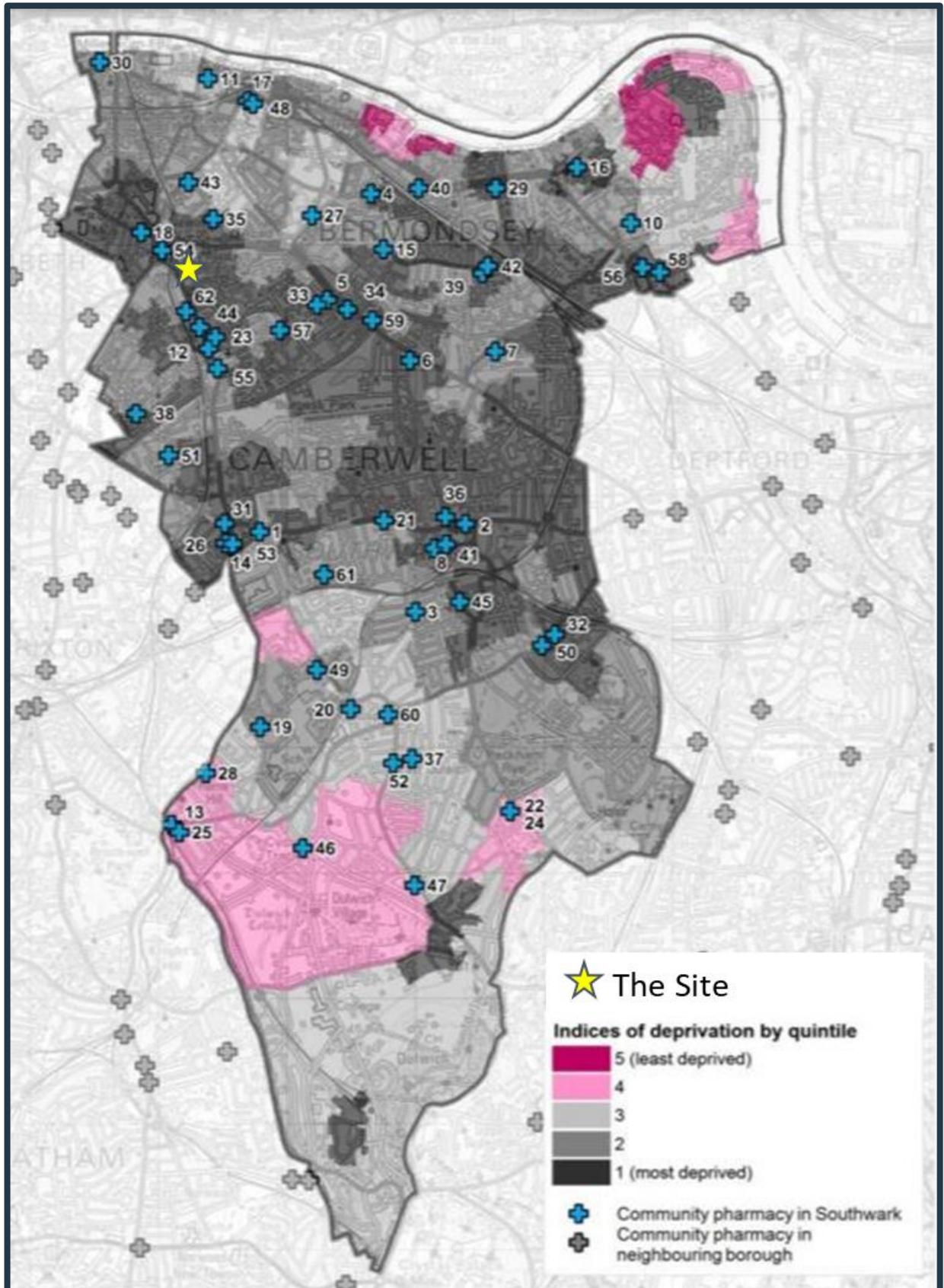
⁴¹ LBS. Consultation Version. Southwark Health & Wellbeing Board. Southwark Pharmaceutical Needs Assessment 2018 – 2021.

Figure 7.9: Number of Community Pharmacies per 100,000 Residents



7.3.26 According to the LBS Pharmaceutical Needs Assessment 2018-2021, *“There is a good correlation between deprivation and the number of pharmacies within each locality.”* It can be seen from **Figure 7.10** that there are higher provisions north of the borough, where deprivation is higher and where the Site is located. This highlights that provision should be allocated to the most deprived locations.

Figure 7.10: Map of Pharmacy Coverage in LBS Against Deprivation



Outpatient Activity

7.3.27 **Table 7.12** shows outpatient activity in 2017/18. At Guy's and St Thomas' Trust, total activity grew 6.1% between 2016/17 and 2017/18; far higher than the London Commissioning Region (3.0%) and England (0.7%). Of total activity in the local Trust, attendances were far higher than other geographical comparators (89% compared to 76% and 78%) and there were no cancellations compared to 14%-15% in the other geographies. The median wait time for a first appointment is 42 days at the local Trust, far longer than London and England (29 and 28 days respectively).

Table 7.12: Outpatient Activity 2017/18⁴²

		Guy's and St Thomas' NHS Foundation Trust	London Commissioning Region	England
Total activity		1.6m	23.4m	119.4m
(growth since 2016/17)		(6.1%)	(3.0%)	(0.7%)
<i>Of which:</i>				
	<i>Attendances</i>	89%	76%	78%
	<i>Did not attend</i>	11%	9%	7%
	<i>Patient cancellations</i>	0%	7%	7%
	<i>Hospital cancellations</i>	0%	8%	7%
First appointment by time waited (days)	Mean	54	57	49
	Median	42	29	28

Public Realm and Amenity

7.3.28 This report uses the IMD living environment domain⁴³ to inform the baseline for public realm provision at the Site. Of the 317 local authority districts in England, LBS is ranked 12th most deprived on the IMD living environment domain, putting it in the top 5% most deprived boroughs in the country. In London, the LBS ranks 6th (out of 33 local authority districts), making it one of the most deprived boroughs in the capital. Deprivation levels since 2015 have decreased slightly; in 2015 the LBS was ranked 11th most deprived local authority nationally.

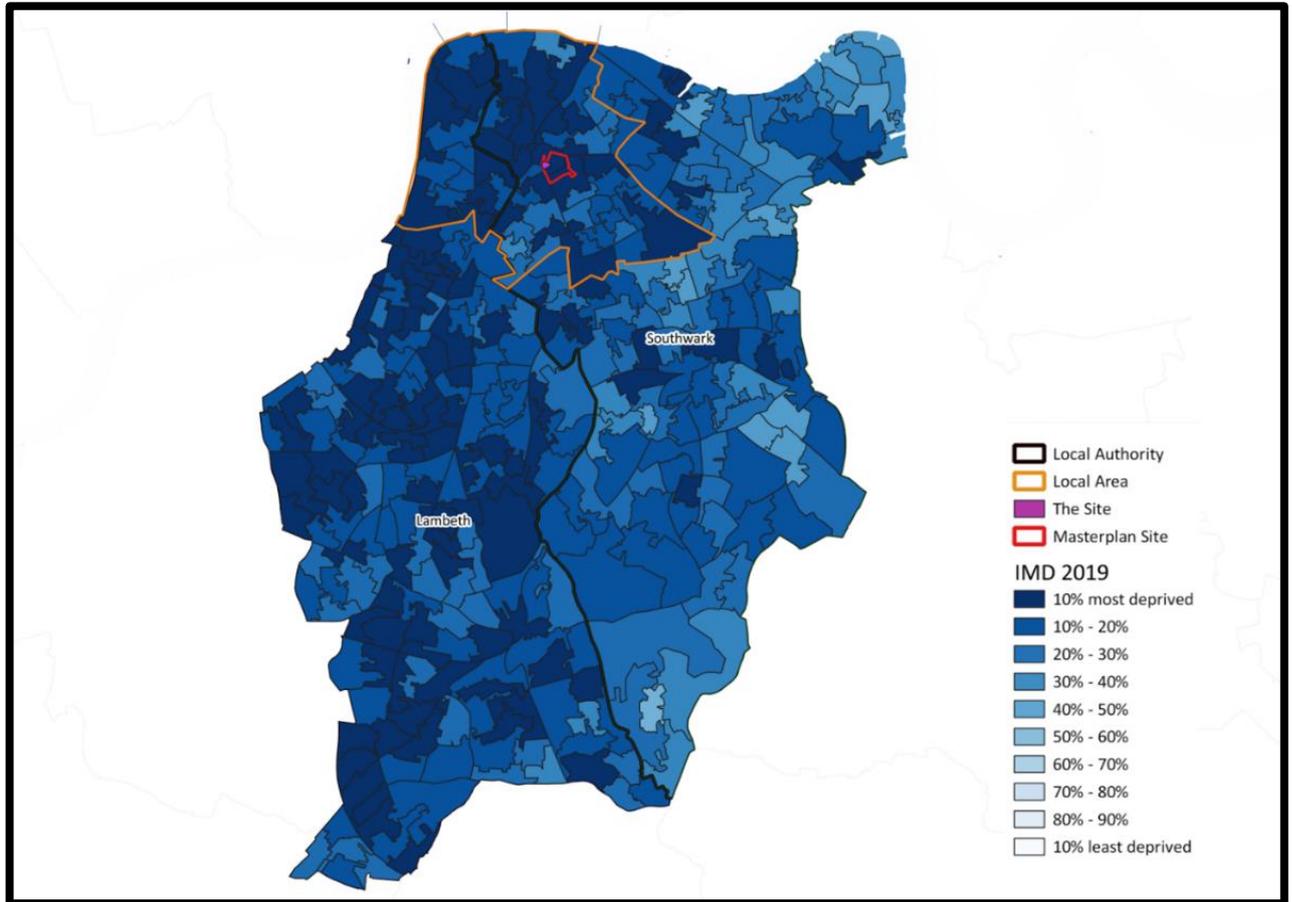
7.3.29 The north west of LBS (where the Site is located) is relatively more deprived than the rest of the borough on this metric. The neighbouring LBL is ranked 42nd most deprived on the living environment domain. The north east part of LBL (nearest to the Site) is relatively more deprived than the rest of LBL.

⁴² NHS Digital. Hospital Outpatient Activity, 2017-18; 2016-17, Provider level analysis. 2020.

⁴³ MGHLG. English Indices of Multiple Deprivation. 2019.

7.3.30 There are 57 LSOAs in the Local Area. Of these, 45 are in the top 20% most deprived and 24 (of the 45) are in the top 10% most deprived in England on the living environment domain. The LSOA in which the Site lies is ranked in the top 10% most deprived in England (**Figure 7.11**).⁴⁴ The Local Area is therefore among the most deprived areas in the UK in terms of living environment.

Figure 7.11: Living Environment Deprivation by LSOA (2019)



Future Baseline

Employment

7.3.31 The GLA has produced long term labour market projections for each local authority. The dataset only provides datapoints for five-year intervals, hence a linear increase has been applied between datapoints to provide estimates for the other years. The latest GLA employment estimates project that, between 2018 and 2026, employment in the LBS will increase by 38,800 as set out in **Table 7.13**⁴⁵. This is growth of 13%, above the London average (8%). There is high variation in future employment growth projected for each London borough, with Newham projecting 34,000 additional jobs (27% growth) compared to Wandsworth which is only projecting 1,000 additional jobs (0.7% growth) between 2018 and 2026. Projected LBS growth is the fourth highest of all London boroughs.

⁴⁴ MGH LG. English Indices of Multiple Deprivation. 2019.

⁴⁵ GLA. 2017 employment projections by borough. 2017

Table 7.13: GLA Employment Projections

Area	2018	2026	Growth	Growth (%)
LBS	296,200	335,000	38,800	13%
London	5,832,800	6,325,000	492,200	8%

Commercial Floorspace

7.3.32 The London Policy Review⁴⁶ states the LBS' forecast floorspace demand between 2016 and 2041 is 506,800 m² (GIA) – the third largest requirement of all London boroughs. LOPR report the stock pipeline over the same time period is 338,300 m² (GIA), meaning that the LBS expects to provide 67% of their demand requirement (compared to 167% at the London level) through existing permissions. This leaves excess demand in LBS of 168,500 m² (GIA). The LOPR reports only eight London boroughs where demand exceeds pipeline supply. Of these, only Islington has a larger excess demand than LBS. All other boroughs have supply pipelines larger than forecast demand. **Table 7.14**⁴⁷ displays these numbers along with annualised figures. This highlights the need for further office development in LBS.

Table 7.14: Office Floorspace Projections m² (GIA)

Area	2016-2041			Annualised		
	Requirement	Supply (as % of Requirement)	Excess Demand	Requirement	Supply (as % of Requirement)	Excess Demand
LBS	506,800	338,300 (67%)	168,500	20,300	13,500 (67%)	6,700
London	4.7m	7.9m (167%)	-3.1m	242,600	188,600 (167%)	-125,800

7.3.33 Due to the increase in employment in the borough, office space is in high demand. The Southwark Employment Land Study explains that:⁴⁸

“Southwark needs to create new and additional employment space in order to satisfy demand. Southwark is forecast to have high levels of employment growth in the types of professional and technical services sectors that generate demand for office space. The London Office Policy Review⁴⁹ had a guideline figure of 400,000 m² over the period 2011-36. On the basis of revised forecasts following London's recent strong economic performance we suggest this figure can be revised up to 600,000 m² for that period. With adjustments for an 8% vacancy factor for efficient market operation, we would estimate the guideline planning target for the period 2014-36 to be 460,000 m². The spatial growth pattern of London

⁴⁶ GLA. Ramidus Consulting Ltd. The London Office Policy Review. 2017.

⁴⁷ GLA. Ramidus Consulting Ltd. The London Office Policy Review. 2017.

⁴⁸ CAG consultants. Southwark Employment Land Study. Part 1 – Final Report. 2016.

⁴⁹ GLA. Ramidus Consulting Ltd. The London Office Policy Review. 2011.

suggests the north part of the borough is likely to be an attractive location for office occupiers. Most of the likely drivers of demand for office space appear to be positive or have already been factored into the projections, such as higher occupational density.”

7.3.34 The LBS retail study – Old Kent Road Update⁵⁰ projects available retail and leisure expenditure and compares this to future commitments (the retail and food and drink pipeline) in order to find residual expenditure. This residual expenditure is the available spend ‘capacity’ or excess demand in the area which could support future retail and leisure provision. The study found that, by 2026, LBS will have spare expenditure enough to support -1,790 m² convenience retail, 24,247 m² comparison retail (22,457 m² total), and 10,721 m² food and drink , over and above future commitments (**Table 7.15**).⁵¹

Table 7.15: Retail Floorspace Capacity Projections in 2026 - m² (GIA) - Over and Above Future Commitments

Retail Type	Floorspace Capacity in 2026
Retail	22,247
<i>Of which convenience retail</i>	<i>-1,790</i>
<i>Of which comparison retail</i>	<i>24,247</i>
Food and beverage	10,721

7.3.35 The most recent available commercial floorspace projections were formed pre-COVID-19. The COVID-19 pandemic may have implications for the demand for future commercial floorspace. However, the likely longer-term impact on demand for commercial floorspace is highly uncertain and will depend on how working from home might evolve and how long it takes to exit the pandemic. The north of LBS, including Elephant and Castle, benefits from a highly central location, and is more likely to remain an attractive place for future commercial tenants.

Medical or Health Provision

7.3.36 The Local Area population is expected to grow by 11,550 residents between 2018 and 2026.⁵² The 11,550 additional residents in the Local Area are expected to require 6.42 additional GP FTEs at the current benchmark ratio of 1,800 patients per GP FTE. If all these residents signed up to local surgeries, the ratio at these surgeries would increase from 2,170 to 2,335 which would increase it further above the benchmark 1,800.

7.3.37 Similarly, for pharmaceutical provision, the population growth in the Local Area would decrease provision per 100,000 from 28 to 25 (in the absence of any increase in provision), which is still above the London average (22 per 100,000) and England average (18 per 100,000) but results in less provision in a highly deprived area.

⁵⁰ Nathaniel Lichfield and Partners. Southwark Retail Study – Old Kent Road Update. 2018.

⁵¹ Nathaniel Lichfield and Partners. Southwark Retail Study – Old Kent Road Update. 2018.

⁵² ONS. Population Projections: GLA (2016) Ward based housing led population projections. 2018.

- 7.3.38 There is no standard ratio for outpatient provision, however it is evident that the population growth in the Local Area would place additional demand on local outpatient services.
- 7.3.39 The ratios have conservatively assumed no growth in provision to 2026. The LBS Infrastructure Delivery Plan⁵³ notes that the NHS Southwark CCG has proposed the creation of three community health hubs which would provide a wide range of services closer to people's homes and often by the local care networks. The three proposed hubs are located at the Elephant and Castle, the SE end of the Old Kent Road opportunity area, and at Dulwich Hospital. It also proposes a number of 'support hubs' – i.e., smaller units providing services which support care provided by general practices. The delivery of these hubs is not certain and their potential impact upon GP and pharmacy provision is not clear, and so they have been excluded from the future baseline.

Public Realm

- 7.3.40 The Approved Development will provide open and amenity space across the Masterplan Site. The Masterplan Site includes a new park and several areas of communal and publicly accessible space, all of which will enhance public realm. Whilst the first phase of The Park opened in 2017 (and so will form part of the existing baseline), the future phases of The Park will contribute to the future baseline. The Approved Development also includes a number of community facilities across the Masterplan Site, including retail/restaurant/café space, community space and leisure space. All these community facilities will contribute to active frontages, increasing the vitality of the Masterplan Site and enhancing the sense of place.

The Approved Development

- 7.3.41 As outlined in **ES Volume 1: Chapter 1 Introduction**, it is reasonably assumed that the rest of the Approved Development will be complete and operational by the opening year of the H1 Development. These other phases should form part of the future baseline for this assessment as they will increase the level of employment, floorspace and population in the study areas. The future baseline projections have been reviewed and they are consistent with a likely future scenario which includes the impact of the rest of the Approved Development.

7.4 Likely Effects of the H1 Development and their Significance

The Completed and Operational H1 Development

- 7.4.1 **Table 7.16** summarises the receptors being considered in this assessment (residents and businesses) and their sensitivities for each effect, and the justification for their allocation.

⁵³ LBS. Infrastructure Delivery Plan. 2017.

Table 7.16: Receptor Sensitivities for Potential Effects Resulting from the Complete and Operational H1 Development

Potential Effect	Study Area	Receptor	Sensitivity	Justification
Creation of new permanent employment opportunities (direct, indirect and induced)	London	Businesses; Residents	Medium	There are relatively low levels of unemployment in London and the capital has seen strong employment growth in recent years. There is also expected to be growth going forward. However, there are pockets of high unemployment and deprivation across the capital and a need to produce new jobs to support the forecast growth in London.
	LBS	Businesses; Residents	Medium	LBS residents have a higher economically active and employment rate than London and GB, but a slightly higher unemployment rate. The claimant rate is higher in LBS than London. However, employment is forecast to grow at a much faster rate to 2026 in LBS than London.
The provision of office floorspace	LBS	Businesses	High	Offices make up 50% of business floorspace in LBS, far higher than other comparators. The stock has increased since 2009-10 at a greater rate but has declined in recent years. It is due to grow at a slightly faster rate than London to 2026. It is one of only eight boroughs across London with more office demand than identified supply in the pipeline, and in fact is the borough with the 2 nd highest excess demand.
Affordable workspace	LBS	Businesses	High	LBS requires at least 10% proposed gross new floorspace as affordable workspace. Much workspace (typically low cost ⁵⁴) has been lost through the permitted development right conversion to housing, which risks making LBS less attractive than other areas for businesses to locate in.

⁵⁴ Avison Young. LBS. Affordable Workspace Support – Evidence of Needs. 2019.

Potential Effect	Study Area	Receptor	Sensitivity	Justification
The provision of other land uses that may arise out of seeking planning permission for flexible land uses, which may include medical or health provision	LBS (retail and food and drink provision)	Businesses	Medium	Retail makes up 15% of business floorspace in LBS, lower than other comparators. Whilst the delivery of retail floorspace has historically been below comparators, it has recently grown at a much faster rate. There is forecast to be capacity for retail and food and drink in 2026.
	Local Area (medical or health provision)	Residents	High	The existing and future patient to GP FTE ratio at local GPs is highly constrained, far above the benchmark 1,800. The Local Area has high existing and future pharmacy provision per population, but this reflects a higher need given the high deprivation in the north of the borough. The local NHS Trust has fast growing outpatient attendances and long wait times relative to London and England.
The creation of new and enhanced public realm and amenity space	Local Area	Residents	High	The Site is in an area ranked in the top 10% most deprived in the UK and 42% of the small areas within the Local Area are within the top 10% most deprived on the Living environment IMD domain.

Creation of New Permanent Employment Opportunities (Direct, Indirect and Induced)

7.4.2 Once completed and operational, the H1 Development proposes to provide 58,032 m² (GIA) of floorspace which has the potential to facilitate several employment-uses including office, retail, professional services, food and drink and medical or health services. As outlined in the methodology, this assessment presents a minimum and maximum scenario for employment. In this minimum, the H1 Development is expected to generate 3,500 gross direct FTEs (**Table 7.17**). This is equivalent to 3,900 gross direct jobs once part time employment is accounted for. In the maximum case, the H1 Development is expected to generate 3,900 FTEs (4,300 gross direct jobs). Since there is no existing employment on site, all these jobs are additional.

7.4.3 The previous analysis has dealt with the gross employment created by the H1 Development. In order to present the net impact of the H1 Development, leakage, displacement and multiplier impacts must be accounted for (as described in the methodology paragraph 7.2.15 - 7.2.16). **Table 7.17** summarises the total additional FTEs and jobs created by the H1 Development accounting for leakage, displacement and multiplier effects outlined in the methodology. It shows that, in the minimum scenario, the H1 Development would support 4,000 net additional FTEs (4,300 net additional jobs). Of these, 3,200 FTEs (3,500 jobs) are expected to be taken by London residents. In the maximum case, the H1 Development is expected to generate 4,400 net additional FTEs (4,800 net additional jobs). Of these, 3,500 FTEs (3,800 jobs) are expected to be taken by London residents.

Table 7.17: Operational Phase – Minimum and Maximum Net Employment

	Minimum		Maximum	
	FTEs	Jobs	FTEs	Jobs
Gross additional	3,500	3,900	3,900	4,300
<i>Of which taken by LBS residents*</i>	<i>370</i>	<i>400</i>	<i>390</i>	<i>430</i>
Net direct (after 25% displacement)	2,700	2,900	2,900	3,200
Net indirect (after 1.5 multiplier)	1,300	1,400	1,500	1,600
Net additional (sum of direct and indirect)	4,000	4,300	4,400	4,800
<i>Of which taken by London residents (after 20% leakage outside London)</i>	<i>3,200</i>	<i>3,500</i>	<i>3,500</i>	<i>3,800</i>

* Note: this is based on a mix of policy compliant local employment rate and commuting patterns depending on the sector as outlined in the methodology section. However, a large proportion of the affordable office floorspace would be expected to support LBS residents/businesses, which could increase the presented figure. There is no evidence that this would be a guaranteed outcome however, and so has not been included in this table, which presents a minimum (conservative) assessment.

7.4.4 In the context of future London employment (6.3 million in 2026), the 4,300 - 4,800 additional jobs equate to an increase of 0.07% - 0.08%. In the context of 4.6 million employed London residents, the 3,500 - 3,800 additional jobs taken by London residents is an increase of 0.08%. On this basis, the H1 Development is expected to have a negligible magnitude of impact (medium sensitivity receptor) in both scenarios. The likely effect of the H1 Development's new employment upon existing London residents and future businesses is considered to be **insignificant**.

7.4.5 Based on the local labour requirements for office and retail jobs (10% and 20% respectively) and assuming that the 16% existing local commuting rate applies to the medical or health jobs, the H1 Development is anticipated to generate 400 - 430 direct jobs for LBS residents. In the context of future LBS employment (335,000 in 2026), the jobs equate to an increase of 0.12% - 0.13%. In the context of 11,900 unemployed LBS residents, the local jobs would correspond to 3.4% - 3.6%. In the context of 184,400 employed LBS residents, this would correspond to a 0.22% - 0.23% increase. On this basis, the H1 Development is expected to have a low magnitude of impact (medium sensitivity receptor) in both scenarios. The likely effect of the H1 Development on new local (direct) jobs upon existing residents and future businesses is considered to be **direct, long-term**, at the **district level** of **minor beneficial significance**.

The Provision of Office Floorspace

7.4.6 **Table 7.19** presents the minimum and maximum possible office floorspace provision against the future requirements for office floorspace outlined in the LOPR.⁵⁵ In all cases, the provision represents a large contribution for one development.

Table 7.18: Office Floorspace Provision in Minimum and Maximum Possible Scenarios

	Minimum	Maximum Possible Provision
Office floorspace provided m ² (GIA)	49,351	58,032
% of total requirement 2016-2041	10%	11%
% of excess demand 2016-2041	29%	34%
Contribution to annual requirement	2 years, 5 months	2 years, 10 months
Contribution to annual excess demand	7 years, 4 months	8 years, 7 months

7.4.7 On these bases, the magnitude of impact in both the minimum and maximum possible is of high magnitude (high sensitivity receptor). In both scenarios, the likely effect of the H1 Development's office floorspace upon businesses is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance**.

The Provision of Affordable Workspace

7.4.8 The Applicant proposes to deliver a variety of workspace types within H1 to create a model that supports businesses with various purposes at different stages of their development.

7.4.9 10% of office floorspace is proposed to be affordable, up to a maximum of 4,702 m² NIA in the maximum scenario. This impact is deemed to be of medium magnitude (high sensitivity receptor). The likely effect of the H1 Development's affordable workspace upon businesses in this maximum scenario is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance**.

7.4.10 A requirement to deliver a new NHS health hub in the area has been identified by the LBS. The health hub would contain GP consulting space, a pharmacy, and outpatients services along with other general support and staff facilities.

7.4.11 The H1 Development provides an opportunity to accommodate this health facility, and so planning permission has been sought for this use as an alternative to office use within the lower floors of the H1 Development. If LBS identifies the H1 Development as the preferred location for this facility, it would need to be accommodated within the floorspace identified for affordable workspace.

⁵⁵ GLA. Ramidus Consulting Ltd. The London Office Policy Review. 2017.

7.4.12 In the minimum scenario if the health hub is delivered alongside zero affordable workspace then the impact of the H1 Development on affordable workspace would be zero impact (high sensitivity receptor). The H1 Development would therefore have **no effect** upon businesses in relation to affordable workspace in this minimum scenario. On the basis that the health hub is an alternative land use and not the intended land use, this scenario should be considered to be less likely than the maximum scenario.

The Provision of Other Land Uses That May Arise Out of Seeking Planning Permission for Flexible Land Uses

Retail

7.4.13 The future baseline found that, in 2026, LBS is expected to have excess demand for convenience floorspace of - 1,790 m² (GIA) and for comparison floorspace of 24,247 m² (GIA). This gives a total excess demand for retail floorspace of 22,457 m² (GIA) in LBS in 2026.

7.4.14 In the minimum case, there would be no additional retail floorspace from the H1 Development, which is a zero magnitude of impact (medium sensitivity receptor). The H1 Development would therefore have **no effect** upon businesses in relation to retail floorspace.

7.4.15 Assessing the maximum provision, where the flexible floorspace is assigned to retail, there would be an additional 1,954 m² (GIA) retail floorspace. This equates to a 0.6% increase on existing LBS retail floorspace and makes up 9% of the borough's assessed total retail capacity projection for 2026. The additional retail floorspace delivered by the H1 Development is likely to have an impact of medium magnitude (medium sensitivity receptor). The likely effect of the H1 Development's retail floorspace maximum provision upon businesses is considered to be **direct, long-term**, at the **district level**, and of **moderate beneficial significance**.

Food and Drink

7.4.16 The future baseline found that there is expected to be excess demand for food and drink floorspace of 10,721 m² (GIA) in LBS in 2026.

7.4.17 In the minimum case there would be no food and drink floorspace delivered at the H1 Development, which is a zero magnitude of impact (medium sensitivity receptor). The H1 Development would therefore have **no effect** upon businesses in relation to food and drink floorspace.

7.4.18 Assessing the maximum possible provision, where the flexible floorspace is assigned to food and drink then there is an additional of 1,689 m² (GIA) floorspace. This equates to a 2.7% increase on existing LBS food and drink floorspace and makes up 16% of the borough's predicted food and drink excess demand for 2026. This additional food and drink floorspace delivered by the H1 Development is likely to have an impact of medium magnitude (medium sensitivity receptor). The likely effect of the H1 Development's food and drink floorspace provision upon residents is considered to be **direct, long-term, local** and at the **district level**, and of **moderate beneficial significance**.

Medical or Health

- 7.4.19 The future baseline found that local GP practices are expected to have a minimum case⁵⁶ patient list size of 163,233 in 2026. Conservatively assuming no GP FTE growth from the existing 69.9, this results in a future patient to GP FTE ratio of 2,335 – far above the 1,800 benchmark. The future baseline also found that the 11,550 additional residents in the Local Area would decrease pharmaceutical provision per 100,000 from 28 to 25, which is still above the London average (22 per 100,000) and England average (18 per 100,000) but results in less provision in a highly deprived area. This conservatively assumes no future pharmaceutical provision. The future demand on outpatients services is assumed to also become more sensitive as a result of the population growth.
- 7.4.20 In the minimum scenario, no health hub would be delivered at the H1 Development, which is a zero impact on health floorspace (high sensitivity receptor). The H1 Development would therefore have **no effect** upon residents in relation to medical or health floorspace.
- 7.4.21 In the maximum provision scenario, a health hub would be delivered. The health hub would contain GP consulting space, a pharmacy and outpatient services, along with other general support staff facilities. The additional pharmacy would increase the provision per 100,000 population from 25 to 26 in 2026. The Health Hub would also serve the needs of the future population in terms of relieving excessive demand for GPs and outpatient services. Given the significant scale of the potential health hub and the fact that, if provided, it could deliver a wide range of much needed health facilities, this would constitute a high magnitude of impact (high sensitivity receptor). The likely effect of the H1 Development's medical or health floorspace provision upon residents is considered to be **direct, long-term, local**, and of **major beneficial significance**. However, given the priority provision of affordable workspace over the medical or health use, this scenario is less likely than the minimum case scenario.

The Creation of New and Enhanced Public Realm and Amenity Space

- 7.4.22 Enhancements to the public realm have been linked to socio-economic benefits. A high-quality public realm can increase pedestrian footfall and foster civic pride in an area, reducing petty crime and vandalism. Research has linked public realm and pedestrian walkability improvements to increased retail footfall and property values.⁵⁷
- 7.4.23 The Approved Development would transform the area through new public open spaces. The H1 Development ties into, completes, and enhances this wider offer. The public realm of the H1 Development has been designed to ensure clarity and safety of movements for all users, distinguishing clearly between the needs of pedestrians, vehicles and cyclists. The pavements, surfaces, and edges design would help unify the scheme, providing a strong and coherent setting for the public realm. The accessibility requirements of partially sighted and disabled people will be a major factor in the determination of surface and edge types to provide a legible and safe environment in conjunction with current accessibility. Rest points will be provided throughout to encourage pause points and support the H1 Development's aspiration to create memorable, enjoyable, and comfortable sense of place. The stepped approach to the massing facilitates the provision of external private amenity space serving the office accommodation in the form of roof terraces. Where the vertical facade fins meet the ground, planting beds

⁵⁶ In which all new residents of the Local Area between 2019 and 2026 choose to register at local surgeries.

⁵⁷ CABE. Paved with gold: the real value of good street design. 2007.

incorporating climbers have been designed to extend the green of the public realm vertically to the green of the landscaped terraces above and link to The Park.

- 7.4.24 Increasing walkability will, in turn, improve the health of the residents and workforce of LBS. The Mayor's Design Advisory Group⁵⁸ (MDAG) emphasise the importance of public realm improvements given the transfer of public health responsibilities to local authorities in 2013, alongside high levels of obesity and air pollution. Public space improvements can drive the shift towards active travel.
- 7.4.25 When Londoners were asked to rank their quality of experience on streets, experience was poorest in those with a high 'movement' function and a low 'place' function.⁵⁹ The H1 Development would help upgrade streets from a movement based, congested, landscape to a more open, accessible, place-based streetscape.
- 7.4.26 The MDAG note how inner London areas like Elephant and Castle will continue to see further intensification, building at higher densities. In areas such as these, *"there should be an even greater focus on the quality of public space at the ground level in order to deliver sustainable and living urban neighbourhoods."* Their recommendations, which are a key consideration for the development of the London Plan, are to:
- Invest in public realm of new central and inner London neighbourhoods where the tension between place and movement is at its most acute and development as its most intense.
 - Invest in the public realm around new transport infrastructure where there are major benefits to be gained by designing interchange integrated with the grain of local areas and where the highest densities of development are likely.
- 7.4.27 The H1 Development provides public realm improvements in a central London location with a high level of public transport accessibility, aligning with the MDAG recommendations.
- 7.4.28 As well as reinforcing a sense of place, there is increasingly strong evidence that improved public realm can have significant external benefits of the development to the wider community. Tourism and worker productivity are also influenced by the public realm offer, attracting visitors and investment. The public realm proposals would transform the Site, whilst the new retail provision will activate those routes, contributing towards the vibrancy of Elephant and Castle, a factor which is increasingly recognised as important for development.
- 7.4.29 The Approved Development as a whole is transforming the area with new public open spaces. The H1 Development ties into, completes and enhances this. For this reason, the impact of the H1 Development on its own is expected to be of low magnitude (high sensitivity receptor). The likely effect of the H1 Development's public realm improvements is considered to be **direct, long-term, local** and of **moderate beneficial significance**.

⁵⁸ Mayor's Design Advisory Group. Public London. 2016.

⁵⁹ Mayor's Design Advisory Group. Public London. 2016.

7.5 Additional Mitigation / Enhancement and Likely Residual Effects of the H1 Development and their Significance

The Completed and Operational H1 Development

7.5.1 The likely effects of the completed and operational H1 Development are considered to be insignificant or beneficial and therefore no mitigation is required.

7.5.2 The likely effects assessment found a minor beneficial effect of local jobs for LBS residents. The Applicant anticipates committing to targeting provision of 10% office and 20% retail jobs being taken by local residents. Additional enhancement measures include the employment initiatives and commitments by the Applicant. The mechanism for calculating employment and skills targets at the H1 Development are expected to be largely the same as for the Approved Development. The Approved Development S106 Employment and Training Scheme states that:

"[The Applicant] supports the Council in its objective to promote the supply of suitable local candidates to jobs in the completed development and the opportunity to promote a skilled, loyal, and committed local workforce."

"[The Applicant] will work with the Council to provide intelligence on the employment and skills needs of its commercial tenants, through the earliest possible introduction of these tenants to the Council and its partners and brokerage of discussions on associated recruitment timetables and skills needs."

"[The Applicant] will also be able to identify opportunities in asset and facilities management which could be prioritised for local and unemployed people."

"Where appropriate and possible, [the Applicant] will explore the opportunity to embed the requirement for local employment in the sub-leases and tenancy agreements with occupiers."

7.5.3 In the case of such enhancement measures, the residual effect on local jobs is expected to remain minor beneficial.

7.5.4 In summary, the likely residual effects of the complete and operational H1 Development are considered to be as follows:

- The likely effect of the H1 Development's new employment upon existing London residents and future London businesses is considered to be **insignificant** in both the minimum and maximum scenarios.
- The likely effect of the H1 Development on new local (direct) jobs upon existing LBS residents and future LBS businesses is considered to be **direct, long-term**, at the **district level** of **minor beneficial significance** in both the minimum and maximum scenarios.
- The likely effect of the H1 Development's office floorspace upon businesses is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance** in both the minimum and maximum scenarios.

- In the maximum scenario, the likely effect of the H1 Development's affordable workspace upon businesses is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance**. In the minimum scenario, the H1 Development would have **no effect** upon businesses in relation to affordable workspace.
- The likely effect of the H1 Development's retail floorspace upon businesses is considered to be **no effect** in the minimum scenario and **direct, long-term**, at the **district level**, and of **moderate beneficial significance** in the maximum scenario.
- The likely effect of the H1 Development's food and drink floorspace upon businesses is considered to be **no effect** in the minimum scenario and **direct, long-term**, at the **district level**, and of **moderate beneficial significance** in the maximum scenario.
- The likely effect of the H1 Development's medical or health floorspace upon residents is considered to be **no effect** in the minimum scenario and **direct, long-term**, at the **district level**, and of **major beneficial significance** in the maximum scenario.
- The likely effect of the H1 Development's public realm improvements is considered to be **direct, long-term**, local and of **moderate beneficial significance**.

7.6 Likely Residual Cumulative Effects and their Significance

The Completed and Operational H1 Development

7.6.1 This section assesses the impact of Cumulative Schemes that are not listed in **Table 7.2** ('the CEA schemes') together with the residual effects of the H1 Development. Effects are presented for all those likely effects considered in the main assessment.

Employment

7.6.2 The CEA schemes are expected to support between 2,600 and 3,000 additional FTEs, which is equivalent to between 2,800 and 3,200 additional jobs once part time workers are taken into account. Together with the employment supported at the H1 Development, the cumulative schemes are expected to support between 6,100 and 6,900 additional FTEs (between 6,700 and 7,400 jobs). In the context of 6.3 million future London employment in 2026, the jobs represent an increase of less than 0.1%. On this basis, the CEA schemes and H1 Development are expected to have a negligible magnitude of impact (medium sensitivity receptor). The likely cumulative effect of the schemes' new employment upon future businesses is considered to be **insignificant**.

7.6.3 The CEA schemes are expected to support approximately 430 – 450 additional local jobs. Together with the residual local employment supported at the H1 Development, the cumulative schemes are expected to support 840 – 880 local jobs. In the context of 11,900 unemployed LBS residents, these local jobs equate to 7.0% - 7.4%. In the context of 184,400 million employed LBS residents, the jobs represent an increase of approximately 0.5%. On this basis, the CEA schemes and H1 Development are expected to have a low magnitude of impact (medium sensitivity

receptor). The likely cumulative effect of the schemes' new local employment upon residents is considered to be **direct, long-term**, at the **district level**, and of **minor beneficial significance**.

The Provision of Office Floorspace

7.6.4 The CEA schemes are expected to provide up to⁶⁰ 31,000 m² (GIA) additional office floorspace. Together with the provision at the H1 Development, the cumulative schemes are expected to deliver between 80,300 m² (GIA) and 88,900 m² (GIA). This accounts for 16% - 18% of the total requirement between 2016 and 2041, or 48% - 53% of the spare capacity over the same period. On this basis, the CEA schemes and H1 Development are expected to have a high magnitude of impact (high sensitivity receptor). The likely cumulative effect of the schemes' new office floorspace provision upon businesses is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance**.

The Provision of Affordable Workspace

7.6.5 The CEA schemes may be expected to adhere to policy requirements and provide 10% of floorspace as affordable workspace. This would equate to 8,000 – 8,900 m² (GIA) – a medium magnitude of impact (high sensitivity receptor). The likely cumulative effect of the schemes' new affordable workspace provision upon businesses is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance**.

The Provision of Other Land Uses that may Arise out of Seeking Planning Permission for Flexible Land Uses, which may Include Medical or Health Provision

Retail

7.6.6 The CEA schemes are expected to provide up to⁶⁰ 9,500 m² (GIA) additional retail floorspace. Together with the provision at the H1 Development, the cumulative schemes are expected to deliver between 9,500 m² (GIA) and 11,400 m² (GIA). This equates to an increase of 2.8% - 3.4% on existing levels, or between 46% and 56% of the spare retail capacity in LBS in 2026. On this basis, the CEA schemes and H1 Development are expected to have a medium magnitude of impact (medium sensitivity receptor). The likely cumulative effect of the schemes' new retail floorspace upon businesses is considered to be direct, **long-term**, at the **district level**, and of **moderate beneficial significance**.

Food and Drink

7.6.7 The CEA schemes are expected to provide up to⁶⁰ 1,400 m² (GIA) additional food and drink floorspace. Together with the provision at the H1 Development, the cumulative schemes are expected to deliver between 1,400 m² (GIA) and 3,100 m² (GIA). This represents an increase of 2.3% - 5.1% on existing levels or would account for between 25% and 54% of the spare food and drink capacity in LBS in 2026. On this basis, the CEA schemes and H1 Development are expected to have a medium magnitude of impact (medium sensitivity receptor). The likely cumulative effect of

⁶⁰ Given the flexible use allocations in some schemes, a maximum possible provision is presented for each floorspace type.

the schemes' new food and drink floorspace upon businesses is considered to be **direct, long-term**, at the **district level**, and of **moderate beneficial significance**.

Medical or Health

7.6.8 Medical or health provision requirements are allocated by public service providers in order to meet rising populations. The CEA schemes are expected to deliver 2,200 residential units (approximately 4,600 residents). The CEA schemes also include one new medical centre in the Aylesbury Estate cumulative scheme. This additional provision is expected to fully mitigate the impact of the 4,600 additional residents. Considering the CEA schemes and the H1 Development together, therefore, the impacts are the same as in the main assessment. In the minimum case for the H1 Development where the health hub is not delivered, the CEA schemes and the H1 Development are expected to have zero impact, leading to **no effect**. If the health hub is delivered at the H1 Development, the CEA schemes and the H1 Development are expected to have high magnitude of impact (high sensitivity receptor). The likely effect of the H1 Development's medical or health floorspace provision upon residents is considered to be **direct, long-term, local**, and of **major beneficial significance**. However, given the priority provision of affordable workspace over the medical or health use, this scenario is less likely than the minimum case scenario.

The Creation of New and Enhanced Public Realm and Amenity Space

7.6.9 The CEA schemes are expected to contribute positively to public realm in landscaping and design. Together with the provision at the H1 Development, the schemes are expected to have a medium magnitude of impact (high sensitivity receptor). The likely cumulative effect of the schemes' new public realm upon residents is considered to be **direct, long-term**, at the **district level**, and of **major beneficial significance**.

7.7 Conclusions

7.7.1 Once complete and operational, the H1 Development is expected to support between 3,900 and 4,300 jobs. There is no employment existing at the Site, and so all these jobs are expected to be additional. Once income and supply chain effects are accounted for, there are expected to be 4,300 – 4,800 additional jobs. Of these, 3,500 – 3,800 are expected to be taken by London residents.

7.7.2 The H1 Development is expected to support between 400 and 430 jobs for LBS residents. Employment and skills initiatives by the Applicant are expected to enhance the opportunities for local labour.

7.7.3 The H1 Development proposes to supply between 49,351 m² and 58,032 m² GIA of office floorspace, accounting for between 29% and 34% of the excess demand in LBS between 2016 and 2041.

7.7.4 Some of the H1 Development office floorspace is allocated for flexible use, which is proposed to be delivered as affordable workspace but with the potential for alternative provision as a health hub if LBS identifies this as its priority. If affordable workspace is deemed the priority use, the H1 Development will meet the emerging policy requirement for at least 10% of the office floorspace to be provided as affordable workspace. Alternatively, some (or all) of the flexible use floorspace could be delivered as a health hub, depending on LBS priorities. The health

hub would contain GP consulting space, a pharmacy and outpatient services, along with other general support staff facilities. The health provision would serve the needs of the future population, helping to relieve the excessive demand in the area. If the health hub is deemed the most necessary for the community, it will be delivered in place of some (or all) affordable workspace. This will be agreed with LBS through the determination of the planning application.

- 7.7.5 The H1 Development is expected to supply between 0 m² and 1,954 m² GIA of retail floorspace. If the maximum of 1,954 m² was delivered, it would account for 10% of LBS' retail capacity projection in 2026.
- 7.7.6 The H1 Development is expected to supply between 0 m² and 1,689 m² GIA of food and drink floorspace. If the maximum of 1,689 m² was delivered, it would account for 29% of LBS' food and drink capacity projection in 2026.
- 7.7.7 The H1 Development will provide public realm improvements, including street furniture, plants, and trees. The H1 Development ties into, completes and enhances the new public open spaces of the Approved Development.
- 7.7.8 Together with the CEA schemes, the H1 Development will support up to 7,400 jobs in London, up to 88,900 m² (GIA) of office floorspace (over half the excess office capacity required to 2041), 10% of which is expected to be affordable. The schemes could deliver up to 11,400 m² (GIA) of retail floorspace (over half the spare retail capacity in 2026) and up to 3,100 m² (GIA) of food and drink floorspace (over half the spare food and drink capacity in 2026). Some schemes include medical or health provision, which will be delivered to support the rising population of the area. The CEA schemes are expected to contribute positively to public realm in landscaping and design.

8. Air Quality

8.1 Introduction

8.1.1 This Chapter has been prepared by Air Quality Consultants Ltd (AQC) and presents an assessment of the likely significant effects on air quality once the H1 Development is completed and operational.

8.1.2 The Chapter is supported by the following appendices:

- **Appendix 8.1** Legislative and Planning Policy Context.
- **Appendix 8.2** EPUK & IAQM Planning for Air Quality Guidance.
- **Appendix 8.3** Professional Experience.
- **Appendix 8.4** Modelling Methodology.
- **Appendix 8.5** London Vehicle Fleet Projections.
- **Appendix 8.6** Air Quality Neutral Methodology.
- **Appendix 8.7** Glossary.

8.2 Assessment Methodology and Significance Criteria

Assessment Methodology

8.2.1 The following approach to the air quality assessment has been detailed in the EIA Scoping Report (December 2020) and agreed with LBS (and their advisors, LUC) through the EIA Scoping process (refer to **ES Volume 3, Appendix 2.1 and Appendix 2.2**) outlined in **ES Volume 1, Chapter 2: EIA Methodology**, which includes:

- Identification of potentially sensitive existing and future receptor locations which could be affected by changes in air quality resulting from the completed and occupied H1 Development.
- Establishment of the relevant existing air quality baseline conditions via a review of:
 - LBS' air quality review and assessment reports documents.
 - Air quality monitoring data from LBS' monitoring network.
 - The national background pollution maps by Defra¹.
 - Defra's Pollutant Release and Transfer Register to establish industrial and waste management sources that may affect the ambient air quality of the Site and its wider area².
- Determining existing and future ambient pollutant concentrations at sensitive receptor locations using dispersion modelling (refer to **ES Volume 3, Appendix 8.4** for further details on modelling methodology). This

¹ Defra. Local Air Quality Management (LAQM) Support Website, Available: <http://laqm.defra.gov.uk/>. 2019.

² Defra. UK Pollutant Release and Transfer Register, Available: <http://prtr.defra.gov.uk/map-search>. 2019.

includes the application of the ADMS 5 air quality dispersion model to take account of future baseline emissions from the Approved Development Energy Centre.

- Application of the ADMS-Roads air quality dispersion models using data from the Applicant's Transport Consultant (BuroHappold), to assess the likely effects of emissions from traffic generated by the completed and operational H1 Development. The technical approach to the air quality assessment is detailed in **ES Volume 3, Appendix 8.4**.
- Comparison of the predicted air pollutant concentrations with LBS' monitored concentrations for the latest year of monitoring data (2019), and adjustment of modelled results where necessary (model verification details are provided in **ES Volume 3, Appendix 8.4**).
- Comparison of the predicted pollutant concentrations with the Air Quality Strategy Objectives (UK AQS)³ (the AQS objectives are discussed later in this Chapter and in **ES Volume 3, Appendix 8.1**).
- Determination of the likely significant effects of the completed and operational H1 Development on air quality, based on the application of the Environmental Protection UK Guidance (EPUK) and Institute of Air Quality Management (IAQM) significance criteria⁴ to modelled results (see **ES Volume 3, Appendix 8.2** for details of the criteria).
- Determination of future air quality conditions that would be experienced by future users of the retail and public realm uses of the completed and operational H1 Development.
- Determination of the impacts from the operation of the proposed life-safety diesel generators, included in the H1 Development.
- Identification of the Primary Mitigation and Tertiary Mitigation, if necessary, associated with the completed and operational H1 Development which would have a beneficial effect on local air quality but cannot be quantified by the air quality model (owing to a lack of standard or recognised methodologies).
- Establishment of the likely residual effects of the H1 Development upon air quality, taking into account any necessary additional mitigation measures (over and above Primary and Tertiary mitigation), if relevant.

8.2.2 The assessment focusses upon emissions of nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}) as these are the primary pollutants of concern with respect to emissions from road traffic. In terms of the Approved Development Energy Centre, which has been considered in the future baseline, the assessment focusses on NO₂ only, as there are no PM₁₀ or PM_{2.5} emissions from the gas-fired energy plant to be used. Emissions from the life-safety diesel generators within the H1 Development comprise NO₂, PM₁₀ and PM_{2.5}, although these have been considered qualitatively.

8.2.3 The Study Area of the assessment is effectively defined by the extent of the road network affected by additional traffic generated by the H1 Development (see **Table A4.2** in **ES Volume 3, Appendix 8.4** for details of the road network considered in the air quality assessment).

³ Department of the Environment, Food and Rural Affairs (Defra). 'The Air Quality Strategy for England, Scotland, Wales & Northern Ireland'. 2007.

⁴ Moorcroft and Barrowcliffe et al, Land-Use Planning & Development Control: Planning For Air Quality v1.2, IAQM, London, 2017.

- 8.2.4 It is noted, the annual mean objectives do not apply at the H1 Development as the uses proposed comprises offices, retail and public realm, which are not relevant exposure to the annual mean air quality objectives as defined in Box 1.1 of Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management Technical Guidance (LAQM.TG16)⁵. The publicly accessible parts of the scheme (i.e. the retail and public realm) represent relevant exposure to the 1-hour mean NO₂ objective, and therefore future receptors within the H1 Development have been considered against these objectives. It is noted, the annual mean objectives have been considered at relevant existing receptors to quantify the changes in air quality with the H1 Development.
- 8.2.5 As required in the new London Plan⁶ a consideration of how the H1 Development is 'Air Quality Positive' has been undertaken. This includes a review of the measures and design features which have been incorporated into the H1 Development in order to maximise benefits to local air quality and reduce exposure.
- 8.2.6 In addition to the air quality impact assessment set out in this Chapter, an 'Air Quality Neutral' assessment was undertaken for the completed and operational H1 Development, in accordance with the requirements of Policy SI 1 (D) of the new London Plan. The methodology of the Air Quality Neutral assessment is provided in **ES Volume 3, Appendix 8.6**.

Assessment Criteria

Health Criteria

- 8.2.7 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely (even in sensitive population groups) or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations 2000⁷ (as amended) for NO₂ and PM₁₀.
- 8.2.8 The UK-wide objectives for NO₂ and PM₁₀ were to have been achieved by 2005 and 2004 respectively and continue to apply in all future years thereafter. The PM_{2.5} objective was to be achieved by 2020. Measurements across the UK have shown that the 1-hour NO₂ objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³⁸. Where relevant, this value has been used as an indication of the likelihood of the 1-hour mean NO₂ objective to be exceeded in the study area. Measurements have also shown that the 24-hour PM₁₀ objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m³. The predicted annual mean PM₁₀ concentrations are thus used as a proxy to determine the likelihood of an

⁵ Defra. Local Air Quality Management Technical Guidance (TG16). February 2018. Available: <https://laqm.defra.gov.uk/technical-guidance/>.

⁶ GLA (2021) The London Plan, The Spatial Development Strategy For Greater London, Available: <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/intend-publish-london-plan-2019>

⁷ The Air Quality (England) Regulations, 2000, Statutory Instrument 928 (2000), HMSO, Available: <http://www.legislation.gov.uk/uksi/2000/928/contents/made>.

⁸ Defra (2018) Review & Assessment: Technical Guidance LAQM.TG16 February 2018 Version, Defra, Available: <https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf>.

exceedance of the 24-hour mean PM₁₀ objective. Where predicted annual mean concentrations are below 32 µg/m³ it is unlikely that the 24-hour mean objective will be exceeded.

- 8.2.9 As discussed above, the objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Detailed in Defra's LAQM.TG16, the annual mean objectives for NO₂ and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels, retail premises or public realm. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including retail premises and public realm areas such as outdoor eating locations and pavements of busy shopping streets.
- 8.2.10 EU Directive 2008/50/EC⁹ sets limit values for NO₂, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010). The limit values for NO₂ are the same numerical concentrations as the UK objectives, but achievement of these values is a national obligation rather than a local one. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and the Department for Transport's (DfT's) Joint Air Quality Unit (JAQU).
- 8.2.11 The relevant air quality criteria for this assessment are provided in **Table 8.1**.

⁹ The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council.

Table 8.1: Air Quality Criteria for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
Nitrogen Dioxide (NO ₂)	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual mean	40 µg/m ³ ^a
Fine Particles (PM ₁₀)	24-hour mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual mean	40 µg/m ³ ^b
Fine Particles (PM _{2.5}) ^c	Annual mean	25 µg/m ³

Notes: ^a A proxy value of 60 µg/m³ as an annual mean can be used to assess the likelihood of the 1-hour mean NO₂ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 1-hour mean NO₂ objective are possible.

^b A proxy value of 32 µg/m³ as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM₁₀ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM₁₀ objective are possible.

^c The PM_{2.5} objective, which is to be met by 2020, is a national target only and there is no provision for the objective in the Air Quality (England) Regulations 2008 (as amended).

World Health Organisation (WHO) Guideline for Annual Mean PM_{2.5}

8.2.12 The WHO has set a guideline for annual mean PM_{2.5} of 10 µg/m³. The guideline is not currently in UK regulations and there is no explicit requirement to assess against it. However, achievement of the guideline is a long-term aspiration of the UK Government and, as set out in paragraph 9.14 of the new London Plan⁶, the GLA also aims to achieve the WHO target by 2030. As such, consideration to the WHO guideline for annual mean PM_{2.5} has been included within this assessment.

Screening Criteria for Road Traffic Assessments

8.2.13 Environmental Protection UK (EPUK) and the IAQM¹⁰ recommend a two-stage screening approach to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in **ES Volume 3, Appendix 8.2**, first considers the size and parking provision of a development; if the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m² of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment. The second stage

¹⁰ Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2, IAQM, London, Available: <http://iaqm.co.uk/guidance/>.

then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. Where these criteria are exceeded, a detailed assessment is required, although the guidance advises that *“the criteria provided are precautionary and should be treated as indicative”,* and *“it may be appropriate to amend them on the basis of professional judgement”.*

Screening Criteria for Point Source Assessments (Life-Safety Diesel Generator)

8.2.14 EPUK and the IAQM have developed an approach to determine whether emissions from point sources, such as generators, have the potential for significant air quality impacts. The first step of the approach, as described in **ES Volume 3, Appendix 8.2**, is to screen the emissions and the emissions parameters to determine whether an assessment is necessary:

“Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion.

In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable”.

This screening approach requires professional judgement, and the experience of the consultants preparing the assessment is set out in **ES Volume 3, Appendix 8.3**.

8.2.15 If it is determined that an assessment of the point source emissions is required, then there is a further stage of screening that can be applied to the model outputs. The approach is that any change in concentration smaller than 0.5% of the long-term environmental standard will be negligible, regardless of the existing air quality conditions. Any change smaller than 1.5% of the long-term environmental standard will be negligible, so long as the total concentration is less than 94% of the standard, and any change smaller than 5.5% of the long-term environmental standard will be negligible, so long as the total concentration is less than 75% of the standard. The guidance also explains that:

“Where peak short term concentrations (those averaged over periods of an hour or less) from an elevated source are in the range 11-20% of the relevant Air Quality Assessment Level (AQAL), then their magnitude can be described as small, those in the range 21-50% medium and those above 51% as large. These are the maximum concentrations experienced in any year and the severity of this impact can be described as slight, moderate and substantial respectively, without the need to reference background or baseline concentrations. In most cases, the assessment of impact severity for a proposed development will be governed by the long-term exposure experienced by receptors and it will not be a necessity to define the significance of effects by reference to short-term impacts. The severity of the impact will be substantial when there is

a risk that the relevant AQAL for short-term concentrations is approached through the presence of the new source, taking into account the contribution of other local sources”.

8.2.16 As a first step, the assessment of the emissions from point sources within the development considers the predicted process contributions using the following criteria:

- is the long-term (annual mean) process contribution less than 0.5% of the long-term environmental standard?; and
- is the short-term (24-hour mean or shorter) process contribution less than 10% of the short-term environmental standard?

8.2.17 Where both of these criteria are met, then the impacts are negligible and thus ‘not significant’. Where these criteria are breached, then a more detailed assessment, considering total concentrations (incorporating local baseline conditions), has been provided.

Sensitive Receptors

8.2.18 Concentrations of NO₂, PM₁₀ and PM_{2.5} have been predicted at locations both within, and close to, the H1 Development. Receptors have been identified to represent relevant exposure within the H1 Development, including the worst-case locations (these being at the façades of the ground floor retail units closest to the sources of road traffic emissions). When selecting receptors, particular attention has been paid to road junctions, where traffic may become congested and where there is a combined effect of several road links, and close to those roads where the traffic increases as a result of the H1 Development will be greatest.

8.2.19 Nine existing residential properties have been identified as receptors for the assessment, including one within the Approved Development¹¹, as these are located close to roads where additional traffic from the H1 Development exceeds the EPUK/IAQM screening criteria. These locations are described in **Table 8.2** and shown in **Figure 8.1**. In addition, concentrations have been modelled at several diffusion tube monitoring sites to verify the model outputs (see **ES Volume 3, Appendix 8.4** for verification method). Many of the receptor locations assessed in the previous ES are not located close to roads significantly affected by the operation of the H1 Development, thus they have not been considered in this assessment.

¹¹ Although Plot H2 is not yet fully operational, concentrations at this location have been considered in the baseline for conservatism, and because it is part of the future baseline.

Figure 8.1: Locations of Existing and Future Receptor Locations

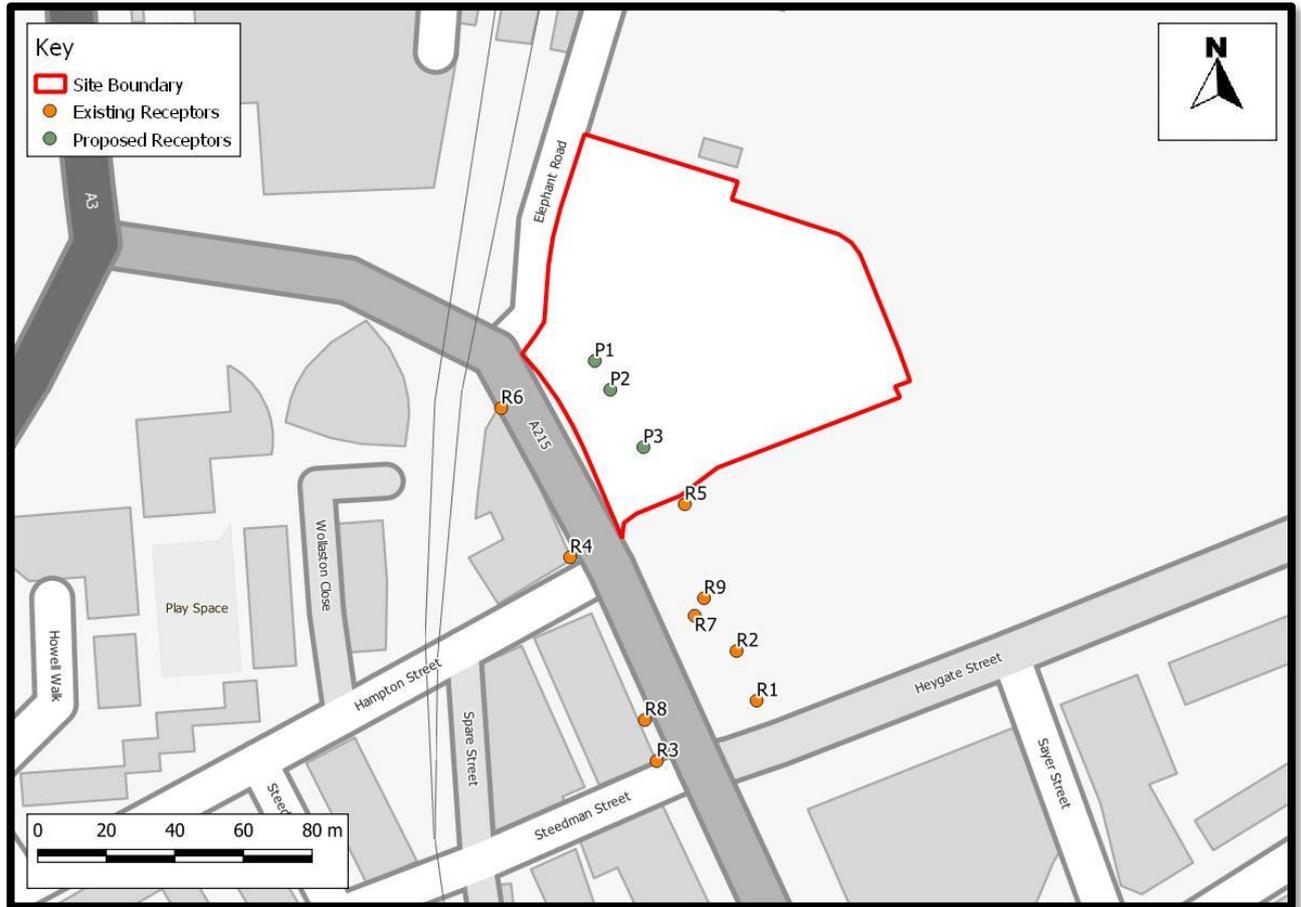


Table 8.2: Description of Existing and Future Receptor Locations

Receptor	Description	Modelled Height (m)
Existing Receptors		
R1	Ground floor commercial property on Walworth Road	1.5
R2	Ground floor commercial property on Walworth Road	1.5
R3	First floor residential property on Walworth Road	4.5
R4	First floor residential property on Walworth Road	4.5
R5	First floor residential property on Walworth Road	4.5
R6	First floor residential property on Walworth Road	4.5
R7	Hurlock Heights	6.5
R8	114 Walworth Road	6.5
R9	Plot H2 of the Approved Development	1.5
Proposed Receptors within H1 Development		
P1	Ground floor retail unit on Western Facade	1.5
P2	Ground floor retail unit on Western Facade	1.5
P3	Ground floor retail unit on Western Facade	1.5

Impact Assessment Methodology

Road Traffic Assessment

Screening Stage

8.2.20 The first step in considering the road traffic impacts of the H1 Development has been to screen the H1 Development and its traffic generation against the criteria set out in the EPUK/IAQM guidance, as described in **ES Volume 3, Appendix 8.2**. Where impacts can be screened out there is no need to progress to a more detailed assessment. As described in Paragraph 8.2.19 the change in traffic has also determined the location of sensitive receptors considered within the modelling assessment.

8.2.21 The H1 Development leads to an increase in traffic greater than the screening criteria along Walworth Road (north and south of Deacon Street) and on Deacon Street itself; as such, detailed dispersion modelling of road traffic

emissions is required, and sensitive receptors along these roads have been considered. The following sections describe the approach to dispersion modelling of road traffic emissions.

Modelling Methodology

8.2.22 Concentrations have been predicted using the ADMS-Roads dispersion model, with vehicle emissions derived using Defra's latest Emission Factor Toolkit (EFT) (v10.1). Details of the model inputs, assumptions and the verification are provided in **ES Volume 3 Appendix 8.4**, together with the method used to derive base and future year background concentrations. Where assumptions have been made, a realistic worst-case approach has been adopted.

Assessment Scenarios

8.2.23 NO₂, PM₁₀ and PM_{2.5} concentrations have been predicted for a base year of 2019 (the most recent full calendar year of monitoring data available from the LBS) and the proposed year of opening of the H1 Development (2026). For 2026, predictions have been made with the H1 Development in place (With the H1 Development) and in the absence of the H1 Development (Without the H1 Development). If the opening year of the H1 Development were to be later than 2026, the assessment undertaken would still be considered worst case, as air quality is likely to improve in the future.

8.2.24 The traffic data used in the assessment for 2026 includes data for all cumulative schemes which would affect flows on the roads included in this assessment, including traffic associated with the earlier phases of the Approved Development. As such, predictions of future pollutant concentrations presented in this Chapter take account of cumulative effects.

8.2.25 The 2026 baseline predictions consider the emissions associated with the Approved Development Energy Centre. Further details of the modelling methodology of the Energy Centre are provided in **ES Volume 3, Appendix 8.4**.

Traffic Data

8.2.26 Traffic data for the assessment have been provided by BuroHappold, who have undertaken the Transport Assessment (TA) for the H1 Development. Traffic generated by the flexible land uses in the H1 Development (by BuroHappold) has been derived using trip rates and a split in land uses that generates a reasonable worst-case scenario. Further details of the traffic data used in this assessment are provided in **ES Volume 3, Appendix 8.4**.

Uncertainty

8.2.27 There are many components that contribute to the uncertainty of modelling predictions. The road traffic emissions dispersion model used in this assessment is dependent upon the traffic data that have been inputted, which will have inherent uncertainties associated with them. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms.

- 8.2.28 An important stage in the process is therefore model verification, which involves comparing the model output with measured concentrations (see **ES Volume 3, Appendix 8.4**). As the model has been verified and adjusted, there can be reasonable confidence in the prediction of base year (2019) concentrations.
- 8.2.29 Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. For obvious reasons, the model cannot be verified in the future, and it is necessary to rely on a series of projections provided by DfT and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions. Historic versions of Defra's EFT tended to over-state emissions reductions into the future. However, analysis of the most recent versions of Defra's EFT carried out by AQC^{12 13} suggest that, on balance, these versions are unlikely to over-state the rate at which NOx emissions decline in the future at an 'average' site in the UK. In practice, the balance of evidence suggests that NOx concentrations are most likely to decline more quickly in the future, on average, than predicted by the current EFT, especially against a base year of 2016 or later. Using EFT v10.1 for future-year forecasts in this report thus provides a robust assessment, given that the model has been verified against measurements made in 2019.
- 8.2.30 The Mayor of London confirmed in June 2018 that changes will be made to the existing Low Emission Zone (LEZ) in 2020, and that the ULEZ will be expanded in 2021. These changes are described in detail in **ES Volume 3, Appendix 8.5**, and can be expected to significantly reduce NOx emissions in London from 2020 onwards; however, they are not reflected in Defra's latest EFT and thus have not been considered in this assessment. The assessment presented in this Chapter is, therefore, very much worst-case in this regard, and it is expected that background concentrations, baseline concentrations, and the impacts of the H1 Development, will be lower than described later in this Chapter. **ES Volume 3, Appendix 8.5** discusses uncertainties regarding the future fleet vehicle mix in London and the scale of the reduction in NOx emissions that can be expected with the adoption of these changes.
- 8.2.31 It should be noted that the assessment is based on baseline air quality data for the 2019 calendar year. These data were gathered before any of the implications of Covid-19 occurred and as such the assessment of baseline conditions is unaffected by any issues relating to Covid-19.
- 8.2.32 The impact assessment assumes a completed development for 2026 and has assumed no long-term benefits or worsening as a result of Covid-19.

Impacts of the Approved Development Energy Centre

- 8.2.33 The H1 Development will not include any new on-site combustion plant for routine energy generation and will instead be connected to the centralised Approved Development Energy Centre, located within Plot H12 of the Approved Development within the Masterplan Site. The impacts of emissions from the Approved Development Energy Centre on air quality, at both existing receptors and locations have been included in the 2026 baseline concentrations presented in this Chapter.

¹² AQC (2020a) Performance of Defra's Emission Factor Toolkit 2013-2019, Available: <https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=7fba769d-f1df-49c4-a2e7-f3dd6f316ec1>.

¹³ AQC (2020b) Comparison of EFT v10 with EFT v9, Available: <https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=9d6b50e1-3897-46cf-90f1-3669c6814f1d>.

8.2.34 Further details of the plant included in the assessment are provided in **ES Volume 3, Appendix 8.4**.

Modelling Methodology

8.2.35 The impacts of emissions from the Approved Development Energy Centre have been modelled using the ADMS-5 dispersion model. ADMS-5 is a new generation model that incorporates a state-of-the-art understanding of the dispersion processes within the atmospheric boundary layer. The model input parameters are set out in **ES Volume 3, Appendix 8.4**.

8.2.36 The air quality modelling has been carried out based on a number of necessary assumptions, detailed further in **ES Volume 3, Appendix 8.4**. Where necessary a realistic worst-case approach has been adopted (the approach is clearly outlined within the assessment).

8.2.37 Entrainment of the plume into the wake of the buildings has been simulated within the ADMS-5 model. ADMS-5 takes a relatively simplistic approach to modelling building downwash effects, thus additional uncertainty is introduced when using the buildings module. In order to ensure a worst-case assessment, sensitivity tests have been carried out whereby the model has been run with no buildings and with all nearby buildings that might affect the dispersion of the energy plant emissions (including the H1 Development buildings). The maximum predicted concentration from these two scenarios has been used throughout this assessment to ensure a reasonable worst-case scenario.

Emissions Data

8.2.38 The emissions data input into the model for the Approved Development Energy Centre were taken from the Air Quality Assessment undertaken for the Reserved Matters Application pursuant to the OPP¹⁴. Further details of the emissions data used in this assessment are provided in **ES Volume 3, Appendix 8.4**.

Uncertainty

8.2.39 The point source dispersion model used in the assessment is dependent upon emission rates, flow rates, exhaust temperatures and other parameters for each source, all of which in reality are variable as the Approved Development Energy Centre will operate at different loads at different times. The assessment has, however, addressed this by applying worst-case assumptions where necessary.

8.2.40 There are additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms. These uncertainties cannot be easily quantified, and it is not possible to verify the point-source model outputs. Where parameters have been estimated the approach has been to use reasonable worst-case assumptions. A sensitivity test with no use of the buildings module has also been carried out and the worst-case result at each location used, in order to address specific uncertainties and to ensure a robust assessment.

¹⁴ Parsons Brinckerhoff (prepared for Lend Lease) (2014) Energy Hub (MP1A) Air Quality Assessment (ref: 12/AP/1092).

Proposed Life-Safety Diesel Generator Assessment

8.2.41 The H1 Development will include a 910 kVA life-safety diesel generator and a 1000 kVA life-safety standby diesel generator, both to be located on the roof of the H1 Development. The generators will be used for the provision of essential power only in the event of complete power cut to the building. The impacts of emissions from the diesel generators have been assessed qualitatively based on professional judgement, as detailed within the EPUK/IAQM guidance.

'Air Quality Neutral'

8.2.42 The guidance relating to air quality neutral follows an approach whereby compliance with 'air quality neutral' is founded on emissions benchmarks that have been derived for both building (energy) use and road transport in different areas of London. Developments that exceed the benchmarks are required to implement on-site or off-site mitigation to offset the excess emissions.

8.2.43 **ES Volume 3, Appendix 8.6** sets out the emissions benchmarks. The approach has been to calculate the emissions from the H1 Development and to compare them with these benchmarks.

'Air Quality Positive'

8.2.44 Policy SI 1 (C) of the new London Plan⁶ states that:

"Masterplans and development briefs for large-scale development proposals subject to an Environment Impact Assessment should consider how air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:

- 1) *how proposals have considered ways to maximise benefits to local air quality, and*
- 2) *what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this."*

Site Suitability

8.2.45 Site suitability has been determined using dispersion modelling, applying the same modelling methodology for road traffic as described in **paragraphs 8.2.23 to 8.2.32**.

Significance Criteria

Methodology for Defining Effects

Receptor Sensitivity

8.2.46 Within this Chapter, all receptors where the air quality objectives apply are considered to be of high sensitivity. Locations where the objectives do not apply must be considered not to be sensitive (i.e. the office uses); therefore, there are no medium or low sensitivity receptors within the context of this assessment.

Magnitude of Impact and Scale of Effect

8.2.47 There is no official guidance in the UK in relation to development control on how to describe air quality impacts and effects. The approach developed jointly by EPUK & IAQM has therefore been used. This includes defining descriptors of the impacts at individual receptors, which take account of the percentage change in concentrations relative to the relevant air quality objective, rounded to the nearest whole number, and the absolute concentration relative to the objective.

8.2.48 **Table 8.3** sets out how impact descriptors have been determined within this assessment.

Table 8.3: Air Quality Impact Scale Descriptors for Individual Receptors for All Pollutants^a

Long-term average concentration at receptor in assessment year ^{b,c}				Change in concentration relative to AQAL ^{c,d}				
% of AQAL	Annual Mean NO ₂ (µg/m ³)	Annual Mean PM ₁₀ (µg/m ³)	Annual Mean PM _{2.5} (µg/m ³)	0%	1%	2-5%	6-10%	>10%
75% or less of AQAL	Less than 30.2	Less than 30.2	Less than 18.9	Negligible	Negligible	Negligible	Minor	Moderate
76-94% of AQAL	30.2 – 37.8	30.2 – 37.8	18.9 – 23.6	Negligible	Negligible	Minor	Moderate	Moderate
95- 102% of AQAL	37.8 – 41.0	37.8 – 41.0	23.6 – 25.6	Negligible	Minor	Moderate	Moderate	Major
103- 109% of AQAL	41.0 – 43.8	41.0 – 43.8	25.6 – 27.4	Negligible	Moderate	Moderate	Major	Major
110% or more of AQAL	More than 43.8	More than 43.8	More than 27.4	Negligible	Moderate	Major	Major	Major

Notes: ^a Values are rounded to the nearest whole number.

^b This is the 'Without H1 Development' concentration where there is a decrease in pollutant concentration and the 'With H1 Development' concentration where there is an increase.

^c AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
^d Minor and Major are used as standard EIA terminology, and correspond to Slight and Substantial respectively in the EPUK/IAQM guidance.

Defining the Effect

Geographic Extent of Effects

- 8.2.49 The geographic extent of the effects is identified. At a spatial level, 'site' or 'local' effects are those affecting the Site and neighbouring receptors, while effects upon receptors beyond the vicinity of the Site and its neighbours are at a 'district' level, and effects upon receptors in adjoining boroughs are at a 'sub-regional' level.
- 8.2.50 Effects affecting London are at a 'regional' level, whilst those which affect different parts of the country, or England, are considered being at a 'national' level.

Effect Duration

- 8.2.51 Effects that result from the completed and operational phase of the H1 Development are classed as 'long-term' effects.

Direct and Indirect Effects

- 8.2.52 The operation of the H1 Development would directly affect concentrations of NO₂, PM₁₀ and PM_{2.5} in the local area.

Categorising Likely Significant Effects

- 8.2.53 Once operational, there is no official guidance in the UK in relation to development control on how to assess the significance of effects. The approach developed jointly by EPUK & IAQM has therefore been used.
- 8.2.54 It is important to differentiate between the terms impact and effect with respect to the assessment of air quality. The term impact is used to describe a change in pollutant concentration at a specific location. The term effect is used to describe an environmental response resulting from an impact, or series of impacts. Within this Chapter, the air quality assessment has used published guidance and criteria to determine the likely air quality impacts at a number of sensitive locations (see **Table 8.2**). The overall significance of the air quality effects is then determined using professional judgement, giving consideration to various factors including the magnitude of the predicted impacts and the presence of any objective exceedances; full details of the EPUK/IAQM approach are provided in **ES Volume 3, Appendix 8.2**. Air quality effects are therefore classed as either 'significant' or 'not significant' in accordance with the EPUK/IAQM approach. The experience of the consultants who have prepared this chapter is set out in **ES Volume 3, Appendix 8.3**.

8.3 Relevant Baseline Conditions

Existing Baseline

Industrial Sources

- 8.3.1 A search of the UK Pollutant Release and Transfer Register website has not identified any significant industrial or waste management sources that are likely to affect the H1 Development, in terms of air quality.

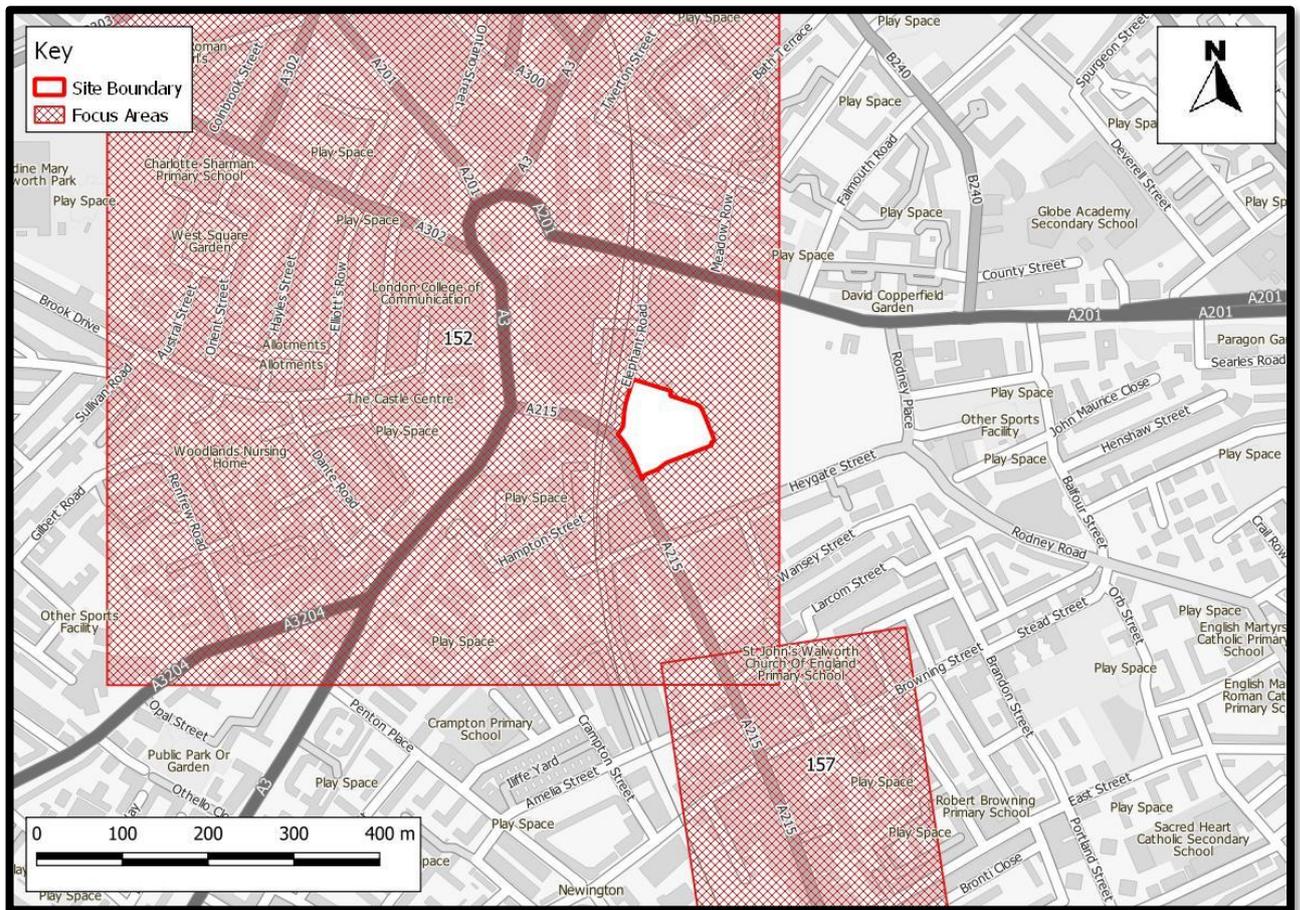
Air Quality Management Areas

8.3.2 LBS has investigated air quality within its area as part of its responsibilities under the LAQM regime and has declared an Air Quality Management Area (AQMA) for exceedances of the annual mean NO₂ objective and the 24-hour mean PM₁₀ objective. The AQMA encompasses the entire northern part of the borough, extending from Rotherhithe to Walworth and Camberwell and up to the boundary of the River Thames. The Site lies within this AQMA.

Air Quality Focus Areas

8.3.3 The H1 Development is located partially within the Elephant and Castle to St George’s Circus and Kennington Lane air quality focus area and approximately 200 m north of the Walworth Road/Camberwell Road/Camberwell Green air quality focus area, which are two of the 187 focus areas in London. These are locations that not only exceed the EU annual mean limit value for NO₂ but also locations with high levels of human exposure. The location of the H1 Development in relation to these two air quality focus areas is shown in **Figure 8.2**.

Figure 8.2: Location of the H1 Development in Relation to the Two Air Quality Focus Areas



Local Air Quality Monitoring

8.3.4 LBS operates two automatic monitoring stations within the borough, one of which (SWK6) is located approximately 200 m west of the H1 Development. LBS also operates a number of NO₂ monitoring sites using diffusion tubes, which are prepared and analysed by Gradko (using the 20% TEA in water method). These include 14 located within

1 km of the H1 Development. Results for the years 2014 to 2019 (the latest year of monitoring data) are summarised in **Table 8.4** and the monitoring locations are shown in **Figure 8.3**.

Figure 8.3: Monitoring Locations

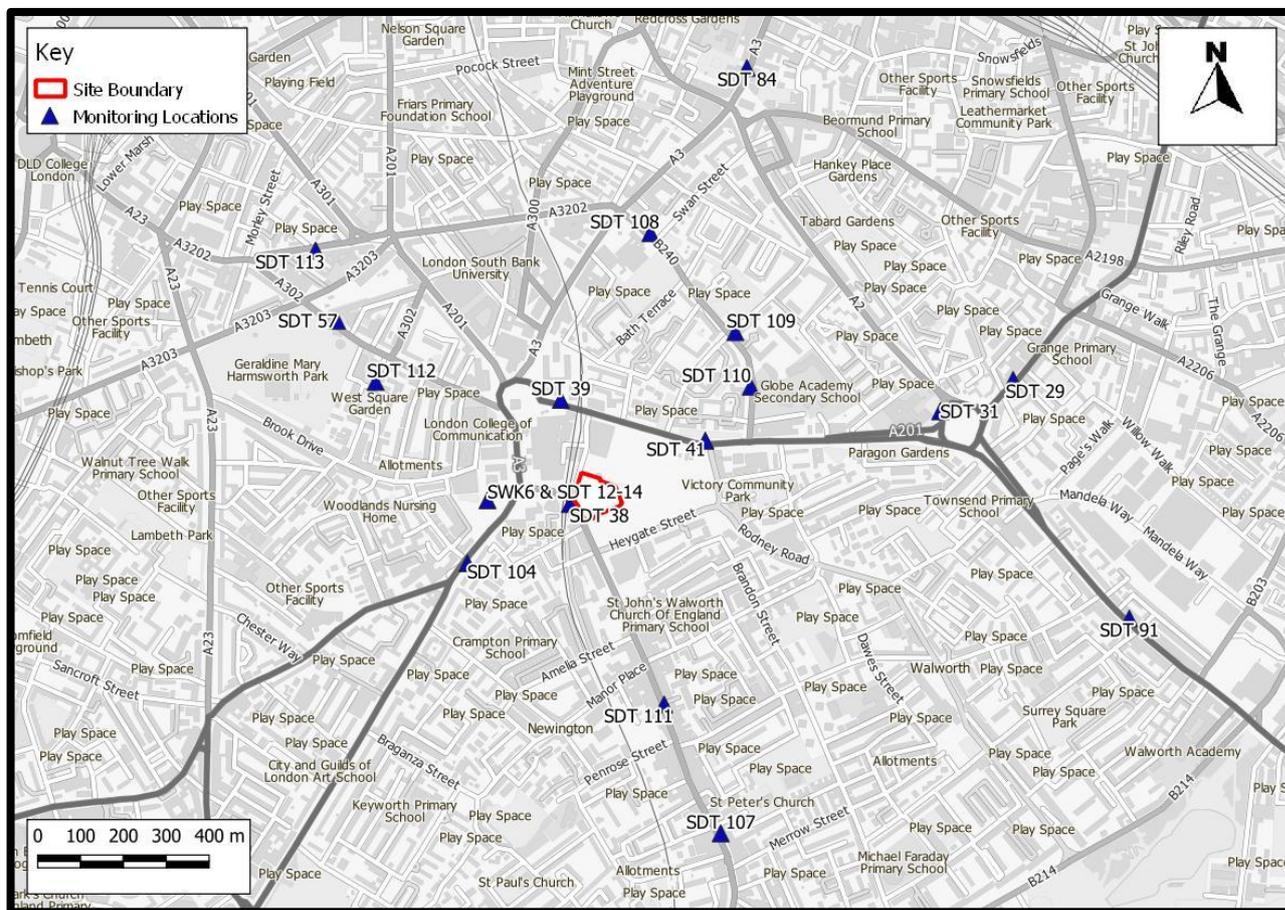


Table 8.4: Summary of NO₂ Monitoring (2014-2019) ^{a,b}

Site No.	Site Type	Location	2014	2015	2016	2017	2018	2019
Automatic Monitors – Annual Mean (µg/m ³)								
SWK6	Urban	Elephant	37.0	41.0	39.0	34.0	32.0	30.0
		Background and Castle						
Objective			40					
Automatic Monitors – No. of Hours > 200 µg/m ³								
SWK6	Urban	Elephant	0	0	0	0	0	0
		Background and Castle						
Objective			18					

Site No.	Site Type	Location	2014	2015	2016	2017	2018	2019
Diffusion Tubes – Annual Mean ($\mu\text{g}/\text{m}^3$)								
SDT12-14	Urban Background	AQMS Elephant and Castle	70.6	65.7	58.9	44.7	35.0	33.3
SDT29	Kerbside	Haddon Hall	72.1	68.4	72.2	75.4	57.0	50.4
SDT31	Kerbside	Bricklayers Arms	54.2	49.7	49.0	47.1	40.6	38.1
SDT38	Kerbside	Walworth Road	82.6	80.8	65.2	64.6	45.0	40.7
SDT39	Kerbside	3 New Kent Road	57.1	53.9	47.5	46.7	39.2	35.1
SDT41	Kerbside	29 New Kent Road	58.4	53.3	47.2	45.9	39.3	37.4
SDT57	Kerbside	Notre Dame School	-	-	54.5	46.8	40.6	35.5
SDT84	Kerbside	8 Little Dorritt Park	-	-	72.5	60.1	44.0	44.3
SDT91	Kerbside	221 Old Kent Road	-	-	-	69.4	61.9	56.0
SDT104	Kerbside	Newington Causeway	-	-	-	71.7	67.6	60.3
SDT107	Kerbside	351 Walworth Road	-	-	-	45.3	39.3	36.5
SDT111	Kerbside	Walworth Road	-	-	-	57.0	50.0	42.0
SDT112	Kerbside	3 West Square	-	-	-	32.3	27.9	25.5
SDT113	Kerbside	43 Westminster Bridge Road	-	-	-	76.3	61.7	57.9

Site No.	Site Type	Location	2014	2015	2016	2017	2018	2019
Objective			40					

Notes: ^a Data provided by LBS.

^b Exceedances of the objectives are shown in **bold**. Measured concentrations over 60 µg/m³, indicating a possible exceedance of the 1-hour mean objective, are shown in shaded grey. A proxy value of 60 µg/m³ can be used to assess the likelihood of the 1-hour mean NO₂ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 1-hour mean NO₂ objective are possible.

8.3.5 As shown in **Table 8.4**, exceedances of the annual mean objective have been recorded at all but one monitoring site since 2014, with seven sites recording exceedances in 2019. Concentrations over 60 µg/m³, (indicating possible exceedances of the 1-hour objective), have also been recorded at seven sites since 2014 but no sites exceeded 60 µg/m³ in 2019. A strong trend of decreasing measured concentrations is apparent at all sites from 2014 to 2019 and this is likely to continue in the near future as emission standards continue to tighten and further local and regional policy measures, such as the proposed ULEZ expansion in November 2021, are implemented (see **ES Volume 3, Appendix 8.5**).

8.3.6 The SWK6 automatic monitor also measures PM₁₀ concentrations. Results for the years 2014 to 2019 are summarised in **Table 8.5**. The results show that concentrations have remained well below the annual mean objective in all years since 2014, as have the number of daily mean concentrations which exceeded 50 µg/m³.

Table 8.5: Summary of PM₁₀ Monitoring (2014-2019)

			2014	2015	2016	2017	2018	2019
PM ₁₀ Annual Mean (µg/m ³)								
SWK6	Urban	Elephant	19.0	20.0	26.0	19.0	20.0	17.0
	Background	and Castle						
Objective			40					
PM ₁₀ – No. of Days > 50 µg/m ³								
SWK6	Urban	Elephant	0	1	21	1	2	14
	Background	and Castle						
Objective			35					

8.3.7 As detailed in LBS' 2019 Air Quality Annual Status Report, LBS plans to monitor PM_{2.5} concentrations in 2020. At the time of writing the ratified PM_{2.5} data for 2020 is unavailable, and are likely to be influenced by Covid-19 as such the monitored concentrations in Southwark have not been considered.

Exceedances of the EU Limit Values

- 8.3.8 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean NO₂ limit value. Furthermore, Defra’s roadside annual mean NO₂ concentrations, which are used to report exceedances of the limit value to the EU, identify exceedances of this limit value in 2019 along many roads in London, including the A3 and A201 near to the Site. The Greater London Urban Area has thus been reported to the EU as exceeding the limit value for annual mean NO₂ concentrations. Defra’s predicted concentrations for 2026, however, do not identify any exceedances within the Study Area. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the Site by the time that the H1 Development is operational.
- 8.3.9 Defra’s Air Quality Plan requires the GLA to prepare an action plan that will “*deliver compliance in the shortest time possible*”, and the 2015 Plan assumed that a Clean Air Zone (CAZ) was required. The GLA has already implemented a LEZ and a ULEZ, thus the authority has effectively already implemented the required CAZ. These have been implemented as part of a package of measures including 12 Low Emission Bus Zones, Low Emission Neighbourhoods, the phasing out of diesel buses and taxis and other measures within the Mayor’s Transport Strategy.

Background Concentrations

- 8.3.10 In addition to the locally measured concentrations, estimated background concentrations in the study area have been determined for 2019 and the anticipated opening year of 2026 using Defra’s 2018-based background maps. The background concentrations are set out in **Table 8.6** and have been derived as described in **ES Volume 3, Appendix 8.4**. The background concentrations are all expected to be below the objectives by the time the H1 Development is anticipated to be operational in 2026.

Table 8.6: Estimated Annual Mean Background Pollutant Concentrations in 2019 and 2026 (µg/m³)^a

Year	NO ₂	PM ₁₀	PM _{2.5}
2019	25.3 – 28.3	20.1 – 20.4	12.7 – 13.0
2026	20.1 – 23.2	18.4 – 18.7	11.6 – 12.0
Objectives	40	40	25 ^b

Notes: ^a Exceedances of the annual mean objective are highlighted in bold.

^b The PM_{2.5} objective, which is to be met by 2020, is a national target only and there is no provision for the objective in the Air Quality (England) Regulations 2008 (as amended.)

Future Baseline

8.3.11 Baseline concentrations of NO₂, PM₁₀ and PM_{2.5} have been modelled at each of the existing receptor locations (see **Figure 8.1** and **Table 8.2** for receptor locations). The results, which cover both the existing (2019) and future year (2026) baseline (Without H1 Development (but including traffic and Approved Development Energy Centre emissions relating to the rest of the Approved Development)), are set out in **Table 8.7** and **Table 8.8**. The modelled road components of nitrogen oxides, PM₁₀ and PM_{2.5} have been increased from those predicted by the model based on a comparison with local measurements (see **ES Volume 3, Appendix 8.4** for the verification methodology).

Table 8.7: Modelled Annual Mean Baseline Concentrations of NO₂ (µg/m³) at Existing Receptors ^a

Receptor	2019	2026 Without H1 Development
R1	39.1	29.4
R2	36.8	27.9
R3	36.7	27.7
R4	37.6	28.4
R5	33.7	25.8
R6	37.8	28.4
R7	35.1	26.7
R8	34.3	26.1
R9	37.4	28.3
Objective	40	

Notes: ^a Exceedances of the annual mean objective are highlighted in bold.

Table 8.8: Modelled Annual Mean Baseline Concentrations of PM₁₀ and PM_{2.5} (µg/m³) at Existing Receptors

Receptor	PM ₁₀		PM _{2.5}	
	2019	2026 Without H1 Development	2019	2026 Without H1 Development
R1	23.2	21.5	14.6	13.5
R2	22.8	21.0	14.4	13.2
R3	22.7	21.0	14.3	13.2
R4	23.1	21.3	14.5	13.4
R5	22.2	20.5	14.0	12.9
R6	23.3	21.6	14.7	13.5
R7	22.4	20.7	14.2	13.0
R8	22.2	20.5	14.0	12.9
R9	22.9	21.2	14.5	13.3
Objective	32 ^a		25 ^b	

Notes: ^a While the annual mean PM₁₀ objective is 40 µg/m³, 32 µg/m³ is the annual mean concentration above which an exceedance of the 24-hour mean PM₁₀ objective is possible, as outlined in LAQM.TG16. A value of 32 µg/m³ is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM₁₀ objective, as recommended in EPUK & IAQM guidance.

^b The PM_{2.5} objective, which is to be met by 2020, is a national target only and there is no provision for the objective in the Air Quality (England) Regulations 2008 (as amended.)

2019 Baseline

8.3.12 As shown in **Table 8.7**, the predicted annual mean concentrations of NO₂ are below the objective at all receptor locations in 2019. The annual mean NO₂ concentrations are below 60 µg/m³ at all receptors; it is, therefore, unlikely that the 1-hour mean NO₂ objective will be exceeded.

8.3.13 **Table 8.8** shows the annual mean concentrations of PM₁₀ and PM_{2.5} are predicted to be well below the objectives in 2019 at all receptors. The annual mean PM₁₀ concentrations are below 32 µg/m³ and it is, therefore, unlikely that the 24-hour mean PM₁₀ objective will be exceeded.

2026 Baseline

- 8.3.14 As shown in **Table 8.7**, the predicted annual mean concentrations of NO₂ are below the objective at all receptor locations. The annual mean NO₂ concentrations are below 60 µg/m³ at all receptors; it is, therefore, unlikely that the 1-hour mean NO₂ objective will be exceeded. **Table 8.8** shows all of the predictions for PM₁₀ and PM_{2.5} are well below the objectives. The annual mean PM₁₀ concentrations are below 32 µg/m³ and it is, therefore, unlikely that the 24-hour mean PM₁₀ objective will be exceeded.
- 8.3.15 At all receptor locations, concentrations of NO₂, PM₁₀ and PM_{2.5} are expected to decrease significantly between 2019 and 2026, primarily due to the gradual introduction of newer vehicles operating to more stringent emissions standards.

8.4 Likely Effects of the H1 Development and their Significance

The Completed and Operational H1 Development

Traffic Impacts

- 8.4.1 Predicted annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} in 2026 are set out in **Tables 8.9 to 8.11** for both the “Without H1 Development” and “With H1 Development” scenarios and take account of emissions from the adjacent road network. Emissions from the Approved Development Energy Centre are included in both the ‘Without H1 Development’ and ‘With H1 Development’ scenarios, because it forms part of the future baseline. These tables also describe the impacts at each receptor using the impact descriptors given in **Table 8.3**.

Table 8.9: Predicted Impacts on Annual Mean NO₂ Concentrations in 2026 (µg/m³)

Receptor	Without H1 Development	With H1 Development	%AQAL ^a	Impact Descriptor
R1	29.4	29.4	0	Negligible
R2	27.9	27.9	0	Negligible
R3	27.7	27.7	0	Negligible
R4	28.3	28.4	0	Negligible
R5	25.8	25.9	0	Negligible
R6	28.4	28.5	0	Negligible
R7	26.7	26.7	0	Negligible
R8	26.1	26.1	0	Negligible
R9	28.3	28.4	0	Negligible
Objective	40		-	-

Notes: ^a % changes are relative to the objective and have been rounded to the nearest whole number.

Table 8.10: Predicted Impacts on Annual Mean PM₁₀ Concentrations in 2026 (µg/m³)

Receptor	Without H1 Development	With H1 Development	%AQAL ^a	Impact Descriptor
R1	21.5	21.5	0	Negligible
R2	21.0	21.0	0	Negligible
R3	21.0	21.0	0	Negligible
R4	21.3	21.3	0	Negligible
R5	20.5	20.5	0	Negligible
R6	21.6	21.6	0	Negligible
R7	20.7	20.7	0	Negligible
R8	20.5	20.5	0	Negligible
R9	21.2	21.2	0	Negligible
Objective	32 ^b		-	-

Notes: ^a % changes are relative to the objective and have been rounded to the nearest whole number.

^b While the annual mean PM₁₀ objective is 40 µg/m³, 32 µg/m³ is the annual mean concentration above which an exceedance of the 24-hour mean PM₁₀ objective is possible, as outlined in LAQM.TG16. A value of 32 µg/m³ is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM₁₀ objective, as recommended in EPUK & IAQM guidance.

Table 8.11: Predicted Impacts on Annual Mean PM_{2.5} Concentrations in 2026 (µg/m³)

Receptor	Without H1 Development	With H1 Development	%AQAL ^a	Impact Descriptor
R1	13.5	13.5	0	Negligible
R2	13.2	13.2	0	Negligible
R3	13.2	13.2	0	Negligible
R4	13.4	13.4	0	Negligible
R5	12.9	12.9	0	Negligible
R6	13.5	13.5	0	Negligible
R7	13.0	13.0	0	Negligible
R8	12.9	12.9	0	Negligible
R9	13.3	13.3	0	Negligible
Objective	25 ^b		-	-

Notes: ^a % changes are relative to the objective and have been rounded to the nearest whole number.

^b The PM_{2.5} objective, which is to be met by 2020, is a national target only and there is no provision for the objective in the Air Quality (England) Regulations 2008 (as amended).

NO₂

- 8.4.2 As shown in **Table 8.9** the annual mean NO₂ concentrations are well below the objective at all existing sensitive receptors, with and without the H1 Development. Furthermore, as the annual mean NO₂ concentrations are below 60 µg/m³, it is unlikely that the 1-hour mean NO₂ objective will be exceeded.
- 8.4.3 The percentage changes in concentrations, relative to the air quality objective (when rounded), are predicted to be zero at all receptors. Using the matrix in **Table 8.3**, these impacts are described as negligible, the effects are '**not significant**'.
- 8.4.4 The changes to the LEZ and ULEZ described in **ES Volume 3, Appendix 8.1**, which the Mayor of London has confirmed are to be implemented, will result in significant reductions in NO_x emissions across London. It has not, however, been possible to account for these in this assessment. Consequently, the results for NO₂ presented in **Table 8.9** are likely to represent a significant over-prediction in terms of total concentrations (see Paragraph 8.2.30 and **ES Volume 3, Appendix 8.51**).

PM₁₀ and PM_{2.5}

- 8.4.5 **Table 8.10** and **Table 8.11** show the annual mean PM₁₀ and PM_{2.5} concentrations are well below the relevant criteria at all existing sensitive receptors, with or without the H1 Development. Furthermore, as the annual mean PM₁₀ concentrations are below 32 µg/m³, it is unlikely that the 24-hour mean PM₁₀ objective will be exceeded.
- 8.4.6 The percentage changes in both PM₁₀ and PM_{2.5} concentrations, relative to the applied annual mean criteria (when rounded), are predicted to be zero at all receptors. Using the matrix in **Table 8.3**, these impacts are described as negligible and therefore the effects are '**not significant**'.
- 8.4.7 As discussed in paragraph 8.2.12, the new London Plan aims to achieve the WHO target for PM_{2.5} of 10 µg/m³ by 2020. As shown in **Table 8.11** in 2026, whilst the predicted annual mean PM_{2.5} concentrations exceed the WHO target at all modelled receptors (maximum predicted concentration as 13.5 µg/m³ at Receptors R1 and R6), the contribution from the H1 Development is less than 0.05 µg/m³ and the change is considered negligible. Given that the H1 Development does not increase PM_{2.5} concentrations at the modelled receptors considered, the effects are considered '**not significant**'.

Impacts of the Proposed Life- Safety Diesel Generators

- 8.4.8 The H1 Development will include a 910 kVA life-safety diesel generator and a 1000 kVA life-safety standby diesel generator, both to be located on the roof of the building. The generators will be used for the provision of essential power only in the event of complete power cut to the building. Routine testing of the emergency generator will be required, however it is anticipated that this will be limited to 2-5 minutes per month and 2-4 hours once a year.
- 8.4.9 The emergency generator flues will terminate above roof level, greater than 86 m AOD; they are located well away from any air quality sensitive uses. As such, given the good dispersion environment, the location of the flue, and infrequent use, the effects of emissions associated with the maintenance of the generators are judged to be **insignificant** with regards to both existing sensitive receptors in the local area as well as future users of the H1 Development, hence quantitative modelling is not required.
- 8.4.10 The technical specifications of the final generators to be installed within the H1 Development will be agreed with LBS prior to commencement and secured through a relevant planning condition.

Significance of Operational Air Quality Effects

- 8.4.11 The operational air quality effects without mitigation in 2026 are judged to be '**not significant**'. This professional judgement is made in accordance with the methodology set out in **ES Volume 3, Appendix 8.2**, and takes account of the assessment that pollutant concentrations at all of the selected worst-case existing receptors along the local road network will be below the air quality objectives, and the magnitude of all of the impacts are predicted to be negligible.

Site Suitability

8.4.12 Predicted air quality conditions for future retail occupants of the H1 Development, taking account of emissions from the adjacent road network and the Approved Development Energy Centre, are set out in **Table 8.12**. Consequently, concentrations of NO₂ at all locations are all well below 60 µg/m³, meaning there will be no exceedances of the 1-hour mean NO₂ objective, to which the ground floor retail and public realm receptors are sensitive. Air quality for future retail occupants of the H1 Development will thus be acceptable.

Table 8.12: Predicted Impacts on Annual Mean NO₂ Concentrations in 2026 (µg/m³)

Receptor	NO ₂
P1	26.9
P2	27.2
P3	27.2
Objective	60

8.4.13 The assessment has demonstrated that the Site allocated for the H1 Development is suitable for office, commercial mixed use and public realm uses, with respect to air quality.

Food and Drink Uses

8.4.14 The H1 Development includes a small amount of flexible use, which could include food and drink uses. Given the proposed location for food and drink uses is to the north of the H1 Development adjacent to The Park, it is considered any cooking odours would be dispersed and diluted away from any odour sensitive uses. As such, given the location of the flexible retail uses, the magnitude of impacts from odours are predicted to be negligible and the effect **not significant**.

'Air Quality Neutral'

Building Emissions

8.4.15 The H1 Development will be connected to the centralised Approved Development Energy Centre located in Plot H12 of the Approved Development within the Masterplan Site. The life-safety diesel generators are exempt from the Air Quality Neutral Calculations. Consequently, building emissions are therefore expected to be well below the Total Building Emissions Benchmarks (BEBs), thus the H1 Development is better than air quality neutral in terms of building emissions.

Road Transport Emissions

- 8.4.16 The Transport Emissions Benchmarks (TEBs) are based on the number of light vehicle trips generated by different land-use classes, together with the associated trip lengths and vehicle emission rates. The guidance also provides an alternative methodology, based on trip rates only, and this has been followed in considering the ‘air quality neutrality’ of the H1 Development in terms of transport emissions.
- 8.4.17 The H1 Development mainly comprises office space with a small amount of flexible use office/retail/services/food and drink/medical and health space. As the final use was not known, it was assumed that the entire H1 Development comprised office space, which is a conservative (worst case) approach as this has the lowest benchmark trip rate.
- 8.4.18 **Table A7.6** in **ES Volume 3, Appendix 8.6** provides default trip rates for different development categories. This information has been used to calculate a benchmark trip rate for the H1 Development in **Table 8.13**. This has then been compared with the actual trip rate of the H1 Development.

Table 8.13: Calculation of Transport Benchmark Trips Rates for the H1 Development

Description	Value	Reference
A Gross Internal Floor Area of Office (m ²)	58,032	ES Volume 1, Chapter 5
B Benchmark Trip Rate (trips/m ² /annum)	4	Table A6.6 in ES, Volume 3, Appendix 8.6
Benchmark Trip Rate (trips/annum)	232,128	A x B

- 8.4.19 According to the Applicant’s Transport Consultant, the H1 Development is anticipated to generate 10,954 car trips per year. The Total Trip Rate of the H1 Development is substantially lower than the Total Trip Rate Benchmark of 232,128 trips/annum. As such, the H1 Development is ‘air quality neutral’ in terms of transport emissions.

‘Air Quality Positive’

- 8.4.20 The air quality positive approach, as outlined in Policy SI 1 (C) of the London Plan, is designed to ensure large-scale developments deliver maximum air quality benefits and improvements, and incorporate best practice and good design measures to reduce exposure to air pollution as far as possible. The EPUK/IAQM guidance¹² also advises that good design and best practice measures should be considered whether or not specific mitigation is required.
- 8.4.21 Whilst the supporting guidance on Air Quality Positive is yet to be published, the H1 Development incorporates the following measures that contribute towards an air quality positive development:
- Setback of the H1 Development from Walworth Road.

- Retention of the existing trees along with further landscape planting along the edge of Walworth Road, to act as a screen from vehicle emissions.
- AA car free development other than allocated accessible spaces. .
- Framework Travel Plan setting out measures to be adopted, to encourage use of sustainable modes of transport to and from the H1 Development.
- Provision of pedestrian and cycle routes.
- 96 cycle parking spaces provided within the public realm and a further 855855 spaces provided in the basement levels of the H1 Development.
- Connection to the Approved Development Energy Centre.

8.4.22 The design of the H1 Development has thus minimised both pollutant emissions and exposure of future occupants.

8.5 Additional Mitigation / Enhancement and Likely Residual Effects of the H1 Development and their Significance

The Completed and Operational H1 Development

8.5.1 The assessment has demonstrated that the H1 Development will not cause any exceedances of the air quality objectives and that the overall air quality effect of the H1 Development will be 'not significant'. As such, there is no requirement for mitigation and the residual effects would remain **not significant**.

8.5.2 Whilst the impact of kitchen odour within the H1 Development are predicted to be not significant, it is noted that any kitchen ventilation extracts would be designed in accordance with best practice design and appropriate regulations. This would be secured by a suitably worded planning condition. As such, the residual effects would remain **not significant**.

8.5.3 Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European UK legislation. The local air quality plan that the GLA is required to produce in order to address limit value exceedances in its area will also help to improve air quality. The proposed changes to the LEZ and ULEZ can reasonably be expected to lead to significant improvements. LBS' Air Quality Action Plan will also be helping to deliver improved air quality.

8.6 Likely Residual Cumulative Effects and their Significance

8.6.1 The traffic data used for the assessment of the 2026 'With H1 Development' scenario incorporates traffic associated with all cumulative schemes which would affect flows on the roads included in this assessment. As such, predictions of future pollutant concentrations presented in this Chapter take account of cumulative effects.

- 8.6.2 Operational effects, which inherently include the cumulative schemes, have been shown to be '**not significant**' in relation to road traffic emissions.
- 8.6.3 As discussed in 8.4.14, the proposed food and drink use space is not located in proximity to any other potential sources of emissions and away from and sensitive receptors. Any off-site kitchen ventilation extracts would be designed in accordance with best practice design and appropriate regulations, and the use agreed with LBS. Taking account of kitchen odour regulations no cumulative residual impacts are expected.

8.7 Conclusions

- 8.7.1 The air quality in the area of the Site is relatively poor, particularly along main roads such as Walworth Road and the A201 close to the H1 Development. An assessment was undertaken to determine both the likely effects of the H1 Development on local air quality and the suitability of the Site for the proposed uses within the H1 Development.
- 8.7.2 Air quality dispersion modelling has been carried out to predict the impacts of additional road traffic on local roads, resulting from the operation of the H1 Development, as well as the expected concentrations of key pollutants at sensitive receptors within the H1 Development. The assessment has considered emissions from the Approved Development Energy Centre located in the Approved Development and traffic in relation to the Approved Development.
- 8.7.3 The operation of the H1 Development is not predicted to result in any significant effects on the receptors considered within this assessment in relation to air quality. In addition, the assessment demonstrated that air quality for future users of the H1 Development would also be acceptable.
- 8.7.4 The H1 Development includes a small amount of flexible use, which could include food and drink uses. Based on the proposed location of these uses within the H1 Development, any cooking odours would be dispersed and diluted away from any odour sensitive uses. In addition, any kitchen ventilation extracts would be designed in accordance with best practice design and appropriate regulations. As such any odours from the H1 Development would also be acceptable.
- 8.7.5 The cumulative effects assessment has identified that the conclusions will not change or be worse than that of the main assessment.
- 8.7.6 Overall, the operational phase of H1 Development will have no -significant effect on air quality. In addition, no significant cumulative effects are likely.

9. Wind Microclimate

9.1 Introduction

9.1.1 This Chapter sets out the likely significant effects of the H1 Development upon wind microclimate. It has been prepared by RWDI. This Chapter is supported by further detailed information contained within **Appendix 9.1: Legislative and Planning Policy Context**, and **Appendix 9.2: Wind Microclimate Technical Report**.

9.2 Assessment Methodology and Significance Criteria

Assessment Methodology

Baseline

9.2.1 The baseline conditions across the existing Site and the surroundings have been defined using wind tunnel testing to provide a detailed, quantitative assessment. The baseline conditions are reflected within the wind scenario – ‘Configuration 1: Existing Site + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings’ (also referred as the ‘Future Baseline Scenario’). Configuration 1 therefore includes Plots H2 to H7, H10, H11a, H11b, H12, H13, and PAV1 of the Approved Development.

9.2.2 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)) at locations across the existing Site and at other surrounding buildings, paths, roads and areas of open spaces for 36 wind directions in 10° increments within a 360m radius of the Site which is considered a large enough scale to ensure all wind effects are captured. Details of the tunnel test methodology is presented in the section ‘Wind Tunnel Test Methodology’ of this ES Chapter.

9.2.3 The results have been combined with long-term meteorological climate data for the London area (Heathrow and London City Airports). 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 within ‘Relevant Baseline Conditions – Meteorological Data’ section and shown in **Figure 9.1**.

9.2.4 Further detail on the wind tunnel testing methodology can be found in **Appendix 9.2: Wind Microclimate Technical Report**.

The Works

9.2.5 The potential microclimate effects during the Works are assessed using the professional judgement of an experienced wind engineer, based on an assessment of the background wind climate at the 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.

- 9.2.6 This approach is 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 H1 Development is completed and occupied (which would include new building entrances and outdoor seating with amenity spaces, for example). Windier conditions (in terms of pedestrian comfort) will be tolerable across the active construction site as this area is not for typical pedestrian use (see section 'Assumptions and Limitations' below).

Assumptions and Limitations

- 9.2.7 It is assumed that there will be restricted access (i.e. not accessible to the general public) across the Site during the Works, and therefore windier conditions will be tolerable as the area is not for typical pedestrian use where the tolerable wind speed threshold would be lower.

Completed and Operational H1 Development

- 9.2.8 To predict the local wind environment associated with the completed H1 Development, and the resulting pedestrian comfort within and in the area surrounding the Site, wind tunnel testing of the H1 Development has been undertaken within the wind tunnel.
- 9.2.9 Wind tunnel testing allows the pedestrian level wind microclimate at and surrounding the Site to be quantified and classified in accordance with the accepted criteria (refer to 'Assessment Criteria' section of this ES Chapter).
- 9.2.10 Wind tunnel testing delivers a detailed assessment of the mean and gust wind conditions in and around the Site for the tested wind directions in terms of pedestrian comfort and safety and provides a basis to assess the potential wind microclimate impacts and likely effects of the H1 Development with regards to its intended use.
- 9.2.11 It is acknowledged that a direct comparison between the completed H1 Development and the baseline conditions would be useful to understand changes from the baseline wind conditions across the Site due to the H1 Development. However, changes in pedestrian activity usually accompany a development (for example the introduction of new amenity spaces) and a direct comparison would not take these changes into account. Therefore, comparisons between the baseline scenario and 'completed H1 Development' scenario have been made where possible.

Wind Tunnel Testing Methodology

- 9.2.12 The methodology for quantifying the pedestrian level wind environment is outlined below within four steps. Further details of the assessment methodology are presented within **Appendix 9.2: Wind Microclimate Technical Report**.
- Step 1: The site's induced wind speeds are measured for the appropriate configuration(s) at the appropriate pedestrian level(s) in the wind tunnel.

- Step 2: Standard meteorological data is adjusted to account for conditions at a subject site (for this assessment, meteorological data has been derived from the meteorological stations at two London airports (Heathrow and London City Airports)).
- Step 3: Data from Step 1 and Step 2 is combined to obtain the expected frequency and magnitude of wind speed for the appropriate configuration(s) and at the appropriate pedestrian level(s).
- Step 4: The results of Step 3 are compared with the Lawson Comfort Criteria (and where relevant, the change in the wind microclimate conditions between appropriate test configuration(s)) to 'grade / score' the conditions within and around the site.

9.2.13 To produce the results within the wind tunnel, a 1:300 scale model comprising the Site and the surrounding area (including relevant existing buildings and other topographical features) was constructed on a 2.4m diameter disc allowing for the surrounding area within a 360 metre (m) radius of the centre of the H1 Development to be modelled (the radius is determined based on the scale model and due to the physical constraints of the modelling in the wind tunnel). This radius is considered a large enough scale to ensure all likely wind effects are captured.

9.2.14 Wind is unsteady, or gusty, and this 'gustiness' or turbulence, varies depending upon the Site. In order to model the likely effects of gustiness or turbulence (which depends on the geographical location), a series of grid, barrier and floor roughness elements have been employed in the wind tunnel in order to create a 'boundary layer' that is representative of the urban location of the Site. The detailed wind tunnel model around the H1 Development is used to fine-tune the flow and create conditions similar to those expected at full scale.

9.2.15 Other developments outside the 360m radius of the Site would not be expected to modify the wind approaching the Site and as such have not been included within the analysis of the surrounding terrain.

9.2.16 To test the impact of the H1 Development, a scale model of the building comprising the completed H1 Development has been constructed (Configuration 2: The H1 Development + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings).

9.2.17 Wind speed measurements within and around the Site for the tested configurations were established using 'Irwin probes'. These sensors are able to measure the mean and gust wind speeds at a full-scale height of approximately 1.5m above the surface upon which the probe is located.

9.2.18 The wind speed was measured at up to 200 locations under the configurations for all wind directions in equal increments, with 0° representing wind blowing from the north and 90° wind from the east and so on.

Model Configurations Tested

9.2.19 The assessment of the wind microclimate is based on the results from a series of tests of physical models within the wind tunnel to provide a detailed, quantitative assessment. Each configuration was initially assessed devoid of landscaping on-site / associated with the H1 Development, in order to consider a worst-case scenario.

9.2.20 Configurations tested within the wind tunnel include:

- Configuration 1: The Existing Site + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings (i.e. the likely future baseline).
- Configuration 2: H1 Development + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings.
- Configuration 3: H1 Development + the Approved Development (except for Plot H1 in its outline consented form) with Existing and Cumulative Surrounding Buildings.

9.2.21 Cumulative schemes identified within the 360m radius of the Site, that are tall enough to have the potential to significantly affect wind, assessed in the wind tunnel model are:

- Shopping Centre Site Elephant and Castle (ref. 16/AP/4458).
- 5-9 Rockingham Street (ref. 19/AP/0750).
- 136-142 New Kent Road (ref. 19/AP/7564).

Lawson Comfort Criteria

9.2.22 The assessment of the wind conditions requires a standard against which the measurements can be compared. The assessment of the wind tunnel results presented in this ES Chapter adopts the Lawson Comfort Criteria ('the Lawson Criteria'), which have been established for over 30 years.

9.2.23 The Lawson Criteria described in **Table 9.1** is presented to define the reaction of an average pedestrian to the wind. 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.

9.2.24 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.

9.2.25 The coloured key in **Table 9.1** corresponds to the presentation of wind tunnel test results.

Table 9.1: Lawson Comfort Criteria

Key	Comfort Category	Threshold	Description
	Uncomfortable	>10 m/s	Winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.
	Walking	8-10 m/s	Relatively high speeds that can be tolerated if the objective is to walk, run or cycle without lingering.
	Strolling	6-8 m/s	Moderate breezes that would be appropriate for strolling along a city/town centre street, plaza or park.
	Standing	4-6 m/s	Gentle breezes suitable for main building entrances, pick-up/drop-off points and bus stops.
	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.

Target Wind Conditions

- 9.2.26 For a mixed-use urban environment, such as the H1 Development and surrounding area, the desired wind microclimate would typically need to have areas suitable for sitting, standing use and strolling (**Table 9.1**).
- 9.2.27 The walking and uncomfortable classifications may be acceptable in isolated areas, but these classifications are also associated with occasional strong winds (which are described below) and so the aim has been to avoid conditions in these categories.

Amenity Areas

- 9.2.28 The target condition for seating in amenity areas is a wind microclimate that is suitable for sitting during the summer season. This is because these areas are more likely to be frequently used during the summer when pedestrians would expect to be able to sit comfortably. If an area is classified as suitable for sitting in the summer, the windier conditions that occur during the winter season usually mean that the area would be classified as suitable for standing in the windiest season, unless additional shelter was provided. For larger amenity spaces, a mix of sitting and standing use wind conditions would be targeted (except where seating is situated which would require a sitting use wind condition).
- 9.2.29 Large amenity spaces and upper level terraces are assessed on the basis that these are amenity spaces intended for good-weather use only. Sitting or standing conditions during the summer would be acceptable in these areas, with standing conditions in areas with no fixed seating.

Entrances

- 9.2.30 Near building entrances, a wind environment suitable for standing or calmer is desired, as pedestrians will transition from the calm indoors to the windier outdoors throughout the year. The assessment for building entrances therefore focuses on the windiest season result. Strolling use wind conditions during the windiest season at secondary entrances such as fire exit or maintenance access are considered acceptable, as these entrances are expected to be used less frequently than a main entrance.
- 9.2.31 In an entrance which is recessed, the recessed zone provides a transition area for pedestrians exiting the building. If strolling conditions are observed on the pavement outside a recessed entrance, acceptable standing conditions would be expected at the recessed entrance.

Thoroughfares

- 9.2.32 A pedestrian thoroughfare should be suitable for strolling during the windiest season. The assessment for pedestrian thoroughfares therefore focuses on the windiest season result.
- 9.2.33 Localised occurrence of walking conditions may be acceptable in areas with limited footfall, or service areas, as long as the strong wind criteria (see section 'Strong Winds') is not exceeded.

Bus Stops

- 9.2.34 Bus stops should be suitable for standing use or calmer wind conditions during the windiest season.

Crossings

- 9.2.35 Pedestrian crossings should be suitable for walking use or calmer wind conditions during the windiest season.

Roadways

- 9.2.36 The Lawson Criteria does not specify criteria for acceptable wind conditions for cyclists; however, the occurrence of winds exceeding the strong winds threshold (as described below) would be considered unsuitable for cyclists. The assessment for roadways focusses on the windiest season.

Strong Winds

- 9.2.37 The Lawson Criteria also specifies a strong wind threshold when winds exceed 15m/s for more than 0.025% of the time (approximately 2.2 hours of the year). Exceedance of this threshold may indicate a need for remedial measures or a careful assessment of the expected use of that location; e.g. is it reasonable to expect older adults or young children to be present at the location on the windiest day of the year?
- 9.2.38 Wind Speeds that exceed 20m/s for more than 0.025% of the time (approximately 2 hours of the year) represent a safety issue for all members of the population, which would require mitigation to provide an appropriate wind microclimate environment.

9.2.39 Strong winds are generally associated with areas which would be classified as acceptable for walking or as uncomfortable. In a mixed-use urban development scheme, 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.

Assumptions

9.2.40 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 terraces on the elevated levels of the H1 Development. This complies with the standard methodology set out by Lawson for wind-microclimate assessments.

9.2.41 It is expected that use of outdoor amenity spaces and rooftop terraces for sitting will be limited to the summer season. During the winter, it would be expected that these spaces would increase a criteria level to standing use.

Methodology for Defining Effects

Receptors and Receptor Sensitivity

9.2.42 The sensitivity of receptors is related to the intended pedestrian usage at each location; there are no definitions for sensitivity, as the important consideration is whether the wind conditions experienced at a particular receptor location are suitable for the intended use (in terms of comfort and strong winds) at that particular location. All receptors are considered to be highly sensitive to the local wind microclimate conditions and are given an equal weighting.

9.2.43 The wind conditions are compared with the intended pedestrian use. With respect to the Site itself, sensitive receptors will include the following locations (where present on the H1 Development) with the required wind conditions specified for each use:

9.2.44 Configurations tested within the wind tunnel include:

- Thoroughfares – targeting strolling wind conditions.
- Entrances – targeting standing wind conditions.
- Amenity spaces – targeting sitting to standing wind conditions during the summer season.

9.2.45 In addition, the wind conditions in the surrounding area will also be considered within the area that would potentially be influenced by the H1 Development. For sensitive receptors surrounding the Site, consideration will be given to the uses listed above where appropriate, as well as:

- Pedestrian crossings – targeting walking wind conditions.
- Bus stops – targeting standing wind conditions.

- Roadways – targeting walking wind conditions.

Receptors

9.2.46 In assessing the wind microclimate there are no definitions for the sensitivity of receptors, with each receptor being highly sensitive to changes to the local wind microclimate conditions. Receptors likely to be affected by the H1 Development include all pedestrians using/visiting the H1 Development and the surrounding areas, as well as pedestrians and cyclists on surrounding thoroughfares, retained entrances to the H1 Development and those of surrounding buildings and surrounding amenity spaces, including café spill out space and outdoor seating.

9.2.47 There is an overall total of 200 measurement locations (refer to **Table 9.2**) across the H1 Development and surrounding area, which have been assessed. The locations of the probes are fixed onto the model and have been determined on the basis of professional judgement based on examination of architectural drawings, reflecting the use of the H1 Development.

9.2.48 The following description of receptor categories for the Site and the approach taken to the allocation of the probe locations to the categories is as follows:

On Site:

- Pedestrian Thoroughfares: includes areas that are immediately adjacent to the H1 Development (i.e. within 5m of the building line). This also includes thoroughfares within the H1 Development.
- Entrances: includes entrances at ground level.
- Amenity areas: ground floor and roof terrace (includes terraces located on the upper levels of the buildings).

Off Site:

- Includes all receptors falling outside the definition of the boundary of Site, such as along roadways and entrances to the surrounding buildings.

Table 9.2: Likely Resource / Receptor

Receptor Type (Season)	Receptor Reference (Probe Measurement Numbers)
Configuration 1:	
On-Site	
Pedestrian	48-56, 60, 62, 64, 65, 88, 90-93, 95, 96, 103-105, 107, 117-125, 128-132, 139-142, 154-156, 158-
Thoroughfares (Windiest)	160, 165, and 167-172
Crossings (Windiest)	N/A
Entrances (Windiest)	N/A

Receptor Type (Season)	Receptor Reference (Probe Measurement Numbers)
Roadway (Windiest)	N/A
Ground Floor Amenity (Summer)	N/A
Off Site	
Pedestrian Thoroughfares (Windiest)	1, 10-14, 19-26, 29, 31-35, 37, 40-47, 57-59, 61, 63, 66-76, 79-82, 85-87, 110, 115, 145, 146, 150, 161, 166, and 173
Crossings (Windiest)	116
Entrances (Windiest)	2-9, 15, 16-18, 27, 28, 30, 36, 38, 39, 77, 84, 101, 102, 126, 134-137, 147-149, 151-153, 162, and 163
Bus Stops (Windiest)	111, 144, and 145
Roadway (Windiest)	78, 83, 94, 100, 108, 109, 112-114, 127, 133, 138, and 143
Ground Floor Amenity (Summer)	N/A
Configurations 2 and 3:	
On-Site	
Pedestrian Thoroughfares (Windiest)	48, 50, 52, 60, 62, 64, 65, 88, 90-93, 95, 96, 98, 99, 107, 117, 119-125, 128-132, 139-142, 154, 156, 158-160, 165, 167, 171, and 172
Crossings (Windiest)	N/A
Entrances (Windiest)	56, 89, 97, 104, 118, 155, 168, 169, and 173
Roadway (Windiest)	N/A
Ground Floor Amenity (Summer)	49, 51, 53-55, 103, 105, and 170
Upper Level Amenity (Summer)	174-200
Off Site	
Pedestrian Thoroughfares (Windiest)	1, 10-14, 19-26, 29, 31-35, 37, 40-47, 57-59, 61, 63, 66-76, 79-82, 85-87, 110, 115, 145, 146, 150, 161, 166, and 173
Crossings (Windiest)	116

Receptor Type (Season)	Receptor Reference (Probe Measurement Numbers)
Entrances (Windiest)	2-9, 15, 16-18, 27, 28, 30, 36, 38, 39, 77, 84, 101, 102, 126, 134-137, 147-149, 151-153, 162, and 163
Bus Stops (Windiest)	111, 144, and 145
Roadway (Windiest)	78, 83, 94, 100, 108, 109, 112-114, 127, 133, 138, and 143
Ground Floor Amenity (Summer)	N/A

Magnitude of Impact

9.2.49 The magnitude of impact for all receptors are defined as high. The impact of all receptors is consistent (in respect of the specific wind direction and speed defined by standard meteorological data) and the effect at each probe location is in accordance with the Lawson Comfort Criteria, described in **Table 9.1**. The impacts to all receptors are the same, as any receptor which has wind conditions windier than required for the intended use will require mitigation, regardless of location.

Defining the Effect

9.2.50 The criteria used in the assessment of both potential and residual effects is based upon the relationship between the desired pedestrian use of an area of the H1 Development and its immediate surroundings (based on the categories defined by the Lawson Comfort Criteria) and the predicted wind conditions at that area. This also allows for the assessment to account for any change in pedestrian activity that might arise because of the H1 Development.

9.2.51 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.

9.2.52 A seven-point scale has been used within this assessment to assess the scale and nature of an effect:

- **Major Beneficial:** wind conditions are three categories calmer than required.
- **Moderate Beneficial:** wind conditions are two categories calmer than required.
- **Minor Beneficial:** wind conditions are one category calmer than required.
- **Insignificant:** wind conditions are those required.
- **Minor Adverse:** wind conditions are one category windier than required.

- **Moderate Adverse:** wind conditions are two categories windier than required.
- **Major Adverse:** wind conditions are three categories windier than required.

9.2.53 The minor, moderate and major categories indicate the degree of the difference between the desired microclimate and the predicted (measured) microclimate. As an example, if the desired wind conditions at a particular location are required to be suitable for standing, but the predicted wind conditions are suitable for strolling, the difference between the desired and predicted wind condition is one category windier than desired. In this case, the scale of the effect would be identified as minor adverse.

9.2.54 Any adverse effect is a 'significant effect' because it implies that a location, or area, has a wind microclimate that is unsuitable for the desired use of that area. On this basis, effects that are adverse need mitigating.

9.2.55 Beneficial effects (minor, moderate and major) as well as insignificant effects are not considered significant as they do not require wind mitigation measures. Significant effects are those where further wind mitigation measures are required.

9.2.56 Effects during the Works are direct, local and short-term (temporary). Effects once the H1 Development is completed are direct, local and long-term (permanent). The geographical extent of the wind microclimate is expected to be within the Site and its immediate surroundings, i.e. a local impact, for all receptors.

9.2.57 Strong winds (affecting pedestrian safety) are not assigned a scale of effect and so overall significance but are reported separately, as any strong wind exceedance is significant and cannot be scaled to major / moderate / minor. Where strong winds occur, mitigation is required (as per adverse effects related to pedestrian comfort).

Off-site locations

9.2.58 Based on the results of the wind tunnel testing and taking the baseline conditions into consideration, the likely effect at particular locations off-site have also been determined.

9.2.59 Should an off-site location be windier than required for the intended use with the H1 Development in situ, but these wind conditions also occur in the baseline (existing or evolved baseline scenario as relevant), this would represent an insignificant effect.

9.2.60 Off-site locations can only be deemed to have a beneficial effect if the wind conditions have been made better because of the H1 Development. This means, if the wind conditions are calmer than required in both the baseline (existing or evolved baseline scenario as relevant) and the complete and operational H1 Development scenarios, this would represent an insignificant effect.

9.2.61 If off-site wind conditions have been made worse because of the H1 Development, but still acceptable for the intended pedestrian usage, this would also represent an insignificant effect.

9.2.62 Where wind conditions are suitable for the intended use in the baseline scenario (existing or evolved baseline scenario as relevant) and become windier than required with the H1 Development in situ, the significant effect is as discussed for on-site locations as above.

9.3 Relevant Baseline Conditions

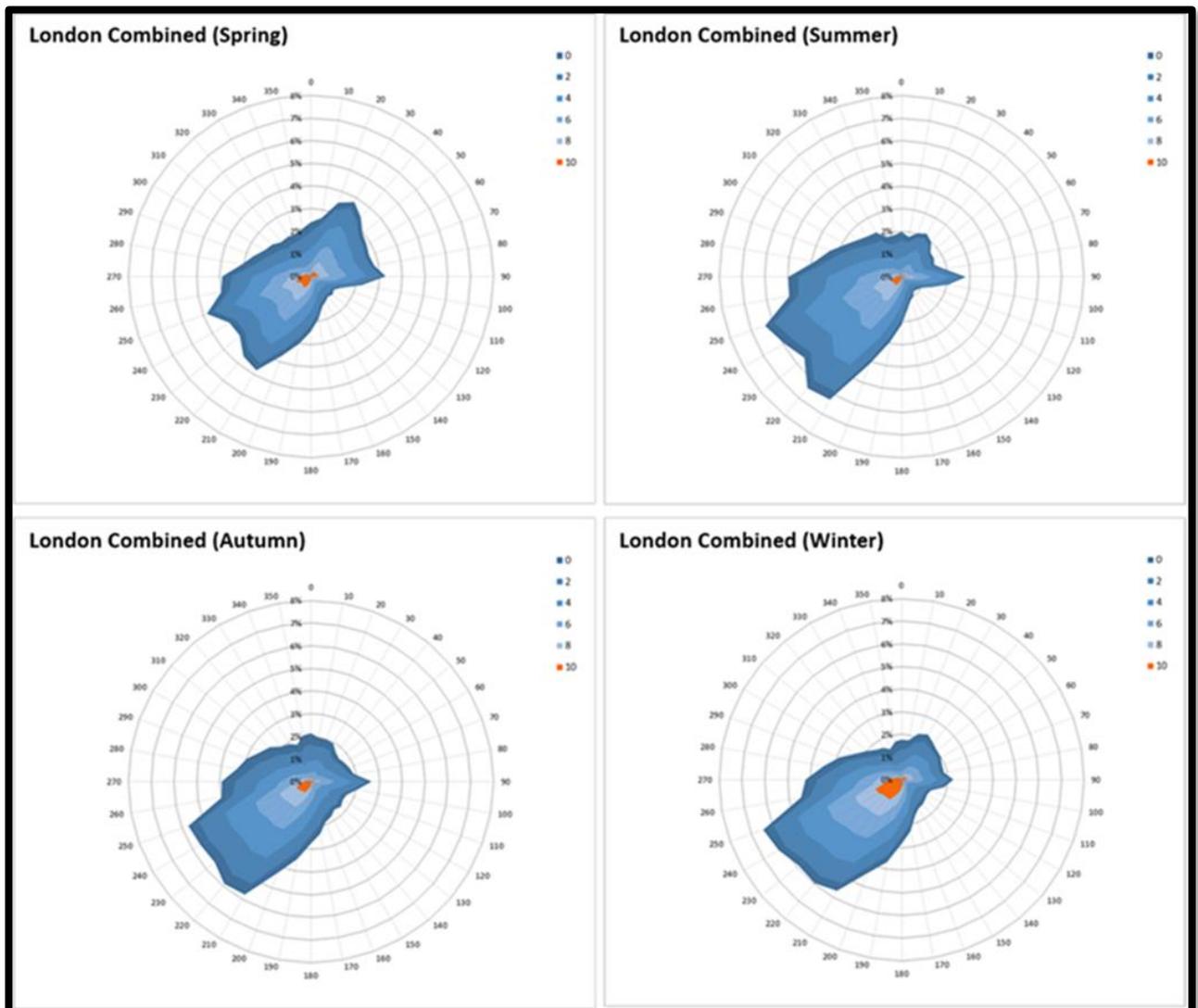
Meteorological Data

9.3.1 The UK Meteorological Office supplies records of the number of hours that wind occurs for ranges of wind speed (m/s) and by direction. Meteorological data for London (Heathrow and London City Airports), shown in the wind rose in **Figure 9.1**, has been used in this assessment as this is deemed to provide an accurate representation of the local wind microclimate for the London area. The meteorological station data is then adjusted to the Site conditions using the methodology set out in ESDU 01008¹.

9.3.2 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, although the winds are colder.

¹ ESDU International, Computer program for wind speeds and turbulence properties: flat or hilly sites in terrain with roughness changes, ESDU 01008, 2001 01008

Figure 9.1: Seasonal Wind Roses for London (London City and Heathrow Airports) - Radial axis indicates the percentage time for which the stated velocity range is exceeded



Future Baseline: Configuration 1: Existing Site + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings

9.3.3 Wind conditions for Configuration 1 are presented in **Figure 9.2** and **Figure 9.3** for the windiest and summer season respectively. Instances of strong winds exceeding 15 m/s for more than 2.2 hours per years are presented in **Figure 9.4**.

9.3.4 Wind conditions were assessed devoid of landscaping in order to assess a worst-case (i.e. windy) scenario at the Site.

Pedestrian Comfort

- 9.3.5 Within the baseline scenario, wind conditions at the Site and within the surrounding area are suitable for sitting to strolling use during the windiest season (**Figure 9.2**).
- 9.3.6 During the summer season (**Figure 9.3**), wind conditions at ground floor level would be generally one category calmer, ranging from suitable for sitting to strolling use.

Thoroughfares

Off-Site

- 9.3.7 Off-site thoroughfare locations have wind conditions suitable for sitting to strolling use during the windiest season in the baseline scenario (**Figure 9.2**).

Crossings

Off-Site

- 9.3.8 The off-site crossing represented by measurement location 116 has standing use wind conditions during the windiest season (**Figure 9.2**).

Entrances

Off-Site

- 9.3.9 Off-site entrances represented by measurement locations 2-9, 15, 16-18, 27, 28, 30, 36, 38, 39, 77, 84, 101, 102, 126, 134-137, 147-149, 151-153, 162, and 163 have sitting to strolling use wind conditions during the windiest season (**Figure 9.2**), with strolling use wind conditions at measurement locations 2 and 147.

Bus Stops

Off-Site

- 9.3.10 Off-site bus stops (represented by measurement locations 111, 144, and 145) have standing to strolling use wind conditions during the windiest season (**Figure 9.2**), with strolling use wind conditions at measurement location 145.

Roadways

Off-Site

- 9.3.11 Off-site roadway locations (represented by measurement locations 78, 83, 94, 100, 108, 109, 112-114, 127, 133, 138, and 143) have sitting to strolling use wind conditions during the windiest season (**Figure 9.2**).

Strong Winds

9.3.12 There is one instance of strong winds exceeding 15m/s for approximately 2.5 hours per year at the entrance at the north-west corner of Block H2 represented by measurement location 147 to the south of the Site.

Figure 9.2: Future Baseline: Configuration 1: Existing Site + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings – Windiest Season – Ground Level

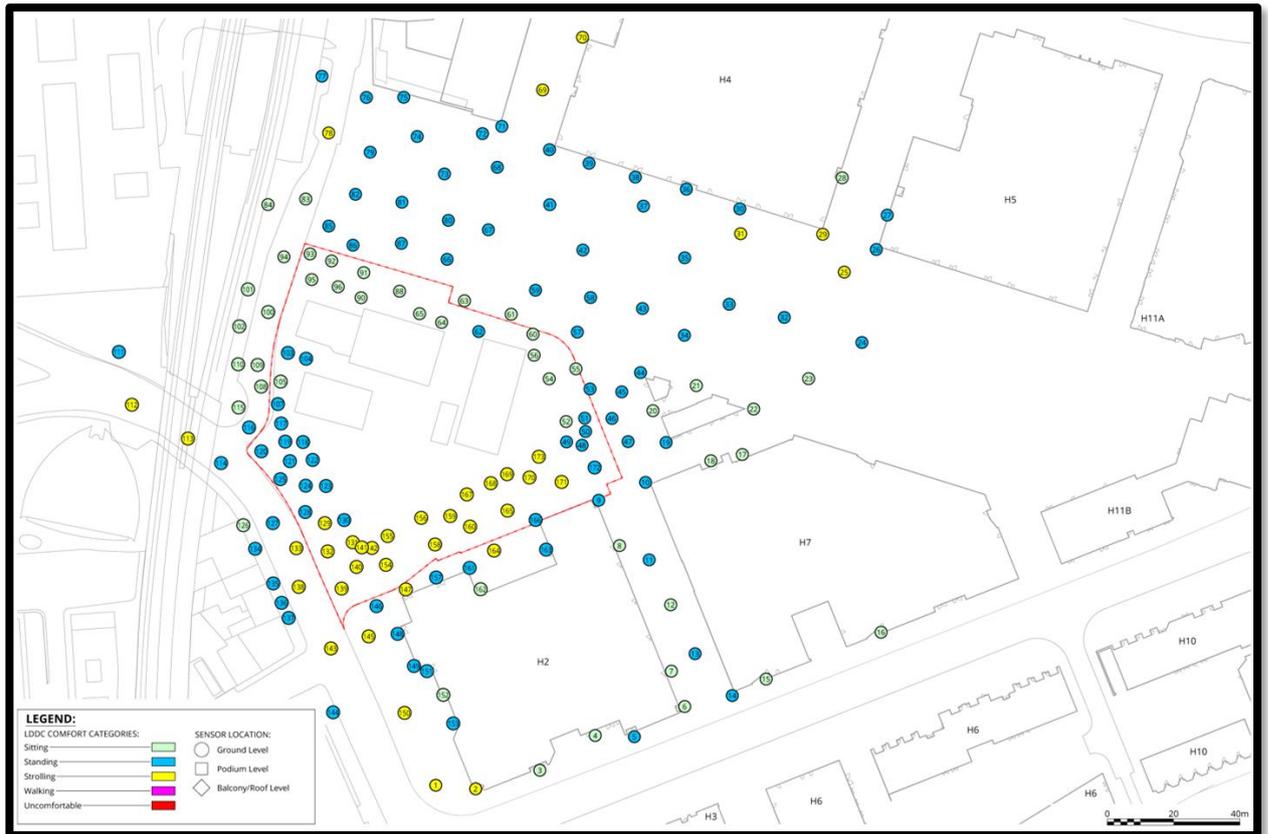


Figure 9.3: Future Baseline: Configuration 1: Existing Site + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings – Summer Season – Ground Level

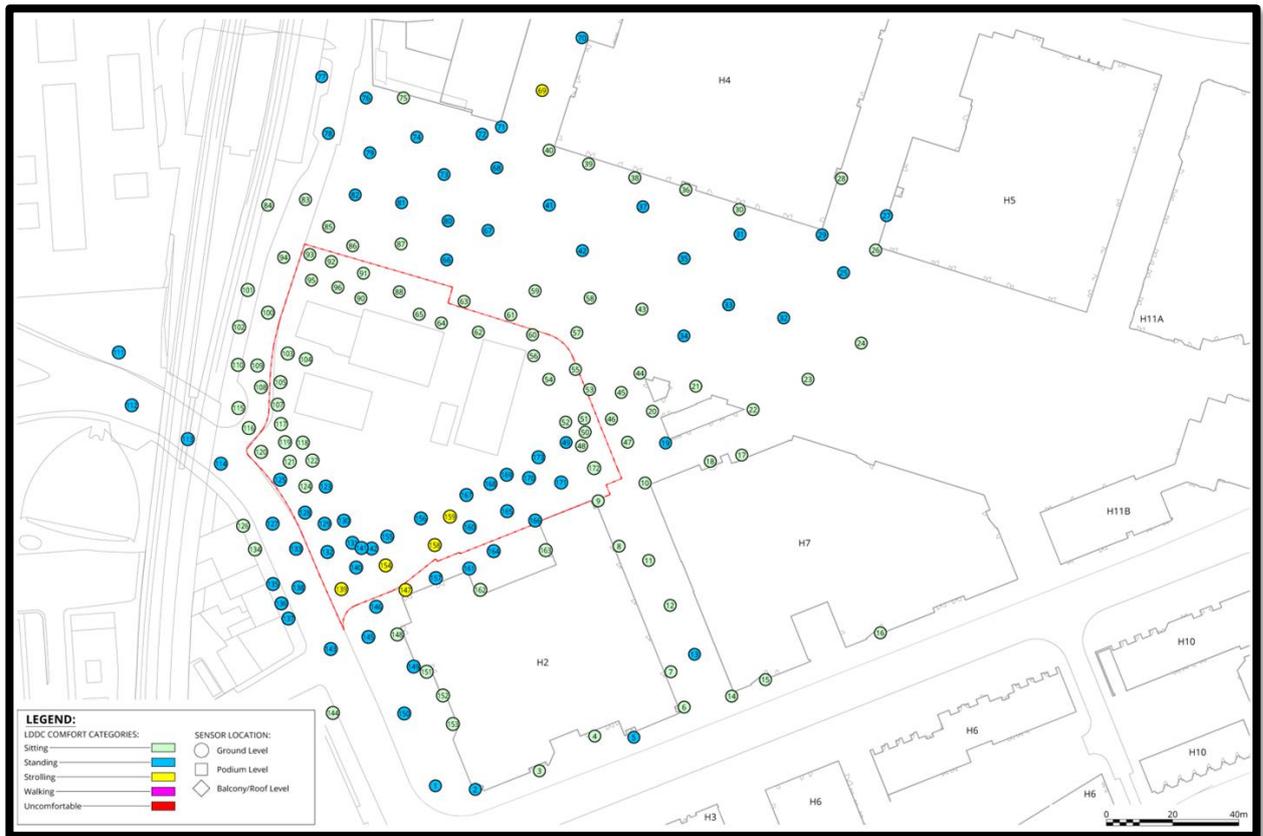
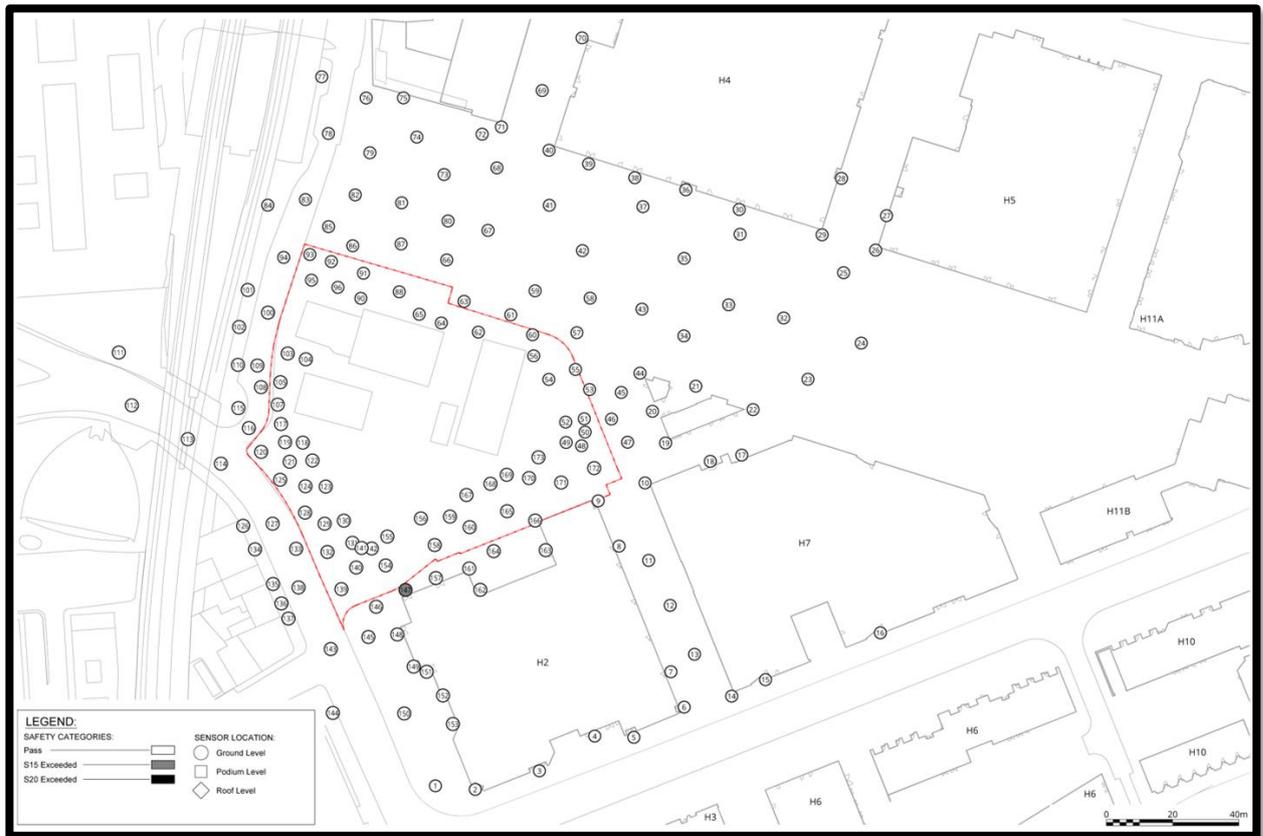


Figure 9.4: Future Baseline: Configuration 1: Existing Site + the Approved Development (except for Plot H1 in its outline consented form) with Existing Surrounding Buildings – Wind Safety Conditions – Ground Level



9.4 Likely Effects of the H1 Development and their Significance

The Works

- 9.4.1 The potential wind microclimate impacts and likely effects during the period of Works have not been directly assessed within the wind tunnel, as this is a temporary condition and would be highly variable as the H1 Development is constructed.
- 9.4.2 Typically for a wind microclimate in London, the potential impacts during the period of Works are assessed using the professional judgement of an experienced wind engineer, based on an assessment of the background wind climate at the Site and an understanding of the effects of wind in the built environment. This approach is taken assuming that the activity on-site during this time (i.e. construction activity) is less sensitive to wind conditions than when the H1 Development is completed and occupied (which would include entrance and amenity space, for example). In addition, there would be appropriate health and safety measures implemented to ensure that the construction workers were adequately protected.
- 9.4.3 A qualitative assessment of the wind tunnel microclimate during the Works has therefore been undertaken and is based on professional judgement (informed by an assessment of the background wind microclimate in the area, the results of the tested configurations for the baseline and completed development scenarios and RWDI's experience of assessing wind in the build environment).
- 9.4.4 Given the conditions described as part of the baseline environment, it is considered that conditions are suitable for a working construction site or pedestrian thoroughfares around the Site (with the hoarding in place). Therefore, the likely effect is expected to be **insignificant**.
- 9.4.5 It is understood that Works relating to the H1 Development could be overlapped with constructions works relating to Plots PAV1, H7, H11a and H11b; this is not expected to have any significant impact on the wind microclimate at and surrounding the Site as these developments would be to the east of the Site and not along the prevailing south-westerly wind directions.
- 9.4.6 As construction of the H1 Development proceeds, the wind conditions at the Site would gradually adjust to those of the completed H1 Development, as described in the following section 'The Completed and Operational H1 Development'.
- 9.4.7 The likely effects to the local wind environment on-Site as a result of the Works would be **insignificant**.

Assumptions

- 9.4.8 It assumed that there will be restricted access (i.e. not accessible to the general public) to the Site during the Works, and therefore windier conditions will be tolerable as the area is not for typical pedestrian use where the tolerable wind speed threshold would be lower.

The Completed and Operational H1 Development

Configuration 2: H1 Development + the Approved Development with Existing Surrounding Buildings

9.4.1 Wind conditions for Configuration 2 are presented in **Figure 9.5** and **Figure 9.6** for the windiest and summer season respectively. Instances of strong winds exceeding 15 m/s for more than 2.2 hours per year are presented in **Figure 9.7**.

9.4.2 Wind conditions were assessed devoid of landscaping in order to assess a worst-case (i.e. windy) scenario at the Site.

Pedestrian Comfort

9.4.3 With the H1 Development in place in the context of the existing surrounding buildings, wind conditions at the Site and within the surrounding area would be suitable for sitting to walking use during the windiest season (**Figure 9.5**).

9.4.4 During the summer season (**Figure 9.6**), wind conditions at ground floor level would be generally one category calmer, ranging from suitable for sitting to strolling use.

Thoroughfares

On-Site

9.4.5 Wind conditions at most of the on-site pedestrian thoroughfares would range from suitable for sitting use to strolling use during the windiest season, representing **direct, long-term, local** effects of **moderate beneficial significance** to an **insignificant** effect (**Figure 9.5**). Walking use wind conditions at thoroughfare location 120 to the west of the H1 Development would be one category windier than desired, representing a **direct, long-term, local** effect of **minor adverse significance**. Wind mitigation measures would be required at this location.

Off-Site

9.4.6 Off-site thoroughfare locations would have wind conditions suitable for sitting to strolling use during the windiest season, suitable for the intended use (**Figure 9.5**). This represents an **insignificant** effect.

Crossings

Off-Site

9.4.7 The off-site crossing represented by measurement location 116 would have strolling use wind conditions during the windiest season, one category windier than in the baseline scenario (Configuration 1) (**Figure 9.5**). Strolling use wind conditions would be calmer than required, representing an **insignificant** effect.

Entrances

On-Site

- 9.4.8 On-site entrances to the H1 Development are represented by measurement locations 56, 89, 97, 104, 118, 155, 168, 169, and 173. All these entrances would have standing use or calmer wind conditions during the windiest season, suitable for the intended use (Figure 9.5). This would represent a **direct, long-term, local effects of minor beneficial significance to insignificant** effect.

Off-Site

- 9.4.9 Off-site entrances represented by measurement locations 2-9, 15, 16-18, 27, 28, 30, 36, 38, 39, 77, 84, 101, 102, 126, 134-137, 147-149, 151-153, 162, and 163 would have sitting to strolling use wind conditions during the windiest season (**Figure 9.5**). Strolling use wind conditions at measurement locations 2 and 147 would be one category windier than desired; however, this would be consistent with the baseline scenario (Configuration 1), and no mitigation would be required. Wind conditions at off-site entrances would represent an **insignificant** effect.

Bus Stops

Off-Site

- 9.4.10 Off-site bus stops (represented by measurement locations 111, 144, and 145) would have standing to strolling use wind conditions during the windiest season (**Figure 9.5**). Strolling use wind conditions at measurement location 145 would be one category windier than desired; however, this would be consistent with the baseline scenario (Configuration 1), and no mitigation would be required. Wind conditions at off-site bus stops would represent an **insignificant** effect.

Roadways

Off-Site

- 9.4.11 Off-site roadway locations (represented by measurement locations 78, 83, 94, 100, 108, 109, 112-114, 127, 133, 138, and 143) would have standing to strolling use wind conditions during the windiest season (**Figure 9.5**). This would represent an **insignificant** effect.

Ground and upper levels amenity spaces

On-Site

- 9.4.12 Ground level amenity spaces within the H1 Development (represented by measurement locations 49, 51, 53-55, 103, 105, and 107) would have a mix of sitting to standing use wind conditions during the summer season (Figure 9.6). This is considered acceptable for a mixed-use amenity space, representing an **insignificant** effect.

9.4.13 As long term seating is intended at locations 49, 51 and 53-55, and location 49 would have standing conditions, localised mitigation measures around this seating area should be implemented. In addition, should a future tenant provide seating at locations 103 and 105 localised mitigation measures around this seating area should be implemented.

9.4.14 Amenity terraces of the H1 Development (represented by measurement locations 174-200) would have sitting use wind conditions during the summer season, suitable for the intended use (**Figure 9.6**). This represents an **insignificant** effect.

Strong Winds

9.4.15 There would be no instances of strong winds exceeding 15m/s for more than 2.2 hours per year in this configuration (**Figure 9.7**). It should be noted that the exceedance which occurs in the baseline scenario (Configuration 1) around the corner of H2 at measurement location 147 would now have suitable conditions with the inclusion of the H1 Development.

Figure 9.5: Configuration 2: H1 Development + the Approved Development with Existing Surrounding Buildings – Windiest Season – Ground and Roof Levels

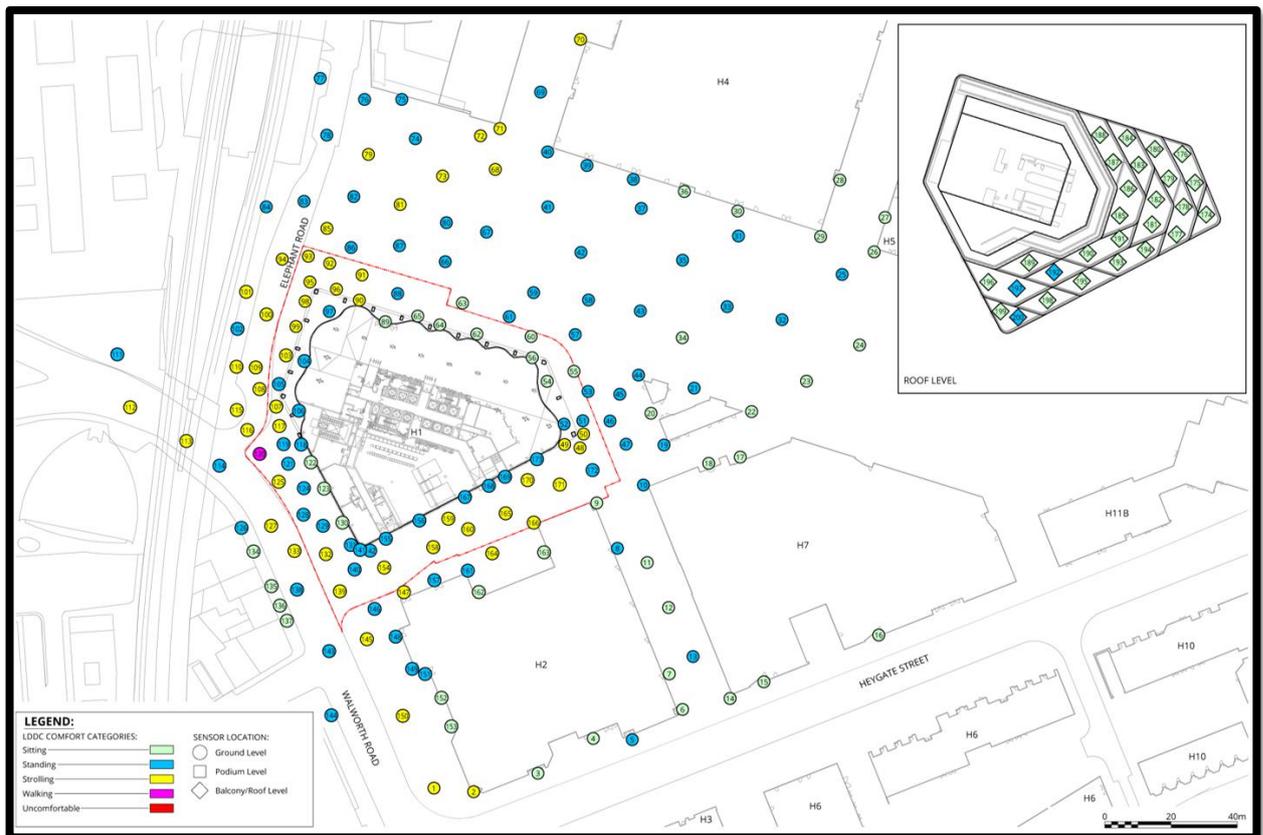


Figure 9.6: Configuration 2: H1 Development + the Approved Development with Existing Surrounding Buildings – Summer Season – Ground and Roof Levels

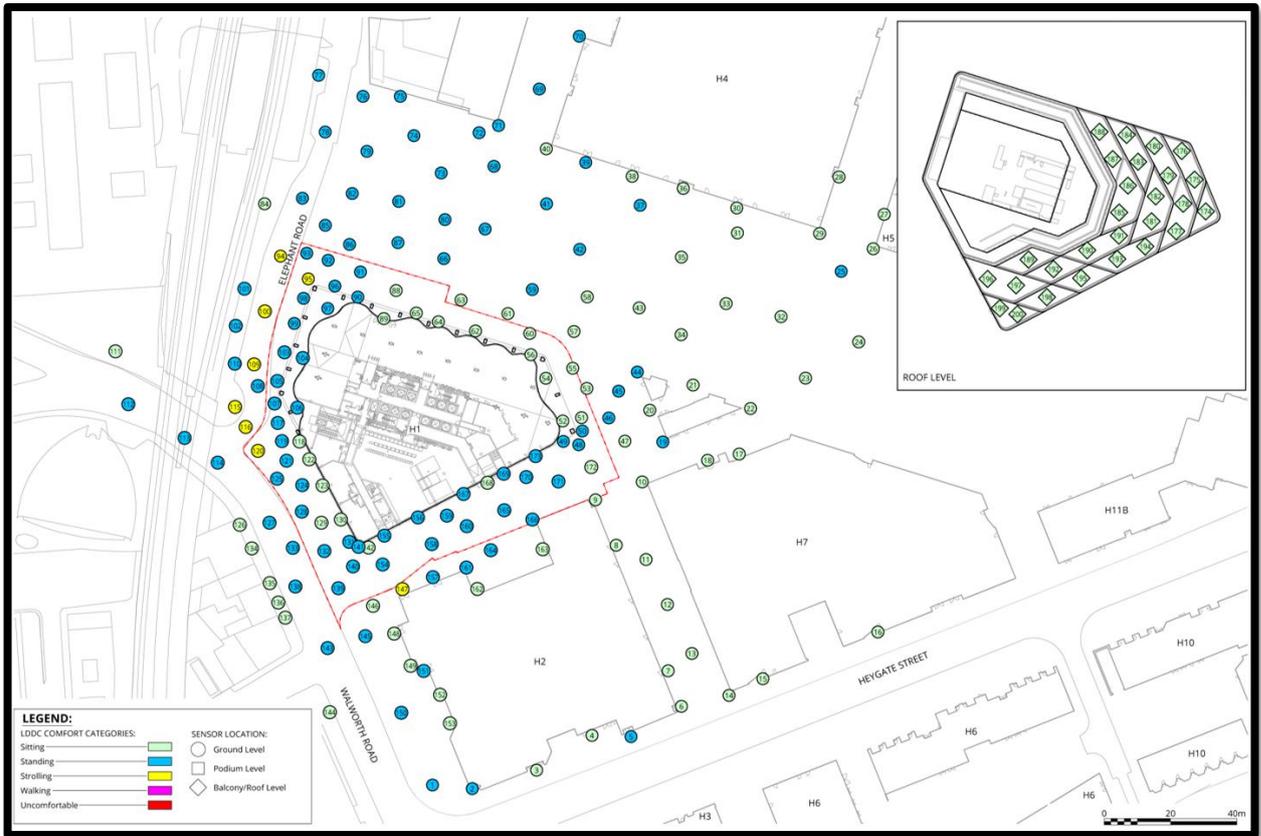
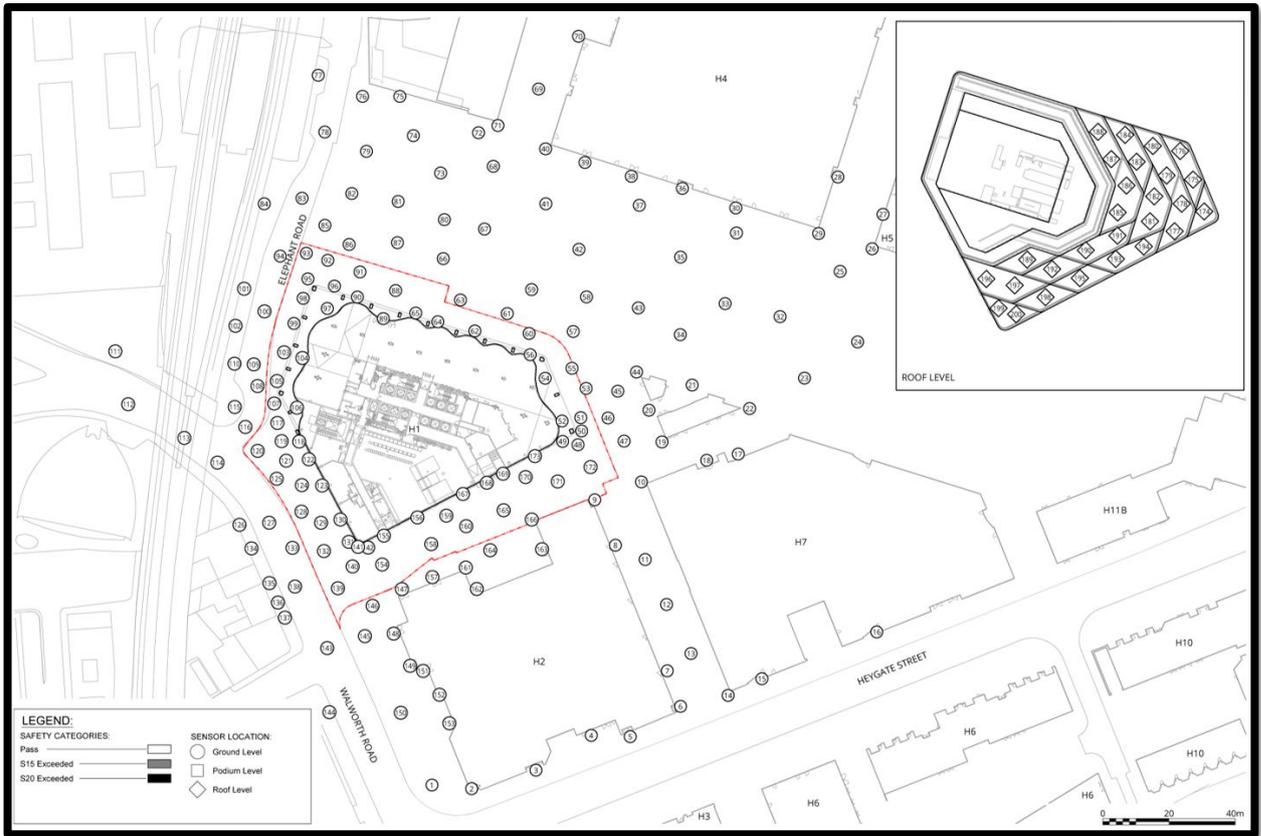


Figure 9.7: Configuration 2: H1 Development + the Approved Development with Existing Surrounding Buildings – Wind Safety Conditions – Ground and Roof Levels



9.5 Additional Mitigation / Enhancement and Likely Residual Effects of the H1 Development and their Significance

The Works

- 9.5.1 During construction, the areas under construction will be hoarded off until the point where the building becomes occupied.
- 9.5.2 No further mitigation is required during the Works and the likely effects to the local wind environment on Site as a result of the Works would remain **insignificant**.

The Completed and Operational H1 Development

- 9.5.3 Wind conditions at and surrounding the H1 Development would be largely suitable for the intended uses in both the context of the existing and cumulative surrounding buildings (respectively Configurations 2 and 3).
- 9.5.4 Thoroughfare location 120 in Configuration 2 would be one category windier than desired, suitable for walking use during the windiest season.
- 9.5.5 Ground level amenity locations 49, 103 and 105 would be one category windier than desired, suitable for standing use during the summer season.
- 9.5.6 It should be noted that all the three configurations tested in the wind tunnel did not include any landscaping, in order to assess a worst-case (i.e. windy) scenario at the Site.
- 9.5.7 The proposed landscaping scheme as shown in **ES Chapter 1, Chapter 5: The Development**, shows that the existing trees along the eastern side of Walworth Road will be retained, and additional trees will be included to the west of the Site where measurement location 120 is located. This is expected to provide beneficial shelter to that area likely resulting in suitable wind conditions for thoroughfare use, and no additional wind mitigation measures would be required in this area.
- 9.5.8 The proposed landscaping would also include 'large movable planted pots' at ground level along the south-eastern side of the H1 Development which would be expected to mitigate conditions at location 49. In addition, should locations 103 and 105 become long-term seating in the future, large movable planted pots would be provided on the western side of the H1 Development to offer beneficial shelter to mitigate conditions at locations 103 and 105.
- 9.5.9 The proposed landscaping scheme would be in place before opening and occupation of the H1 Development.
- 9.5.10 The wind conditions around all areas of the H1 Development and surrounding area, would give rise to **insignificant** residual effects or **direct, long-term, local** residual effects **of minor to moderate beneficial**

significance. Thoroughfare location 120 to the west of the H1 Development is expected to have suitable wind conditions with the proposed landscaping scheme in place, representing an **insignificant** residual effect.

9.6 Likely Residual Cumulative Effects and their Significance

The Works

9.6.1 The cumulative schemes are not considered likely to have a material impact on the wind microclimate at the Site due to the relative distance between the developments. Wind conditions during the Works are expected to gradually adjust from those in the baseline scenario (Configuration 1) to those of Configuration 3 with the H1 Development and the cumulative schemes in place.

9.6.2 The changes in the local wind environment on-Site as a result of the Works is considered likely to result in effects classified as **insignificant**.

Assumptions

9.6.3 It is assumed that there will be restricted access (i.e. not accessible to the general public) to the Site during the Works, and therefore windier conditions will be tolerable as the area is not for typical pedestrian use where the tolerable wind speed threshold would be lower.

The Completed and Operational H1 Development

Configuration 3: H1 Development + the Approved Development with Cumulative Surrounding Buildings

9.6.4 Wind conditions for Configuration 3 are presented in **Figure 9.8** and **Figure 9.9** for the windiest and summer season respectively. Instances of strong winds exceeding 15 m/s for more than 2.2 hours per year are presented in **Figure 9.10**.

9.6.5 Wind conditions were assessed devoid of landscaping in order to assess a worst-case (i.e. windy) scenario at the Site.

9.6.6 Cumulative schemes included in Configuration 3 are:

- Elephant and Castle Shopping Centre (ref. 16/AP/4458);
- 5-9 Rockingham Street (ref. 19/AP/0750); and
- 136-142 New Kent Road (ref. 19/AP/7564).

Pedestrian Comfort

- 9.6.7 With the H1 Development in place in the context of the cumulative surrounding buildings, wind conditions at the Site and within the surrounding area are suitable for sitting to walking use during the windiest season (**Figure 9.8**). Wind conditions would be largely consistent with those of Configuration 2, with slightly windier conditions to the west of the Site along Elephant Road.
- 9.6.8 During the summer season (**Figure 9.9**), wind conditions at ground floor level would be generally one category calmer, ranging from suitable for sitting to strolling use.

Thoroughfares

On-Site

- 9.6.9 Wind conditions at all the on-site pedestrian thoroughfares would range from suitable for sitting use to strolling use during the windiest season, representing **direct, long-term, local effects of moderate beneficial significance to insignificant effect (Figure 9.8)**.

Off-Site

- 9.6.10 Off-site thoroughfare locations would have wind conditions suitable for sitting to strolling use during the windiest season, suitable for the intended use (**Figure 9.8**). This would represent an **insignificant** effect.

Crossings

Off-Site

- 9.6.11 Wind conditions at the crossing represented by measurement location 116 would remain suitable for strolling use during the windiest season, one category windier than in the baseline scenario (**Figure 9.8**). Strolling use wind conditions would be calmer than required, representing an **insignificant** effect.

Entrances

On-Site

- 9.6.12 Wind conditions at all the entrances to the H1 Development (represented by measurement locations 56, 89, 97, 104, 118, 155, 168, 169, and 173) would be suitable for standing use or calmer during the windiest season, suitable for the intended use (**Figure 9.8**). This represents **direct, long-term, local effects of minor beneficial significance to insignificant effects**.

Off-Site

- 9.6.13 Off-site entrances to the surrounding buildings (represented by measurement locations 2-9, 15, 16-18, 27, 28, 30, 36, 38, 39, 77, 84, 101, 102, 126, 134-137, 147-149, 151-153, 162, and 163) would have sitting to strolling use wind

conditions during the windiest season (**Figure 9.8**). Strolling use wind conditions at entrances to Block H2 represented by measurement locations 2 and 147 would be one category windier than desired; however, this would be consistent with the baseline scenario, and no mitigation would be required. Wind conditions at off-site entrances would represent an **insignificant** effect.

Bus Stops

Off-Site

- 9.6.14 Off-site bus stops (represented by measurement locations 111, 144, and 145) would have standing to strolling use wind conditions during the windiest season (**Figure 9.8**). Strolling use wind conditions at measurement location 145 would be one category windier than desired; however, this would be consistent with the baseline scenario, and no mitigation would be required.
- 9.6.15 Wind conditions at the bus stop location 111 along Walworth Road would be one category windier than desired, suitable for strolling use during the windiest season. However, the bus stop cover (not included in the wind tunnel model) is expected to provide beneficial shelter in this area, and no additional mitigation would be required.
- 9.6.16 Wind conditions at all the off-site bus stops would represent an **insignificant** effect.

Roadways

Off-Site

- 9.6.17 Off-site roadway locations (represented by measurement locations 78, 83, 94, 100, 108, 109, 112-114, 127, 133, 138, and 143) would have standing to walking use wind conditions during the windiest season, with walking use wind conditions at measurement locations 94 and 100 (**Figure 9.8**). This would represent an **insignificant** effect.

Ground and upper levels amenity spaces

On-Site

- 9.6.18 Ground level amenity spaces (represented by measurement locations 49, 51, 53-55, 103, 105, and 170) would have wind conditions largely consistent with those of Configuration 2, ranging from sitting to standing use during the summer season (**Figure 9.9**). This is considered acceptable for a mixed-use amenity space, representing an **insignificant** effect.
- 9.6.19 Long term seating is intended at locations 49, 51, and 53-55 (and potentially locations 103 and 105 should a future tenant provide seating at these locations), and locations 49 and 103 would have standing conditions. As outlined above the proposed landscaping scheme would include 'large moveable planted pots' at ground level; these features are to be included along the south-eastern side of the H1 Development, which would be expected to mitigate conditions at location 49. In addition, should location 103 become long-term seating in the future,

large movable planted pots would be provided on the western side of the H1 Development to offer beneficial shelter to mitigate conditions at location 103.

- 9.6.20 Amenity terraces of the H1 Development (represented by measurement locations 174-200) would have sitting use wind conditions during the summer season, suitable for the intended use (**Figure 9.9**). This would represent an **insignificant** effect.

Strong Winds

- 9.6.21 No instances of strong winds exceeding 15m/s for more than 2.2 hours per year would occur in this configuration (**Figure 9.10**).

Figure 9.8: Configuration 3: H1 Development + the Approved Development with Cumulative Surrounding Buildings – Windiest Season – Ground and Roof Levels

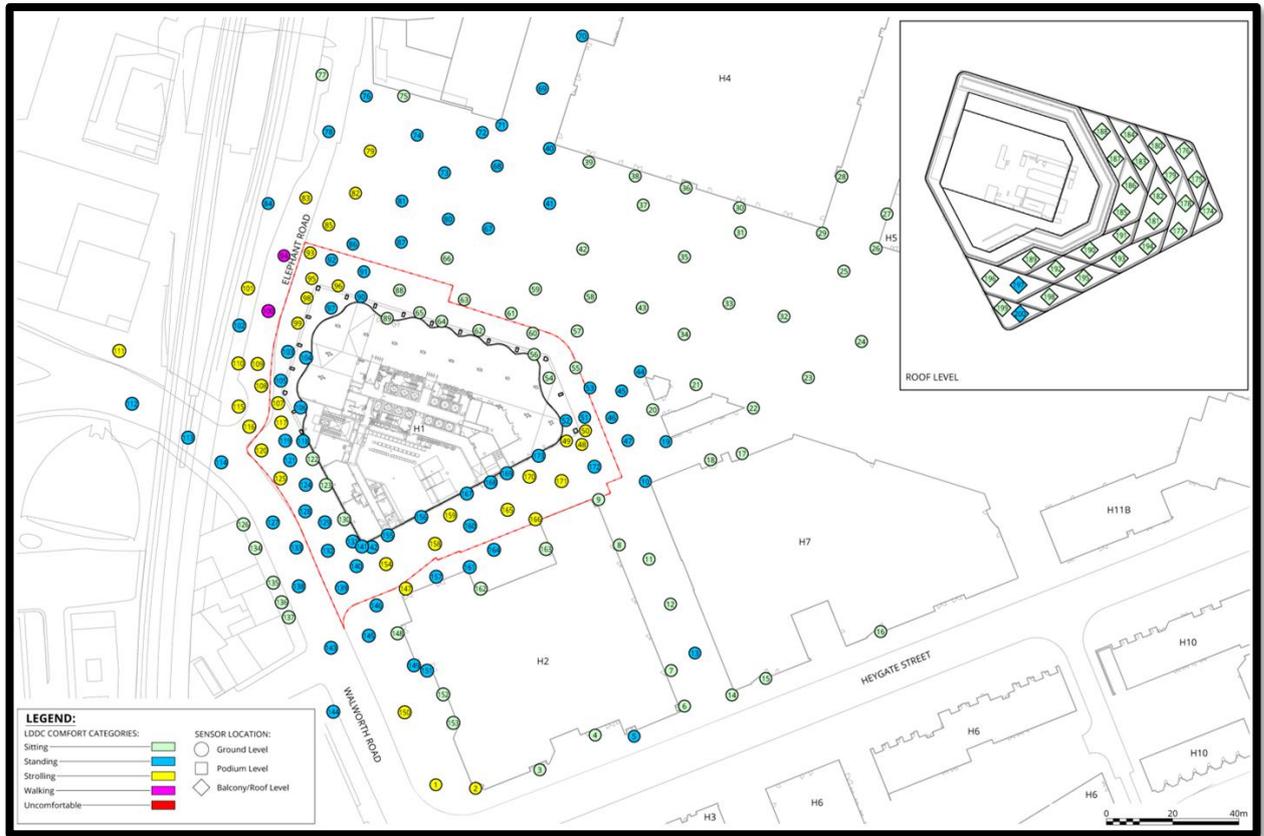


Figure 9.9: Configuration 3: H1 Development + the Approved Development with Cumulative Surrounding Buildings – Summer Season – Ground and Roof Levels

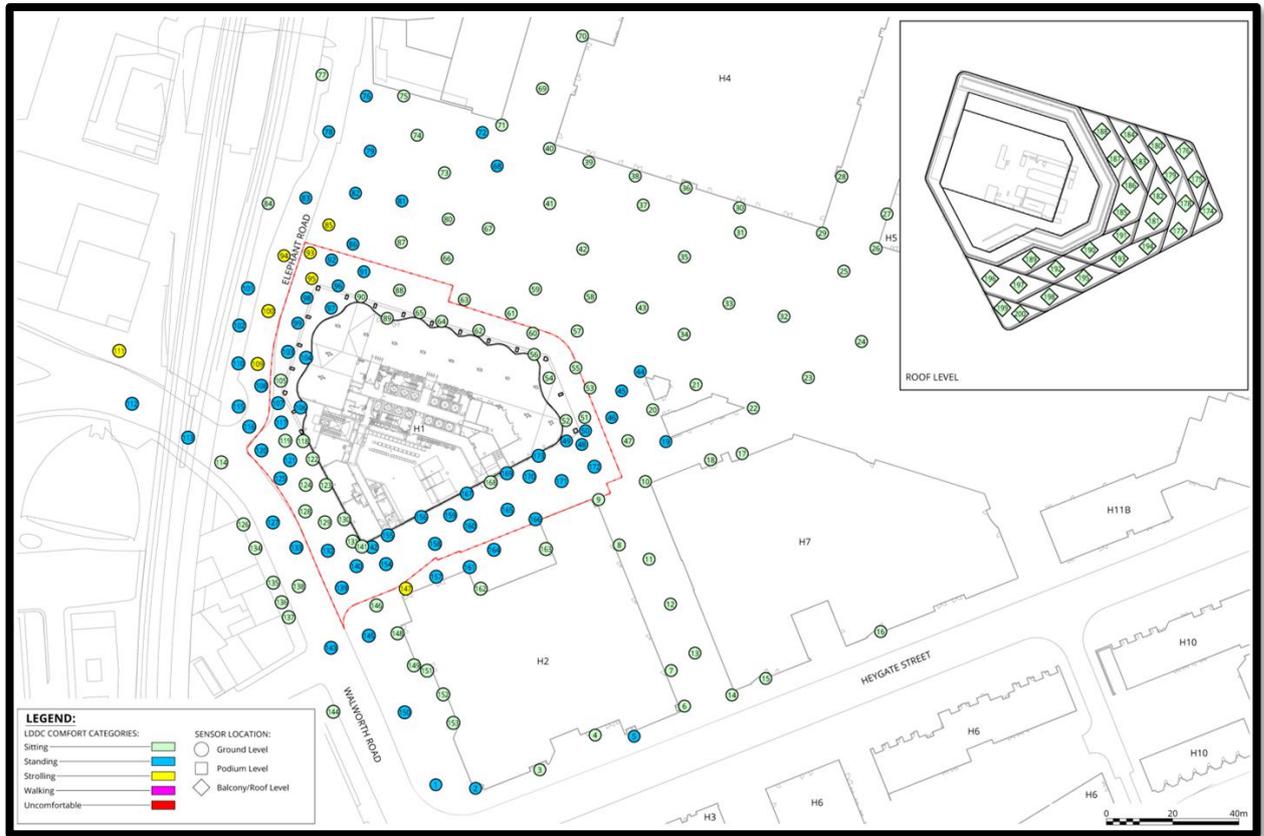
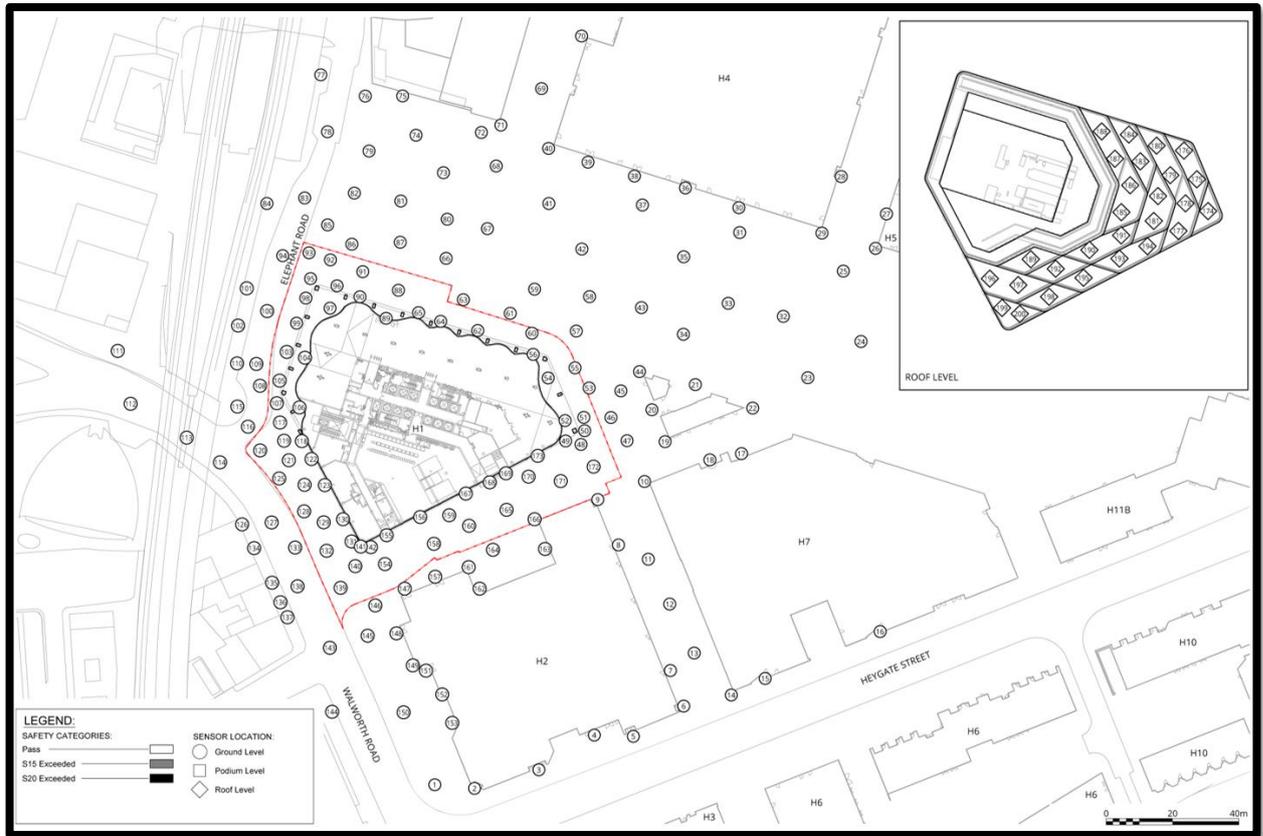


Figure 9.10: Configuration 3: H1 Development + the Approved Development with Cumulative Surrounding Buildings – Wind Safety Conditions – Ground and Roof Levels



9.7 Conclusions

- 9.7.1 An assessment of the likely wind conditions as a result of the H1 Development and the suitability of these in terms of pedestrian comfort were undertaken. The assessment has been informed by appropriate meteorological data and detailed wind tunnel testing.
- 9.7.2 The wind microclimate at the Site and in the surrounding area (Configuration 1) is relatively calm, suitable for sitting to strolling use throughout the year. Entrance locations 2 and 147 to Block H2 would be one category windier than desired during the windiest season, and instances of strong winds would occur at measurement location 147 throughout the year.
- 9.7.3 The wind effects of the Works has been assessed using professional judgement and informed by an analysis of the background windiness of the Site based on the meteorological data. As construction of the H1 Development proceeds, the wind conditions of the Site would gradually adjust to the conditions of the completed H1 Development (Configuration 2).
- 9.7.4 With the inclusion of the H1 Development in the context of the Approved Development and existing surroundings (Configuration 2), slightly calmer wind conditions would occur during the windiest season to the north of Block H2 compared to Configuration 1; however, windier conditions would occur to the west and north-

west of the H1 Development. Entrance locations 2 and 147 to Block H2 would remain one category windier than desired, thoroughfare location 120 would have wind conditions one category windier than suitable, and ground level amenity locations 49, 103 and 105 would be one category windier than suitable.

- 9.7.5 The proposed landscaping scheme of trees and large movable planted pots is expected to provide beneficial shelter at thoroughfare location 120 and amenity locations 49 where long term seating is proposed. In addition, should locations 103 and 105 become long-term seating in the future, large movable planted pots would be provided to offer beneficial shelter. No additional mitigation would be required for location 2 and 147 given that this would be consistent with the baseline scenario. The proposed landscaping scheme would be in place before opening and occupation of the H1 Development. No instances of strong winds would occur in this configuration.
- 9.7.6 With the inclusion of the cumulative schemes (Configuration 3), slightly windier conditions would occur along Elephant Road, and strolling use wind conditions would persist at entrance locations 2 and 147 to Block H2. Wind conditions at the bus stop 111 along Walworth Road would be one category windier than desired during the windiest season. However, the existing bus stop cover is expected to provide beneficial shelter in this area, and no additional mitigation would be required. No instances of strong winds would occur in this configuration.
- 9.7.7 Overall, wind conditions at and surrounding the H1 Development with the proposed landscaping scheme are expected to be suitable for the intended use in both the context of the existing + Approved Development and cumulative surroundings (Configurations 2 and 3).

10. Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution

10.1 Introduction

10.1.1 This Chapter, prepared by GIA, presents an assessment of likely significant effects of the H1 Development on the daylight and sunlight amenity to the occupiers of existing and future neighbouring sensitive properties and overshadowing to amenity areas in the vicinity of the Site. Additionally, solar glare to surrounding road and rail viewpoints has been assessed as well as the potential for light pollution arising from the H1 Development at nearby sensitive properties.

10.1.2 As noted in **ES Volume 1, Chapter 1: Introduction** the Site forms part of the wider Elephant Park masterplan (Approved Development), for which planning permission was granted under the OPP for the demolition of all buildings and redevelopment of the Site. As a result, demolition of the buildings formerly on the Site has since been completed and thus the surrounding buildings enjoy uncharacteristically high daylight and sunlight levels for the urban context given the temporary cleared nature of the Site. The assessments of likely significant effects have been undertaken by comparison to the Site in its current cleared condition. Given that the Site was cleared for development to take place, and the temporarily high daylight and sunlight baseline levels, the assessments portray a worst-case scenario. It should also be noted that the buildings within the Approved Development and the neighbouring Elephant and Castle Shopping Centre Cumulative Scheme, have all been designed with the expectation of a large-scale development coming forward on the Site, supported by the Site benefiting from outline permission through the OPP.

10.1.3 A supplementary stand-alone report entitled '*Daylight & Sunlight – Impacts upon Surrounding Properties*' has also been prepared by GIA to review the daylight and sunlight impacts in more contextual detail, demonstrating the likely effects of the H1 Development when compared to those of the OPP, should the Site have been built-out as per the Approved Development parameters. This does not form part of the EIA, but is provided for information purposes and is appended to the Planning Statement submitted with the Planning Application.

10.1.4 This Chapter is supported by the following Appendices:

- **Appendix 10.1: Daylight and Sunlight Assessment.**
- **Appendix 10.2: Overshadowing Assessment.**
- **Appendix 10.3: Solar Glare Assessment.**
- **Appendix 10.4: Light Pollution Assessment.**

10.2 Assessment Methodology and Significance Criteria

Assessment Guidelines

10.2.1 The non-mandatory Building Research Establishment (BRE) 'Site Layout Planning for Daylight and Sunlight – A guide to good practice' (hereafter the BRE Guidelines¹) suggests that residential properties have the highest requirement for daylight and sunlight and states, in paragraph 2.2.2 that *"the guidelines are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed"*. The guidelines may also be applied to any non-domestic building where the occupants have a reasonable expectation of daylight, however, there are no such buildings within the defined study area which would be considered sensitive to daylight and sunlight alterations as a result of the H1 Development. Therefore, this Chapter focuses on those residential buildings surrounding the Site which would have the potential to be affected by the H1 Development.

10.2.2 Additionally, in line with the BRE Guidelines, public and private amenity areas surrounding the Site which have the potential to be affected by the H1 Development are considered within this Chapter. Paragraph 13 Appendix I of the BRE Guidelines states that *"adverse impacts occur when there is a significant decrease in the [...] amount of sunlight reaching an open space"*.

10.2.3 The BRE Guidelines are the industry recognised standard for assessing all matters related to daylight, sunlight and overshadowing, and are the primary reference within all national and local policy. The BRE Guidelines provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. The BRE Guidelines are intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice presented in the BRE Guidelines is not mandatory and should not be used as an instrument of planning policy, the Guidelines state:

"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."

10.2.4 The BRE Guidelines also state:

"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. In special circumstances the developer or planning authority may wish to use different target values... in an area with modern high-rise buildings, a higher degree of obstruction maybe unavoidable if new developments are to match the height and proportions of existing building"

10.2.5 The values in the BRE Guidelines are derived on the basis of a 2-3 storey suburban model, therefore the application of its guidelines in urban environments or regeneration areas should be treated flexibly. This is acknowledged

¹ Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition, 2011

within the BRE Guidelines, stating in paragraph 2.2.3:

“The numerical values given here are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints.”

- 10.2.6 Therefore, when determining whether changes in light conditions are in line with policy and guidance, it is important to consider other contextual matters, such as instances where the existing light levels within neighbouring properties are already low, or where the proposed residual values are commensurate with those that would be expected in urban areas of similar density. Furthermore, daylight and sunlight impact of a development should be balanced against the improvements and benefits which the scheme will bring to the area.
- 10.2.7 The BRE Guidelines also reference the potential for solar glare and light pollution effects arising from developments comprising large areas of glazing or reflective cladding and sources of artificial light respectively. The solar glare assessment has therefore been undertaken by reference to the BRE Guidelines as well as the International Commission on Illumination (CIE) CIE Collection on Glare (CIE 146:2002), which provides guidance on when reflections can result in adverse effects. In relation to the suggested lighting level, values to ascertain the acceptability of artificial lighting levels are outlined in the The Institution of Lighting Professionals (ILP) Guidance for the Reduction of Obtrusive Light GN01:2011, which is the primary resource of light pollution guidance.

Study Area

- 10.2.8 The study area was determined by firstly undertaking a review of the surrounding land uses using information and data sourced from the Valuation Office Agency (VOA) website. This review was undertaken for all surrounding properties in close enough proximity to the Site to be affected by the H1 Development, including properties within the Approved Development, to identify any receptors that should be considered as potentially sensitive. The BRE Guidelines outline that if a new development, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal of the existing building, it may be adversely affected. As such, this suggestion is used to define the study area, which is refined (extended or reduced) using professional judgement. The sensitive receptors within the study area and therefore included in the assessment are shown on **Figure 10.1** in **Section 10.3**.
- 10.2.9 Based on the above, a three-dimensional (3D) model was then developed for the existing surrounding properties and the Approved Development buildings. No existing buildings have been modelled within the Site owing to its cleared status in the baseline condition. The 3D models have also been used to establish where existing buildings (and Approved Development buildings) obscure the H1 Development from the view of windows of potentially sensitive receptors.

Scenarios Assessed

- 10.2.10 The following scenarios were considered and are reported within this Chapter:

- Future Baseline.

- The H1 Development.
- Cumulative.

Future Baseline

10.2.11 This scenario represents the future baseline condition illustrated in drawings in **Appendix 10.1** and considers the receptors shown in Figure 10.1. All plots within the Approved Development, (with the exception of the Consented H1) have been considered in the future baseline as this represents a realistic scenario of the surroundings by the time the H1 Development would be complete and occupied.

H1 Development

10.2.12 This scenario consists of the complete and operational H1 Development in the context of the future baseline surrounding environment, which is illustrated in drawings in **Appendix 10.1**. This scenario assesses the potential effects of the H1 Development on the surrounding sensitive receptors.

10.2.13 In ascertaining the likely daylight, sunlight and overshadowing effects, comparisons are made with the future baseline scenario.

10.2.14 The potential for solar glare is assessed in absolute terms upon the façade of the H1 Development. This is considered to represent the worst-case scenario.

10.2.15 The potential for light pollution is assessed in absolute terms from the H1 Development. In the H1 Development scenario there are no existing residential properties located in the Elephant and Castle Shopping Centre development site, which would be sensitive to light pollution from the H1 Development. However, the future Elephant and Castle Shopping Centre Cumulative Scheme does include residential accommodation that would be sensitive to light pollution from the H1 Development and therefore requires assessment in the cumulative scenario. The light pollution assessment therefore includes the Elephant and Castle Shopping Centre Cumulative Scheme as built out, which is discussed in the cumulative scenario section. Given the position of the H1 Development relative to the other sensitive properties, the inclusion of the Elephant and Castle Shopping Centre Cumulative Scheme does not affect the light pollution assessment effects in the H1 Development scenario.

Cumulative

10.2.16 Due to relative distance and the scale of the Elephant and Castle Shopping Centre Cumulative Scheme (see **Figure 2.1** within **ES Volume 1, Chapter 2: EIA Methodology**) in relation to the H1 Development and surrounding sensitive receptors, a cumulative scenario is considered to be necessary. All other cumulative schemes are not considered relevant to the assessment owing to their scale and distance from the H1 Development and receptors. This has been determined using professional judgement.

10.2.17 Additionally, given the residential nature of the Elephant and Castle Shopping Centre Cumulative Scheme, it has been considered as a 'future receptor' and therefore technically assessed in relation to daylight and sunlight in the cumulative scenario. The consent for the Elephant and Castle Shopping Centre Cumulative Scheme also comprises

outdoor amenity space, which has therefore also been assessed for overshadowing. The Elephant and Castle Shopping Centre Cumulative Scheme is also sensitive to light pollution from the H1 Development and is therefore assessed as a future receptor.

Assessment Methodology

The Works

10.2.18 No technical analysis of the likely significant effects on the surrounding properties and amenity areas during the Works was undertaken due to the transient nature of the massing of the H1 Development as construction progresses. However, a qualitative assessment of the likely effects during the Works was undertaken based on professional judgement.

The Completed and Operational H1 Development

Daylight

10.2.19 The BRE Guidelines specify two primary methods for assessing daylight within an existing sensitive receptor:

- Vertical Sky Component (VSC).
- No Sky Line (NSL).

10.2.20 In addition, Average Daylight Factor (ADF) is sometimes considered an appropriate metric. The BRE Guidelines state that this method of assessment for daylight should be applied to new developments to determine daylight availability rather than existing neighbouring buildings, unless the internal subdivision of the properties is known. The ADF gives a more detailed assessment of the daylight within a room and takes into account the highest number of factors in establishing a quantitative output.

10.2.21 Because the internal subdivision of rooms within the future receptors (Elephant and Castle Shopping Centre Cumulative Scheme) and receptors within the Approved Development (H2, H4 and H7) are known, the ADF method of assessment has been used as a supplementary assessment.

10.2.22 These three methods of daylight assessment used for the H1 Development assessment are described in further detail below.

Vertical Sky Component (VSC) Method

10.2.23 VSC is a 'spot' measure of the skylight reaching the mid-point of a window from an overcast sky. It represents the amount of visible sky that can be seen from that reference point, from over and around an obstruction in front of the window. That area of visible sky is expressed as a percentage of an unobstructed hemisphere of sky, and, therefore, represents the amount of daylight available for that particular window.

10.2.24 The 3D model uses Waldram Diagrams (used to calculate the percentage of sky that a building allows to the street below) to establish the VSC and 3D geometric calculations for daylight distribution.

10.2.25 Only those surrounding properties which have windows facing towards the Site were included in the assessment. If a nearby property has no windows facing the Site, these properties would not be affected by the H1 Development in terms of light.

10.2.26 The assessment is calculated from the centre of a window on the outward face and measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings.

10.2.27 The maximum VSC value is 39.9% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state:

“If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if either:

- *The VSC measured at the centre of an existing main window is less than 27%, and less than 0.8 times its former value.*
- *The area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value.”*

No Sky Line (NSL) Method

10.2.28 The NSL method is a measure of the distribution of daylight at the ‘working plane’ within a room. The ‘working plane’ is a horizontal plane 0.85 m above finished floor level for residential properties. The NSL divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane lies beyond the NSL (i.e. it receives no direct sky light), then the distribution of daylight in the room may be poor and supplementary electric lighting may be required. Floor levels were assumed for surrounding properties where access or detailed planning drawings were not obtained. Where floor levels were assumed, the working plane has been located 850 mm above the assumed Finished Floor Level (FFL). The following surrounding properties (see **Figure 10.1** in **Section 10.3**) have assumed layouts and FFL:

- Mawes House (partial).
- 82, 84, 88, 92 and 94-96 Walworth Road.

10.2.29 Where actual room layouts were available, these were considered in the modelling of the internal layouts within the surrounding properties. Obtaining these room layouts enables precise evaluation of the diffuse levels of daylight within each of the rooms via the NSL. Layouts were available within the public domain for the following properties (see **Figure 10.1** in **Section 10.3**):

- Mawes House (partial).
- Portchester House.
- Strata Tower.
- Tantallon House.
- Julian Markham House.

- H2, H7 and H4 within the Approved Development.

10.2.30 For the remaining properties and rooms, where layout information was not available, assumptions were made as to the use and internal configuration of the rooms (from external observations) behind the fenestration observed. In such cases a standard 4.2 m (14 ft) room depth was assumed, unless the building form dictated otherwise. This is common practice where access to buildings for surveying is unavailable.

10.2.31 The potential effects of daylighting distribution in an existing building can be found by plotting the NSL in each of the main rooms. For houses, this would include living rooms, dining rooms and kitchens. Bedrooms should also be analysed, although they are less important. The BRE Guidelines identify that if the area of a room that does receive direct sky light is reduced to less than 0.8 times its former value, then this would be noticeable to its occupants.

Average Daylight Factor (ADF)

10.2.32 This method of assessment takes into account the total glazed area to the room, the visible light transmittance of the glazing proposed, the total area and reflectance properties of the room surfaces including all walls, ceilings and floors for the room being assessed. The method also takes into account the VSC and the quantum of reflected light. The ADF analysis has been undertaken using specialist software, Radiance. This is, therefore, a significantly more detailed method of assessment than the VSC method.

10.2.33 The BRE Guidelines state the following in Appendix C:

“If a predominantly day lit appearance is required, then ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These additional recommendations are minimum values of Average Daylight Factor, and should be attained even if a predominantly day lit appearance is not achievable.”

Sunlight

10.2.34 The BRE Guidelines specify one method for assessing sunlight within an existing sensitive receptor, Annual Probable Sunlight Hours (APSH). This method of sunlight assessment used for the H1 Development assessment is described in further detail below.

Annual Probable Sunlight Hours

10.2.35 The Annual Probable Sunlight Hours (APSH) is a measure of sunlight that a given window may expect over a year period, and where there is no obstruction, equates to a maximum of 1,486 hours. The BRE Guidelines recognise that sunlight is less important than daylight in the amenity of a room and is heavily influenced by orientation. North facing windows may receive sunlight on only a handful of occasions in a year, and windows facing eastwards or westwards will only receive sunlight for some of the day. The BRE Guidelines states that only windows with an orientation within 90 degrees of south ought to be assessed. Therefore, in terms of sunlight, only rooms facing within 90 degrees of due south are assessed for APSH as north facing rooms will not receive direct sunlight.

10.2.36 The future baseline condition of both total APSH and winter PSH are assessed. The APSH and winter PSH have different BRE Guidelines criteria, as set out in **Table 10.1**. For the assessment of the H1 Development, the total APSH and winter PSH were reported separately, to provide a more detailed assessment reflecting the different sunlight conditions.

10.2.37 The BRE Guidelines note:

"...In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."

"...all main living rooms of dwellings...should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun".

"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked."

...a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".

10.2.38 The BRE Guidelines provide that a window may be adversely affected if a point at the centre of the window receives for the whole year, less than 25% of the APSH, including at least 5% of the APSH during the winter months (21st September to 21st March) and less than 0.8 times its former sunlight hours during either period, and if there is a reduction in APSH which is greater than 4%.

10.2.39 It was often not possible to determine the room uses within each of the neighbouring properties, nor was it clear which windows should be considered as the 'main windows'. Therefore, regardless of use, all the rooms with windows facing the Site and within 90 degrees of due south were considered in the assessment.

Overshadowing

10.2.40 The following methodologies are used to assess overshadowing:

- Transient Overshadowing (TOS).
- Sun Hours on Ground.

10.2.41 Both TOS and Sun Hours on Ground assessments determine the extent of overshadowing on surrounding public and private amenity areas. TOS is initially used as a screening exercise to determine the approximate hours of the day an amenity area is cast in shadow from the H1 Development. Where significant effects are expected to occur on an amenity area with distinct boundaries, a Sun Hours on Ground assessment is undertaken to quantify any additional overshadowing owing to the H1 Development.

10.2.42 Both methods are described below.

Transient Overshadowing

10.2.43 The BRE Guidelines suggests that where large buildings are proposed that may affect open spaces, it is useful to plot a shadow plan to illustrate the location of shadows at different times of the day and year. For the purpose of this assessment the hourly shadows were mapped for the following three key dates:

- 21st March (Spring Equinox).
- 21st June (Summer Solstice).
- 21st December (Winter Solstice).

10.2.44 21st September (Autumn Equinox) provides the same overshadowing images as March 21st (Spring Equinox) as the sun follows the same path at these corresponding times of year. Therefore, 21st March is used within the overshadowing assessment.

10.2.45 Transient overshadowing was calculated at hourly intervals from sunrise, throughout the day, until sunset, as illustrated in **Appendix 10.2**. On December 21st, the sun would be at its lowest point causing long shadows to be cast and represents the worst-case scenario in terms of overshadowing.

Sun Hours on Ground

10.2.46 The BRE Guidelines suggest that 'sun hours on ground' assessment should be undertaken on the Equinox (21st March and 21st September). Using specialist software, Radiance, the path of the sun was tracked to determine where the sun would reach the ground and where it would not on these dates.

10.2.47 It is recommended that at least half of an amenity area should receive at least 2 hours of sunlight on March 21st or the area which receives 2 hours of direct sunlight should not be reduced to less than 0.8 times its former value (i.e. there should be no more than a 20% reduction).

Summary of the BRE Guidelines Criteria for Daylight, Sunlight and Overshadowing

10.2.48 The criteria set out within the BRE Guidelines for daylight, sunlight and overshadowing summarised in **Table 10.1** are used as guidance for the assessments. Numerical analysis and professional judgement have also been used to determine the scale and nature of the likely effects.

Table 10.1: Summary of the BRE Guidelines Criteria for Daylight, Sunlight and Overshadowing

Topic	Method	BRE Guidelines 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)	The recommended ADF levels for dwelling are for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. No criteria are given to measure alterations in ADF levels.
Sunlight	Annual Probable Sunlight Hours (APSH)	A room may be adversely affected if a point at the centre of its window(s) receives for the whole year, less than 25% of the APSH including at least 5% of the PSH during the winter months (21 st September to 21 st March) and less than 0.8 times its former sunlight hours during either period, and (for existing neighbouring buildings), if there is a reduction in APSH which is greater than 4%.
Overshadowing	Sun Hours on Ground	An area of amenity space or garden may be adversely affected if less than half (50%) of the area is prevented by buildings from receiving two hours of sunlight on the 21 st March (as suggested by the BRE Guidelines ²) and the area which can receive some sun on the 21 st March is less than 0.8 times its former value.

Solar Glare

10.2.49 Solar glare is particularly important at pedestrian and road junctions, where glare can cause temporary blinding of drivers or pedestrians. Typically, elements considered to be reflective are either glazed apertures or specular metal cladding.

10.2.50 The BRE Guidelines includes the following statement in regard to the potential for reflected solar glare from a new development:

“Glare or solar dazzle can occur when sunlight is reflected from a glazed façade. This can affect road users outside and the occupants of adjoining buildings. The problem can occur either when there are large areas of reflective glass or cladding on the façade, or when there are areas of glass or cladding which slope back so that high altitude sunlight can be reflected along the ground. Thus solar dazzle is only a long term problem only for some heavily glazed (or mirror clad) buildings...”

² Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition, 2011

10.2.51 Solar Glare effects can only be quantitatively assessed where the façade details of a proposed building are known. Typically, only highly glazed buildings are considered which are visible from sensitive receptors like road junctions or, as in this case, railway lines. As such, the solar glare assessment only considers the potential effects of the H1 Development and therefore no assessment of the cumulative effects is required.

Viewpoints for Railway lines

10.2.52 Instances of solar reflection have the potential to affect train drivers and their view of signals. Due to the proximity of the Site to the railway line running to and from Elephant and Castle Station, an assessment has been undertaken from these viewpoints, see **Figure 10.3**.

10.2.53 In the case of a train driver, the view direction is defined by the rail tracks. The Railway Group Standard GE/RT8037 Signal Positioning and Visibility sets the eye level of the driver at 2.75 m above the rails. The assessment also considers a train drivers field of vision which takes the angular extent seen at any given time, which for humans facing forwards is approximately 180 degrees.

Solar Glare Technical Assessment

10.2.54 The potential for reflected solar glare or dazzle from glazed or reflective façades from the H1 Development has been assessed using specialist lighting software, Radiance, showing the path of the sun for the entire year. From this, two computer generated angular images have been produced for each selected viewpoint, indicating the area which sees the reflection of the sun path at any point during the year. A modified diagram portraying a standardised extent of human vision is then overlaid onto the image.

10.2.55 **Figure 8** within **Appendix 10.3** highlights the degrees of vision corresponding to the foveal view, with a red circle of 3° of angle in order to identify the area most sensitive to reflected solar glare. Another red circle represents the incidence of the 30° radius of our typical field of view in order to identify a secondary area of sensitivity to potential reflected glare instances.

10.2.56 As stated in the International Commission on Illumination (CIE) CIE Collection on Glare (CIE 146:2002), occurrences at angles beyond 30° would be of little significance in most situations but may be relevant in exceptional circumstances. When seated in a driving seat of a typical car, for example, the limits of the windscreen would generally obstruct the driver's view at angles beyond 30° from the line of sight.

10.2.57 The methodology for solar glare is not aimed at addressing the intensity of an instance of reflected solar glare, but rather its occurrence, duration throughout the year and the location of this occurrence in respect of an individual's line of sight. It is also to be noted that the hours presented reflect solar time and therefore do not take Daylight Saving Hours into account.

10.2.58 It must be noted that the solar glare assessments undertaken assume a worst-case scenario whereby the sun will shine every day during daylight hours which is not the case within the UK.

Light Pollution

10.2.59 Light pollution is defined as any light emitting from artificial sources into spaces where it is unwanted, such as spillage of light from office or commercial buildings onto residential accommodation, where this would cause nuisance to the occupants. Commercial buildings and office spaces are illuminated to 500 lux (in accordance with British Standard BS EN 12464-1:2002) and are highly glazed thus have the potential to cause effects from light spillage, whilst residential buildings are illuminated to lower levels and are less likely to be highly glazed, therefore do not require assessments in terms of light pollution effects. The Institution of Lighting Professionals (ILP) Guidance for the Reduction of Obtrusive Light GN01:2011 (hereafter the ILP Guidance) provide suggested lighting level values to ascertain the acceptability of lighting levels on light pollution.

10.2.60 It should be noted that artificial light is not always perceived as being negative, particularly in areas of high crime where good street lighting and light into street environments is seen as a positive attribute. Adverse effects caused as a result of electric lighting include the intrusion of light into sensitive locations such as adjacent residential accommodation, areas of special night-time interest, ecologically sensitive areas, or needless spillage into the night sky.

10.2.61 Potential light pollution effects of a new H1 Development are typically assessed in relation to four specific criteria:

- Sky Glow is the brightening of the night sky over our towns, cities and countryside. It can be quantified by measuring the Upward Light Ratio (ULR), which is the maximum permitted percentage (%) of luminaire flux for the total installation that goes directly into the sky;
- Light Intrusion is the spilling of light beyond the boundary of a proposed development. It is assessed as vertical illuminance in lux (Ev) measured flat at the centre of the sensitive receptor;
- Luminaire Intensity is the uncomfortable brightness of a light source when viewed against a dark background. It is applied to each source visible from a sensitive receptor and is measured as source intensity (I) (kcd); and
- Building Luminance which can cause an increase in the brightness of a general area and is measured in cd per metre squared (L) as an average over the building facade caused only by external lighting.

10.2.62 Whilst the ILP Guidance relates and refers to external luminaires only, commercial buildings with large areas of glazing and possible night-time usage can sometimes cause light intrusion from their internal luminaires. For this reason, quantitative light pollution assessments can be undertaken in relation to these internal luminaires.

10.2.63 The H1 Development comprises a detailed application for office uses and as such the façade and internal details of a proposed building are known. Therefore, the H1 Development is assessed as a potential source of light intrusion to surrounding sensitive properties. A technical assessment of Sky Glow, Luminaire Intensity and Building Luminance is inappropriate for internal lighting and has therefore not been considered as part of this assessment.

Light Intrusion Methodology

10.2.64 The assessment has been undertaken by preparing a computer-generated 3D model of the H1 Development and using specialist lighting simulation software, Radiance. The light fittings used for this lighting simulation represent

typical office luminaires achieving an average illuminance of 500 lux across the working plane. This assessment assumes that all luminaires are switched on at once and no blinds or shading devices are deployed and so it should be considered a worst-case assessment.

10.2.65 The ILP Guidance provides light pollution targets by Environmental Zone (ranging from E0 Protected dark areas to E4 Urban). The targets also consider a pre-curfew and post-curfew condition, i.e. before 11pm at night and after 11pm until morning. Based on the environmental zones detailed in the ILP Guidance, as set out in **Table 10.2**, the Site is classified as environmental zone E4. This zone allows for a maximum pre-curfew light intrusion level of 25 lux and a maximum post-curfew light intrusion level of 5 lux.

Table 10.2: ILP Guidelines Light Pollution Criteria Environmental Zones

Environmental Zone	Sky Glow ULR (Max %) (1)	Light Intrusion (into windows) Ev (Lux) (2)		Luminaire Intensity (candelas) (3)		Building Luminance Pre- curfew (4)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average L (cd/m2)
E0 – Dark areas (e.g. UNESCO Starlight Reserves, IDA Dark Sky Parks)	0	0	0	0	0	0
E1- Intrinsically dark areas (e.g. National Parks, areas of outstanding natural beauty)	0	2	0 (1*)	2,500	0	0
E2- Low district brightness (e.g. rural or small village locations)	2.5	5	1	7,500	500	5
E3- Medium district brightness (e.g. small town centres or urban locations)	5.0	10	2	10,000	1,000	10
E4- High district brightness (e.g. town/city centres with high levels of night time activity)	15.0	25	5	25,000	2,500	25

Notes: ULR = Upward Light Ratio of the Installation is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky
 Ev = Vertical Illuminance in Lux and is measure flat on the glazing at the centre of the window
 I = Light Intensity in Cd
 L = Luminance in Cd/m2
 Curfew = The time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the planning authority. If not otherwise stated – 23.00 hrs is suggested.
 * = From Public road lighting installations only.

Significance Criteria

Significance of Effects Overview

10.2.66 In terms of sensitivity, in accordance with the BRE Guidelines, surrounding residential properties are considered highly sensitive to daylight and sunlight levels, and specifically habitable rooms within the properties such as living rooms, kitchens and bedrooms. All existing residential receptors included within this assessment are considered highly sensitive due to the expectation of natural light and given equal weighting.

10.2.67 For overshadowing, all public and private areas of open space such as parks, squares and communal gardens in proximity to the Site are considered highly sensitive and are considered within the assessment.

10.2.68 Similarly, for solar glare, all viewpoints are considered to be of high sensitivity and in relation to light pollution, all of the receptors that have been assessed are considered to be of high sensitivity.

10.2.69 The key terminology used to describe the magnitude of effects within this chapter is as follows and is further described in the below sections of this chapter:

- Major.
- Moderate.
- Minor.
- Insignificant*.

* The BRE Guidelines refer to the term negligible, however in order to remain consistent with the rest of the ES, the term insignificant was used

10.2.70 If an effect was judged as negative (for example, a relative reduction in VSC from baseline conditions), then the resulting effect was described as being adverse. There are no set criteria for beneficial effects in the BRE Guidelines.

10.2.71 'Short' to 'medium-term' effects are considered to be those associated with the Works, and 'long-term' effects are those associated with the completed and operational H1 Development.

10.2.72 At a spatial level, daylight, sunlight, overshadowing and solar glare and light pollution effects occur at a 'local' level, affecting only the surrounding sensitive receptors.

Evaluating the Significance of Effects - Daylight and Sunlight

10.2.73 For daylight and sunlight, the BRE Guidelines outline the approach within the accompanying Appendix I, in terms of assigning criteria to assess the effects:

10.2.74 Section 3 of Appendix I states: *"Adverse impacts occur when there is a significant decrease in the amount of skylight [...] reaching an existing building where it is required [...]. The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied."*

10.2.75 Paragraph 5 of Appendix I states: *“Where the loss of skylight [...] fully meets the guidelines, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows [...] lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines and a larger number of windows [...] are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight [...] in the affected building [...].”*

10.2.76 Paragraph 6 of Appendix I states: *“Where the loss of skylight [...] does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse.*

10.2.77 The classification of minor adverse is documented within Appendix 1, Paragraph 6 of the BRE Guidelines:

“Factors tending towards a minor adverse impact include:

- *Only a small number of windows [...] are affected;*
- *The loss of light is only marginally outside the guidelines;*
- *An affected room has other sources of skylight [...]; and/or*
- *The affected building [...] has a low level of requirement for skylight [...].”*

10.2.78 The classification of major adverse is documented within Appendix I, Paragraph 7 of the BRE Guidelines:

“Factors tending towards a major adverse impact include:

- *A large number of windows [...] are affected;*
- *The loss of light is substantially outside the guidelines;*
- *All the windows in a particular property are affected; and*
- *The affected indoor [...] spaces have a particular strong requirement for skylight [...], e.g. a living room in a dwelling [...].”*

10.2.79 Where the BRE Guidelines are met, the effects would be considered insignificant.

10.2.80 The initial numerical criteria for determining the significance of effect for VSC, NSL and APSH is based on percentage alterations, referenced in the BRE Guidelines. This is summarised in **Table 10.3**.

Table 10.3: Summary of VSC, NSL and APSH Significance Criteria

Topic	Method
Insignificant *	<p>Where results show compliance with the BRE Guidelines criteria, the effect is considered to be insignificant since the BRE Guidelines indicate that the occupants are unlikely to experience any noticeable change to their daylight and sunlight amenity levels.</p> <p>Equivalent to alterations less than 20% from the relevant baseline conditions.</p>
Minor	<p>An alteration from the relevant baseline conditions that may be marginally noticeable to the occupant. This may include a number of marginal infringements (adverse) or marginal improvements (beneficial) of the numerical levels suggested in the BRE Guidelines which should be viewed in context.</p> <p>Equivalent to alterations between 20 to 29.9% from the relevant baseline conditions.</p>
Moderate	<p>An alteration from the relevant baseline conditions that may cause a moderate noticeable change to the occupant. This may consist of a large proportion of marginal infringements (adverse) or marginal improvements (beneficial) of the numerical values suggested in the BRE Guidelines and / or a small percentage of significant infringements.</p> <p>Equivalent to alterations between 30 to 39.9% from the relevant baseline conditions.</p>
Major	<p>An alteration from the relevant baseline conditions that may cause a major noticeable change to the occupant. This would consist of a large proportion of significant infringements (adverse) or significant improvements (beneficial) of the numerical values suggested within the 2011 BRE Guidelines.</p> <p>Equivalent to alterations greater than 40% from the relevant baseline conditions</p>

Note: * The BRE Guidelines make reference to the term negligible, however in order to remain consistent with the rest of the ES, the term insignificant was used.

10.2.81 In addition to the thresholds set out within **Table 10.3** if the retained VSC levels are $\geq 27\%$ and the NSL levels are $> 80\%$, the effects are considered insignificant, regardless of the alteration. Similarly, if the retained total APSH levels are $\geq 25\%$ with at least 5% of this occurring in the winter months, the effects are considered insignificant, regardless of the alteration.

10.2.82 Additionally, it is acknowledged that the values in the BRE Guidelines are derived on the basis of a 2-3 storey suburban model. Paragraph 2.2.3. notes that *"The numerical values given here are purely advisory. Different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints."* Therefore, the application of the BRE Guidelines should be treated flexibly.

10.2.83 In more urban environments large factor reductions are difficult to avoid and, as such, weight should also be given to the retained values rather than just the percentage change whereby a realistic VSC level in a dense urban environment could be considered to be around 15%.

10.2.84 This view on retained VSC levels is supported by the Greater London Authority's hearing report³ for the Monmouth House and Featherstone Street development in the London Borough of Islington where it was considered in Para 120, Page 31:

"For general guidance, whilst the BRE guidelines recommend a target value of 27% VSC when measured on an absolute scale, that value is derived from a low density suburban housing model. In an inner city urban environment, VSC values in excess of 20% should be considered as reasonably good, and VSC in the mid-teens should be acceptable."

10.2.85 Detailed matters such as window size, room use, room size, window number or dual aspect rooms are also taken into account when assigning an overall significance per property, as well as the percentage alterations, absolute changes, and any other relevant factors. For example, there may be mitigating factors such as balconies, overhangs or design features which may also affect the determination of assigning the criteria.

10.2.86 For instances where existing VSC, NSL and APSH levels within a property are low, any alteration may result in a disproportionate percentage change, whereby the actual change in daylight or sunlight within the property experienced by the occupant may not be as noticeable as the percentage change would suggest. This is another example of when professional judgement is taken into account.

10.2.87 Where room uses are unknown, all rooms assessed within the property or building are considered habitable to give the worst-case scenario for potential daylight and sunlight effects caused by the H1 Development.

10.2.88 Where the scale of VSC levels and NSL levels within a property differ, professional judgement was also applied to determine an overall significance of effect. In addition, if the scale of APSH and Winter PSH differ greatly, professional judgement has also been used to determine the significance of the effect. This has been based on the factors previously stated.

Evaluating the Significance of Effects - Overshadowing

10.2.89 The BRE Guidelines do not include criteria for the scale and nature of effects and subsequent significance of transient overshadowing other than to identify the different times of the day and year when shadow would be cast over a surrounding area.

10.2.90 The assessment of likely effects as a result of transient overshadowing is therefore based on professional judgement, taking into consideration the conditions of the existing Site and surrounding area, and comparing these conditions against the effect of the transient overshadowing arising from the H1 Development.

10.2.91 It is suggested in the BRE Guidelines that for an area to appear adequately sunlit throughout the year, at least half (50%) of any assessment area should see direct sunlight for at least two hours on the 21st March. If, as a result of new built form, an existing assessment area will not meet the BRE Guidelines and the area which can receive two hours of direct sunlight on 21st March is reduced to less than 0.8 times its former area, then the loss of sunlight is

³ Greater London Authority (GLA), Representation Hearing Report D&P/3698/03 - Monmouth House, 58-64 City Road, and Speedfix House, 19-23 Featherstone Street, London, EC1Y, 2016
(https://www.london.gov.uk/sites/default/files/monmouth_house_representation_hearing_report_3698.pdf)

likely to be noticeable. Where significant effects are shown to be likely in the transient overshadowing, a quantitative (sun hours on ground) assessment will be undertaken for amenity areas with distinct boundaries. The sun hours on ground criteria is outlined in **Table 10.4**.

10.2.92 Where the results show compliance with the BRE Guidelines criteria, the occupants are unlikely to experience any noticeable change to their sunlight amenity levels. For the purposes of this assessment, such an effect would be considered insignificant. Should the relevant criteria not be achieved, a judgement is made as to the significance based on the level of loss, retained sunlight levels and the relevant baseline conditions. As such, a combination of transient overshadowing and sun hours on ground methods are used to assign significance criteria to sensitive amenity areas.

10.2.93 **Table 10.4** sets out the numerical BRE Guidelines criteria adopted in relation to the Sun Hours on Ground assessment.

Table 10.4: Summary of Overshadowing Significance Criteria

Topic	Description
Insignificant	Over 50% of the amenity area will receive 2 hours of sunlight or less than 20% alteration in area which receives 2 hours of direct sunlight.
Minor	20-29.9% reduction or increase in the area which receives 2 hours of direct sunlight (and below 50% retained area).
Moderate	30-39.9 % change in the area which receives 2 hours of direct sunlight (and below 50 % retained area) when compared to the relevant baseline conditions.
Major	≥ 40% reduction or increase in the area which receives 2 hours of direct sunlight (and below 50% retained area).

Evaluating the Significance of Effects - Solar Glare

10.2.94 There are no quantitative criteria within the BRE Guidelines or elsewhere regarding acceptable levels of solar glare. Generally, however, solar reflections at high altitudes are less likely to cause nuisance or distraction as one has to look upwards to see it.

10.2.95 Professional judgement has therefore been applied to assign the significance of solar glare arising from the H1 Development and to determine the criteria for assessing the significance of solar glare set out in **Table 10.5**.

10.2.96 Multiple viewpoints may be chosen for each of the train line or road signals affected. In terms of significance criteria however, professional judgement has been used to determine the effect at the location rather than the individual perspectives within a section of track or road junction. Factors that could influence the significance of effect may include:

- Sunlight availability probability.

- Area of façade off which reflections are visible.
- Period of time reflections are visible.
- Angle at which reflections are visible from line of sight.
- Views of the development being obscured for example by trees.
- The time of day at which the solar reflection will occur for example during peak traffic times.

10.2.97 Initially, the following guide will be used to ascertain the possible significance for each view and the factors listed above will then be taken into consideration to determine the overall significance for the designated viewpoint.

Table 10.5: Summary of Solar Glare Significance Criteria

Topic	Description
Insignificant	No reflections are visible or if visible all occur at angles greater than 30° from the driver's line of sight and so, as stated by the CIE, will be of "little significance".
Minor	Solar reflections are visible within 30° to 10° or between 10° to 5° of the driver's line of sight for a short period of time.
Moderate	Solar reflections are visible within 10° and 5° of the driver's line of sight occurring for a long period of time.
Major	Solar reflections are visible within 5° of a driver's line of sight.

Notes: Mitigating factors such as alternative and unaffected signals/traffic lights and car visor angle may result in the assignment of significance which differs from the above.

Evaluating the Significance of Effects - Light Pollution

10.2.98 The ILP Guidance Notes do not provide details on assigning significance of effects for light pollution, therefore the assessment is based on professional judgement considering the extent of the residential façade adversely affected as well as the extent to which the thresholds set out in the guidance are exceeded. **Table 10.6** highlights the criteria used to assign a specific significance.

Table 10.6: Summary of Light Pollution Significance Criteria

Topic	Description
Insignificant	No breaches of ILP criteria for pre-curfew or post-curfew.
Minor	Small breaches of ILP post-curfew criteria, marginally noticeable to the sensitive receptor. This may include marginal breaches of the ILP criteria which should be viewed in the context of the urban character of the area. No breaches in ILP pre-curfew criteria.
Moderate	Breaches in ILP post-curfew criteria which may cause a moderate noticeable change to the sensitive receptor. This may consist of a large proportion of marginal infringements of the numerical values suggested in the ILP guidance and/or a small percentage of significant infringements. No breaches in ILP pre-curfew criteria.
Major	Breaches in ILP post-curfew criteria which may cause a major noticeable change to the sensitive receptor. This may consist of a large proportion of significant breaches of both the pre-curfew and post-curfew criteria suggested within the ILP Guidance Notes.

Assumptions and Limitations

- 10.2.99 Where actual room layouts were available, these have been considered when modelling the internal layouts of surrounding properties. Where layout information was not available assumptions have been made as to the use and internal configuration of the rooms (from external observations) behind the fenestration observed. In such cases a standard 4.2m (14ft) room depth has been assumed, unless the building form dictated otherwise. This is common practice where access to buildings for surveying is unavailable. Obtaining these room layouts enables precise evaluation of the diffuse levels of daylight within each of the rooms via the NSL.
- 10.2.100 Floor levels have been assumed for surrounding properties where access has not been obtained. With the working plane located 850mm above the finished floor level, this has the potential to affect the assessment of NSL.
- 10.2.101 For solar glare, although great care has been taken in identifying typical viewpoints, this does not guarantee that there are no additional sensitive locations where reflected solar glare could present a particular risk. For practical reasons, the area of the assessment has been limited to the area surrounding the H1 Development. At greater distances, the likelihood of solar reflections causing significant glare is reduced as the time that buildings will reflect is reduced and the area of façade visible constitutes a reduced angle and so reduces the possibility of the whole sun disk being reflected. This is the standard approach adopted to solar glare assessment within EIA.
- 10.2.102 In addition, the methodology for solar glare is not aimed at addressing the intensity of an instance of reflected solar glare, but rather its occurrence, duration throughout the year, and the location of this occurrence in respect of an individual's line of sight. It must also be noted that the hours presented reflect solar time and therefore do not take Daylight Saving Hours into account.

10.3 Relevant Baseline Conditions

Future Baseline

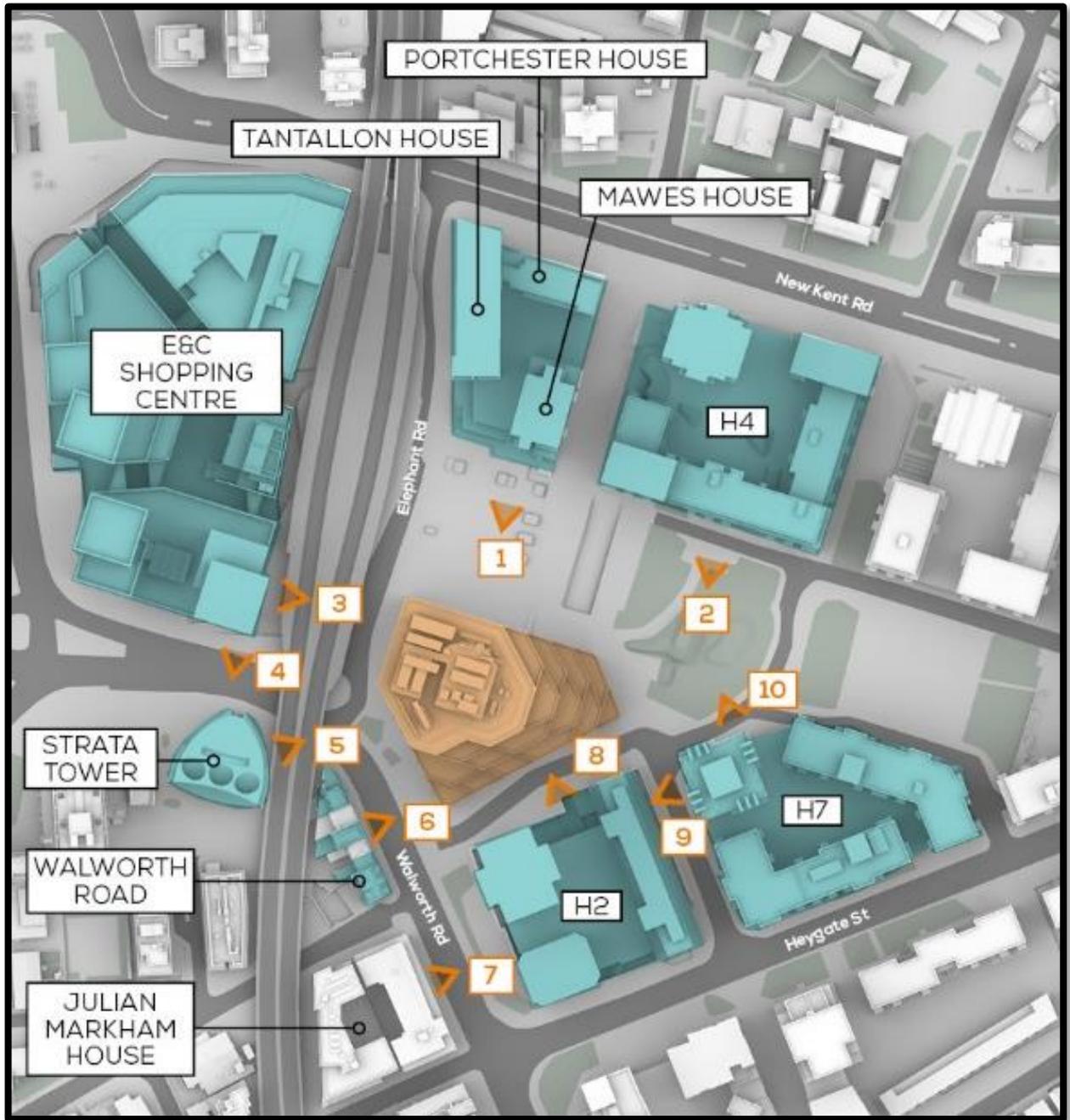
- 10.3.1 The existing H1 Site is cleared and thus void of permanent structures.
- 10.3.2 The existing surrounding buildings are primarily residential, with terraced properties along Walworth Road and high-rise buildings to the west, south and north. The Approved Development plots are all considered to be fully built out in the future baseline condition, which will comprise buildings ranging from three to 31 storeys. Whilst it is acknowledged that an outline permission exists for Plot H1, the assessments are undertaken assuming that the consented H1 is not built out, in order to understand the changes which occur as a result of the H1 Development.
- 10.3.3 In ascertaining the daylight, sunlight and overshadowing effects to existing receptors, the H1 Development is assessed against the future baseline scenario.

Sensitive Receptors

Receptors

- 10.3.4 A total of 872 windows serving 761 rooms within 10 existing surrounding residential buildings were assessed for daylight. For sunlight 522 rooms within these residential buildings were assessed. The full daylight and sunlight future baseline assessment for these receptors can be found within **Appendix 10.1**, with sensitive receptors listed in **Table 10.7**. A total of 1,664 windows serving 1,043 rooms within the residential buildings on Plots H2, H4 and H7 within the Approved Development were assessed for daylight. All other buildings within the Approved Development are considered to be too far from the H1 Development to be affected. For sunlight 645 rooms within these Plots of the Approved Development were assessed. The full daylight and sunlight future baseline assessment for existing sensitive receptors can be found within **Appendix 10.1**, with sensitive receptors listed in **Table 10.7**.
- 10.3.5 **Figure 10.1** shows in blue the sensitive properties assessed for changes in daylight and sunlight amenity as a result of the H1 Development. In addition to the Existing Receptors and Receptors within the Approved Development, **Figure 10.1** shows the Elephant and Castle Shopping Centre Cumulative Scheme, located to the north west of the H1 Development. This cumulative scheme is considered a sensitive future receptor, given its residential content and is therefore assessed for daylight and sunlight impacts in the Cumulative Scenario section.

Figure 10.1: Sensitive Properties



10.3.6 The surrounding properties considered sensitive to daylight and sunlight are set out below in **Table 10.7**.

Table 10.7: Sensitive Properties

Receptor	Type	Distance to Site
Existing Receptors		
82 Walworth Road	Existing Residential	20m
84 Walworth Road	Existing Residential	20m
88 Walworth Road	Existing Residential	25m
92 Walworth Road	Existing Residential	30m
94-96 Walworth Road	Existing Residential	30m
Julian Markham House	Existing Student Accommodation	50m
Mawes House	Existing Residential	55m
Portchester House	Existing Student Accommodation	110m
Tantallon House	Existing Residential	80m
Strata Tower	Existing Residential	50m
Receptors within the Approved Development		
H2	Residential within the Approved Development	25m
H4	Residential within the Approved Development	25m
H7	Residential within the Approved Development	50m

10.3.7 **Figure 10.2** shows in blue the sensitive amenity areas assessed for changes in overshadowing as a result of the H1 Development. The surrounding amenity areas considered sensitive to overshadowing are listed within **Table 10.8**. **Figure 10.2** also shows the amenity areas within Elephant and Castle Shopping Centre Cumulative Scheme (Areas 4, 5 and 6), located to the north east of the H1 Development. These amenity areas are considered sensitive future receptors and are therefore assessed for overshadowing impacts in the Cumulative Scenario section. The full overshadowing future baseline assessment for amenity areas can be found within **Appendix 10.2**.

Figure 10.2: Sensitive Amenity Areas

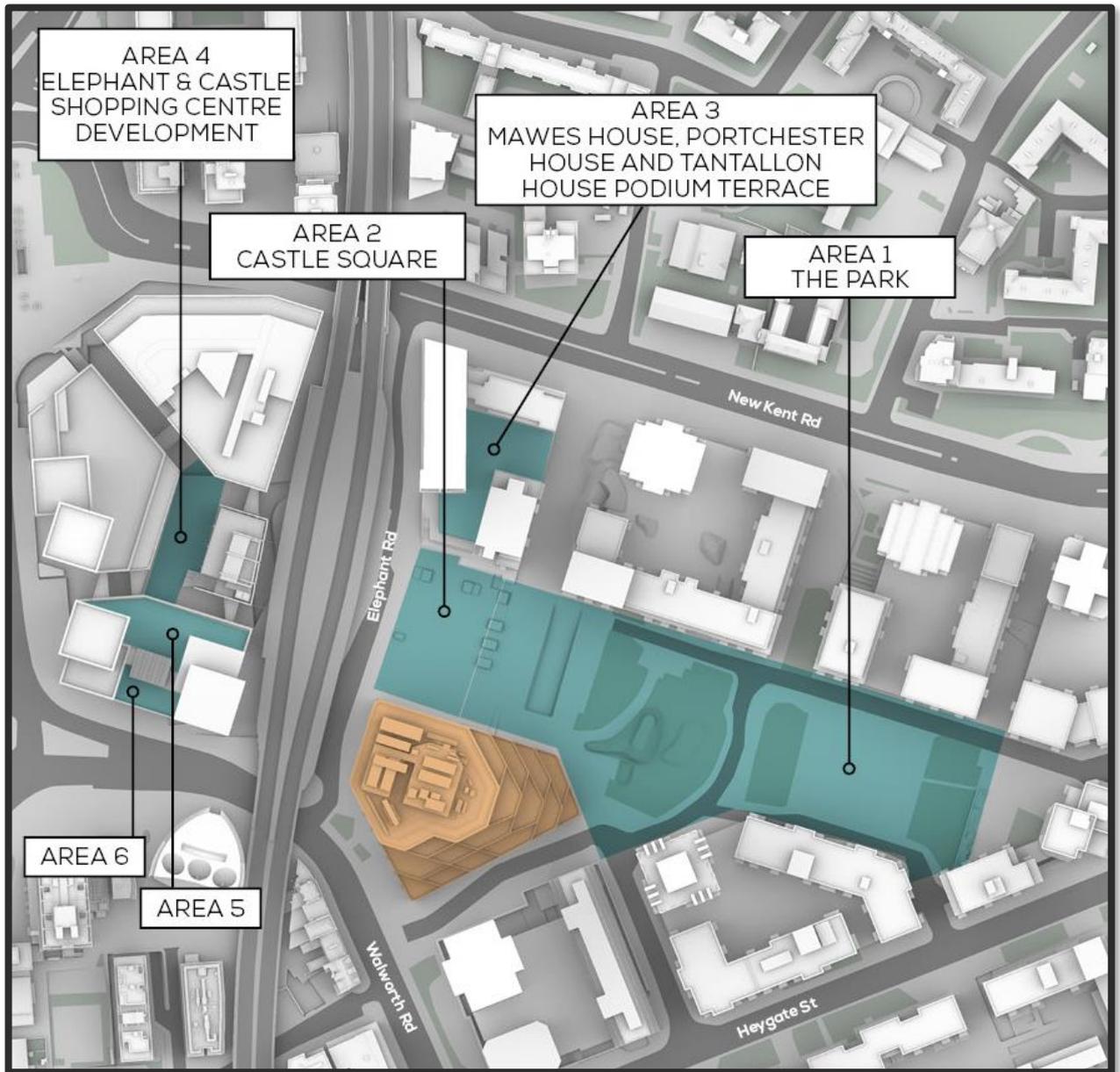


Table 10.8: Sensitive Amenity Areas

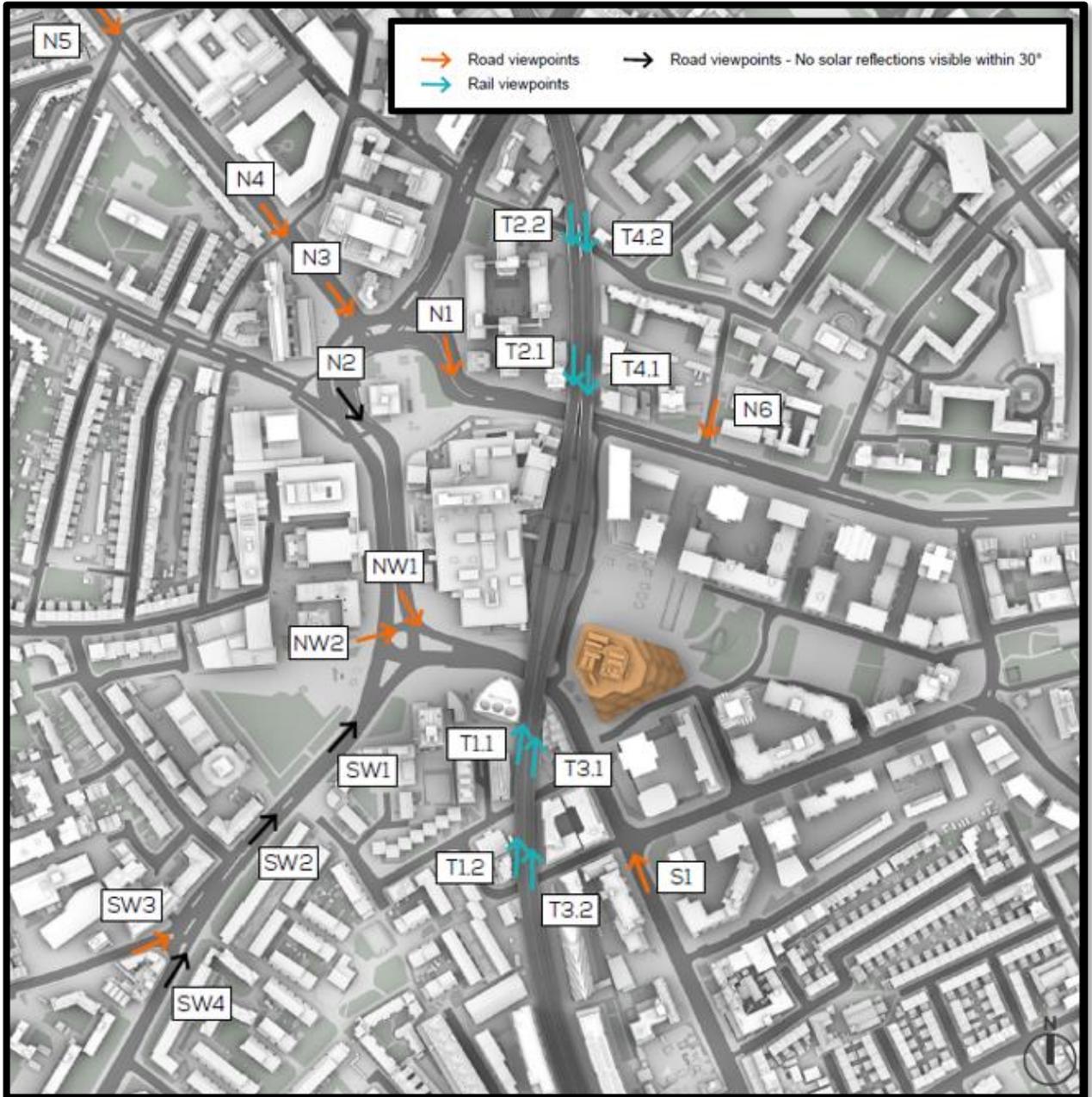
Receptor	Type	Distance to Site
Existing Amenity Areas		
The Park (1)	Public amenity area	15m
Castle Square (2)	Public amenity area	10m
Podium Terrace between Mawes House, Portchester House and Tantallon House (3)	Podium terrace	100m

10.3.8 The following surrounding road and rail viewpoints considered sensitive are listed within **Table 10.9**, as shown on **Figure 10.3**. Where relevant, viewpoints have been grouped together.

Table 10.9: Solar Glare Sensitive Viewpoints

Receptor	Type
N1 – N6	Road viewpoint
NW1 – NW2	Road viewpoint
SW1 – SW2	Road viewpoint
S1	Road viewpoint
T1.1 – T1.2	Rail viewpoint
T2.1 – T2.2	Rail viewpoint
T3.1 – T3.2	Rail viewpoint
T4.1 – T4.2	Rail viewpoint

Figure 10.3: Solar Glare Sensitive Viewpoints



10.3.9 The below properties, which are existing, future and within the Approved Development as shown on **Figure 10.1**, are considered to be in close enough proximity to the H1 Development to be sensitive to light pollution effects. As noted above, in the H1 Development configuration there are no existing residential properties located in the Elephant and Castle Shopping Centre Development site, which would be sensitive to light pollution from the H1 Development. The future Elephant and Castle Shopping Centre Development includes residential accommodation and is consequently sensitive to light pollution from the H1 Development, and therefore requires assessment. The light pollution assessment therefore includes the Elephant and Castle Shopping Centre Development as built out, which is discussed in the Cumulative Scenario section. Given the position of the H1 Development relative to the other sensitive properties, the inclusion of the Elephant and Castle Shopping Centre Development does not affect the light pollution assessment effects in the H1 Development scenario.

- 82, 84, 88, 92 and 94-96 Walworth Road.
- Julian Markham House.
- Mawes House.
- Portchester House.
- Strata Tower.
- Tantallon House.
- H2.
- H4.
- H7.
- Elephant and Castle Shopping Centre Development (Cumulative Scheme).

10.4 Likely Effects of the H1 Development and their Significance

The Works

- 10.4.1 The magnitude of impact and resultant potential effect in relation to the daylight, sunlight, overshadowing, solar glare and light pollution on the surrounding receptors would vary throughout the construction phase, depending on the level of obstruction caused.
- 10.4.2 During the Works, a number of tall cranes are likely to be present on Site, however their size and temporary presence would lead to generally imperceptible effects of a temporary nature. Given the cleared nature of the existing Site, the effects to daylight, sunlight, and overshadowing at receptors surrounding the Site would range from **insignificant** to those reported in the Completed and Operational section, as the H1 Development is constructed and clad. Whilst it is acknowledged that there is potential for overlap in construction works relating to the H1 Development and Plots H7, H11a and H11b of the Approved Development, any temporary daylight, sunlight and overshadowing effects to surrounding sensitive receptors during the Works would gradually increase, as construction progresses, to those reported in the Completed and Operational H1 Development scenario. With all plots within the Approved Development built out in the future baseline scenario, it is therefore considered that the completed H1 Development (in the context of the built out Approved Development) represents the worst-case assessment in terms of likely daylight, sunlight and overshadowing effects to surrounding sensitive receptors.
- 10.4.3 In terms of solar glare, as construction works progress, and the facades of the H1 Development are installed, the potential solar glare effects would be similar to those once the Complete and Operational H1 Development, as presented below. As such, the overall effect in terms of solar glare would range from **insignificant** to those as set out in the assessment of the Complete and Operational H1 Development scenario below. It is therefore considered that the H1 Development represents the worst-case assessment in terms of likely solar glare effects.
- 10.4.4 Whilst temporary construction lighting would be used on the Site, the design is not known and therefore cannot be assessed. There is potential for these effects to be adverse on neighbouring residential receptors, however any

artificial lighting used on Site would be controlled in the Construction Environmental Management Plan (CEMP). It is likely that the artificial lighting proposed within the office space is not utilised until the H1 Development is fully operational and therefore the worst-case scenario is represented by the assessment of the H1 Development in the following section, which reports an overall **insignificant** effect.

The Completed and Operational H1 Development

Daylight to surrounding receptors

Existing Receptors

10.4.5 The full daylight assessment for the H1 Development in relation to existing residential receptors can be found within **Appendix 10.1** and is summarised in below in Table **10.9**.

10.4.6 In the H1 Development scenario, of the 872 windows assessed for VSC, 614 (70.4%) meet the BRE Guidelines criteria. Of the 761 rooms assessed for NSL, 683 (89.8%) meet the BRE Guidelines criteria.

Table 10.9: Summary of VSC and NSL results with the H1 Development

Address	VSC						NSL					
	Total No. of Windows	No. Windows That Meet BRE Guidelines	Below BRE Guidelines			Total	Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction				20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	
82 Walworth Road	10	0	0	0	10	10	4	2	0	0	2	2
84 Walworth Road	10	0	0	0	10	10	6	0	0	0	6	6
88 Walworth Road	12	0	0	0	12	12	7	5	2	0	0	2
92 Walworth Road	7	0	0	0	7	7	3	2	0	0	1	1
94-96 Walworth	19	4	1	4	10	15	15	10	1	4	0	5

Address	VSC						NSL					
	Total No. of Windows	No. Windows That Meet BRE Guidelines	Below BRE Guidelines			Total	Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction				20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	
Road												
Julian Markham House	146	129	17	0	0	17	127	127	0	0	0	0
Mawes House	256	210	26	8	12	46	208	192	8	5	3	16
Portchester House	161	157	3	1	0	4	140	111	14	8	7	29
Tantallon House	115	74	23	17	1	41	115	110	5	0	0	5
Strata Tower	136	40	56	40	0	96	136	124	12	0	0	12
Totals	872	614	126	70	62	258	761	683	42	17	19	78

82 Walworth Road

10.4.7 82 Walworth Road is located to the south west of the Site. The front facing façade of the building was considered to be sensitive to daylight alterations, on the first to second floor. A total of 10 windows serving four rooms were assessed for daylight within this building.

10.4.8 For VSC, with the H1 Development in place, none of the windows assessed would meet the BRE Guidelines criteria. All 10 windows, serving rooms of unknown use, would experience alterations in VSC beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.9 For NSL, with the H1 Development in place, two of the rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. The two remaining rooms would experience alterations in NSL beyond 40%, which would be a direct, long-term, local effect of major adverse significance. Both affected rooms retain in excess of 50% NSL which is commensurate with the existing levels in the surrounding area and is considered

acceptable for a high-density urban location.

10.4.10 All the affected rooms face directly onto the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight for an urban context. Any significant development of the Site will cause a reduction in daylight levels of a significant magnitude.

10.4.11 Overall, whilst the retained NSL levels are acceptable for an urban context, owing to the magnitude of the alterations in VSC levels, the effect to this property as a result of the H1 Development is considered to be **direct, long-term, local** and of **major adverse significance**.

84 Walworth Road

10.4.12 84 Walworth Road is located to the south west of the Site. The front facing façade of the building was considered to be sensitive to daylight alterations, on the first to third floor. A total of 10 windows serving six rooms were assessed for daylight within this building.

10.4.13 For VSC, with the H1 Development in place, none of the windows assessed would meet the BRE Guidelines criteria. All 10 windows, serving rooms of unknown use, would experience alterations in VSC beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.14 For NSL, with the H1 Development in place, none of the rooms assessed would meet the BRE Guidelines criteria. All six rooms would experience alterations in VSC beyond 40%, which would be a direct, long-term, local effect of major adverse significance. Five of the six affected rooms retain in excess of 50% NSL which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.

10.4.15 All the affected rooms face directly onto the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight for an urban context. Therefore, any significant development of the Site will cause a reduction in daylight levels of a significant magnitude.

10.4.16 Overall, whilst the retained NSL levels are acceptable for an urban context, owing to the magnitude of the alterations in VSC levels the effect to this property as a result of the H1 Development is considered to be **direct, long-term, local** and of **major adverse significance**.

88 Walworth Road

10.4.17 88 Walworth Road is located to the south west of the Site. The front facing façade of the building was considered to be sensitive to daylight alterations, on the ground to third floor. A total of 12 windows serving seven rooms were assessed for daylight within this building.

10.4.18 For VSC, with the H1 Development in place, none of the windows assessed would meet the BRE Guidelines criteria. All 12 windows, serving rooms of unknown use, would experience alterations in VSC beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.19 All the affected windows face directly onto the site in its currently cleared state, thereby receiving

disproportionately high levels of daylight for an urban context. Therefore, any significant development of the site will cause a reduction in daylight levels of a significant magnitude.

10.4.20 For NSL, with the H1 Development in place, five of the rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. The two remaining room would experience alterations in NSL between 20-29.9% which would be a direct, long-term, local effect of minor adverse significance. The two affected rooms retain NSL levels of 69.5% and 75.9% respectively, which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.

10.4.21 Overall, whilst the retained NSL levels are acceptable for an urban context, owing to the magnitude of the alterations in VSC levels the effect to this property as a result of the H1 Development is considered to be **direct, long-term, local** and of **major adverse** significance.

92 Walworth Road

10.4.22 92 Walworth Road is located to the south west of the Site. The front facing façade of the building was considered to be sensitive to daylight alterations, on the first to third floor. A total of seven windows serving three rooms were assessed for daylight within this building.

10.4.23 For VSC, with the H1 Development in place, none of the windows assessed would meet the BRE Guidelines criteria. All seven windows, serving rooms of unknown use, would experience alterations in VSC beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.24 All the affected windows face directly onto the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight for an urban context. Therefore, any significant development of the Site will cause a reduction in daylight levels of a significant magnitude.

10.4.25 For NSL, with the H1 Development in place, two of the rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. The remaining room would experience alterations in NSL between 20-29.9% which would be a direct, long-term, local effect of minor adverse significance. Furthermore, this room is served by a dormer window which inherently restricts sky visibility, therefore the alterations in NSL to this room are a function of the architecture of this building itself.

10.4.26 Overall, owing to the magnitude of the alterations in VSC levels the effects to this property as a result of the H1 Development is considered to be **direct, long-term, local** and of **major adverse significance**.

94-96 Walworth Road

10.4.27 94-96 Walworth Road is located to the south west of the Site. The front facing façade of the building was considered to be sensitive to daylight alterations, from the first to fourth floor. A total of 19 windows serving 15 rooms were assessed for daylight within this building.

10.4.28 For VSC, with the H1 Development in place, four of the windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. One window would experience alterations in VSC between 20-

29.9% which is considered to be a minor adverse effect and four would experience alterations in VSC between 30-39.9% which is considered to be a moderate adverse effect. The remaining 10 windows would experience alterations beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.29 All the affected windows face directly onto the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight for an urban context, however their daylight is partially restricted by the tower of H2 of the Approved Development directly to the east. Therefore, any significant development of the Site will cause a reduction in daylight levels of a significant magnitude.

10.4.30 For NSL, with the H1 Development in place, 10 of the 15 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. One room would experience alterations in NSL between 20-29.9% which is considered a minor adverse effect and the remaining four would experience alterations in NSL between 30-39.9% which would be a direct, long-term, local effect of moderate adverse significance. Four of the five affected rooms retain in excess of 50% NSL which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location and the final rooms retains an NSL of 49.4%.

10.4.31 Overall, owing to the magnitude of the alterations in VSC levels the effects to this property as a result of the H1 Development is considered to be **direct, long-term, local** and of **major adverse significance**.

Julian Markham House (Student Accommodation)

10.4.32 Julian Markham House is located south of the Site and comprises student accommodation, therefore based on professional judgement it carries less sensitivity to changes to daylight levels than standard residential uses in terms of daylight owing to the transient nature of its occupiers. The front and northern side facing façades of the building were considered to be sensitive to daylight alterations, from the first to seventh floor. A total of 146 windows serving 127 rooms were assessed for daylight within this building.

10.4.33 For VSC, with the H1 Development in place, 129 of the 146 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. The remaining 17 windows would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect, which would be a direct, long-term, local effect of minor adverse significance.

10.4.34 For NSL, with the H1 Development in place, all 127 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect.

10.4.35 Overall, in consideration of all rooms experiencing insignificant effects in terms of NSL and the magnitude of alterations in terms of VSC, the effects to this building as a result of the H1 Development are considered to be **direct, long-term, local** and of **minor adverse significance**.

Mawes House

10.4.36 Mawes House a high-rise building located north of the Site and comprises residential accommodation. The front and eastern side facing façades of the building were considered to be sensitive to daylight alterations, from the

first to 15th floor. A total of 256 windows serving 208 rooms were assessed for daylight within this building.

- 10.4.37 For VSC, with the H1 Development in place, 210 of the 256 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 26 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and the eight would experience alterations in VSC between 30-39.9% which would be a moderate adverse effect. The remaining 12 would experience alterations beyond 40%, which would direct, long-term, local effect of major adverse significance.
- 10.4.38 13 of the affected windows are understood to serve bathrooms which are non-habitable rooms and thus do not have an expectation of daylight as stated in the BRE Guidelines (para 2.2.2). A further 12 are understood to serve kitchens which are considered to have lower sensitivity to alteration in daylight. The remaining 21 windows serve bedrooms and retain VSC levels in excess of 15% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location. In addition, seven of these bedrooms are also served by a second window which does not experience a noticeable change in daylight.
- 10.4.39 For NSL, with the H1 Development in place, 192 of the 208 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms, eight would experience alterations in NSL between 20-29.9% which is considered a minor adverse effect and five would experience alterations in NSL between 30-39.9% which would be a moderate adverse effect. The remaining three would experience alterations beyond 40%, which would be a direct, long-term, local effect of major adverse significance.
- 10.4.40 Three of the affected rooms are known to be bathrooms which are non-habitable rooms and thus do not have an expectation of daylight as stated in the BRE Guidelines (para 2.2.2). The remaining 13 are understood to be kitchens which are considered to have lower sensitivity to alteration in daylight. These 13 kitchens all retain in excess of 50% NSL which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.
- 10.4.41 Overall, in consideration of the majority of windows being unaffected in terms of VSC and majority of rooms being unaffected in terms of NSL; the few affected rooms being either non-habitable uses or a lower sensitivity; and the retained levels of light being acceptable for the urban context; the effects to this building as a result of the H1 Development is considered to be **direct, long-term, local** and of **minor to moderate adverse significance**.

Portchester House (Student Accommodation)

- 10.4.42 Portchester House is located north of the Site and comprises student accommodation, therefore based on professional judgement it carries less sensitivity to changes to daylight levels than standard residential uses in terms of daylight owing to the transient nature of its occupiers. The south facing courtyard façade of the building was considered to be sensitive to daylight alterations, from the first to 18th floor. A total of 161 windows serving 140 rooms were assessed for daylight within this building.
- 10.4.43 For VSC, with the H1 Development in place, 157 of the 161 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, three would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and the remaining one would

experience alterations in VSC between 30-39.9% which would be a moderate adverse effect.

10.4.44 All four affected windows have very low baseline VSC levels of below 5.0% as a result of their obstructed location on the lower floors within an acute internal corner of the courtyard. In instances of low existing VSC values such as these, any alteration may result in a disproportionate percentage change. This is shown by the small absolute changes experienced by the four affected windows of 1.0%, two with 1.1% and 1.2% VSC respectively, a small absolute change of this nature is unlikely to be noticeable to the occupant. Furthermore, the rooms these four windows serve are also served by a second window which does not experience a noticeable change in daylight.

10.4.45 For NSL, with the H1 Development in place, 111 of the 140 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms, 14 would experience alterations in NSL between 20-29.9% which is considered a minor adverse effect and eight would experience alterations in NSL between 30-39.9% which would be a moderate adverse effect. The remaining seven would experience alterations beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.46 The affected rooms experience lower levels of NSL as they are located on the lower floors and face into a narrow courtyard where the massing of Mawes House and Tantallon House limit the visibility of the sky, as such, these rooms are reliant on light provided across the Site in its currently cleared state and any significant increase in height within the Site would lead to alterations of this magnitude. This is common of courtyard schemes and thus the changes in NSL are predominantly a function of the architecture of Portchester House itself.

10.4.47 Overall, in consideration of the majority of windows being unaffected in terms of VSC and the majority of rooms being unaffected in terms of NSL; the few affected windows experiencing disproportionate alterations as a function of their low existing VSC levels; and the rooms affected in terms of NSL seeing changes in sky visibility predominantly as a function of the architecture of Portchester House itself; the effects to this building as a result of the H1 Development are considered to be **direct, long-term, local** and of **minor adverse significance**.

Tantallon House

10.4.48 Tantallon House is located north of the Site and comprises residential accommodation. The south facing façade of the building was considered to be sensitive to daylight alterations, from the first to 23rd floor. A total of 115 windows serving 115 rooms were assessed for daylight within this building.

10.4.49 For VSC, with the H1 Development in place, 74 of the 115 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 23 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and 17 would experience alterations in VSC between 30-39.9% which would be considered a moderate adverse effect. The remaining window would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.4.50 All 41 affected windows are located behind a recessed balcony or façade inset which limits the visibility of the sky dome, leading to a disproportionate percentage alteration and therefore the alterations in VSC are a function of the architecture of this building itself.

- 10.4.51 For NSL, with the H1 Development in place, 110 of the 115 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. The five affected rooms would experience alterations in NSL between 20-29.9% which would be a direct, long-term, local effect of minor adverse significance.
- 10.4.52 All five affected rooms retain NSL levels in excess of 70% which is considered acceptable within an urban location.
- 10.4.53 Overall, in consideration of the majority of windows being unaffected in terms of VSC and the majority of rooms being unaffected in terms of NSL; the retained NSL levels within the few affected rooms being only marginally below recommendation; and the windows affected in terms of VSC doing so as a function of the obstruction caused by their balconies and inset location; the effects to this building as a result of the H1 Development are considered to be **direct, long-term, local** and of **minor adverse significance**.

Strata Tower

- 10.4.54 Strata Tower is located west of the Site and comprises residential accommodation. The eastern façade of the building was considered to be sensitive to daylight alterations, from the second to 18th floor. A total of 136 windows serving 136 rooms were assessed for daylight within this building.
- 10.4.55 For VSC, with the H1 Development in place, 40 of the 136 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 56 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and the remaining 40 would experience alterations in VSC between 30-39.9% which would be a direct, long-term, local effect of moderate adverse significance.
- 10.4.56 All 96 windows retain VSC levels in excess of 15% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.
- 10.4.57 For NSL, with the H1 Development in place, 124 of the 136 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. All 12 affected rooms would experience alterations in NSL between 20-29.9% which is considered which would be direct, long-term, local effect of minor adverse significance.
- 10.4.58 All 12 affected rooms retain NSL levels in excess of 50% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.
- 10.4.59 Overall, in consideration of the majority of windows being unaffected in terms of VSC and majority of rooms being unaffected in terms of NSL; and the retained levels of light being acceptable for the urban context; the effects to this building as a result of the H1 Development is considered to be **direct, long-term, local** and of **minor adverse significance**.

Receptors within the Approved Development

- 10.4.60 The full daylight assessment for the H1 Development in relation to receptors within the Approved Development (Plots H2, H4 and H7) can be found within **Appendix 10.1** and are summarised in below in **Table 10.10**.
- 10.4.61 In the H1 Development scenario, of the 1,664 windows assessed for VSC, 1,158 (69.6%) meet the BRE Guidelines

criteria. Of the 1,043 rooms assessed for NSL, 912 (87.4%) meet the BRE Guidelines criteria.

10.4.62 The receptors within the Approved Development have been designed to account for the impact of significant massing within the Site. Because the room subdivisions are known, and in accordance with the BRE Guidelines Appendix F, ADF target values are considered appropriate for assessing loss of light due to these buildings being part of a new series of buildings being built one after another and designed as part of the larger group. Of the 1,043 rooms assessed for ADF, 882 (84.6%) see no change in their ADF levels or retain ADF levels that meet the BRE Guidelines criteria.

Table 10.10: Summary of VSC and NSL results to Receptors within the Approved Development with the H1 Development

Address	VSC						NSL					
	Total No. of Windows	No. Windows That Meet BRE Guidelines	Below BRE Guidelines			Total	Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction				20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	
H2	657	380	40	65	172	277	327	268	8	8	43	59
H4	300	184	64	37	15	116	258	232	22	4	0	26
H7	707	594	30	28	55	113	458	412	10	9	27	46
Total	1664	1158	134	130	242	506	1043	912	40	21	70	131

H2

10.4.63 This plot is located within the Approved Development and comprises residential accommodation within three buildings, where their northerly elevations face the Site. A total of 657 windows serving 327 rooms were assessed for daylight within this plot.

10.4.64 For VSC, with the H1 Development in place, 380 of the 657 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 40 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and 65 would experience alterations in VSC between 30-39.9% which would be considered a moderate adverse effect. The remaining 172 windows would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.4.65 131 of the 277 windows that are affected in terms of VSC (14 minor adverse, 23 moderate adverse and 94 major adverse) are located beneath a balcony which inherently limits the visibility of the sky dome, leading to low existing VSC levels and a disproportionate percentage alteration, therefore the alterations in VSC are a function of the architectural features of this plot itself. The remaining 146 windows face directly over the Site, some through the H2 courtyard also, and therefore receive most of their light from across the Site in its currently cleared state, thereby receiving uncharacteristically high levels of daylight for the urban context.

10.4.66 For NSL, with the H1 Development in place, 268 of the 327 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms, eight would experience alterations in NSL between 20-29.9% which is considered a minor adverse effect and eight would experience alterations in NSL between 30-39.9% which would be considered a moderate adverse effect. The remaining 43 rooms would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.4.67 For ADF, with the H1 Development in place, 245 of the 327 rooms either meet the BRE Guidelines criteria for their room use or see no change to their ADF levels, and therefore experience an insignificant effect.

10.4.68 197 of the 277 windows affected in terms of VSC (26 minor adverse, 45 moderate adverse and 126 major adverse) serve one of 114 dual-aspect living/kitchen/dining rooms (L/K/Ds) or living rooms. For these 114 dual aspect L/K/Ds or living rooms:

- 103 have one or more of their windows unaffected by the H1 Development which reduce the impact of the losses in light experienced;
- The remaining 11 dual-aspect L/K/Ds or living rooms are located within the northern facades of Blocks A/D and C and receive disproportionately high levels of daylight in the future baseline scenario due to the currently cleared nature of the Site;
- 107 are not affected in terms of NSL and the remaining seven retain an NSL in excess of 50% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location;
- 95 retain an ADF level of 1.5% or greater which accords with the BRE recommendation for living spaces;
- Seven are marginally below recommendation with ADF levels of 1.3% or 1.4% and are considered not materially different from a room that sees an ADF of 1.5%;
- Seven see marginal changes to their ADF levels of 0.1% or 0.2%; and
- The final five are on the lowest four floors of Block C, facing directly onto the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight for an urban context. Therefore, any significant development of the Site will cause a reduction in daylight levels.

10.4.69 Further to the 114 dual-aspect L/K/Ds or living rooms affected in terms of VSC, one dual-aspect living room is affected in terms of NSL but is unaffected in terms of VSC and ADF. This living room retains an NSL of 57.5% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.

10.4.70 Six other L/K/Ds or living rooms are unaffected in terms of VSC and NSL however see a marginal alteration to their ADF levels of 0.1% or 0.2% ADF, which would not perceptibly alter the use of the room.

10.4.71 The remaining 80 windows affected in terms of VSC serve one of 74 bedrooms, six of which are dual-aspect with both their windows affected in terms of VSC.

- 26 of these 74 bedrooms are unaffected in terms of NSL.
- A further 31 retain an NSL in excess of 50% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.
- 40 of the 74 bedrooms retain ADF levels that meet the level recommended by BRE.
- 19 retain an ADF of 0.8% or 0.9% which is marginally below the recommended level and considered acceptable within an urban context.
- Eight of the remaining 15 bedrooms see a marginal alteration to their ADF levels of 0.1% or 0.2% ADF, which would not perceptibly alter the use of the room.
- The final seven are on the lowest three floors facing north directly onto the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight for an urban context. Any significant development of the Site will cause a reduction in daylight levels of a significant magnitude.

10.4.72 Finally, one kitchen is unaffected in terms of VSC however experience lower levels of NSL as it is located on the lowest floor and faces into the courtyard of H2 where the massing of Block A/D and C limit the visibility of the sky, as such, this room is reliant on light provided across the Site in its currently cleared state and any significant increase in height within the Site would lead to alterations of this magnitude. This kitchen sees a marginal alteration in ADF of 0.1% which is not considered perceptible.

10.4.73 Overall, whilst many of the affected windows see lower VSC levels as a function of the architectural features of these buildings, and the majority having mitigating windows serving the same room, given the magnitude of effect in terms of both VSC and NSL to the rooms facing directly over the Site in its currently cleared state the effects to this plot as a result of the H1 Development are considered to be **direct, long-term, local** and of **major adverse significance**.

H4

10.4.74 This plot is located within the Approved Development and just the southerly elevation of one building is relevant for assessment, which has residential accommodation on the first to 11th floor. It is currently nearing completion and occupation. A total of 300 windows serving 258 rooms were assessed for daylight within this building.

10.4.75 For VSC, with the H1 Development in place, 184 of the 300 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 64 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and 37 would experience alterations in VSC between 30-39.9% which would be considered a moderate adverse effect. The remaining 15 windows would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

- 10.4.76 89 of the 116 windows that are affected in terms of VSC (42 minor adverse, 32 moderate adverse and 15 major adverse) are located beneath a balcony which inherently limits the visibility of the sky dome, leading to a disproportionate percentage alteration and therefore the alterations in VSC are a function of the architectural features of this building itself. Of the remaining 27 windows which face directly over the site, and therefore receive most of their light from across the Site in its currently cleared state, 22 retain a VSC level of 15% or greater which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.
- 10.4.77 For NSL, with the H1 Development in place, 232 of the 258 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms, 22 would experience alterations in NSL between 20-29.9% which is considered a minor adverse effect and the remaining four would experience alterations in NSL between 30-39.9% which would be considered a direct, long-term, local effect of moderate adverse significance.
- 10.4.78 For ADF, with the H1 Development in place, 223 of the 258 rooms either meet the BRE Guidelines criteria for their room use or see no change to their ADF levels, therefore experiencing an insignificant effect.
- 10.4.79 91 of the 116 windows affected in terms of VSC serve one of 81 L/K/Ds or studios, 13 of which have one or more of their windows unaffected by the H1 Development which reduces the impact of the losses in light experienced. 80 of these 81 L/K/Ds or studios are not affected in terms of NSL and the remaining living/kitchen/dining room retains an NSL of 79.7% which is only just below the BRE Guidelines criteria of 80%. 53 retain an ADF level of 1.5% or greater which accords with the BRE recommendation for living spaces, 15 are marginally below recommendation with ADF levels of 1.3% or 1.4% and are considered not materially different from a room that sees an ADF of 1.5%, the final 13 see ADF levels between 1.0% and 1.2% which is considered acceptable within an urban context for living rooms with a balcony obstructing their windows.
- 10.4.80 The remaining 25 windows affected in terms of VSC serve one of 25 bedrooms. Six of these 25 bedrooms are unaffected in terms of NSL and the remaining 19 retain an NSL in excess of 65% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location. All 25 bedrooms retain ADF levels that meet the BRE recommendation and therefore remain acceptably daylit.
- 10.4.81 Overall, in consideration of the majority of rooms being unaffected in terms of NSL and retaining acceptable ADF levels; all bedrooms affected in terms of VSC retaining acceptable ADF levels; the affected L/K/Ds doing so as a function of their architectural features; and those without a balcony that are affected in terms of VSC or NSL retaining acceptable daylight levels for an urban context, the effects to this building as a result of the H1 Development are considered to be **direct, long-term, local** and of **minor adverse significance**.

H7

- 10.4.82 This plot is located within the Approved Development and has three buildings considered relevant for assessment, comprising residential accommodation on the first to 23rd floor. Construction of the plot has not yet started, and so the residential accommodation is not yet occupied. A total of 707 windows serving 458 rooms were assessed

for daylight within these buildings.

- 10.4.83 For VSC, with the H1 Development in place, 594 of the 707 windows assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 30 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and 28 would experience alterations in NSL between 30-39.9% which would be considered a moderate adverse effect. The remaining 55 windows would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.
- 10.4.84 83 of the 113 windows that are affected in terms of VSC (14 minor adverse, 17 moderate adverse and 52 major adverse) are located beneath a balcony which inherently limits the visibility of the sky dome, leading to low VSC levels in the future baseline scenario and disproportionate percentage alterations, therefore the alterations in VSC are a function of the architectural features of this building itself. Of the remaining 30 windows, seven retain VSC levels in excess of 15% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location, 16 are on the lower floors facing west into Sayer Street and Block A/D of H2, which restrict their daylight availability resulting in the majority of their daylight being received across the Site in its currently cleared state. The final seven have very low future baseline VSC levels owing to their obstructed location, which is leading to a disproportionate percentage alteration, the absolute alteration in their levels is less than 2% VSC which is not considered a perceptible change in light.
- 10.4.85 For NSL, with the H1 Development in place, 412 of the 458 rooms assessed would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms, 10 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and nine would experience alterations in NSL between 30-39.9% which would be considered a moderate adverse effect. The remaining 27 rooms would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.
- 10.4.86 For ADF, with the H1 Development in place, 414 of the 458 rooms either meet the BRE Guidelines criteria for their room use or see no change to their ADF levels, and therefore experience an insignificant effect.
- 10.4.87 57 of the 113 windows affected in terms of VSC (16 minor adverse, 13 moderate adverse and 28 major adverse) serve one of 45 dual-aspect L/K/Ds, 33 of which have one or more of their windows unaffected by the H1 Development which reduce the impact of the losses in light experienced. The remaining 12 dual-aspect L/K/Ds are located on the lower floors of the tower, facing Sayer Street, where Block A/D of H2 obstructs a significant portion of the sky, and thus these windows are reliant on light provided from the side, across the Site in its currently cleared state. Therefore, any significant development of the Site will cause a reduction in daylight levels of a significant magnitude. 31 of these 45 dual-aspect L/K/Ds are not affected in terms of NSL and 26 either retain ADF levels of 1.5% or greater, or are not affected by the H1 Development. In terms of ADF, of the remaining 19, seven are marginally below recommendation with ADF levels of 1.3% or 1.4% and are considered not materially different from a room that sees an ADF of 1.5%, whilst 10 see marginal changes to their ADF levels of 0.1% or 0.2% and the final two are located on the lower floors of the tower, facing Sayer Street, where Block A/D of H2 obstructs a significant portion of the sky, and thus these windows are reliant on light provided from the side, across the Site in its currently cleared state. Therefore, any significant development of the Site will cause a reduction in daylight levels of a significant magnitude. Further to the 45 dual-aspect L/K/Ds affected in terms of VSC, four dual-aspect

L/K/Ds are affected in terms of ADF. These L/K/Ds see a marginal alteration to their ADF levels of 0.1% ADF, which would not perceptibly alter the use of the room.

10.4.88 The remaining 56 windows affected in terms of VSC serve one of 54 bedrooms, 14 of which have a second window serving the rooms that is unaffected by the H1 Development and reduces the impact of the losses in light experienced. 31 of these 54 bedrooms are unaffected in terms of NSL and a further 16 have low existing levels, thus leading to a disproportionate percentage alteration. 37 of the 54 bedrooms retain ADF levels that meet the level recommended BRE or are unaffected by the H1 Development, whilst seven retain an ADF of 0.8% or 0.9% which is marginally below the recommended level and considered acceptable within an urban context. Seven of the remaining 10 bedrooms see a marginal alteration to their ADF levels of 0.1% or 0.2% ADF, which would not perceptibly alter the use of the room and the final three are on the lowest three floors beneath a balcony and are reliant on light provided across the Site in its currently cleared state, therefore owing to their balconies restricting their daylight availability, any significant development of the Site will cause a reduction in daylight levels.

10.4.89 Overall, in consideration of the majority of rooms being unaffected in terms of NSL and retaining acceptable ADF levels; the majority of affected rooms see lower daylight availability as a function of their architectural features and the existing urban fabric; and the reasonable retained ADF levels within the rooms affected in terms of VSC, the effects to this plot as a result of the H1 Development are considered to be **direct, long-term, local** and of **moderate adverse significance**.

Sunlight to surrounding receptors

Existing Receptors

10.4.90 The full sunlight assessment for the H1 Development in relation to existing receptors can be found within **Appendix 10.1** and is summarised in below in **Table 10.11**.

10.4.91 82, 84, 88 and 92 Walworth Road do not have any relevant windows facing within 90 degrees of due south and have therefore not be assessed for effects in terms of sunlight.

10.4.92 In the H1 Development scenario, of the 522 rooms assessed for APSH and Winter PSH, 490 (93.9%) meet the BRE Guidelines criteria.

10.4.93 Those properties highlighted in blue experience little or no impact (below 20% alterations) and are therefore considered to be **insignificant** in relation to sunlight alterations resulting from the H1 Development. These four buildings are therefore not discussed further.

Table 10.11: Summary of APSH and Winter PSH results to Existing Receptors with the H1 Development

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	APSH			Winter PSH		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
94-96 Walworth Road	2	2	0	0	0	0	0	0
Julian Markham House	6	6	0	0	0	0	0	0
Mawes House	208	197	2	4	5	0	0	11
Portchester House	140	140	0	0	0	0	0	0
Tantallon House	115	94	11	10	0	0	0	2
Strata Tower	51	51	0	0	0	0	0	0
Totals	522	490	13	14	5	0	0	13

Mawes House

10.4.94 Mawes House is a high-rise building located north of the Site. The front and eastern side facing façades of the building are considered to be sensitive to sunlight alterations, from the first to 15th floor. A total of 208 rooms were assessed for sunlight within this building.

10.4.95 For sunlight, with the H1 Development in place, 197 of the 208 rooms assessed would meet the BRE Guidelines criteria in relation to APSH and Winter PSH.

10.4.96 Of the affected rooms for APSH, two would experience alterations between 20-29.9% which is considered minor adverse and four would experience alterations between 30-39.9% which is considered a moderate adverse effect. The remaining five would experience alterations beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.97 Of the affected rooms for Winter PSH, all 11 would experience alterations beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.98 All 11 affected rooms are known to be bathrooms which are non-habitable rooms and thus do not have an expectation of sunlight.

10.4.99 Overall, in consideration of the few affected rooms being bathrooms and thus not sensitive to changes in sunlight, the effects to this building as a result of the H1 Development are considered to be **insignificant**.

Tantallon House

10.4.100 Tantallon House is located north of the Site and comprises residential accommodation. The south facing façade of the building was considered to be sensitive to sunlight alterations, from the first to 21st floor. A total of 115 rooms were assessed for sunlight within this building.

10.4.101 For sunlight, with the H1 Development in place, 94 of the 115 rooms assessed would meet the BRE Guidelines criteria in relation to APSH and Winter PSH.

10.4.102 Of the affected rooms for APSH, 11 would experience alterations between 20-29.9% which is considered minor adverse and the remaining 10 would experience alterations between 30-39.9% which would be a direct, long-term, local effect of moderate adverse significance.

10.4.103 Two of the affected rooms would experience reductions in Winter PSH beyond 40%, which would be a direct, long-term, local effect of major adverse significance.

10.4.104 All 21 affected rooms are located behind a recessed balcony which acts as a shading device in the summer months when the sun is higher in the sky and inherently restrict the availability of sunlight, thus the alterations in sunlight to these rooms are a function of the architectural features of this building itself. 10 are bedrooms which are lower sensitivity in terms of sunlight and 11 are L/K/Ds. All 11 L/K/Ds retain Winter PSH levels in excess of the BRE Guidelines criteria and would have access to good levels of sunlight within their balconies in the summer months.

10.4.105 Overall, in consideration of the majority of rooms being unaffected in terms of APSH and Winter PSH; half of those rooms affected being bedrooms which are lower sensitivity; all L/K/Ds unaffected in terms of Winter PSH; and the affected rooms see lower sunlight availability as a function of the obstruction caused by their balconies and inset location, the effects to this property as a result of the H1 Development is considered to be **direct, long-term, local** and of **minor adverse significance**.

Receptors within the Approved Development

10.4.106 The full sunlight assessment for the H1 Development in relation to receptors within the Approved Development (H2, H4 and H7) can be found within **Appendix 10.1** and are summarised in below in **Table 10.12**.

10.4.107 In the H1 Development scenario, of the 645 rooms assessed for APSH and Winter PSH, 598 (92.7%) meet the BRE Guidelines criteria.

10.4.108 Those properties highlighted in blue experience little or no impact (below 20% alterations) and are therefore considered to be **insignificant** in relation to sunlight alterations resulting from the H1 Development. This Plot is therefore not discussed further.

Table 10.12 Summary of APSH and Winter PSH results to the Approved Development with the H1 Development

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	APSH			Winter PSH		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
H2	146	146	0	0	0	0	0	0
H4	225	195	12	12	6	0	0	0
H7	274	257	1	0	16	0	0	0
Totals	645	598	13	12	22	0	0	0

H4

10.4.109 This building is located within the Approved Development and the first to 11th floor comprises residential accommodation. The plot is currently nearing completion and occupation. A total of 225 rooms were assessed for sunlight within this building.

10.4.110 For sunlight, with the H1 Development in place, 195 of the 225 rooms assessed would meet the BRE Guidelines criteria in relation to APSH and Winter PSH and would therefore experience an insignificant effect.

10.4.111 Of the affected rooms for APSH, 12 would experience alterations between 20-29.9% which is considered minor adverse and 12 would experience alterations between 30-39.9% which would be a moderate adverse effect. The remaining six rooms would experience alterations in APSH beyond 40%, which would be direct, long-term, local effect of major adverse significance.

10.4.112 None of the rooms would experience alterations in Winter PSH.

10.4.113 All 30 affected rooms are located beneath a balcony which acts as a shading device in the summer months when the sun is higher in the sky and inherently restrict the availability of sunlight, thus the alterations in sunlight to these rooms are a function of the architectural features of this building itself. 27 of the affected rooms are L/K/Ds whilst three are studios. All affected rooms retain Winter PSH levels in excess of the BRE Guidelines criteria and would have access to good levels of sunlight within their balconies in the summer months.

10.4.114 Overall, in consideration of the majority of rooms being unaffected in terms of APSH and Winter PSH; all L/K/Ds retaining good levels of Winter PSH; and the affected rooms see lower sunlight availability as a function of the obstruction cause by their balconies, the effects to this property as a result of the H1 Development is considered

to be **direct, long-term, local** and of **minor adverse significance**.

H7

10.4.115 These blocks are located within the Approved Development and comprise residential accommodation. Construction of the plot has not yet started, and so the residential accommodation is not yet occupied. A total of 274 rooms were assessed for sunlight within these buildings.

10.4.116 For sunlight, with the H1 Development in place, 257 of the 274 rooms assessed would meet the BRE Guidelines criteria in relation to APSH and Winter PSH and would therefore experience an insignificant effect.

10.4.117 Of the affected rooms for APSH, one would experience alterations between 20-29.9% which is considered minor adverse and the remaining 16 rooms would experience alterations in APSH beyond 40%, which would be direct, long-term, local effect of major adverse significance.

10.4.118 None of the rooms would experience alterations in Winter PSH.

10.4.119 16 of the 17 rooms affected in terms of APSH are bedrooms which are lower sensitivity in terms of sunlight and the final room is a living/kitchen/dining room. All 16 bedrooms have very low existing APSH and Winter PSH levels owing to their northerly aspect with one small side window facing west onto a balcony being technically relevant for assessment although occupants would not have an expectation of receiving sunlight from this window. The one living/kitchen/dining room which experiences a minor adverse effect in terms of APSH and is unaffected in terms of Winter PSH is dual-aspect with one north facing window and one window that faces almost due west directly over the currently cleared Site. The affected living/kitchen/dining room retains 17% APSH which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location.

10.4.120 Overall, in consideration of the majority of rooms being unaffected in terms of APSH and Winter PSH; most of the affected rooms being bedrooms and thus lower sensitivity; and the one affected living/kitchen/dining room retaining acceptable levels of sunlight for the urban context, the effects to these blocks as a result of the H1 Development is considered to be **direct, long-term, local** and of **minor adverse significance**.

Overshadowing

10.4.121 The potential overshadowing impacts of the H1 Development on surrounding amenity areas have been assessed against the future baseline scenario. The full overshadowing assessment of the H1 Development is presented in **Appendix: 10.2** and the location of the three amenity areas is shown in **Figure 10.2**.

21st March

10.4.122 On this day shadow is cast from the H1 Development from 08:00 GMT. At this time, Castle Square and The Park are partially cast in shadow in the existing condition, with the podium terrace of Mawes House, Portchester House and Tantallon House completely overshadowed in the existing condition. As the shadows move clockwise

throughout the day, the H1 Development begins to overshadow Castle Square between approximately 09:30 GMT until 15:00 GMT. A small portion at the front of the podium terrace of Mawes House, Portchester House and Tantallon House becomes overshadowed by the H1 Development from 12:00 GMT, which clears by approximately 13:30 GMT. Throughout the afternoon from approximately 13:00 GMT, strips of shadow from the H1 Development are cast over The Park, which experiences intermittent sunshine during this time. 21st June

10.4.123 On this day shadow is cast from the H1 Development from 06:00 BST. At this time, all three areas (Castle Square, The Park and the podium terrace of Mawes House, Portchester House and Tantallon House) are overshadowed in the existing condition. The shadows move clockwise throughout the day, without any areas being affected by the H1 Development until approximately 10:30 BST. At this time, shadow from the H1 Development begins to encroach on Castle Square, which travels across approximately half of the area until 18:00 BST. At 14:00 BST, a small portion of The Park would see overshadowing by the H1 Development, during the afternoon, the shadow increases to cover approximately half of The Park and then at 19:00 BST, the shadow has passed. The podium terrace of Mawes House, Portchester House and Tantallon House is unaffected on this day.

21st December

10.4.124 On this day shadow is cast from the H1 Development from 09:00 GMT. At this time, all three areas (Castle Square, The Park and the podium terrace of Mawes House, Portchester House and Tantallon House) are completely overshadowed in the existing condition. From 10:00 GMT to approximately 11:30 GMT, small areas of additional shadow can be experienced within Castle Square from the H1 Development, which then increases in area until just before 15:00 GMT. A strip of shadows is cast over the podium terrace of Mawes House, Portchester House and Tantallon House from 11:00 GMT, which clears by 14:00 GMT. The Park is unaffected on this day.

Sun Hours on Ground

10.4.125 Given the potential for overshadowing, all three amenity areas (Castle Square, the podium terrace of Mawes House, Portchester House and Tantallon House, and The Park) have been assessed using sun hours on ground. The BRE Guidelines suggest that for new developments, surrounding amenity areas should receive at least two hours of sun within 50% of their area on the Equinox (21st March and 21st September). If this is not achieved, then the area which receives two hours of direct sunlight should not be reduced to less than 0.8 times its former value (i.e. there should be no more than a 20% reduction).

10.4.126 Both The Park and Castle Square retain at least two hours of sun on ground within 55% and 63% of their area respectively on 21st March with the H1 Development in place, and therefore meet the BRE Guidelines criteria which is considered an insignificant effect. The podium terrace of Mawes House, Portchester House and Tantallon House would see 47% of its area retain two hours of sun on ground on 21st March which is only marginally below the BRE Guidelines criteria of 50% and sees a 4% reduction from the existing sun on ground of 49%, this is therefore considered an insignificant effect.

Conclusion

10.4.127 Therefore, whilst additional shadow will be cast by the H1 Development within the three amenity areas as evidenced by the transient overshadowing, based on all three amenity areas meeting the BRE Guidelines criteria for sun hours on ground, the overall effect as a result of the H1 Development in terms of overshadowing is considered to be **insignificant**.

Solar Glare

10.4.128 The full solar glare assessment is provided in **Appendix: 10.3**, with the sensitive locations assessed shown in **Figure 10.3**

10.4.129 The assessment has been undertaken from nearby locations which are considered to be sensitive in terms of solar glare (noted by the reference N1, N2 etc.). The assessment considers the potential occurrence, proximity and duration of solar reflections from the H1 Development owing to its size and large areas of glazed façade at nearby road traffic junctions and railway lines.

10.4.130 At the locations where there is more than one road traffic signal from which the H1 Development is visible, several viewpoints have been tested (noted by the reference A, B, C etc.) in order to have a better understanding of the likely impact that the H1 Development might have upon road users' responsiveness where there would be an option of deferring to an unaffected viewpoint. The number of viewpoints tested per location varies according to the number of lanes, direction of travel and number of traffic lights. This is specified in the discussion below where appropriate.

10.4.131 Following a review of the study area, a total of 21 locations have been assessed comprising 13 road locations and eight railway locations.

Road user viewpoints

10.4.132 It is considered that **insignificant** effects occur at four of the 13 road locations by black arrows on **Figure 10.3**.

This is because either there is:

- No Effect: the H1 Development is either not visible, or the H1 Development is visible but no solar reflections occur; or
- Insignificant Effect: reflections would occur beyond 30° of a driver's line of sight. In accordance with the Solar Glare significance criteria highlighted in the methodology section, solar reflections occurring at angles greater than 30° from the driver's line of sight will not affect the driver's responsiveness and therefore can be considered insignificant.

10.4.133 These are:

- N2.
- SW1.

- SW2.
- SW4.

10.4.134 Therefore, these four locations are not discussed further, and the remaining nine locations are discussed in further detail below.

10.4.135 At a further six locations, it is considered that an insignificant effect would occur (listed below). This is because, although solar reflections would occur within 30° of a road user's line of sight, these instances occur for a very short period of time on limited portions of the façade or beyond 10° of the driver's view with at least one other viewpoints per location which is not significantly affected. Therefore, they would not affect a road user's responsiveness. These are:

- N1 (A and B).
- N3 (A, B, C and D).
- N4 (A and B).
- NW1 (A, B, C and D).
- NW2 (A and B).
- S1 (A and B).

10.4.136 The remaining three locations are discussed in further detail below.

N5 (A and B)

10.4.137 Two viewpoints have been tested at this location. At both viewpoints, the potential instances of solar glare would be visible on a limited portion of the façade and from a distance, between 05:00 GMT and 06:00 GMT and 16:00 GMT to 17:00 GMT during the mid-seasons. At N5A, these would occur between approximately 7° to 11° of a driver's line of sight and at N5B between approximately 15° to 19°, both of which would be considered a minor adverse effect. Given the limited view of the façade where potential reflections would be visible, and with alternative traffic lights visible within the field of view, the overall potential for reflection is not considered likely to affect a driver's responsiveness and is therefore considered **direct, long-term, local** and of **minor adverse significance**.

N6

10.4.138 One viewpoint has been tested at this location. The potential instances of solar glare would be visible on a limited portion of the façade, which occur above the mitigating 5° visor line. The potential for reflections would occur between 07:00 GMT and 08:00 GMT during the mid-season from approximately 15° to 22° of a driver's line of sight which is considered a minor adverse effect. Given the limited view of the façade where potential reflections would be visible, the overall potential for reflection is not considered likely to affect a driver's responsiveness and is therefore considered **direct, long-term, local** and of **minor adverse significance**.

SW3

10.4.139 One viewpoint has been tested at this location. The potential instances of solar glare would be visible on a limited portion of the façade, between 16:00 GMT and 17:00 GMT from mid-January to mid-March and mid-September to mid-November at approximately 2° to 7° of a driver's line of sight. Given the limited view of the façade where potential reflections would be visible and the short duration of any reflections, the overall potential for reflection is not considered likely to affect a driver's responsiveness and is therefore considered **direct, long-term, local** and of **minor adverse significance**.

Train Driver Viewpoints

10.4.140 This assessment of the railway tracks in relation to solar glare consider a train driver's line of sight along the four tracks approaching and departing Elephant and Castle Station from north and south. Reflective elements of the H1 Development are visible within 30° of a train driver's line of sight from all eight rail viewpoints tested along these four tracks and therefore each are discussed below in further detail.

10.4.141 It is considered that an insignificant effect occurs at three of the four tracks. This is because either there is:

- No Effect: the H1 Development is either not visible, or the H1 Development is visible, but no solar reflections occur.
- Insignificant Effect: reflections would occur beyond 30° of a driver's line of sight. In accordance with the Solar Glare significance criteria highlighted in the methodology section, solar reflections occurring at angles greater than 30° from the driver's line of sight will not affect the driver's responsiveness and therefore can be considered insignificant.

10.4.142 These are:

- Track 2 (2.1 and 2.2).
- Track 3 (3.1 and 3.2).
- Track 4 (4.1 and 4.2).

10.4.143 The remaining track is therefore discussed in further detail.

Track 1

10.4.144 Two viewpoints have been tested along track 1. At both viewpoints, potential effects would occur between 16:00 GMT and 18:00 GMT throughout the summer months. At viewpoint 1.1, the portion of façade where reflections would be visible are beyond 29° of a driver's line of sight and at viewpoint 1.2 between 18° and 28° both of which are considered a minor adverse effect. Therefore, as the train driver approaches Elephant and Castle Station along track 1, there is potential for a **direct, long-term, local** effect of **minor adverse significance**.

Light Pollution

10.4.145 The potential light pollution impacts arising from the H1 Development upon the 13 sensitive buildings surrounding the Site as well as blocks within the Approved Development have been assessed and the environmental zone is defined as E4 – High district brightness (e.g. town/city centres with high levels of night time activity). These are:

- 82, 84, 88, 92 and 94-96 Walworth Road.
- Julian Markham House.
- Mawes House.
- Portchester House.
- Strata Tower.
- Tantallon House.
- H2 of the Approved Development.
- H4 of the Approved Development.
- H7 of the Approved Development.

10.4.146 The assessment undertaken considers the light trespass pre- and post-curfew, with the technical assessment found within **Appendix 10.4**.

10.4.147 Pre-curfew (before 11pm), the levels of light pollution would be non-existent and therefore within the 25-lux threshold set out within the ILP guidance for a city centre location (E4) for all 13 sensitive surrounding receptors assessed. Therefore, no impact occurs pre-curfew.

10.4.148 The assessment also shows the potential for light intrusion post-curfew (after 11pm). At all 13 of the surrounding sensitive receptors the levels of light trespass would be well below the 5-lux threshold set out within the ILP guidance for E4, ranging from 0-3.5 lux. The majority of windows across all 13 properties would experience no impact. Therefore, the effect is considered **insignificant** overall, based on a worst-case scenario whereby the office would be fully lit at night.

10.5 Additional Mitigation / Enhancement and Likely Residual Effects of the H1 Development and their Significance

The Works

10.5.1 Given that any effects during the Works are not anticipated to be worse than when the buildings are complete and operational, no mitigation measures are required. Therefore, the residual daylight, sunlight, overshadowing, solar glare and light pollution effects to the surrounding receptors during the Works remain as reported in the H1 Development section, ranging from **insignificant** to the residual effects reported in the Completed and Operational section below.

The Completed and Operational H1 Development

10.5.2 No additional mitigation is required for the H1 Development, with mitigation measures embedded within the design of the massing and façades. Therefore, the likely residual daylight, sunlight, overshadowing, solar glare and light pollution effects of the H1 Development once complete and operational would be as follows:

- In relation to daylight, **direct, permanent, long-term** and **local** to surrounding receptors, ranging from **minor** to **major adverse significance**.
- In relation to sunlight **insignificant** effect to **direct, long-term** and **local** effects of **minor adverse significance**
- In relation to overshadowing **insignificant** effects.
- In relation to solar glare an **insignificant** effect to **direct, long-term, local** effect of **minor adverse significance**.
- In relation to light pollution **insignificant** effects.

10.6 Likely Residual Cumulative Effects and their Significance

The Works

10.6.1 The H1 Development in conjunction with cumulative schemes represents the worst-case scenario.

10.6.2 As such, the cumulative effects during the Works would gradually increase and vary until those reported in the Completed and Operational H1 Development scenario in conjunction with cumulative schemes for daylight, sunlight, overshadowing, solar glare and light pollution as set out below are reached. Therefore, the residual cumulative daylight, sunlight, overshadowing, solar glare and light pollution effects to the surrounding receptors during the Works range from **insignificant** to the residual effects reported in the Completed and Operational H1 Development section below.

The Completed and Operational H1 Development

10.6.3 The H1 Development has been assessed in conjunction with the consented Elephant and Castle Shopping Centre Cumulative Scheme. The cumulative effects in relation to daylight, sunlight overshadowing at surrounding receptors are described below.

Daylight to surrounding receptors

10.6.4 The full daylight assessment for the cumulative scenario in relation to existing receptors can be found within **Appendix 10.1** and is summarised in below in **Table 10.13**.

10.6.5 In the cumulative scenario, of the 872 windows assessed for VSC, 576 (66.1%) meet the BRE Guidelines criteria. Of the 761 rooms assessed for NSL, 681 (89.5%) meet the BRE Guidelines criteria.

10.6.6 The properties highlighted below in blue do not experience any change in impact when compared to the H1 Development scenario and therefore, the significance of effect remains as reported in the H1 Development section. The cumulative effect to 82 Walworth Road, 84 Walworth Road, 88 Walworth Road, 92 Walworth Road and 94-96 Walworth Road are considered to remain to as **direct, long-term, local** and of **major adverse significance**. The effect to Portchester House is considered to remain as **direct, long-term, local** and of **minor adverse significance**.

10.6.7 Four sensitive properties, Julian Markham House, Mawes House, Tantallon House and Strata Tower would experience additional impacts in the cumulative scenario. However, these are small in scale and not considered likely to be noticeable. Therefore, the significance of effect remains as reported in the H1 Development section. As such Julian Markham, Tantallon House and Strata Tower are considered to experience cumulative effects of **direct, long-term, local** and **minor adverse significance**. Mawes House is considered to experience a cumulative effect of **direct, long-term, local** and of **minor to moderate adverse significance**.

Table 10.13: Summary of VSC and NSL results with the Cumulative Scenario

Address	VSC						NSL					
	Total No. of Windows	Below BRE Guidelines					Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total
		No. Windows That Meet BRE Guidelines	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction			30-39.9% Reduction	>40% Reduction		
82 Walworth	10	0	0	0	10	10	4	2	0	0	2	2

Address	VSC						NSL					
	Total No. of Windows	No. Windows That Meet BRE Guidelines	Below BRE Guidelines			Total	Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction				20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	
Road												
84 Walworth Road	10	0	0	0	10	10	6	0	0	0	6	6
88 Walworth Road	12	0	0	0	12	12	7	5	2	0	0	2
92 Walworth Road	7	0	0	0	7	7	3	2	0	0	1	1
94-96 Walworth Road	19	4	0	4	11	15	15	10	1	4	0	5
Julian Markham House	146	112	34	0	0	34	127	125	0	1	1	2
Mawes House	256	201	25	15	15	55	208	192	8	5	3	16
Portchester House	161	157	3	1	0	4	140	111	14	8	7	29
Tantallon House	115	67	21	19	8	48	115	110	5	0	0	5
Strata Tower	136	35	51	46	4	101	136	124	12	0	0	12
Totals	872	576	134	85	77	296	761	681	42	18	20	80

Daylight to Receptors within the Approved Development

10.6.8 The full daylight assessment for the cumulative scenario in relation to receptors within the Approved Development can be found within **Appendix 10.1** and are summarised in below in **Table 10.14**.

10.6.9 In the cumulative scenario, of the 1,664 windows assessed for VSC, 1,097 (65.9%) meet the BRE Guidelines criteria. Of the 1,043 rooms assessed for NSL, 904 (86.7%) meet the BRE Guidelines criteria. Of the 1,043 rooms assessed for ADF, 856 (82.1%) see no change in their ADF levels or retain ADF levels that meet the BRE Guidelines criteria.

10.6.10 All three Approved Development receptors, H2, H4 and H7 would experience additional impacts in the cumulative scenario. However, these are small in scale and are not considered likely to be noticeable. Therefore, the significance of effect remains as reported in the H1 Development section. As such H4 is considered to experience cumulative effects of **direct, long-term, local** and **minor adverse significance** and remains unchanged from the H1 Developments scenario. H7 is considered to experience a cumulative effect of **direct, long-term, local** and of **moderate adverse significance** and remains unchanged from the H1 Developments scenario. H2 is considered to experience a cumulative effect of **direct, long-term, local** and of **major adverse significance** and remains unchanged from the H1 Developments scenario.

Table 10.14: Summary of VSC and NSL results to Receptors within the Approved Development with the Cumulative Scenario

Address	VSC						NSL					
	Total No. of Windows	No. Windows That Meet BRE Guidelines	Below BRE Guidelines			Total	Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction				20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	
H2	657	369	44	54	190	288	327	267	8	7	45	60
H4	300	143	79	52	26	157	258	227	23	8	0	31
H7	707	585	39	25	58	122	458	410	10	11	27	48
Total	1664	1097	162	131	274	567	1043	904	41	26	72	139

Sunlight to surrounding receptors

10.6.11 The full sunlight assessment for the cumulative scenario in relation to existing receptors can be found within **Appendix 10.1** and is summarised in below in **Table 10.15**

10.6.12 In the cumulative scenario, of the 522 rooms assessed for APSH and Winter PSH, 472 (90.4%) meet the BRE Guidelines criteria.

10.6.13 The properties highlighted below in blue do not experience any change in impact when compared to the H1 Development scenario. Therefore, the significance of effect remains as reported in the H1 Development section. As such, the cumulative effect to 94-96 Walworth Road, Julian Markham House, Mawes House, Portchester House, and Strata Tower is considered to remain **insignificant**.

10.6.14 One sensitive property Tantallon House, would experience additional impacts in the cumulative scenario. However, these are small in scale and not considered likely to be noticeable. Therefore, the cumulative effect remains as reported in the H1 Development section, which is **direct, long-term, local** and of **minor adverse significance**.

Table 10.15: Summary of APSH and Winter PSH results to Existing Receptors with the Cumulative Scenario

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	APSH			Winter PSH		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
94-96 Walworth Road	2	2	0	0	0	0	0	0
Julian Markham House	6	6	0	0	0	0	0	0
Mawes House	208	197	2	4	5	0	0	11
Portchester House	140	140	0	0	0	0	0	0
Strata Tower	51	51	0	0	0	0	0	0
Tantallon House	115	76	16	14	9	0	0	2
Totals	522	472	18	18	14	0	0	13

Sunlight to Receptors within the Approved Development

10.6.15 The full sunlight assessment for the cumulative scenario in relation to receptors within the Approved Development (H2, H4 and H7) can be found within **Appendix 10.1** and are summarised in below in **Table 10.16**.

10.6.16 In the H1 Development scenario, of the 645 rooms assessed for APSH and Winter PSH, 594 (92.7%) meet the BRE Guidelines criteria.

10.6.17 The properties highlighted below in blue do not experience any change in impact when compared to the H1 Development scenario and therefore, the significance of effect remains as reported in the H1 Development section. As such, the cumulative effect to H2 is considered to remain as **insignificant**. The effect to H4 and H7 is considered to remain as **direct, long-term, local** and of **minor adverse significance**.

Table 10.16 Summary of APSH and Winter PSH results to the Approved Development with the Cumulative Scenario

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	APSH			Winter PSH		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
H2	146	146	0	0	0	0	0	0
H4	225	195	12	12	6	0	0	0
H7	274	257	1	0	16	0	0	0
Totals	645	598	13	12	22	0	0	0

Overshadowing

Sun Hours on Ground

10.6.18 The three amenity areas (Castle Square, the Podium Terrace of Mawes House, Portchester House and Tantallon House, and The Park) have been assessed using sun hours on ground within a cumulative scenario.

10.6.19 The Park experiences no change from the H1 Development scenario, retaining at least two hours of sun on 55% of its area in the cumulative scenario, which is considered to be an overall **insignificant cumulative** effect. Castle Square experiences a greater reduction in the cumulative scenario, however it would retain at least two hours of sun within 55% of its area, which is considered to be an overall **insignificant cumulative** effect. The Podium Terraces would see a reduction from 49% in the existing scenario to 36% in the cumulative scenario, which is a

27% reduction in its area which experiences two hours of sun, and is therefore considered to experience a **direct, long-term, local cumulative** effect of **minor adverse significance** overall.

Cumulative Receptors

10.6.20 This scenario has been considered for the purposes of assessing the potential for impacts to the Elephant and Castle Shopping Centre Cumulative Scheme as a result of the H1 Development. The scenario therefore consists of the future baseline condition described above, in combination with the Elephant and Castle Shopping Centre development in situ.

10.6.21 In ascertaining the daylight and sunlight effects to the sensitive components of the Elephant and Castle Shopping Centre Cumulative Scheme, the effect of the H1 Development is assessed in the context of the Cumulative Scenario.

10.6.22 A total of 192 windows serving 155 rooms within one future residential building in the Elephant and Castle Shopping Centre Cumulative Scheme, were assessed for daylight. For sunlight, 122 rooms within this building were assessed.

Daylight

10.6.23 The full daylight assessment for the H1 Development in relation to the future receptor, Elephant and Castle Shopping Centre Cumulative Scheme, can be found in **Appendix 10.1** and is summarised in **Table 10.17**.

10.6.24 For VSC, with the H1 Development in place, of the 192 windows assessed, 97 (50.5%) meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected windows, 32 would experience alterations in VSC between 20-29.9% which is considered a minor adverse effect and 20 would experience alterations in NSL between 30-39.9% which would be considered a moderate adverse effect. The remaining 43 window would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.6.25 For NSL, with the H1 Development in place, of the 155 rooms assessed, 106 (68.4%) would meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms, 13 would experience alterations in NSL between 20-29.9% which is considered a minor adverse effect and 25 would experience alterations in NSL between 30-39.9% which would be considered a moderate adverse effect. The remaining 11 windows would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.6.26 64 of the 95 windows affected in terms of VSC (11 minor adverse, 10 moderate adverse and 43 major adverse) see low existing VSC levels owing to their location behind a recessed balcony which inherently limits the visibility of the sky dome. This leads to a disproportionate percentage alteration and therefore the alterations in VSC to these windows is a function of the architectural features of this building itself. The remaining 31 retain VSC levels of 19.2% or greater which is commensurate with the with existing levels in the surrounding area and is considered acceptable for a high-density urban location.

10.6.27 When considering ADF, 105 (68%) of the 155 rooms assessed would retain the levels recommended by BRE or are

unaffected by the H1 Development, these rooms are therefore considered to experience an insignificant effect. The number of rooms falling short of guidance for ADF remains unchanged from the Future Baseline scenario.

- 10.6.28 All 50 rooms falling short of guidance are L/K/Ds located behind a recessed balcony which limits the availability of daylight. Six of the 50 L/K/Ds experience an alteration between 0.1% and 0.2% ADF when compared to the Future Baseline scenario which is not considered noticeable, 32 would experience alterations between 0.3% and 0.5% ADF and 13 would experience alterations in excess of 0.5% ADF. The alterations can be largely attributed to the obstruction caused by their location behind a recessed balcony and thus the disproportionate alterations are a result of the architectural features of the scheme itself.
- 10.6.29 67 of the 95 windows affected in terms of VSC (11 minor adverse, 13 moderate adverse and 43 major adverse) serve one of 49 L/K/Ds or living rooms, seven of which have a second window that is unaffected by the H1 Development which reduces the impact of the losses in light experienced. 47 of these 49 L/K/Ds or living rooms have their windows located behind a recessed balcony which inherently restricts visibility of the sky. Due to their balconies, 41 of these 47 L/K/Ds or living rooms are also affected in terms of NSL and all 47 are affected in terms of ADF. 32 retain an NSL of 50% or greater which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location. Whilst all 47 are affected in term of ADF, due to their balconies, they all see lower existing levels of ADF, therefore the lower daylight levels are predominantly a function of the design of this building itself. These L/K/Ds or living rooms are located within the eastern facade, facing directly over the Site in its currently cleared state, thereby receiving disproportionately high levels of daylight. Therefore, any significant development of the Site will cause a reduction in daylight levels.
- 10.6.30 The two L/K/Ds or living rooms not affected by balconies retain VSC levels greater than 19%, one of the two meets the BRE Guidelines criteria for NSL levels and the second retains an NSL of 61.7%, and both retain ADF levels in excess of the BRE recommendation, therefore these rooms remain acceptably daylit.
- 10.6.31 Further to the 49 L/K/Ds or living rooms affected in terms of VSC, three L/K/Ds that are located on the top floor behind a balcony are unaffected in terms of VSC and NSL but see changes in their ADF levels. The changes in ADF levels to these three rooms are marginal alterations of 0.1% or 0.2% ADF, which would not perceptibly alter the use of the room.
- 10.6.32 The remaining 28 windows affected in terms of VSC serve one of 28 bedrooms, two of which are dual-aspect with a second window unaffected in terms of VSC. All 28 windows retain a VSC in excess of 19% which is commensurate with the existing levels in the surrounding area and is considered acceptable for a high-density urban location. 21 of these 28 affected bedrooms are unaffected in terms of NSL and the remaining seven retain an NSL in excess of 77% which is marginally below the BRE Guidelines criteria of 80%. All 28 affected bedrooms retain ADF levels of 2.0% or greater which is far in excess of the level recommended by BRE and thus remain well daylit.
- 10.6.33 Overall, in consideration of all affected bedrooms retaining good ADF levels; the majority of affected L/K/Ds or living rooms seeing lower daylight levels as a function of their balconies; and the majority of the affected L/K/Ds or living rooms retaining NSL levels considered acceptable within an urban context, this property is considered to experience **direct, long-term, and local** effects of **moderate adverse significance**.

Table 10.17: Summary of VSC and NSL results to Future Receptors within Elephant and Castle Shopping Centre Cumulative Scheme

Address	VSC					NSL						
	Total No. of Windows	Below BRE Guidelines			Total	Total No. of Rooms	No. Rooms that meet the 0.8 Times Former Value Criteria	Below BRE Guidelines			Total	
No. Windows That Meet BRE Guidelines		20-29.9% Reduction	30-39.9% Reduction	>40% Reduction				20-29.9% Reduction	30-39.9% Reduction	>40% Reduction		
Elephant and Castle Shopping Centre Cumulative Scheme	192	97	32	20	43	95	155	106	13	25	11	49

Sunlight

10.6.34 The full sunlight assessment for the H1 Development in relation to the future receptor, Elephant and Castle Shopping Centre Cumulative Scheme can be found within **Appendix 10.1** and is summarised in below in **Table 10.18**.

10.6.35 For sunlight, with the H1 Development in place, of the 122 rooms assessed, 81 (66.4%) meet the BRE Guidelines criteria and therefore experience an insignificant effect. Of the affected rooms for APSH, 11 would experience alterations between 20-29.9% which is considered a minor adverse effect and five between 30-39.9% which would be considered a moderate adverse effect. The remaining 25 rooms would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.6.36 In relation to Winter PSH, 37 of the rooms seeing impacts would experience an alteration beyond 40% which would be a direct, long-term, local effect of major adverse significance.

10.6.37 The 41 affected rooms are all L/K/Ds that are almost due east facing, behind a recessed balcony, both of which significantly limit sunlight availability. These rooms face directly over the Site in its currently cleared state, thereby receiving disproportionately high levels of sunlight for east facing rooms behind a recessed balcony. Therefore, any significant development of the Site will cause a reduction in sunlight levels.

10.6.38 Overall, in consideration of the affected L/K/Ds doing so as a function of their balconies and almost due east orientation, this property is to experience **direct, long-term, and local** cumulative effects of **moderate adverse significance**.

Table 10.18: Summary of APSH and Winter PSH results to Future Receptors within Elephant and Castle Shopping Centre Cumulative Scheme

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	APSH			Winter PSH		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
Elephant and Castle Shopping Centre development	122	81	11	5	25	0	0	37

Overshadowing

10.6.39 The three future amenity areas within the Elephant and Castle Shopping Centre Cumulative Scheme (4, 5 and 6, see **Figure 10.2**) have been assessed as future sensitive amenity areas. Area 4 is unaffected with the H1 Development in place and therefore sees an **insignificant** effect in terms of overshadowing. Area 6 would retain two hours of sun on 74% of its area on 21st March with the H1 Development in place and thus exceeds the BRE Guidelines criteria and will see an **insignificant** effect in terms of overshadowing. Area 5 sees a reduction of 31% which is considered a moderate adverse effect. In the future baseline condition only 26% of its area would receive two or more hours of sun on ground, which is well below the BRE Guidelines recommendation of 50%. Additionally, in the future baseline condition the majority of the area meeting the BRE Guidelines criteria does so very marginally, with just over two hours of sun on March 21st, with the H1 Development in place, the area that would no longer meet the BRE Guidelines criteria would be only marginally below two hours with between 1.5 and 2.0 hours. The overall effect is therefore considered to be **direct, long-term, and local** effects of **minor adverse significance**.

Light Pollution

10.6.40 The potential light pollution impacts arising from the H1 Development upon the surrounding future surrounding sensitive buildings (the Elephant and Castle Shopping Centre Cumulative Scheme) have been assessed and the environmental zone is defined as E4 – High district brightness (e.g. town/city centres with high levels of night-time activity).

- 10.6.41 The assessment undertaken considers the light trespass pre- and post-curfew, with the technical assessment found within **Appendix 10.4**.
- 10.6.42 Pre-curfew (before 11pm), the levels of light pollution on the sensitive future receptors assessed within the Elephant and Castle Shopping Centre Cumulative Scheme would be non-existent and therefore within the 25-lux threshold set out within the ILP guidance for a city centre location (E4). Therefore, no impact occurs pre-curfew.
- 10.6.43 The assessment also shows the potential for light intrusion post-curfew (after 11pm). At the surrounding future sensitive receptor, the levels of light trespass would be well below the 5-lux threshold set out within the ILP guidance for E4, ranging from 0-3.5 lux. The majority of windows across all the Elephant and Castle Shopping Centre Cumulative Scheme would experience no impact. Therefore, the effect is considered **insignificant** overall, based on a worst-case scenario whereby the office would be fully lit at night.

Conclusions

- 10.6.44 Construction of the H1 Development would have a gradually increasing effect on the levels of daylight, sunlight, overshadowing and solar glare to existing residential properties, amenity spaces and road and rail viewpoints surrounding the Site as the massing of the H1 Development steadily increases. Those effects that are perceptible as the H1 Development nears completion would be similar to those of the completed H1 Development. No significant light pollution effects are considered to occur as a result of construction.
- 10.6.45 Following completion of the H1 Development, the results of the assessment show that the surrounding residential properties would experience alterations in daylight amenity. With the H1 Development in situ, the properties along Walworth Road would experience significant reductions, however, this is not uncommon where buildings overlook a cleared site and therefore receive disproportionately high levels of daylight in the future baseline condition. Mawes House would experience alterations in daylight, however, predominantly kitchens, bathrooms and bedrooms would be affected, which are less sensitive. Portchester House and Julian Markham House are student accommodation which are considered to be less sensitive owing to their transient occupancy, both of which have levels below the BRE Guidelines recommendations in the future baseline and therefore experience disproportionate percentage reductions. The majority of windows and rooms at these student accommodation buildings are unaffected by the H1 Development. At Strata Tower and Tantallon House, the retained levels of daylight are commensurate with the existing levels in the surrounding area and are considered to be acceptable for a high-density urban location. All residential buildings assessed within the Approved Development would experience reductions as a result of the H1 Development, in particular the neighbouring Plot H2. However, this is not unusual given the cleared nature of the Site and its urban context, and these buildings were designed as part of the Elephant Park Masterplan in anticipation of a development coming forward on Plot H1 (further information and consideration of which is provided in the separate report appended to the Planning Statement).
- 10.6.46 In relation to sunlight, 93.9% of the rooms within the residential properties surrounding the Site would meet the BRE Guidelines criteria. Mawes House would experience changes in sunlight, however these would only impact bathrooms which are non-habitable rooms and are therefore not sensitive to changes in sunlight. The reductions

in sunlight to Tantallon House occur as a function of the balconies intercepting the sun's rays in the summer months, acting as a shading device, but in the winter months, these rooms remain acceptably sunlit. Of the residential buildings within the Approved Development, H2 would not be significantly affected by the H1 Development, with H4 and H7 experiencing only minor reductions in sunlight amenity given the urban context of the Site and its surroundings.

- 10.6.47 In terms of the potential for the H1 Development to result in overshadowing of existing amenity spaces in the vicinity of the Site, all three amenity spaces assessed remain compliant with the criteria set down in the BRE Guidelines, experiencing little to no impact as a result of the H1 Development.
- 10.6.48 The solar glare assessments show that the glare created by the H1 Development would in almost all cases occur beyond 30° from a seated position within a car or a train. Therefore, the limits of the windscreen would block out the glare and this is compliant with guidance. Any instances of potential reflections occurring within 30° would be limited to a small portion of the façade or occurring for only a short period of time.
- 10.6.49 Ten sensitive properties surrounding the Site and three within the Approved Development have been assessed in relation to light pollution. No transgressions beyond ILP Guidance would occur in relation to light pollution at surrounding sensitive properties. Therefore, the effect to all properties is considered insignificant overall.
- 10.6.50 When considering the cumulative scenario, with the Elephant and Castle Shopping Centre Cumulative Scheme in conjunction with the H1 Development, the daylight and sunlight effects to surrounding sensitive properties would remain as per the H1 Development, with no significant additional effects occurring. In relation to overshadowing, two of the surrounding amenity areas, The Park and Castle Square would experience no change in overall effects from the H1 Development scenario, with the Podium Terraces experiencing a small amount of additional shadow cast from the Elephant and Castle Shopping Centre Cumulative Scheme.
- 10.6.51 When considering the changes in daylight and sunlight to the future sensitive receptor Elephant and Castle Shopping Centre Cumulative Scheme, the H1 Development would cause alterations compared to the future baseline. The changes in light are mostly to rooms that have their daylight and sunlight availability limited by a recessed balcony and face directly over the cleared Site. This is not uncommon where buildings, particularly with balconies, overlook a cleared Site and therefore receive disproportionately high levels of light in the future baseline condition. The proposed amenity areas within the Elephant and Castle Shopping Centre Cumulative Scheme would not be meaningfully affected by the H1 Development. Little to no light pollution impacts from the H1 Development to this future sensitive residential building would occur.

11. Greenhouse Gases

11.1 Introduction

11.1.1 This Chapter has been prepared by Air Quality Consultants Ltd (AQC) and presents an assessment of the likely significant effects of the H1 Development on Greenhouse Gas (GHG) emissions.

11.1.2 The Chapter is supported by further detailed information contained in:

- **Appendix 11.1 Legislation, Policy and Guidance.**
- **Appendix 11.2 ICE Carbon Coefficients and Calculations.**
- **Appendix 11.3 Construction Traffic Data.**
- **Appendix 11.4 Extract from Energy Statement.**
- **Appendix 11.5 Extract from London Atmospheric Emissions Inventory.**

11.2 Assessment Methodology and Significance Criteria

Assessment Methodology

11.2.1 The EIA Directive 2014¹ sets out the rationale for incorporating climate change into the EIA process. It states:

“Climate change will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change.”

11.2.2 The requirements of the EIA Directive 2014, implemented in the UK by the EIA Regulations 2017² requires that the assessment provides³:

“A description of the likely significant effects of the development on the environment resulting from, inter alia:

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change”.

11.2.3 As agreed through the EIA Scoping process, outlined in **ES Volume 1, Chapter 2: EIA Methodology**, the assessment of the effect of the H1 Development on climate change considers the release of GHGs from activities associated with the H1 Development. GHGs are gases with the potential to affect climate change through, for example, an increase in global temperature.

¹ Directive 2014/52/EU of the European Parliament and of the Council on the assessment of effects of certain public and private projects on the environment.

² The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

³ See <https://www.gov.uk/guidance/environmental-impact-assessment#Preparing-an-Environmental-Statement1>.

11.2.4 GHGs are defined in terms of their Global Warming Potential (GWP), which is expressed in units of CO₂ equivalent (CO₂e) over 100 years. This allows for the emissions of the seven key GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride to be expressed in terms of their equivalent global warming potential, in mass of CO₂e.

Study Area and Sensitive Receptors

11.2.5 The assessment of GHG does not include identification of sensitive receptors, as GHG emissions do not directly affect specific locations, but lead to indirect effects by contributing to climate change. Impacts on specific areas are not included within this assessment, since the impacts of GHG emissions will affect the global atmosphere, and therefore need to be considered in a total context, rather than on localised areas.

Emission Sources

11.2.6 The assessment took a whole life approach to develop a GHG footprint for the H1 Development. The footprint sources considered include GHG emissions:

- Embedded in the material used in the construction of the H1 Development.
- From traffic movements during The Works.
- From energy consumed by the completed and operational H1 Development.
- From the operational repair, maintenance and refurbishment of the H1 Development.
- From transport associated with the completed and operational H1 Development.

11.2.7 In addition to the emissions sources listed above, there are some minor GHG emissions sources that were scoped out of the assessment. These emissions are all a very small component of the overall GHG footprint and cannot be calculated with a sufficient degree of accuracy to meaningfully inform the assessment.

11.2.8 The emissions sources scoped out of the assessment, as agreed through the EIA Scoping process, outlined in **ES Volume 1, Chapter 2: EIA Methodology**, were waste disposal, construction site activities (e.g. construction plant, site offices, welfare facilities etc.) and water consumption (which is very a small contributor to GHG emissions). The GHG emissions from the traffic movements during The Works were calculated, whilst GHG's from construction plant are small and were not considered further. Measures to reduce GHGs from these sources have been considered where possible later in this Chapter.

11.2.9 The UK has committed to achieve net zero carbon emissions from 2050 onwards, therefore by the end of the building's life (over 60 years from completion) it can reasonably be expected that emissions from demolition, transport and waste processing will be net zero. As such, emissions from decommissioning of the H1 Development building at the end of its life have not been considered further. Any residual emissions from waste disposal will be minimal as the waste is largely inert and recyclable and any such emissions will represent a very small proportion of the H1 Development's GHG footprint. As such it was not considered necessary to include end of life emissions estimates within the assessment.

- 11.2.10 **Table 11.1** sets out the baseline and scenarios adopted by the assessment, key sources of data and methodologies used.
- 11.2.11 The assessment (using the methodologies referenced in **Table 11.1**) determines the baseline GHG emissions and the GHG emissions from the H1 Development in the year of opening (2026) and assumes an estimated operational lifetime of 60 years, which is a typical assumption for a development of this type and is in accordance with British Standard EN 15978:2011.
- 11.2.12 The quantification of annual emissions for the assessment was carried out to allow comparison of the H1 Development's GHG emissions to regional annual GHG emissions for context. The 'net emissions' are the change in the GHG emissions between the baseline and the H1 Development, taking account of GHG reduction measures. Offsetting of emissions was also considered in the calculation of residual net GHG emissions.
- 11.2.13 The assessment estimates the H1 Development's GHG emissions in the opening year as this provides a worst-case assessment, due to expected decarbonisation of the energy supply in the future and increase in sustainable transport.

Table 11.1: GHG Assessment Scenarios

Development Phase	Baseline	H1 Development	Methods and Data Sources	Reference
The Works: Embedded Carbon	The baseline is assumed to be zero.	The completed Development as defined in ES Volume 1, Chapter 5: The Development.	GHG calculation using ICE embodied energy and carbon coefficients for the different construction materials within the H1 Development, per mass of construction material.	ES Volume 1, Chapter 5: The Development.
The Works: Transport	The baseline is assumed to be zero.	Traffic generated by the construction of the H1 Development.	Application of 2020 GHG factors to km travelled by vehicle type.	Provided by the Applicant's Transport Consultant (see ES Volume 3, Appendix 11.3).
The Completed and Operational Development: Repair, Maintenance and Refurbishment	The baseline is assumed to be zero.	The completed H1 Development as defined in ES Volume 1, Chapter 5: The Development.	Application of factors published by RICS to estimate GHG emissions from repair, maintenance and refurbishment based on embedded GHGs in construction materials.	ES Volume 1, Chapter 6: The Works.
The Completed and Operational Development: Transport	The baseline is assumed to be zero.	Opening year (2026) transport GHG emissions.	Application of 2026 GHG factors to km travelled by mode from transport assessment.	Provided by the Applicant's Transport Consultant (see Table 11.8).
The Completed and Operational Development: Energy	The baseline is assumed to be zero.	The H1 Development, including measures to meet Be Lean, Be Clean, Be Green and Be Seen.	Development CO ₂ from energy use taking into account savings from the Energy Assessment.	Provided by the Energy Assessment ⁴ for the H1 Development which accompanies the Planning Application.

Assessment Approach - The Works

11.2.14 GHGs associated with the Works of the H1 Development relate to those embedded in the materials from which the H1 Development is constructed, and with those related to traffic movements generated during the enabling works and construction activities.

Embedded Carbon

11.2.15 The Site forms part of the Approved Development and is currently void of permanent structures, thus no materials from existing buildings will be recycled or reused on Site.

11.2.16 Embedded GHG emissions have been calculated based on the Inventory of Carbon and Energy (ICE) embodied energy and carbon coefficients⁵. These factors are available for a range of construction materials, including aggregate, cement, concrete and metals, and are provided as kilograms of GHGs per kg of material. The ICE factors have been determined for the appropriate material type and then multiplied by the predicted mass of each construction material, using estimates regarding the thickness of some materials, such as cladding, finishes and walls (to convert to a surface area to a volume), and also estimates of material density.

11.2.17 A summary of the GHG factors assumed for the assessment are provided in **Table 11.2**, and detailed further in **ES Volume 3, Appendix 11.2**.

⁵ Circular Ecology (2019) Inventory of Carbon & Energy (ICE), Version 3.0.

Table 11.2: Selected Embedded GHG Factors

Material	ICE Embodied Carbon Coefficient (kg/CO ₂ e/kg)	ICE Category
Concrete	0.103	Concrete General
Rebar	1.99	Steel, Rebar
Steel	1.27	Engineering steel
Blockwork walls	0.093	Concrete Blocks - high density cell H525
Excavation	0.024	Soil - General (Rammed Soil)
Insulation	1.86	General Insulation
Waterproof membrane	4.2	Damp proof course
Cellcore heave board	3.29	Polystyrene
Aluminium	6.58	Aluminium sheet
Timber soffit	0.493	Average timber
CLT	0.437	Timber, CLT - No Carbon Storage
Paving to colonnade - granite	0.7	Granite
Gravel/ballast to main roof	0.079	General stone

The Works Traffic

11.2.18 The estimated number of construction trips to and from the Site during the whole construction period were provided by the Applicant's Transport Consultant and are detailed in **Appendix 11.3**. These were provided for Light Goods Vehicles (LGVs) below 3.5 tonnes and Heavy Goods Vehicles (HGVs) below and above 7.5 tonnes. The precise origin/destination of these trips is not known and so the average travel distance for all articulated HGVs was assumed to be 47 km. This distance is based on the distance by road from London Gateway port, from which imported construction materials may be sourced⁶. The assumed travel distance for rigid HGVs, such as tippers to deliver aggregates, concrete mixers and waste removal vehicles was assumed to be 5.6 km, which is sufficient to encompass key distribution locations for the construction materials and waste disposal used for the H1 Development, such as concrete batching sites and construction waste transfer stations. Although these distances were estimates, and vehicle trips to and from the Site during the Works will vary greatly in origin and destination,

⁶ Assumption based to London Gateway as the nearest port. The detailed construction logistics will be determined post-planning.

the distances were intended to be worst-case travel distances when applied to all construction phase vehicles, resulting in a robust estimate of overall construction phase transport emissions.

11.2.19 GHG emission factors for construction transport were obtained from the Department of Business, Energy and Industrial Strategy (BEIS) publication on GHG Conversion Factors for Company Reporting⁷ which sets out GHG emissions factors for a range of modes of transport valid for 2020. The GHG emissions factor are applied to the calculated total construction travel distance to estimate the GHG emissions from construction transport. The use of 2020 factors for construction transport are conservative, as emissions from road transport are likely to decarbonise in future years as vehicles become more fuel efficient.

11.2.20 A summary of the 2020 GHG emission factors for selected modes of construction transport used in this GHG assessment are provided in **Table 11.3**. The assumption was made that each HGV arrives at the Site fully laden and leaves empty. In reality, some vehicles may arrive empty and leave laden (for example to remove waste), but as in each case a HGV journey is one-way laden and one-way unladen, the assumption that all HGVs arrive laden was made for simplicity.

Table 11.3: 2020 Construction Transport GHG Factors by Mode (selected modes)

Activity	Type	Unit	2020 BEIS Factor (kgCO ₂ e)
LGV	Average Van	km	0.2471
Rigid HGV (below 7.5 tonnes)	Average Rigid HGV – 0% laden	km	0.666
	Average Rigid HGV – 100% laden	km	0.9155
Articulated HGV (above 7.5 tonnes)	Average Artic HGV – 0% laden	km	0.6519
	Average Artic HGV – 100% laden	km	1.0702

Assessment Approach - The Completed and Operational H1 Development

Repair, Maintenance and Refurbishment

11.2.21 Over the lifetime of the H1 Development there will be GHG emissions associated with the repair, maintenance and refurbishment of the building⁸. These emissions are effectively 'unregulated' as there is no policy or standard for establishing compliance, nor is there published data on good practice against which developments can be benchmarked. Nonetheless, emissions from repair, maintenance and refurbishment were considered in the GHG

⁷ BEIS (2020) UK Government GHG Conversion Factors for Company Reporting.

⁸ Refurbishment refers to ongoing refurbishment of elements of the building as required during its estimated 60 year lifetime and does not include a complete whole-building refurbishment, as this would occur at the end of the building's practical life and would be subject to a future lifecycle GHG assessment.

assessment based on data from RICS⁹. RICS estimate that for commercial developments, embedded GHG emissions during use (i.e. repair, maintenance and refurbishment) are around 91% of the embedded GHG emissions to practical completion. The lifetime GHG emissions from repair refurbishment and maintenance was therefore estimated to be 91% of the embedded emissions of the H1 Development discussed in **Section 11.4**.

Transport

11.2.22 GHG emission factors for transport in 2020 (latest data available) were obtained from the BEIS publication on GHG Conversion Factors for Company Reporting which sets out GHG emission factors for a range of modes of transport valid for 2020.

11.2.23 Factors for 2026 (first likely year of occupation i.e. opening year) were determined by applying engine and fuel efficiency factors (sourced from the WebTAG data book¹⁰) to the 2020 BEIS factors for different types of fuel/energy source, and vehicle size/type. A summary of the 2026 GHG emission factors for selected modes of transport used in this GHG assessment are provided in **Table 11.4**.

Table 11.4: 2026 Operational Transport GHG Factors by Mode (selected modes)

Mode	Type	Unit	Calculated 2026 Factor (kgCO ₂ e)
Rail	National Rail	Passenger.km	0.02589
London Underground	London Underground	Passenger.km	0.01927
Bus	London Local Bus	Passenger.km	0.07856
Taxi	Black Cab	Km	0.28931
Car Passenger	Average Car	km	0.14763

Notes: ^a The GHG factor for London buses has been used for all bus and coach passenger kms as this is a higher factor than for coaches and is therefore a worst-case assumption.

Energy Consumption

11.2.24 In terms of the baseline setting for energy use, the IEMA guidance¹¹ acknowledges that baseline energy use for existing buildings can be very difficult to calculate. The IEMA guidance recommends that baseline energy use is considered to be zero, or an alternative baseline is considered, whereby the GHG emissions from an alternative development or building design are considered. In this case, the baseline energy consumption was assumed to be

⁹ RICS, 2017. Whole Life Carbon Assessment for the Built Environment.

¹⁰ Department for Transport (2020) TAG data book May 2019 v1.12, Available: <https://www.gov.uk/government/publications/tag-data-book>

¹¹ IEMA (2017) Assessing Greenhouse Gas Emissions and Evaluating their Significance.

zero as the Site is currently void of permanent structures and existing structures have been demolished. This would also provide a conservative assessment.

- 11.2.25 GHG emissions associated with the energy use of the H1 Development were taken from the Energy Assessment⁴ (submitted as a separate supporting document to the Planning Application), taking account of energy efficiency measures to be incorporated within the H1 Development. These were based on the energy demand of the H1 Development and published GHG emission factors for gas and electricity use (SAP10).
- 11.2.26 It should be noted that for energy consumption during operation, the GHG emissions are presented as CO₂ rather than CO₂e. The use of CO₂ emissions factors (rather than CO₂e) will underestimate the GHG emissions from energy by approximately 1%¹², however these are used for consistency with the Energy Assessment, which is prepared in line with Policy requirements. Any underestimation is minor and will not alter the conclusions of the assessment.
- 11.2.27 The assessment considers regulated energy consumption, which is energy consumption from heating and cooling, lighting, and on-site infrastructure such as lifts, and unregulated energy consumption, which is electricity consumption from the behaviour of the building's users, such as phones, computers and other electrical appliances.
- 11.2.28 Further detail on the GHG factors and GHG emissions from energy consumption is provided in the Energy Assessment; an extract of the Energy Assessment detailing the information used in this assessment is provided in **ES Volume 3, Appendix 11.4.**

Net Zero Policy Implications

- 11.2.29 The UK recently legislated a 2050 net zero target following recommendations and analysis completed by the Committee on Climate Change (CCC). The CCC's Net Zero report¹³ established a "Further Ambition" scenario which considers feasible and cost-effective policy and technology interventions to ensure the UK can meet its new net zero target.
- 11.2.30 For power generation under this scenario, the CCC consider that 100% of power generation by 2050 will be low carbon and for ground transport it forecasts that all ground transportation (apart from small numbers of HGVs) will be electrically or hydrogen powered. The CCC therefore forecast that power and ground transportation sectors are largely decarbonised by 2050 with any residual emissions removed through technical and or natural means.
- 11.2.31 The implications of the UK adopting the net zero target are that it is reasonable to assume that government policies will be brought forward to ensure the net zero target is achieved. The recent government announcement bringing forward the ban on sale of new petrol or diesel vehicles to 2035 is an example of policy that is being developed.

¹² For UK electricity, CO₂e/kWh is estimated by BEIS to be 0.9% higher than CO₂/kWh.

¹³ Committee on Climate Change (2019) Net Zero. The UK's contribution to stopping global warming, 2019. Found at <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

11.2.32 For this assessment, all operational and ground transportation emissions from the H1 Development are therefore likely to be zero before or by 2050.

Significance Criteria

Magnitude of Impact

11.2.33 There are no impact descriptors for GHG emissions; the approach taken is therefore to consider the calculated GHG emissions from the H1 Development in the context of regional GHG emissions for Greater London as published within the London Atmospheric Emissions Inventory¹⁴ and in the context of GHG emissions for London Borough of Southwark (LBS) as published within the London Energy and Greenhouse Gas Inventory (LEGGI)¹⁵.

Defining Likely Significant Effects

11.2.34 For GHG emissions there are no recognised criteria for determining the scale of the likely effects. Similarly, there are no impact descriptors for GHG emissions.

11.2.35 In terms of defining significance, guidance from IEMA was adopted, which has identified three underlying principles to inform the assessment of significance, as follows:

- The GHG emissions from all projects will contribute to climate change; the largest interrelated cumulative environmental effect.
- The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive e.g. population, fauna, soil, etc.
- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant.

11.2.36 Therefore, in the absence of any effect criteria or a defined threshold, IEMA recommends that all GHG emissions are significant. This does not mean that the contribution of GHGs from the H1 Development alone will equate to a likely significant effect; for the majority of development projects, the individual contribution to total GHG emissions (from local through to global scale) will be very small. However, the IEMA guidance recognises that the contribution of GHG emissions to climate change is a cumulative global issue, and as such it is important for developments of all scales to acknowledge the significance of any increases in GHG emissions, and that the EIA should ensure the project addresses their occurrence by taking appropriate mitigating action.

11.2.37 In terms of mitigation, IEMA recommends that mitigation should in the first instance seek to avoid GHG emissions. Where GHG emissions cannot be avoided, the development should aim to reduce the residual significance of a project's emissions at all stages. Where additional GHG emissions remain but cannot be further reduced at source,

¹⁴ LAEI (2013) London Atmospheric Emissions Inventory (LAEI) 2013, Available: <https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory-2013>

¹⁵ London Energy and Greenhouse Gas Inventory (2020) London Energy and Greenhouse Gas Inventory for 2017, Available at: <https://data.london.gov.uk/dataset/leggiEnergyandGreenhouse,carbonreductiontargetsforLondon>

approaches should be considered that compensate the project's remaining emissions, for example through offsetting.

11.2.38 As above, given all GHG emissions are significant, the approach to defining likely significant effects was carried out in three steps:

- The first step was to compare the H1 Development's GHG emissions in the opening year to the baseline GHG emissions, to determine whether there is a net increase or decrease in GHG emissions as a result of the H1 Development.
- The second step was to compare the calculated change in emissions to Greater London and borough-wide GHG emissions for context.
- The third step applies expert judgment on the significance of those emissions taking into account the changes in emissions, their contribution to Greater London and borough-wide GHG emissions, their consistency with relevant policy, and an evaluation of the mitigation measures proposed to avoid, reduce and compensate GHG emissions. It is noted that even with mitigation any change in GHG will be an indirect, long-term, global significant adverse effect.

11.2.39 Significant effects are concluded for the H1 Development GHG footprint overall, therefore the Works and operation of the H1 Development are considered together.

11.3 Relevant Baseline Conditions

11.3.1 The IEMA guidance recognises that the contribution of GHG emissions to climate change is a cumulative global issue, and as such it is important for developments of all scales to acknowledge the significance of any increases in GHG emissions. The future baseline (as described in **ES Volume 1, Chapter 2: EIA Methodology**) is not considered relevant as, following the IEMA guidance, the assessment only focuses on the contribution of GHG emissions from the H1 Development. The H1 Development is expected to be completed and operational in 2026 and as such an opening year of 2026 has been calculated to determine the contribution of GHG emissions from the Works and operation of the H1 Development. The total carbon footprint for the H1 Development has been calculated and compared against the Greater London and borough-wide emissions to provide context to the H1 Development GHG Emission Footprint.

The Works

11.3.2 Baseline embedded carbon for construction relates to existing buildings on site. As discussed above, the Site is void of permanent structures, thus there are no materials from The Works to be recycled or reused and therefore the baseline embedded carbon was assumed as zero.

The Completed and Operational H1 Development

11.3.3 GHG emissions associated with repairs, maintenance and refurbishment of the baseline were assumed to be zero due to the absence of existing buildings on the Site. This provides a conservative assessment.

11.3.4 Given the Site is vacant, and in line with the IEMA guidance recommendations, a worst case assumption was used whereby the baseline transport and energy emissions were assumed to be zero.

11.3.5 A summary of the estimated baseline GHG emissions is provided in **Table 11.5**. The total assumed baseline GHG emissions were zero tonnes/annum CO₂e.

Table 11.5: Summary of Baseline GHG Emissions

Development Phase		Baseline CO ₂ e Emissions (tonnes/annum)	Comment/Rationale
Construction		0	No materials are recycled or reused.
	Repairs, Maintenance and Refurbishment	0	Assumed none, which is a conservative assumption.
Operation	Transport	0	The baseline transport emissions are assumed to be zero (worst-case assumption).
	Energy	0	The baseline energy emissions are assumed to be zero (worst-case assumption)
Total		0	Construction + Operation

11.4 Likely Effects of the H1 Development and their Significance

The Works

Embedded Carbon

11.4.1 To calculate the embedded carbon from construction, the mass of each building material has been multiplied by the corresponding ICE carbon coefficient obtained from the inventory. The calculation of the embedded carbon in the H1 Development, completed in **Table 11.6** is therefore:

Sum of Each Mass of Material (kg) x Relevant Embodied Carbon Coefficient (kgCO₂e/kg) / 1,000 = Embedded GHG (tonnes CO₂e)

Table 11.6: Calculation of GHG from Construction

Material	Mass (kg) ^a	ICE Carbon Coefficient (kgCO _{2e} /kg)	Embedded GHGs from Construction (tonnes CO _{2e})
Concrete	50,758,368	0.103	5,228
Rebar	2,974,000	1.99	5,918
Steel	3,509,000	1.27	4,456
Blockwork walls	277,830	0.093	26
Excavation	62,429,940	0.024	1,498
Insulation	41,040	1.86	76
Waterproof membrane	35,671	4.2	150
Cellcore heave board	870,581	3.29	2,864
Aluminium	319,956	6.58	2,105
Timber soffit	419,265	0.493	207
CLT	938,610	0.437	410
Paving to colonnade – granite	36,850	0.7	26
Gravel/ballast	201,960	0.079	16
Total	-	-	22,981

^a Quantities provided by the Applicant and converted to kg (see **ES Volume 3, Appendix 11.2** for further details).

11.4.2 The total embedded CO_{2e} emissions for the H1 Development from construction to practical completion are 22,981 tonnes. Based on a development lifetime of 60 years, this equates to 383 tonnes/annum.

11.4.3 Since the H1 Development is to be constructed on land that has been previously developed and does not lead to a significant loss in habitat, no land use change GHG emissions¹⁶ are assumed to occur.

Construction Traffic

11.4.4 The calculation of construction transport related GHG emissions for the H1 Development are presented in **Table 11.7**. The assessment multiplies the calculated 2020 GHG emission factors for each mode of travel (see **Table 11.3**)

¹⁶ Land use change can result in GHG emissions for example by the removal of habitats (e.g. woodland) that act as carbon sinks.

by the average annual distance travelled. Total vehicle numbers were provided by the Applicant's Transport Consultant (Buro Happold).

Table 11.7: Assessment of GHG Emissions from Construction Transport

Mode	Direction to/from Site	Trips During Construction	Distance Travelled During Construction (km) ^a	CO ₂ e Tonnes ^b
LGVs	Inbound	3,751	24,009	5.9
	Outbound	3,751	24,009	5.9
Rigid HGVs ^{c,d}	Inbound	1,899	10,635	7.1
	Outbound	1,899	10,635	9.7
Articulated HGVs ^{c,d}	Inbound	5,053	237,514	254.2
	Outbound	5,053	237,514	154.8
Total	-	21,408	544,316	437.7

Notes: ^a Total distances travelled are calculated by multiplying the number of trips by the average distances travelled by each vehicle type.

^b CO₂e emissions are calculated by multiplying distance travelled by CO₂e factors by mode from **Table 11.3**.

^c Assuming that 50% of all HGVs are articulated and 50% are rigid.

^d Assuming rigid HGVs are 0% laden inbound and 100% laden outbound, and that articulated HGVs are 100% laden inbound and 0% laden outbound.

11.4.5 The total CO₂e emissions from construction traffic for the H1 Development are 437.7 tonnes. Based on a development lifetime of 60 years, this equates to 7.3 tonnes/annum (although all of these emissions will occur in the construction phase prior to building occupation).

11.4.6 While there is the potential for there to be overlap in Works relating to the H1 Development and construction works relating to Plots H7, H11a and H11b, it is not necessary to specifically consider the potential cumulative effects as all effects of GHG emissions will occur at the global level (i.e. climate change) and not at specific local receptors. Following the IEMA guidance, the assessment only focuses on the contribution of GHG emissions from the H1 Development.

The Completed and Operational H1 Development

Repair, Maintenance and Refurbishment

11.4.7 GHG emissions relating to the repair, maintenance and refurbishment of the H1 Development over its lifetime were estimated based on the embedded construction carbon emissions and were estimated to equal 91% of the

values presented in **Table 11.6**. GHG emissions were estimated to total 20,913 tonnes, or 349 tonnes per annum (over the 60 year life of the H1 Development).

Transport

11.4.8 The assessment of transport related GHG emissions for the H1 Development in the opening year (2026) are presented in **Table 11.8**. The transport data used in the assessment was provided by the appointed Transport Consultant (Buro Happold). The assessment of transport related GHG emissions multiplies GHG emission factors published by BEIS, adjusted to the year 2026 for each mode of travel (see **Table 11.4**), by the distance travelled (obtained from the Transport Consultant), as reproduced in **Table 11.8** below.

Table 11.8: Assessment of GHG Emissions from Operational Transport

Mode	Distance per Trip (km)	Trips per Annum (two-way)	Distance Travelled per Annum (km)	CO ₂ e Tonnes (per annum) ^a
National Rail	16.6	1,540,562	25,573,329	662
Underground	11.3	959,967	10,847,627	209
Bus	5.9	878,051	5,180,501	407
Taxi	18.9	10,954	207,031	60
Motorcycle	15.9	11,838	188,224	19
Cycle	7.6	428,277	3,267,754	0
Walk	1.0	728,689	699,541	0
Total	-	4,558,338	45,964,007	1,357

Notes: ^a CO₂e emissions are calculated by multiplying distance travelled by CO₂e factors by mode from **Table 11.4**.

11.4.9 As shown in **Table 11.8**, the total transport GHG emissions are calculated as 1,357 tonnes of CO₂e per annum.

Energy Consumption

11.4.10 The CO₂ emissions from energy consumption of the H1 Development are described in the Energy Assessment which accompanies the Planning Application. It should be noted that for energy it is CO₂ emissions and not CO₂e emissions that were reported, but this is to ensure consistency with the energy strategy and Greater London Authority (GLA) policy requirements.

11.4.11 The Energy Assessment compares the H1 Development to a notional “baseline” of compliance with Part L Building Regulations. This is not used as the baseline in this GHG assessment, but it is important in demonstrating that the Development meets the CO₂ emission policy requirements of the London Plan¹⁷.

Regulated Energy Consumption

11.4.12 **Table 11.9** summarises the improvement in performance for the H1 Development for regulated CO₂ emissions, taking into account measures to address Policy SI 2 of the London Plan to be lean, be clean and be green offsets to meet the GLA target for zero carbon development and target to achieve minimum on-site carbon reductions of 35% compared to Part L of the Building Regulations for non-domestic developments.

Table 11.9: Assessment of CO₂ Emissions from Regulated Energy Consumption

Regulated Emissions	Regulated non-domestic (Tonnes CO ₂ per annum)
No energy strategy assuming Part L compliance	712
With Energy Strategy	441
% Improvement	38.1

11.4.13 **Table 11.9** shows that the H1 Development will achieve a 38.1% improvement in site-wide regulated carbon emissions over Part L 2013 compliance and therefore exceeds the Mayor’s target of more than 35% improvement.

Unregulated Energy Consumption

11.4.14 **Table 11.10** summarises the unregulated CO₂ emissions. Unregulated emissions are not subject to a policy requirement for improvement against any benchmarks, so the emissions following the application of the Energy Statement are presented.

Table 11.10: Assessment of CO₂ Emissions from Unregulated Energy Consumption

Unregulated Emissions	Unregulated non-domestic (Tonnes CO ₂ per annum)
No energy strategy assuming Part L compliance	657

¹⁷ GLA (2021) The London Plan, The Spatial Development Strategy For Greater London, Available: https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf

Total GHG Emission Footprint of the H1 Development (during the Works and once Complete and Operational)

11.4.15 **Table 11.11** and **Figure 11.1** summarise the GHG emissions for the H1 Development in the opening year for each footprint element, during the Works and once the H1 Development is complete and operational. The GHG emissions from embedded materials used in construction and emissions from construction transportation were annualised assuming a 60-year life. Annualising the embedded and construction transportation GHG emissions allows them to be compared on a like-for-like basis to the operational GHG emissions which are reported on a per annum basis.

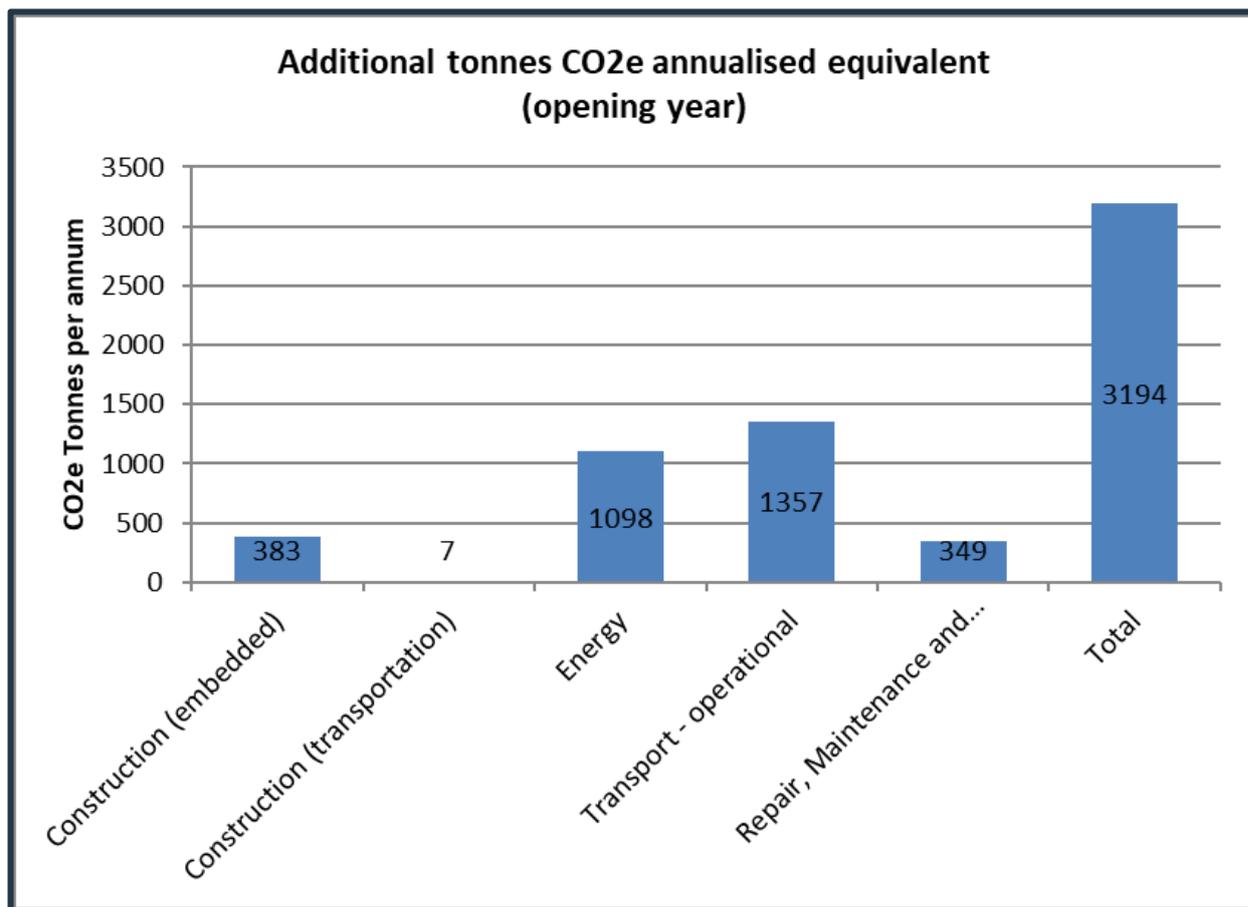
11.4.16 As shown in **Table 11.11**, the H1 Development will result in a net increase in GHG emissions in the opening year of 2026. This is the first step of the assessment of significance as described in **Section 11.2**.

Table 11.11: GHG Footprint for H1 Development in 2026 ^a

Development Phase	Footprint Element	Tonnes of CO ₂ e/annum		
		Baseline	Opening Year	Net Emissions
Construction	Embedded	0	383	383
	Transport	0	7	7
Operation	Repair, Maintenance and Refurbishment	0	349	349
	Energy	0	1,098	1,098
	Transport	0	1,357	1,357
Total		0	3,194	3,194

Notes: ^a All figures rounded to the nearest tonne.

Figure 11.1 Summary of GHG Footprint for the H1 Development



GHG Comparison

11.4.17 The second step in determining the likely significant effects is to compare the net change in GHG emissions in the opening year to Greater London and borough-wide GHG emissions. **Table 11.12** presents residual CO₂e data for the H1 Development with a comparison to CO₂ emissions data taken from the 2013 London Atmospheric Emissions Inventory for the GLA area for the year 2025 (the closest year of available data to the opening year of the H1 Development). Comparison of the GHG emissions from the H1 Development with those within Greater London shows that the H1 Development is 0.01% of total emissions in the GLA, and no more than 0.02% when looking at any individual aspect of the footprint.

Table 11.12: Comparison of H1 Development Footprint to Greater London Emissions

Development Phase	Footprint Element	Opening Year CO ₂ e Emissions (tonnes) from H1 Development	2025 CO ₂ e Emissions (tonnes) from within GLA ^a	Notes	H1 Development as % of GLA
Construction	Embedded	383	-	There is no data on embedded CO ₂ e for London	-
	Transport	7	8,799,911	Based on Road Transport	0.00008
Operation	Repair, Maintenance and Refurbishment	349	-	There is no data on embedded CO ₂ e for London	-
	Energy	1,098	11,481,204	Combined regulated and unregulated	0.01
	Transport	1,357	8,876,393	Combined data for road and rail transport	0.02
Total All Sources ^b		3,194	25,130,268	All GLA Sources	0.01

Notes: ^a The London Atmospheric Emissions Inventory data presented are for 2025.

^b Total includes sources not listed in this table.

11.4.18 In terms of borough-wide emissions, the total LBS CO₂e emissions detailed in the LEGGI for 2017 (the latest available data) is 484,501 tonnes per year. Compared to this value, the estimated 2026 CO₂e footprint for the H1 Development (3,194 tonnes) represents 0.6% of borough-wide emissions.

11.4.19 IEMA guidance makes clear that any increase in GHG emissions might be considered significant; given the H1 Development contributes to GHG, the effect is considered indirect, long-term, global significant adverse. However, for context, the emissions are a small component (approximately 0.01%) of Greater London emissions for the year 2025 and 0.6% of borough-wide emissions for the year 2017. The principles of the IEMA guidance are that where GHGs cannot be avoided, that mitigation should be provided to minimise GHGs. The mitigation is discussed in the following section.

Tertiary Mitigation

11.4.20 The final stage of assessment of significance is to consider the GHG emissions in the context of the proposed mitigation and relevant policy targets.

11.4.21 As above, the proposed H1 Development will result in additional GHG emissions compared to the baseline and there will be GHG emissions in the opening year of 2,617 tonnes per annum. Consequently, the following mitigation measures will be implemented to avoid, reduce and compensate the GHG emissions during construction and throughout the lifetime of the H1 Development, however, given it is not possible to quantify the success of the mitigation measures and GHG emissions would still be generated by the H1 Development. As a worst-case it is assumed a net increase in GHG emissions against the baseline GHG emissions (as 2,617 tonnes per annum) will remain.

The Works

Construction Materials

11.4.22 Reducing GHG emissions during the construction phase would include consideration of minimising the use of materials as well as the procurement of sustainable materials, with consideration of the embedded carbon footprint of the material from the extraction of the raw materials, the production of the final construction products and the transport of products between the factory and the H1 Development.

Construction Waste

11.4.23 The Applicant has developed a Site-specific Construction Environmental Management Plan (CEMP) which is provided at **Appendix 6.1**. The CEMP details control measures and activities to be undertaken to minimise environmental effects, including matters regarding waste management, as well as energy and water usage.

11.4.24 A Construction Waste Management Plan (CWMP) would be prepared and submitted as committed to through the CEMP, which would contain measures to minimise waste generation, opportunities for reuse and recycling, and consideration of alternatives to removing waste by methods other than by road.

Construction Site Energy, Plant and Machinery

11.4.25 In terms of machinery, plant use, and site energy usage, energy consumption monitoring and reduction plans would be in place and all relevant contractors would be required to investigate opportunities to minimise and reduce the use of energy so as to avoid excessive energy consumption and resulting GHG emissions. This may include measures such as use of low emission or electric plant and machinery, on site engine idling policy and energy efficient site lighting. During site establishment, small power operations and tower crane and hoist use would utilise grid-generated electrical energy.

Construction Traffic

11.4.26 To dissuade construction staff from arriving on-site via private motorised vehicles, no car parking would be available, and construction staff would be advised against parking off-site. Walking, cycling and other sustainable forms of transport would be promoted, and pedestrian site access would be segregated from the road by physical barriers to ensure safety upon arrival and departure. In terms of construction transport, an Outline Construction Logistics Plan (CLP) forms part of the Transport Assessment which accompanies the Planning Application. The CLP

sets out the measures to reduce the environmental impact from the construction stage and to optimise the efficient delivery and collection of goods and materials to the Site.

The Completed and Operational H1 Development

Transport

11.4.27 A Travel Plan was developed for the H1 Development and accompanies the Planning Application. The Travel Plan sets out the measures to be adopted to encourage use of sustainable modes of transport to and from the H1 Development.

11.4.28 The following measures are proposed to influence sustainable travel behaviour from the H1 Development:

- Provision of circa 855 cycle parking spaces within the basement levels, including Sheffield stands and folding bike lockers, and 96 spaces scattered throughout the public realm aspect of the Site, which meets the requirements of the London Plan;
- Provision of pedestrian and cycle routes; and
- Accessible car parking spaces, which meets the requirements of the London Plan.

Energy Consumption

11.4.29 The H1 Development would achieve an overall total on-site regulated carbon reduction of 38.1% relative to Part L of the Building Regulations which meets the requirements of the London Plan (as a target to achieve minimum on-site carbon reductions of 35% compared to Part L of the Building Regulations for non-domestic development). To achieve the reductions, the following measures have been included in the Energy Assessment:

- Connection to the existing Elephant Park District Heating Network;
- Heat recovery on mechanical ventilation and air handling plant;
- Use of highly efficient lighting; and
- Construction using a high-performance insulated fabric with low air permeability (e.g. low thermal transfer glazing).

Policy Intervention

11.4.30 The H1 Development meets the requirements of the London Plan, with a reduction of more than 35% in regulated emissions when compared to the Part L of the Building Regulations Part L baseline.

11.4.31 As detailed in **Section 11.2**, the UK adopted a net zero target to be achieved no later than 2050, with UK government legally mandated to take steps across the economy to meet this target. This will include measures to decarbonise UK power supply as well as ground transportation, the effects of which it is reasonable to assume will be to reduce the longer term operational GHG emissions associated with the H1 Development to zero by 2050.

Significance of the GHG Emission Footprint of the H1 Development (during the Works and once Complete and Operational)

11.4.32 Whilst in the context of regional GHG emissions (as 0.01% of total emissions in the Greater London and 0.5% of borough-wide emissions) the emissions are small, the IEMA guidance makes clear that any increase in GHG emissions should be considered significant. To be consistent with the significance of effects as detailed throughout the ES, an indirect, long-term, global significant adverse effect is predicted. However, the above comparison against the Greater London and borough-wide GHG emissions should be considered when determining the overall effect.

11.5 Additional Mitigation / Enhancement and Likely Residual Effects of the H1 Development and their Significance

11.5.1 Mitigation measures are included within the H1 Development, during the Works and once the H1 Development is complete and operational to reduce GHG emissions. These measures follow best practice and are in accordance with relevant local, regional and national policy on climate change. It is therefore judged that although there are effects, these have been minimised through an appropriate degree of mitigation consistent with best practice and IEMA guidance. As such no further mitigation measures are proposed and the residual effects remain as indirect, long-term, global significant adverse.

11.6 Likely Residual Cumulative Effects and their Significance

11.6.1 As above, the H1 Development would have residual GHG emissions in the opening year. With regards to cumulative schemes, the IEMA guidance is clear that any GHG emissions are considered significant, but it is important to acknowledge that significant effects from climate change relate to cumulative global GHG emissions from all sources driving up atmospheric temperatures (i.e. global GHG emissions) and do not relate to a direct effect resulting from a small additional GHG contribution associated with the H1 Development. As such, with cumulative schemes, the residual effect above remains, as an indirect, long-term, global significant adverse effect.

11.7 Conclusions

11.7.1 The GHG emissions associated with the Works and the Completed and Operational H1 Development were estimated and the significance of resultant effects were assessed.

11.7.2 The assessment took a whole life approach to develop a GHG footprint for the H1 Development, including emissions associated with construction materials, additional construction and operational traffic movements, operational energy consumption and ongoing repair, maintenance and refurbishment activities. The maximum carbon footprint of the completed and operational H1 Development was calculated to provide a conservative assessment.

- 11.7.3 The GHG assessment has identified that the H1 Development will lead to GHG emissions, throughout its lifetime. However, the H1 Development's individual contribution to total Greater London and borough-wide GHG emissions is small. In addition, mitigation is provided to avoid and reduce the GHG emissions, including the H1 Development meeting the requirements of the London Plan, with a reduction of more than 35% in regulated emissions when compared to the Part L of the building regulations baseline.
- 11.7.4 The cumulative effects assessment has identified that the conclusions will not change or be worse than that of the main assessment.
- 11.7.5 Based on the above, it is therefore judged that although there are effects, these have been minimised through an appropriate degree of mitigation consistent with best practice and IEMA guidance.

12. Effect Interactions

12.1 Introduction

12.1.1 This Chapter presents an assessment of the likely significant effect interactions of the H1 Development; that is, the likely combination of significant environmental effects generated by the H1 Development in isolation upon a particular receptor or group of receptors. Effect interactions generated by the H1 Development were considered for the Works and the completed and operational H1 Development.

12.1.2 This Chapter, prepared by Avison Young, was informed by all assessments undertaken as part of the Environmental Impact Assessment (EIA) and subsequently reported in the Environmental Statement (ES). As such, this Chapter draws from information contained in **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**.

12.1.3 It should be noted that effect interactions are commonly referred to as a type of 'cumulative effect'. However, as outlined in **ES Volume 1, ES Chapter 2: EIA Methodology**, the likely cumulative effects of the H1 Development with other Cumulative Schemes per environmental topic area scoped into the ES (different to 'effect interactions') are considered separately within **ES Volume 1, Chapter 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**.

12.2 Assessment Methodology and Significance Criteria

Assessment Methodology

12.2.1 There are no established methodologies for assessing, qualifying or quantifying the interaction of effects from a particular project upon a receptor or group of receptors. However, the following method was employed, based upon professional judgement, experience and a review of other similar assessments undertaken to inform recently published ESs for urban regeneration projects:

- A review of **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects** to establish:
 - The range of likely significant residual effects arising from the Works and the completed and operational H1 Development in isolation.
 - The receptor or group of receptors affected by the identified likely significant residual effects of the Works and the completed and operational H1 Development in isolation.
- Tabulation of the above, thereby allowing for the identification of receptors, or groups of receptors, that would experience multiple likely significant residual environmental effects.

12.2.2 Only likely significant residual effects were considered in this assessment. This is owing to the following:

- Insignificant effects would have no potential to interact with any other likely residual effects.
- The reasonable assumption that all Primary and Tertiary Mitigation and additional (Secondary) Mitigation referred to in **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects** would be implemented.

Significance Criteria

12.2.3 The significance of each individual likely significant environmental effect was defined according to the methodologies outlined in **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**. However, once again, there are no accepted methodologies which allow for the establishment of the relative significance of effect interactions. This is partially due to the fact that the assessment of effect interactions do not compare 'like effects' with 'like effects'.

12.2.4 In view of the above, this assessment can only identify the range of likely significant residual environmental effects (and their significance as defined in **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**) upon a particular receptor or group of receptors. In order to undertake a worst-case scenario assessment, it was assumed that the combination of two or more significant residual effects from two or more environmental topics (i.e. **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**) upon a particular receptor or group of receptors would constitute a **significant** effect interaction.

12.3 Likely Residual Effect Interactions of the H1 Development and their Significance

The Works

12.3.1 **Table 12.1** summarises all likely significant residual effects associated with the Works, as identified in **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**. **Table 12.1** also identifies the receptor or groups of receptors affected by the significant residual effects.

Table 12.1: Likely Significant Residual Effects of the Works

Topic and Type of Significant Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
Wind Microclimate (WM)		
<i>No significant residual effects associated with the Works.</i>		
Daylight, Sunlight and Overshadowing (DSO)		
<i>No significant residual effects associated with the Works.</i>		
Greenhouse Gasses (GHG)		
GHG1 – Greenhouses Gas emissions associated with the Works.	Indirect, long-term, global effects, adverse in nature.	Global atmosphere.
Townscape, Visual and Above Ground Heritage		
TVAGH1 – Temporary visual intrusion during the Works on townscape character.	Direct, temporary, short-term, local level effects, minor to moderate in scale and adverse in nature.	Local townscape character surrounding the Site.
TVAGH2 – Temporary visual intrusion during the Works on close local views.	Direct, temporary, short-term, local level effects, moderate in scale and adverse in nature.	Local views towards the Site, such as View 14 from the Elephant Road to the north of the Site, View 16 from Walworth Road to the south-west and View 17 from the southern end of the Elephant and Castle junction.
TVAGH3 – Temporary visual intrusion during the Works on medium distance views.	Direct, temporary, short-term, local level effects, minor in scale and adverse in nature.	Medium distance views towards the Site, such as View 9 from Penton Place, View 10 from Brook Drive and View 15 from Rodney Place.

12.3.2 **Table 12.2** reorganises the results of **Table 12.1** so that the full range of likely residual environmental effects arising from the Works upon specific receptors or groups of receptors can be easily identified. As noted earlier in this Chapter, the combination of two or more significant residual effects from two or more environmental topics upon a particular receptor or group of receptors was judged as a **significant** effect interaction.

Table 12.2: Likely Significant Effect Interactions of the Works

Receptor / Group of Receptors Affected	Likely Significant Residual Effects of the Works	Would Significant Effect Interactions be Experienced?
Global atmosphere.	GHG1.	No.
Local townscape character surrounding the Site.	TVAGH1.	No.
Local views towards the Site.	TVAGH2.	No.
Medium distance views towards the Site.	TVAGH3.	No.

Notes:

GHG1 - **Indirect, long-term, global** effects, **adverse** in nature.
 TVAGH1 - **Direct, temporary, short-term, local level** effects of **minor to moderate adverse significance**.
 TVAGH2 - **Direct, temporary, short-term, local level** effects of **moderate adverse significance**.
 TVAGH3 - **Direct, temporary, short-term, local level** effects of **minor adverse significance**.

12.3.3 **Table 12.2** demonstrates that significant residual effect interactions attributable to the Works would not be anticipated because likely significant environmental effects at a receptor / group of receptors have not been identified in relation to more than one topic and type of residual effect.

The Completed and Operational H1 Development

12.3.4 **Table 12.3** summarises all likely significant residual effects associated with the completed and operational H1 Development, as identified in **ES Volume 1, Chapters 7 to 11** inclusive and **ES Volume 2 - Townscape, Visual and Above Ground Heritage Effects**. **Table 12.3** also identifies the receptor or groups of receptors affected by the significant residual effect.

Table 12.3: Likely Significant Residual Effects of the Completed and Operational H1 Development

Topic and Type of Significant Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
Socio-economics (SE)		
SE1 - Creation of new local (direct) jobs resulting from the completed and operational H1 Development.	Direct, long-term, district level effects of minor beneficial significance .	The existing residents, future businesses and the district economy.
SE2 - The provision of office floorspace.	Direct, long-term, district level effects of major beneficial significance .	The district economy.

Topic and Type of Significant Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
SE3 - The provision of affordable workspace.	No effect to direct, long-term, district level effects of major beneficial significance.	The district economy.
SE4 – The provision of retail floorspace within the flexible land uses.	No effect to direct, long-term, district level effects of moderate beneficial significance.	The district economy.
SE5 – The provision of Food & Beverage floorspace within the flexible land uses.	No effect to direct, long-term, local and district level effects of moderate beneficial significance.	The local and district economy.
SE6 – The provision of health floorspace within the flexible land uses.	No effect to direct, long-term, district level effects of major beneficial significance.	The existing and future residents and the district economy.
SE7 - The creation of new and enhanced public realm and amenity space.	Direct, long-term, local level effects of major beneficial significance.	The local economy.
Air Quality (AQ)		
<i>No significant residual effects associated with the completed and operational H1 Development.</i>		
Wind Microclimate (WM)		
WM1 - Long-term changes in the local wind environment as a result of the completed H1 Development.	Insignificant to direct, long-term, local effects of minor to moderate beneficial significance.	On-site future pedestrian users of the Site using on-Site entrances and thoroughfares.
Daylight, Sunlight and Overshadowing (DSO)		
DSO1 - Long-term changes to the duration and quantum of daylight to existing residential properties surrounding the Site (including those within the Approved Development) as a result of the completed H1 Development.	Direct, long-term, local effects of minor to major adverse significance.	<p>The following receptors surrounding the Site would experience major adverse effects:</p> <ul style="list-style-type: none"> 82, 84, 88, 92, 94-96 Walworth Road. <p>The following receptors surrounding the Site would experience minor to moderate adverse effects:</p> <ul style="list-style-type: none"> Mawes House. <p>The following receptors surrounding</p>

Topic and Type of Significant Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
		<p>the Site would experience minor adverse effects:</p> <ul style="list-style-type: none"> • Julian Markham House (Student Accommodation). • Portchester House (Student Accommodation). • Strata Tower. • Tantallon House. <p>The following receptor within the Approved Development would experience major adverse effects:</p> <ul style="list-style-type: none"> • H2. <p>The following receptor within the Approved Development would experience moderate adverse effects:</p> <ul style="list-style-type: none"> • H7. <p>The following receptor within the Approved Development would experience minor adverse effects:</p> <ul style="list-style-type: none"> • H4.
<p>DSO2 - Long-term changes to the duration and quantum of sunlight to existing residential properties surrounding the Site (including those within the Approved Development) as a result of the completed H1 Development.</p>	<p>Insignificant to direct, long-term, local effects of minor adverse significance.</p>	<p>The following receptor surrounding the Site would experience minor adverse effects:</p> <ul style="list-style-type: none"> • Tantallon House. <p>The following receptors within the Approved Development would experience minor adverse effects:</p> <ul style="list-style-type: none"> • H4. • H7.

Topic and Type of Significant Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
DSO3 - Long-term changes to solar glare at sensitive viewpoints (road users and train drivers) surrounding the Site (including those within the Approved Development) as a result of the completed H1 Development.	Insignificant to direct, long-term, local effects of minor adverse significance.	<p>The following road user viewpoints would experience minor adverse effects:</p> <ul style="list-style-type: none"> • N5A and N5B. • N6. • SW3. <p>The following train driver user viewpoints would experience minor adverse effects:</p> <ul style="list-style-type: none"> • Track 1.
Greenhouse Gasses (GHG)		
GHG2 – Greenhouses Gas emissions associated with the completed and operational H1 Development.	Indirect, long-term, global effects, adverse in nature.	Global atmosphere.
Townscape, Visual and Above Ground Heritage (TVAG)		
TVAGH4 – Changes to the townscape character, context and quality of the Site and its surrounds and resultant effects on identified townscape character areas.	Insignificant to direct, long-term, local effects, minor to moderate in scale and beneficial in nature.	<p>The following Townscape Character Areas (TCAs) would experience insignificant to minor effects:</p> <ul style="list-style-type: none"> • TCA8 Newington Butts. • TCA9 Kennington. <p>The following Townscape Character Areas (TCAs) would experience insignificant to moderate effects:</p> <ul style="list-style-type: none"> • TCA1 Walworth. • TCA2 Elephant and Castle Town Centre. • TCA6 Walworth Road Corridor. • TCA7 Pullens.

Topic and Type of Significant Residual Effect	Likely Significance of Residual Effect	Receptor / Group of Receptors Affected
TVAGH5 – Effects upon a selection of non-statutory short, medium and long-range views (including the visual amenity experienced by people within the views) due to the presence of the completed and operational H1 Development.	Insignificant to direct, long-term, local effects, minor to moderate in scale and beneficial in nature.	<p>The following Views would experience insignificant to minor effects:</p> <ul style="list-style-type: none"> View 12 St George's Circus. <p>The following Views would experience minor effects:</p> <ul style="list-style-type: none"> View 7 Walworth Road. View 10 Brook Drive. View 11 St George's Road. <p>The following Views would experience moderate effects:</p> <ul style="list-style-type: none"> View 9 Penton Place. View 14 Elephant Road. View 16 and 16N Walworth Road. View 17 St Mary's Churchyard.

12.3.5 **Table 12.4** reorganises the results of **Table 12.3** so that the full range of likely residual environmental effects arising from the completed and operational H1 Development upon specific receptors or groups of receptors can be easily identified. As noted earlier in this Chapter, the combination of two or more significant residual effects from two or more environmental topics upon a particular receptor or group of receptors was judged as a **significant** effect interaction.

Table 12.4: Likely Significant Effect Interactions of the Completed and Operational H1 Development

Receptor / Group of Receptors Affected	Likely Significant Residual Effects of the Completed and Operational H1 Development	Would Significant Effect Interactions be Experienced?
The district economy.	SE1, SE2, SE3, SE4, SE5 and SE6.	Yes, however they would be beneficial.
The local economy.	SE5 and SE7.	Yes, however they would be beneficial.
Residential Population	SE1 and SE6.	Yes, however they would be beneficial.
Future Businesses	SE1.	No.

Receptor / Group of Receptors Affected	Likely Significant Residual Effects of the Completed and Operational H1 Development	Would Significant Effect Interactions be Experienced?
On-site future pedestrian users of the Site using on-Site entrances and thoroughfares.	WM1.	No.
Sensitive receptors surrounding the Site.	DSO1, DSO2 and TVAGH5.	Yes, including the following receptors within the area surrounding the Site: <ul style="list-style-type: none"> Mawes House and Tantallon House. H2 within the Approved Development.
Sensitive receptors within the Approved Development.	DSO1 and DSO2.	Yes, for the following receptors within the Approved Development <ul style="list-style-type: none"> H4 and H7.
Road and rails users.	DSO3.	No.
Global atmosphere.	GHG2.	No.
Townscape Character Areas (TCAs).	TVAGH4.	No.
Non-statutory short, medium and long-range views.	TVAGH5.	No.

Notes:

SE1 -	Direct, long-term, district level effects of minor beneficial significance .
SE2 -	Direct, long-term, district level effects of major beneficial significance .
SE3 -	No effect to direct, long-term, district level effects of major beneficial significance .
SE4 -	No effect to direct, long-term, district level effects of moderate beneficial significance .
SE5 -	No effect to Direct, long-term, local and district level effects of moderate beneficial significance .
SE6 -	No effects to direct, long-term, district level effects of major beneficial significance .
SE7 -	Direct, long-term, local level effects of major beneficial significance .
WM1 -	Direct, long-term, local effects of minor to moderate beneficial significance .
DSO1 -	Insignificant to direct, long-term, local effects of minor to major adverse significance .
DSO2 -	Insignificant to direct, long-term, local effects of minor adverse significance .
DSO3	Insignificant to direct, long-term, local effects of minor adverse significance .
GHG2 -	Indirect, long-term, global effects, adverse in nature.
TVAGH4 -	Insignificant to direct, long-term, local effects of minor to moderate beneficial significance .
TVAGH5 -	Insignificant to direct, long-term, local effects of minor to moderate beneficial significance .

12.3.6 **Table 12.4** demonstrates that significant adverse residual effect interactions attributable to the completed and operational H1 Development would be limited to the following:

- Properties to the north of the Masterplan Site, including Mawes House and Tantallon House, and to the south, including H2, would experience significant effect interactions between changes to daylight levels, sunlight levels and changes to their visual setting. Mawes House would experience alterations in daylight, however, predominantly kitchens, bathrooms and bedrooms would be affected, which are less sensitive. For

Tantallon House, the retained levels of daylight are commensurate with the existing levels in the surrounding area and are considered acceptable for a high-density urban location. For H2, reductions in daylight experienced are not unusual given the cleared nature of the Site and its urban context. With regards to changes to visual setting, these would be beneficial, as described for View 14: Elephant Road which is located to the north of the Masterplan Site and View 16: Walworth Road, located to the south of the Masterplan Site. Accordingly, residual effects interacting at the same time would not result in a worsened adverse effect. Considering this, together with the acknowledgement of the wider regeneration of the surrounding area, no additional mitigation was considered necessary.

- **Buildings H4 and H7 within the Approved Development** would experience significant effect interactions between changes to daylight and sunlight. However, this is not unusual given the cleared nature of the Site and its urban context. As such, no additional mitigation was considered necessary.

12.3.7 No further significant residual effect interactions would be anticipated for the completed and operational H1 Development.

12.4 Conclusions

12.4.1 There would be no significant residual effect interactions during the Works. Significant residual effect interactions during the completed and operational H1 Development would be extremely limited, comprising:

- **Properties to the north of the Masterplan Site, including Mawes House and Tantallon House** - alterations of internal daylight and sunlight environments and changes to their visual setting.
- **Buildings H4 and H7 within the Approved Development** - alterations of internal daylight and sunlight environments.

12.4.2 Considering the above, no additional mitigation would be required to address significant effect interactions during either the Works or the completed and operational H1 Development.

